



# CENTRAL HUDSON GAS & ELECTRIC 2019-2023 CORPORATE CAPITAL FORECAST JULY 1<sup>st</sup> 2018



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## EXECUTIVE SUMMARY

This document presents the comprehensive Capital Expenditure Plan for the electric and gas transmission and distribution systems and common program areas of Central Hudson Gas & Electric Corporation (Central Hudson or Company) for the period 2019 through 2023 (Capital Plan). This Capital Plan positions Central Hudson to continue to provide safe and reliable service to customers. This Capital Plan is consistent with the mission statement of the Company as shown below:

“Central Hudson's mission is to deliver electricity and natural gas to an expanding customer base in a safe, reliable, courteous and affordable manner; to produce growing financial returns for shareholders; to foster a culture that encourages employees to reach their full potential; and to be a good corporate citizen.”

This Capital Plan outlines forecasted expenditures of \$543 million in the electric delivery system, \$300 million in the gas delivery system and \$259 million in common program areas over the five - year period. The projects and programs proposed in this Capital Plan are what the Company has determined is needed to deliver safe and reliable service to customers. The Company is continually re-evaluating and reprioritizing projects, and the latter years of this Capital Plan will likely change as a result of these reevaluations and assessments. The Capital Plan is developed annually consistent with the Company's Capital Prioritization Process Guidelines.

The 5-Year Capital Plan contains projects which will help achieve Central Hudson's strategic objective of providing exceptional value to our Stakeholders by:

- **Business Modernization:** Modernizing our business through electric and natural gas system investments and process improvements.
- **Operational Excellence:** Continuously improving our performance while maintaining cost effective and efficient operations.
- **Energy Leadership:** Advocating on behalf of customers and other stakeholders.
- **Organizational Development:** Investing in programs and employee development to position the organization for continued success in the future.

### *Capital Forecast – Additions*

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>TOTAL</u>
ELECTRIC	\$ 96,820	\$ 98,973	\$ 99,665	\$ 101,785	\$ 101,340	\$ 498,583
GAS	56,758	55,698	58,483	59,936	60,558	291,433
COMMON	<u>61,085</u>	<u>48,343</u>	<u>51,592</u>	<u>57,587</u>	<u>40,713</u>	<u>259,320</u>
CORPORATE TOTAL	<u>\$ 214,663</u>	<u>\$ 203,014</u>	<u>\$ 209,740</u>	<u>\$ 219,309</u>	<u>\$ 202,611</u>	<u>\$ 1,049,336</u>

## Capital Forecast – Removal

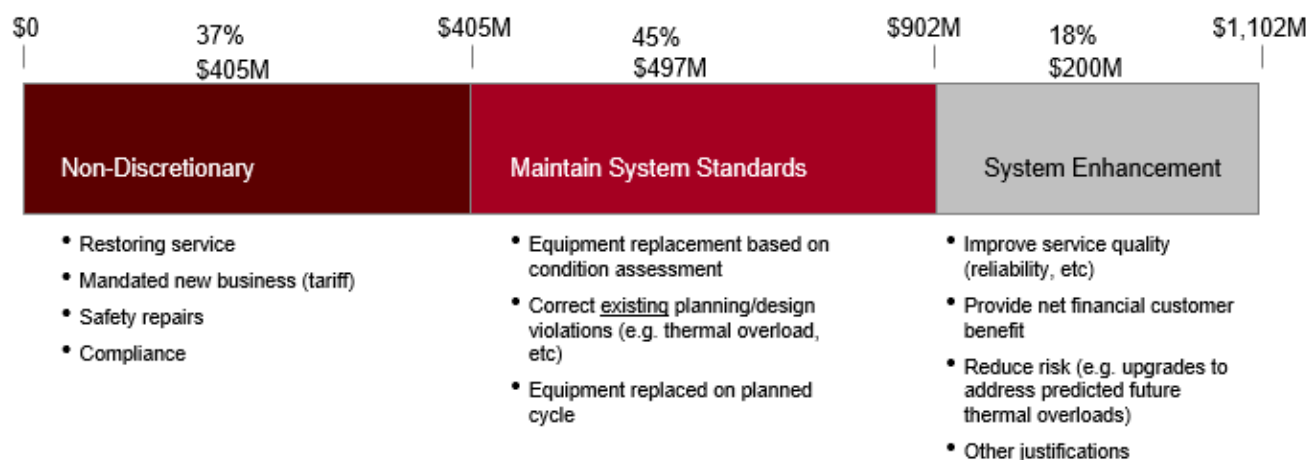
	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>TOTAL</u>
ELECTRIC	\$ 7,658	\$ 9,116	\$ 8,883	\$ 9,233	\$ 9,362	\$ 44,252
GAS	1,746	1,746	1,826	1,831	1,841	8,991
COMMON	<u>(169)</u>	<u>(162)</u>	<u>(181)</u>	<u>(138)</u>	<u>(12)</u>	<u>(661)</u>
CORPORATE TOTAL	<u>\$ 9,235</u>	<u>\$ 10,701</u>	<u>\$ 10,528</u>	<u>\$ 10,926</u>	<u>\$ 11,192</u>	<u>\$ 52,582</u>

## Introduction

Central Hudson’s Corporate Capital Forecast continues to increase at a modest rate and with the addition of several large multi-year capital initiatives being presented this year, the capital plan now totals \$1,102 million in capital expenditures over the five year period 2019-2023. This total represents 1.3% compound average growth rate (CAGR) over the 5-year period. The growth is coming from the gas program forecast driven by the continuation of the Leak Prone Pipe program expenditures and the common program driven by increases in IT software needs, a planned training facility and additional office space.

## 5-Year Corporate Capital Forecast Summary

A breakdown of the Capital Forecast is shown below indicating the level of spending as they have been prioritized by their summary categories. Non-discretionary is the level spending that is necessary to meet the minimum standards of service or compliance with Public Service Law. Maintaining System Standards is the level of spending required to maintain our current level of service reliability and safety or to meet obligations set through the rate proceedings. System Enhancement is capital spending aimed at improving our quality of service, reducing risk, or reducing operating costs.





The System Enhancement Capital Spending has been further segregated into the following categories:

- **Projects with a Net Financial Customer Benefit**
  - Projects Revenue requirement of the capital investment is lower than the net benefit (e.g. cost savings) for customers
  - Reduces customer bills in the long term (after next rate case)
  - Increases earnings both short term and long term
- **Projects that Reduce Risk**
  - Investment reduces the risk of a system failure that would:
    - Reduce potential public safety at risk
    - Result in widespread incident, impacting system integrity
    - Spur significant punitive regulatory action
- **Projects that Improve Reliability**
  - Investment improves reliability at a cost that (we believe) customers are willing to pay
  - Demonstrate that increased cost is warranted by the improvement in service quality (benchmark and compare cost per customer outage avoided).
- **Other Projects**
  - Projects that do not clearly fit in the other categories, but can be justified for other reasons
  - Requires detailed individual business case
  - Demonstrate a clear strategic rationale
  - Show financial projections (customer bill impact and earnings impact)
  - Assess risks (regulatory disallowance, etc)

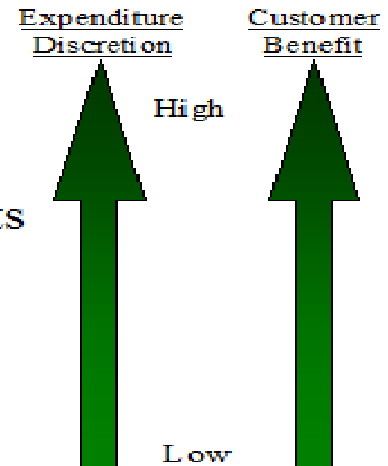
Each year, Central Hudson, through its planning and forecasting processes develops a recommended Capital Expenditures Budget for the upcoming fiscal year as well as a forecast for upcoming five-year period.

The corporate capital forecast is developed through a bottom up process where planning studies, infrastructure issues, compliance requirements, and other corporate initiatives identify specific capital needs. Following the Company's Capital Prioritization Process Guidelines, these needs are prioritized based on whether the need is non-discretionary (mandated or otherwise not optional), required to maintain the existing level of service or reliability, or a system or service enhancement. In addition to the costs of the projects, the timing of the projects is also analyzed to determine the most appropriate time for the capital investment to be made either due to load growth, risk of failure, or business need.

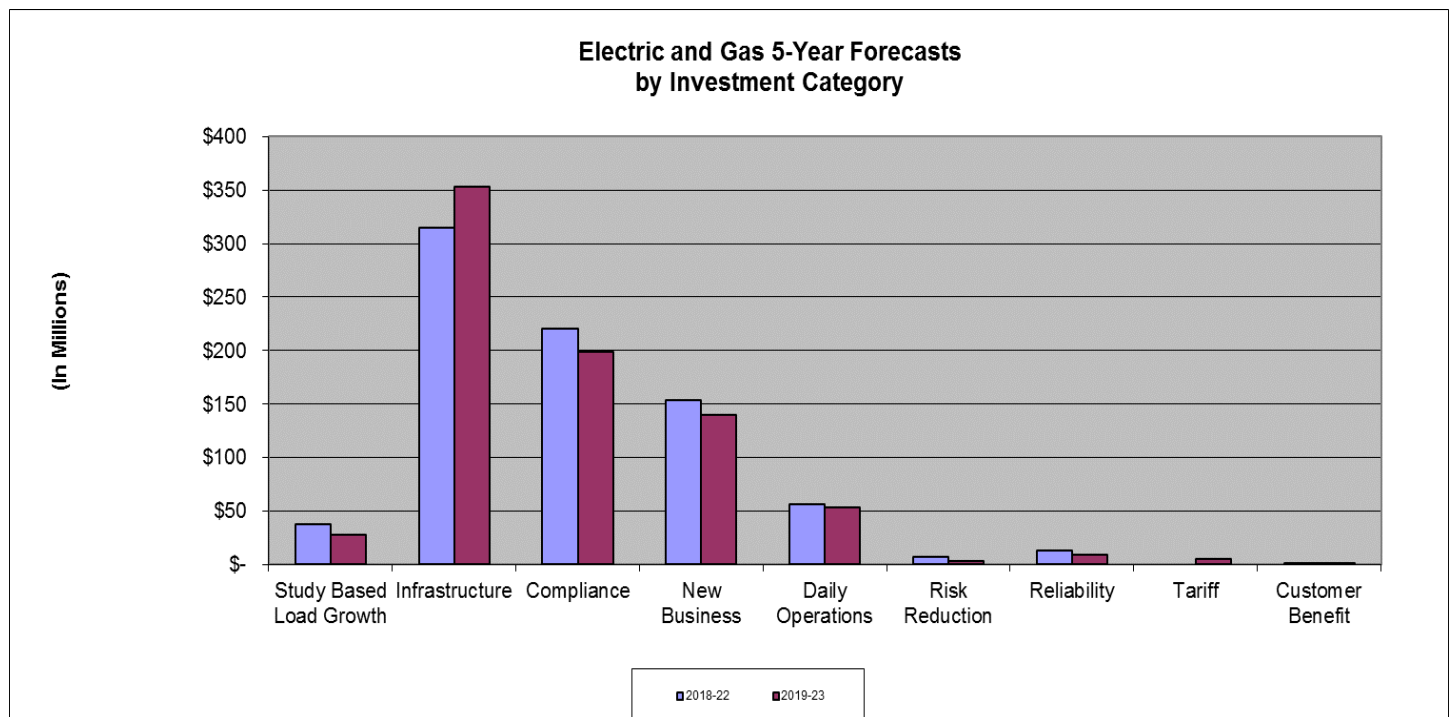
In addition to the summary categories, the needs are prioritized based on the investment categories shown below. It should be noted that those projects with the least amount of discretion also have the least amount of benefit for customers in terms of improving their level of service quality or reducing operating costs. It is important that we continue to develop sound justifications for the system enhancement projects since they do provide the most benefit to customers.

## Categories of System Capital Investments

- System Expansion/Enhancement
- Study Based Load Growth
- Infrastructure/Planned Replacements
- New Business/Customer Additions
- Compliance
- Daily Operations/Repairs and Unplanned Replacements



As can be seen in the comparative graph on the next page load growth related projects represent a very small percentage of the expenditures in the Capital Plan. The major driver of investment continues to replacing infrastructure based on condition with the most significant uptick in expenditures is for the Leak Prone Pipe program.



On the electric side, the Distribution Automation Program is a major continuing initiative that has been included in the 5-year forecast. Central Hudson began implementing its integrated Smart

Grid strategy in 2015. This program includes implementing a Distribution Management System (DMS) to improve reliability, system safety, and system efficiency. We are creating detailed electric models in the ESRI Geographic Information System to be used as the asset database. Intelligent Electronic Devices (e.g. electronic reclosers, switched capacitors, and voltage regulating devices) and sensors are being installed that will provide real time data to the DMS so that it can become a centralized decision maker based on current system conditions rather than anticipated peak loads, as well as predicted conditions in future hours. Concurrent with system wide implementation, there is a large infrastructure improvement plan to create robust mainline feeders that can be looped through switching to restore customers after an outage or optimize and balance feeders during normal operations as well as improve hosting capacity. Voltage control and switching restoration modules that will be included in the DMS are consistent with the REV policy goals of improving efficiency, reliability, and resiliency. Upon site acceptance testing, the system will consider the impact of Distributed Energy Resources (DERs) in switching and voltage optimization decisions utilizing generation profiles. The DMS is being developed so DERs can be integrated into the system for monitoring and control through additional modules as needed. The remaining 5-year cost of the Distribution Automation component of this program is \$31.1 million.

The single largest component of the gas capital program is the Leak Prone Pipe (LPP) replacement projects. Central Hudson operates 1,287 miles of distribution main, which currently includes 181 miles of LPP. Over the three years period of 2013 – 2015 an average of 6.4 miles of leak prone pipe had been replaced annually. In 2016 and 2017, 18 and 19 miles of leak prone pipe were eliminated, respectively. For 2018 it is projected that we will eliminate 20 miles LPP. Expenditures are tracked monthly using the Operations Report. The main replacement projects are identified and prioritized using the GL Main Replacement Prioritization Program (MRP) which develops a risk ‘score’ based on pipe and operating characteristics such as material, operating pressure, age, diameter, leak history, location (proximity to buildings, business district, flood prone areas) and, cathodic protection status. This risk score measures the relative likelihood and the consequences of a leak associated with each pipeline segment. In addition Subject Matter Expert (SME’s) input review and planned highway rebuilds are taken into consideration when developing the proposed main replacement project listing.

Accelerating the replacement of leak prone distribution pipe is driven by a number of factors, including recent events in the Northeast experienced by utility operators of similar systems receiving nationwide attention and a renewed focus on pipeline safety by government and regulators, coupled with the internal need to meet Public Service Commission rate case safety metrics and to a much lesser extent the reduction of operating and maintenance costs associated with leak inventory. The total for cast iron and unprotected steel main replacement is \$153 million in the 5-year forecast (average annual expenditure of \$31M). By increasing current annual expenditures on replacement of leak prone pipe with the most risk, the current replacement program will result in the elimination of all leak prone pipe within the next 9 - 11 years.

The Gas New Business plan reflects a significant reduction from the prior forecast recognizing the fact that the Company is dramatically reducing its gas expansion program.

The Common Capital Forecast consists of following categories; Land and Buildings, Office Furniture, Tools & Equipment, Transportation, and Information & Technology. Land & Buildings capital forecast comprises several significant projects including the South Rd office building, Kingston office space buildout, training, as well as system operation center, and infrastructure replacement

projects due to age or equipment failures. The Tools forecast consists of replacements driven by the replacements of the vehicles they are utilized on, obsolescence and incompatibility, decreased reliability, discontinued manufacturer support, and conformance to changing OSHA or other regulations. Transportation capital forecast is built primarily on the replacement of vehicles and equipment base on industry standard replacement criteria. The IT Capital Budget consists of investments for business driven software implementations, upgrades to existing software solutions, and infrastructure or hardware lifecycle upgrades and ongoing extensions resulting from corresponding software updates or implementations. Significant detail regarding out IT expenditures plan is included in the Common program section.

## **Resource Needs of Future Program**

Central Hudson will face the following opportunities and challenges as we implement this Capital Plan.

On the electric side, the Company will need to continue to develop enhanced competencies in both asset management as well as centralized distribution system operations. Improvements are being made to the System Planning Process with a transition in forecasting methodologies and application of a more probabilistic approach to integrate DERs into the risk and growth profiles. This process will encompass both how we determine asset replacements and the methods used to optimize the portfolio of projects and programs. To ensure that the Plan proceeds in the most optimal fashion, the Company will need to reassess the timing and reprioritize projects using both these improved asset management approaches and the understanding of system needs. Planning shall remain as a core competency for the Company.

On the gas side of the business, the accelerated replacement of leak prone distribution piping, enhancements on the transmission system, and regulator station upgrades and replacements requires detailed project prioritization and system planning. Additionally, engineering design, permitting, estimating and field construction management and oversight resources will be required to maintain the high degree of safety, and quality installations occurring today.

With regard to construction, it is envisioned that the bulk of the incremental electric and gas transmission and distribution construction will be performed by contracted resources. Although there is an increase in the amount of capital construction, it is not so large an increase as to give any concern that contract resources would not be available to complete the work. Consideration for additional field oversight for this construction work will also likely be needed and these resources in the Customer Services Group would charge their labor to capital.



## ELECTRIC PROGRAM SUMMARY

### Electric System Overview

The Central Hudson electric system serves approximately 300,000 electric customers in New York State's Mid-Hudson River Valley. Central Hudson electric service territory extends from the suburbs of metropolitan New York City north to the Capital District at Albany.

The Central Hudson system is comprised of substations having an aggregate transformer capacity of approximately 5.0 million kilovolt amps, a transmission system consists of 596 circuit miles and a distribution system consists of 7,174 pole miles of overhead lines and 1,565 trench miles of underground lines, as well as customer service lines and meters.

The transmission system operates at voltages of 69 kilovolts, 115 kilovolts and 345 kilovolts. The table below provides a more detailed breakdown of the transmission system.

<b>Operating Voltage</b>	<b>Design Voltage</b>	<b>Overhead Circuit Miles</b>	<b>Pipe-Type Cable Circuit Miles</b>	<b>Total Circuit Miles</b>
345 kV	345 kV	76	0	76
115 kV	115 kV	211	4.1	215.1
69 kV	69 kV	266	0	305
	115 kV construction operating at 69 kV	39		
<b>Total</b>		592	4.1	596.1

The distribution system operates at voltages of 4.16 kilovolts, 4.8 kilovolts, 13.2 kilovolts, and 34.5 kilovolts. It also encompasses subtransmission systems that operate at 14.4 kilovolts in three urban areas of our service territory, feeding into secondary networks. The table below provides a more detailed breakdown of the overhead portion of the distribution system, based upon the voltage at which a feeder exits the substation.

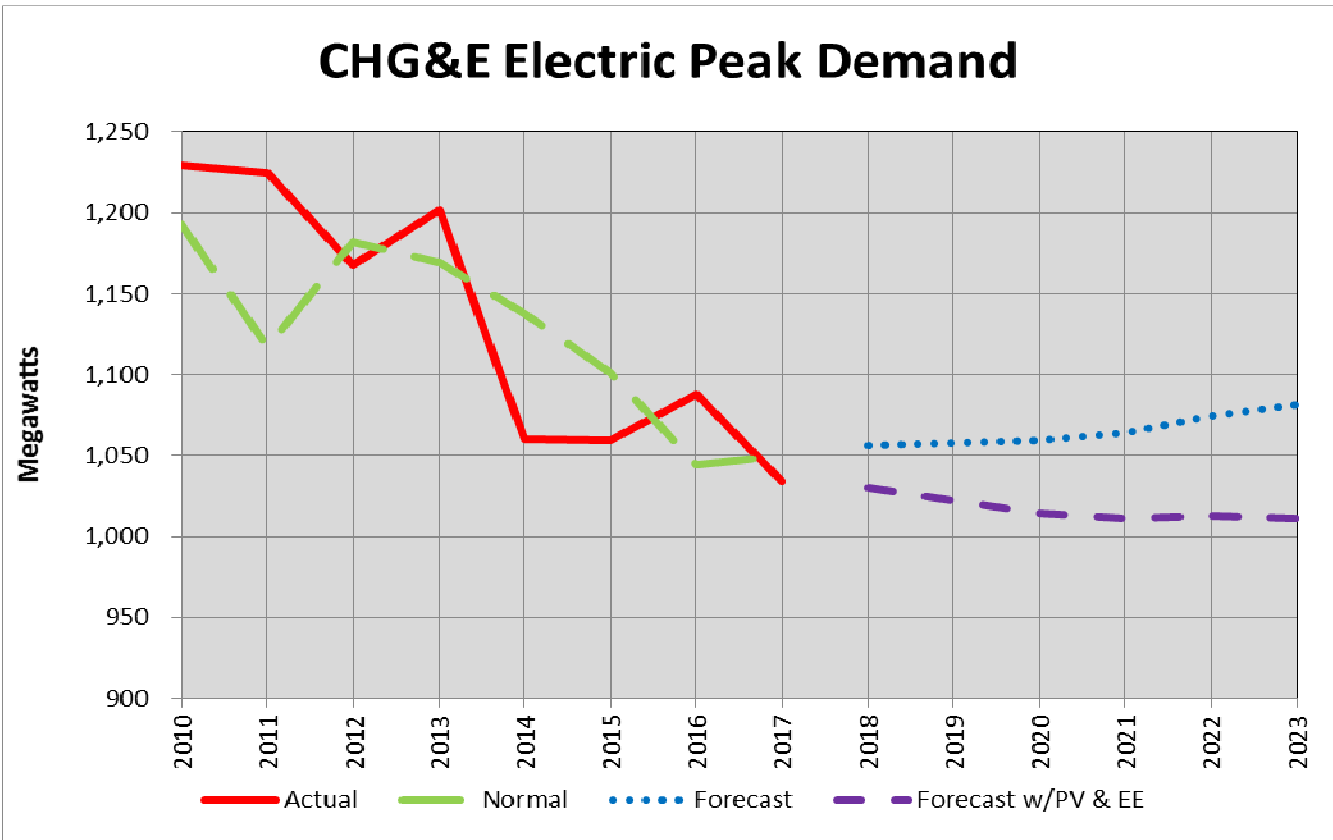
<b>Conductor</b>	<b>Pole Miles of Line at Substation Exit</b>
34.5 kV Overhead	209
13.2 kV Single Phase	4,554
13.2 kV Three Phase	2,355
5 kV or Under	56
Total	7,174

Central Hudson’s roughly 75 electric substations contain the power transformers that change the voltage from one level to another.

**Electric Forecast Overview**

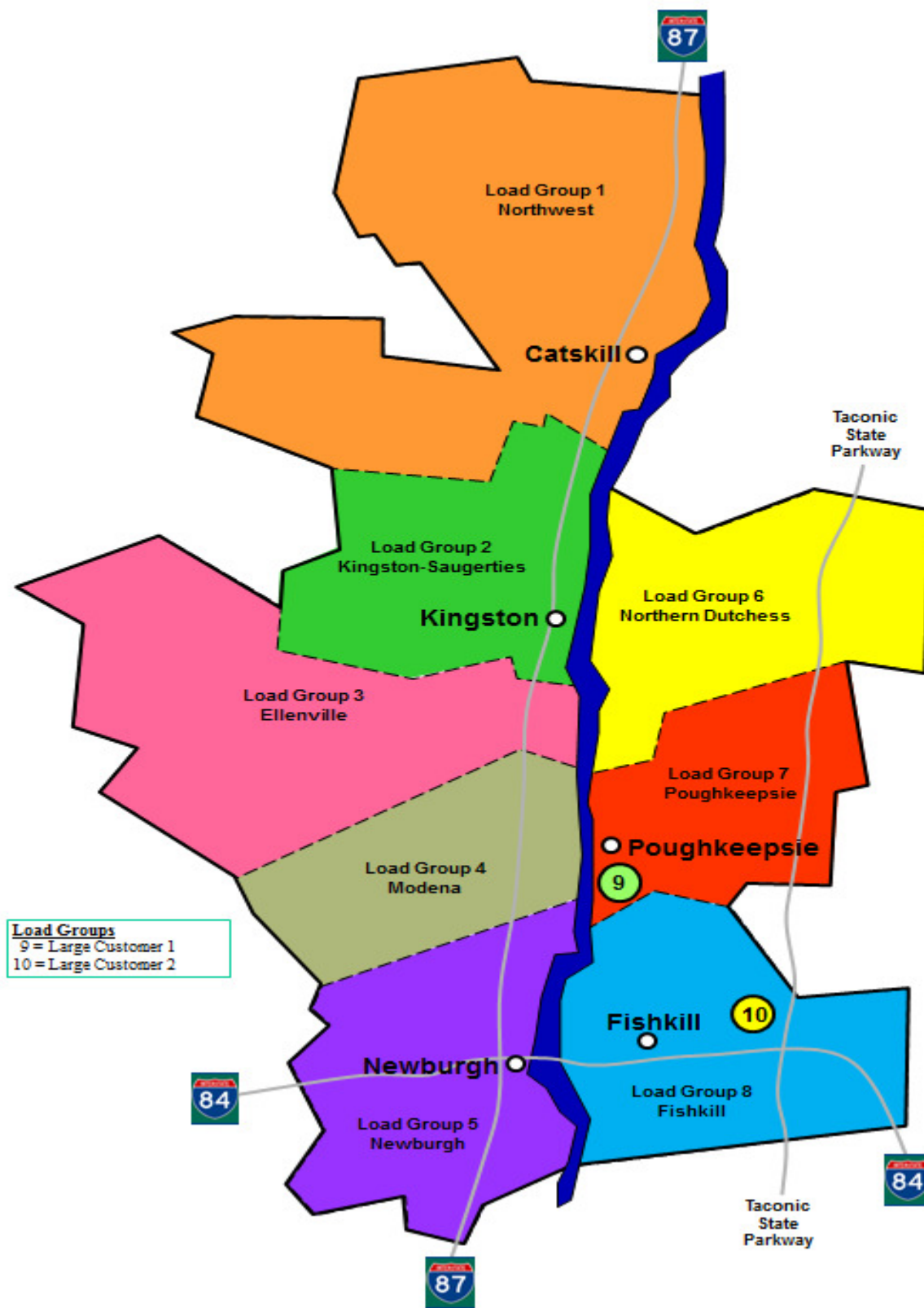
Central Hudson’s electric capital forecast for the next 5-year period is developed each year using the most recent planning studies, customer and sales forecasts, corporate load forecasts, and other corporate trends. For the electric capital forecast, a weather adjusted peak electric demand 1,050 MW system load (demand) for 2017 was used as the base year.

The current system peak forecast is shown on the graph below. As can be seen on the graph Central Hudson’s peak demand is showing a modest decline based primarily on the regional economy, and the effects of the Company’s energy efficiency programs and demand management programs.



In addition, Central Hudson utilizes distribution planning areas to aid in the identification of needs, their timing, and the quantification of the risks, as well as assess the alternatives available to meet those needs. These distribution planning areas largely are based on where the ability exists to transfer load among area substations. The graphic on the next page shows the distribution planning area load groups.

## CHGE Franchise Territory by Electric Load Group



## Electric Program Detail

The Electric Capital Forecast is developed utilizing guidelines, planning standards and engineering judgment. The forecast is completed for each budget category and integrated into a comprehensive plan. The summaries below provide the annual forecasts for each of the electric program categories.

### *Electric Capital Forecast – Additions*

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>TOTAL</u>
Production	\$ 2,019	\$ 1,473	\$ 1,540	\$ 1,335	\$ 2,121	\$ 8,487
Transmission	19,340	21,548	23,443	25,611	23,038	112,980
Substation	19,312	19,720	18,348	16,221	16,114	89,716
New Business	6,670	6,901	7,132	7,114	7,240	35,057
Distribution Improvements	41,291	40,593	39,978	41,620	42,683	206,165
Transformers	5,696	6,034	6,415	6,343	6,479	30,967
Meters	<u>2,493</u>	<u>2,703</u>	<u>2,808</u>	<u>3,542</u>	<u>3,664</u>	<u>15,211</u>
Total	<u>\$ 96,820</u>	<u>\$ 98,973</u>	<u>\$ 99,665</u>	<u>\$ 101,785</u>	<u>\$ 101,340</u>	<u>\$ 498,583</u>

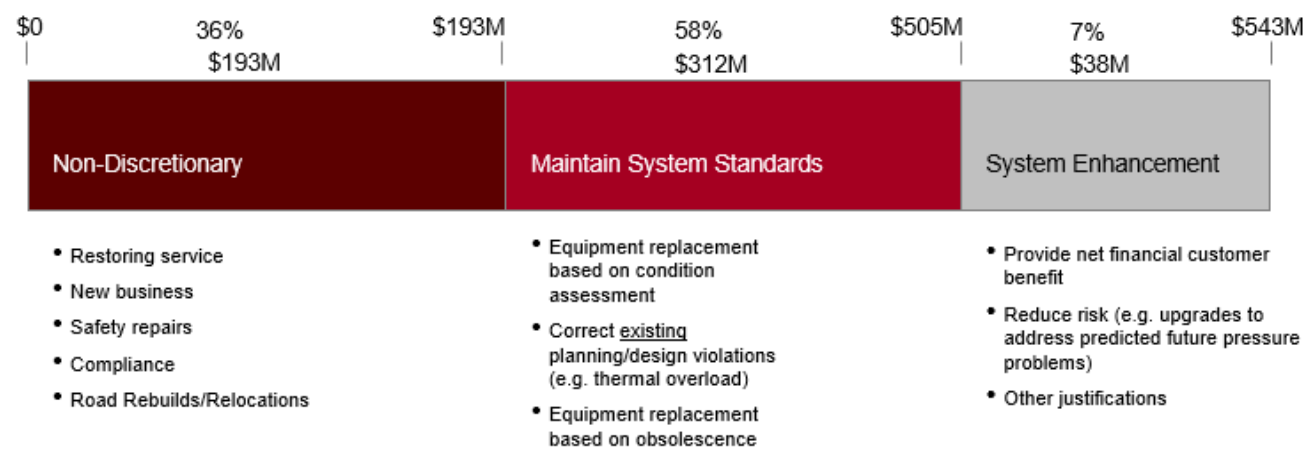
### *Electric Capital Forecast – Removal*

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>TOTAL</u>
Production	\$ 204	\$ 130	\$ 117	\$ 624	\$ 166	\$ 1,242
Transmission	2,642	3,805	3,325	3,296	3,533	16,602
Substation	1,786	2,090	2,102	1,973	2,265	10,215
New Business	255	261	266	272	277	1,331
Distribution Improvements	2,350	2,403	2,636	2,621	2,667	12,678
Transformers	409	417	426	435	443	2,130
Meters	<u>10</u>	<u>10</u>	<u>11</u>	<u>11</u>	<u>11</u>	<u>53</u>
Total	<u>\$ 7,658</u>	<u>\$ 9,116</u>	<u>\$ 8,883</u>	<u>\$ 9,233</u>	<u>\$ 9,362</u>	<u>\$ 44,252</u>

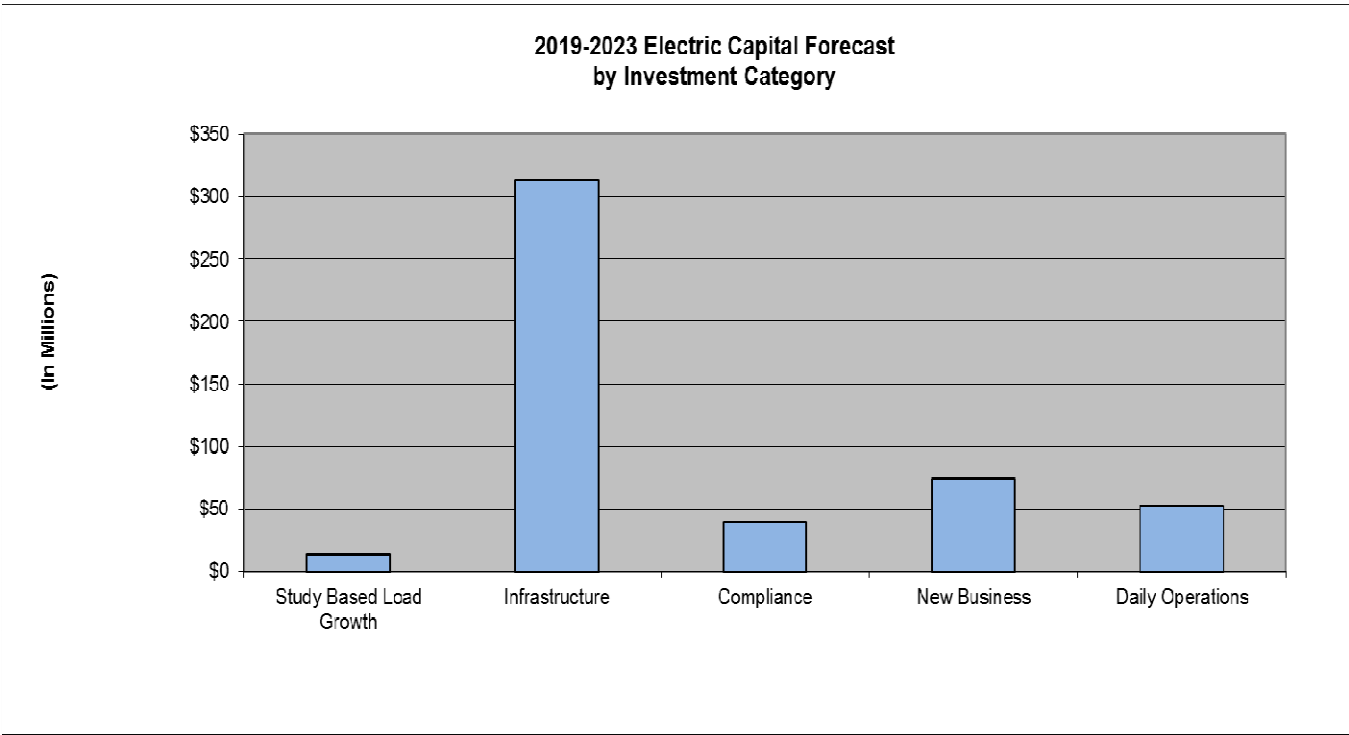
A breakdown of the Electric Capital Forecast is shown below indicating the level of spending as they have been prioritized. Non-discretionary is the level spending that is necessary to meet the



minimum standards of service or compliance with public service law. Maintaining System Standards is the level of spending required to maintain our current level of service reliability and to meet obligations set through the rate proceedings. System Enhancement is capital spending aimed at improving our level of service, reducing risk, or reducing operating costs.



In addition, the projects within the Electric Program are categorized by Investment Category as follows: growth, compliance, day-to-day business management, and infrastructure replacement. The bar graph below shows the breakdown of the projects in our current five-year forecast by these Investment Categories.



## Electric Transmission

For the Electric Transmission System, the purpose is to serve the expected load by developing a rational program to maintain reliability, avoid unacceptable risks, strive for the most economical reinforcements, and allow for equipment maintenance.

The facilities need to be planned, designed, operated and maintained according to “Good Utility Practice.” These are any of the practices, methods or actions required by FERC, NERC, NPCC, NYSRC, NYISO, PSC, applicable law, regulations, or policies and standards, or engaged in or approved by a significant portion of the electric utility industry. Electric Transmission Planning analyses are based on planning criteria where the transmission system is designed and operated to conform to applicable reliability rules: no electric transmission facility should be loaded beyond its normal rating prior to any contingency; no facility to be loaded beyond its applicable emergency rating following any contingency; and fault levels are to be within equipment ratings.

The thermal, voltage, and system stability performance is analyzed under the various customer/load scenarios to assess the load serving capability, identify alternatives to increase load serving capability where needed, and evaluate alternatives.

The significant Electric Transmission projects in the 5-year forecast are: rebuild of the 115 kV HF line; rebuild of the 69kV CL line; rebuild of the 69kV KM & TV lines; rebuild of the Hurley Ave – Saugerties SB line for 115kV; and the rebuild of the Saugerties – North Catskill H line for 115kV. All of these projects are driven by infrastructure conditions. A project that appeared in previous 5-year forecasts, the Northwest Reinforcement Project (which adds a 345 kV interconnection to the Catskill District 115kV system), has been deferred due to the Targeted Demand Response (DR) Program; this DR program is expected to delay the Northwest Reinforcement in service date until at least 2029.

The “HF” line rebuild is intended to address significant infrastructure issues on the line identified through our inspection program. This line was constructed in the 1968. The inspections identified that over 83% of the structures on this 2.05 mile line would require replacement due to identified component defects. Based on the number of structures identified as needing replacement, a more comprehensive approach to the rebuild was evaluated. A full rebuild and reconductoring with 1033.5 ACSR is planned with the increase in conductor size justified based on loss savings. Expenditures for this project in the Five –Year Capital Plan are currently estimated at \$1.86M for 2019 with a current anticipated in service date of July 2019.

The “CL” line rebuild is intended to address significant infrastructure issues on the line identified through our inspection program. This line was constructed in the 1940’s. The inspections identified that 69% of the structures on this 11.7 mile line would require replacement due to identified component defects in addition to another 23% of the structure having a significant number of minor defects. Based on the number of structures identified as needing replacement, a more comprehensive approach to the rebuild was evaluated. A full rebuild and reconductoring with 795 ACSR is planned with the increase in conductor size justified based on matching the thermal capability of the transmission loop and the portion of the line that was rebuilt in 2008. Expenditures for this project in the Five –Year Capital Plan are currently estimated at \$2.3M for 2018 and \$8.1M for 2019 with a current anticipated in service date of December 2019.

Additionally, rebuilding the KM & TV lines is identified in the 5 year forecast. Inspections have identified 58% and 53%, respectively, of the line's wood pole structures needing replacement. These lines originally were constructed in the 1920's and 1930's. In addition to addressing known infrastructure issues, potential benefits of the KM & TV lines rebuild include an increase of the transmission supply to the Myers Corners substation. The main concern impacting the rebuild is the proximity to the Dutchess County Airport. This project is expected to be constructed in 2021- 2022 at a total cost of approximately \$12.9M.

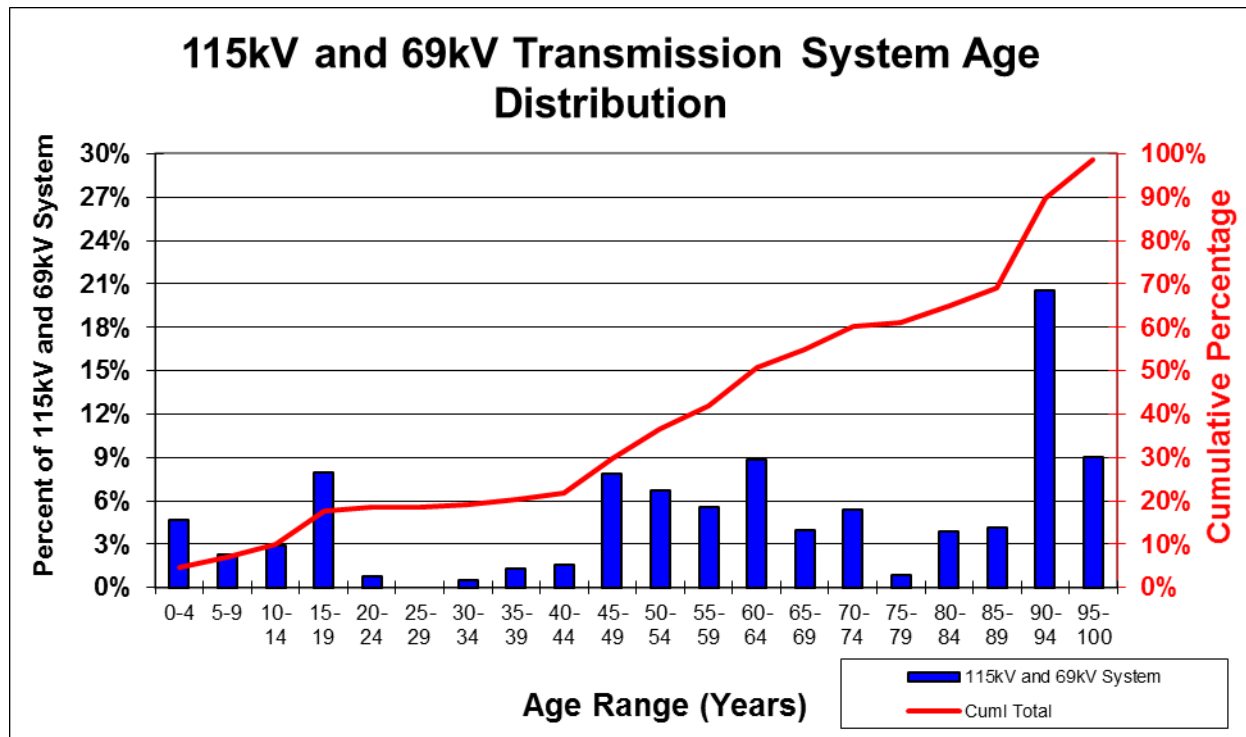
<b>KM Line Condition</b>				
		<b>Structures to</b>		
<b><u>Section</u></b>	<b><u>Miles</u></b>	<b><u>Replace</u></b>	<b><u>Repair</u></b>	<b><u>Probable Replacement Percentage</u></b>
Knapps Corners – P33581	1.0	10	5	65.2%
P33581 – P33591	0.5	9	5	60.8%
P33591 – P140218	0.35	0	0	0
P140218 - Myers Corners	1.0	9	2	64.7%
Totals	2.85	28	12	58.0%

<b>TV Line Condition</b>				
		<b>Structures to</b>		
<b><u>Section</u></b>	<b><u>Miles</u></b>	<b><u>Replace</u></b>	<b><u>Repair</u></b>	<b><u>Probable Replacement Percentage</u></b>
Myers Corners – P46006	1.0	8	2	58.8%
P46006 – North Chelsea	5.3	42	24	52.4%
Totals	6.3	50	26	53.1%

Rebuilding the 69kV H & SB line also is identified in the 5 year forecast. This transmission path is another of Central Hudson's oldest (c. 1919); it is steel lattice construction. Inspections have shown 32% of structures needing replacement with another 36% in need of significant repair. These findings have initiated a review of the line to develop the most economical alternative to rebuild the line, improve reliability, and (if possible) improve load-serving capability for the Northwest Area. Each line will be rebuilt for 115kV but continue to be operated at 69kV for the foreseeable future. This project is expected to be constructed from 2020 through 2022 at a total cost of approximately \$38M.

<b>H &amp; SB Line Condition</b>						
<u>Line</u>	<u>Section</u>	<u>Miles</u>	<u># of Structures</u>	<u>Structures to</u>		<u>% of structures that require work</u>
				<u>Replace/Add mid-span pole</u>	<u>Repair</u>	
H	Saugerties – N. Catskill	12.061	138	41	66	78%
SB	Hurley Ave. - Saugerties	11.11	118	41	25	56%
	<b>Total</b>	<b>23.171</b>	256	82	91	68%

In addition to the above capital expenditures, there are several programs in Electric Transmission designed to reduce risk and improve infrastructure. The “High Priority Replacements (HPR)” Program under the Electric Transmission Budget provides funding to respond to results of the inspections completed each year. High Priority Replacement projects address infrastructure issues that will reduce the risk of system failure, contact incidents, or loss of reliability. The graph directly below indicates the approximate Transmission System Age Distribution. The replacement work is prioritized based upon whether it is part of the 345 kV or underlying system and whether the feed is radial or networked. When an inspection severity of 4 or 5 has been indicated, structures, insulators, and other capital items are replaced according to a specified timeline.





## Electric Substation & Distribution

Central Hudson Electric Substation and Distribution capital programs are developed based on our current planning criteria and address load serving capability, infrastructure, compliance and reliability/operating issues. For infrastructure based issues, Central Hudson utilizes its asset management process, including field inspections, condition monitoring, periodic testing and more in-depth analysis and studies to identify trends, equipment issues and ultimately recommend replacement programs. Infrastructure based replacements also will be reviewed to determine whether to replace units in-kind or pursue an alternative solution. Load serving capability projects related to substation equipment or distribution circuits are identified through our planning process. For each area and substation the capacity and operability of the system under the various load forecast scenarios is analyzed. This analysis includes a review of the Substation and Distribution facilities, requiring a full understanding of the limiting components. For any areas or substations where load serving capability has been identified as a potential problem, plans and alternatives by area are evaluated to develop the best solution considering all costs, benefits, and long-range growth potential. The solutions sets for these projects include both traditional utility projects and the use of Non-Wires Alternative solutions to replace or defer the potential capital upgrades.

