



## CENTRAL HUDSON GAS & ELECTRIC 2018-2022 CORPORATE CAPITAL FORECAST JULY 1<sup>st</sup> 2017



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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 2018 through 2022 (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 \$531 million in the electric delivery system, \$324 million in the gas delivery system and \$283 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 later 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 that will help achieve the following strategic objectives of Central Hudson:

- Practicing continuous improvement in everything we do
- Investing in electric and gas transmission and distribution infrastructure and common program areas to maintain current levels of customer service;
- Investing capital when justified to reduce risk, enhance reliability, and improve customer satisfaction;
- Advocating regulatory and public policy outcomes that are in the interest of our customers and investors; and
- Moderating cost pressures that increase total customer bill costs and variability.

### *Capital Forecast – Additions*

	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>TOTAL</u>
ELECTRIC	\$ 95,118	\$ 98,746	\$ 104,409	\$ 101,240	\$ 89,212	\$ 488,726
GAS	59,072	62,498	59,647	66,474	67,161	314,853
COMMON	<u>56,857</u>	<u>69,222</u>	<u>52,316</u>	<u>45,488</u>	<u>59,885</u>	<u>283,769</u>
CORPORATE TOTAL	<u>\$ 211,048</u>	<u>\$ 230,466</u>	<u>\$ 216,372</u>	<u>\$ 213,203</u>	<u>\$ 216,259</u>	<u>\$ 1,087,348</u>

## Capital Forecast – Removal

	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>TOTAL</u>
ELECTRIC	\$ 7,352	\$ 7,511	\$ 8,979	\$ 8,519	\$ 9,062	\$ 41,423
GAS	1,762	1,801	1,801	1,872	1,861	9,096
COMMON	<u>216</u>	<u>(148)</u>	<u>(155)</u>	<u>(175)</u>	<u>(131)</u>	<u>(393)</u>
CORPORATE TOTAL	<u>\$ 9,331</u>	<u>\$ 9,163</u>	<u>\$ 10,625</u>	<u>\$ 10,216</u>	<u>\$ 10,792</u>	<u>\$ 50,126</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 Base Case scenario now totals \$1,137 million in capital expenditures over the five year period 2018-2022. This total represents a 13% increase over the prior year's 5-year forecast. The electric program forecast is showing an increase from the prior forecast driven by Distribution Improvements and much lesser extent New Business. The gas program forecast continues to increase as a result of additional Leak Prone Pipe program expenditures. The common program is increasing due to IT software needs, a planned training facility and additional office space.

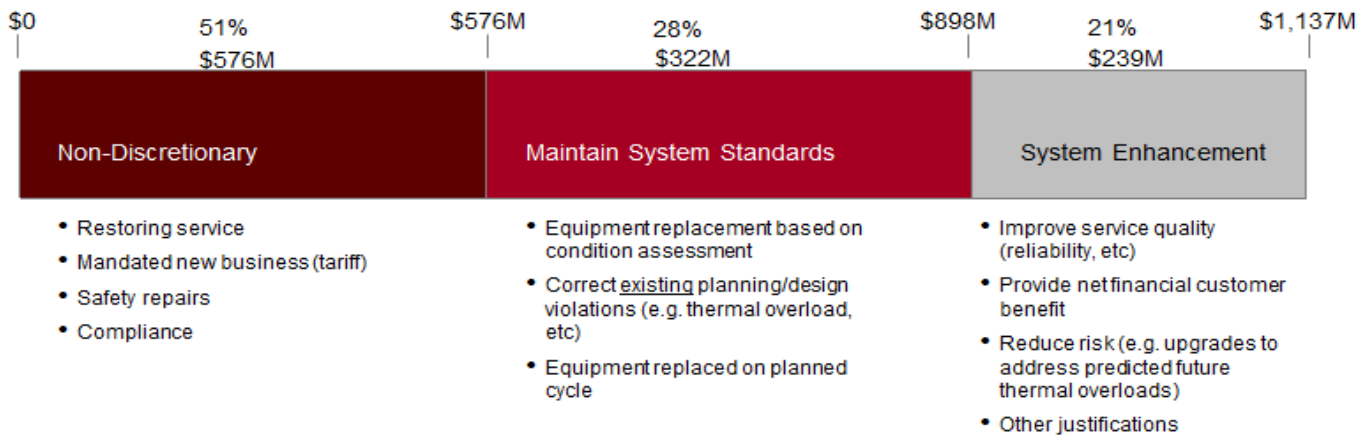
The major changes to the forecast from the prior year's will be covered in more detailed in the body of this report.