The planning criteria are based on a combination of economic factors, current industry practice, design and practical considerations, reliability and judgment. Influencing Factors are:

- Infrastructure Condition – If infrastructure must be replaced because it has reached the end of its life, consider the most effective means to replace it.
- Thermal limits - related to the ability of the facility to withstand load related heating without damage
- Protection– minimum fault current levels need to be maintained to ensure safe operation
- Power Quality - provide adequate voltage to customer premise ANSI C84.1, +/- 5.0% range during normal conditions (lower voltage in Conservation Voltage Reduction), +5.8% to – 8.3% under emergency conditions; eliminate stray voltage
- Reliability/Operational Flexibility – proximity of solutions to load/\$/Customer Outage Avoided, \$/Customer Minute Interrupted, and integration of Distribution Automation
- Regulatory Requirements - NESC, NYPSC

From this process, substation upgrades, equipment replacement programs and projects establishing new substations or the addition of circuits and transformers in existing substations are identified. Due to the projected declining load forecast in the majority of our planning areas, there are a very limited number of growth driven major substation and distribution projects that have been identified through the planning process in this 5-year forecast. Based on the age and the continuing condition assessment of our major substation and distribution infrastructure, there are a number of projects and programs to proactively replace equipment prior to the development of age/condition related operating issues. The addition of a new substation in the Beekman/Phillips Road area of our service territory due to load growth and transmission/substation upgrades to reinforce and increase the load serving capability in the Northwest Area of our system have been deferred outside of our five-year forecast due to Non-Wires Alternative solutions.

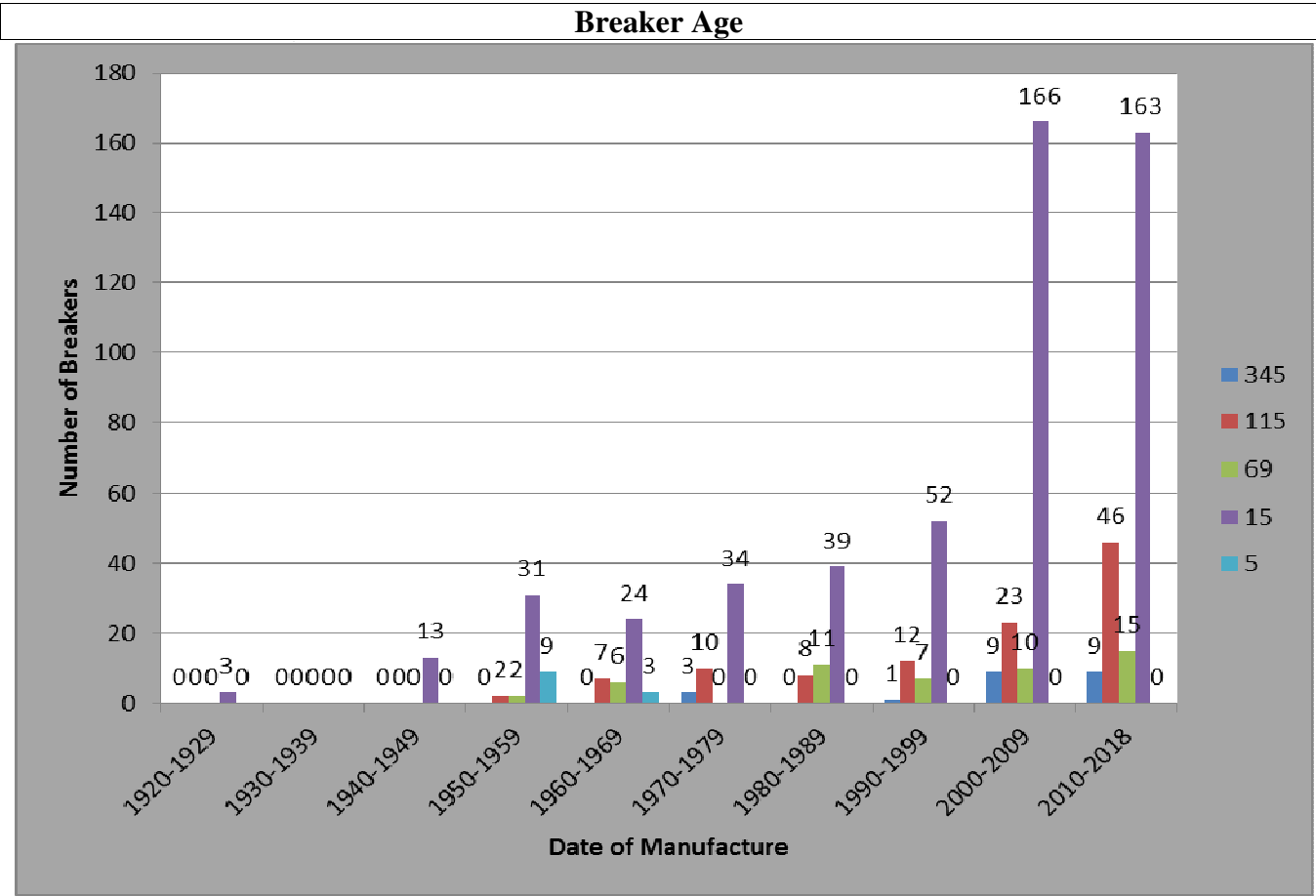
\$82.1M is allocated to infrastructure-related substation programs and projects within the five year forecast. Major substation rebuilds or partial rebuilds due to infrastructure considerations include

work/upgrades at the following substations: Union Avenue, Knapps Corners, Hurley Avenue 115kV, Rock Tavern 115kV, Greenfield Road, Montgomery, Modena and Woodstock. Additional major substation projects include: the addition of a second transformer for reliability and operational flexibility at the New Baltimore Substation in addition to avoiding otherwise required Distribution system infrastructure work; and the installation of a new tapped 115KV-69kV substation at the Tilcon site to continue to provide service to this larger industrial customer while allowing for the retirement of approximately 2.5 miles of a poor condition transmission line that runs through a residential neighborhood.

A major substation infrastructure program included in the five-year forecast is the continuation of our Breaker Replacement Program. This program was initiated to improve infrastructure and maintain system reliability through a planned prioritized equipment replacement program. The assessment process for the selection and prioritization of the breakers included in the replacement program is as follows:

- Breaker Duty: All power circuit breakers with breaker duties greater than 85 % with highest priority given for breakers with duties greater than 100%.
- Condition: All of the power circuit breakers identified based upon the recommendations from our Operations Services Division. These recommendations are based upon reports of failures or reports of poor testing results.
- Obsolescence: Several of the circuit breakers on our system still employ outdated technology, specifically relating to interrupter design. Others suffer from extended service lives and parts are no longer available for many others.
- Other Factors: Other power circuit breakers on our system meet the above breaker duty or condition selection criteria, but they have not been selected for this replacement program because they will be replaced with new breakers as part of new substation construction projects.

The Breaker Replacement Program has been in place since 2009, all of the originally identified 196 breakers have been replaced. As a continuation of this program, 75 breakers have been identified for planned replacement in the 5-year forecast horizon, with a cost of \$10.6M. Many of these breakers targeted for replacement will be combined with other identified work at stations to create larger projects, as was the case with the 37 breakers identified for replacement in 2018. Reference Breaker graph on the next page.

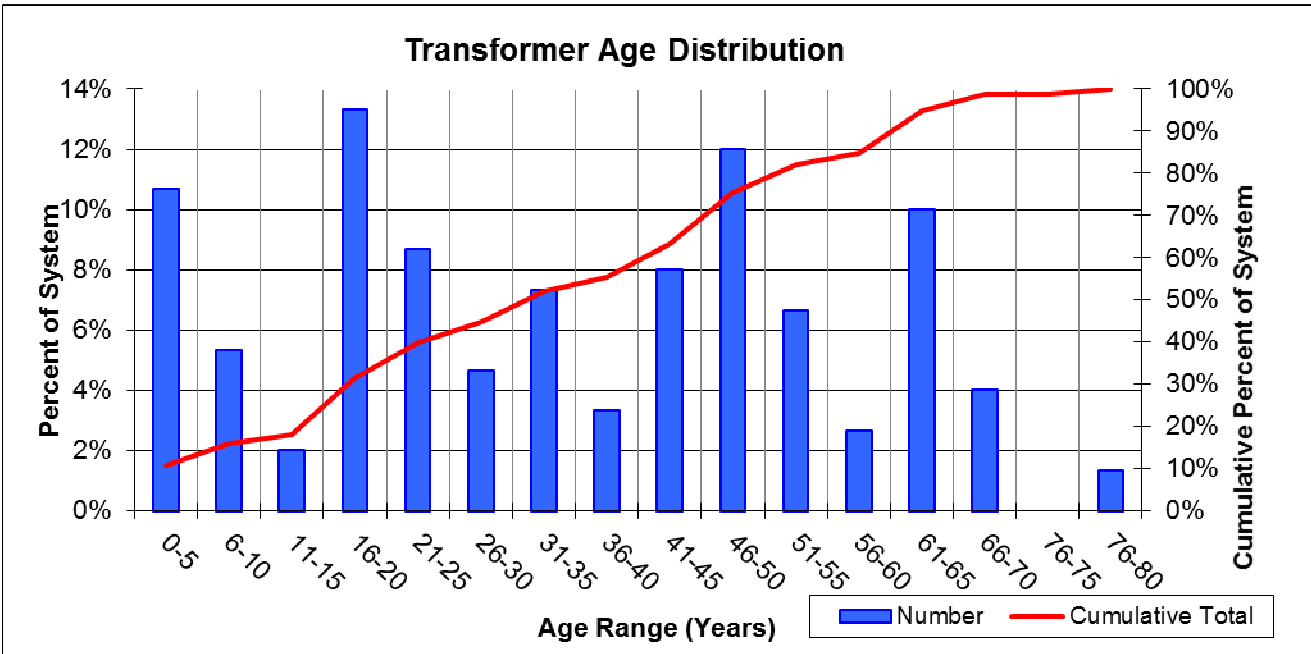


Additional major infrastructure replacement programs associated with substation equipment include the continued condition assessment and replacement of protective relaying equipment and substation power transformers. Targeted replacement programs for circuit switchers, disconnect switches, and motor-operated switch (MOS), have commenced based on feedback and maintenance trends from Substation Operations.

The comprehensive relay and metering modernization program included in the 5-year forecast identifies outdated meters, relays, and communications infrastructure. There is \$14.6M in the 5 year forecast to complete the current program. Many of these items will be integrated into comprehensive substation rebuilds or major upgrades to take advantage of construction efficiencies.

With regard to the substation power transformers, the condition of the power transformers varies and the ability to maintain them is tied closely to their age. Recent focused replacement of poor performing transformers has reduced the average age of our substation transformer fleet to approximately 35 years old; however, some transformers remain that are up to 80 years old and are in deteriorating condition. The transformers are monitored using: dissolved gas analysis; oil screen/testing; and Doble power factor testing at an interval based on voltage level and equipment criticality. Transformers are replaced based on this testing and overall condition assessment. There are five substation transformer projects in the 5-year forecast associated with the condition based replacement of aging transformers totaling \$12.9M. These projects include transformer replacements

at the following substations: Boulevard, Stanfordville, North Chelsea, North Catskill and Knapps Corners. Additionally, there is the planned installation of two 115/69 kV transformers at the Kerhonkson Substation coordinated with the retirement of the Modena 115/69kV transformer and the upgrade of the P and MK Lines to 115kV operation.



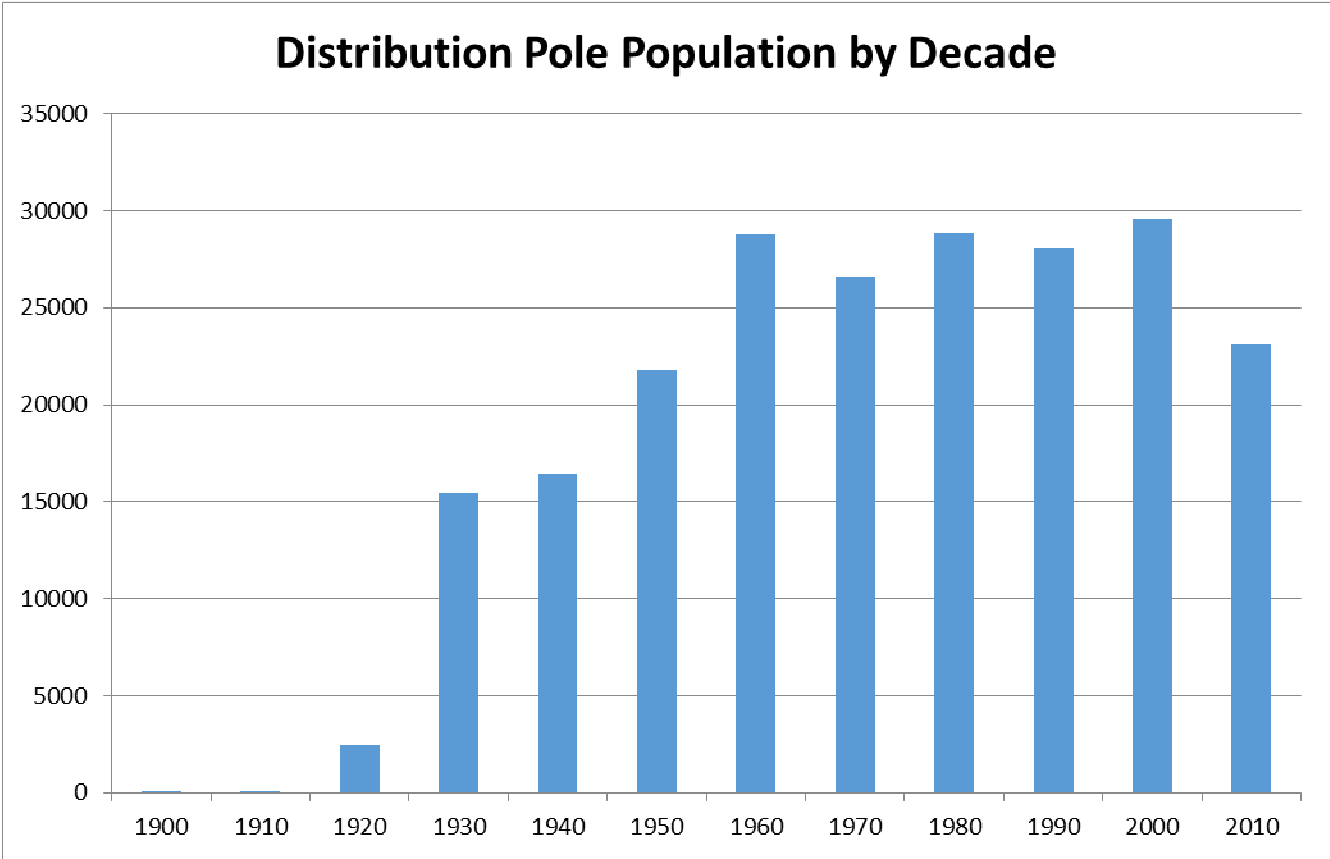
A condition based program has been created to identify and replace switchgear units that are in poor or deteriorating condition. There is \$5.7M in the 5 year forecast allotted to start these replacements. The following substations have been included in the switchgear replacement projects in the 5 year forecast; Cossackie, Woodstock, Myers Corners Sturgeon Pool Generator Breakers, Montgomery Street, Converse Street and Lincoln Park.

Similar to the breaker replacement program, programs have been created to address concerns with the remaining life of substation circuit switchers, disconnect switches, and motor operated switches. Replacement programs have been created to replace proactively these devices subject to potential failure. Recent problems have been identified with certain style switches, and there are limited to no replacement parts available. There is \$5.3M in the 5 year forecast allotted to these replacements.

The Distribution projects are identified as thermal, growth, and voltage related projects (approximately \$4.9M of growth related projects in the five year forecast, plus a \$3M project that is being evaluated for a non-wires alternative), reliability improvement projects justified on a cost per outage avoided basis, and operating improvements allowing flexibility in restoration. In addition to these projects, there are several more specific Distribution Improvement programs or initiatives that are related to infrastructure or reliability issues that are in the capital forecast. These major programs include the Customer Experiencing Multiple Interruptions/Worst Circuit program, the secondary network replacement program, the 5kV aerial cable replacement program, the overhead secondary replacement program, the 4800V conversion program, the copper wire replacement program, the oil switch and network protector replacement programs, and the URD replacement program.



With regard to the distribution infrastructure, there are ongoing programs designed to replace proactively aging or failing equipment. In addition to the Operating/Infrastructure program, the replacement of distribution poles identified through the inspection program is one of those programs. The graph below provides an overview of the age of the Company’s Distribution pole plant.



Due to the New York State Broadband Program and other initiatives, there has been a significant increase in make-ready work to ensure NESC clearances are maintained and poles are not overloaded with these additional attachments. While the attacher is responsible for these incremental costs, if a pole is already in poor condition, the Company must cover those costs. There is \$4.5 million in the 5-year capital plan allocated to make-ready costs. This represents an increase from prior expenditure levels.

The Distribution Automation Program is a major initiative that commenced in 2015 and continues to be included in the 5 year forecast. Central Hudson will continue with the Automatic Load Transfer (ALT) switch and recloser replacement programs. This program will be integrated with DMS to improve reliability, system safety, and system efficiency, enhancing the capability of ALTs to include more complex Fault Location, Isolation and Service Restoration (FLISR), while providing for Volt-VAr Optimization. There also is a large infrastructure improvement aspect of this project which will alter the design of the electric distribution system by creating robust mainline feeders that can be looped through switching to restore customer after an outage or optimize and balance feeders during normal operations.

To accomplish this, there also will be an increased number of switched capacitors, electronic reclosers, and voltage regulators, all of which will be tied back to the DMS to optimize system operation as well as improve reliability and power quality. The cost of this program within the five year forecast, including the additional ALTs, reclosers, capacitors and DMS/DSCADA system is approximately \$31.1 million and is estimated to have a positive cost/benefit ratio primarily due to the reduced energy usage (supply savings) and capital deferral. Much of the costs are related to the rebuilding and reconductoring of electric distribution mainline, some of which would need to be replaced as part of the normal asset replacement program. Additional benefits will include reduced system losses, improved switching safety, and improved restoration times through the use of manual switching when an ALT is not available. Since a portion of these costs are related to the replacement of aging infrastructure, these costs would be required to maintain system standards and are not included as system enhancement projects.

### **New Business, Transformer, and Meters**

The remainder of the Electric Capital Budget, the New Business, Transformers, and Meters capital forecast is based on the projected customer growth from the corporate forecast. A regression analysis of the prior 5 years capital expenditures and growth rates is performed for these categories to predict the capital expenditures for the upcoming 5 years given the various growth scenarios. In addition any specifically identified transformer or meter replacement programs are included in the forecast. For Transformers, there is an increase in the five-year forecast due to equipment (capacitors and regulators) associated with our DA program described above.

## **GAS PROGRAM SUMMARY**

The Central Hudson gas system contains well over 2,000 miles of pipeline facilities ranging in age from new to over 100 years of age. It supplies gas service to approximately 81,000 customers in communities near the Mid-Hudson River Valley from Woodbury in the south to Cossack in the north and ranges from Carmel in the east to as far west as Montgomery.

The Company's gas transmission system consists of 165 miles of steel piping ranging from 6-16" in diameter, four gate stations and 3 flow control stations. The Maximum Allowable Operating Pressure (MAOP) is between 350-750 PSIG. The majority (81%) of the transmission system was installed during the 1950's and 1960's. The MPI and MPR transmission lines were the last to be installed (1990's) and account for 12.8% of the total transmission pipeline inventory. Three of the four gate stations date to the 1950's and early 1960's. The last gate station, Pleasant Valley, was constructed in the early 1990's to take gas from the then new Iroquois gas transmission line.

A total of 138 gas regulators stations are utilized to supply the distribution system. The stations either reduce transmission pressure to distribution pressure - or further reduce distribution pressure to a lower pressure.

The gas distribution system is comprised of 1,287 miles of distribution main that operates at pressures from utilization (inches of water column) up to 120 psig. Nominal pipe diameters range from ½" to 16 inch in size and are comprised of plastic, steel, wrought iron, and cast iron. The predominant material is plastic which makes up 742 miles of the total inventory and cathodically protected steel which accounts for an additional 364 miles. Currently Central Hudson defines leak prone pipe (LPP) as cast iron, wrought iron and unprotected steel. This represents a total of 181 miles or 14% of the total distribution main inventory. The Company's gas service inventory totals 63,142 services of which 43,091 are plastic 8,385 are protected steel and 66 are copper. The remainder are considered leak prone.

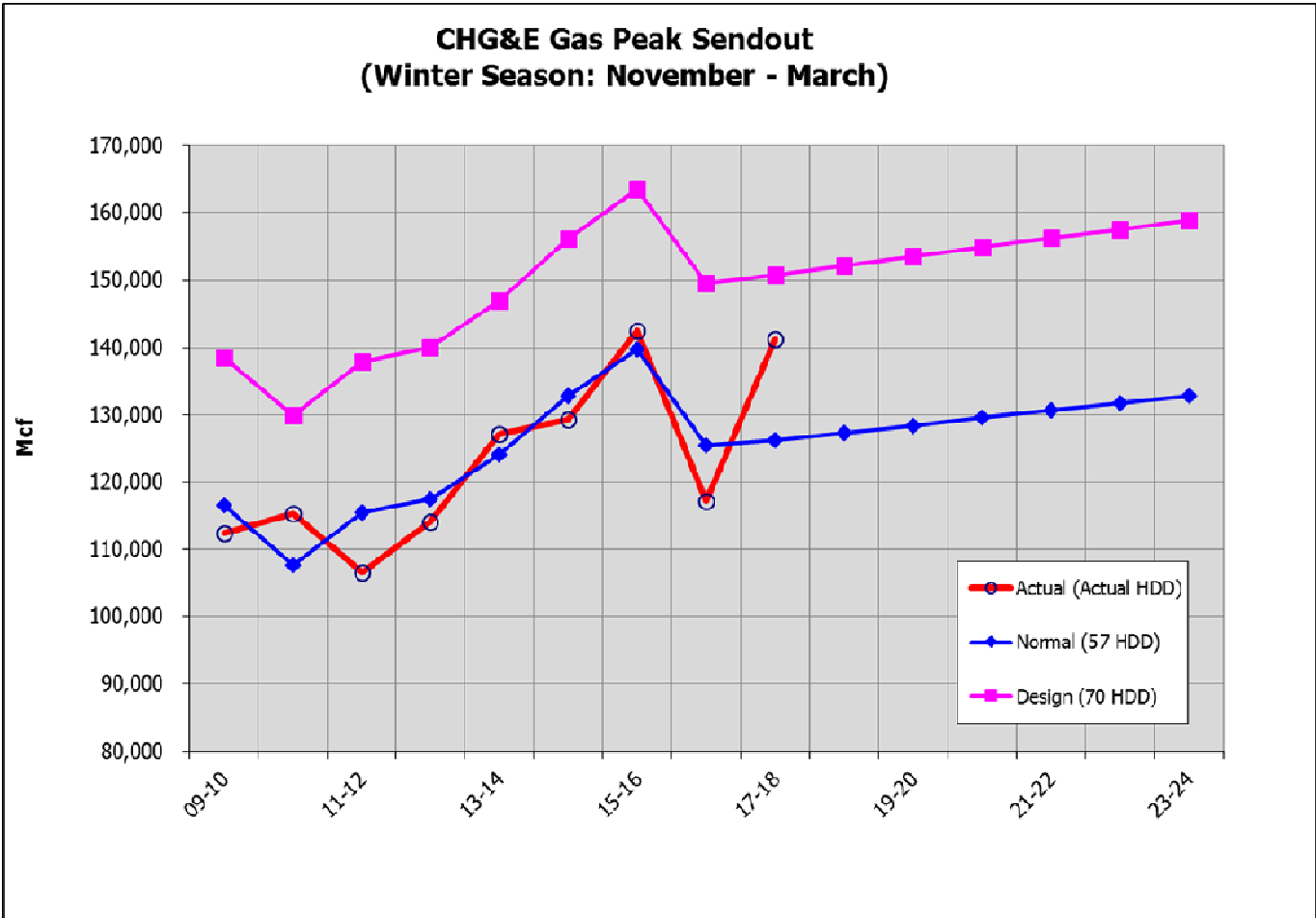
Low pressure systems exist in each of the larger Cities of Beacon, Newburgh, Poughkeepsie, Kingston, Saugerties, and Catskill. Construction on these systems started in the early 1900s and piping has been added and replaced regularly since that time. These systems contain significant lengths of cast iron, universal, bare steel, and wrought iron piping. Portions of the piping must be replaced in order to maintain a manageable leak inventory. These older communities have transformed from residential/ commercial and industrial centers into primarily residential, light commercial and governmental centers and gas loads have generally stabilized or slightly declined over the years.

## **Gas Forecast Overview**

Central Hudson's gas capital forecast for the next 5-year period is developed each year using a number of inputs such as planning studies, econometric forecasts, corporate load forecasts, facility inspection results, integrity recommendations, field operations feedback as well as others.

Central Hudson's gas peak load forecast is allocated into planning areas to identify system capacity needs and the timing of those needs, quantify the risks of the load growth outpacing our ability to serve that load, and assess the alternatives available to meet that load. As a result of these

efforts, the needs are identified, the timing determined, and the alternatives developed from planning studies.



The New Business and Meters capital forecast is based on the projected customer growth from the corporate forecast. The New Business plan reflects a significant reduction from the prior forecast recognizing the fact that the Company is dramatically reducing its gas expansion program.

For the Gas System, the primary evaluation criteria for area studies are load serving capability, based on system configuration, capacity, and the resulting pressures during design day. The planning criteria are based on AGA Engineering Practices. The minimum operating pressures which are allowed under these planning criteria are 50% of the local system set pressure. Pressures below 50% could result in loss of gas service to individual customers and a significant public safety issue.

The planning criterion is single contingency with no reserved load. The planning process evaluates the risk associated with load growth uncertainties, the risk of pressure falling below minimum required, the number of customers impacted, and the time associated with restoration of service.

The planning process evaluates alternatives to meet capacity needs based on economic analyses of viable alternatives and develops recommendations and timing that meets system needs at the lowest NPV cost.

## Gas Program Detail

The Gas Capital forecast is developed utilizing guidelines, planning standard and engineering judgment. The forecast is completed for each budget category and integrated into a comprehensive plan. The following is a summary of the five year capital forecast for each of the categories.

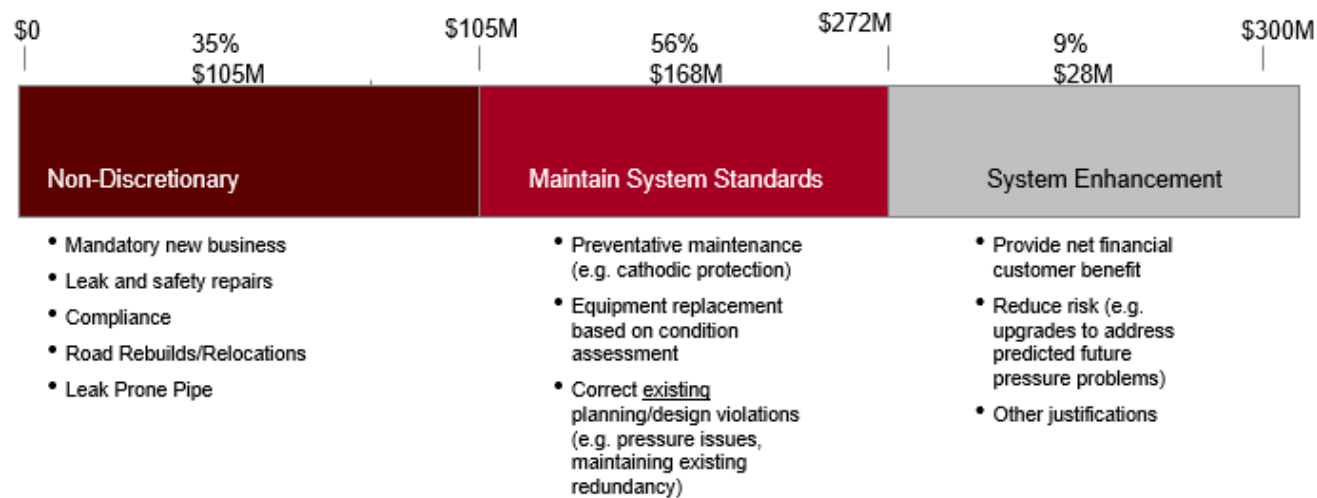
### *Gas Capital Forecast – Additions*

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>TOTAL</u>
Production	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Transmission	1,707	1,505	2,375	2,437	2,360	10,385
Regulating Stations	2,100	2,434	2,594	2,552	2,012	11,692
New Business	9,559	9,971	10,020	10,483	10,584	50,616
Distribution Improvements	40,363	38,796	40,829	41,709	42,737	204,434
Meters	<u>3,029</u>	<u>2,993</u>	<u>2,665</u>	<u>2,755</u>	<u>2,864</u>	<u>14,306</u>
Total	<u>\$ 56,758</u>	<u>\$ 55,698</u>	<u>\$ 58,483</u>	<u>\$ 59,936</u>	<u>\$ 60,558</u>	<u>\$ 291,433</u>

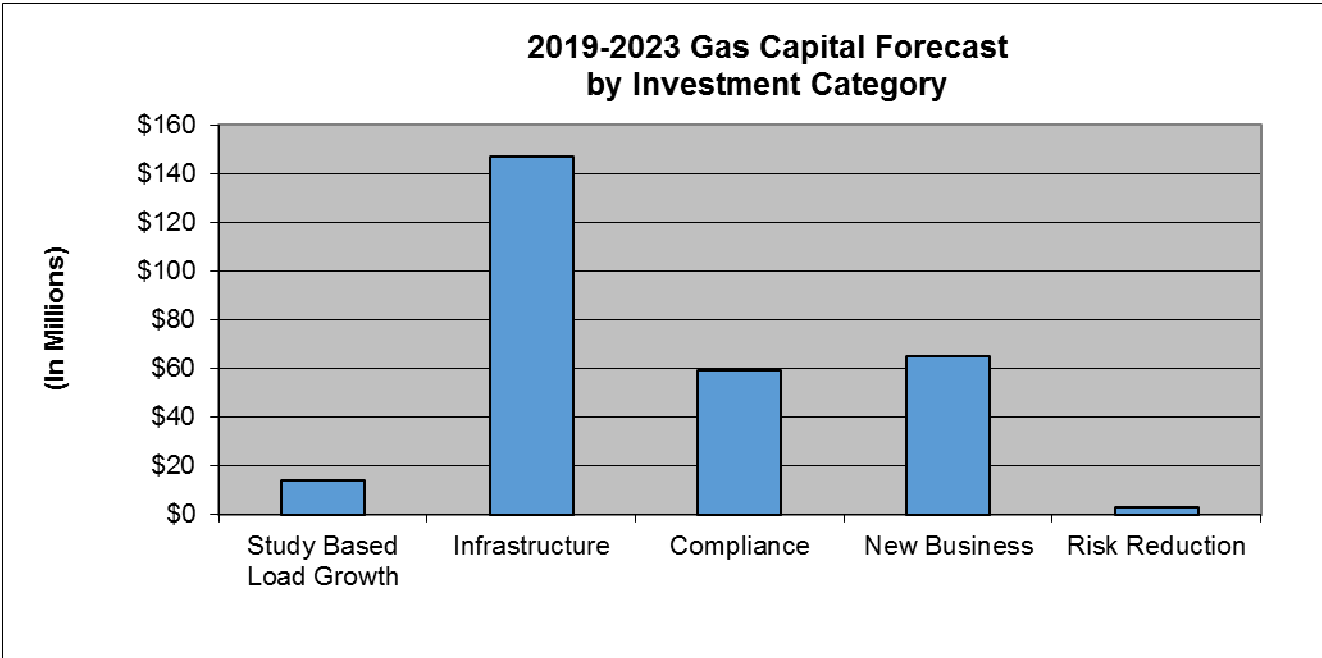
### *Gas Capital Forecast – Removal*

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>TOTAL</u>
Production	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Transmission	102	63	107	87	89	447
Regulating Stations	107	115	117	109	89	537
New Business	204	209	213	218	221	1,065
Distribution Improvements	1,328	1,356	1,385	1,414	1,439	6,922
Meters	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>21</u>
Total	<u>\$ 1,746</u>	<u>\$ 1,746</u>	<u>\$ 1,826</u>	<u>\$ 1,831</u>	<u>\$ 1,841</u>	<u>\$ 8,991</u>

A breakdown of the Gas Capital Forecast is shown below indicating the level of spending as they have been prioritized. Non-discretionary is the level spending that is necessary to meet the minimum standards of service or compliance with public service law. Maintaining System Standards is the level of spending required to maintain our current level of service safety and reliability and to meet obligations set through the rate proceedings. System Enhancement is capital spending aimed at improving our level of service, reducing risk, or reducing operating costs.



In addition, the projects within the Gas Program are categorized by Investment Category as follows: growth, compliance, day-to-day business management, and infrastructure replacement. The bar graph below shows the breakdown of the projects in our current five-year forecast by these Investment Categories.





## **Gas Transmission**

The Gas Transmission category consists of gate station and transmission capital projects. Sample projects may include transmission line replacement/relocations, transmission valve replacements, upgrade/replacement of gate station flow control equipment, etc. The development of the Gas Transmission 5-Year Capital Forecast is derived from the following inputs:

- Load Growth
- Transmission Integrity Management Program (TIMP)
- Regulatory Requirements
- Equipment Obsolescence/Performance
- Inspection Results
- Municipal Projects

The Gas Transmission projects are designed to provide necessary capacity, reduce risk and improve infrastructure. Gas Transmission Capital Projects are primarily a mix of compliance, risk reduction and infrastructure. They may stem from System Load Studies or studies performed as part of the Pipeline Integrity Program. These studies result in selected pipeline projects such as casing removals or the installation of remotely operated valves (ROV's). The transmission flow control equipment such as remote terminal units (RTU's) is evaluated to determine useful remaining life. The Gas Transmission 5-Year Capital forecast addresses a number of infrastructure and integrity issues. The remainder of the capital forecast focuses on the following areas for system improvement; TIMP related projects, flow control system upgrades and remote operated valves.

## **Gas Regulator Stations**

The Gas Regulator Station category consists of regulator station capital projects. The projects range from the installation of new stations to the replacement/upgrade of station equipment. The development of the Gas Regulator Station 5-Year Capital Forecast is driven by the following inputs:

- Load Growth
- Regulatory Requirements
- Equipment Obsolescence/Performance
- Inspection Results

The Gas Regulator Station projects consist primarily of a mix of capacity, compliance and infrastructure projects. The large scale main replacements associated with the LPP Replacement Program will result in changes in the low and medium pressure system flows. As a result modifications will be made to existing stations as needed to account for increase flow. In some cases stations will be eliminated due to these large scale replacement projects. The remainder of the Gas Regulator Station capital forecast is related to infrastructure and compliance due to regulatory requirements, equipment obsolescence, maintenance issues, improved/remote pressure control, retirements, and relocations. In addition a number of regulator and relief valves have been identified for replacement since they are no longer supported by the manufacturer and are considered obsolete.

## Gas Distribution Improvements

The Gas Distribution Improvement category consists primarily of new or replacement main and valve projects as well as service replacements. Projects in this category may include LPP main replacements, main reinforcements, additional valve installations, etc. The development of the Gas Distribution 5 Year Capital Forecast is derived from the following inputs:

- Load Growth
- Distribution Integrity Management Program (DIMP)
- Risk Assessment (including leak history, material type, location, etc.)
- Regulatory Updates/Mandates
- Inspection Results
- Municipal Projects

The Gas Distribution 5 Year Capital Forecast is driven primarily by the mandated replacement of Leak Prone Pipe (LPP). As detailed in its current rate agreement the Company is required to eliminate a minimum of 15 miles of leak prone pipe each year.

The LPP replacement projects are identified and prioritized using the GL Main Replacement Prioritization Program (MRP) which develops a risk 'score' based on pipe and operating characteristics such as material, operating pressure, age, diameter, leak history, location (proximity to buildings, business district, flood prone areas) and, cathodic protection. This risk score measures the relative likelihood and the consequences of a leak associated with each pipeline segment. In addition Subject Matter Expert (SME's) review is taken into consideration when developing the proposed main replacement project listing. Based on industry best practice LPP projects consist of 1- 2 mile 'neighborhood' projects which result in limited disruption to customers and more economical replacement of LPP. While this methodology does result in the replacement of existing short sections (< 100 feet) of plastic and protected steel previously replaced due to undermines or leak repairs the overall efficiencies gained through bypassing and elimination of prolonged customer interruption are significantly more cost effective. The total budget for LPP replacement is \$153 million in the 5 year forecast (average annual expenditure of \$31M). By increasing current annual expenditures on replacement of leak prone pipe with the most risk, the current replacement program will result in the elimination of all leak prone pipe within the next 9 – 11 years.

Included in the Gas Distribution capital budget is funding for main replacements or relocations associated with municipal projects such as road rebuilds. The actual project cost is included when the actual project is known otherwise the budgeted amounts are trended from past year expenditures.

Also included in Gas Distribution Improvements are reinforcements to existing systems based on area studies such as the West Point bypass to Highland Falls. The West Point bypass to Highland Falls project would consist of constructing a bypass around or through West Point to serve customers in Highland Falls therefore eliminating the Company's reliance on West Point's gas system to serve these customers. The current configuration of system poses a significant reliability risk that is best mitigated with the construction of a distribution feed to directly serve those customers.

## **New Business & Meters**

The New Business section of the Gas Capital Budget is based primarily on the projected customer growth from the corporate forecast. The forecasted expenditure level is significantly reduced from the prior forecast based on the changing strategy of less focus on gas expansion. The Gas New Business has forecast over \$51 million over the 5-year period for residential and commercial additions.

The Gas Meters capital forecast is based on the projected customer growth from the corporate forecast. The forecasted expenditure level is based on the updated forecasted customer growth rates. The meter forecast is based on the annual needs for non-load related meter installations (Meter Testing Program or ERT meter requests) approximately 2,800 meters during the forecast period, and the forecast level based on the customer growth, peak, and sales forecast.

## COMMON PROGRAM SUMMARY

The Common Capital Forecast consists of Land and Buildings, Office Furniture, Tools & Equipment, Transportation, and the Information & Technology Capital Budget Forecasts. The following is a summary of the five year capital forecast for each of these categories.

### *Common Capital Forecast – Additions*

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>TOTAL</u>
Lands and Buildings	\$ 16,280	\$ 8,861	\$ 17,405	\$ 20,755	\$ 8,956	\$ 72,258
Office Equipment	25,164	21,331	20,410	23,891	19,723	110,519
Tools	1,313	1,510	1,485	1,516	1,543	7,366
Communication	9,209	6,706	2,350	1,290	199	19,754
Transportation	<u>9,119</u>	<u>9,935</u>	<u>9,942</u>	<u>10,136</u>	<u>10,291</u>	<u>49,423</u>
Total	<u>\$ 61,085</u>	<u>\$ 48,343</u>	<u>\$ 51,592</u>	<u>\$ 57,587</u>	<u>\$ 40,713</u>	<u>\$ 259,320</u>

### *Common Capital Forecast – Removal*

	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>TOTAL</u>
Lands and Buildings	\$ 280	\$ 287	\$ 268	\$ 311	\$ 437	\$ 1,583
Office Equipment	-	-	-	-	-	-
Tools	0	0	0	0	0	1
Communication	1	1	1	1	1	5
Transportation	<u>(450)</u>	<u>(450)</u>	<u>(450)</u>	<u>(450)</u>	<u>(450)</u>	<u>(2,250)</u>
Total	<u>\$ (169)</u>	<u>\$ (162)</u>	<u>\$ (181)</u>	<u>\$ (138)</u>	<u>\$ (12)</u>	<u>\$ (661)</u>

### **Land and Building**

The Common Capital Program includes the “Lands and Buildings” and “Office Equipment” categories. The forecast for the “Lands and Buildings” and “Office Equipment” categories is typically associated with the replacement of existing minor capital components. However in this forecast, the “Lands and Buildings” category includes some major capital replacements at our facilities (roofs, windows, and HVAC equipment) and multiple larger facility projects. The first large project is the rebuilding/expansion of office space (808/809) and parking at our South Road headquarters. Several alternatives were evaluated to increase office space, including building a new facility or leasing space. The proposed project will also address improvements needed in the vehicle maintenance facility at our headquarters. The current estimated cost of this project during the five year forecast period is \$11.2M

with the majority of expenditures in 2019 and project completion anticipated by 2020. The second project is the buildout of remaining office space at the Company's Kingston headquarters. There is existing unoccupied space at the Kingston facility and the buildout will leverage available space for staffing additions/flexibility coupled with a new disaster recovery site for our IT assets (which have outgrown the space available at our current site located at our Newburgh headquarters). The estimated build out costs for the Kingston project over the five year forecast period is \$3.2M with the majority of expenditures occurring in 2019 and 2020. The final significant project is the establishment of a dedicated training facility and integrated transmission and distribution system operations centers. The training center is a multiphase initiative which recognizes that with the significant amount of new technology and substantial turnover occurring in the work force new facilities are required. The estimated costs in the five year forecast for this facility is \$26M. As part of the design of this planned facility is the future buildout of an integrated transmission and distribution system operations center and a backup call center location to supplement our existing Newburgh site (which has insufficient space). Coupled with the Company's grid modernization efforts is a need to move to 24/7 monitoring and control of the distribution system. The plan is to create a fully integrated transmission and distribution system operations center on the campus of the training center. Other large projects in the later years of this 5-year forecast include the rebuild of the transformer shop and new Newburgh HQ facility. The "Lands and Buildings" category also includes capital improvements for energy efficiency improvements at existing Company facilities.


The Office Furniture Capital Budget consists of normal replacements due to wear and tear and those driven by office upgrades or changes requiring additions to meet the new use of the space.

### **Information Technology / Communications**

Central Hudson is continuing to make strategic investments in Information Technology (IT) in order to meet rapidly expanding customer, industry, regulatory, business, and employee needs. Its mission, strategic imperatives, and key initiatives are illustrated graphically below.

## Central Hudson IT Mission

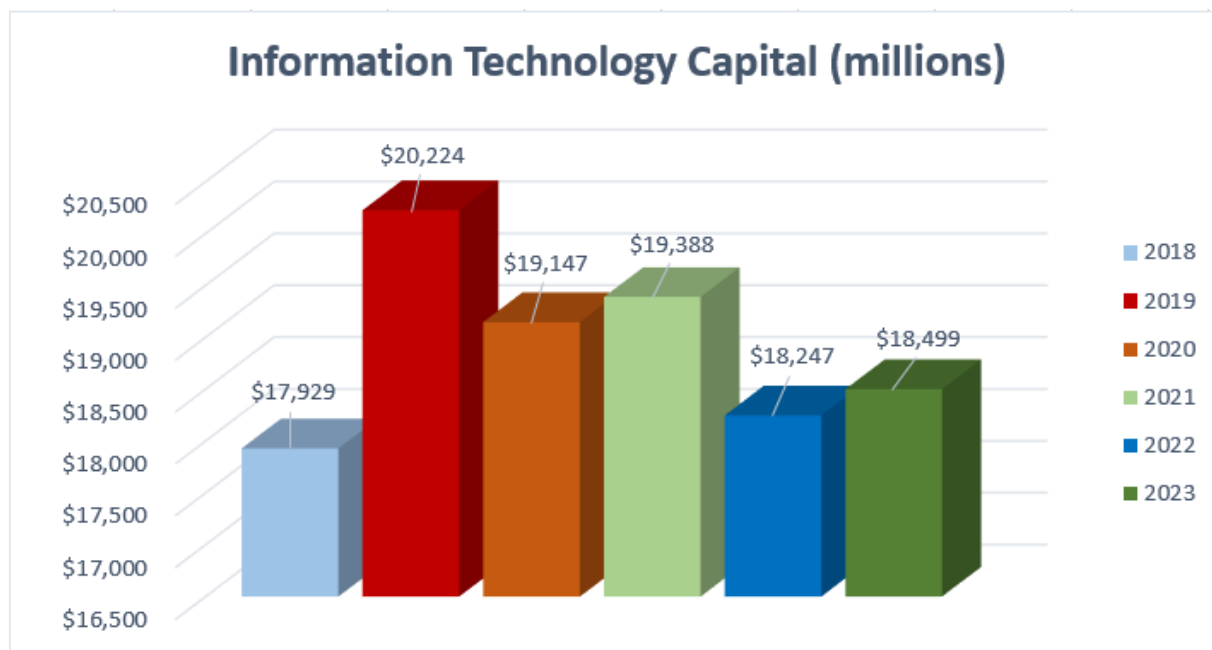
*We will empower our employees, partners, and customers by providing innovative, integrated information and technology solutions*

Strategic Imperatives		
 <b>DELIVER BUSINESS SOLUTIONS</b>	<b>Support internal business processes</b> <ul style="list-style-type: none"> <li>» HRIS - TotalHR replacement</li> <li>» PowerPlan - Construction budgeting redesign</li> <li>» Enterprise Content Management</li> <li>» Clarity replacement</li> <li>» Corporate intranet, Wiki redesign</li> <li>» Increase speed of application testing</li> <li>» Geographic Information System (GIS) initiatives</li> <li>» Emergency Management System initiatives</li> <li>» Emergent software packages</li> <li>» Additional business driven initiatives</li> </ul>	
	<b>Support customers and meet industry, regulatory demands</b> <ul style="list-style-type: none"> <li>» Business Intelligence</li> <li>» Enterprise SOA Framework</li> <li>» Unified Communications, VoIP, IVR - Extending collaboration</li> <li>» CIS modernization</li> </ul>	
 <b>ENRICH CUSTOMER, BUSINESS PARTNER EXPERIENCE</b>	<b>Enrich and improve customer experience, engagement</b> <ul style="list-style-type: none"> <li>» Digital Initiatives for Customer Engagement (DICE)</li> </ul>	
 <b>IMPROVE OPERATIONAL EXCELLENCE</b>	<b>Deliver reliable, cost-effective technology solutions</b> <ul style="list-style-type: none"> <li>» Upgrades and enhancements</li> <li>» Hardware &amp; infrastructure</li> </ul>	
 <b>SECURE SYSTEMS &amp; INFORMATION</b>	<b>Ensure overall security of business, customer information</b> <ul style="list-style-type: none"> <li>» Identity Access Management (IAM)</li> <li>» Security Information &amp; Event Management (SIEM)</li> </ul>	

The IT strategy combined with establishing partnerships with all other areas of the business ensures Central Hudson is able to meet changing regulatory and customer expectations, translating these needs to the most optimal and effective technology solutions while continuing to ensure the reliability, availability, usability, and overall security of the IT technology portfolio.

The rapid pace of technology change compounds the level of disruptions in the utility industry. The IT investment portfolio aims to modernize multiple business functions and their associated systems while continuing to focus on extending customer digital offerings, further automating and optimizing business functions, and confronting ongoing cybersecurity threats. See the chart below that represents the growth from our 2018 capital plan to our forecasted 2019– 2023 plan:





The IT Capital Budget consists of foundational investments to maintain, secure, and modernize systems and investments to enrich the customer experience. These modernization efforts aim to address aging applications, non-optimal business processes, anticipated business requirements gaps, digitization of manual processes, and optimization of technology architecture. The foundational investments fall into two categories: 1) meeting expanding customer, regulatory, business, and industry driven demands; and 2) investments core to running the business. The foundational investments necessary to meet expanding customer, regulatory, business, and industry driven demands can be further broken down into 1) those that have a direct impact on our ability to serve our customers and to meet industry or regulatory demands, 2) those ensuring overall security of business and customer information, and 3) those supporting internal business processes. The foundational investments that are core to running the business relate to 1) upgrades and enhancements to existing systems and 2) infrastructure or hardware lifecycle upgrades and ongoing extensions resulting from corresponding software updates or implementations. The investments related to enriching customer experience are investments necessary to provide customers with more personalized information combined with new products and services offerings, extended self-service options, and ongoing investments to optimize our digital (Web/Mobile/Social) channels. These investments aim to meet the experience customers have come to expect based on their interactions with other industries and service companies. All investments are evaluated through the IT Steering Committee with alignment to strategy and financial analysis used as the criteria for approving the project. See below for some highlight initiatives:

#### Key Business Initiatives

- CIS Modernization** – Customer Information System (CIS) Modernization aims to address anticipated industry, regulatory, and customer expectation advancements combined with resource attrition and diminishing technical and business knowledge with an aging, complex application. CIS is core to the majority of business operations supporting key functions in customer billing and collections, payment processing, rate configuration, service orders, load

profiles, meter inventory and processing, revenue reporting, and many other critical business processes. Modernization will translate to a significant multi-year effort spanning across multiple groups where resource management, organizational change management, and communication among key leadership roles will be critical to the project's success.

- **DICE** – Digital Initiatives for Customer Engagement (DICE) is comprised of three focus areas: New Products and Services, Extending Self-Service, and Digital Channels Optimization. The initiatives consist of bundled service enhancements across each focus area, as prioritized by the business need.
- **HRIS** – Human Resources Information System (HRIS) replaces an aging and disjointed set of HR processes and applications with a new system for all core processes, including but not limited to payroll, benefits administration, management of training activities, performance management, and recruiting. This will also enable the implementation of a critically important Learning Management System (LMS) to centrally track and manage all aspects of employee training and development.
- **PowerPlan Budgeting Redesign** – This redesign aims to decouple business process customizations within the application and the implementation of best in class, industry based out of the box budgeting processes.
- **Clarity Replacement** – This budgeting and forecasting application requires replacement as IBM is no longer providing product updates or support to Clarity.
- **IAM** – Identity Access Management (IAM) is part of a layered approach within the Cybersecurity program, implementing a centralized system that automates the provisioning of end user system access. IAM is a key cybersecurity control domain with a high-risk profile and this system will enable a controlled and auditable solution ensuring the appropriate access is authorized to the right resources in the right systems.
- **SOA** – Services Oriented Architecture (SOA) fully supports all other investment areas, including CIS. SOA provides the vital middle layer that sits between source systems and contains the data and business logic that is required to integrate systems and third parties. The implementation continues with the redesign of application interfaces from a legacy based point-to-point architecture, to a services-oriented approach with application logic and synchronization of data occurring in a middle layer vs. within each application. This approach provides a more efficient, flexible, scalable, and agile approach to application integration.

The ongoing investments with our IT infrastructure include our networks, servers, computers, mobile devices, security devices, and all of the components that link these devices, altogether spanning more than 2,500 devices. The infrastructure investments include recurring device lifecycle upgrades and replacements along with the implementation of new devices to support new business solutions.

For planning purposes, the life cycle of the IT infrastructure is anticipated to be between 5 and 8 years on average, but varies depending upon the type of equipment. The useful life largely depends on usage, environment, technology obsolescence and incompatibility, decreased reliability and discontinued manufacturer support:

- Mainframe, peripherals, storage and printers - 8 years
- PC & laptops – 5 years
- Mobile Computers – 3 years
- Network Printers – 3 years
- Network devices – 5 years
- Telephone systems – 10 to 12 years

Within the communication budget is funding for the Company's Network Strategy project. The Network Strategy project is an enterprise solution to address communication needs among the company's fixed assets and was justified based on a business case in our 2014 rate filing to move away from costly, unreliable third party communication providers.. These fixed assets include corporate offices, gas gate and regulator stations, electric substations, electric distribution automation devices, mobile radio tower and large customer meters, the two-way network is being built with a high speed backbone and medium bandwidth mesh radio network to communicate to more dispersed assets. The five year forecast includes \$18.7M for this project.

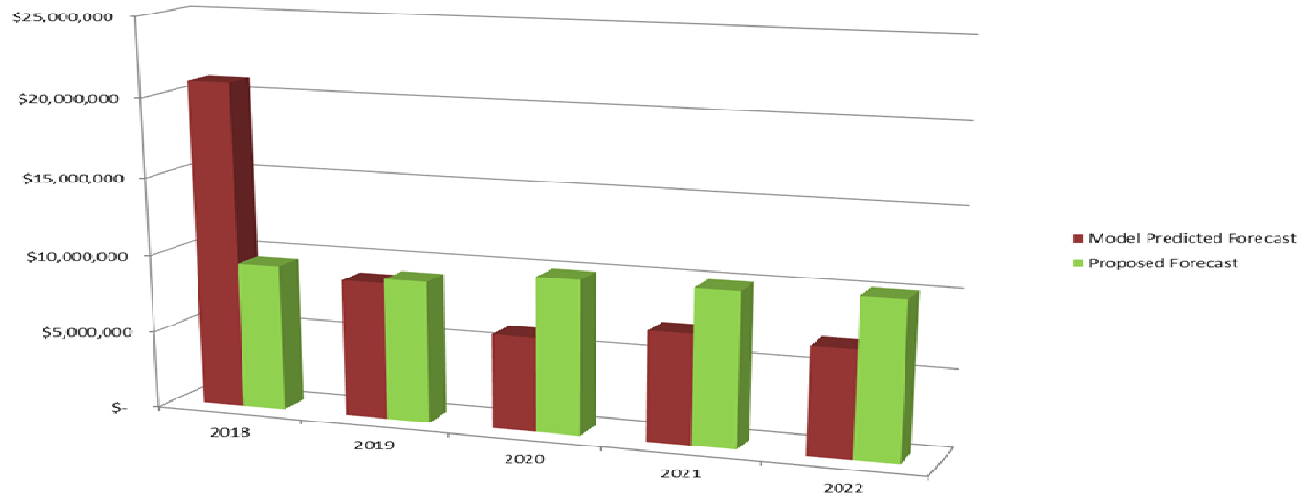
### **Transportation and Tools**

The Tools budget consists of equipping new vehicles with tools, obsolescence and incompatibility, decreased reliability, discontinued manufacturer support, and conformance to changing OSHA or other regulations. Specialized tools required to accomplish new tasks or support the application of new techniques, are typically purchased after a trial use period.

The Transportation Capital Forecast is based primarily on the replacement of equipment. Historically, light duty vehicles were replaced every 10 years/150k miles, medium duty trucks every 12 years/150k miles, and power operated equipment (bucket trucks) every 12 yrs. /13,000 engine hours. In 2015 new replacement criteria were implemented based on industry benchmarking information for each class of vehicle. This resulted in an updated fleet replacement schedule that replaces light/medium duty units at 7 years / 120k miles and heavy duty units at 10 years / 9,500 engine hours. The changes in criteria were designed to increase fleet reliability and availability, control expense and O&M costs as vehicles and equipment neared the end of their lifecycle. In addition, the expanded capital construction program and in some cases the type of work (i.e., off-road) were factored into the forecast. Results of the analysis and implementation of new methodology resulted in the following:

- \$49M spend over the next 5 years to align with the updated useful lives ("flush the fleet");
- Reduces average fleet age and "*caps*" fleet age at 10 years
- More levelized spend over the next 5 years;
- Added \$1.7M / year for replacing non-road equipment ;
- Added \$800K/year for replacing specialized track equipment;
- With new mileage and hour tracking systems being installed, fleet can be managed on utilization – most vehicles will be replaced before they reach 10 years old

**Transportation Vehicle Forecast 2018-2022**



## **SUMMARY SCHEDULES 2019-2023 FORECAST**

**2019- 2023 Construction Forecast (\$000's)**  
**INSTALLATION W/ AFUDC**  
(with inflation & OH adjustment)

		Expenditures with AFUDC									2019-2023 Proposed Budget Total	
		JP Settlement Budget 2018	2019 Proposed Budget (1st Half)	2019 Proposed Budget (2nd Half)	2019 Proposed Budget	2020 Proposed Budget (1 <sup>st</sup> Half)	2020 Proposed Budget (2 <sup>nd</sup> Half)	2020 Proposed Budget	2021 Proposed Budget	2022 Proposed Budget		2023 Proposed Budget
ELECTRIC PROGRAM												
Hydro & Gas Turbines	11	1,910	669	1,350	2,019	736	736	1,473	1,540	1,335	2,121	8,487
Transmission	12	19,458	8,734	10,606	19,340	9,997	11,550	21,548	23,443	25,611	23,038	112,980
Substations	13	16,185	11,285	8,027	19,312	8,041	11,680	19,720	18,348	16,221	16,114	89,716
New Business	14	6,520	3,335	3,335	6,670	3,451	3,451	6,901	7,132	7,114	7,240	35,057
Dist. Improvements	15	35,759	20,390	20,901	41,291	18,019	22,575	40,593	39,978	41,620	42,683	206,165
Transformers	16	5,358	2,809	2,886	5,696	3,017	3,017	6,034	6,415	6,343	6,479	30,967
Meters	17	2,383	1,496	997	2,493	1,352	1,352	2,703	2,808	3,542	3,664	15,211
Total Electric Program		87,574	48,717	48,103	96,820	44,613	54,360	98,973	99,665	101,785	101,340	498,583
GAS PROGRAM												
Production	21	-	-	-	-	-	-	-	-	-	-	-
Transmission	22	2,717	552	1,156	1,707	457	1,048	1,505	2,375	2,437	2,360	10,385
Regulator Stations	23	1,743	822	1,278	2,100	1,101	1,332	2,434	2,594	2,552	2,012	11,692
New Business	24	9,427	4,759	4,800	9,559	4,964	5,006	9,971	10,020	10,483	10,584	50,616
Dist. Improvements	25	38,631	16,050	24,313	40,363	15,427	23,369	38,796	40,829	41,709	42,737	204,434
Meters	27	2,895	1,514	1,514	3,029	1,496	1,496	2,993	2,665	2,755	2,864	14,306
Total Gas Program		55,414	23,698	33,060	56,758	23,447	32,251	55,698	58,483	59,936	60,558	291,433
COMMON PROGRAM												
Buildings	41	8,250	8,091	8,189	16,280	4,406	4,455	8,861	17,405	20,755	8,956	72,258
Buildings Minors		3,871	2,127	2,153	4,280	2,070	2,094	4,164	4,191	15,709	7,822	36,167
Major Expansion		4,379	5,964	6,036	12,000	2,335	2,362	4,697	13,214	5,045	1,135	36,091
Office Equipment	42	20,449	12,901	12,262	25,164	10,548	10,784	21,331	20,410	23,891	19,723	110,519
General	421	306	82	82	163	156	156	313	213	326	277	1,292
EMS	423	2,055	2,551	1,616	4,168	628	628	1,256	175	4,883	394	10,876
EDP	4222	3,113	1,493	1,493	2,986	1,502	1,502	3,005	3,068	3,132	3,187	15,378
Softw are	4220	14,270	8,499	8,739	17,238	7,953	8,189	16,142	16,321	15,114	15,313	80,127
Security	424	704	276	332	608	308	308	616	634	435	553	2,846
Tools	43	1,285	657	657	1,313	755	755	1,510	1,485	1,516	1,543	7,366
Communication	44	8,242	5,206	4,003	9,209	3,353	3,353	6,706	2,350	1,290	199	19,754
Transportation	45	8,297	4,559	4,559	9,119	4,968	4,968	9,935	9,942	10,136	10,291	49,423
Total Common Program		46,523	31,415	29,670	61,085	24,029	24,314	48,343	51,592	57,587	40,713	259,320
CORPORATE TOTAL		189,510	103,830	110,833	214,663	92,088	110,926	203,014	209,740	219,309	202,611	1,049,336



**2019- 2023 Construction Forecast (\$000's)**  
**REMOVAL**  
(with inflation)

		Expenditures								
		JP Settlement Budget 2018	2019 Proposed Budget (1st Half)	2019 Proposed Budget (2nd Half)	2019 Proposed Budget	2020 Proposed Budget	2021 Proposed Budget	2022 Proposed Budget	2023 Proposed Budget	2019-2023 Proposed Budget Total
<b>ELECTRIC PROGRAM</b>										
Hydro & Gas Turbines	11	128	118	87	204	130	117	624	166	1,242
Transmission	12	2,448	1,321	1,321	2,642	3,805	3,325	3,296	3,533	16,602
Substations	13	1,752	880	906	1,786	2,090	2,102	1,973	2,265	10,215
New Business	14	255	128	128	255	261	266	272	277	1,331
Dist. Improvements	15	2,351	1,175	1,175	2,350	2,403	2,636	2,621	2,667	12,678
Transformers	16	409	204	204	409	417	426	435	443	2,130
Meters	17	10	5	5	10	10	11	11	11	53
Total Electric Program		7,352	3,831	3,827	7,658	9,116	8,883	9,233	9,362	44,252
<b>GAS PROGRAM</b>										
Production	21	-	-	-	-	-	-	-	-	-
Transmission	22	123	51	51	102	63	107	87	89	447
Regulator Stations	23	102	54	54	107	115	117	109	89	537
New Business	24	511	102	102	204	209	213	218	221	1,065
Dist. Improvements	25	1,022	664	664	1,328	1,356	1,385	1,414	1,439	6,922
Meters	27	4	2	2	4	4	4	4	4	21
Total Gas Program		1,762	873	873	1,746	1,746	1,826	1,831	1,841	8,991
<b>COMMON PROGRAM</b>										
Buildings	41	665	140	140	280	287	268	311	437	1,583
Buildings Minors		257	140	140	280	287	268	311	437	1,583
Major Expansion		409	-	-	-	-	-	-	-	-
Office Equipment	42	-	-	-	-	-	-	-	-	-
General	421	-	-	-	-	-	-	-	-	-
EMS	423	-	-	-	-	-	-	-	-	-
EDP	4222	-	-	-	-	-	-	-	-	-
Software	4220	-	-	-	-	-	-	-	-	-
Security	424	-	-	-	-	-	-	-	-	-
Tools	43	0	0	0	0	0	0	0	0	1
Communication	44	1	1	1	1	1	1	1	1	5
Transportation	45	(450)	(225)	(225)	(450)	(450)	(450)	(450)	(450)	(2,250)
Total Common Program		216	(84)	(84)	(169)	(162)	(181)	(138)	(12)	(661)
<b>CORPORATE TOTAL</b>		9,331	4,619	4,615	9,235	10,701	10,528	10,926	11,192	52,582

## **ELECTRIC PROGRAM INDIVIDUAL PROJECT SUBMITTAL**



## Budget Submittal Form for Electric Projects

Project Name:	<input type="text" value="Coxsackie Major Overhaul"/>		
Form submitted by:	<input type="text" value="Michael Hogan"/>		
Budget Group:	<input type="text" value="11 - Hydro &amp; Gas Turbines"/>		
Summary Category:	<input type="text" value="Maintain System Standards"/>		
Investment Category:	<input type="text" value="Infrastructure"/>		
Number of Customers Affected:	<input type="text" value="ALL"/>		
For Category 15 only:	Budget Year Submitted	<input type="text"/>	
	Project ID (District-YYYY-ID)	<input type="text"/>	

### Description of Problem

The last time the units were overhauled was about 40 years ago. Despite the low run time, age still comes into consideration with the health of the unit. Inspection have noted some fatigue and the units should be considered for a major overhaul in 2022.

### Solution

Send unit out for a shop overhaul.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$1,060,000"/>	<input type="text" value="\$ 0"/>	<input type="text" value="\$ 0"/>	<input type="text" value="\$ 0"/>	<input type="text" value="\$ 0"/>	<input type="text" value="\$1,060,000"/>	<input type="text" value="\$960,000"/>
<b>Expense</b>	<input type="text" value="\$ 0"/>	<input type="text" value="\$ 0"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☒ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## Risk Reduction

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

**Project Name:**

**Form submitted by:**

**Budget Group:**

**Summary Category:**

**Investment Category:**

**Number of Customers Affected:**

**For Category 15 only:**      **Budget Year Submitted**

**Project ID (District-YYYY-ID)**

**Description of Problem**

The last time the units were overhauled was about 40 years ago. Despite he low run time, age still comes into consideration with the health of the unit. Inspection have noted some fatigue and the units should be considered for a major overhaul in 2023.

**Solution**

Send unit out for a shop overhaul.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$1,060,000"/>	<input type="text" value="\$ 0"/>	<input type="text" value="\$ 0"/>	<input type="text" value="\$ 0"/>	<input type="text" value="\$ 0"/>	<input type="text" value="\$1,060,000"/>	<input type="text" value="\$960,000"/>
<b>Expense</b>	<input type="text" value="\$ 0"/>	<input type="text" value="\$ 0"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☒ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	Sturgeon Pool Unit 3 - New Wet Section		
Form submitted by:	Michael Hogan		
Budget Group:	11 - Hydro & Gas Turbines		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:	ALL		
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

## Description of Problem

Sturgeon Pool's Unit #1 had a violent generator failure on November 15 2011. The rotor was the cause of the failure and necessitated removing and sending out the rotor to be rewound. Further investigation found the wet section to have significant erosion due to years of cavitation issues. The design of the runner was developed in 1922 and has since been determined to be flawed, in that excessive cavitation occurs at various locations on the wheel. Unit #1 runner was subsequently replaced with a redesign runner that will significantly reduce cavitation. Unit #2 has an identical design and operating history. Visual inspections (limited access) suggest that the same damage from cavitation is present on this unit. Since the upper rotor section needs to be removed in order to work on the wet section, and the rotor will be removed for a rotor rewind project, it would be more efficient to perform wet section work in conjunction with the rotor rewind project.

## Solution

Based on work on Unit #1's wet section, the estimated cost \$919,000 (\$0 for removal and \$919,000 for installation) is anticipated for this project. In a cost saving measure for future units, the design and fabrication drawings necessary to reproduce the wheel were incorporated into Unit 1's project. Using the same design, it is anticipated to provide at least \$100,000 in savings for this unit compared to Unit #1.

This project would provide:

- A new redesigned runner (developed in Unit #1's project) that will be attached to the existing shaft
- New redesigned stainless steel wicket gates
- New head cover
- New gate arms
- New bearings

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$1,033,000"/>	<input type="text" value="\$1,033,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$ 0"/>	<input type="text" value="\$ 0"/>	<input type="text" value="\$ 0"/>	<input type="text" value="\$ 0"/>
<b>Expense</b>	<input type="text" value="\$ 0"/>	<input type="text" value="\$ 0"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

☒ Environmental

☒ Timing/Permitting

☐ Manpower

☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

☐ Reduced O&M

☒ Reduced Customer Bill

☐ Other

**Service**

Non-Storm Reliability

☐ \$/COA

☐ 5 Year Average # Outages Avoided

Non-Storm Operating

☐ \$/CMA

☐ 5 Year Average Duration of Outages

Customer Satisfaction

☐ Complaints

☐ Critical Customers

☐ LSA Customers

☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

Project Name:	High Priority Repair (HPR) Program
Form submitted by:	K.Bragg
Budget Group:	12 - Transmission
Summary Category:	Non-Discretionary
Investment Category:	Compliance
Number of Customers Affected:	
For Category 15 only:	Budget Year Submitted
	Project ID (District-YYYY-ID)

### Description of Problem

Transmission lines are inspected on a cyclical basis with varying methods ranging from aerial patrols to comprehensive ground patrols. Inspection results are stored in a searchable database, currently the Wagner NextGrid System. This database contains data recorded from all types of inspection methods including aerial patrol, comprehensive aerial inspection, comprehensive ground inspection, ground line testing and treatment, climbing inspection, corona camera inspection, infrared inspection, and other types of inspection as well. Inspection data is recorded for all transmission assets including poles, insulators, guy wires and anchors, structure hardware, foundations, grounding, conductors, static wires, suspect clearances, and right of ways (including encroachments, vegetation, access, etc). After the completion of each inspection cycle, results are analyzed and condition assessments are assigned to the appropriate component of each structure. These conditions are rated on a scale from "1" to "6" with "6" being in the most need of repair. Components with ratings of either "6", "5" or "4" must be repaired or replaced within 2 weeks, 1 year and 3 years, respectively, after the date of the assessment.

### Solution

There is a need to provide funding to respond to the results of the inspection process described above. In some instances components can simply be replaced while in other instances an entire structure might need to be replaced. The design work is then completed and materials ordered. Aside from emergency replacements, HPR driven replacements are typically grouped in packages by line and location to efficiently utilize field resources.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="27,299,000"/>	<input type="text" value="6,073,000"/>	<input type="text" value="6,140,000"/>	<input type="text" value="5,163,000"/>	<input type="text" value="4,569,000"/>	<input type="text" value="5,354,000"/>	<input type="text" value="4,869,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☒ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☒ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☒ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



Project ID (District-YYYY-ID)

- Insulators
- Conductor
- Poles
- Structure members
- Other Equipment that fails and is beyond repair
- Minor Pole Relocations

Install new and update existing equipment as required during the course of a year that is not specifically tied to a major project. Budget projections include for (9) basic single pole replacements annually based on historical project data.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="1,325,000"/>	<input type="text" value="229,000"/>	<input type="text" value="250,000"/>	<input type="text" value="294,000"/>	<input type="text" value="262,000"/>	<input type="text" value="289,000"/>	<input type="text" value="263,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☒ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☒ Public Safety
- ☐ Other Program Type

### Compliance

- ☒ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☒ NESC Codes
- ☒ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

Project Name:	ROW Repair Project		
Form submitted by:	K.Bragg		
Budget Group:	12 - Transmission		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

### Description of Problem

Central Hudson had committed voluntarily to obtain additional right of way as follow up to the Northeast Blackout of 2003. The report to the PSC stated that we would identify easements that were deficient from the standard of 100 foot on 69kV and 115kV lines and 150 foot on 345kV lines.

### Solution

Central Hudson has identified easement deficiencies along its 69kV, 115kV and 345kV transmission line corridors. The adjacent property owners have been identified and, if haven't already, will be contacted in an attempt to acquire the additional ROW. A vendor will be chosen to provide all of the required work and services to document and obtain additional easement agreements throughout the service territory.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="3,165,000"/>	<input type="text" value="498,000"/>	<input type="text" value="510,000"/>	<input type="text" value="875,000"/>	<input type="text" value="640,000"/>	<input type="text" value="643,000"/>	<input type="text" value="584,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☒ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☒ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



## Budget Submittal Form for Electric Projects

Project Name:	ACSR Replacement Project _ WH 1 and WH 2 Line Rebuild		
Form submitted by:	K.Bragg		
Budget Group:	12 - Transmission		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

### Description of Problem

During 2003, samples were taken of the WH1 & WH2 line conductor for testing by NEETRAC; this testing revealed evidence of conductor annealing which can result in clearance issues. During the System-Wide Sag Analysis Screening Program, 36 spans of the WH-1 and WH-2 were identified as spans with potential road clearance violations. See EP #2011-010. Also as of 2015, Inspections findings indicate that (47) structures on the line have conditions warranting repair or replacement.

### Solution

As recommended, Central Hudson's portion of the 69 kV WH-1 and WH-2 lines should be rebuilt as a single circuit 69 kV line along the same route with 795 ACSR conductor with OPGW neutral for substation communications. The WH-1/2 line taps to Greenfield Road should be rebuilt as a single circuit 69 kV line along the same route with 795 ACSR conductor & OPGW. The Honk Falls WH-769 Breaker should be replaced per the Breaker Replacement Program.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate: Bid Estimate

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	\$1,772,000	\$0	\$0	\$0	\$0	\$1,772,000	
Expense							

**Cost Risks**

- ☒ Environmental Matting for Access
- ☒ Timing/Permitting Permitting approvals needed for construction start
- ☐ Manpower
- ☒ Other Outage constraints involving the NYC DEP and ability of hydro-generation facilities to operate during critical time periods throughout the year.

**Primary Project Objective** Risk Reduction

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☒ Critical Customers NYC Board of Water Supply - Hydro Generation Facilities
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☒ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☒ NESC Codes
- ☒ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

EP #2011-010

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

Project Name:	HF Line Rebuild - 115kV		
Form submitted by:	K.Bragg		
Budget Group:	12 - Transmission		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

### Description of Problem

In 2017, a field inspection of the 2.05 mile 115kV "HF" Line (Fishkill Plains - East Fishkill) showed that 83% of the existing structure plant would require replacement due to component defects. Central Hudson's Network Strategy group has also identified the HF Line as requiring the installation of fiber optic communication from the Fishkill Plains Substation to the East Fishkill Substation as part of the overall system communication plan.

### Solution

Given the level of replacement needed to repair the identified component defects, it has been proposed to rebuild all 2.05 miles of the existing 115kV "HF" Line. This would include replacement of all structures, conductor and overhead ground wire. The voltage is planned to remain at 115kV. Structures will remain in the same general locations, and the height of the structures are not planned to increase by more than 10 feet. The total number of structures has the potential to decrease as the design is developed. Additional rights-of-way (ROW) are not required for this rebuild and at this time no existing ROW deficiencies have been identified. OPGW (fiber optic ground wire) will be installed as part of the rebuild project in accordance with the needs of the Network Strategy Group.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="1,855,000"/>	<input type="text" value="1,855,000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☒ Environmental
- ☒ Timing/Permitting
- ☒ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☒ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## Risk Reduction

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☒ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☒ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☒ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

EP#2018-002

Or

Project Alternatives Considered

Decision criteria for alternative selection



## Budget Submittal Form for Electric Projects

Project Name:	<input type="text" value="Network Strategy"/>		
Form submitted by:	<input type="text" value="K.Bragg"/>		
Budget Group:	<input type="text" value="12 - Transmission"/>		
Summary Category:	<input type="text" value="Maintain System Standards"/>		
Investment Category:	<input type="text" value="Infrastructure"/>		
Number of Customers Affected:	<input type="text"/>		
For Category 15 only:	Budget Year Submitted	<input type="text"/>	
	Project ID (District-YYYY-ID)	<input type="text"/>	

### Description of Problem

In 2015, Central Hudson's Network Strategy Group created a comprehensive plan to install various communication systems throughout the service territory. These communication systems would be placed strategically to allow for efficient and secure company communications between various critical facilities.

### Solution

The Network Strategy Group has identified several existing transmission lines which provide existing pathways that can be utilized for communication connections as part of the overall system communication plan. Central Hudson will be installing fiber optic communication on these existing electric transmission pole plants over the course of the next 5 years.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

☒ Environmental

☒ Timing/Permitting

☐ Manpower

☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

☐ Reduced O&M

☒ Reduced Customer Bill

☐ Other

**Service**

Non-Storm Reliability

☐ \$/COA

☐ 5 Year Average # Outages Avoided

Non-Storm Operating

☐ \$/CMA

☐ 5 Year Average Duration of Outages

Customer Satisfaction

☐ Complaints

☐ Critical Customers

☐ LSA Customers

☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☒ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☒ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

Project Name:	CL Line Rebuild - 69kV		
Form submitted by:	K.Bragg		
Budget Group:	12 - Transmission		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

### Description of Problem

In 2015, a field inspection of the 11.7 mile 69kV "CL" Line (North Catskill - Lawrenceville - South Cairo) showed that 69% of the existing structure plant would require replacement due to component defects. There were also an additional 23% of structures that showed a significant number of minor defects indicating an overall poor structure condition.

### Solution

Given the level of replacement needed to repair the identified component defects, it has been proposed to rebuild 10.16 miles of the existing 11.7 mile line. The 1.54 mile section of line immediately outside of the North Catskill Substation was recently replaced with new steel structures in 2008. The rebuild will include the replacement of all structures, conductors and overhead ground wire in the designated 10.16 mile section of line. The line voltage is planned to remain at 69kV.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="8,083,000"/>	<input type="text" value="8,031,000"/>	<input type="text" value="52,000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☒ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☒ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☒ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☒ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

E.P.#2017-011

Or

Project Alternatives Considered

Decision criteria for alternative selection



## Budget Submittal Form for Electric Projects

<b>Project Name:</b>	FV Line Rebuild 69 kV: Salisbury – Smithfield		
<b>Form submitted by:</b>	K.Bragg		
<b>Budget Group:</b>	12 - Transmission		
<b>Summary Category:</b>	Maintain System Standards		
<b>Investment Category:</b>	Infrastructure		
<b>Number of Customers Affected:</b>			
<b>For Category 15 only:</b>	<b>Budget Year Submitted</b>		
	<b>Project ID (District-YYYY-ID)</b>		

### Description of Problem

The FV Line is a 69 kV line connecting the Northeast Utilities Salisbury Substation to the Smithfield Substation; Central Hudson owns approximately 4.5 miles of this line. The 4/0 ACSR conductor was installed in 1948. The results of conductor testing by NEETRAC show corrosion of the steel core and evidence of annealing of aluminum strands and fatigue due to vibration.

### Solution

Reconductor Central Hudson's portion of this line (4.5 miles) with 795 ACSR with OPGW neutral for substation communications. This project will need to be coordinated with Northeast utilities. The reconducted FV line will help maintain system reliability and reduce system losses.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="1,772,000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="1,772,000"/>	<input type="text" value="1,612,000"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☒ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☒ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

**Project Name:** 69kV KM Line Rebuild - Knapps Corners to Myers Corners - 102C

**Form submitted by:** K.Bragg

**Budget Group:** 12 - Transmission

**Summary Category:** Maintain System Standards

**Investment Category:** Infrastructure

**Number of Customers Affected:**

**For Category 15 only:**      **Budget Year Submitted**

**Project ID (District-YYYY-ID)**

## Description of Problem

The 2.85 mile 69 kV KM line from Knapps Corners to Myers Corners was built in the 1920's with wood pole construction. Inspection results indicate that approximately 58% of the structures are in need of replacement due to the poor condition. Additionally, portions of the static wire are 5/16" steel, which has been identified as problematic and is in need of replacement/upgrade. The additional load from the upgraded static wire requires the replacement of additional structures (the number remains to be determined).

## Solution

Central Hudson will be rebuilding the KM Line for 69kV from the Knapps Corners Substation to the Myers Corners Substation with OPGW to support the expansion of the fiber network and to maintain reliability.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="3,740,000"/>	<input type="text" value="199,000"/>	<input type="text" value="1,142,000"/>	<input type="text" value="2,399,000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☒ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☒ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☒ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study 

KM & TV Line Rebuild and EP2005-010 5-16inch Steel Static Wire Assessment

Or

Project Alternatives Considered

Internal project alternatives analysis in progress

Decision criteria for alternative selection



## Budget Submittal Form for Electric Projects

<b>Project Name:</b>	69kV TV Line Rebuild - Myers Corners to North Chelsea - 102C		
<b>Form submitted by:</b>	K.Bragg		
<b>Budget Group:</b>	12 - Transmission		
<b>Summary Category:</b>	Maintain System Standards		
<b>Investment Category:</b>	Infrastructure		
<b>Number of Customers Affected:</b>			
<b>For Category 15 only:</b>	<b>Budget Year Submitted</b>		
	<b>Project ID (District-YYYY-ID)</b>		

### Description of Problem

The 6.3 mile 69 kV TV line from Myers Corners to North Chelsea was built in the 1920's with wood pole construction. Inspection results indicate that approximately 53% of the structures are in need of replacement due to the poor condition. The transmission supply to Meyers Corners Substation currently is limited by the area transmission (North Chelsea 115/69 kV transformer). Myers Corners Substation currently is operating at 69 kV and is designed for 115 kV operation.

### Solution

In order to maintain reliability and to provide sufficient load serving capability to the Myers Corners area, Central Hudson will be rebuilding the TV Line for 69kV from the Myers Corners Substation to the North Chelsea Substation with OPGW to support the expansion of the fiber network.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="8,262,000"/>	<input type="text" value="199,000"/>	<input type="text" value="1,051,000"/>	<input type="text" value="4,132,000"/>	<input type="text" value="2,881,000"/>	<input type="text"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☒ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☒ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☒ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

E.P#2017-010

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

<b>Project Name:</b>	SB Line New 115kV Line Hurley Ave to Saugerties		
<b>Form submitted by:</b>	K.Bragg		
<b>Budget Group:</b>	12 - Transmission		
<b>Summary Category:</b>	Maintain System Standards		
<b>Investment Category:</b>	Infrastructure		
<b>Number of Customers Affected:</b>			
<b>For Category 15 only:</b>	<b>Budget Year Submitted</b>		
	<b>Project ID (District-YYYY-ID)</b>		

### Description of Problem

The 69 kV H & SB Lines connect the North Catskill, Saugerties & Hurley Avenue Substations. Together, the lines are approximately 23.4 miles in length. The 11.1 mile portion of the line from Hurley Avenue to Saugerties is designated as the SB Line. The majority of structures and conductor on this line were built in 1919 and are close to reaching the end of their useful life. There are also a number of spans identified on this line as part of Central Hudson's SAG Mitigation program.

### Solution

To address the aging infrastructure and provide the potential for additional area load serving capability to the Northwest Area, the chosen course of action is to rebuild the SB Line for 115 kV. The 115 kV SB line rebuild and an additional 115 kV reinforcement in the Northwest Area will also help maintain system reliability. The budgetary cost estimates below reflect the conceptual estimates found in the relevant planning memo (EP2015-003) as well as additional adjustments based on similar in-progress article VII actual expenditures.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="16,920,000"/>	<input type="text" value="797,000"/>	<input type="text" value="9,180,000"/>	<input type="text" value="6,657,000"/>	<input type="text" value="286,000"/>	<input type="text"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☒ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☒ Public Safety
- ☐ Other Program Type

### Compliance

- ☒ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☒ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☒ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

EP2015-003

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	H Line New 115kV Saugerties to North Catskill		
Form submitted by:	K.Bragg		
Budget Group:	12 - Transmission		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

## Description of Problem

The 69 kV H & SB Lines connect the North Catskill, Saugerties & Hurley Avenue Substations. Together, the lines are approximately 23.4 miles in length. The 12.3 mile portion of the line from North Catskill to Saugerties is designated as the H Line. The majority of structures and conductor on this line were built in 1919 and are close to reaching the end of their useful life. There are also a number of spans identified on this line as part of Central Hudson's SAG Mitigation program.

## Solution

To address the aging infrastructure and potentially provide additional area load serving capability to the Northwest Area, the chosen course of action is to rebuild the H Line for 115 kV. The 115 kV H line rebuild and an additional 115 kV reinforcement in the Northwest Area will also help maintain system reliability. The budgetary cost estimates below reflect the conceptual estimates found in the relevant planning memo (EP2015-003) as well as additional adjustments based on similar in-progress article VII actual expenditures.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="20,451,000"/>	<input type="text" value="405,000"/>	<input type="text" value="1,440,000"/>	<input type="text" value="3,473,000"/>	<input type="text" value="15,132,000"/>	<input type="text"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☒ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☒ Public Safety
- ☐ Other Program Type

### Compliance

- ☒ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☒ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☒ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

EP2015-003

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

Project Name:	HG Line 69kV Rebuild (Honk Falls - Neversink)		
Form submitted by:	K.Bragg		
Budget Group:	12 - Transmission		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

### Description of Problem

The 69kV "HG" Line is 16.17 miles in length. The line was constructed in two pieces, one in the late 1930's and the other in the early 1950's. The line is a vital piece of Central Hudson's 69kV Electric Transmission loop in the Ellenville area and provides service to (3) hydro-generation facilities. Despite conducting numerous maintenance projects on the line, inspection findings indicate that approximately 60% of the line is still in need of replacement as a result of aging infrastructure and poor overall condition. In addition to the required structure work, Central Hudson has also experienced several in-service failures of the conductor which resulted in outages. The vast majority of the conductor is of the original line vintage and has required numerous repairs over the past several years.

### Solution

Given the amount of structures requiring repair or replacement and the age / condition of the conductor, Central Hudson is proposing a complete rebuild of the entire 16.17 miles of the 69kV "HG" Line from the Honk Falls Substation to the Neversink Substation. A planning memo is in-progress and will be available later in 2018.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="16,048,000"/>	<input type="text" value="100,000"/>	<input type="text" value="102,000"/>	<input type="text" value="272,000"/>	<input type="text" value="1,600,000"/>	<input type="text" value="13,975,000"/>	<input type="text" value="12,709,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☒ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☒ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations ☐

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## Risk Reduction

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☒ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☒ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☒ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Planning Memo in-progress

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	<input type="text" value="Substation Minor Projects"/>		
Form submitted by:	<input type="text" value="Brett Arteta"/>		
Budget Group:	<input type="text" value="13 - Substations"/>		
Summary Category:	<input type="text" value="Non-Discretionary"/>		
Investment Category:	<input type="text" value="Daily Operations"/>		
Number of Customers Affected:	<input type="text"/>		
For Category 15 only:	Budget Year Submitted	<input type="text"/>	
	Project ID (District-YYYY-ID)	<input type="text"/>	

## Description of Problem

Minor Substation projects are completed throughout the year based on failures and equipment condition assessments. These are smaller scale projects and typically based on the need to update/replace substation equipment including:

- Battery Chargers
- Meters
- Controls
- Communications
- Other Equipment that fails and is unrepairable

## Solution

Install new and update existing equipment as required during the course of a year that is not specifically tied to a major project upgrade.

**Cost estimate (include AFUDC if appropriate)**

**Type of estimate:**

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$2,611,000"/>	<input type="text" value="\$478,000"/>	<input type="text" value="\$520,000"/>	<input type="text" value="\$542,000"/>	<input type="text" value="\$532,000"/>	<input type="text" value="\$538,000"/>	<input type="text" value="\$518,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

**Project Name:** ESP Infrastructure Replacement

**Form submitted by:** Brett Arteta

**Budget Group:** 13 - Substations

**Summary Category:** Maintain System Standards

**Investment Category:** Infrastructure

**Number of Customers Affected:**

**For Category 15 only:**     **Budget Year Submitted**

**Project ID (District-YYYY-ID)**

## Description of Problem

A variety of equipment exists in Central Hudson substations, including protective relays, meters, recloser controls, and other control & communications equipment such as Remote Terminal Units (RTUs). Each of these components serves an integral role in contribution to the overall, integrated substation protection, control, and monitoring function.

The need for upgraded infrastructure has been made evident through the inclusion of new substations and through various targeted replacement programs, all in the Category 13 Capital Forecast. These programs include the RTU Retrofit Program, the Breaker Replacement Program, and the Generation 1 Relay Replacement Program. These programs only address a sample of individual concerns without giving consideration to remaining equipment in the station that should be upgraded on an integrated basis. Without an integrated program, the remaining outdated equipment in the substations is replaced through attrition solely: an accelerated replacement schedule is recommended that takes advantage of the savings that can be realized by performing incremental work at the same time as previously identified and justified capital work.

## Solution

Install new and update existing equipment as required during the course of a year that is not specifically tied to a major project upgrade. These upgrades, when coupled with existing projects in a location, can take advantage of construction efficiencies to reduce overall costs of performing the work separately.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$5,185,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$546,000"/>	<input type="text" value="\$2,191,000"/>	<input type="text" value="\$2,448,000"/>	<input type="text" value="\$1,042,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

SR#2011-07

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

**Project Name:** RTU Replacement Program

**Form submitted by:** Brett Arteta

**Budget Group:** 13 - Substations

**Summary Category:** Maintain System Standards

**Investment Category:** Infrastructure

**Number of Customers Affected:**

**For Category 15 only:**      **Budget Year Submitted**

**Project ID (District-YYYY-ID)**

## Description of Problem

The first and second generation of Remote Terminal Units (RTU's) require more extensive maintenance due to age-related component failures. Many of these RTU's are now unsupported by the manufacturers and have limited or no parts availability for maintenance and repair.

## Solution

Planned replacement of first and second generation of RTU's located at Substations, see attached RTU Replacement Table.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,739,000"/>	<input type="text" value="\$253,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$64,000"/>	<input type="text" value="\$812,000"/>	<input type="text" value="\$611,000"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

Primary Project Objective

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Central Hudson's "RTU Replacement Table"

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

<b>Project Name:</b>	Circuit Breaker Replacement Program (345kV)
<b>Form submitted by:</b>	Brett Arteta
<b>Budget Group:</b>	13 - Substations
<b>Summary Category:</b>	Maintain System Standards
<b>Investment Category:</b>	Infrastructure
<b>Number of Customers Affected:</b>	
<b>For Category 15 only:</b>	
<b>Budget Year Submitted</b>	
<b>Project ID (District-YYYY-ID)</b>	

### Description of Problem

Central Hudson has on-going condition based circuit breaker replacement program. The majority of power circuit breakers on the Central Hudson System have been in operation for over 40 years. Some of the breakers have operating issues and others are obsolete and do not have spare parts available for repair or maintenance.