## Comparison of 2016-2020 and 2017-2021 Electric, Gas & Common Forecast (Additions & Removals) (with inflation & overhead adjustments)

<b>ELECTRIC PROGRAM</b>	
2018-2022 Forecast	\$ 530,149
2017-2021 Forecast	\$ 483,199
Change	\$ 46,950
<b>GAS PROGRAM</b>	
2018-2022 Forecast	\$ 323,868
2017-2021 Forecast	296,645
Change	\$ 27,223
<b>COMMON PROGRAM</b>	
2018-2022 Forecast	\$ 283,769
2017-2021 Forecast	211,964
Change	\$ 71,805
<b>CORPORATE TOTAL</b>	
2018-2022 Forecast	\$ 1,137,786
2017-2021 Forecast	991,808
Change	\$ 145,978

## 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)



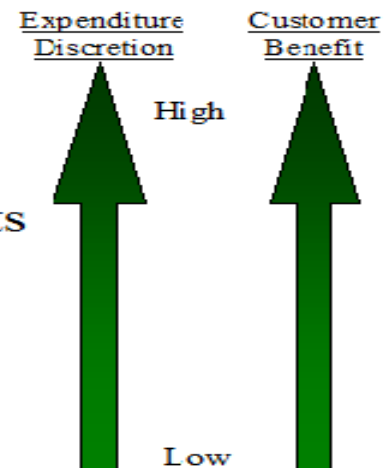
Each year, Central Hudson Gas & Electric Corporation, through its planning and forecasting processes develops a recommended Capital Expenditures Budget for the upcoming fiscal year as well as a forecast for upcoming five-year period.

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.

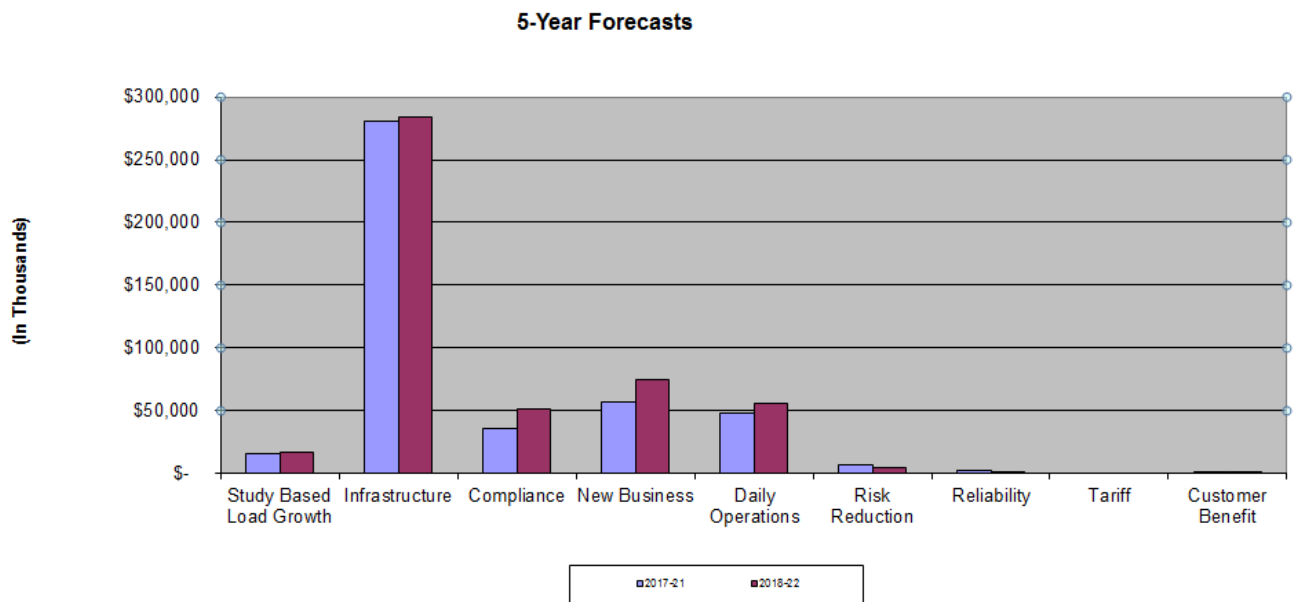
In addition to the summary categories, the needs are prioritized based on the investment categories shown below. It should be noted that those projects with the least amount of discretion also have the least amount of benefit for customers in terms of improving their level of service quality or reducing 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 initiative that has been included in the 5-year forecast. Central Hudson began implementing its integrated Smart Grid strategy in 2015. This program is developing 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 replacement projects. Central Hudson operates 1208 miles of distribution main, which includes about 196 of cast iron or unprotected steel. Over the three years period of 2013 – 2015 an average of 6.4 miles of leak prone pipe had been replaced annually. In 2016, 18 miles of leak prone pipe was eliminated and the company is projecting to eliminate 19 miles in 2017. 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 \$175 million in the 5-year forecast (average annual expenditure of \$35M). 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 10 – 12 years.