### Solution

Selective replacement of specific breakers as specified by the program. (This represents the continuation of our on-going circuit breaker replacement program).

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$2,312,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$774,000"/>	<input type="text" value="\$790,000"/>	<input type="text" value="\$748,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☒ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
- ☐ Equipment Type
- ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Central Hudson’s “BRP 2019-2023 Five Year Forecast”

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

**Project Name:**

**Form submitted by:**

**Budget Group:**

**Summary Category:**

**Investment Category:**

**Number of Customers Affected:**

**For Category 15 only:**      **Budget Year Submitted**

**Project ID (District-YYYY-ID)**

**Description of Problem**

Central Hudson has on going condition based circuit breaker replacement program. The majority of power circuit breakers on the Central Hudson System have been in operation for over 40 years. Some of the breakers have operating issues and others are obsolete and do not have spare parts available for repair or maintenance.

**Solution**

Selective replacement of specific breakers as specified by the program. (This represents the continuation of our on-going circuit breaker replacement program).

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$2,913,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$231,000"/>	<input type="text" value="\$396,000"/>	<input type="text" value="\$2,286,000"/>	<input type="text" value="\$4,256,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☒ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Central Hudson’s “BRP 2019-2023 Five Year Forecast”

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

Project Name:	345 kV Switch Replacement Program		
Form submitted by:	Brett Arteta		
Budget Group:	13 - Substations		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

## Description of Problem

Problems have been identified with the TTT-7, EA, VR2 and VT-1 style motor operated 345kV air disconnects at the Roseton, Rock Tavern and Hurley Ave substations. Limited to no replacement parts are available for these style switches. These disconnects have reached the end of their useful lives, are problematic, and have resulted in extended time trouble-shooting problems and result in increased callouts. There have been several failures in recent times and due to frequency of operation and general condition.

## Solution

With the developing trend of problems and consideration given to the criticality of the bulk 345kV system, a multi-year systematic 345kV disconnect replacement program has been developed.

**Cost estimate (include AFUDC if appropriate)**

**Type of estimate:**

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$2,925,000"/>	<input type="text" value="\$574,000"/>	<input type="text" value="\$625,000"/>	<input type="text" value="\$650,000"/>	<input type="text" value="\$608,000"/>	<input type="text" value="\$468,000"/>	<input type="text" value="\$650,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

E. Schultz: "Operations Services Infrastructure Projects", May 10, 2013.

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	115 kV Switch Replacement Program		
Form submitted by:	Brett Arteta		
Budget Group:	13 - Substations		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

## Description of Problem

Based on condition, age and criticality, Operations Services has identified 115kV disconnect switches as candidates for targeted replacements.

The 115kV Switch Replacement Program will operate similar to our on-going Breaker Replacement Program. Switches will be identified by condition, criticality, age, use, availability of parts, and maintenance issues in order to create a prioritized list for replacement.

## Solution

Development of a 115kV switch replacement program.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$4,416,000"/>	<input type="text" value="\$485,000"/>	<input type="text" value="\$520,000"/>	<input type="text" value="\$572,000"/>	<input type="text" value="\$761,000"/>	<input type="text" value="\$2,078,000"/>	<input type="text" value="\$3,214,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

Project Name: Transformer Condition-Based Replacements

Form submitted by: Brett Arteta

Budget Group: 13 - Substations

Summary Category: Maintain System Standards

Investment Category: Infrastructure

Number of Customers Affected:

For Category 15 only:      Budget Year Submitted

Project ID (District-YYYY-ID)

## Description of Problem

Several existing power transformers have been identified for replacement due to condition. These transformers include:

Smithfield Transformer #1 (69/13.8 kV)  
Forgebrook Transformers # 1 & #2 (115/13.8 kV)  
Pulvers Corners Transformer #4 (69/13.8 kV)  
Union Avenue Transformers # 1 & #2 (115/13.8 kV)  
Tinkertown Transformers # 1 & #2 (69/13.8 kV)  
Converse Street Transformer #2 (14/4 kV)  
East Park Transformer #1 (69/13.8 kV)  
Grimley Road Transformer #2 (69/13.8 kV)  
Neversink Transformers # 3 & #6 (69/13.8 kV)  
Ohioville Transformers # 1 & #2 (115/13.8 kV)  
South Cairo Transformer #1 (69/13.8 kV)

## Solution

Replace transformers and any associated relaying as appropriate.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,039,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$1,039,000"/>	<input type="text" value="\$6,000,000"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	Switchgear Condition-Based Replacements		
Form submitted by:	Brett Arteta		
Budget Group:	13 - Substations		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

## Description of Problem

Several existing switchgears have been identified for replacement due to age and condition. These switchgears are located in the following substations:

Converse Street Substation  
Lincoln Park Substation  
Sturgeon Pool Generator Breakers Substation  
Montgomery Street Substation

## Solution

Replace switchgears and any associated relaying as appropriate.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$3,148,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$1,070,000"/>	<input type="text" value="\$2,078,000"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

Project Name:	Boulevard Transformer Replacement		
Form submitted by:	Brett Arteta		
Budget Group:	13 - Substations		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

### Description of Problem

As part of the ongoing review of the substation power transformer fleet, Operations Services completes a condition-based assessment of those transformers that are 55 years old or greater. This assessment is based on routine testing and monitoring to determine an overall condition and condition-trend of the transformer.

As part of this review, Boulevard Transformer #1 (Phases #1, #2 and #3) was assessed and determined to be in poor and degrading condition. This transformer has been in service since 1954 and located at this station since 1998.

The power factor results for the three single-phase banks have been consistently above acceptable values in all insulation. Results for Phase #3 low-ground insulation increased by 75% from 1998 to 2010. Results for all other insulation in Phases #1, #2 and #3 have been consistently above acceptable values (between 0.5% and 1%) over the testing period. Dissolved gas-in-oil analysis results indicate that the Phase #1 unit has just begun to show signs of cellulose overheating.

In addition, Boulevard Transformer #2 is 76+ years old and has increased power factor readings. Based on the age and condition, this transformer requires replacement.

### Solution

Replace the existing three transformers at Boulevard with two 13.4MVA (12MVA) transformers.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,506,000"/>	<input type="text" value="\$1,506,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☒ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

See below.

Or

**Project Alternatives Considered**

S. Martino, E.P. # 2014-003, "Boulevard/Jansen Ave./South Wall St./Converse St. Area Study" November 21, 2014.

**Decision criteria for alternative selection**



## Budget Submittal Form for Electric Projects

Project Name:	North Catskill Substation Upgrade		
Form submitted by:	Brett Arteta		
Budget Group:	13 - Substations		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

### Description of Problem

As part of the ongoing review of the substation power transformer fleet, Operations Services completes a condition-based assessment of those transformers that are 55 years old or greater. This assessment is based on routine testing and monitoring to determine an overall condition and condition-trend of the transformer.

Based on this assessment, it has been determined that the existing 115/69kV transformers at North Catskill have reached the end of their useful life and require replacement.

Much of the equipment at the North Catskill Substation has been identified for replacement on the following programs: RTU Replacement Program and the ESP Infrastructure Replacement Program.

### Solution

Replace existing 115/69 kV Transformer #4 and Transformer # 5 with three phase 115/69 kV 56 MVA autotransformers. The various programs above have been combined into one substation modernization project.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$4,482,000"/>	<input type="text" value="\$1,378,000"/>	<input type="text" value="\$3,103,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Chan, R.: "H & SB Lines". E.P. #2015-003. August 4, 2015.

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

**Project Name:** Coldenham Substation Modernization

**Form submitted by:** Brett Arteta

**Budget Group:** 13 - Substations

**Summary Category:** Maintain System Standards

**Investment Category:** Infrastructure

**Number of Customers Affected:**

**For Category 15 only:**      **Budget Year Submitted**

**Project ID (District-YYYY-ID)**

## Description of Problem

Much of the equipment at the Coldenham Substation has been identified for replacement on the following programs: Generation 1 Relay Replacement Program, RTU Replacement Program, DA/LTC Replacement Program, and the ESP Infrastructure Replacement Program.

## Solution

The various programs above have been combined into one substation modernization project.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,298,000"/>	<input type="text" value="\$1,298,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

**Project Name:**

**Form submitted by:**

**Budget Group:**

**Summary Category:**

**Investment Category:**

**Number of Customers Affected:**

**For Category 15 only:**      **Budget Year Submitted**

**Project ID (District-YYYY-ID)**

## Description of Problem

Much of the equipment at the Hurley Avenue 115 kV Substation has been identified for replacement on the following programs: DA/LTC Replacement Program, Breaker Replacement Program and the ESP Infrastructure Replacement Program.

## Solution

The various programs above have been combined into one 115 kV substation modernization project.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,498,000"/>	<input type="text" value="\$1,498,000"/>	<input type="text" value="\$"/>	<input type="text" value="\$"/>	<input type="text" value="\$"/>	<input type="text" value="\$"/>	<input type="text" value="\$"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

<b>Project Name:</b>	North Chelsea Transformer Replacement		
<b>Form submitted by:</b>	Brett Arteta		
<b>Budget Group:</b>	13 - Substations		
<b>Summary Category:</b>	Maintain System Standards		
<b>Investment Category:</b>	Infrastructure		
<b>Number of Customers Affected:</b>			
<b>For Category 15 only:</b>	<b>Budget Year Submitted</b>		
	<b>Project ID (District-YYYY-ID)</b>		

### Description of Problem

The 69kV G Line is being rebuilt due to asset condition and a 69kV source will be required at the North Chelsea Substation.

As part of the ongoing review of the substation power transformer fleet, Operations Services completes a condition-based assessment of those transformers that are 55 years old or greater. This assessment is based on routine testing and monitoring to determine an overall condition and condition-trend of the transformer.

Based on this assessment, it has been determined that the existing three single phase 115/69kV transformers at North Chelsea have reached the end of their useful life and require replacement.

### Solution

Replace existing three 115/69 kV single phase transformers with a three phase 115/69 kV 56 MVA autotransformer.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,351,000"/>	<input type="text" value="\$1,351,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

See below.

Or

**Project Alternatives Considered**

"Central Hudson Gas & Electric Long Range Electric System Plan", October 2013

**Decision criteria for alternative selection**



# Budget Submittal Form for Electric Projects

Project Name:	North Catskill Substation Upgrade		
Form submitted by:	Brett Arteta		
Budget Group:	13 - Substations		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

## Description of Problem

As part of the ongoing review of the substation power transformer fleet, Operations Services completes a condition-based assessment of those transformers that are 55 years old or greater. This assessment is based on routine testing and monitoring to determine an overall condition and condition-trend of the transformer.

Based on this assessment, it has been determined that the existing 115/69kV transformers at North Catskill have reached the end of their useful life and require replacement.

Much of the equipment at the North Catskill Substation has been identified for replacement on the following programs: RTU Replacement Program and the ESP Infrastructure Replacement Program.

## Solution

Replace existing 115/69 kV Transformer #4 and Transformer # 5 with three phase 115/69 kV 56 MVA autotransformers. The various programs above have been combined into one substation modernization project.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$4,482,000"/>	<input type="text" value="\$1,378,000"/>	<input type="text" value="\$3,103,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Chan, R.: "H & SB Lines". E.P. #2015-003. August 4, 2015.

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

**Project Name:** Pleasant Valley 115kV Substation Modernization

**Form submitted by:** Brett Arteta

**Budget Group:** 13 - Substations

**Summary Category:** Maintain System Standards

**Investment Category:** Infrastructure

**Number of Customers Affected:**

**For Category 15 only:**      **Budget Year Submitted**

**Project ID (District-YYYY-ID)**

## Description of Problem

Much of the equipment at the Pleasant Valley 115 kV Substation has been identified for replacement on the following programs: Breaker Replacement Program, 115 kV Disconnect Replacement Program, and the ESP Infrastructure Replacement Program.

## Solution

The various programs above have been combined into one 115 kV substation modernization project. Five 115 kV circuit breakers will be replaced along with Bus #1 and Bus #2 relays and all associated electromagnetic breaker relays. Twenty-four 115 kV Disconnect Switches will be replaced on Bus #1 and Bus #2.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,207,000"/>	<input type="text" value="\$659,000"/>	<input type="text" value="\$548,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

**Project Name:**

**Form submitted by:**

**Budget Group:**

**Summary Category:**

**Investment Category:**

**Number of Customers Affected:**

**For Category 15 only:**      **Budget Year Submitted**

**Project ID (District-YYYY-ID)**

## Description of Problem

Much of the equipment at the Rock Tavern 115 kV Substation has been identified for replacement on the following programs: Breaker Replacement Program and the ESP Infrastructure Replacement Program.

## Solution

The various programs above have been combined into one 115 kV substation modernization project. Three 115 kV circuit breakers and one 69 kV circuit breaker will be replaced along with Bus #1 and Bus #2 relays, Transformer #2 relays, and all associated electromagnetic breaker relays.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,848,000"/>	<input type="text" value="\$90,000"/>	<input type="text" value="\$1,759,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

**Project Name:**

**Form submitted by:**

**Budget Group:**

**Summary Category:**

**Investment Category:**

**Number of Customers Affected:**

**For Category 15 only:**      **Budget Year Submitted**

**Project ID (District-YYYY-ID)**

## Description of Problem

As part of the ongoing review of the substation power transformer fleet, Operations Services completes a condition-based assessment of those transformers that are 55 years old or greater. This assessment is based on routine testing and monitoring to determine an overall condition and condition-trend of the transformer. Based on this assessment, the existing Stanfordville Substation transformer has reached the end of its useful life and requires replacement.

## Solution

Replace the existing transformer at the Stanfordville Substation with a 10 MVA 69/13.8kV bank.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$1,850,000"/>	<input type="text" value="\$330,000"/>	<input type="text" value="\$1,521,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



## Budget Submittal Form for Electric Projects

Project Name:	Woodstock Substation Switchgear Replacement		
Form submitted by:	Brett Arteta		
Budget Group:	13 - Substations		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

### Description of Problem

The existing external switchgear and control house switchgear has reached the end of its useful life and replacement parts are difficult to obtain or no longer available. Maintenance issues have been experienced with racking the 1947 vintage breakers in the external switchgear. Replacement parts for the racking mechanisms are no longer available.

The external switchgear and control house switchgear have separate DC voltage supplies, a 24 volt and a 48 volt battery system, respectively. There is no room to upgrade either battery system, and maintenance of the system is problematic.

### Solution

It is recommended that the external switchgear and control house switchgear be replaced with a new Power Control Center (PCC). The PCC will contain two bus's with a normally open tie breaker, 15kV breakers rated 2000A and 1200A, protective relaying, interconnection cabinet, PT's, station service transformers, RTU, and DC battery system. The PCC will contain provisions for future expansion.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$3,116,000"/>	<input type="text" value="\$619,000"/>	<input type="text" value="\$2,497,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☒ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

Project Name:	Kerhonkson Substation Autotransformers
Form submitted by:	Brett Arteta
Budget Group:	13 - Substations
Summary Category:	System Enhancements
Investment Category:	Reliability
Number of Customers Affected:	
For Category 15 only:	Budget Year Submitted
	Project ID (District-YYYY-ID)

### Description of Problem

The existing Modena Substation 115kV/69kV single phase autotransformers have reached the end of their useful life. These units are part of a group of sister transformers installed at the Ohioville, North Chelsea and Modena Substations. Based on condition, age and several failures of these single phase units, these transformers are all planned for replacement. Based on a review of the Ellenville Transmission Area, it is recommended that following the retirement of the Modena 115kV/69kV autotransformers, new autotransformers be installed at the Kerhonkson Substation. This work will need to be completed in conjunction with the upgrade of the P and MK Lines to 115kV operation.

In addition to addressing the infrastructure issues, this work will increase the load serving capability within the Ellenville Area. It is recommended to replace the autotransformers and convert the P and MK lines to 115kV operation by 2020. The majority of the work required for the line conversion has been completed previously based predominately on infrastructure issues (rebuild of the P & MK Lines, rebuild of the High Falls, Galeville, Kerhonkson and Sturgeon Pool Substations).

### Solution

Install two new 115/69kV autotransformers at the Kerhonkson Substation and reconfigure the 69kV bus at the Honk Falls Substation.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$5,074,000"/>	<input type="text" value="\$599,000"/>	<input type="text" value="\$2,069,000"/>	<input type="text" value="\$2,406,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

☒ Thermal/Load Serving Capability

☐ Equipment Type

☐ Current % loaded

☐ Voltage (Stray, Low, High)

☐ Power Quality

Other

## **Risk Reduction**

### Safety

☐ Employee Safety

☐ Public Safety

☐ Other Program Type

### Compliance

☐ Inspections

☐ Road Rebuild

☐ Joint Facilities/CATV Agreement

☐ NESC Codes

☐ Other Program Type

### Infrastructure

☐ Average Age of Infrastructure  years

☐ Failure Rates

☐ Obsolete/ Unserviceable Equipment

☐ Condition

☐ Accessibility (Off Road, underground)

☒ Strategic Replacement

☐ Other Program Type

### Resilience

☐ \$/COA (with storm)

☐ \$/CMA (with storm)

☐ Customer Cost of Outage (ICE Calculator)

☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Chan, R.: "P & MK Area Study". E.P. #2010-008. May 2, 2011.

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	Knapps Corners Substation		
Form submitted by:	Brett Arteta		
Budget Group:	13 - Substations		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

## Description of Problem

The existing Knapps Corners Substation was built in 1941 and later expanded in 1953. Based on condition and age, the major substation equipment (power transformers, circuit breakers, disconnect switches, control house, relaying and control equipment) requires replacement.

## Solution

Replace the existing Knapps Corners Substation with a new Substation on adjacent property. The existing substation cannot be removed from service during construction and the existing footprint is constrained. This creates difficulties, impacts reliability and increases the cost of rebuilding the substation in the same location. Based on these factors, a new substation will be constructed adjacent to the existing one, and the existing substation will be retired/removed.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$9,694,000"/>	<input type="text" value="\$2,183,000"/>	<input type="text" value="\$4,265,000"/>	<input type="text" value="\$3,246,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

## Alternatives Analysis

Reference Report or Study

See below.

Or

### Project Alternatives Considered

Loeven, E.A.: "Knapps Corners 15 kV Bus Reconfiguration", S.R.2012-01. June 1, 2012.  
Paull, J.: "Knapps Corners Substation Breaker Study", E.P. # 2009-01. December, 2, 2009.  
"New Knapps Corners Substation Justification 20160630". June 30, 2016.

### Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

**Project Name:**

**Form submitted by:**

**Budget Group:**

**Summary Category:**

**Investment Category:**

**Number of Customers Affected:**

**For Category 15 only:**      **Budget Year Submitted**

**Project ID (District-YYYY-ID)**

## Description of Problem

Based on infrastructure issues determined by inspections and a condition based assessment, the 69kV TR needs to be rebuilt. This line is the sole supply to a quarry limiting the ability to obtain outages during a rebuild of the line. A review has determined that the most economical solution is to build a new substation tapped off of the 115kV SC line to supply the quarry and to retire the TR Line.

## Solution

Install a new 115/69 kV Substation to serve Tilcon. Additionally, install a new 115 kV breaker at the Sand Dock Substation to limit exposure to IBM resulting from a fault at the new tap on the SC Line.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$5,055,000"/>	<input type="text" value="\$200,000"/>	<input type="text" value="\$776,000"/>	<input type="text" value="\$4,080,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☒ Critical Customers
- ☐ LSA Customers
- ☒ Public Relations Considerations

### Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

### **Risk Reduction**

#### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

#### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

#### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

#### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

**Project Alternatives Considered**

An alternative considered was to rebuild the TR Line in kind. Construction would be costly and lengthy due to the restrictions from the quarry on the allowable outage durations to perform the work.

**Decision criteria for alternative selection**



# Budget Submittal Form for Electric Projects

**Project Name:** Myers Corners Substation Switchgear Replacement

**Form submitted by:** Brett Arteta

**Budget Group:** 13 - Substations

**Summary Category:** Maintain System Standards

**Investment Category:** Infrastructure

**Number of Customers Affected:**

**For Category 15 only:**      **Budget Year Submitted**

**Project ID (District-YYYY-ID)**

## Description of Problem

The existing external switchgear has reached the end of its useful life and replacement parts are difficult to obtain or no longer available. The switchgear roof has been repaired over the years but water ingress has damaged much of the inner ceiling.

## Solution

It is recommended that the external switchgear be replaced with a new switchgear. The switchgear will contain two bus's with a normally closed tie breaker, 15kV breakers rated 2000A and 1200A, protective relaying, interconnection cabinet, PT's, and station service transformers. The switchgear will contain provisions for future expansion.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$2,118,000"/>	<input type="text" value="\$50,000"/>	<input type="text" value="\$133,000"/>	<input type="text" value="\$1,883,000"/>	<input type="text" value="\$51,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☒ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

Project Name:	New Baltimore Transformer Replacement		
Form submitted by:	Brett Arteta		
Budget Group:	13 - Substations		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

## Description of Problem

Due to their proximity, the Coxackie and New Baltimore Substations provide reserve capability and operating flexibility between the two substations. The existing distribution infrastructure between the substations is aging, in poor condition and has access limitations due to CSX railroad expansion. To maintain reliability and operating flexibility in this area, the distribution infrastructure requires replacement. A review of the area determined that a more cost effective solution is to install a second transformer and associated circuit positions at the New Baltimore Substation.

## Solution

Add an additional 12 MVA transformer and associated distribution feeders to the New Baltimore Substation.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$1,903,000"/>	<input type="text" value="\$50,000"/>	<input type="text" value="\$254,000"/>	<input type="text" value="\$314,000"/>	<input type="text" value="\$1,285,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	115KV Terminal Upgrades for High Falls, Galeville and Modena		
Form submitted by:	Brett Arteta		
Budget Group:	13 - Substations		
Summary Category:	System Enhancement		
Investment Category:	Reliability		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

## Description of Problem

Based on the projected load growth and load serving capability within the Ellenville Area, it is recommended to convert the P and MK lines to 115kV operation. The majority of the work required for the line conversion has been completed (rebuild of the P & MK Lines, rebuild of the High Falls, Galeville, Kerhonkson and Sturgeon Pool Substations).

To meet our current protection standards, remaining work for the upgrade of the P&MK Lines to 115kV will include protection upgrades, including pilot protection (high speed coverage of 100% of the line) and direct transfer trip for the lines upgrading to 115kV operation.

## Solution

Relay pilot schemes will be installed at the High Falls, Galeville, Kerhonkson, and Modena Substations for primary line protection and direct transfer trip.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,157,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$21,000"/>	<input type="text" value="\$314,000"/>	<input type="text" value="\$822,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Chan, R.: "P & MK Area Study". E.P. #2010-008. May 2, 2011.

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

Project Name:	Greenfield Road - Substation Upgrade		
Form submitted by:	Brett Arteta		
Budget Group:	13 - Substations		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

## Description of Problem

As part of the ongoing review of the substation power transformer fleet, Operations Services completes a condition-based assessment of those transformers that are 55 years old or greater. This assessment is based on routine testing and monitoring to determine an overall condition and condition-trend of the transformer. Based on this assessment, the existing 69-4.16kV Greenfield Road Substation transformers have reached the end of their useful life and require replacement.

## Solution

Retire all of the 4 kV equipment including Transformers #1 and #3 and all other associated equipment. Two existing 69-13.8kV three phase transformers will be utilized (current plans are to use the Modena Substation spare and the retired Kerhonkson Substation transformers).

**Cost estimate (include AFUDC if appropriate)**

**Type of estimate:**

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$1,174,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$21,000"/>	<input type="text" value="\$393,000"/>	<input type="text" value="\$760,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

EP2016-012 Spare 10\_12MVA Transformer Relocations.pdf

Or

Project Alternatives Considered

Decision criteria for alternative selection



## Budget Submittal Form for Electric Projects

<b>Project Name:</b>	Montgomery Street Substation Switchgear Replacement	
<b>Form submitted by:</b>	Brett Arteta	
<b>Budget Group:</b>	13 - Substations	
<b>Summary Category:</b>	Maintain System Standards	
<b>Investment Category:</b>	Infrastructure	
<b>Number of Customers Affected:</b>		
<b>For Category 15 only:</b>	<b>Budget Year Submitted</b>	
	<b>Project ID (District-YYYY-ID)</b>	

### Description of Problem

The existing internal switchgear has reached the end of its useful life and replacement parts are difficult to obtain or no longer available. Maintenance issues have been experienced with racking the vintage breakers in the internal switchgear. Replacement parts for the racking mechanisms are no longer available.

### Solution

It is recommended that the internal switchgear be replaced with a new switchgear. The switchgear will contain three bus's with normally closed tie breakers, 15kV breakers rated 2000A and 1200A, protective relaying, interconnection cabinet, PT's, and station service transformers. The switchgear will contain provisions for future expansion.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$2,267,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$314,000"/>	<input type="text" value="\$1,953,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☒ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

**Project Name:**

**Form submitted by:**

**Budget Group:**

**Summary Category:**

**Investment Category:**

**Number of Customers Affected:**

**For Category 15 only:**      **Budget Year Submitted**

**Project ID (District-YYYY-ID)**

## Description of Problem

The existing internal switchgear has reached the end of its useful life and replacement parts are difficult to obtain or no longer available. Maintenance issues have been experienced with racking the vintage breakers in the internal switchgear. Replacement parts for the racking mechanisms are no longer available.

## Solution

It is recommended that the internal switchgear be replaced with a new switchgear. The switchgear will contain two bus's with a normally closed tie breaker, 15kV breakers rated 2000A and 1200A, protective relaying, interconnection cabinet, PT's, and station service transformers. The switchgear will contain provisions for future expansion.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$2,261,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$52,000"/>	<input type="text" value="\$502,000"/>	<input type="text" value="\$1,707,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
- ☐ Equipment Type
- ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☒ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

**Project Name:**

**Form submitted by:**

**Budget Group:**

**Summary Category:**

**Investment Category:**

**Number of Customers Affected:**

**For Category 15 only:**      **Budget Year Submitted**

**Project ID (District-YYYY-ID)**

**Description of Problem**

Much of the equipment at the Shenandoah Substation has been identified for replacement on the following programs: Breaker Replacement Program, DA/LTC Replacement Program, and the ESP Infrastructure Replacement Program.

**Solution**

The various programs above have been combined into one substation modernization project.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$3,379,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$2,176,000"/>	<input type="text" value="\$1,203,000"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

**Project Name:** Jansen Avenue Substation Upgrade

**Form submitted by:** Brett Arteta

**Budget Group:** 13 - Substations

**Summary Category:** Maintain System Standards

**Investment Category:** Infrastructure

**Number of Customers Affected:**

**For Category 15 only:**      **Budget Year Submitted**

**Project ID (District-YYYY-ID)**

## Description of Problem

Much of the equipment at the Jansen Avenue Substation has been identified for replacement on the following programs: Breaker Replacement Program, DA/LTC Replacement Program, and the ESP Infrastructure Replacement Program.

## Solution

The various programs above have been combined into one substation modernization project.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$3,325,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$3,325,000"/>	<input type="text" value="\$800,000"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	5kV Aerial Cable Replacement Program		
Form submitted by:	Chris Ritacco		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Non-Discretionary		
Investment Category:	Infrastructure		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2019	
	Project ID (District-YYYY-ID)		

## Description of Problem

Much of the 5kV aerial cable in the Central Hudson service territory is from as early as the 1930s. The cable is aged and prone to failure. The cable has also been the cause of many voltage issues on the system. Additionally, the cable typically contain lead and asbestos which adds an environmental concern to the issues. And repairs can be difficult and lengthy as well.

## Solution

A 5kV aerial replacement program was installed to mitigate all of the reliability, loading, environmental, and safety concerns associated with this cable. Additionally when cable is replaced, the typical practice to convert the customers over to the 13.2kV voltage class. This aids in Central Hudson's goal to move away from 4kV operation to flatten the voltage profile, better enabling CVR and increasing hosting capacity of DERs.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$2,549,000"/>	<input type="text" value="\$308,000"/>	<input type="text" value="\$785,000"/>	<input type="text" value="\$480,000"/>	<input type="text" value="\$484,000"/>	<input type="text" value="\$492,000"/>	<input type="text" value="\$2,250,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☒ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA ☐
- ☒ 5 Year Average # Outages Avoided ☐

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

☒ Thermal/Load Serving Capability

☐ Equipment Type

☐ Current % loaded

☐ Voltage (Stray, Low, High)

☐ Power Quality

Other

## Risk Reduction

### Safety

☒ Employee Safety

☒ Public Safety

☐ Other Program Type

### Compliance

☐ Inspections

☐ Road Rebuild

☐ Joint Facilities/CATV Agreement

☐ NESC Codes

☐ Other Program Type

### Infrastructure

☒ Average Age of Infrastructure  years

☒ Failure Rates

☒ Obsolete/ Unserviceable Equipment

☒ Condition

☐ Accessibility (Off Road, underground)

☐ Strategic Replacement

☐ Other Program Type

### Resilience

☐ \$/COA (with storm)

☐ \$/CMA (with storm)

☐ Customer Cost of Outage (ICE Calculator)

☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

Project Name:	14.4kV Cable Rejuvenation Program
Form submitted by:	N. Conza
Budget Group:	15 - Distribution Improvements
Summary Category:	Maintain System Standards
Investment Category:	Infrastructure
Number of Customers Affected:	Varies
For Category 15 only:	Budget Year Submitted 2017
	Project ID (District-YYYY-ID)

### Description of Problem

The 14.4kV Rejuvenation program was initiated in 2009, with the replacement of the Poughkeepsie PO, PK and PU PILC network feeder main lines, as well as the majority of the WN cable feed to the Montgomery Street substation.

The remaining Newburgh 14.4kV feeds to the Montgomery Street Substation are the B, F and R cables. Just as in Poughkeepsie, these cables are in need of replacement due to age and condition. The underground infrastructure, which is nearly 90 years old is also in need of replacement. The final portion of the WN cable is also in need or replacement due to cable age. The infrastructure is nearly 100 years old and all spare conduits have collapsed. The conduits are currently inaccessible due to a library being built over them in 1973.

The Poughkeepsie PO, PK and PU feeders have lateral section off their main lines that are partially PILC. Plans to address these are being developed for implementation in 2022.

Underground inspections have consistently identified numerous locations in the underground network system in need of cable replacement and infrastructure repair. The majority of the 14.4kV infrastructure is close to 100 years old and is in need of regular maintenance and repairs. Funding has been allocated in the 14.4kV Rejuvenation Program to address inspection findings in the underground system.

### Solution

Replace the remaining Newburgh 14.4kV cables, as well as their associated infrastructure.

Replacement of the remaining portions of the Poughkeepsie 14.4kV network feeder PILC, as well as their associated infrastructure.

Annual inspection-related repairs of the 14.4kV and network underground cables and associated infrastructure.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$8,911,000"/>	<input type="text" value="\$2,052,000"/>	<input type="text" value="\$524,000"/>	<input type="text" value="\$1,067,000"/>	<input type="text" value="\$2,206,000"/>	<input type="text" value="\$3,063,000"/>	<input type="text" value="\$8,430,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☒ Critical Customers
- ☐ LSA Customers
- ☒ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☒ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

E.P. #2011-001

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	4800V Conversion/Infrastructure Program		
Form submitted by:	Chris Ritacco		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2019	
	Project ID (District-YYYY-ID)		

## Description of Problem

An infrastructure concern in the Central Hudson territory is the 4800V circuitry. These 4800V pockets limit the operational flexibility, load serving capability, and hosting capacity for DERs. Another concern with the 4800V circuitry is the age. Central Hudson abandoned the practice of installing 4800V circuitry in the 1940s. Much of the area infrastructure is over 70 years old and has exceeded its useful life. Central Hudson has well over 100 miles of 4800V circuitry remaining.

## Solution

A conversion program was developed to eliminate 4800V aging infrastructure. The program focuses on upgrading 4800V mainline circuitry to 13.2kV operation. A particular focus is placed on developing projects that eliminate overloaded, step-down transformer banks in order to mitigate thermal and infrastructure concerns, as well as remove any of the other potential hazards associated with 4800V circuitry.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$11,185,000"/>	<input type="text" value="\$1,998,000"/>	<input type="text" value="\$1,146,000"/>	<input type="text" value="\$988,000"/>	<input type="text" value="\$3,224,000"/>	<input type="text" value="\$3,829,000"/>	<input type="text" value="\$17,500,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA
- ☒ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☒ Thermal/Load Serving Capability
  - ☒ Equipment Type
  - ☒ Current % loaded
- ☒ Voltage (Stray, Low, High)
- ☒ Power Quality

Other

## **Risk Reduction**

### Safety

- ☒ Employee Safety
- ☒ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☒ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☒ \$/COA (with storm)
- ☒ \$/CMA (with storm)
- ☒ Customer Cost of Outage (ICE Calculator)
- ☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

Project Name:	CATV Make-Ready
Form submitted by:	Chris Ritacco
Budget Group:	15 - Distribution Improvements
Summary Category:	Non-Discretionary
Investment Category:	Compliance
Number of Customers Affected:	Varies
For Category 15 only:	Budget Year Submitted 2019
	Project ID (District-YYYY-ID)

### Description of Problem

As the communication companies continue to expand their infrastructure, the proper NESC clearances between communication and electric facilities must be maintained and the poles must have sufficient capability to carry the additional facilities. With the governor's broadband initiative, the volume of these projects is increasing significantly.

### Solution

Develop work orders to address any emerging CATV work.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$4,738,000"/>	<input type="text" value="\$1,539,000"/>	<input type="text" value="\$1,047,000"/>	<input type="text" value="\$1,067,000"/>	<input type="text" value="\$537,000"/>	<input type="text" value="\$547,000"/>	<input type="text" value="\$2,500,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☒ Timing/Permitting
- ☒ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA
- ☒ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☒ Inspections
- ☐ Road Rebuild
- ☒ Joint Facilities/CATV Agreement
- ☒ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



## Budget Submittal Form for Electric Projects

Project Name:	CEMI / Worst Circuit Reliability Program		
Form submitted by:	Chris Ritacco		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2019	
	Project ID (District-YYYY-ID)		

### Description of Problem

Central Hudson maximizes its reliability improvement efforts through continuous analysis and planning. Reliability improvement projects are generally prioritized using a \$/customer outage avoided criteria. This program allows us to address specific circuits and "pockets" of customers that tend to experience a significantly higher frequency of outages than average, where \$/customer outage avoided criteria is used as an acceptance and prioritization criteria but would not enable projects to be over the cut line for the general Reliability program.

### Solution

The CEMI (customers experiencing multiple interruptions) and Worst Performing Circuits program have been designed to help identify and develop reliability improvements for these customers. Projects are similar to projects identified in the Reliability program. The customers experiencing the poorest of reliability are identified, and improvement projects are developed annually.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$5,350,000"/>	<input type="text" value="\$1,067,000"/>	<input type="text" value="\$1,047,000"/>	<input type="text" value="\$1,067,000"/>	<input type="text" value="\$1,075,000"/>	<input type="text" value="\$1,094,000"/>	<input type="text" value="\$5,000,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA ☐
- ☒ 5 Year Average # Outages Avoided ☐

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☒ Complaints
- ☒ Critical Customers ☐
- ☒ LSA Customers
- ☒ Public Relations Considerations ☐

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☒ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☒ \$/COA (with storm)
- ☒ \$/CMA (with storm)
- ☒ Customer Cost of Outage (ICE Calculator)
- ☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

Project Name:	Copper Wire Replacement Program		
Form submitted by:	Chris Ritacco		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2019	
	Project ID (District-YYYY-ID)		

## Description of Problem

There is a proliferation of primary copper wire on Central Hudson's distribution system. These conductors are not only antiquated and prone to failure; they are frequently undersized (#4 and #6) for modern operational needs, such as CVR and FLISR. They are also susceptible to burndown during reclose operations.

## Solution

The copper wire replacement program was developed to begin to phase out all of the undersized, antiquated, copper conductors. The wire is typically replaced with new, higher capacity ACSR wire. The new conductors are rated for 13.2kV operation, are stronger, and can handle additional loading.

**Cost estimate (include AFUDC if appropriate)**

**Type of estimate:**

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$3,186,000"/>	<input type="text" value="\$616,000"/>	<input type="text" value="\$628,000"/>	<input type="text" value="\$640,000"/>	<input type="text" value="\$645,000"/>	<input type="text" value="\$656,000"/>	<input type="text" value="\$3,000,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA
- ☒ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☒ Complaints
- ☒ Critical Customers
- ☒ LSA Customers
- ☒ Public Relations Considerations

## Service Standards

- ☒ Thermal/Load Serving Capability
  - ☒ Equipment Type
  - ☒ Current % loaded
- ☒ Voltage (Stray, Low, High)
- ☒ Power Quality

Other

## Risk Reduction

### Safety

- ☒ Employee Safety
- ☒ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☒ \$/COA (with storm)
- ☒ \$/CMA (with storm)
- ☒ Customer Cost of Outage (ICE Calculator)
- ☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



## Budget Submittal Form for Electric Projects

Project Name:	Cutout Replacement		
Form submitted by:	Chris Ritacco		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2019	
	Project ID (District-YYYY-ID)		

### Description of Problem

The failure of porcelain cutouts is one of the primary equipment failure causes in the Central Hudson service territory. Typically, when a cutout fails, all customers downstream, as well as between the cutout and upstream protective device, experience an interruption.

### Solution

Central Hudson continues to pro-actively monitor and address cutout replacements as necessary at the district level. Cutouts housing fuses and solid blades impacting greater than 500 customers were replaced through an earlier program, but conventional transformers and capacitors were frequently excluded, and some circuits have grown to exceed this threshold. In addition, there is a positive reliability benefit to reducing the threshold below 500 customers.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$1,327,000"/>	<input type="text" value="\$257,000"/>	<input type="text" value="\$262,000"/>	<input type="text" value="\$267,000"/>	<input type="text" value="\$269,000"/>	<input type="text" value="\$273,000"/>	<input type="text" value="\$1,250,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA ☐
- ☒ 5 Year Average # Outages Avoided ☐

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☒ Complaints
- ☒ Critical Customers ☐
- ☒ LSA Customers
- ☒ Public Relations Considerations ☐

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☒ \$/COA (with storm)
- ☒ \$/CMA (with storm)
- ☒ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

Project Name:	Distribution Automation Program		
Form submitted by:	Chris Ritacco		
Budget Group:	15 - Distribution Improvements		
Summary Category:	System Enhancements		
Investment Category:	Infrastructure		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2019	
	Project ID (District-YYYY-ID)		

## Description of Problem

An aging infrastructure, inefficient grid, rising energy costs, increased demand for uninterrupted service, and increased adoption of distributed energy resources, as well as availability of more sophisticated technology, have driven the need for a reformation of the electric distribution system.

## Solution

The Electric Distribution Automation program was developed in order to address these growing concerns. Through the implementation of a Distribution Management System (DMS), Central Hudson will be able to implement programs such as Volt-Var optimization (VVO), Conservation Voltage Reduction (CVR), and Fault Location Isolation and Service Restoration (FLISR). Programs such as these are aimed to lower customer energy usage, defer transmission investments, replace aging assets, incorporate modern technology, improve customer reliability, and facilitate integration of distributed energy resources.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$27,669,000"/>	<input type="text" value="\$6,568,000"/>	<input type="text" value="\$6,807,000"/>	<input type="text" value="\$6,723,000"/>	<input type="text" value="\$4,837,000"/>	<input type="text" value="\$2,735,000"/>	<input type="text" value="\$2,500,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☒ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☒ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA
- ☒ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☒ Complaints
- ☒ Critical Customers
- ☒ LSA Customers
- ☒ Public Relations Considerations

## Service Standards

- ☒ Thermal/Load Serving Capability
  - ☒ Equipment Type
  - ☒ Current % loaded
- ☒ Voltage (Stray, Low, High)
- ☒ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☒ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☒ \$/COA (with storm)
- ☒ \$/CMA (with storm)
- ☒ Customer Cost of Outage (ICE Calculator)
- ☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

E.P. #2015-12, E.P. #2016-05, E.P. #2016-14

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	Distribution Improvement Blankets		
Form submitted by:	Chris Ritacco		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Non-Discretionary		
Investment Category:	Daily Operations		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2019	
	Project ID (District-YYYY-ID)		

## Description of Problem

Newly emerging, operational work on the distribution system must be addressed on a routine basis, such as emergency work and compliance related issues.

## Solution

Develop work orders to address emerging operational work.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$46,757,000"/>	<input type="text" value="\$8,210,000"/>	<input type="text" value="\$9,425,000"/>	<input type="text" value="\$9,604,000"/>	<input type="text" value="\$9,673,000"/>	<input type="text" value="\$9,845,000"/>	<input type="text" value="\$45,000,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☒ Timing/Permitting
- ☒ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA
- ☒ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☒ Complaints
- ☒ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☒ Inspections
- ☐ Road Rebuild
- ☒ Joint Facilities/CATV Agreement
- ☒ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

Project Name:	Distribution Improvement Conversions		
Form submitted by:	Chris Ritacco		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Non-Discretionary		
Investment Category:	Daily Operations		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2019	
	Project ID (District-YYYY-ID)		

## Description of Problem

Customers fed off a lower than standard distribution voltage class (13.2kV) can often have low or errant voltages and experience below average reliability. Hosting capacity for distributed energy resources is also limited. Despite significant planning efforts, some of these problems emerge based upon changes in customer behaviors.

## Solution

Conversion from 4kV to 13.2kV operation often is recommended where customers are experiencing low or errant voltage or a step-down transformer is overloaded. Polyphasing, reconductoring, or installation of mitigating equipment also are examples of projects that could fall under this line item on an emerging basis.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$1,593,000"/>	<input type="text" value="\$308,000"/>	<input type="text" value="\$314,000"/>	<input type="text" value="\$320,000"/>	<input type="text" value="\$322,000"/>	<input type="text" value="\$328,000"/>	<input type="text" value="\$1,500,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☒ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA ☐
- ☒ 5 Year Average # Outages Avoided ☐

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☒ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☒ Thermal/Load Serving Capability
  - ☒ Equipment Type
  - ☒ Current % loaded
- ☒ Voltage (Stray, Low, High)
- ☒ Power Quality

Other

## **Risk Reduction**

### Safety

- ☒ Employee Safety
- ☒ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☒ \$/COA (with storm)
- ☒ \$/CMA (with storm)
- ☒ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	Distribution Improvement Minors		
Form submitted by:	Chris Ritacco		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2019	
	Project ID (District-YYYY-ID)		

## Description of Problem

Newly emerging, operational work on the distribution system is often unforeseen and must be addressed in a timely manner.

## Solution

Develop work orders for minor, newly emerging operational work, which are then classified as minors units of property or locals according to the latest Central Hudson Accounting Rules.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$3,186,000"/>	<input type="text" value="\$616,000"/>	<input type="text" value="\$628,000"/>	<input type="text" value="\$640,000"/>	<input type="text" value="\$645,000"/>	<input type="text" value="\$656,000"/>	<input type="text" value="\$3,000,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA ☐
- ☒ 5 Year Average # Outages Avoided ☐

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☒ Complaints
- ☒ Critical Customers ☐
- ☒ LSA Customers
- ☒ Public Relations Considerations ☐

## Service Standards

☒ Thermal/Load Serving Capability

☐ Equipment Type

☐ Current % loaded

☐ Voltage (Stray, Low, High)

☐ Power Quality

Other

## **Risk Reduction**

### Safety

☐ Employee Safety

☐ Public Safety

☐ Other Program Type

### Compliance

☐ Inspections

☐ Road Rebuild

☐ Joint Facilities/CATV Agreement

☐ NESC Codes

☐ Other Program Type

### Infrastructure

☒ Average Age of Infrastructure  years

☒ Failure Rates

☒ Obsolete/ Unserviceable Equipment

☒ Condition

☒ Accessibility (Off Road, underground)

☒ Strategic Replacement

☒ Other Program Type

### Resilience

☒ \$/COA (with storm)

☒ \$/CMA (with storm)

☒ Customer Cost of Outage (ICE Calculator)

☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

<b>Project Name:</b>	Distribution Improvement Operating/Infrastructure				
<b>Form submitted by:</b>	Chris Ritacco				
<b>Budget Group:</b>	15 - Distribution Improvements				
<b>Summary Category:</b>	Maintain System Standards				
<b>Investment Category:</b>	Infrastructure				
<b>Number of Customers Affected:</b>	Varies				
<b>For Category 15 only:</b>	<table><tr><td><b>Budget Year Submitted</b></td><td>2019</td></tr><tr><td><b>Project ID (District-YYYY-ID)</b></td><td>1551-0X</td></tr></table>	<b>Budget Year Submitted</b>	2019	<b>Project ID (District-YYYY-ID)</b>	1551-0X
<b>Budget Year Submitted</b>	2019				
<b>Project ID (District-YYYY-ID)</b>	1551-0X				

## Description of Problem

One of the primary focuses of the Category 15 Capital Budget plan is to improve the reliability of the Central Hudson customers. Operational limitations in the distribution circuitry is a primary driver in the overall duration that the average customer experiences. In addition, aged infrastructure in poor condition may create operational limitations and/or future risk of an increase in outages.

## Solution

Operating projects are developed with the primary goal being of reducing the duration of outages. Typical projects involve developing a tie between feeders, or reconductoring the lines to make the tie stronger so more load can be reenergized through switching. Many of these projects also address failing infrastructure that does not fall under a specific program.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$19,192,000"/>	<input type="text" value="\$2,904,000"/>	<input type="text" value="\$3,977,000"/>	<input type="text" value="\$4,395,000"/>	<input type="text" value="\$3,977,000"/>	<input type="text" value="\$3,938,000"/>	<input type="text" value="\$16,600,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☒ Complaints
- ☒ Critical Customers
- ☒ LSA Customers
- ☒ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☒ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☒ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☒ \$/COA (with storm)
- ☒ \$/CMA (with storm)
- ☒ Customer Cost of Outage (ICE Calculator)
- ☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



## Budget Submittal Form for Electric Projects

<b>Project Name:</b>	Distribution Improvement - Reliability				
<b>Form submitted by:</b>	Chris Ritacco				
<b>Budget Group:</b>	15 - Distribution Improvements				
<b>Summary Category:</b>	Maintain System Standards				
<b>Investment Category:</b>	Infrastructure				
<b>Number of Customers Affected:</b>	Varies				
<b>For Category 15 only:</b>	<table><tr><td><b>Budget Year Submitted</b></td><td>2019</td></tr><tr><td><b>Project ID (District-YYYY-ID)</b></td><td></td></tr></table>	<b>Budget Year Submitted</b>	2019	<b>Project ID (District-YYYY-ID)</b>	
<b>Budget Year Submitted</b>	2019				
<b>Project ID (District-YYYY-ID)</b>					

### Description of Problem

One of the primary focuses of the Category 15 Capital Budget plan is to improve the reliability of electric service for Central Hudson's customers.

### Solution

Projects are developed and prioritized according to a 5 year historical average \$/COA (customer outage avoided), but ancillary benefits to customer satisfaction and resiliency also are considered. Examples of improvement projects include relocating circuitry from off-road to on-road, closing gaps (i.e., new circuit ties), installing electronic reclosers, and replacing failure prone equipment.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$12,446,000"/>	<input type="text" value="\$2,052,000"/>	<input type="text" value="\$2,304,000"/>	<input type="text" value="\$2,668,000"/>	<input type="text" value="\$2,687,000"/>	<input type="text" value="\$2,735,000"/>	<input type="text" value="\$12,500,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☒ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA
- ☒ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☒ Complaints
- ☒ Critical Customers
- ☒ LSA Customers
- ☒ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☒ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☒ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☒ \$/COA (with storm)
- ☒ \$/CMA (with storm)
- ☒ Customer Cost of Outage (ICE Calculator)
- ☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

<b>Project Name:</b>	Distribution Improvement - Thermal/Voltage				
<b>Form submitted by:</b>	Chris Ritacco				
<b>Budget Group:</b>	15 - Distribution Improvements				
<b>Summary Category:</b>	Maintain System Standards				
<b>Investment Category:</b>	Growth				
<b>Number of Customers Affected:</b>	Varies				
<b>For Category 15 only:</b>	<table><tr><td><b>Budget Year Submitted</b></td><td>2019</td></tr><tr><td><b>Project ID (District-YYYY-ID)</b></td><td></td></tr></table>	<b>Budget Year Submitted</b>	2019	<b>Project ID (District-YYYY-ID)</b>	
<b>Budget Year Submitted</b>	2019				
<b>Project ID (District-YYYY-ID)</b>					

### Description of Problem

Although the overall system peak load is declining, load growth or stray voltage in a particular area may cause equipment to exceed its thermal ratings or load serving capabilities. Additionally, overloaded equipment has a tendency to fail which can be a safety concern and compromises customer reliability.

### Solution

Load relief projects are often recommended to mitigate the loading, thermal, and voltage concerns. Polyphasing, reconductoring, voltage conversions, or building new lines also are examples of projects that could fall under this line item.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$13,434,000"/>	<input type="text" value="\$3,797,000"/>	<input type="text" value="\$2,356,000"/>	<input type="text" value="\$2,401,000"/>	<input type="text" value="\$2,418,000"/>	<input type="text" value="\$2,461,000"/>	<input type="text" value="\$11,250,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA
- ☒ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☒ Thermal/Load Serving Capability
  - ☒ Equipment Type
  - ☒ Current % loaded
- ☒ Voltage (Stray, Low, High)
- ☒ Power Quality

Other

## **Risk Reduction**

### Safety

- ☒ Employee Safety
- ☒ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	Distribution Pole Replacement Program		
Form submitted by:	Chris Ritacco		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2019	
	Project ID (District-YYYY-ID)		

## Description of Problem

Central Hudson currently owns over 220,000 distribution poles. All but a few are made of wood materials. Much of this pole plant is antiquated and undersized. The average age of the pole plant is over 40 years old with nearly 100,000 poles installed in the 1960's and earlier (50+ years old). Many of these poles have been exposed to rot, woodpeckers, and other weather related decay. As the poles weaken, their likelihood of failure increases.

## Solution

The facility inspections program helps determine if poles are in need of replacement due to conditions such as broken poles, severe pole lean, pole rot, wash out, evidence of flashover, and woodpecker holes. Recent improvements in Central Hudson's testing procedures helped identify over four times as many defective poles from years past.

As a result of the Inspections program, defective poles are identified and replaced based on the severity rating of the deficiency. Projects are evaluated for other incremental system benefits, such as relocating poles on road or designing to NESC Grade B construction. Additionally, other poles may be replaced due to a violation of Central Hudson Electric Construction Standards, NESC, IEEE, and other national and international standards. The replacement of weak and failing poles is a key driver to improve customer reliability.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate: ☒ Conceptual Estimate

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	\$22,321,000	\$4,105,000	\$4,189,000	\$4,268,000	\$4,837,000	\$4,922,000	\$22,500,000
<b>Expense</b>							

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill ☐
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA
- ☒ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☒ Complaints
- ☒ Critical Customers
- ☒ LSA Customers
- ☒ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☒ Public Safety
- ☐ Other Program Type

### Compliance

- ☒ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☒ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☒ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☒ \$/COA (with storm)
- ☒ \$/CMA (with storm)
- ☒ Customer Cost of Outage (ICE Calculator)
- ☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

<b>Project Name:</b>	Recloser Replacement Program				
<b>Form submitted by:</b>	Chris Ritacco				
<b>Budget Group:</b>	15 - Distribution Improvements				
<b>Summary Category:</b>	Maintain System Standards				
<b>Investment Category:</b>	Infrastructure				
<b>Number of Customers Affected:</b>	Varies				
<b>For Category 15 only:</b>	<table><tr><td><b>Budget Year Submitted</b></td><td>2019</td></tr><tr><td><b>Project ID (District-YYYY-ID)</b></td><td></td></tr></table>	<b>Budget Year Submitted</b>	2019	<b>Project ID (District-YYYY-ID)</b>	
<b>Budget Year Submitted</b>	2019				
<b>Project ID (District-YYYY-ID)</b>					

### Description of Problem

Transient protection on the distribution system has always been provided by distribution reclosers. Historically, the reclosers were of the hydraulic type. Although these devices work well, they require extensive maintenance after several years, provide no remote control or status, and the extent of the transient protection is limited.

### Solution

The Central Hudson Recloser Replacement program is designed to replace hydraulic reclosers with electronic. Development of this program used quantifiable attributes including a decrease in maintenance costs as well as the additional information provided by the electronic controllers and the ability to prevent outages through improved transient protection.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$3,143,000"/>	<input type="text" value="\$359,000"/>	<input type="text" value="\$681,000"/>	<input type="text" value="\$694,000"/>	<input type="text" value="\$699,000"/>	<input type="text" value="\$711,000"/>	<input type="text" value="\$2,550,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA
- ☒ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☒ Complaints
- ☒ Critical Customers
- ☒ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☒ \$/COA (with storm)
- ☒ \$/CMA (with storm)
- ☒ Customer Cost of Outage (ICE Calculator)
- ☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



## Budget Submittal Form for Electric Projects

<b>Project Name:</b>	Overhead Secondary Replacement Program				
<b>Form submitted by:</b>	Chris Ritacco				
<b>Budget Group:</b>	15 - Distribution Improvements				
<b>Summary Category:</b>	Maintain System Standards				
<b>Investment Category:</b>	Infrastructure				
<b>Number of Customers Affected:</b>	Varies				
<b>For Category 15 only:</b>	<table><tr><td><b>Budget Year Submitted</b></td><td>2019</td></tr><tr><td><b>Project ID (District-YYYY-ID)</b></td><td></td></tr></table>	<b>Budget Year Submitted</b>	2019	<b>Project ID (District-YYYY-ID)</b>	
<b>Budget Year Submitted</b>	2019				
<b>Project ID (District-YYYY-ID)</b>					

### Description of Problem

Many secondary wires serving older homes in the Central Hudson service territory are open, bare conductor. This design is antiquated and prone to failure. Also, the bare conductors provide no insulation from foreign contact and contribute to decreased reliability. There is also a tenancy for one leg or the neutral to fail, resulting in partial power or voltage swings that damage customer equipment.

### Solution

The overhead secondary replacement program was developed to begin to phase out all of the antiquated, open wire secondary. The wire is typically replaced with new, triplex cable. The conductors are stronger, more resistant to contact faults, and can handle additional loading.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$1,062,000"/>	<input type="text" value="\$205,000"/>	<input type="text" value="\$209,000"/>	<input type="text" value="\$213,000"/>	<input type="text" value="\$215,000"/>	<input type="text" value="\$219,000"/>	<input type="text" value="\$1,000,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA ☐
- ☒ 5 Year Average # Outages Avoided ☐

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☒ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☒ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☒ Voltage (Stray, Low, High)
- ☒ Power Quality

Other

## **Risk Reduction**

### Safety

- ☒ Employee Safety
- ☒ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☒ \$/COA (with storm)
- ☒ \$/CMA (with storm)
- ☒ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

Project Name:	Relocation Blankets		
Form submitted by:	Chris Ritacco		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Non-Discretionary		
Investment Category:	Compliance		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2019	
	Project ID (District-YYYY-ID)	15BL-02	

### Description of Problem

Central Hudson commonly experiences unforeseen issues with the location of existing infrastructure. Some examples are interference with new construction and new business, minor road and bridge rebuilds, and making operational improvements. These issues require Central Hudson to relocate its facilities.

### Solution

Create work orders to relocate facilities to a new location. The new location should be designed for optimal present and future operation.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$1,062,000"/>	<input type="text" value="\$205,000"/>	<input type="text" value="\$209,000"/>	<input type="text" value="\$213,000"/>	<input type="text" value="\$215,000"/>	<input type="text" value="\$219,000"/>	<input type="text" value="\$1,000,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☐ Other ☐

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☒ Complaints
- ☒ Critical Customers ☐
- ☒ LSA Customers
- ☒ Public Relations Considerations ☐

## Service Standards

- ☐ Thermal/Load Serving Capability
- ☐ Equipment Type
- ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☒ Employee Safety
- ☒ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☒ Road Rebuild
- ☒ Joint Facilities/CATV Agreement
- ☒ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☒ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	Road Rebuild Relocation Projects		
Form submitted by:	Chris Ritacco		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Non-Discretionary		
Investment Category:	Compliance		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2019	
	Project ID (District-YYYY-ID)	1531-0X	

## Description of Problem

Central Hudson commonly experiences unforeseen issues with the location of existing infrastructure during road and bridge rebuilds. These issues require Central Hudson to relocate its facilities.

## Solution

Central Hudson coordinates with the local municipalities and the Department of Transportation for highway rebuild and road paving projects. The highway rebuilds and road paving projects usually consist of relocation and replacement of existing infrastructure. The infrastructure is optimally designed for both present and projected use through engineering studies.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$3,982,000"/>	<input type="text" value="\$770,000"/>	<input type="text" value="\$785,000"/>	<input type="text" value="\$800,000"/>	<input type="text" value="\$806,000"/>	<input type="text" value="\$820,000"/>	<input type="text" value="\$3,750,000"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☒ Timing/Permitting
- ☒ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☒ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
- ☐ Equipment Type
- ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## Risk Reduction

### Safety

- ☒ Employee Safety
- ☒ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☒ Road Rebuild
- ☒ Joint Facilities/CATV Agreement
- ☒ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☒ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





# Budget Submittal Form for Electric Projects

Project Name:	Secondary Network Upgrade Program		
Form submitted by:	H. Wilson-Sowah		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2019	
	Project ID (District-YYYY-ID)		

## Description of Problem

The secondary network infrastructure in Poughkeepsie, Kingston, and Newburgh is nearly 100 years old. Many of the ducts in the secondary network system have either collapsed or have been abandoned. Pull box and manholes are in poor conditions and are in need of new roofs and in some cases, need to be completely rebuilt.

Underground inspections have consistently identified numerous locations in the underground secondary network system in need of cable replacement and infrastructure repair. Funding has been allocated in the Secondary Network Program to address inspection findings in the underground system.

## Solution

Annual inspection-related repairs of the secondary network underground cables and associated infrastructure, including duct bank, pull boxes and manholes identify projects requiring immediate upgrades. In addition, project portfolios have been developed for each network system.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate: Preliminary Estimate

	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Future
Capital	\$2,547,000	\$770,000	\$262,000	\$267,000	\$537,000	\$711,000	\$2,000,000
Expense							

**Cost Risks**

- ☒ Environmental challenges with old tie duct work
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

Primary Project Objective Risk Reduction

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☒ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☒ Critical Customers
- ☐ LSA Customers
- ☒ Public Relations Considerations risk of failing cables/structure

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☒ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



## Budget Submittal Form for Electric Projects

<b>Project Name:</b>	URD Replacement				
<b>Form submitted by:</b>	H. Wilson-Sowah				
<b>Budget Group:</b>	15 - Distribution Improvements				
<b>Summary Category:</b>	Maintain System Standards				
<b>Investment Category:</b>	Infrastructure				
<b>Number of Customers Affected:</b>	Varies				
<b>For Category 15 only:</b>	<table><tr><td><b>Budget Year Submitted</b></td><td>2019</td></tr><tr><td><b>Project ID (District-YYYY-ID)</b></td><td></td></tr></table>	<b>Budget Year Submitted</b>	2019	<b>Project ID (District-YYYY-ID)</b>	
<b>Budget Year Submitted</b>	2019				
<b>Project ID (District-YYYY-ID)</b>					

### Description of Problem

Central Hudson's underground residential development (URD) cables are aging and are experiencing failures. Although the impact to reliability so far has been relatively small, the utility industry as a whole recognizes the potential larger impact these aging cables will have on reliability in the future. Pro-active measures are needed to curb these failures and improve system reliability.

### Solution

Central Hudson conducted a successful R&D project in 2017 with IMCORP that proved the technology to detect partial discharge in cables and pinpoint the location of defects that will eventually result in a fault and customer outage. This allows for cable health assessment that would help target specific problems and coordinate repairs, rather than replace or rejuvenate older cable wholesale. Central Hudson will develop a program to target high risk URDs that meet testing eligibility criteria. Where testing is not a fit, more traditional replacement is required.

In conjunction with the targeted IMCORP testing, there will be wholesale replacement of specific URD cables that have already been identified as in extremely poor condition. These URDs have been determined to be outside the scope of a partial discharge test, due to the numerous failures over the years.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$5,120,000"/>	<input type="text" value="\$800,000"/>	<input type="text" value="\$524,000"/>	<input type="text" value="\$534,000"/>	<input type="text" value="\$1,075,000"/>	<input type="text" value="\$2,188,000"/>	<input type="text" value="\$5,000,000"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA
- ☒ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☒ Complaints
- ☒ Critical Customers
- ☒ LSA Customers
- ☒ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☒ Failure Rates
- ☒ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☒ \$/COA (with storm)
- ☒ \$/CMA (with storm)
- ☒ Customer Cost of Outage (ICE Calculator)
- ☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Imcorp Cable Testing R&D project at Central Hudson 2018

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

Project Name:	ALT Program		
Form submitted by:	Chris Ritacco		
Budget Group:	15 - Distribution Improvements		
Summary Category:	System Enhancement		
Investment Category:	Infrastructure		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2019	
	Project ID (District-YYYY-ID)		

### Description of Problem

One of the primary focuses of the Category 15 Capital Budget plan is to improve the reliability of the Central Hudson customers. The improvement is focused on both the frequency and duration in which a customer is without power. In addition, there is a focus on improving power factor and voltage profiles throughout the year by replacing fixed capacitors with switched capacitors that can react to the dynamic characteristics of the grid.

### Solution

The Automatic Load Transfer (ALT) program was designed to improve the electric service reliability for customers. ALT switch teams transfer pockets of load to alternate feeds for loss of primary feed. Customers within the scope of an ALT team typically see an improvement in reliability. The switched capacitor program was deployed to reduce costs associated with manually opening fixed capacitor banks and to better align the opening and closing of capacitors with system needs to maintain power factor and voltage.

As Distribution Automation is deployed, it will integrate these devices and supersede the need for continuation of this program.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$257,000"/>	<input type="text" value="\$257,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA ☐
- ☒ 5 Year Average # Outages Avoided ☐

Non-Storm Operating

- ☒ \$/CMA
- ☒ 5 Year Average Duration of Outages

Customer Satisfaction

- ☒ Complaints
- ☒ Critical Customers ☐
- ☒ LSA Customers
- ☒ Public Relations Considerations ☐

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☒ \$/COA (with storm)
- ☒ \$/CMA (with storm)
- ☒ Customer Cost of Outage (ICE Calculator)
- ☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	2061/1071 - Rebuild Route 26, 12.0 Miles, Part 1 through 6		
Form submitted by:	Lawrence Saltis		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:	1,179		
For Category 15 only:	Budget Year Submitted	2015	
	Project ID (District-YYYY-ID)	C-2015-01a	

## Description of Problem

The 12 mile double circuit both on and off road along Route 26 was originally constructed in the mid 1930's. The top circuit operated at 14.4 kV and was part of the 14.4 transmission system that predated the current 69 kV system. The lower circuit fed the customers in the area. The double circuit feeds 863 customers from Freehold circuit 2061 and 316 customers from Cocksackie circuit 1071. The existing pole plant is in very poor condition and needs to be rebuilt. In addition, numerous stray voltage problems exist along many of the single phase spurs fed off the three phase mainline.

## Solution

Rebuild the 12 mile mainline over 6 years utilizing 336 MCM WR and a 3/0 neutral and eliminate the need for a double circuit. The improved neutral path should alleviate the stray voltage problems along the single phase spurs fed off the three phase mainline

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$3,600,000"/>	<input type="text" value="\$600,000"/>	<input type="text" value="\$600,000"/>	<input type="text" value="\$600,000"/>	<input type="text" value="\$600,000"/>	<input type="text" value="\$600,000"/>	<input type="text" value="\$600,000"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA
- ☒ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
- ☐ Equipment Type
- ☐ Current % loaded
- ☒ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

Project Name:	3002L - Route 9W and Cementon Conversion		
Form submitted by:	Lawrence Saltis		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:	226		
For Category 15 only:	Budget Year Submitted	2019	
	Project ID (District-YYYY-ID)	Catskill-2019-01	

### Description of Problem

The Route 9W feed to Cementon operates at 2400 volts (3002L). The pole plant and copper conductor is in very poor condition. The Route 9W three phase conductor is #4 Cu. The conductor on the single phase spurs in Cementon is #6 Cu. The pole plant was built in 1939. In addition, stray voltage problems exist in the area. Two neutral isolators were recently installed.

There is no tie available to reserve Cementon and West Camp in northern Saugerties. The ultimate goal is to establish a three phase tie along Route 9W such that North Catskill circuit 2001 can reserve these areas. For this reason, the conductor on Route 9W feeding to Cementon should be reconducted utilizing 336 MCM Wr. The underground portion by the two Railroad tunnels on Route 9W have already been replaced with three phases of 500 MCM copper cable.

### Solution

Reconductor and convert to 7.62kV operation 3.0 miles of existing three phase circuitry on Route 9W utilizing 336 MCM Wr. conductor. Reconductor and convert to 7.62kV operation 1.75 miles of single phase circuitry utilizing 1/0 al. Wr. conductor. Rebuilding and converting will replace the aged infrastructure with new facilities. Converting the area to 7.62 kV operation will help mitigate the stray voltage problems. The project should be completed in two phases.

Utilizing 336 MCM Wr. conductor on Route 9W will facilitate constructing a three phase tie to the Cementon and West Camp in northern Saugerties in the future.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,250,000"/>	<input type="text" value="\$625,000"/>	<input type="text" value="\$625,000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA
- ☒ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
- ☐ Equipment Type
- ☐ Current % loaded
- ☒ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☒ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☒ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	3014 - Relocate Mainline out of SR Line ROW
Form submitted by:	Matt Sefcik
Budget Group:	15 - Distribution Improvements
Summary Category:	Maintain System Standards
Investment Category:	Infrastructure
Number of Customers Affected:	8,335
For Category 15 only:	Budget Year Submitted 2019
	Project ID (District-YYYY-ID) K-2019-02

## Description of Problem

The radial SR Transmission Line is correctly positioned off-center on the eastern side within its right-of-way. The Woodstock 3014 Mainline, also located in this corridor, is positioned in the middle of the right-of-way. The SR Line has locked out three times in five years due to uphill trees falling from outside the western side of the right-of-way into the conductor, specifically between the Woodstock Substation and Zena Road. Large portions of the Woodstock substation load was interrupted an additional time when distribution automatic splices failed on the distribution circuits which were carrying the Woodstock circuits due to scheduled work on the SR Line.

The Woodstock 3012 is one of the more heavily loaded circuits, peaking around 7.9 MVA. It is also consistently one of the Top Three worst performing circuits (by means of SAIFI and ECM) in the entire Central Hudson service territory. Previous Capital Budget Projects were developed (K-2011-19) to reduce load on the 3012 by bringing the 3014 up along Chestnut Hill and subsuming some load. Right-of-way issues have prevented this project from being completed.

## Solution

Construct a new 3014 aerial cable mainline from the substation up Route 375 to Mill Hill Rd, subsuming the load along Tinker St up to Rock City Rd, then Rock City Rd, Meads Mountain, Glasco Turnpike ending at Route 212. While performing construction here, the antiquated PILC aerial cable mainline for the 3013 circuit should be reconducted as well with new aerial cable. From the sub to Mill Stream Rd, this section of Rt 375 will be triple-circuited (3012 open wire w/ 3013 and 3014 'express' aerial cable runs).

This project will allow for improved reliability for the 3014 circuit, allow for better capacity utilization between the 3014 and 3012 circuits, and improve reliability of the 3012/3012 'Byrdcliffe' looped ALT team by becoming multi-circuit: 3012/3014. A single-phase spur line would be built under the rebuilt SR Line to serve the local 17 customers in the transmission corridor.

Triple-circuiting up Rt 375, which includes new cable for the 3014 and a new cable for the 3013, and double-circuiting along Millstream is estimated at \$1,200,000. New switchgear and circuit exits for Woodstock are planned for 2020 (K-2019-05). Rebuilding 18 structures on the SR Line is estimated at \$540,000, and would come from the Cat 12 budget, planned 2Q 2019. It would be prudent to collaborate between trans, sub, and dist for maximum efficiency.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,200,000"/>	<input type="text" value="\$1,200,000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☒ \$/COA
- ☒ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
- ☐ Equipment Type
- ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☒ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☒ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

**Project Alternatives Considered**

Bundled 69kV conductor up Rt 28 from Hurley Ave for a second transmission line feed: too expensive. K-2011-19 to bring circuitry up Chestnut Hill: ROW issues.  
Smart Grid automatic transfers: Not yet ready for automatic operation, doesn't address efficient capacity utilization, doesn't address looped ALT issue.

**Decision criteria for alternative selection**





## Budget Submittal Form for Electric Projects

Project Name:	Extend Circuitry 1.6 Miles Underground Along Rt. 17K
Form submitted by:	Angelo Onevelo
Budget Group:	15 - Distribution Improvements
Summary Category:	Maintain System Standards
Investment Category:	Growth
Number of Customers Affected:	147
For Category 15 only:	Budget Year Submitted 2017
	Project ID (District-YYYY-ID) N-2017-06

### Description of Problem

The area around Rt. 17K and Rt. 300 in the Town of Newburgh has seen substantial load growth in recent years. The Bethlehem Road 4092 circuit is the primary circuit that feeds this load pocket along Rt. 300. In 2013, the 4092 circuit peaked at 5.37 MVA. Switching options are greatly limited during peak times. The Coldenham 4027 circuit is the circuit that feeds down Rt. 17K on both the east and west sides of I-87. This circuit has consistently peaked over its 6/9 MVA design criteria in 2013, 2014 and 2015 at 8.62 MVA, 7.29 MVA and 7.10 MVA respectively. A budget project currently scheduled for 2017 (N-2017-01) will offload 3 MW from the Coldenham 4027 circuit. Once this work is completed, the 4027 circuit will peak at approximately 4.5 MW. With the additional load from Amerisource (Matrix) in 2017, the circuit will peak at approximately 5.9 MVA. With this additional loading from Amerisource (Matrix), additional load growth will be limited due to available circuit capacity in the area.

### Solution

In order to meet the demand of future expected load growth, it is proposed to extend the 4025 circuit from Governor's Drive to the intersection of Rt. 17K and Rt. 300. This circuit extension would be comprised of underground conduit construction and would run for approximately 1.6 miles. This will allow of utilization of the lightly loaded Coldenham 4025 circuit. This will also allow for the development of expected load growth in the Rt. 17K and Rt. 300 area.

This project will fall within the criteria for non-wires alternatives.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="3,000,000"/>	<input type="text" value="3,000,000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

☒ Thermal/Load Serving Capability

☒ Equipment Type

☐ Current % loaded

☐ Voltage (Stray, Low, High)

☐ Power Quality

Other

## **Risk Reduction**

### Safety

☐ Employee Safety

☐ Public Safety

☐ Other Program Type

### Compliance

☐ Inspections

☐ Road Rebuild

☐ Joint Facilities/CATV Agreement

☐ NESC Codes

☐ Other Program Type

### Infrastructure

☐ Average Age of Infrastructure  years

☐ Failure Rates

☐ Obsolete/ Unserviceable Equipment

☐ Condition

☐ Accessibility (Off Road, underground)

☐ Strategic Replacement

☐ Other Program Type

### Resilience

☐ \$/COA (with storm)

☐ \$/CMA (with storm)

☐ Customer Cost of Outage (ICE Calculator)

☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



## Budget Submittal Form for Electric Projects

<b>Project Name:</b>	B, F, & R Cables
<b>Form submitted by:</b>	N. Conza
<b>Budget Group:</b>	15 - Distribution Improvements
<b>Summary Category:</b>	Maintain System Standards
<b>Investment Category:</b>	Infrastructure
<b>Number of Customers Affected:</b>	
<b>For Category 15 only:</b>	
Budget Year Submitted	2017
Project ID (District-YYYY-ID)	N-2017-08

### Description of Problem

The B, F & R cables that feed the Montgomery Street Substation are mostly comprised of PILC cables. Sections of these cables were installed between 1928 and 1956. Numerous repairs have been made to these cables over the years due to leaking lead splices. In 2015, a major repair was performed on 3 simultaneous leaks in the same manhole. The infrastructure is just as old as the cables and is in poor condition. The 4" fiber duct configuration has resulted in the lead cables being stacked on each other in each manhole. A major failure of one of the cables could potentially result in loss of all three cables. Of the 3 spare ducts in this duct bank, only 2 are available due to a collapse and failed cable pull. The structural integrity of these aging fiber ducts cannot and should not be relied on for new cables.

### Solution

Construct a new duct bank and replace the B, F & R cables up to I84 between 2018 and 2026. Continuation south of I84 shall be evaluated in 2022 and assigned a new Newburgh project ID number.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate: Preliminary Estimate

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	\$8,250,000	\$500,000	\$500,000	\$1,000,000	\$1,250,000	\$1,250,000	\$3,750,000
<b>Expense</b>							

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective** Risk Reduction

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☒ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

E.P. #2011-001

Or

Project Alternatives Considered

Decision criteria for alternative selection





## Budget Submittal Form for Electric Projects

<b>Project Name:</b>	Union Avenue Circuit Exit Integration
<b>Form submitted by:</b>	Ryan Yakush
<b>Budget Group:</b>	15 - Distribution Improvements
<b>Summary Category:</b>	Maintain System Standards
<b>Investment Category:</b>	Infrastructure
<b>Number of Customers Affected:</b>	18,432
<b>For Category 15 only:</b>	<b>Budget Year Submitted</b> 2018
	<b>Project ID (District-YYYY-ID)</b> N-2018-06

### Description of Problem

Scheduled for Spring 2018, the switchgear for Union Avenue lower yard is to be replaced. A distribution plan is required to tie the new location of the switchgear into existing circuitry. This is an opportune time to examine all circuit exits between the upper and lower yards and develop a plan in coordination with the substation work that will improve the area.

### Solution

Install a 3x2 duct bank consisting of 6" conduit from the manholes inside the lower yard to a new manhole on the northwest corner of Rt. 32 and Union Ave. Install a 4x3 duct bank consisting of 6" conduit from MH5 to the northwest corner of Rt. 32 and Union Ave. Install a 2x2 duct bank consisting of 6" conduit under Rt. 32 to a new manhole on the northeast corner of Rt. 32 and Union Ave. Install a 3x2 duct bank consisting of 6" conduit out the back of the substation to Hillside Ave.

See Union Avenue Integration Study EP # 2017-09 for additional details.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="2,300,000"/>	<input type="text" value="1,000,000"/>	<input type="text" value="1,300,000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☒ Thermal/Load Serving Capability
- ☒ Equipment Type
- ☒ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## Risk Reduction

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☒ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Union Avenue Integration Study EP # 2017-09

Or

Project Alternatives Considered

Decision criteria for alternative selection

Project: P-11-29

Title: 7061/7071 - Close gap, relocate circuitry on-road to create 13.2kV tie (Ph 2)

History:

Cablevision has recently purchased the franchise rights to the Milan Township and as a result, significant make-ready CATV work has been completed on the south side of Rt. 199 in 2010. The Milan side of Milan Hollow Rd. is now fed by the 7061 circuit, and portions have been converted to 13.2kV operation. New poles were set and spanned to accommodate a future 3-phase tie using 336 AA conductor. All new wire installed along Milan Hollow was 336 AA conductor.

Solution: (refer to the attached circuit maps)

Close the 0.4 mile gap between the 7061 and 7071 circuits along Milan Hollow Rd. Move the existing 7071 circuitry out of the swamp and on-road. Polyphase and convert the remaining portions of the 7061 side of Milan Hollow Rd. This will create a strong 13.2kV tie between the two circuits, and can allow for offloading Stanfordville Substation in the future should the load in the area continue to grow.

Phase II: Polyphase 1.7 miles of circuitry along Milan Hollow Rd. using 336 WR AA conductors. Convert to 13.2kV operation and polyphase an additional 1.4 miles of circuitry along Milan Hollow Rd. using 336 WR AA conductors. Convert all spurs to 13.2kV operation

Cost: (refer to the attached circuit maps)

• Polyphase I. 7 miles of circuitry along Milan Hollow Rd.....	\$510,000
• Convert to 13.2kV operation & polyphase 1.4 miles of circuitry along Milan Hollow Rd.....	\$420,000
• Convert all spurs to 13.2kV operation.....	\$220,000
<b>Total Cost (Capital)=</b>	<b>\$1,150,000</b>

Summary:

Polyphase I. 7 miles of circuitry, and convert and polyphase an additional 1.4 miles of circuitry using 336 WR AA conductor along Milan Hollow Rd. This will allow for the creation of a strong three-phase tie between the 7061 and 7071 circuits. Should load growth continue in the Town of Stanfordville, this tie can also then be used to offload Stanfordville Substation in the future.

Project: P-11-24

Title: 7072/7091 ckt. - Reconductor circuitry along Rt. 82 (Ph I)

History:

The Pulvers Corners 7091 circuit has just one 13.2kV tie point (external to the substation), located on Rt. 82, where it connects with the Stanfordville 7072 circuit. This tie point, however, is limited by the 7072 mainline along Rt. 82, consisting largely of #4 bare copper. Due to the lack of a strong tie on the 7091 circuit, switching capabilities are severely limited. There is currently no way to pick up the entire circuit feeding into Pine Plains in the event of a fault along the mainline, leaving much of the Village without power until repairs are completed.

Solution: (refer to the attached circuit map)

Reconductor the existing 3-phase, 13.2 kV, #4 bare copper phase conductor circuitry on Rt. 82, from the solid blade cutouts on P59705 in Stanfordville to Route 83 in Pine Plains (a total of 7.7 miles), with 336 AA phase conductor with a 3/0 bare aluminum neutral conductor.

Phase I: Reconductor 3.7 miles on Rt. 82, from the solid blade cutouts on P59705 in Stanfordville to Attlebury Hill Rd. with 336 AA phase conductors and a 3/0 bare aluminum neutral.

Cost: (refer to the attached circuit map)

• Phase I	\$1,110,000
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Total Cost (Capital) = **\$1,110,000**

Benefits:

Completion of this project will create a strong 13.2 kV tie on Rt. 82 between the 7072 and the 7091 circuits, allowing for the entire 7091 circuit to be picked up in the event of a fault on the mainline.

Project: P-11-30

Title: 7072/7091 ckt. - Reconductor circuitry along Rt. 82 (Ph 2)

History:

The Pulvers Corners 7091 circuit has just one 13.2kV tie point (external to the substation), located on Rt. 82, where it connects with the Stanfordville 7072 circuit. This tie point, however, is limited by the 7072 mainline along Rt. 82, consisting largely of #4 bare copper. Due to the lack of a strong tie on the 7091 circuit, switching capabilities are severely limited. There is currently no way to pick up the entire circuit feeding into Pine Plains in the event of a fault along the mainline, leaving much of the Village without power until repairs are completed.

Solution: (refer to the attached circuit map)

Reconductor the existing 3-phase, 13.2 kV, #4 bare copper phase conductor circuitry on Rt. 82, from the solid blade cutouts on P59705 in Stanfordville to Route 83 in Pine Plains (a total of 7.7 miles), with 336 AA phase conductor with a 3/0 bare aluminum neutral conductor.

Phase II: Reconductor 4.0 miles on Rt. 82, from Attlebury Hill Rd. to Route 83 with 336 AA phase conductors and a 3/0 bare aluminum neutral.

Cost: (refer to the attached circuit map)

• Phase II	\$1,200,000
<hr/>	
Total Cost (Capital) = <b>\$1,200,000</b>	

Benefits:

Completion of this project will create a strong 13.2 kV tie on Rt. 82 between the 7072 and the 7091 circuits, allowing for the entire 7091 circuit to be picked up in the event of a fault on the mainline.



## Budget Submittal Form for Electric Projects

<b>Project Name:</b>	Secondary Network Upgrade (Infrastructure) - Market St. Poughkeepsie		
<b>Form submitted by:</b>	N. Conza		
<b>Budget Group:</b>	15 - Distribution Improvements		
<b>Summary Category:</b>	Maintain System Standards		
<b>Investment Category:</b>	Infrastructure		
<b>Number of Customers Affected:</b>			
<b>For Category 15 only:</b>	<b>Budget Year Submitted</b>	2017	
	<b>Project ID (District-YYYY-ID)</b>	P-2017-07	

### Description of Problem

The secondary network infrastructure on Market St. (south of Main St.) is in poor condition. Parts of it have collapsed, and numerous conductors that have burned in the clear have not been able to be replaced due to non-existing spare conduits.

### Solution

Install new conduits on both the east and west sides of Market St.



**Cost estimate (include AFUDC if appropriate)**

**Type of estimate:**

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$1,000,000"/>	<input type="text" value="\$300,000"/>	<input type="text" value="\$200,000"/>	<input type="text" value="\$500,000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

Non-Storm Operating

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

Customer Satisfaction

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## **Risk Reduction**

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☐ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

**Project Alternatives Considered**

There are no other alternatives to feed the customers on Market Street off the secondary network.

**Decision criteria for alternative selection**

# Budget Submittal Form for Electric Projects

**Project Name:** P-2019-01 - 7051 - Retire 7051 & 7056 Off-Road Mainline and Re-Distribute Northwest Dutchess

**Form submitted by:** Joseph Kisch

**Budget Group:** 15 - Distribution Improvements

**Summary Category:** Maintain System Standards

**Investment Category:** Infrastructure

**Number of Customers Affected:** 723

**For Category 15 only:** Budget Year Submitted 2019

Project ID (District-YYYY-ID) P-2019-01

## Description of Problem

The infrastructure for the Rhinebeck 7051 & 7056 off-road 3-phase line (former PR & RR Cables) is approximately 40 years old and in worsening condition. Presently, there is no load beyond pole # P21740 on the 7056 side of the infrastructure. It has remained energized though with the intent for it to be utilized for switching purposes when needed. A field review of this circuitry was performed in 2016 and it was found that the 1/0 stranded copper line is riddled with automatics and broken strands. This in return has effectively rendered this circuitry unavailable for switching purposes. The construction of the Milan 7061 & 7062 circuits have provided stronger ties for the area where the 7056 off-road circuitry is no longer needed.

The 7051 side of the infrastructure serves as the mainline express feed for the circuit's load center in northern Red Hook and Tivoli. The approximate 7 miles of circuitry is currently comprised of 336 ASCR, 3/0 Al, 1/0 Cu, and # 2 Cu and a field review of the conductor yielded similar results as the 7056 side. The large off-road exposure for this circuit's mainline makes it susceptible to many outages. Outages along this circuitry have longer than average durations due to the difficulties associated with repairing the line. The Rhinebeck 7051 circuit was identified in the 2017 Annual Reliability Report as one of the top 5% worst performing circuits from 2013-2017 within the Central Hudson Territory.

## Solution

It is recommended to retire the 7 miles of off-road circuitry in its entirety and rebuild the 7051 mainline on-road. From there, the load for northern Rhinebeck, Red Hook, and Tivoli will be redistributed amongst the 7051, 7054, & 7062 circuits. The project comprises of two phases:

**Phase I:** Build the 4 miles of 7051 first-zone circuitry on road along Rt 9G, Middle Rd, Rokeby Rd, and Benner Rd. The Village of Red Hook load that is currently being served by the 7054, 7056, & 7061 can then be reconfigured to be transferred onto the 7051 and relocate the Electronic recloser currently located on pole # 165715 to Benner Rd near Garden St. This will allow for the off-road circuitry between Rt 9G & Fisk St (south of pole # 137323)

**Phase II:** Reconductoring and building new 3 phase construction will be required in 4 different locations: 1) 0.5 mi along Pitcher Ln and Budds Corners Rd. 2) 1.6 mi along Linden Ave. 3) 1,115' Underground along Echo Valley Rd to feed URD # 181. 4) 0.3 mi along Thompson St & Elizabeth St. [Continued on next page].

Additionally, single phase spurs will be required in 3 different locations to inherit small pockets of load previously fed from the off road line: 1) 0.1 mi along Cookingham Ln to feed eastern portion of street. 2) 0.25 mi along the north side of Mill St (fed from Rockefeller Ln). 3.) 425' underground along Seymour Dr. to partially feed URD # 248.

It should be noted as well that 3 locations will require a reconfiguration of the old circuitry to single-phase spurs in order to serve off-road customers: 1) 400' off-road behind Echo Valley Rd (Near old East Red Hook Substation). 2) 400' off-road behind Mill St (from the Rt. 9 side) to partially serve URD # 248. 3) 600' off of Rt. 9 near Hannaford to feed the lights for the supermarket's parking lot. The 3-phase feed for Stamp Inc. near Rt. 9G (~0.25 mi) will need to be preserved as well.

The completion of both phases will reconfigure the load in the northwestern part of the district via three circuits. The general areas that the circuits will feed (along with anticipated peak loads) are listed below:

- Rhinebeck 7051 (4.2 MVA) – Northern Rhinebeck (West of Rt. 9), Village of Red Hook, & Town of Red Hook (West of Rt. 9 & South of Whalesback Rd)
- Rhinebeck 7054 (3.92 MVA) – Northern Rhinebeck (East of Rt. 9) & Town of Red Hook (West of Rt. 9 & South of Whalesback Rd)
- Milan 7062 (5.21 MVA) – Northern Milan, Town of Red Hook (North of Whalesback Rd.), & Tivoli

In addition to these three distribution feeders, the Rhinebeck 7056 and Milan 7061 are the two nearest distribution feeders to this area that could be utilized for switching purposes. Their anticipated peak loads are expected to be 4.63 MVA & 3.89 MVA respectively.

**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$2,000,000"/>	<input type="text" value="\$1,200,000"/>	<input type="text" value="\$800,000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

Non-Storm Reliability

☒ \$/COA

☒ 5 Year Average # Outages Avoided

Non-Storm Operating

☒ \$/CMA

☒ Year Average Duration of Outages

Customer Satisfaction

☐ Complaints

☐ Critical Customers

☐ LSA Customers

☐ Public Relations Considerations

## Service Standards

- ☐ Thermal/Load Serving Capability
  - ☐ Equipment Type
  - ☐ Current % loaded
- ☐ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

## Risk Reduction

### Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

### Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

### Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☒ Condition
- ☒ Accessibility (Off Road, underground)
- ☐ Strategic Replacement
- ☐ Other Program Type

### Resilience

- ☒ \$/COA (with storm)
- ☒ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



## Budget Submittal Form for Electric Projects

<b>Project Name:</b>	P-2015-01 – 7081/7095 – Convert Shekomeko
<b>Form submitted by:</b>	J. Kisch
<b>Budget Group:</b>	15 - Distribution Improvements
<b>Summary Category:</b>	Maintain System Standards
<b>Investment Category:</b>	Infrastructure
<b>Number of Customers Affected:</b>	152
<b>For Category 15 only:</b>	Budget Year Submitted 2015
	Project ID (District-YYYY-ID) P-2015-01

### Description of Problem

The Smithfield 7095 circuitry feeding to the west is built in a vertical configuration along transmission towers running adjacent to the E Line for 2.5 miles before transitioning to distribution poles on Pugsley Hill Rd. On 8/15/12, lightning struck this portion of the 7095 in the first zone of protection, necessitating downstream switching for the single phase circuitry. It was found that the utilized tie point did not have the capacity to deliver sufficient voltage to the area. In order to correct this, additional sections of circuitry were subsequently offloaded onto adjacent tie points. Following this, it was again discovered that the strain on these new sources also did not have the capacity to deliver the 114 minimum allowable voltage. This cascading voltage issue led to multiple abnormal conditions. This one outage necessitated offloads onto the 7072, the 7081, and the 7091.

Due to the 7095's uncommon distribution build along the E Line transmission tower, this area remained in abnormal configuration for several weeks.

This portion of the 7095 circuitry starts out 7.62kV for 2.2 miles, steps down to 4.8kV delta for 1.8 miles, steps back up to 7.62kV for 1.7 miles, and then steps back down again to provide for a 4.8kV delta tie point.

For these 4.8kV delta circuitry sections, the existing wire size is #4 copper, with an average pole plant age of 48.6 years.

### Solution

Shekomeko can be strengthened by completing multiple conversions that can be done in up to 3 phases. Phase 1 would be to reconductor and convert 1.7 miles of single phase along McGhee Hill Rd/Northeast Center Rd and install a stepdown for Tripp Rd. Also, reconductor and convert 1.2 miles of single phase along Rt. 83/Rt. 82A/Sn Fri Rd. Phase 2 would be to reconductor and convert 1.4 miles of single phase along Hunns Lake Rd and close a small on-road gap at Smithfield Valley Rd and install a stepdown for the southern part of Smithfield Valley Rd. This also eliminates a difficult 0.5 mile off-road line to patrol feeding from Hunns Lake Rd to this area (which had at least 5 outages since 2010 potentially attributable to this off-road section). Phase 2 also includes reconductoring and converting 1.2 miles of single phase along Pugsley Hill and Shaefer. Phase 3 would be to reconductor and convert 1.3 miles of single phase along Carpenter Hill and 0.9 miles of single phase along Conklin Hill.