The Common Capital Forecast consists of following categories; Land and Buildings, Office Furniture, Tools & Equipment, Transportation, and Information & Technology. Land & Buildings capital forecast comprises primarily of 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 distribution automation. 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, accelerating the replacement of leak prone distribution piping, enhancements on the transmission system, and regulator station upgrades and replacements will require further 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 5.0 million kilovolt amps, a transmission system consists of 622 circuit miles and a distribution system consists of 7,300 pole miles of overhead lines and 1,400 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.

Operating Voltage	Design Voltage	Overhead Circuit Miles	Pipe-Type Cable Circuit Miles	Total Circuit Miles
345 kV	345 kV	76	0	76
115 kV	115 kV	230	3.9	233.9
69 kV	69 kV	272	0	312
	115 kV construction operating at 69 kV	40		
<b>Total</b>		618	3.9	621.9

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.

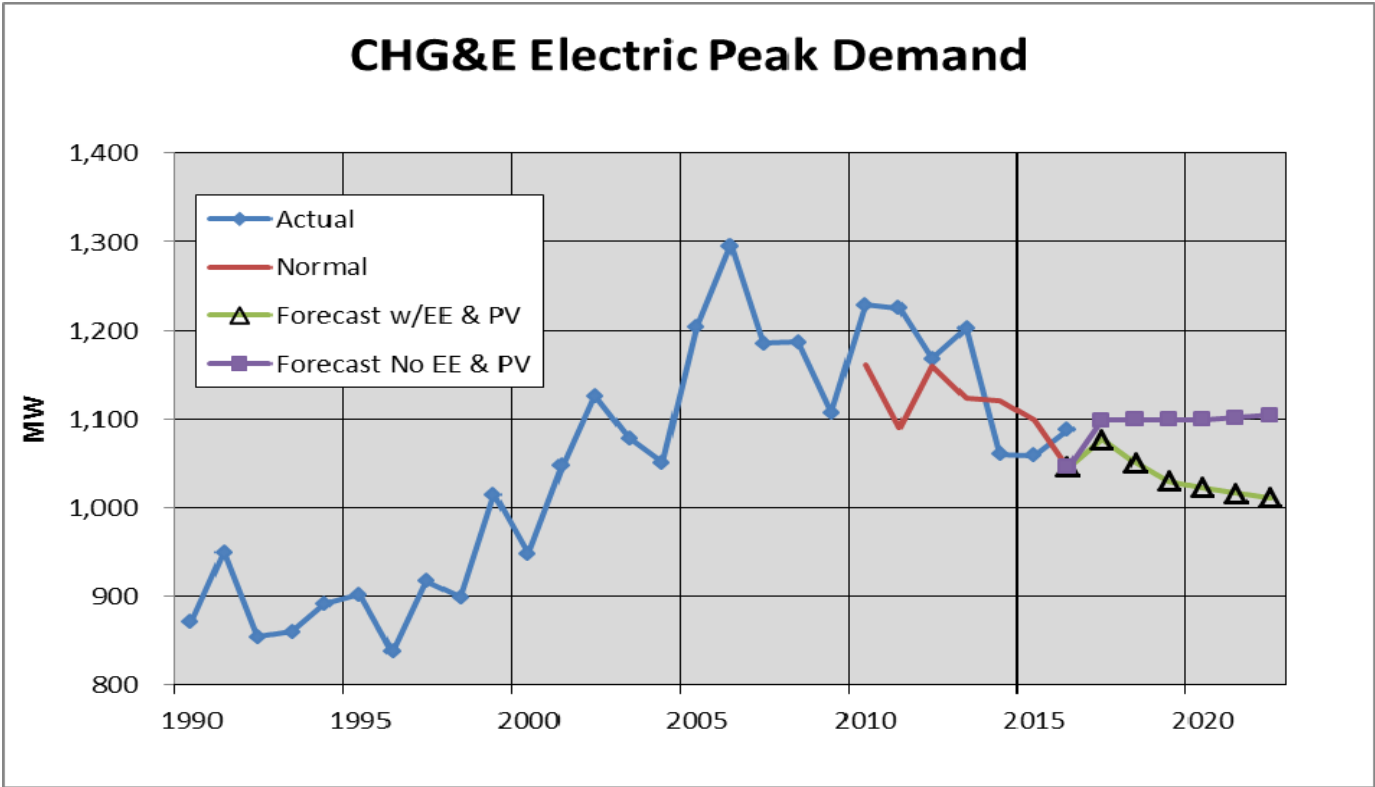
Conductor	Pole Miles of Line
34 kV Overhead	204
13.2 kV Single Phase	4,572
13.2 kV Three Phase	2,380
5 kV or Under	137