This would eliminate low voltage issues when in an abnormal configuration - which would most likely last for several weeks. This would create five 7.62kV tie points, and eliminate the unconventional voltage changes along the 7095 (high to low to high to low). There are not many foreseen tree issues. (Please see original write-up for previous work completed in the area)



**Cost estimate (include AFUDC if appropriate)**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,540,000"/>	<input type="text" value="\$580,000"/>	<input type="text" value="\$520,000"/>	<input type="text" value="\$444,000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Service**

**Non-Storm Reliability**

- ☐ \$/COA
- ☐ 5 Year Average # Outages Avoided

**Non-Storm Operating**

- ☐ \$/CMA
- ☐ 5 Year Average Duration of Outages

**Customer Satisfaction**

- ☐ Complaints
- ☐ Critical Customers
- ☐ LSA Customers
- ☐ Public Relations Considerations



Service Standards

- ☐ Thermal/Load Serving Capability
- ☐ Equipment Type
- ☐ Current % loaded
- ☒ Voltage (Stray, Low, High)
- ☐ Power Quality

Other

**Risk Reduction**

Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

Compliance

- ☐ Inspections
- ☐ Road Rebuild
- ☐ Joint Facilities/CATV Agreement
- ☐ NESC Codes
- ☐ Other Program Type

Infrastructure

- ☒ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Condition
- ☒ Accessibility (Off Road, underground)
- ☒ Strategic Replacement
- ☐ Other Program Type

Resilience

- ☐ \$/COA (with storm)
- ☐ \$/CMA (with storm)
- ☐ Customer Cost of Outage (ICE Calculator)
- ☐ Grade B Construction

Other

**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection

## **GAS PROGRAM INDIVIDUAL PROJECT SUBMITTAL**



# Budget Submittal Form for Gas Projects

Project Name:	AH Line Valves, Project 22-3
Form submitted by:	Tera Stoner
Recommended In-Service Year:	2019 through 2023
Budget Group:	22 - Transmission
Summary Category:	Maintain System Standards
Investment Category:	Infrastructure
Number of Customers Affected:	0

## Description of Problem

Gas system:	AH Line
Gas pressure:	618
Existing pipe size and material:	10"
Proposed length replacement:	various

Line valves along the AH Gas Transmission Line will be replace due to age and wear to transform the line valve assembly into a pig-able unit including ports to accommodate pipeline inspection tools.

## Solution

Proposed size:	uncertain
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See above.



**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

Capital	<input type="text" value="\$3,178,000"/>	<input type="text" value="\$609,000"/>	<input type="text" value="\$310,000"/>	<input type="text" value="\$692,000"/>	<input type="text" value="\$855,000"/>	<input type="text" value="\$712,000"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Replacement
- ☐ Reinforcement
- ☐ Road Rebuild
- ☐ Other

**Service**

Reliability

- ☐ Radial feed
- ☐ Loop tie

Gas Safety

- Pipeline type
- Number of closed leaks in past 10 years
- Number of hazardous (Class 1, 2A and 2)
- Number of active leaks
- Length of leak prone pipe eliminated
- Number of high pressure service replacement
- Number of isolated service replacement

Customer Impact

- ☐ Complaints
- ☐ Critical Customers
- ☐ Public Relations Considerations

Other

**Risk Reduction**

Safety

- ☐ Reduce risk of incident
- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Benefits

Compliance

- ☐ Central Hudson Inspections
- ☐ Elimination of Integrity Related Issues
- ☐ Other Program Type

Infrastructure

- Infrastructure year installed
- Number of Services
- ☐ Indoor meter sets
- ☐ Metallic
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Strategic Replacement
- ☐ Flood zone
- ☐ Main feeder route
- ☐ Low pressure system
- ☐ Other Program Type

Other



**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection

Central Hudson performs an annual inspection of all gas transmission line valves. The replacement schedule for line valves may change in priority due to the annual inspection findings.



# Budget Submittal Form for Gas Projects

Project Name:	Remote Operated Valves, Project 22-4
Form submitted by:	Tera Stoner
Recommended In-Service Year:	2019 through 2023
Budget Group:	22 - Transmission
Summary Category:	System Enhancements
Investment Category:	Risk Reduction
Number of Customers Affected:	0

## Description of Problem

Gas system:	Transmission
Gas pressure:	512 psi through 750 psi
Existing pipe size and material:	
Proposed length replacement:	

The US Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHSMA) will mandate in the near future operators of natural gas transmission lines to have in-service line valves capable of remote operation to isolate a section of main should there be a rupture. In this way, PHSMA hopes to reduce the response time and contain the situation in a timely manner. Central Hudson only has manually operated valves where a crew must travel to the line valve's location and physically close the valve.

## Solution

Proposed size:	uncertain
----------------	-----------

In 2016 an analysis of Central Hudson's current transmission line valves were reviewed for the feasibility of implementing remote control operations. Conceptual cost estimates were calculated.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

Capital	<input type="text" value="\$2,919,000"/>	<input type="text" value="\$521,000"/>	<input type="text" value="\$516,000"/>	<input type="text" value="\$296,000"/>	<input type="text" value="\$765,000"/>	<input type="text" value="\$821,000"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Replacement
- ☐ Reinforcement
- ☐ Road Rebuild
- ☐ Other

**Service**

Reliability

- ☐ Radial feed
- ☐ Loop tie

Gas Safety

- Pipeline type
- Number of closed leaks in past 10 years
- Number of hazardous (Class 1, 2A and 2)
- Number of active leaks
- Length of leak prone pipe eliminated
- Number of high pressure service replacement
- Number of isolated service replacement

### Customer Impact

- ☐ Complaints
- ☐ Critical Customers
- ☐ Public Relations Considerations

### Other

## **Risk Reduction**

### Safety

- ☒ Reduce risk of incident
- ☐ Employee Safety
- ☒ Public Safety
- ☐ Other Benefits

### Compliance

- ☒ Central Hudson Inspections
- ☒ Elimination of Integrity Related Issues
- ☐ Other Program Type

### Infrastructure

Infrastructure year installed

Number of Services

- ☐ Indoor meter sets
- ☐ Metallic
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Strategic Replacement
  - ☐ Flood zone
  - ☐ Main feeder route
  - ☐ Low pressure system
- ☐ Other Program Type

### Other

## **Alternatives Analysis**

Reference Report or Study

Or

### **Project Alternatives Considered**

It is assumed the current gear box on a line valve can be removed and an actuator applied. However, the TP and the AH Line were installed between 1950 and 1960 and current valve actuator models may not be compatible with valves of this age. New valve assemblies will be required taking advantage of a launch port for internal integrity testing tools. In this case it may cost as much as \$486,000 per valve for the manual to remote operated conversion. After analyzing several white papers discussing the issue, Gas & Mechanical Engineering recommends a line valve can only be activated by a System Operator. Other companies are proposing to use line break sensors, which are not feasible for Central Hudson's system.

### **Decision criteria for alternative selection**

Distribution regulator stations to feed from the transmission main itself may require remote operate capabilities at the station's inlet valve.



# Budget Submittal Form for Gas Projects

Project Name:	Pig Launching Station for Internal Line Inspection, Project 22-6
Form submitted by:	Tera Stoner
Recommended In-Service Year:	2019 through 2023
Budget Group:	22 - Transmission
Summary Category:	Maintain System Standards
Investment Category:	Infrastructure
Number of Customers Affected:	0

## Description of Problem

Gas system:	various
Gas pressure:	512 psi to 750 psi
Existing pipe size and material:	various
Proposed length replacement:	various

Funds are reserved to install a site(s) where internal inspection tools may need to be inserted into the pipeline.

## Solution

Proposed size:	uncertain
----------------	-----------

Each scenario will have to be analyzed separately given the internal inspection tool required.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

Capital	<input type="text" value="\$1,491,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$308,000"/>	<input type="text" value="\$317,000"/>	<input type="text" value="\$430,000"/>	<input type="text" value="\$436,000"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Replacement
- ☐ Reinforcement
- ☐ Road Rebuild
- ☐ Other

**Service**

Reliability

- ☐ Radial feed
- ☐ Loop tie

Gas Safety

- Pipeline type
- Number of closed leaks in past 10 years
- Number of hazardous (Class 1, 2A and 2)
- Number of active leaks
- Length of leak prone pipe eliminated
- Number of high pressure service replacement
- Number of isolated service replacement

### Customer Impact

- ☐ Complaints
- ☐ Critical Customers
- ☐ Public Relations Considerations

### Other

## **Risk Reduction**

### Safety

- ☐ Reduce risk of incident
- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Benefits

### Compliance

- ☒ Central Hudson Inspections
- ☒ Elimination of Integrity Related Issues
- ☐ Other Program Type

### Infrastructure

Infrastructure year installed

Number of Services

- ☐ Indoor meter sets
- ☐ Metallic
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Strategic Replacement
  - ☐ Flood zone
  - ☐ Main feeder route
  - ☐ Low pressure system
- ☐ Other Program Type

### Other



## **Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Gas Projects

Project Name:	Pipeline Integrity, Project 22-9
Form submitted by:	Tera Stoner
Recommended In-Service Year:	2019 through 2023
Budget Group:	22 - Transmission
Summary Category:	Maintain System Standards
Investment Category:	Infrastructure
Number of Customers Affected:	0

## Description of Problem

Gas system:	various
Gas pressure:	512 psi to 750 psi
Existing pipe size and material:	various
Proposed length replacement:	various

Funds reserved for instances where inspections under the Pipeline Integrity Program may require a pig launch, replacement of pipe, erosion mitigation, ROW security gates, or resolution of easement issues. The removal of casings no longer required by NYSDOT or railroads must also be considered.

## Solution

Proposed size:	uncertain
----------------	-----------

For each instance require capital funding for replacement of pipe, erosion mitigation, ROW security gates, or resolution of easement issues, all work is analyzed and designed to provide the most cost effective approach. Majority of construction work is competitively bid besides where specialty services may be required such as those provided by Pipetel or TDW Services.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,574,000"/>	<input type="text" value="\$302,000"/>	<input type="text" value="\$308,000"/>	<input type="text" value="\$317,000"/>	<input type="text" value="\$321,000"/>	<input type="text" value="\$326,000"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Replacement
- ☐ Reinforcement
- ☐ Road Rebuild
- ☐ Other

**Service**

Reliability

- ☐ Radial feed
- ☐ Loop tie

Gas Safety

- Pipeline type
- Number of closed leaks in past 10 years
- Number of hazardous (Class 1, 2A and 2)
- Number of active leaks
- Length of leak prone pipe eliminated
- Number of high pressure service replacement
- Number of isolated service replacement

### Customer Impact

- ☐ Complaints
- ☐ Critical Customers
- ☐ Public Relations Considerations

### Other

## **Risk Reduction**

### Safety

- ☒ Reduce risk of incident
- ☐ Employee Safety
- ☒ Public Safety
- ☐ Other Benefits

### Compliance

- ☒ Central Hudson Inspections
- ☒ Elimination of Integrity Related Issues
- ☐ Other Program Type

### Infrastructure

Infrastructure year installed

Number of Services

- ☐ Indoor meter sets
- ☐ Metallic
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Strategic Replacement
  - ☐ Flood zone
  - ☐ Main feeder route
  - ☐ Low pressure system
- ☐ Other Program Type

### Other

**Alternatives Analysis**

Reference Report or Study

Or

**Project Alternatives Considered**

For each instance require capital funding for a possible replacement of pipe, erosion mitigation, ROW security gates, or resolution of easement issues, all work is analyzed and designed to provide the most cost effective approach. Majority of construction work is competitively bid besides where specialty services may be required such as those provided by Pipetel or TDW Services.

**Decision criteria for alternative selection**



# Budget Submittal Form for Gas Projects

Project Name:	Poughkeepsie Receival Rebuild, Project 23-10
Form submitted by:	Tera Stoner
Recommended In-Service Year:	2021-2022
Budget Group:	23 - Regulator Stations
Summary Category:	System Enhancements
Investment Category:	Reliability
Number of Customers Affected:	0

## Description of Problem

Gas system:	TP System to PN Line
Gas pressure:	512 psi to 60 psi
Existing pipe size and material:	various
Proposed length replacement:	various

The rebuild of the MP to TP Line control valve also affects the inlet configuration to the regulator runs where pressure is reduced from transmission level to 60 psi to feed the PN Line, PMP System, and PLP System. Environmental Services have since not identified the need to relocate the station piping at this time for the MGP Site Remediation. However, additional information has been gathered as to how this station is the primary support to the Poughkeepsie Distribution Systems and the Poughkeepsie area has a whole has experienced load growth. Regulator runs shall be reconfigured to upgrade the existing heater, correct flange classifications, upgrade from Axial Flow Valve Regulators to modern fully supported regulators while also meeting the needs of the capacity load adjustments driven by Distribution Improvement Projects.

## Solution

Proposed size:	uncertain
----------------	-----------

As studies are completed realizing the effects Distribution Improvement Projects have on station load, piping shall be sized according to these requirements. Likely an 8-inch outlet header will be required following a 6-inch inlet header for the 60 psi pressure control runs. A heater and filter will also be incorporated. The header sizes for the medium pressure regulator runs will likely be 8-inch for the inlet header and 10-inch for the outlet header. The header sizes for the low pressure regulator runs will likely be 8-inch for the inlet header and 16-inch for the outlet header. The pressure control regulators and over pressure monitor devices will be fully supported models.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

Capital	<input type="text" value="\$1,466,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$661,000"/>	<input type="text" value="\$805,000"/>	<input type="text" value="\$0"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☒ Replacement
- ☐ Reinforcement
- ☐ Road Rebuild
- ☐ Other

**Service**

Reliability

- ☐ Radial feed
- ☐ Loop tie

Gas Safety

- Pipeline type
- Number of closed leaks in past 10 years
- Number of hazardous (Class 1, 2A and 2)
- Number of active leaks
- Length of leak prone pipe eliminated
- Number of high pressure service replacement
- Number of isolated service replacement

Customer Impact

- ☐ Complaints
- ☐ Critical Customers
- ☐ Public Relations Considerations

Other

**Risk Reduction**

Safety

- ☐ Reduce risk of incident
- ☒ Employee Safety
- ☒ Public Safety
- ☐ Other Benefits

Compliance

- ☐ Central Hudson Inspections
- ☐ Elimination of Integrity Related Issues
- ☐ Other Program Type

Infrastructure

Infrastructure year installed

Number of Services

- ☐ Indoor meter sets
- ☐ Metallic
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Strategic Replacement
- ☐ Flood zone
- ☐ Main feeder route
- ☐ Low pressure system
- ☐ Other Program Type

Other



## **Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Gas Projects

Project Name:	Highland Falls Gas Reinforcement
Form submitted by:	L. Cambalik
Recommended In-Service Year:	2019
Budget Group:	25 - Distribution Improvements
Summary Category:	Maintain System Standards
Investment Category:	Growth
Number of Customers Affected:	1,050

## Description of Problem

Gas system:	WP
Gas pressure:	120 Psig
Existing pipe size and material:	1930's vintage 6" steel pipeline
Proposed length replacement:	3.1 Miles

The Village of Highland Falls is currently fed radially via piping owned by and operated by the United States Military Academy at West Point. This arrangement has been in place for over 85 years. The West Point gas system consists of piping that dates back to the 1930's. Due to potential security activities West Point has indicated they cannot guarantee gas flow to village on an uninterrupted basis.

## Solution

Proposed size:	Install of 3.1 Miles of 8" Steel Pipe Operating at 120 Psig
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The Company has reviewed and studied several options to insure continuous flow to Village of Highland Falls. The solution which provides the most customer benefit is the installation of 3.1 miles of 8" steel distribution pipeline owned and operated by Central Hudson that traverses US Military Academy property and directly feeds the Highland Falls gas system. The pipeline will operate at maximum allowable operating pressure of 120 Psig. Pending the outcome of negotiations with West Point personnel the project will be designed and permitted in 2018 with construction and in-service in 2019.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$4,961,000"/>	<input type="text" value="\$4,961,000"/>	<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Expense	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

**Cost Risks**

- ☐ Environmental
- ☒ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits**

**Economic**

- ☐ Reduced O&M
- ☐ Replacement
- ☒ Reinforcement
- ☐ Road Rebuild
- ☐ Other

**Service**

Reliability

- ☒ Radial feed
- ☐ Loop tie

Gas Safety

- Pipeline type
- Number of closed leaks in past 10 years
- Number of hazardous (Class 1, 2A and 2)
- Number of active leaks
- Length of leak prone pipe eliminated
- Number of high pressure service replacement
- Number of isolated service replacement

Customer Impact

- ☐ Complaints
- ☒ Critical Customers
- ☐ Public Relations Considerations

Other

**Risk Reduction**

Safety

- ☐ Reduce risk of incident
- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Benefits

Compliance

- ☐ Central Hudson Inspections
- ☐ Elimination of Integrity Related Issues
- ☐ Other Program Type

Infrastructure

- Infrastructure year installed
- Number of Services
- ☐ Indoor meter sets
- ☐ Metallic
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Strategic Replacement
- ☐ Flood zone
- ☐ Main feeder route
- ☐ Low pressure system
- ☐ Other Program Type

Other

## **Alternatives Analysis**

Reference Report or Study

Or

### **Project Alternatives Considered**

Alternatives evaluated included the installation of a gas distribution pipeline outside the USMA at West Point property along state and county roads as well the use of compressed natural gas (CNG) supplies.

### **Decision criteria for alternative selection**

The proposed project was the least cost alternative that provided the most benefit to the Village of Highland Falls and West Point.



# Budget Submittal Form for Gas Projects

Project Name:	Service Replacement and Minor Projects
Form submitted by:	K. Reer
Recommended In-Service Year:	2019 to 2023
Budget Group:	25 - Distribution Improvements
Summary Category:	Maintain System Standards
Investment Category:	Infrastructure
Number of Customers Affected:	77,000

## Description of Problem

Gas system:	Low, Medium and High Pressure Systems -
Gas pressure:	Various
Existing pipe size and material:	Funding program is for minor main projects and service replacements system-wide
Proposed length replacement:	N/A

Central Hudson has approximately 60,000 gas service lines and 1250 miles of gas distribution pipe. Minor property unit replacement projects for mains and service line replacements are performed as a normal part of operations. Significant numbers of service lines are replaced as an integral part of the LPP replacement program, the requirements for which are Set forth in the following excerpt.

"The allowed per-mile cost includes....and is set as follows: (1) \$1.780 million per mile for 2018, (2) \$1.895 million per mile for 2019; (3) \$2.010 million per mile for 2020; and \$2.125 million per mile for 2021)." "Effective in 2018, the Company will replace or eliminate, at a minimum, 15 miles of LPP per year."

## Solution

Proposed size:	This funding project is for Blankets and Service Replacement Limited Terms.
----------------	---

2018: Service replacements - normal operational needs: \$2,500, Service replacements - associated with pipeline replacement work (LPP): \$8,500, Blanket work orders - minor units; \$550. Total 2019 funding; \$11,550.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate: Preliminary Estimate

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	\$44,534,000	\$9,770,000	\$8,586,000	\$8,438,000	\$9,039,000	\$8,700,000	\$73,000,000
Expense							

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

Risk Reduction

**Benefits**

**Economic**

- ☒ Reduced O&M New pipe reduces leak repair costs
- ☒ Replacement Per rate case orders, elimination of risk and reduction of operating expense
- ☐ Reinforcement
- ☐ Road Rebuild
- ☐ Other

**Service**

Reliability

- ☐ Radial feed
- ☐ Loop tie

Gas Safety

- D Pipeline type
- N/A Number of closed leaks in past 10 years
- N/A Number of hazardous (Class 1, 2A and 2)
- 100+ Number of active leaks
- Length of leak prone pipe eliminated
- Number of high pressure service replacement
- Number of isolated service replacement

Customer Impact

- ☐ Complaints
- ☐ Critical Customers
- ☐ Public Relations Considerations

Other

**Risk Reduction**

Safety

- ☒ Reduce risk of incident
- ☐ Employee Safety
- ☒ Public Safety
- ☐ Other Benefits

Compliance

- ☐ Central Hudson Inspections
- ☒ Elimination of Integrity Related Issues
- ☐ Other Program Type

Infrastructure

Infrastructure year installed

1000/yr Number of Services

- ☐ Indoor meter sets
- ☒ Metallic
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Strategic Replacement
- ☐ Flood zone
- ☐ Main feeder route
- ☐ Low pressure system

☐ Other Program Type

Other

Move indoor service lines outdoors wherever possible, install EFVs on pounds pressure service lines, reduce or eliminate the approximately 17000 LPP services in inventory and reduce leak survey and repair costs, reduce risk, improve system capacity.



**Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Gas Projects

Project Name:	Leak Prone Pipe Replacement Projects
Form submitted by:	K. Reer
Recommended In-Service Year:	2019 to 2023
Budget Group:	25 - Distribution Improvements
Summary Category:	Maintain System Standards
Investment Category:	Infrastructure
Number of Customers Affected:	77,000

## Description of Problem

Gas system:	Low, Medium and High Pressure Systems -
Gas pressure:	Various
Existing pipe size and material:	Program applies to all Bare steel, wrought iron, and cast iron piping materials
Proposed length replacement:	15.0 Miles/Year

Central Hudson has an inventory of approximately 175 miles of gas distribution pipe considered "leak prone". This piping has been identified the the most recent rate case as requiring replacement. The settlement order set aside funding per the following race case order excerpt:

"The allowed per-mile cost includes....and is set as follows: (1) \$1.780 million per mile for 2018, (2) \$1.895 million per mile for 2019; (3) \$2.010 million per mile for 2020; and \$2.125 million per mile for 2021)." "Effective in 2018, the Company will replace or eliminate, at a minimum, 15 miles of LPP per year."

Applies to Funding Account 2-2580-00-YY

## Solution

Proposed size:	This funding project is for Neighborhood LPP Project specific work orders.
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2019: Port Ewen System: \$8,127(k), North Highland: \$2,397, West Haight Area: \$4,373, East Newburgh Broadway to Third: \$4,816, Cornwall: \$2,450, Sharon Drive and Route 9: \$3,525, Montgomery: \$3,154.

Projects for years 2020 to 2023 have been tentatively identified and required funding detail provided in the spreadsheet.

**Cost estimate (include AFUDC if appropriate):****Type of estimate:** Preliminary Estimate

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	\$152,865,000	\$24,854,000	\$29,991,000	\$32,259,000	\$29,205,000	\$36,557,00	\$221,000,000
<b>Expense</b>	\$3,250,000	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000	\$7,500,000

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

Risk Reduction

**Benefits****Economic**

- ☐ Reduced O&M
- ☒ Replacement Per rate case orders, elimination of risk and reduction of operating expense
- ☐ Reinforcement
- ☐ Road Rebuild
- ☐ Other

**Service**

## Reliability

- ☐ Radial feed
- ☐ Loop tie

## Gas Safety

- D Pipeline type
- N/A Number of closed leaks in past 10 years
- N/A Number of hazardous (Class 1, 2A and 2)
- 100+ Number of active leaks
- 14.0 Length of leak prone pipe eliminated
- 0 Number of high pressure service replacement
- Number of isolated service replacement

Customer Impact

- ☐ Complaints
- ☐ Critical Customers
- ☐ Public Relations Considerations

Other

**Risk Reduction**

Safety

- ☒ Reduce risk of incident
- ☐ Employee Safety
- ☒ Public Safety
- ☐ Other Benefits

Compliance

- ☐ Central Hudson Inspections
- ☒ Elimination of Integrity Related Issues
- ☐ Other Program Type

Infrastructure

1875 + Infrastructure year installed

1000/yr Number of Services

- ☐ Indoor meter sets
- ☒ Metallic
- ☐ Obsolete/ Unserviceable Equipment
- ☐ Strategic Replacement
- ☐ Flood zone
- ☒ Main feeder route
- ☒ Low pressure system
- ☐ Other Program Type

Other

## **Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection

## **COMMON PROGRAM INDIVIDUAL PROJECT SUBMITTAL**



## Budget Submittal Form for Common Projects

Project Name:	Poughkeepsie Headquarters – Build new parking area and office bldg.
Form submitted by:	Stefanie Pola
Budget Group:	41 - Buildings
Summary Category:	System Enhancement
Investment Category:	Daily Operations

### Description of Problem

Due to the growth in headcount there is a lack of office space and parking at the Poughkeepsie headquarters. There is also a need for expanded vehicle maintenance. The existing Poughkeepsie garage area is inadequate for some equipment which then requires equipment to be moved up to Kingston garage.

### Solution

This project will build a new office building and parking area for approximately 300 people on the South Ave. facility. Office and conference space is needed to conduct business operations. This project would also accommodate parking which is limited at the site. The new building facility will provide the opportunity to relocate large groups of employees to improve workflow and production. It will also provide space for a modernizing garage area for Transportation.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="10,354,000"/>	<input type="text" value="3,424,000"/>	<input type="text" value="6,889,000"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="TBD"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☒ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☐ Strategic Replacement
- ☐ Other Program Type



Other

--

**Alternatives Analysis**

Reference Report or Study

--

Or

Project Alternatives Considered

--

Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

Project Name:	Kingston - Office Space Build Out
Form submitted by:	Stefanie Pola
Budget Group:	41 - Buildings
Summary Category:	System Enhancement
Investment Category:	Daily Operations

## Description of Problem

Inadequate office space, restrooms, and operations space for daily operations at district offices.

## Solution

Build out of the open office space, including restrooms, & a disaster recovery area will create additional office space for new employees and a place for disaster recovery and back up of systems currently located at the Poughkeepsie headquarters. This will increase the efficiency of the office as well as accommodate teams for restoration and recovery making corporate process more efficient.

**Cost estimate (include AFUDC if appropriate):**

**Type of estimate:**

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="3,178,000"/>	<input type="text" value="1,578,000"/>	<input type="text" value="1,601,000"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☒ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☐ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

Project Name:	Training and System Operation Facilities
Form submitted by:	Stefanie Pola
Budget Group:	41 - Buildings
Summary Category:	System Enhancement
Investment Category:	Daily Operations

## Description of Problem

Central Hudson does not presently have a dedicated, centrally located training facility at which we can prepare our entire employee population with all the necessary skills to perform their duties. Central Hudson also does not have office facilities for the addition of a Distribution System Operation either with the existing Transmission System Operations or in any other facilities without the need for major renovations.

## Solution

The proposed combined Employee Safety, Training and Development Academy and a System Operations facility. This new facility would enable scenario-based training. This will allow for repeatability, practice of procedures in a real life situation as well as in the face of adversity – while simultaneously performing in a safe and controlled environment. While also providing space for a combined Distribution and Transmission System Operations primary control center. The facility has been designed to provide flexibility for other corporate uses and to facilitate collaboration with emergency services, municipalities, and other outside agencies.

**Cost estimate (include AFUDC if appropriate):**

**Type of estimate:**

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="26,020,000"/>	<input type="text" value="3,534,000"/>	<input type="text" value="3,095,000"/>	<input type="text" value="13,213,000"/>	<input type="text" value="5,044,000"/>	<input type="text" value="1,134,000"/>	<input type="text" value="TBD"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☒ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☐ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

Project Name:	Business Intelligence (Cognos)
Form submitted by:	Vicki Wheeler
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Daily Operations

## Description of Problem

The BI program was set up about 5 years ago mainly to address the data silo'd in the mainframe and also provide a solution for numerous reports that required various input sources and therefore were compiled manually into massive spreadsheets. It started out very small with only one full-time resource and an informal project management and request submission process. Now it is a formal program with a defined team and a formal project management process along with IT Steering Committee review and approval of the projects to be undertaken.

## Solution

We purchased Cognos and a single Netezza box in December 2011. We hired a skilled contract resource (still on the team today) to start rolling out reports in 2012. Over time, we have built up the team to 3 contract resources and one full time CH PM and a part time Program Manager. In 2016 a second, DR/Test Netezza box was purchased. Many reports and dashboards have been implemented that provide the business areas with way more information than they have ever had before in terms of managing their work and getting visibility into patterns etc; we cannot keep up with the demand for more. The 5 year plan will be established later this year and include rolling some of the reporting up into corporate wide KPIs, pushing data out to mobile devices, creating a enterprise data framework, near real-time data updates and exploring predictive analytics.



**Cost estimate (include AFUDC if appropriate):**

Type of estimate: Preliminary Estimate

	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Future
Capital	\$6,557,000	\$1,258,000	\$1,291,000	\$1,312,000	\$1,339,000	\$1,357,000	TBD
Expense	\$0	\$0	\$0	\$0	\$0	\$0	TBD

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☒ Manpower resource availability due to additional workload, changing priorities
- ☒ Other funding availability due to changing priorities/competing projects

**Primary Project Objective** Service

**Benefits:**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☒ Other improved business processes, data management, visibility

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☒ Inspections Projects implemented to monitor and manage gas inspections and
- ☒ Code Requirement/PSC Various projects to monitor & manage code & PSC requirements
- ☒ Other Program Type Various projects to monitor & manage operational compliance

**Infrastructure**

- ☐ Average Age of Infrastructure years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☐ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

<b>Project Name:</b>	CIS / REV Modernization
<b>Form submitted by:</b>	Jordan Randall
<b>Budget Group:</b>	42 - Office Equipment
<b>Summary Category:</b>	Maintain System Standards
<b>Investment Category:</b>	Infrastructure

## Description of Problem

The CIS system is a custom built mainframe application that has been in service since 1984. It handles all of the possible interactions with a customer, not just billing, A/R, payments etc. As such it is the hub for just about all other applications in use, both mainframe and otherwise. It has grown in size and complexity over the years, and requires that changes be made by analysts with a significant number of years experience dealing with the system. Most of the original programmers are no longer with Central Hudson and the few remaining are at risk of retiring in the not too distant future. Making changes to CIS can be a long process, mostly in terms of testing through everything to make sure nothing was impacted downstream and unexpectedly.

REV (Reforming the Energy Vision) came into the picture recently, and is changing the utility business. There is more regulatory activity and requirements now than ever before This means the CIS has to change along with it. Due to the points mentioned above, that is not a very agile process and can take more time than we have. For example, our REV demonstration project by the end of 2016 is going to allow customers to choose to have a smart meter installed to provide them with detailed energy analytics. It seems very likely that complex, variable time of use billing rates could come shortly thereafter, in order to allow customers to take full advantage of their new smart meters. With all of the other regulatory requirements that have been stacked up waiting for us to roll out monthly billing on July 1, 2016, it could be some time before we are able to program in house any new complex billing rates.

## Solution

For the last year or so, we have been bringing in various vendors to demo their solutions to help us investigate other CIS options that would allow us to increase our CIS billing flexibility:

1. a 'bolt on' rate engine that could calculate a new complex rate value for a meter reading and pass all the info back to the existing CIS. This could include a hosted solution by another Fortis utility.
2. a new billing CIS that could store account data, process all the billing functions for the accounts with those new rates and interface with the existing CIS to pass over any required data to book.
3. a new fully functional CIS that could take certain accounts and perform all CIS processes required for that account - in effect having 2 parallel CIS systems with the assumption that all accounts would eventually over time wind up in the new CIS. At which time the existing CIS would be sunsetted.

All of these options require significant interfacing with the existing CIS so it is still unclear at this point which solution could be the best fit for us. We continue to research and bring various vendors in to perform demo's of their products. At some point in the near future we will likely select one of the vendors to come in and perform a requirements gathering workshop with us to dive more in depth into what solution(s) have the most pros and the least cons for our situation.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate: Preliminary Estimate

	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Future
Capital	\$14,997,000	\$3,145,000	\$3,173,000	\$3,062,000	\$2,790,000	\$2,827,000	TBD
Expense							

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☒ Manpower resource availability due to additional workload, changing priorities, retirements
- ☒ Other funding availability due to changing priorities/competing projects

**Primary Project Objective** Service

**Benefits:**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☒ Other improved agility & time to market with regulatory and other billing modifications to 32 yr old CIS

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☒ Other Program Type new rate design requirements from Public Service Commission

**Infrastructure**

- ☐ Average Age of Infrastructure years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☒ Condition CIS custom software increasingly complex (mainframe HW it runs on very current)
- ☒ Strategic Replacement Aging CIS (1984) will need full/partial replacement eventually
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

so far: Itron's rate engine, Nexant's rate engine, Oracle's CC&B (multiple vendors), hosted solution with TEP, Hansen's Nirvanasoft, an SAP hosted solution (multiple vendors). Still in progress.
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Decision criteria for alternative selection

not laid out yet.
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# Budget Submittal Form for Common Projects

Project Name:	Increase Quality & Speed of Delivery of Application Testing
Form submitted by:	Jordan Randall
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Daily Operations

## Description of Problem

Currently there's no standard and automated way of testing software functionality. So the results are not consistent and it takes longer to validate the functionality.

## Solution

Continuation to design test scripts across all systems coupled with the automation of testing wherever effective. This will save time and make testing more consistent. It'll also help in validating functionality ( in the form of regression testing) whenever code changes are made.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate: Preliminary Estimate

	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Future
Capital	\$2,732,000	\$524,000	\$538,000	\$547,000	\$558,000	\$565,000	
Expense							

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☒ Manpower
- ☒ Other conflicting priorities.

Primary Project Objective Service

**Benefits:**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☒ Other improved business processes, data management

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☐ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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## Budget Submittal Form for Common Projects

Project Name:	Clarity Replacement/Upgrades Enhancements
Form submitted by:	Jordan Randall
Budget Group:	42 - Office Equipment
Summary Category:	Maintain System Standards
Investment Category:	Infrastructure

### Description of Problem

Clarity- our planning system has reached End Of Life. IBM, who developed and supported Clairty has announced that it's discontinuing the support. We need to replace the system so that the business is not disrupted.

### Solution

Implement newer product like IBM Cognos TM1 which provides similar functionality.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate: Preliminary Estimate

	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Future
Capital	\$1,348,000	\$0	\$0	\$0	\$670,000	\$678,000	TBD
Expense							

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☒ Manpower
- ☒ Other Conflicting priorities

**Primary Project Objective** Service

**Benefits:**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☒ Other Better insight into financial planning

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☒ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

Project Name:	Cyber Security
Form submitted by:	Jordan Randall
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Compliance

## Description of Problem

Currently we do not have an efficient way to grant or revoke access from authorized individuals leaving us vulnerable to have users with elevated level of access where not needed. Also we need to have better oversight and governance over the process.

## Solution

Implement an Identity and Access Management tool. This is a multi-phased project. In Phase 1, the project will develop workflows that will replace current manual process of on-boarding and off-borading of employees and contractors. In the subsequent phases the workflows for access control at the application level will be implemented.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate: Preliminary Estimate

	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Future
Capital	\$509,000	\$79,000	\$104,000	\$107,000	\$109,000	\$111,000	
Expense							

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☒ Manpower resource availability due to additional workload, changing priorities
- ☒ Other funding availability due to changing priorities/competing projects

**Primary Project Objective** Safety/Security

**Benefits:**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☒ Other improved identity and access control and better oversight and governance over the process.

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☒ Other Program Type Cyber Safety

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☐ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

**Project Name:** Emergent Software Package/Upgrades

**Form submitted by:** Jordan Randall

**Budget Group:** 42 - Office Equipment

**Summary Category:** Maintain System Standards

**Investment Category:** Infrastructure

## Description of Problem

Technology and customer expectations are changing fast. IT needs to prepared to understand these trends and be prepared to implement changes wherever necessary.

## Solution

Ongoing emerging IT related capital spend from unknown, but expected IT requests that fall outside of the planning windows to misc. upgrades, etc.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate: Preliminary Estimate

	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Future
Capital	\$7,465,000	\$1,048,000	\$1,291,000	\$1,531,000	\$1,786,000	\$1,809,000	
Expense							

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☒ Manpower
- ☒ Other conflicting priorities

**Primary Project Objective** Service

**Benefits:**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☒ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☒ Strategic Replacement existing mainframe system 20+ years old
- ☐ Other Program Type



Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

**Project Name:**

**Form submitted by:**

**Budget Group:**

**Summary Category:**

**Investment Category:**

## Description of Problem

Our existing communication tools do not provide a seamless experience over different types of communications like instant messaging, voice, video conferencing.

## Solution

Extension, upgrades, and enhancements of UC collaboration solutions.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate: Preliminary Estimate

	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Future
Capital	\$3,593,000	\$944,000	\$645,000	\$656,000	\$670,000	\$678,000	TBD
Expense							

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☒ Manpower
- ☒ Other

Primary Project Objective Service

**Benefits:**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☒ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☒ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

Project Name:	ECM Program
Form submitted by:	Jordan Randall
Budget Group:	42 - Office Equipment
Summary Category:	Non-Discretionary
Investment Category:	Compliance

## Description of Problem

Records Management for electronic documents and email had been a challenge for Central Hudson for some years due to the proliferation of documents on various share drives. In 2012 an RFP was sent out to various software vendors for ECM (Enterprise Content Management) solutions and OpenText was selected. The first phase, to roll out the software to all areas of the company, was guided by the following primary objectives:

- 1. Increase compliance with Central Hudson's Records Management policy, and
- 2. Improve the efficiency of the Company's execution of legal and regulatory holds and discovery.

Since then the ECM Program was set up to implement various basic functionality in different Phases, guided by the original objectives and a 5 year plan.

## Solution

The ECM Program got underway in 2012 with the purchase of the OpenText Content Server software and related modules. Phases 1-3 were completed by December 31, 2015 to install the basic software, roll it out across the entire company and then start implementing various RM functionality as well as a major software upgrade. Phase IV is scheduled up through Dec 31, 2016. The ECM 5 year plan for 2017-2021 is currently being updated and will include another major software upgrade (to Content Suite 16), Email management, Dispositioning, Physical Objects, Groups & Permissions redesign, new functionality enhancements, etc. Each calendar year is typically another Phase, starting up with Phase V in 2017 (Year 1 below). Our strategic partner for ECM implementations is currently Cognizant, and we have no plans to replace them.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate: Preliminary Estimate

	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Future
Capital	\$5,787,000	\$1,337,000	\$1,371,000	\$1,394,000	\$837,000	\$848,000	TBD
Expense	\$0	\$0	\$0	\$0	\$0	\$0	TBD

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☒ Manpower resource availability due to additional workload, changing priorities
- ☒ Other funding availability due to changing priorities/competing projects

**Primary Project Objective** Risk Reduction

**Benefits:**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☒ Other Compliance; improved business processes

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☒ Other Program Type Records Management

**Infrastructure**

- ☐ Average Age of Infrastructure years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☐ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

Project Name:	Wiki/CentralHudson.com Redesign - WCM (Web Content Management)
Form submitted by:	Jordan Randall
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Daily Operations

## Description of Problem

The implementation will provide the foundation to extending customer self-services, REV related services, and the REV driven customer portal:

- o Provides the foundation for a scalable Wiki and Website
- o Enables analytics across our web properties including customer self service
- o Combined with Portal solution provides the platform for overall customer engagement growth

This project is directly related to enabling our group mission and supports our strategic imperatives - 'Enrich Customer & Business Partner Experience'.

## Solution

Software solution purchased, preliminary planning done in 2015. Incorporates a redesign of the Wiki & CentralHudson.com leveraging a WEB Content Management solution that will provide a single development platform for both Web & Mobile enablement of the Wiki and CentralHudson.com. Intent is to drive personalization and provide the ability to have tracking of usage for channel analytics leveraged to see where employees & customers are transacting, dropping off, etc in order to identify where to focus and to ensure focused employee & customer adoption.



**Cost estimate (include AFUDC if appropriate):**

Type of estimate: Preliminary Estimate

	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Future
Capital	\$2,003,000	\$577,000	\$592,000	\$273,000	\$279,000	\$283,000	TBD
Expense							

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☒ Manpower resource availability due to additional workload, changing priorities
- ☒ Other funding availability due to changing priorities/competing projects

**Primary Project Objective** Service

**Benefits:**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☒ Other improved web presence and visibility into customer/employee use of the web (and wiki)

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections Projects implemented to monitor and manage gas inspections and
- ☐ Code Requirement/PSC Various projects to monitor & manage code & PSC requirements
- ☐ Other Program Type Various projects to monitor & manage operational compliance

**Infrastructure**

- ☐ Average Age of Infrastructure years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☒ Strategic Replacement wiki is old; cumbersome; little external website analytics capability
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

Project Name:	Digital Initiatives for Customer Engagement (DICE)
Form submitted by:	Jordan Randall
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Daily Operations

## Description of Problem

This project is an initial investment to keep momentum going forward on digital initiatives as prioritized by the Digital Interactive Working Group. Ongoing investment in Digital (Web/Mobile/Social) customer enablement via extending self service capabilities, growing adoption of existing self service offerings, and aligning customer experience across all channels.

## Solution

Expanded investment in digital will enable significant progress in development, translating to more customer engagement and satisfaction. Identification of potential productivity and/or hard savings through reductions in costs of other customer touchpoints will need to be estimated and measured.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$12,021,000"/>	<input type="text" value="\$2,307,000"/>	<input type="text" value="\$2,366,000"/>	<input type="text" value="\$2,406,000"/>	<input type="text" value="\$2,455,000"/>	<input type="text" value="\$2,487,000"/>	<input type="text" value="TBD"/>
Expense	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="TBD"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☒ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☐ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

Project Name:	Business Agility with Enterprise SOA
Form submitted by:	Jordan Randall
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Daily Operations

## Description of Problem

The Business Agility with an Enterprise SOA (Service Oriented Architecture) project will establish the foundation and tools to allow Central Hudson to be more agile in business process implementation by exposing core business logic and enabling the integration of key processes and information. SOA will be key to how fast we deliver, how we can leverage existing business functions across our portfolio, and to how we build the foundation for our future with mobile application solutions, cloud, and modernization vs. mass replacement. By making foundational investments, we will enable a flexible, scalable, secure, and reliable environment. This environment will be poised for current and anticipated information and technology demands across the enterprise coupled with a continued focus on digital (web, mobile, social, IVR), self-service oriented offerings to increase overall customer engagement.

## Solution

In 2014, the software tools were purchased for Oracle SOA Suite and in 2015, together with our Strategic Partners, we installed and configured these tools. In 2016, we have deployed several services within SOA. The continued investment in SOA is a necessity in order to reduce complexity and costs. It will bring flexibility, interoperability, discoverability, reusability, and shared services, allowing us to leverage new and existing business logic via exposed services.

The investment aims to fully implement SOA across the entire application portfolio. In 2017, we continue with limited incremental progress. The investment in outer years allow us to increase progress through full implementation and continuous extension of portfolio.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$6,505,000"/>	<input type="text" value="\$1,206,000"/>	<input type="text" value="\$1,291,000"/>	<input type="text" value="\$1,312,000"/>	<input type="text" value="\$1,339,000"/>	<input type="text" value="\$1,357,000"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☒ Timing/Permitting
- ☒ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☐ Strategic Replacement
- ☒ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

**Project Name:**

**Form submitted by:**

**Budget Group:**

**Summary Category:**

**Investment Category:**

## Description of Problem

This project is to include bundling of minor changes on our mainframe systems into planned releases.

## Solution

By bundling mainframe enhancements and improvements into a release, we are able to satisfy the business requirements with minimal impact on our production systems.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,639,000"/>	<input type="text" value="\$315,000"/>	<input type="text" value="\$323,000"/>	<input type="text" value="\$328,000"/>	<input type="text" value="\$335,000"/>	<input type="text" value="\$339,000"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☒ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☐ Strategic Replacement
- ☒ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

Project Name:	TotalHR Replacement
Form submitted by:	Nicole Tancredi
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancements
Investment Category:	Infrastructure

## Description of Problem

TotalHR system has been upgraded and kept up to date but lacks features such as Performance Management, Employee Self Service portal, etc.

## Solution

Replacement of TotalHR with a full featured solution will provide a more robust solution for the HR department and for employees.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,994,000"/>	<input type="text" value="\$734,000"/>	<input type="text" value="\$538,000"/>	<input type="text" value="\$273,000"/>	<input type="text" value="\$223,000"/>	<input type="text" value="\$226,000"/>	<input type="text" value="0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☒ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☒ Strategic Replacement
- ☒ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

**Project Name:**

**Form submitted by:**

**Budget Group:**

**Summary Category:**

**Investment Category:**

## Description of Problem

The existing EMS s/w is approaching end of life phase where the vendor stop supporting the current version we're on. This will leave us with unsupported version of this critical s/w.