Central Hudson’s roughly 77 electric substations contain the power transformers that change the voltage from one level to another.

**Electric Forecast Overview**

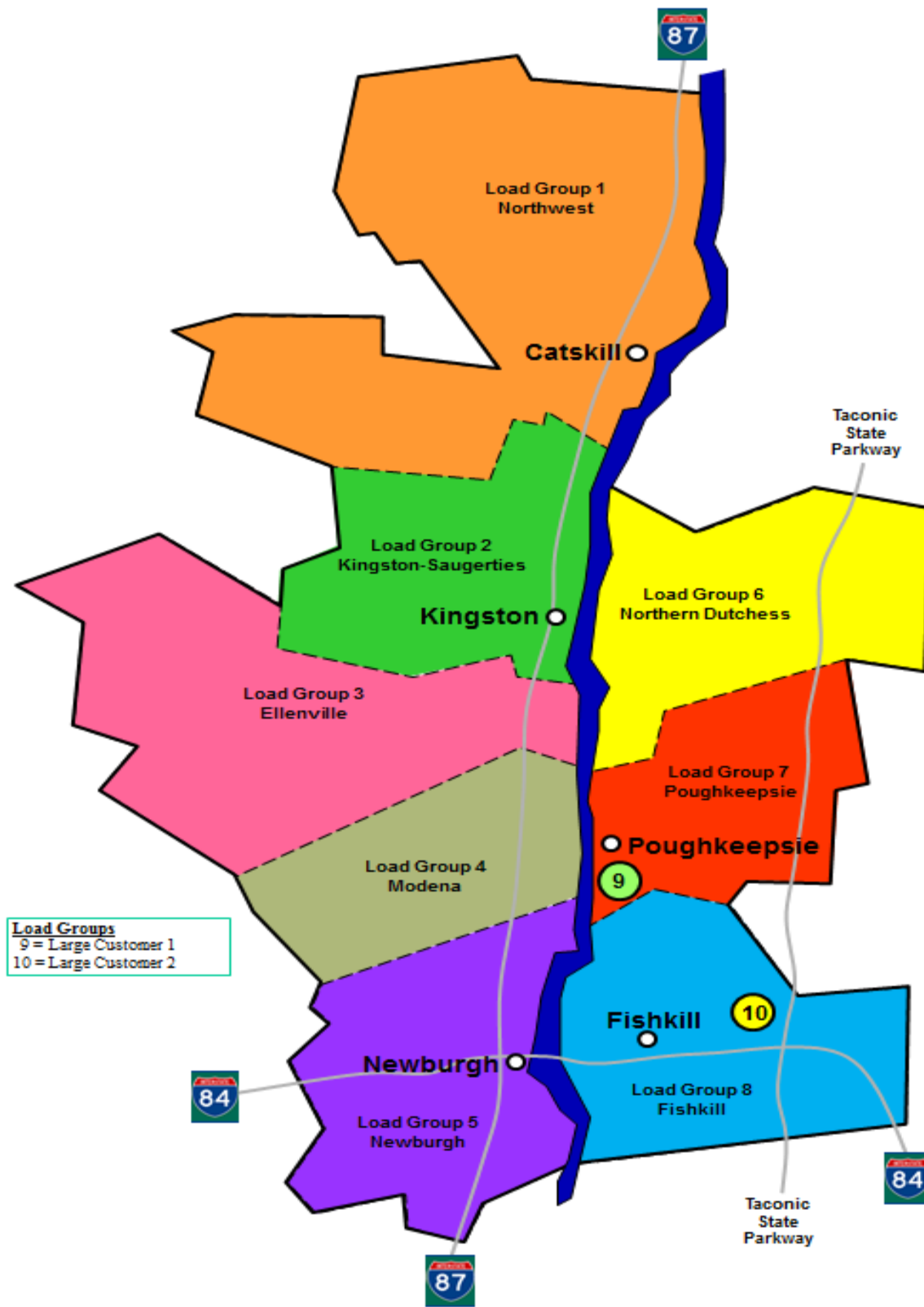
Central Hudson’s electric capital forecast for the next 5-year period is developed each year using the most recent planning studies, customer and sales forecasts, corporate load forecasts, and other corporate trends. For the electric capital forecast, a weather adjusted peak electric demand 1,046 MW system load (demand) for 2016 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.