## Solution

Various software upgrades, enhancements, and/or other software needs for this domain.

**Cost estimate (include AFUDC if appropriate):**

**Type of estimate:**

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$1,585,000"/>	<input type="text" value="\$341,000"/>	<input type="text" value="\$242,000"/>	<input type="text" value="\$328,000"/>	<input type="text" value="\$335,000"/>	<input type="text" value="\$339,000"/>	<input type="text" value="TBD"/>
<b>Expense</b>	<input type="text" value="\$632,000"/>	<input type="text" value="\$45,000"/>	<input type="text" value="\$90,000"/>	<input type="text" value="\$135,000"/>	<input type="text" value="\$180,000"/>	<input type="text" value="\$182,000"/>	<input type="text" value="TBD"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☒ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☐ Strategic Replacement
- ☐ Other Program Type



Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

Project Name:	Electric GIS
Form submitted by:	Jordan Randall
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Infrastructure

## Description of Problem

Existing Electric GIS solution lacks capability of estimating design and underground manholes.

## Solution

Upgrade GIS.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,449,000"/>	<input type="text" value="\$341,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$547,000"/>	<input type="text" value="\$279,000"/>	<input type="text" value="\$283,000"/>	<input type="text"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☒ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

**Project Name:**

**Form submitted by:**

**Budget Group:**

**Summary Category:**

**Investment Category:**

## Description of Problem

Support continuous growth of IT and Corporate related Hardware projects.

## Solution

Replace aging Hardware and upgrading when needed to more efficient standards.

**Cost estimate (include AFUDC if appropriate):**

**Type of estimate:**

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$2,764,000"/>	<input type="text" value="\$613,000"/>	<input type="text" value="\$522,000"/>	<input type="text" value="\$533,000"/>	<input type="text" value="\$544,000"/>	<input type="text" value="\$553,000"/>	<input type="text" value="0"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☒ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

**Project Name:**

**Form submitted by:**

**Budget Group:**

**Summary Category:**

**Investment Category:**

## Description of Problem

Mobile computing becomes outdated and runs its useful life.

## Solution

Maintaining a continuous mobile replacement cycle is critical for the company to operate



**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,302,000"/>	<input type="text" value="\$226,000"/>	<input type="text" value="\$261,000"/>	<input type="text" value="\$266,000"/>	<input type="text" value="\$272,000"/>	<input type="text" value="\$277,000"/>	<input type="text" value="TBD"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Risk Reduction**

Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

Compliance

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☒ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

Project Name:	Mobility Upgrade
Form submitted by:	Surekha Jadhav
Budget Group:	42 - Office Equipment
Summary Category:	Maintain System Standards
Investment Category:	Infrastructure

## Description of Problem

Current mobility solution - h/w and s/w is aging. The s/w is approaching end of support phase leaving our critical resources with unsupported h/w and s/w.

## Solution

Replace aging h/w and upgrade mobility (mobile workforce management) s/w to a more recent version of the s/w. The below mentioned \$1.987M is representative of the 2018 spend (not 2019-2023).

**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$437,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$437,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="TBD"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☒ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

**Project Name:**

**Form submitted by:**

**Budget Group:**

**Summary Category:**

**Investment Category:**

## Description of Problem

Maintaining a constant upgrade and replacement system is essential for the company and the IT to grow and maintain standards held against us internally and externally.

## Solution

Continuously replacing Network Infrastructure is essential for the company and the IT to grow.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$2,764,000"/>	<input type="text" value="\$613,000"/>	<input type="text" value="\$522,000"/>	<input type="text" value="\$533,000"/>	<input type="text" value="\$544,000"/>	<input type="text" value="\$553,000"/>	<input type="text" value="0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☒ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

**Project Name:**

**Form submitted by:**

**Budget Group:**

**Summary Category:**

**Investment Category:**

## Description of Problem

PC and Laptops run a useful course - when they slow down or break it interferes with the business and could consist of missing critical deadlines.

## Solution

Maintaining a continuous PC and Laptop replacement cycle is critical for the company to operate.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$2,716,000"/>	<input type="text" value="\$565,000"/>	<input type="text" value="\$522,000"/>	<input type="text" value="\$533,000"/>	<input type="text" value="\$544,000"/>	<input type="text" value="\$553,000"/>	<input type="text" value="TBD"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Risk Reduction**

Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

Compliance

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☒ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

**Project Name:**

**Form submitted by:**

**Budget Group:**

**Summary Category:**

**Investment Category:**

## Description of Problem

Maintaining a constant upgrade system is essential for the company and the IT to grow and maintain standards held against us internally and externally.

## Solution

Continuously replacing Servers and upgrading them is essential for the company and the IT to grow.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$4,505,000"/>	<input type="text" value="\$848,000"/>	<input type="text" value="\$887,000"/>	<input type="text" value="\$905,000"/>	<input type="text" value="\$924,000"/>	<input type="text" value="\$941,000"/>	<input type="text" value="0"/>
Expense	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☒ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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# Budget Submittal Form for Common Projects

Project Name:	PPM - Project Portfolio Management Solution
Form submitted by:	Jordan Randall
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Infrastructure

## Description of Problem

Currently there's no easy way to track lifecycle of a project. It's either done manually or not done at all. This makes it hard to decide the progress, status of the project. There's also no way to know the resource allocation.

## Solution

Implement a Project Portfolio Management tool that will allow us

- 1) To manage centralized processes, methods and lifecycle of a project
- 2) Manage resources in an efficient way and
- 3) Collectively manage projects at the portfolio level based on key characteristics.

**Cost estimate (include AFUDC if appropriate):**

Type of estimate:

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
Capital	<input type="text" value="\$1,093,000"/>	<input type="text" value="\$210,000"/>	<input type="text" value="\$215,000"/>	<input type="text" value="\$219,000"/>	<input type="text" value="\$223,000"/>	<input type="text" value="\$226,000"/>	<input type="text"/>
Expense	<input type="text" value="\$60,000"/>	<input type="text" value="\$60,000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☒ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Risk Reduction**

Safety

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

Compliance

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

Infrastructure

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☐ Strategic Replacement
- ☒ Other Program Type



Other

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**Alternatives Analysis**

Reference Report or Study

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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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## Budget Submittal Form for Common Projects

Project Name:	DMS Upgrade and OMS Implementation
Form submitted by:	Erica Tyler
Budget Group:	4230 - EMS
Summary Category:	Non-Discretionary
Investment Category:	Infrastructure

### Description of Problem

The Distribution Management System (DMS) was purchased from Schneider Electric (SE) in 2014. As part of the purchase, the Outage Management System (OMS) software module was also purchased to replace the existing GE PowerOn Restore OMS.

The existing OMS interfaces to DMS and also has a separate GIS model requiring maintenance and updates.

The DMS vendor (SE) recommends an upgrade at the implementation of the OMS to obtain all latest functionality and to also address Windows 2012 Server end of life deadlines.

### Solution

As recommended by the vendor, DMS will be upgraded to the latest release and the OMS module will be implemented. Design sessions will begin in 2019 and the commissioning will occur in 2020.

The upgrade addresses replacement of end of life Windows operating systems and also addresses several OMS issues. The implementation of OMS within the DMS eliminates the need to maintain a separate model and utilizes a single source, (ESRI), for the Electric GIS model. Additionally, this also eliminates the need for a DMS/OMS interface.

The existing OMS and the DMS will be used in parallel starting in 2021 for the districts modeled in the DMS. The existing OMS will be phased out over time and eliminated in 2022.

**Cost estimate (include AFUDC if appropriate):**

**Type of estimate:**

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$3,092,000"/>	<input type="text" value="\$2,049,000"/>	<input type="text" value="\$1,043,000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☐ Strategic Replacement
- ☐ Other Program Type

Other	Based on the recommendation from the vendor, the upgrade will allow for a reliable Distribution Management System with Outage Management System and also address aging software and hardware issues. By maintaining an up-to-date system, there are reduced risks of threats to control system networks.
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### **Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Continue to maintain and operate two systems with multiple databases and seperate GIS models.

Decision criteria for alternative selection



## Budget Submittal Form for Common Projects

**Project Name:** EMS Software Upgrade (Non-JUMP)

**Form submitted by:** Erica Tyler

**Budget Group:** 4230 - EMS

**Summary Category:** Maintain System Standards

**Investment Category:** Infrastructure

### Description of Problem

To maintain reliable and secure operations of the Energy Management System (EMS).

### Solution

This is a placeholder for the next required upgrade of the existing EMS system. This upgrade will replace aging GE PowerOn Reliance software and hardware or replace existing EMS with a new system vendor.

Decision is dependent upon the direction of the EMS software now that the GE/Alstom merger is complete.

Evaluation of possible EMS systems will be completed in 2021 with the system updated or new EMS implemented in 2022 and finalized in 2023.

**Cost estimate (include AFUDC if appropriate):**

**Type of estimate:**

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="\$5,270,000"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="\$116,000"/>	<input type="text" value="\$4,822,000"/>	<input type="text" value="\$332,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☐ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☐ Strategic Replacement
- ☐ Other Program Type

Other	<p>Provide a reliable Energy Management System for operations to monitor and operate the Electric and Gas Transmission systems and maintain strict compliance for system security.</p> <p>Consideration will be given to moving to a common platform with the DMS.</p> <p>The schedule of this project may be modified to coincide with the new Primary Control Center.</p>
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## **Alternatives Analysis**

Reference Report or Study

Or

Project Alternatives Considered

Decision criteria for alternative selection



## Budget Submittal Form for Common Projects

**Project Name:** EMS-DMS Building 810 Redesign

**Form submitted by:** Erica Tyler

**Budget Group:** 4230 - EMS

**Summary Category:** System Enhancement

**Investment Category:** Daily Operations

### Description of Problem

The Energy Management System (EMS), Distribution Management System (DMS) and Network Strategy (NS) require a 24/7 Control Operations Center within a secured Physical Security Perimeter. Projected staffing levels has exceeded the available work space within the existing secured area that is necessary for these control systems in 2021 when full staffing of Distribution System Operations is reached.

For the long term Central Hudson is working on the the planning and design of a new Training Center and Primary Control Center, which is a separate project.

For the short term, upgrades are needed to Bldg 810. These upgrades started in 2018 and will be completed in 2019.

### Solution

The following line items are included for the redesign of the existing Bldg 810 to accommodate Transmission and Distribution System Operations.

Building 810 Renovations to support DMS / DSO - Console and Casework  
EMS PCC Video Wall Situational Awareness Software Solution

The new video wall project improves the situational awareness at the existing PCC. Eventually this PCC will become the Alternate Control Center (ACC) once the move to the new location is complete.

In addition, this project will provide valuable learning opportunities. Experience gained from the design of the video wall and the layout of the Distribution System Operator work stations will be used during the design of the new PCC.



**Cost estimate (include AFUDC if appropriate):**

**Type of estimate:**

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	<input type="text" value="TBD"/>	<input type="text" value="\$1,461,000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Expense</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☒ Other

**Primary Project Objective**

**Benefits:**

**Economic**

- ☐ Reduced O&M
- ☐ Reduced Customer Bill
- ☒ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☐ Average Age of Infrastructure  years
- ☐ Failure Rates
- ☐ Obsolete/Unserviceable Equipment
- ☐ Condition
- ☐ Strategic Replacement
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

Future sites for the Training Center and PCC are being evaluated.
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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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## Budget Submittal Form for Common Projects

<b>Project Name:</b>	Network Strategy Project
<b>Form submitted by:</b>	Tera Stoner
<b>Budget Group:</b>	44 - Communication
<b>Summary Category:</b>	System Enhancement
<b>Investment Category:</b>	Customer Benefit

### Description of Problem

Central Hudson is in the process of constructing an internal network for communication with its fixed assets. This project is referred to as the Network Strategy Project. The Network Strategy Project was approved in the Order Approving Rate Plan issued by the New York State Public Service Commission on June 17, 2015. The Network Strategy Team developed the following problem statement. "A well-defined plan to leverage technologies for current and future communication needs does not exist. This absence has led to a patchwork of infrastructure and technologies that lacks adequate documentation and results in poor reliability for some applications. A long term, cost effective strategy is needed to establish robust systems that provide reliable and secure communications."

### Solution

Network Strategy is a well-defined plan to leverage technologies for current and future communication needs. This is a long-term cost effective strategy to establish robust systems that provide reliable and secure communications that we can control, monitor and maintain 24x7x365. The scope of Network Strategy is communication with Central Hudson's fixed assets. Central Hudson's fixed assets included in the scope are corporate offices, gas gate and regulator stations, electric substations, electric system distribution automation equipment, mobile radio towers, and large customer meter installations. Central Hudson's planned topology is a tiered network. Tier 1 is the high bandwidth backbone connecting our most critical sites, including our most critical substations. Tier 1 will be a combination of existing and new fiber optic cables and microwave connections. Most of the sites on the Tier 1 network will also serve as gateways for connection to the Tier 2 network. Tier 2 is the medium bandwidth network. Tier 2 will be a mesh radio network for communication with distribution automation equipment, electric substations, gas regulator stations and large customer meter installations. Provision would be made available for a future Tier 3 low bandwidth network that could reach further into our territory for future needs.

**Cost estimate (include AFUDC if appropriate):**

**Type of estimate:** Preliminary Estimate

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	\$18,204,000	\$8,494,000	\$6,497,000	\$2,137,000	\$1,076,000		
<b>Expense</b>							

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☐ Manpower
- ☐ Other

**Primary Project Objective** Service

**Benefits:**

**Economic**

- ☒ Reduced O&M operational costs are projected to decrease
- ☒ Reduced Customer Bill Project supports the DMS/DA implementation and resulting cost reductions.
- ☐ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☒ Average Age of Infrastructure 20 years
- ☒ Failure Rates high failure rates with existing TELCO equipment
- ☒ Obsolete/Unserviceable Equipment existing equipment obsolete/difficult to maintain
- ☐ Condition
- ☒ Strategic Replacement New system will provide higher reliability, speed and security
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

2015 Business as Usual vs DA/NS/DMS Cost Justification Analysis
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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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## Budget Submittal Form for Common Projects

<b>Project Name:</b>	Network Strategy Mahopac Gate Station to Tuxedo Gate Station Loop
<b>Form submitted by:</b>	Tera Stoner
<b>Budget Group:</b>	44 - Communication
<b>Summary Category:</b>	System Enhancement
<b>Investment Category:</b>	Infrastructure

### Description of Problem

Central Hudson is in the process of constructing an internal network for communication with its fixed assets. This project is referred to as the Network Strategy Project. As part of this project, a communication link must be established between the two southern most natural gas gate stations, the Tuxedo Gate Station and the Mahopac Gate Station. Various options need to be analyzed to obtain a cost effective solution achieving a secure link.

### Solution

At this time, it is intended the Tuxedo Gate Station will be served by fiber optic. While the loop to the Mahopac Gate Station will involve microwave radio links between Mt. Beacon to Stoney Point then onto Mahopac.

**Cost estimate (include AFUDC if appropriate):**

**Type of estimate:** Preliminary Estimate

	<u>Total</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Future</u>
<b>Capital</b>	\$511,000	\$511,000	\$0	\$0	\$0	\$0	
<b>Expense</b>							TBD

**Cost Risks**

- ☐ Environmental
- ☒ Timing/Permitting Permitting may be required for specific components based on the chosen design.
- ☐ Manpower
- ☐ Other

**Primary Project Objective** Service

**Benefits:**

**Economic**

- ☒ Reduced O&M operational costs are projected to decrease
- ☐ Reduced Customer Bill
- ☐ Other

**Risk Reduction**

**Safety**

- ☐ Employee Safety
- ☐ Public Safety
- ☐ Other Program Type

**Compliance**

- ☐ Inspections
- ☐ Code Requirement/PSC
- ☐ Other Program Type

**Infrastructure**

- ☒ Average Age of Infrastructure 20 years
- ☒ Failure Rates high failure rates with existing TELCO equipment
- ☒ Obsolete/Unserviceable Equipment existing equipment obsolete/difficult to maintain
- ☐ Condition
- ☒ Strategic Replacement New system will provide higher reliability, speed and security
- ☐ Other Program Type

Other

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**Alternatives Analysis**

Reference Report or Study

2015 Business as Usual vs DA/NS/DMS Cost Justification Analysis
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Or

Project Alternatives Considered

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Decision criteria for alternative selection

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## **DETAIL SCHEDULES 2019-2023 FORECAST**

ELECTRIC ADDITIONS						W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Growth vs. Sustaining	Discretion Level	Investment Type	Preliminary In-Service Date	2019	2020	2021	2022	2023	5-Year Total
Production	Hydro Minor Projects	G-Sustaining	Maintain Standards	Infrastructure	On-going	157	158	163	163	0	640
Production	GT Minor Projects	G-Sustaining	Maintain Standards	Infrastructure	On-going	157	158	163	163	0	640
Production	Sturgeon Pool Wet Section Unit#3	G-Sustaining	Maintain Standards	Infrastructure	12/31/2019	1033	0	0	0	0	1033
Production	Dashville Rotor Unit#1	G-Sustaining	Maintain Standards	Infrastructure	12/31/2019	672	0	0	0	0	672
Production	Dashville Rotor Unit#2	G-Sustaining	Maintain Standards	Infrastructure	12/31/2020	0	681	0	0	0	681
Production	Sturgeon Pool Dam Camera System	G-Sustaining	Non Discretionary	Compliance	12/31/2020	0	211	0	0	0	211
Production	High Falls Facility Camera System	G-Sustaining	Non Discretionary	Daily Operations	12/31/2020	0	211	0	0	0	211
Production	Dashville Facility Camera System	G-Sustaining	Non Discretionary	Daily Operations	12/31/2021	0	0	217	0	0	217
Production	Dashville Rubber Gate Replacement	G-Sustaining	Maintain Standards	Infrastructure	12/31/2021	0	53	868	0	0	921
Production	Hydro SCADA - New Com Link	G-Sustaining	Non Discretionary	Daily Operations	12/31/2021	0	0	130	0	0	130
Production	Dashville Remote Start	G-Sustaining	Non Discretionary	Compliance	12/31/2022	0	0	0	266	0	266
Production	Dashville Window Replacements	G-Sustaining	Maintain Standards	Infrastructure	12/31/2022	0	0	0	330	0	330
Production	Sturgeon Pool Window Replacements	G-Sustaining	Maintain Standards	Infrastructure	12/31/2022	0	0	0	414	0	414
Production	GT Major Overhaul - Cocksackie	G-Sustaining	Maintain Standards	Infrastructure	12/31/2023	0	0	0	0	1060	1060
Production	GT Major Overhaul - South Cairo	G-Sustaining	Maintain Standards	Infrastructure	12/31/2024	0	0	0	0	1060	1060
Production	Subtotal - Electric Production					2019	1473	1540	1335	2121	8487
Transmission	High Priority Replacements	T-Sustaining	Non Discretionary	Compliance	On-going	6073	6140	5163	4569	5354	27299
Transmission	Transmission Minor Projects	T-Sustaining	Non Discretionary	Daily Operations	On-going	229	250	294	262	289	1325
Transmission	- FK Line (Kerhonkson - High Falls)	T-Sustaining	Maintain Standards	Infrastructure	12/31/2019	904	142	0	0	0	1046
Transmission	- P Line (High Falls - Sturgeon Pool)	T-Sustaining	Maintain Standards	Infrastructure	12/31/2020	0	669	0	0	0	669
Transmission	- MK or HK Line (Honk Falls - Kerhonkson)	T-Sustaining	Maintain Standards	Infrastructure	12/31/2020	0	555	0	0	0	555
Transmission	- WH Line (Neversink Tap - Neversink)	T-Sustaining	Maintain Standards	Infrastructure	12/31/2021	0	0	0	0	1006	1006
Transmission	ROW Repair Project (Deficiencies)	T-Sustaining	Maintain Standards	Infrastructure	On-going	498	510	875	640	643	3165
Transmission	HF Line: 115kV Line Rebuild - Fishkill Plains - East Fishkill	T-Sustaining	Maintain Standards	Infrastructure	12/1/2019	1855	0	0	0	0	1855
Transmission	CL Line: 69kV Line Rebuild - North Catskill - Cairo	T-Sustaining	Maintain Standards	Infrastructure	12/1/2019	8031	52	0	0	0	8083
Transmission	Honk Falls Substation Tie-in (Kerhonkson Autotransformers)	T-Sustaining	Maintain Standards	Infrastructure	12/1/2020	50	210	0	0	0	260
Transmission	ACSR Conductor Replacement Program, FV - Part 102C	T-Sustaining	Maintain Standards	Infrastructure	12/1/2023	0	0	0	0	1772	1772
Transmission	Knapps Corners Substation Tie-in (115kV KB & SK Lines)	T-Sustaining	Maintain Standards	Infrastructure	6/1/2021	0	105	179	0	0	284
Transmission	Trap Rock Substation Tie-in and TR Line retirement	T-Sustaining	Maintain Standards	Infrastructure	6/1/2022	0	0	0	240	0	240
Transmission	69kV KM Line Rebuild - Knapps to Myers - 102C	T-Sustaining	Maintain Standards	Infrastructure	12/1/2021	199	1142	2399	0	0	3740
Transmission	69kV TV Line Rebuild - Myers to North Chelsea - 102C	T-Sustaining	Maintain Standards	Infrastructure	12/1/2021	199	1051	4132	2881	0	8262
Transmission	SB Line: New 115kV Line - Hurley Ave. to Saugerties - Article VII: 11.11 miles	T-Sustaining	Maintain Standards	Infrastructure	12/1/2021	797	9180	6657	286	0	16920
Transmission	H Line: New 115kV Line - Saugerties to N.Catskill - Article VII: 12.25 miles	T-Sustaining	Maintain Standards	Infrastructure	12/1/2022	405	1440	3473	15132	0	20451
Transmission	HG Line: New 69kV Line - Honk Falls to Neversink - Part 102C	T-Sustaining	Maintain Standards	Infrastructure	12/1/2023	100	102	272	1600	13975	16048
Transmission	Subtotal - Electric Transmission					19340	21548	23443	25611	23038	112980
Substation	Substation Minor Projects	D-Sustaining	Non Discretionary	Daily Operations	On-going	478	520	542	532	538	2611
Substation	Substation Battery Replacement Program	D-Sustaining	Non Discretionary	Compliance	On-going	0	26	73	40	42	181
Substation	ESP Infrastructure Repl. (relays, meters, data transfer equip, etc.).	D-Sustaining	Maintain Standards	Infrastructure	On-going	0	0	546	2191	2448	5185
Substation	RTU / PLC Replacement Program	D-Sustaining	Maintain Standards	Infrastructure	On-going	253	0	64	812	611	1739
Substation	Breaker Replacement Program (345kV)	D-Sustaining	Maintain Standards	Infrastructure	On-going	0	774	790	748	0	2312
Substation	Breaker Replacement Program (115kV, 69kV, 13.8kV)	D-Sustaining	Maintain Standards	Infrastructure	On-going	0	0	231	396	2286	2913
Substation	345kV Switch Replacement Program	T-Sustaining	Maintain Standards	Infrastructure	On-going	574	625	650	608	468	2925
Substation	115kV Switch Replacement Program	T-Sustaining	Maintain Standards	Infrastructure	On-going	485	520	572	761	2078	4416
Substation	Transformer Condition-based Replacements	D-Sustaining	Maintain Standards	Infrastructure	Future	0	0	0	0	1039	1039
Substation	Switchgear Condition-based Replacements	D-Sustaining	Maintain Standards	Infrastructure	Future	0	0	0	1070	2078	3148
Substation	Fishkill Plains Upgrade (13.8kV Breakers and Relays)	D-Sustaining	Maintain Standards	Infrastructure	12/31/2018	50	0	0	0	0	50
Substation	Boulevard - Transformer Replacements	D-Sustaining	Maintain Standards	Infrastructure	3/30/2019	1506	0	0	0	0	1506
Substation	Montgomery Substation Upgrade	D-Sustaining	Maintain Standards	Infrastructure	6/30/2019	3507	0	0	0	0	3507
Substation	Coldenham Upgrade (J & CW Lines; 13.8kV relays)	D-Sustaining	Maintain Standards	Infrastructure	6/30/2019	1298	0	0	0	0	1298
Substation	Rock Tavern J Line (DLP Replacement)	T-Sustaining	Maintain Standards	Infrastructure	6/30/2019	150	0	0	0	0	150
Substation	East Walden CW Line (DLP & E/M Replacements)	T-Sustaining	Maintain Standards	Infrastructure	6/30/2019	150	0	0	0	0	150
Substation	Cocksackie New Switchgear	D-Sustaining	Maintain Standards	Infrastructure	6/30/2019	899	0	0	0	0	899
Substation	West Balmville Upgrade	D-Sustaining	Maintain Standards	Infrastructure	6/30/2019	499	0	0	0	0	499
Substation	Sand Dock - Add Breaker For Tilcon	T-Sustaining	Maintain Standards	Infrastructure	6/1/2019	194	0	0	0	0	194
Substation	Hurley Ave 115kV Substation Modernization	T-Sustaining	Maintain Standards	Infrastructure	10/30/2019	1498	0	0	0	0	1498
Substation	North Chelsea - Single Phase 115/69kV AutoTransformers Replacement (56MVA)	T-Sustaining	Maintain Standards	Infrastructure	12/31/2019	1351	0	0	0	0	1351

	ELECTRIC ADDITIONS					W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Growth vs. Sustaining	Discretion Level	Investment Type	Preliminary In-Service Date	2019	2020	2021	2022	2023	5-Year Total
Substation	Honk Falls Bus Tie (69kV Bus reconfiguration)	T-Sustaining	System Enhancements	Reliability	12/1/2019	194	0	0	0	0	194
Substation	North Catskill Substation Upgrade	D-Sustaining	Maintain Standards	Infrastructure	3/30/2020	1378	3103	0	0	0	4482
Substation	Pleasant Valley 115kV Modernization (5 - 115kV Breakers and Relays)	T-Sustaining	Maintain Standards	Infrastructure	3/30/2020	659	548	0	0	0	1207
Substation	Rock Tavern 115kV Modernization (6 -115kV Breakers and Relays)	T-Sustaining	Maintain Standards	Infrastructure	6/1/2020	90	1759	0	0	0	1848
Substation	Stanfordville Substation Upgrade (new 12MVA transformer; ESP Infra; RTU)	D-Sustaining	Maintain Standards	Infrastructure	6/1/2020	330	1521	0	0	0	1850
Substation	Woodstock - Switchgear Replacement	D-Sustaining	Maintain Standards	Infrastructure	12/1/2020	619	2497	0	0	0	3116
Substation	Kerhonkson 115/69kV Autotransformers (2 - 56MVA)	T-Sustaining	System Enhancements	Reliability	6/30/2021	599	2069	2406	0	0	5074
Substation	Knapps Corners - New Substation	D-Sustaining	Maintain Standards	Infrastructure	6/1/2021	2183	4265	3246	0	0	9694
Substation	Tilcon - Tap Station	T-Sustaining	Non Discretionary	Tariff	6/1/2021	200	776	4080	0	0	5055
Substation	Converse St. Upgrade (14/4kV Transformer, relays, and RTU)	D-Sustaining	Maintain Standards	Infrastructure	12/1/2021	0	31	753	0	0	784
Substation	Myers Corners Switchgear Upgrade & 69kV Breaker TV-399-KM Repl	D-Sustaining	Maintain Standards	Infrastructure	12/1/2021	50	133	1883	51	0	2118
Substation	New Baltimore Upgrade (New 12MVA Transformer, relays, and 15kV breakers)	D-Sustaining	Maintain Standards	Infrastructure	6/30/2022	50	254	314	1285	0	1903
Substation	Modena - Add 3rd Bkr to complete 115kV Ring Bus (see P&MK memo)	T-Sustaining	System Enhancements	Reliability	6/30/2022	67	206	230	0	0	503
Substation	Terminal upgrade work for 115kV (High Falls, Galeville, Sturgeon Pool, and Modena)	T-Sustaining	System Enhancements	Reliability	6/30/2022	0	21	314	822	0	1157
Substation	Greenfield Rd. - Substation Upgrade (Reuse Kerhonkson & Modena Transformers)	D-Sustaining	Maintain Standards	Infrastructure	6/30/2022	0	21	393	760	0	1174
Substation	Montgomery St. 14kV Switchgear Upgrade	D-Sustaining	Maintain Standards	Infrastructure	6/30/2022	0	0	314	1953	0	2267
Substation	Smithfield Relay Modernization	D-Sustaining	Maintain Standards	Infrastructure	12/1/2022	0	0	445	308	0	753
Substation	Lincoln Park Switchgear Upgrade	D-Sustaining	Maintain Standards	Infrastructure	12/1/2022	0	52	502	1707	0	2261
Substation	Shenandoah Upgrade (26 - 15kV Roll ins and Relay Replacements)	D-Sustaining	Maintain Standards	Infrastructure	6/1/2023	0	0	0	2176	1203	3379
Substation	Jansen Ave Substation Upgrade	Future	Maintain Standards	Infrastructure	Future	0	0	0	0	3325	3325
Substation	Subtotal - Electric Substation					19312	19720	18348	16221	16114	89716
New Business	New Business	D-Growth	Non Discretionary	New Business	On-going	1783	1845	1907	1902	1936	9374
New Business	New Business - Blanket OH	D-Growth	Non Discretionary	New Business	On-going	4032	4172	4311	4300	4377	21193
New Business	New Business - Blanket URD Combo	D-Growth	Non Discretionary	New Business	On-going	744	770	795	793	808	3910
New Business	New Business - Blanket URD	D-Growth	Non Discretionary	New Business	On-going	110	114	118	118	120	580
New Business	Subtotal - Electric New Business					6670	6901	7132	7114	7240	35057
Distribution	Distribution Improvement Blankets (15BL-01)	D-Sustaining	Non Discretionary	Daily Operations	On-going	8210	9425	9604	9673	9845	46757
Distribution	Relocation Blankets (15BL-02)	D-Sustaining	Non Discretionary	Compliance	On-going	205	209	213	215	219	1062
Distribution	Distribution Improvement Minors (1511-0X)	D-Sustaining	Maintain Standards	Infrastructure	On-going	616	628	640	645	656	3186
Distribution	Distribution Improvement Conversions (1521-0X)	D-Growth	Non Discretionary	Daily Operations	On-going	308	314	320	322	328	1593
Distribution	Road/Bridge Rebuild Relocation Projects (1531-0X)	D-Sustaining	Non Discretionary	Compliance	On-going	770	785	800	806	820	3982
Distribution	CATV Make-ready	D-Sustaining	Non Discretionary	Compliance	On-going	1539	1047	1067	537	547	4738
Distribution	Distribution Improvement (1551-0X) - Thermal / Voltage	D-Growth	Maintain Standards	Study Based Growth	On-going	3797	2356	2401	2418	2461	13434
Distribution	Distribution Improvement (1551-0X) - Reliability	D-Sustaining	Maintain Standards	Infrastructure	On-going	2052	2304	2668	2687	2735	12446
Distribution	CEMI/Worst Circuit Reliability Program	D-Sustaining	Maintain Standards	Infrastructure	On-going	1067	1047	1067	1075	1094	5350
Distribution	Cutout Replacement Program - lower threshold	D-Sustaining	Maintain Standards	Infrastructure	On-going	257	262	267	269	273	1327
Distribution	Distribution Improvement (1551-0X) - Operating/ Infrastructure	D-Sustaining	Maintain Standards	Infrastructure	On-going	2904	3977	4395	3977	3938	19192
Distribution	5kV Aerial Cable Replacement Program	D-Sustaining	Maintain Standards	Infrastructure	On-going	308	785	480	484	492	2549
Distribution	Overhead Secondary Replacement Program	D-Sustaining	Maintain Standards	Infrastructure	On-going	205	209	213	215	219	1062
Distribution	Distribution Pole Replacement Program	D-Sustaining	Maintain Standards	Infrastructure	On-going	4105	4189	4268	4837	4922	22321
Distribution	Copper Wire Replacement Program	D-Sustaining	Maintain Standards	Infrastructure	On-going	616	628	640	645	656	3186
Distribution	4800 V Conversion/Infrastructure Program	D-Sustaining	Maintain Standards	Infrastructure	On-going	1998	1146	988	3224	3829	11185
Distribution	14.4 kV Cable Rejuvenation	D-Sustaining	Maintain Standards	Infrastructure	On-going	2052	524	1067	2206	3063	8911
Distribution	Oil Switch Replacement	D-Sustaining	Maintain Standards	Infrastructure	On-going	103	105	107	107	109	531
Distribution	CE Mesh / Protector Relays	D-Sustaining	Maintain Standards	Infrastructure	On-going	92	126	128	129	131	606
Distribution	Secondary Network Upgrade Program (All Districts)	D-Sustaining	Maintain Standards	Infrastructure	On-going	770	262	267	537	711	2547
Distribution	URD replacement	D-Sustaining	Maintain Standards	Infrastructure	On-going	800	524	534	1075	2188	5120
Distribution	Montgomery Substation Circuit Exits	D-Sustaining	Maintain Standards	Infrastructure	6/1/2020	308	0	0	0	0	308

ELECTRIC ADDITIONS						W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Growth vs. Sustaining	Discretion Level	Investment Type	Preliminary In-Service Date	2019	2020	2021	2022	2023	5-Year Total
Distribution	Stanfordville Integration	D-Sustaining	Maintain Standards	Infrastructure	6/1/2019	410	0	0	0	0	410
Distribution	Greenfield Road Substation Integration	D-Sustaining	Maintain Standards	Infrastructure	12/1/2020	0	943	0	0	0	943
Distribution	Clinton Avenue Retirement	D-Sustaining	Maintain Standards	Infrastructure	12/1/2021	0	0	427	0	0	427
Distribution	Knapps Corners circuit exits	D-Sustaining	Maintain Standards	Infrastructure	6/1/2020	0	838	0	0	0	838
Distribution	Coxsackie Circuit exits	D-Sustaining	Maintain Standards	Infrastructure	12/31/2019	616	0	0	0	0	616
Distribution	New Baltimore Circuit exits	D-Sustaining	Maintain Standards	Infrastructure	12/1/2020	0	471	0	0	0	471
Distribution	Distribution Automation - Major Program	D-Sustaining	System Enhancements	Infrastructure	On-going	6568	6807	6723	4837	2735	27669
Distribution	Electronic Recloser Replacement Program	D-Sustaining	Maintain Standards	Infrastructure	On-going	359	681	694	699	711	3143
Distribution	Distribution Automation - ALT Program	D-Sustaining	System Enhancements	Infrastructure	On-going	257	0	0	0	0	257
Distribution	Subtotal - Electric Distribution Improvements					41291	40593	39978	41620	42683	206165
Transformer	Transformers - New Business	D-Sustaining	Non Discretionary	New Business	On-going	4738	5031	5311	5565	5891	26536
Transformer	Capacitors	D-Sustaining	Non Discretionary	Infrastructure	On-going	147	150	153	161	169	781
Transformer	Regulators	D-Sustaining	Non Discretionary	Infrastructure	On-going	766	808	905	569	368	3417
Transformer	Network Protectors	D-Sustaining	Non Discretionary	Infrastructure	On-going	44	45	46	48	51	233
Transformer	Subtotal - Electric Transformers					5696	6034	6415	6343	6479	30967
Meter	X041A - Special Meter Installations	D-Sustaining	Non Discretionary	Compliance	On-going	158	162	165	168	171	824
Meter	X042A - Instrument Transformers	D-Sustaining	Non Discretionary	Compliance	On-going	269	274	280	285	290	1399
Meter	X043A - Electric Meters	D-Sustaining	Non Discretionary	New Business	On-going	2066	2267	2363	3088	3202	12988
Meter	Subtotal - Electric Meters					2493	2703	2808	3542	3664	15211
	Total - Electric					96,820	98,973	99,665	101,785	101,340	498,583

ELECTRIC REMOVALS									
CAT.	Description	Discretion Level	Investment Type	2019	2020	2021	2022	2023	5-Year Total
Production	Hydro Minor Projects	Maintain Standards	Infrastructure	5	5	112	5	0	128
Production	GT Minor Projects	Maintain Standards	Infrastructure	5	5	5	0	0	16
Production	Sturgeon Pool Wet Section Unit#2	Non Discretionary	Daily Operations	0	0	0	5	0	5
Production	Sturgeon Pool Wet Section Unit#3	Non Discretionary	Daily Operations	77	0	0	0	0	77
Production	Dashville Rotor Unit#1	Non Discretionary	Daily Operations	0	120	0	0	0	120
Production	Dashville Rotor Unit#2	Non Discretionary	Daily Operations	118	0	0	0	0	118
Production	Dashville Rubber Gate Replacement	Non Discretionary	Daily Operations	0	0	0	109	0	109
Production	Dashville Window Replacements	Maintain Standards	Infrastructure	0	0	0	224	0	224
Production	Sturgeon Pool Window Replacements	Maintain Standards	Infrastructure	0	0	0	281	0	281
Production	GT Major Overhaul - Cossackie	Non Discretionary	Daily Operations	0	0	0	0	83	83
Production	GT Major Overhaul - South Cairo	Non Discretionary	Daily Operations	0	0	0	0	83	83
Production	Subtotal - Electric Production			204	130	117	624	166	1,242
Transmission	High Priority Replacements	Non Discretionary	Compliance	998	1262	1179	605	1217	5262
Transmission	Transmission Minor Projects	Non Discretionary	Daily Operations	51	54	58	62	66	291
Transmission	- FK Line (Kerhonkson - High Falls)	Maintain Standards	Infrastructure	131	0	0	0	0	131
Transmission	- P Line (High Falls - Sturgeon Pool)	Maintain Standards	Infrastructure	0	77	0	0	0	77
Transmission	- MK or HK Line (Honk Falls - Kerhonkson)	Maintain Standards	Infrastructure	0	67	0	0	0	67
Transmission	- WH Line (Neversink Tap - Neversink)	Maintain Standards	Infrastructure	0	0	0	95	0	95
Transmission	HF Line: 115kV Line Rebuild - Fishkill Plains - East Fishkill	Maintain Standards	Infrastructure	153	0	0	0	0	153
Transmission	CL Line: 69kV Line Rebuild - North Catskill - Cairo	Maintain Standards	Infrastructure	871	0	0	0	0	871
Transmission	Honk Falls Substation Tie-in (Kerhonkson Autotransformers)	Maintain Standards	Infrastructure	0	55	0	0	0	55
Transmission	ACSR Conductor Replacement Program, FV - Part 102C	Maintain Standards	Infrastructure	0	0	0	0	368	368
Transmission	Knapps Corners Substation Tie-in (115kV KB & SK Lines)	Maintain Standards	Infrastructure	0	55	0	0	0	55
Transmission	Trap Rock Substation Tie-in and TR Line retirement	Maintain Standards	Infrastructure	0	0	0	722	0	722
Transmission	69kV KM Line Rebuild - Knapps to Myers - 102C	Maintain Standards	Infrastructure	26	26	639	0	0	691
Transmission	69kV TV Line Rebuild - Myers to North Chelsea - 102C	Maintain Standards	Infrastructure	26	26	647	0	0	698
Transmission	SB Line: New 115kV Line - Hurley Ave. to Saugerties - Article VII: 11.11 miles	Maintain Standards	Infrastructure	0	1239	600	0	0	1839
Transmission	H Line: New 115kV Line - Saugerties to N.Catskill - Article VII: 12.25 miles	Maintain Standards	Infrastructure	0	55	203	1813	0	2072
Transmission	HG Line: New 69kV Line - Honk Falls to Neversink - Part 102C	Maintain Standards	Infrastructure	0	0	0	0	1881	1881
Transmission	Retirement of O & OB Line Section from Dashville Tap to Ohioville	Maintain Standards	Infrastructure	362	335	0	0	0	697
Transmission	Retirement of G Line Section from Todd Hill to Myers Corners	Maintain Standards	Infrastructure	26	552	0	0	0	577
Transmission	Subtotal - Electric Transmission			2,642	3,805	3,325	3,296	3,533	16,602
Substation	Substation Minor Projects	Non Discretion	Daily Operations	202	212	220	228	238	1101
Substation	Substation Battery Replacement Program	Non Discretion	Compliance	0	7	24	11	13	56
Substation	ESP Infrastructure Repl. (relays, meters, data transfer equip, etc.).	Maintain Standards	Infrastructure	0	0	149	435	553	1137
Substation	RTU / PLC Replacement Program	Maintain Standards	Infrastructure	0	0	27	131	166	323
Substation	Breaker Replacement Program (345kV)	Maintain Standards	Infrastructure	0	78	80	82	0	240
Substation	Breaker Replacement Program (115kV, 69kV, 13.8kV)	Maintain Standards	Infrastructure	0	0	53	103	553	710
Substation	345kV Switch Replacement Program	Maintain Standards	Infrastructure	55	56	58	59	50	278
Substation	115kV Switch Replacement Program	Maintain Standards	Infrastructure	55	56	58	82	221	472
Substation	Transformer Condition-based Replacements	Maintain Standards	Infrastructure	0	0	0	0	304	304
Substation	Switchgear Condition-based Replacements	Maintain Standards	Infrastructure	0	0	0	120	111	230
Substation	Montgomery Substation Upgrade	Maintain Standards	Infrastructure	111	0	0	0	0	111
Substation	Cossackie New Switchgear	Maintain Standards	Infrastructure	204	0	0	0	0	204
Substation	West Balmville Upgrade	Maintain Standards	Infrastructure	51	0	0	0	0	51
Substation	Sand Dock - Add Breaker For Tilcon	Maintain Standards	Infrastructure	26	0	0	0	0	26
Substation	Hurley Ave 115kV Substation Modernization	Maintain Standards	Infrastructure	153	0	0	0	0	153
Substation	North Chelsea - Single Phase 115/69kV AutoTransformers Replacement (56MVA)	Maintain Standards	Infrastructure	151	0	0	0	0	151
Substation	Honk Falls Bus Tie (69kV Bus reconfiguration)	System Enhancement	Reliability	20	0	0	0	0	20
Substation	North Catskill Substation Upgrade	Maintain Standards	Infrastructure	255	0	0	0	0	255
Substation	Pleasant Valley 115kV Modernization (5 - 115kV Breakers and Relays)	Maintain Standards	Infrastructure	102	156	0	0	0	259
Substation	Rock Tavern 115kV Modernization (6 -115kV Breakers and Relays)	Maintain Standards	Infrastructure	102	209	0	0	0	311
Substation	Stanfordville Substation Upgrade (new 12MVA transformer; ESP Infra; RTU)	Maintain Standards	Infrastructure	102	104	0	0	0	207
Substation	Woodstock - Switchgear Replacement	Maintain Standards	Infrastructure	0	313	0	0	0	313
Substation	Kerhonkson 115/69kV Autotransformers (2 - 56MVA)	System Enhancement	Reliability	0	313	245	0	0	558

ELECTRIC REMOVALS									
CAT.	Description	Discretion Level	Investment Type	2019	2020	2021	2022	2023	5-Year Total
Substation	Converse St. Upgrade (14/4kV Transformer, relays, and RTU)	Maintain Standards	Infrastructure	0	10	11	0	0	21
Substation	Myers Corners Switchgear Upgrade & 69kV Breaker TV-399-KM Repl	Maintain Standards	Infrastructure	0	0	213	0	0	213
Substation	New Baltimore Upgrade (New 12MVA Transformer, relays, and 15kV breakers)	Maintain Standards	Infrastructure	0	0	85	22	0	107
Substation	Modena - Add 3rd Bkr to complete 115kV Ring Bus (see P&MK memo)	System Enhancement	Reliability	0	21	0	0	0	21
Substation	Terminal upgrade work for 115kV (High Falls, Galeville, Sturgeon Pool, and Modena)	System Enhancement	Reliability	0	0	0	114	0	114
Substation	Greenfield Rd. - Substation Upgrade (Reuse Kerhonkson & Modena Transformers)	Maintain Standards	Infrastructure	0	0	32	109	0	141
Substation	Montgomery St. 14kV Switchgear Upgrade	Maintain Standards	Infrastructure	0	0	160	163	0	323
Substation	Smithfield Relay Modernization	Maintain Standards	Infrastructure	0	0	128	54	0	182
Substation	Lincoln Park Switchgear Upgrade	Maintain Standards	Infrastructure	0	0	27	163	0	190
Substation	Shenandoah Upgrade (26 - 15kV Roll ins and Relay Replacements)	Maintain Standards	Infrastructure	0	0	0	98	55	153
Substation	Subtotal - Electric Substation			1,786	2,090	2,102	1,973	2,265	10,215
New Business	New Business	Non Discretionary	New Business	110	112	115	117	119	572
New Business	New Business - Blanket OH	Non Discretionary	New Business	102	104	107	109	111	532
New Business	New Business - Blanket URD Combo	Non Discretionary	New Business	22	22	23	23	24	113
New Business	New Business - Blanket URD	Non Discretionary	New Business	22	22	23	23	24	113
New Business	Subtotal - Electric New Business			255	261	266	272	277	1,331
Distribution	Distribution Improvement Blankets (15BL-01)	Non Discretionary	Daily Operations	298	385	439	421	425	1968
Distribution	Relocation Blankets (15BL-02)	Non Discretionary	Compliance	13	14	15	15	15	71
Distribution	Distribution Improvement Minors (1511-0X)	Non Discretionary	Infrastructure	38	41	46	44	45	214
Distribution	Distribution Improvement Conversions (1521-0X)	Non Discretionary	Infrastructure	19	20	23	22	22	107
Distribution	Road/Bridge Rebuild Relocation Projects (1531-0X)	Non Discretionary	Compliance	48	51	58	56	56	268
Distribution	CATV Make-ready	Non Discretionary	Compliance	95	68	77	37	37	315
Distribution	Distribution Improvement (1551-0X) - Thermal / Voltage	Non Discretionary	Study Based Load	236	153	174	167	168	896
Distribution	Distribution Improvement (1551-0X) - Reliability	Non Discretionary	Infrastructure	127	149	193	185	187	841
Distribution	CEMI/Worst Circuit Reliability Program	Non Discretionary	Infrastructure	66	68	77	74	75	360
Distribution	Cutout Replacement Program - lower threshold	Non Discretionary	Infrastructure	16	17	19	19	19	89
Distribution	Distribution Improvement (1551-0X) - Operating/ Infrastructure	Non Discretionary	Infrastructure	180	257	318	274	269	1298
Distribution	5kV Aerial Cable Replacement Program	Non Discretionary	Infrastructure	19	51	35	33	34	172
Distribution	Overhead Secondary Replacement Program	Non Discretionary	Infrastructure	13	14	15	15	15	71
Distribution	Distribution Pole Replacement Program	Non Discretionary	Infrastructure	255	271	309	333	336	1504
Distribution	Copper Wire Replacement Program	Non Discretionary	Infrastructure	38	41	46	44	45	214
Distribution	4800 V Conversion/Infrastructure Program	Non Discretionary	Infrastructure	124	74	71	222	261	753
Distribution	14.4 kV Cable Rejuvenation	Non Discretionary	Infrastructure	127	34	77	152	209	599
Distribution	Oil Switch Replacement	Non Discretionary	Infrastructure	6	7	8	7	7	36
Distribution	CE Mesh / Protector Relays	Non Discretionary	Infrastructure	6	8	9	9	9	41
Distribution	Secondary Network Upgrade Program (All Districts)	Non Discretionary	Infrastructure	48	17	19	37	49	170
Distribution	URD replacement	Non Discretionary	Infrastructure	50	34	39	74	149	346
Distribution	Montgomery Substation Circuit Exits	Non Discretionary	Infrastructure	19	0	0	0	0	19
Distribution	Stanfordville Integration	Non Discretionary	Infrastructure	25	0	0	0	0	25
Distribution	Greenfield Road Substation Integration	Non Discretionary	Infrastructure	0	61	0	0	0	61
Distribution	Clinton Avenue Retirement	Non Discretionary	Infrastructure	0	0	31	0	0	31
Distribution	Knapps Corners circuit exits	Non Discretionary	Infrastructure	0	54	0	0	0	54
Distribution	Coxsackie Circuit exits	Non Discretionary	Infrastructure	38	0	0	0	0	38
Distribution	New Baltimore Circuit exits	Non Discretionary	Infrastructure	0	31	0	0	0	31
Distribution	Distribution Automation - Major Program	Non Discretionary	Infrastructure	407	441	486	333	187	1854
Distribution	Electronic Recloser Replacement Program	Non Discretionary	Infrastructure	22	44	50	48	49	213
Distribution	Distribution Automation - ALT Program	Non Discretionary	Infrastructure	16	0	0	0	0	16
Distribution	Subtotal - Electric Distribution Improvement			2,350	2,403	2,636	2,621	2,667	12,678
Transformers	Transformers - New Business	Non Discretionary	New Business	409	417	426	435	443	2130
Transformers	Subtotal - Electric Transformers			409	417	426	435	443	2,130
Meters	X041A - Special Meter Installations	Non Discretionary	Compliance	10	10	11	11	11	53
Meters	Subtotal - Electric Meters			10	10	11	11	11	53
	Total - Electric			7,658	9,116	8,883	9,233	9,362	44,252

GAS ADDITIONS					W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Discretion Level	Investment Type	Preliminary In-Service Date	2019	2020	2021	2022	2023	5-Year Total
Transmission	Prior Year Projects	Maintain Standards	Infrastructure	12/1/2019	128	-	-	-	-	128
Transmission	Cathodic Test Stations	Maintain Standards	Infrastructure	12/1/2019	46	-	-	-	-	46
Transmission	Pipeline Integrity	Maintain Standards	Infrastructure	12/1/2019	302	-	-	-	-	302
Transmission	Remote Operated Valves	System Enhancements	Risk Reduction	12/1/2019	521	-	-	-	-	521
Transmission	Gas Chromatographs	System Enhancements	Customer Benefit	12/1/2019	101	-	-	-	-	101
Transmission	AH Line Valve (AH-9) Replacement	Maintain Standards	Infrastructure	12/1/2019	304	-	-	-	-	304
Transmission	AH Line Valve (AH-10) Replacement	Maintain Standards	Infrastructure	12/1/2019	304	-	-	-	-	304
Transmission	Prior Year Projects	Maintain Standards	Infrastructure	12/1/2020	-	26	-	-	-	26
Transmission	Cathodic Test Stations	Maintain Standards	Infrastructure	12/1/2020	-	36	-	-	-	36
Transmission	Pipeline Integrity	Maintain Standards	Infrastructure	12/1/2020	-	308	-	-	-	308
Transmission	Remote Operated Valves	System Enhancements	Risk Reduction	12/1/2020	-	516	-	-	-	516
Transmission	Pig Launching Station(s) for Internal Line Inspection	Maintain Standards	Infrastructure	12/1/2020	-	308	-	-	-	308
Transmission	AH Line Valve (AH-5) Replacement	Maintain Standards	Infrastructure	12/1/2020	-	310	-	-	-	310
Transmission	Prior Year Projects	Maintain Standards	Infrastructure	12/1/2021	-	-	27	-	-	27
Transmission	Cathodic Test Stations	Maintain Standards	Infrastructure	12/1/2021	-	-	37	-	-	37
Transmission	Pipeline Integrity	Maintain Standards	Infrastructure	12/1/2021	-	-	317	-	-	317
Transmission	Remote Operated Valves	System Enhancements	Risk Reduction	12/1/2021	-	-	296	-	-	296
Transmission	AH Line Valve (AH-15) Replacement	Maintain Standards	Infrastructure	12/1/2021	-	-	346	-	-	346
Transmission	AH Line Valve (AH-16) Replacement	Maintain Standards	Infrastructure	12/1/2021	-	-	346	-	-	346
Transmission	Mahopac Gate Station Filter and Heater	Maintain Standards	Risk Reduction	12/1/2021	-	-	690	-	-	690
Transmission	Pig Launching Station(s) for Internal Line Inspection	Maintain Standards	Infrastructure	12/1/2021	-	-	317	-	-	317
Transmission	Prior Year Projects	Maintain Standards	Infrastructure	12/1/2022	-	-	-	27	-	27
Transmission	Cathodic Test Stations	Maintain Standards	Infrastructure	12/1/2022	-	-	-	38	-	38
Transmission	Pipeline Integrity	Maintain Standards	Infrastructure	12/1/2022	-	-	-	321	-	321
Transmission	Remote Operated Valves	System Enhancements	Risk Reduction	12/1/2022	-	-	-	765	-	765
Transmission	AH Line Valve (AH-12, 13, 14) Replacement	Maintain Standards	Infrastructure	12/1/2022	-	-	-	855	-	855
Transmission	Pig Launching Station(s) for Internal Line Inspection	Maintain Standards	Infrastructure	12/1/2022	-	-	-	430	-	430
Transmission	Prior Year Projects	Maintain Standards	Infrastructure	12/1/2023	-	-	-	-	28	28
Transmission	Cathodic Test Stations	Maintain Standards	Infrastructure	12/1/2023	-	-	-	-	39	39
Transmission	Pipeline Integrity	Maintain Standards	Infrastructure	12/1/2023	-	-	-	-	326	326
Transmission	Remote Operated Valves	System Enhancements	Risk Reduction	12/1/2023	-	-	-	-	821	821
Transmission	AH Line Valve (AH-6) Replacement	Maintain Standards	Infrastructure	12/1/2023	-	-	-	-	356	356
Transmission	AH Line Valve (AH-7) Replacement	Maintain Standards	Infrastructure	12/1/2023	-	-	-	-	356	356
Transmission	Pig Launching Station(s) for Internal Line Inspection	Maintain Standards	Infrastructure	12/1/2023	-	-	-	-	436	436
Transmission	Subtotal Transmission				1,707	1,505	2,375	2,437	2,360	10,385
Regulator Stations	Prior Year Projects	Maintain Standards	Infrastructure	12/1/2019	232	-	-	-	-	232
Regulator Stations	Pressure Control Improvements	Maintain Standards	Infrastructure	12/1/2019	102	-	-	-	-	102
Regulator Stations	Pressure Recording Chart Replacements	Maintain Standards	Infrastructure	12/1/2019	102	-	-	-	-	102
Regulator Stations	Clark St. Regulator Station Purchase Property	System Enhancements	Reliability	12/1/2019	153	-	-	-	-	153
Regulator Stations	Coxsackie Regulator Station Rebuild	Maintain Standards	Infrastructure	12/1/2019	499	-	-	-	-	499
Regulator Stations	Cannon St. Regulator Station Rebuild	Maintain Standards	Infrastructure	12/1/2019	807	-	-	-	-	807
Regulator Stations	Vails Gate Heater Install	Maintain Standards	Reliability	12/1/2019	204	-	-	-	-	204
Regulator Stations	Prior Year Projects	Maintain Standards	Infrastructure	12/1/2020	-	132	-	-	-	132
Regulator Stations	Pressure Control Improvements	Maintain Standards	Infrastructure	12/1/2020	-	157	-	-	-	157
Regulator Stations	Pressure Recording Chart Replacements	Maintain Standards	Infrastructure	12/1/2020	-	157	-	-	-	157
Regulator Stations	Regulator Station SCADA Implementation	Maintain Standards	Infrastructure	12/1/2020	-	209	-	-	-	209
Regulator Stations	Clark St. Regulator Station Rebuild	Maintain Standards	Infrastructure	12/1/2020	-	530	-	-	-	530
Regulator Stations	Monument Square Property Purchase	System Enhancements	Reliability	12/1/2020	-	209	-	-	-	209
Regulator Stations	Lake Katrine Heater Install	Maintain Standards	Infrastructure	12/1/2020	-	209	-	-	-	209
Regulator Stations	Marist College Heater Install	Maintain Standards	Infrastructure	12/1/2020	-	209	-	-	-	209
Regulator Stations	Broadway Regulator Station Build	Maintain Standards	Infrastructure	12/1/2020	-	621	-	-	-	621
Regulator Stations	Prior Year Projects	Maintain Standards	Infrastructure	12/1/2021	-	-	27	-	-	27



	GAS ADDITIONS				W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Discretion Level	Investment Type	Preliminary In-Service Date	2019	2020	2021	2022	2023	5-Year Total
Regulator Stations	Pressure Control Improvements	Maintain Standards	Infrastructure	12/1/2021	-	-	161	-	-	161
Regulator Stations	Pressure Recording Chart Replacements	Maintain Standards	Infrastructure	12/1/2021	-	-	161	-	-	161
Regulator Stations	Regulator Station SCADA Implementation	Maintain Standards	Infrastructure	12/1/2021	-	-	213	-	-	213
Regulator Stations	Central Valley Heater Install	Maintain Standards	Infrastructure	12/1/2021	-	-	213	-	-	213
Regulator Stations	Highland Mills Heater Install	Maintain Standards	Infrastructure	12/1/2021	-	-	213	-	-	213
Regulator Stations	KS System Additional Feed, New Regulator Station	Maintain Standards	Infrastructure	12/1/2021	-	-	418	-	-	418
Regulator Stations	Poughkeepsie Receival Low and Medium Pressure Rebuild	Maintain Standards	Reliability	12/1/2021	-	-	661	-	-	661
Regulator Stations	Monument Square Station Rebuild	Maintain Standards	Infrastructure	12/1/2021	-	-	526	-	-	526
Regulator Stations	Prior Year Projects	Maintain Standards	Infrastructure	12/1/2022	-	-	-	27	-	27
Regulator Stations	Pressure Control Improvements	Maintain Standards	Infrastructure	12/1/2022	-	-	-	162	-	162
Regulator Stations	Pressure Recording Chart Replacements	Maintain Standards	Infrastructure	12/1/2022	-	-	-	162	-	162
Regulator Stations	Regulator Station SCADA Implementation	Maintain Standards	Infrastructure	12/1/2022	-	-	-	216	-	216
Regulator Stations	Vail Road Heater Install	Maintain Standards	Infrastructure	12/1/2022	-	-	-	243	-	243
Regulator Stations	Cochecton Heater Install	Maintain Standards	Infrastructure	12/1/2022	-	-	-	243	-	243
Regulator Stations	Blue Point Heater Install	Maintain Standards	Infrastructure	12/1/2022	-	-	-	243	-	243
Regulator Stations	Poughkeepsie Receival Heater, Filter, Inlet Valves Rebuild	System Enhancements	Reliability	12/1/2022	-	-	-	805	-	805
Regulator Stations	North Grand Regulator Station Rebuild	Maintain Standards	Infrastructure	12/1/2022	-	-	-	450	-	450
Regulator Stations	Prior Year Projects	Maintain Standards	Infrastructure	12/1/2023	-	-	-	-	28	28
Regulator Stations	Pressure Control Improvements	Maintain Standards	Infrastructure	12/1/2023	-	-	-	-	167	167
Regulator Stations	Pressure Recording Chart Replacements	Maintain Standards	Infrastructure	12/1/2023	-	-	-	-	167	167
Regulator Stations	Regulator Station SCADA Implementation	Maintain Standards	Infrastructure	12/1/2023	-	-	-	-	222	222
Regulator Stations	Cronomer Hill Regulator Station Rebuild	Maintain Standards	Infrastructure	12/1/2023	-	-	-	-	770	770
Regulator Stations	Regulator Station Rebuild/Build New Distribution Improvement	Maintain Standards	Infrastructure	12/1/2023	-	-	-	-	659	659
Regulator Stations	Subtotal Regulator Stations				2,100	2,434	2,594	2,552	2,012	11,692
New Business	Residential Conversion	System Enhancements	New Business	Multiple	3,329	3,516	3,590	3,620	3,655	17710
New Business	Commercial Conversion	System Enhancements	New Business	Multiple	1,133	1,050	1,072	1,081	1,091	5426
New Business	Traditional NB Res/Comm	Non Discretionary	New Business	Multiple	1,802	1,994	2,143	2,161	2,182	10283
New Business	URD	Non Discretionary	New Business	Multiple	3,296	3,411	3,215	3,620	3,655	17197
New Business	Subtotal New Business				9,559	9,971	10,020	10,483	10,584	50,616
Distribution	Corrosion Control	Maintain Standards	Infrastructure	Multiple	133	156	160	163	163	775
Distribution	Unidentified Road Rebuild - Includes Paving Proj	Maintain Standards	Infrastructure	Multiple	1,531	2,607	1,600	1,086	2,941	9764
Distribution	Unident Cast Iron	Non Discretionary	Compliance	Multiple	204	209	187	190	191	980
Distribution	Unident Leaking - Includes Active Corrosion	Maintain Standards	Infrastructure	Multiple	1,020	521	533	543	545	3163
Distribution	Service Replacement Blankets - Emergent	Non Discretionary	Compliance	Multiple	3,572	2,607	2,667	2,715	2,723	14283
Distribution	Service Partial Replacement Identified DIPS	Non Discretionary	Compliance	Multiple	2,504	2,891	2,536	3,118	3,790	14839
Distribution	Svce Repl Blankets DIPS	Non Discretionary	Compliance	Multiple	4,648	3,775	5,055	4,690	7,907	26075
Distribution	Isolated Service Replacement Blankets	Non Discretionary	Compliance	Multiple	510	521	533	543	545	2653
Distribution	Local Orders -	Maintain Standards	Infrastructure	Multiple	408	365	373	380	381	1908
Distribution	Uptown Kingston	Maintain Standards	Infrastructure	2018	1,840	-	-	-	-	1840
Distribution	Port Ewen - PK Line	Maintain Standards	Infrastructure	2019	1,840	-	-	-	-	1840
Distribution	PN Line Next Mile South	Maintain Standards	Infrastructure	2020	-	2,607	-	-	-	2607
Distribution	PN Line - 9D Wappingers South	Maintain Standards	Infrastructure	2021	-	-	3,200	-	-	3200
Distribution	PN Line - New Pipe to IBM	Maintain Standards	Infrastructure	2022	-	-	-	3,259	-	3259
Distribution	PN Line - Wappingers Creek North	Maintain Standards	Infrastructure	2022	-	-	-	3,082	-	3082
Distribution	Place Holder	Maintain Standards	Infrastructure	2023	-	-	-	-	1,089	1089
Distribution	West Point by Pass	Maintain Standards	Study Based Load Growth	2019	4,961	-	-	-	-	4961
Distribution	Westbrook/Windwood	Maintain Standards	Study Based Load Growth	2019	2,041	-	-	-	-	2041
Distribution	Downing West of Grand	Maintain Standards	Study Based Load Growth	2020	-	782	-	-	-	782
Distribution	TV Line	Maintain Standards	Study Based Load Growth	2020	-	1,558	-	-	-	1558
Distribution	Reinforcement Place Holder	Maintain Standards	Study Based Load Growth	2021	-	-	917	-	-	917
Distribution	Marys Avenue Tie - Reserve for Spring Street	Maintain Standards	Study Based Load Growth	2021	-	-	533	-	-	533
Distribution	TV Line - Lourdes to PN	Maintain Standards	Study Based Load Growth	2022	-	-	-	2,172	-	2172
Distribution	Place Holder	Maintain Standards	Infrastructure	2023	-	-	-	-	1,089	1089



	GAS ADDITIONS				W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Discretion Level	Investment Type	Preliminary In-Service Date	2019	2020	2021	2022	2023	5-Year Total
Distribution	SW Kingston	Maintain Standards	Infrastructure	2019	2,576	-	-	-	-	2576
Distribution	North Highland	Maintain Standards	Infrastructure	2019	1,764	-	-	-	-	1764
Distribution	Fairview Station Neighborhood	Maintain Standards	Infrastructure	2019	2,015	-	-	-	-	2015
Distribution	Kingston and Wilbur	Maintain Standards	Infrastructure	2019	2,085	-	-	-	-	2085
Distribution	Fleetwood Manor	Maintain Standards	Infrastructure	2019	1,408	-	-	-	-	1408
Distribution	Cornwall 6	Maintain Standards	Infrastructure	2019	1,522	-	-	-	-	1522
Distribution	East Newburgh Broadway to Third	Maintain Standards	Infrastructure	2019	3,046	-	-	-	-	3046
Distribution	Unident	Maintain Standards	Infrastructure	2019	736	-	-	-	-	736
Distribution	PE and PK	Maintain Standards	Infrastructure	2020	-	5,030	-	-	-	5030
Distribution	Uptown Fair/John Wall	Maintain Standards	Infrastructure	2020	-	2,579	-	-	-	2579
Distribution	South Highland	Maintain Standards	Infrastructure	2020	-	2,570	-	-	-	2570
Distribution	Yates and Loockerman	Maintain Standards	Infrastructure	2020	-	3,253	-	-	-	3253
Distribution	NLP north of South Street	Maintain Standards	Infrastructure	2020	-	3,296	-	-	-	3296
Distribution	Lacey Field	Maintain Standards	Infrastructure	2020	-	1,023	-	-	-	1023
Distribution	Nbg Holder to Liberty	Maintain Standards	Infrastructure	2020	-	2,446	-	-	-	2446
Distribution	KLP Garden Smith Foxhall	Maintain Standards	Infrastructure	2021	-	-	3,057	-	-	3057
Distribution	SW Poughkeepsie Hooker to Hamilton	Maintain Standards	Infrastructure	2021	-	-	3,607	-	-	3607
Distribution	Mansion/Violet/Hamilton	Maintain Standards	Infrastructure	2021	-	-	3,562	-	-	3562
Distribution	Hudson View Development	Maintain Standards	Infrastructure	2021	-	-	1,714	-	-	1714
Distribution	Cornwall 4 Main and Hudson	Maintain Standards	Infrastructure	2021	-	-	1,969	-	-	1969
Distribution	nlp/nm South Clarke Street	Maintain Standards	Infrastructure	2021	-	-	2,184	-	-	2184
Distribution	Cedar Avenue Neighborhood	Maintain Standards	Infrastructure	2021	-	-	1,976	-	-	1976
Distribution	BN Line	Maintain Standards	Infrastructure	2021	-	-	4,465	-	-	4465
Distribution	Clifton/East Checter Street	Maintain Standards	Infrastructure	2022	-	-	-	2,677	-	2677
Distribution	Clifton Reg Station Neighborhood	Maintain Standards	Infrastructure	2022	-	-	-	3,185	-	3185
Distribution	West Haight	Maintain Standards	Infrastructure	2022	-	-	-	2,911	-	2911
Distribution	East Poughkeepsie, College to Hooker	Maintain Standards	Infrastructure	2022	-	-	-	2,858	-	2858
Distribution	North NLP - Carpenter Ave area	Maintain Standards	Infrastructure	2022	-	-	-	2,846	-	2846
Distribution	NLP Washington Street area	Maintain Standards	Infrastructure	2022	-	-	-	3,467	-	3467
Distribution	NW Village of Fishkill	Maintain Standards	Infrastructure	2022	-	-	-	906	-	906
Distribution	Dutchess Park	Maintain Standards	Infrastructure	2022	-	-	-	916	-	916
Distribution	Pass Holder	Maintain Standards	Infrastructure	2023	-	-	-	-	21,375	21375
Distribution	Subtotal Distribution Improvements				40,363	38,796	40,829	41,709	42,737	204,434
Meters	X081A - Gas Meters	Non Discretionary	New Business		1,598	1,637	1,389	1,565	1,762	7951
Meters	X084A - Special Meter Installation	Non Discretionary	New Business		1,431	1,356	1,277	1,190	1,101	6355
Meters	Subtotal Gas Meters				3,029	2,993	2,665	2,755	2,864	14,306
	Total Gas				56,758	55,698	58,483	59,936	60,558	291,433

COMMON ADDITIONS		Discretion Level	Preliminary In-Service Date	W/ AFUDC, Inflation & OH Adjustments					5-Year Total
CAT.	Description			2019	2020	2021	2022	2023	
Land & Buildings	Daily Operations - Electric	System Enhancements	on going	53	53	55	56	57	274
Land & Buildings	Daily Operations - Flooring	Maintain Standards	on going	53	53	55	56	57	274
Land & Buildings	Daily Operations - HVAC	Maintain Standards	on going	53	53	55	56	57	274
Land & Buildings	Daily Operations - Unidentified	System Enhancements	on going	526	534	551	560	567	2737
Land & Buildings	Repave Parking Lot (Multi Year) (Kingston)	System Enhancements	on going	263	267	275	280	283	1369
Land & Buildings	Repave Parking Lots (Multi Year)	Maintain Standards	on going	263	267	275	280	283	1369
Land & Buildings	Install 2nd Elevator Car Bldg 803	Maintain Standards	2019	316	0	0	0	0	316
Land & Buildings	Repave Back Parking Lot near Line Garage (Newburgh)	Maintain Standards	2019	84	0	0	0	0	84
Land & Buildings	Renovate Cottage for Additional Meeting Space	Maintain Standards	2019	210	0	0	0	0	210
Land & Buildings	Paving back parking area and roadway into site	System Enhancements	2019	210	0	0	0	0	210
Land & Buildings	Replace Ice Machine	System Enhancements	2019	5	0	0	0	0	5
Land & Buildings	Building 802 - Install Awning @ Drafting Entrance	Maintain Standards	2019	11	0	0	0	0	11
Land & Buildings	Building 807 - Customer Service Entrance Awning	Maintain Standards	2019	11	0	0	0	0	11
Land & Buildings	Building 810 - Install Awning @ Back Entrance	System Enhancements	2019	11	0	0	0	0	11
Land & Buildings	Bldg 806 - Expand Transformer Storage area	Maintain Standards	2019	53	0	0	0	0	53
Land & Buildings	Building 801 Replace 50 Ton RTU	Maintain Standards	2019	137	0	0	0	0	137
Land & Buildings	Building 803 - Call Center Break Room Renovation	System Enhancements	2019	53	0	0	0	0	53
Land & Buildings	Building 810 - Replace Roof	Maintain Standards	2019	263	0	0	0	0	263
Land & Buildings	Replace Roof - 1/3 Back Building	Maintain Standards	2019	526	0	0	0	0	526
Land & Buildings	Remove Steam / Water Pipes - Main Building (Asbestos)	Maintain Standards	2019	84	0	0	0	0	84
Land & Buildings	Install Roof over wire storage area (Fishkill)	Maintain Standards	2019	126	0	0	0	0	126
Land & Buildings	Transformer Shop Roof Replacement	Maintain Standards	2019	158	0	0	0	0	158
Land & Buildings	Replace Storm Drains	System Enhancements	2019	53	0	0	0	0	53
Land & Buildings	Pedestrian Entrance Doors - Main Building & Garage	System Enhancements	2019	37	0	0	0	0	37
Land & Buildings	Swing Arm for Transformer Platform (Greenville)	Maintain Standards	2019	42	0	0	0	0	42
Land & Buildings	Bldg 810 - Replace Heat Pumps sys ops with RTU	Maintain Standards	2019	210	0	0	0	0	210
Land & Buildings	Extend water main from Main Office to Service Bldgs	Non Discretionary	2019	210	0	0	0	0	210
Land & Buildings	Pave Portion of Parking Lot	Maintain Standards	2020	0	160	0	0	0	160
Land & Buildings	Install Backup Generator	Maintain Standards	2020	0	53	0	0	0	53
Land & Buildings	Lighting Upgrade - Storeroom	System Enhancements	2020	0	43	0	0	0	43
Land & Buildings	Replace Exhaust Fan in lineman's garage	Maintain Standards	2020	0	27	0	0	0	27
Land & Buildings	Replace Pavillion & Bath House Roof	Maintain Standards	2020	0	75	0	0	0	75
Land & Buildings	Lighting Upgrade - Storeroom	System Enhancements	2020	0	43	0	0	0	43
Land & Buildings	Replace/Upgrade 803 RTU CHAZ Unit Main Floor	System Enhancements	2020	0	213	0	0	0	213
Land & Buildings	Replace Training Room HVAC Unit hook up to new controls	System Enhancements	2020	0	64	0	0	0	64
Land & Buildings	Pave Pole & Equipment area	System Enhancements	2020	0	85	0	0	0	85
Land & Buildings	Replace Carpeting - Call Centers	System Enhancements	2020	0	80	0	0	0	80
Land & Buildings	Bldg 810 - Install fire protection under raised floor	System Enhancements	2020	0	98	0	0	0	98
Land & Buildings	Bldg 806 - Restroom Renovation	Maintain Standards	2020	0	80	0	0	0	80
Land & Buildings	Upgrade Lighting - Butler Bldg	Maintain Standards	2020	0	11	0	0	0	11
Land & Buildings	Replace Roof - 1/3 Back Building	Maintain Standards	2020	0	534	0	0	0	534
Land & Buildings	Install fire protection @ EC Lineman's, Transformer, Storeroom	System Enhancements	2020	0	192	0	0	0	192
Land & Buildings	Renovate Restrooms	System Enhancements	2020	0	213	0	0	0	213
Land & Buildings	Bldg 810 - Replace leibert units in Computer Room	Maintain Standards	2020	0	192	0	0	0	192
Land & Buildings	Bldg 803 - Replace HVAC Units S1 & S2 level	Maintain Standards	2020	0	267	0	0	0	267
Land & Buildings	Bldg 801 - Replace Windows 2nd Floor	System Enhancements	2020	0	240	0	0	0	240
Land & Buildings	Controls System HVAC	System Enhancements	2021	0	0	330	0	0	330
Land & Buildings	Resurface Gas Garage Floors - Linemen's Garage	System Enhancements	2021	0	0	55	0	0	55
Land & Buildings	Resurface Gas Garage Floors - Gas Garage	Maintain Standards	2021	0	0	55	0	0	55
Land & Buildings	Building 803 - Replace Asbestos Tile	System Enhancements	2021	0	0	55	0	0	55
Land & Buildings	Building 800 - Create Women's Rest Room 1st Floor	System Enhancements	2021	0	0	66	0	0	66
Land & Buildings	Building 805 Resurface and Restripe Garage Floors	Maintain Standards	2021	0	0	66	0	0	66
Land & Buildings	Building 806 - Roof Replacement	Maintain Standards	2021	0	0	275	0	0	275
Land & Buildings	Bldg 807 - Credit Union Roof Replacement	System Enhancements	2021	0	0	275	0	0	275
Land & Buildings	Replace Carpeting - Main Bldg and Training Room (Fishkill)	Maintain Standards	2021	0	0	90	0	0	90
Land & Buildings	Replace Sidewalks	Maintain Standards	2021	0	0	61	0	0	61
Land & Buildings	Replace Roof Front Bldg	Maintain Standards	2021	0	0	154	0	0	154
Land & Buildings	Replace Carpet in Auditorium with VCT	Maintain Standards	2021	0	0	55	0	0	55
Land & Buildings	Replace Sloped Roof - Front Annex Bldg	System Enhancements	2021	0	0	385	0	0	385
Land & Buildings	Replace lighting in the garge areas	System Enhancements	2021	0	0	33	0	0	33
Land & Buildings	Pole Racks	System Enhancements	2021	0	0	165	0	0	165
Land & Buildings	Replace Roof Transportation Garage	Maintain Standards	2021	0	0	529	0	0	529
Land & Buildings	Replace lighting throughout Electricians Area	System Enhancements	2022	0	0	0	224	0	224
Land & Buildings	Bldg 805 Replace Roof	Maintain Standards	2022	0	0	0	112	0	112
Land & Buildings	Replace HVAC Units	Maintain Standards	2022	0	0	0	168	0	168
Land & Buildings	Roof Replacement	Maintain Standards	2022	0	0	0	146	0	146
Land & Buildings	Replace Storeroom roof	Maintain Standards	2022	0	0	0	560	0	560
Land & Buildings	Renovate Restrooms in Storeroom	System Enhancements	2022	0	0	0	168	0	168
Land & Buildings	Replace Roof - Linemens Bldg	Maintain Standards	2022	0	0	0	540	0	540
Land & Buildings	Restroom Renovations	Maintain Standards	2022	0	0	0	252	0	252
Land & Buildings	Raise Roof Height Fishkill Transportation	System Enhancements	2022	0	0	0	258	0	258
Land & Buildings	Hook up to municipal sewer	System Enhancements	2022	0	0	0	252	0	252

COMMON ADDITIONS				W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Discretion Level	Preliminary In-Service Date	2019	2020	2021	2022	2023	5-Year Total
Land & Buildings	Replace Windows	Maintain Standards	2022	0	0	0	252	0	252
Land & Buildings	Building 807 Relocate Transformers and Replace Steps	System Enhancements	2023	0	0	0	0	340	340
Land & Buildings	Bldg 802 - Replace Windows	Maintain Standards	2023	0	0	0	0	170	170
Land & Buildings	Replace Carpet - Contact Center	Maintain Standards	2023	0	0	0	0	113	113
Land & Buildings	Renovate Sys Ops Restrooms	Maintain Standards	2023	0	0	0	0	170	170
Land & Buildings	Replace Window - Bldg 805/806	Maintain Standards	2023	0	0	0	0	113	113
Land & Buildings	Install new freight Elevator	Maintain Standards	2023	0	0	0	0	453	453
Land & Buildings	Install Additional Parking Area behind bldg	Maintain Standards	2023	0	0	0	0	227	227
Land & Buildings	Pave Portion of parking and roadway	Maintain Standards	2023	0	0	0	0	340	340
Land & Buildings	Replace Roof Linemen's Garage	System Enhancements	2023	0	0	0	0	340	340
Land & Buildings	Renovate Restrooms	System Enhancements	2023	0	0	0	0	170	170
Land & Buildings	Install New Carpet	Maintain Standards	2023	0	0	0	0	57	57
Land & Buildings	Install New HVAC Unit	Maintain Standards	2023	0	0	0	0	113	113
Land & Buildings	Install New Roof Training Center	Maintain Standards	2023	0	0	0	0	227	227
Land & Buildings	Architectural Design	Maintain Standards	On-going	263	267	275	280	283	1369
Land & Buildings	Kingston Build Out - 1st Floor	System Enhancements	2020	0	1601	0	0	0	1601
Land & Buildings	Kingston Build Out - 2nd Floor	System Enhancements	2019	1578	0	0	0	0	1578
Land & Buildings	Linemen and Gas Training Centers	System Enhancements	On-going	3534	3095	13213	5044	1134	26020
Land & Buildings	Parking Lot & Office Bldg	System Enhancements	2019	6889	0	0	0	0	6889
Land & Buildings	Newburgh - New Facility	System Enhancements	2022	0	0	0	11208	0	11208
Land & Buildings	Disaster Recovery Site	System Enhancements	2023	0	0	0	0	1701	1701
Land & Buildings	Transformer Shop Rebuild	System Enhancements	2023	0	0	0	0	1701	1701
Office Equipment	South Road - Daily Operations - Larger Projects	Maintain Standards	on going	66	68	69	71	72	346
Office Equipment	South Road - Misc. Furniture	Maintain Standards	on going	41	42	43	44	44	213
Office Equipment	South Road - Office Chair Replacement Program	Maintain Standards	on going	36	37	37	38	39	186
Office Equipment	New Office Furniture	Maintain Standards	2019	20	0	0	0	0	20
Office Equipment	Additional Cubicles - Lake Katrine	Maintain Standards	multi	0	42	64	65	66	237
Office Equipment	Bldg 807 - Dispatch Office	Maintain Standards	2020	0	21	0	0	0	21
Office Equipment	New Line & Gas Training Facility	Maintain Standards	2020	0	104	0	0	0	104
Office Equipment	Newburgh - New Facility	System Enhancements	2022	0	0	0	109	0	109
Office Equipment	Disaster Recovery	Maintain Standards	2023	0	0	0	0	55	55
EMS	Miscellaneous Hardware and Software Failures	Non Discretionary	on going	54	56	59	61	62	292
EMS	Building 810 Renovations to support DMS / DSO - Console and Casework	System Enhancements	6/1/2019	1461	0	0	0	0	1461
EMS	PCC Video Wall Situational Awareness Software Solution	System Enhancements	6/1/2019	358	0	0	0	0	358
EMS	EMS eDNA Historian Upgrade	Maintain Standards	6/1/2019	98	0	0	0	0	98
EMS	DMS Upgrade and OMS Implementation	Non Discretionary	12/1/2020	2049	1043	0	0	0	3092
EMS	EMS Windows Server/Workstation Replacement	Maintain Standards	6/1/2020	148	156	0	0	0	305
EMS	EMS Software Upgrade (non-JUMP)	Maintain Standards	12/1/2022	0	0	116	4822	332	5270
Hardware	Hardware Minors	Maintain Standards	Annual	147	156	160	163	166	792
Hardware	PC and Laptop Replacements	Maintain Standards	Annual	565	522	533	544	553	2716
Hardware	Mobile (Pen) Computing Replacements	Maintain Standards	Annual	226	261	266	272	277	1302
Hardware	Monitors, Network Printers-Adds/Repl.	Maintain Standards	Annual	113	130	133	136	138	651
Hardware	Server Replacements and Storage Upgrades	Maintain Standards	Annual	848	887	905	924	941	4505
Hardware	Network Infrastructure Upgrades/Replacements	Maintain Standards	Annual	339	365	373	381	387	1845
Hardware	Cyber Security	Reduces Risk	Annual	79	104	107	109	111	509
Hardware	Copiers (new budget line item requested by Tim B)	Maintain Standards	Annual	57	57	59	60	61	293
Hardware	IT Strategic Initiatives Hardware	Maintain Standards	12/31/2019	613	522	533	544	553	2764
Software	Business Intelligence (Cognos) - Upgrades & Enhancements	System Enhancements	Annual	419	430	437	446	452	2186
Software	Business Intelligence (Cognos) - New Development	System Enhancements	Annual	839	860	875	893	905	4371
Software	Enterprise Content Management - future Phases	Non Discretionary	Annual	1337	1371	1394	837	848	5787
Software	Cyber Security	Reduces Risk	Annual	419	430	437	446	452	2186
Software	PPM - Project Portfolio Management Solution	System Enhancements	12/31/2016	210	215	219	223	226	1093
Software	Mainframe Bundled Releases	System Enhancements	Annual	315	323	328	335	339	1639
Software	Wiki/CentralHudson.com Redesign - WCM	System Enhancements	12/31/2016	577	592	273	279	283	2003
Software	Increase the Quality & Speed of Delivery of Application Testing	System Enhancements	Annual Bundled Releases	524	538	547	558	565	2732
Software	Emergent Software Packages/Upgrades	Maintain Standards	Annual	1048	1291	1531	1786	1809	7465
Software	Unified Communications, VoIP, IVR - Upgrades & Enhancements	Maintain Standards	Annual	210	215	219	223	226	1093
Software	Unified Communications, VoIP, IVR - Extending Collaboration	System Enhancements	Annual	734	430	437	446	452	2500
Software	Business Agility with an Enterprise SOA Framework	System Enhancements	Annual Bundled Releases	1206	1291	1312	1339	1357	6505
Software	CIS / REV Modernization	Maintain Standards	Annual	3145	3173	3062	2790	2827	14997
Software	Digital Initiatives for Customer Engagement (DICE)(Includes all Web, Mobile, Social initiatives as prioritized by the DIWG)	System Enhancements	Annual Bundled Releases	2307	2366	2406	2455	2487	12021
Software	Mobility Upgrade - (Tim H)*	Maintain Standards	12/1/2017	0	0	437	0	0	437
Software	Emergency Management Software - Upgrades & Enhancements	Maintain Standards	Annual	341	242	328	335	339	1585
Software	ARCOS Upgrades & Enhancements	System Enhancements	6/1/2016	0	43	164	0	0	207
Software	HRIS - TotalHR Replacement	System Enhancements	12/31/2019	734	538	273	223	226	1994
Software	EmpCenter Upgrades & Enhancements	System Enhancements	12/31/2015	157	161	164	167	170	820
Software	Electric GIS - Estimating Design (Frank B)	System Enhancements	6/1/2017	341	0	0	0	0	341
Software	Electric GIS - Upgrades & Enhancements (Frank B)	System Enhancements	12/31/2022	0	0	547	279	283	1108
Software	UG Network Management GIS Solution	Improve Reliability	12/31/2021	0	269	273	0	0	542
Software	Field Modeling for ESRI/GIS	Improve Reliability	Annual	105	108	109	0	0	322

COMMON ADDITIONS				W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Discretion Level	Preliminary In-Service Date	2019	2020	2021	2022	2023	5-Year Total
Software	Interconnection Portal	System Enhancements	Annual	157	161	164	0	0	483
Software	Gas Transmission Integrity Management Software	System Enhancements	12/31/2019	684	0	0	0	0	684
Software	Taurigma Automated Fault Location and Event Retriever (Eric L)	System Enhancements	Annual	74	0	0	0	0	74
Software	Control Room Managmeent (CRM - Time Reporting)	Maintain Standards	12/31/2018	0	0	55	0	0	55
Software	TOA Upgrades & Enhancements	Maintain Standards	12/31/2018	0	0	164	0	0	164
Software	GL Essentials Upgrades & Enhancements	Maintain Standards	Annual	255	72	0	271	275	873
Software	EAM - Enterprise Asset Mgmt	Maintain Standards	12/31/2019	629	215	0	0	0	844
Software	Chevin - Fleetwave Upgrades & Enhancements	System Enhancements	12/31/2015	210	108	109	112	113	651
Software	Claims System Replacement	System Enhancements	multiple	0	0	55	0	0	55
Software	CDM - Financial Reporting	System Enhancements	12/31/2020	0	54	0	0	0	54
Software	AP Automation System Upgrade	System Enhancements	12/1/2015	262	0	0	0	0	262
Software	PowerPlan - Upgrades & Enhancements	System Enhancements	12/1/2018	0	645	0	0	0	645
Software	Clarify Replacement/Upgrade & Enhancements	Maintain Standards	12/31/2019	0	0	0	670	678	1348
Security	Spackenkill Sub Cameras/Intrusion Detection	System Enhancements	2019	133	0	0	0	0	133
Security	Poughkeepsie River Crossing Pump House/Intrusion detection	System Enhancements	2019	143	0	0	0	0	143
Security	Walden Sub Cameras /Intrusion Detection	System Enhancements	2019	179	0	0	0	0	179
Security	Hudson Crossing Cameras/Intrusion Detection	System Enhancements	2019	153	0	0	0	0	153
Security	Myers Corners Sub Cameras/Intrusion Detection	System Enhancements	2020	0	136	0	0	0	136
Security	Napanoch Sub Cameras/Intrusion Detection	System Enhancements	2020	0	104	0	0	0	104
Security	District Office Exterior Camera Upgrade	System Enhancements	2020	0	104	0	0	0	104
Security	Rifton - Cameras/Intrusion Detection	System Enhancements	2020	0	136	0	0	0	136
Security	North Chelsea Sub Cameras/Intrusion Detection	System Enhancements	2020	0	136	0	0	0	136
Security	Mahopac Gas Sub Cameras/Intrusion detection	System Enhancements	2021	0	0	85	0	0	85
Security	Pleasant Valley Sub Additional Cameras/Intrusion detection	System Enhancements	2021	0	0	64	0	0	64
Security	Rock Tavern Sub Thermal Security Cameras	System Enhancements	2021	0	0	186	0	0	186
Security	Roseton Sub Thermal Security Cameras	System Enhancements	2021	0	0	85	0	0	85
Security	Smithfield Sub Cameras/Intrusion detection	System Enhancements	2021	0	0	107	0	0	107
Security	Highland Sub Cameras/Intrusion Detection	System Enhancements	2021	0	0	107	0	0	107
Security	Poughkeepsie Gas Cameras/Intrusion detection	System Enhancements	2022	0	0	0	109	0	109
Security	Upgrade Servers, Cameras, DVRS Critical Facilities	System Enhancements	2022	0	0	0	326	0	326
Security	Substation Gunshot Detection System	System Enhancements	2023	0	0	0	0	332	332
Security	Security Barriers Corporate and District Offices	System Enhancements	2023	0	0	0	0	221	221
Security				608	616	634	435	553	2,846
Tools	Small Tools	Maintain Standards	0	1313	1510	1485	1516	1543	7366
Tools	Tools								
Communications	Network Strategy	System Enhancements	Ongoing	8494	6497	2137	1076	0	18204
Communications	South Loop Project (Mahopac and Tuxedo)	System Enhancements	6/1/2019	511	0	0	0	0	511
Communications	Radio Minor	System Enhancements	Ongoing	204	209	213	214	199	1039
Communications	Communication			9,209	6,706	2,350	1,290	199	19,754
Transportation	Transportaion	Maintain Standards	0	9119	9935	9942	10136	10291	49423
	Total			61,085	48,343	51,592	57,587	40,713	259,320