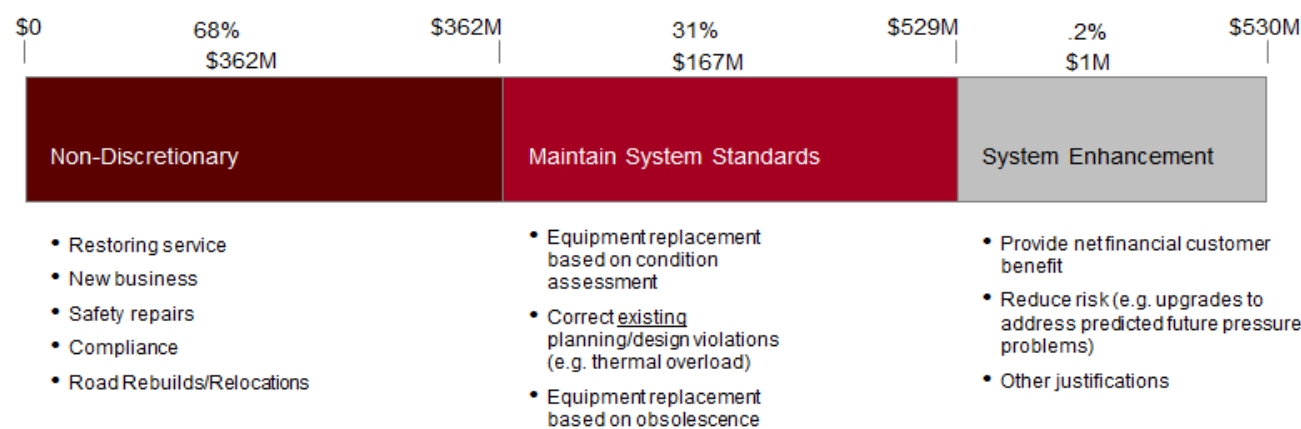
### *Electric Capital Forecast – Additions*

	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>TOTAL</u>
Production	\$ 1,911	\$ 2,075	\$ 1,545	\$ 1,639	\$ 1,448	\$ 8,618
Transmission	19,506	19,726	21,686	23,635	18,979	103,532
Substation	18,846	18,428	19,064	17,629	16,591	90,557
New Business	6,597	6,258	6,572	6,797	6,764	32,987
Distribution Improvements	39,040	42,445	45,313	41,493	35,940	204,231
Transformers	6,197	6,743	7,092	6,849	6,227	33,109
Meters	<u>3,022</u>	<u>3,071</u>	<u>3,138</u>	<u>3,197</u>	<u>3,264</u>	<u>15,691</u>
Total	<u>\$ 95,118</u>	<u>\$ 98,746</u>	<u>\$ 104,409</u>	<u>\$ 101,240</u>	<u>\$ 89,212</u>	<u>\$ 488,726</u>

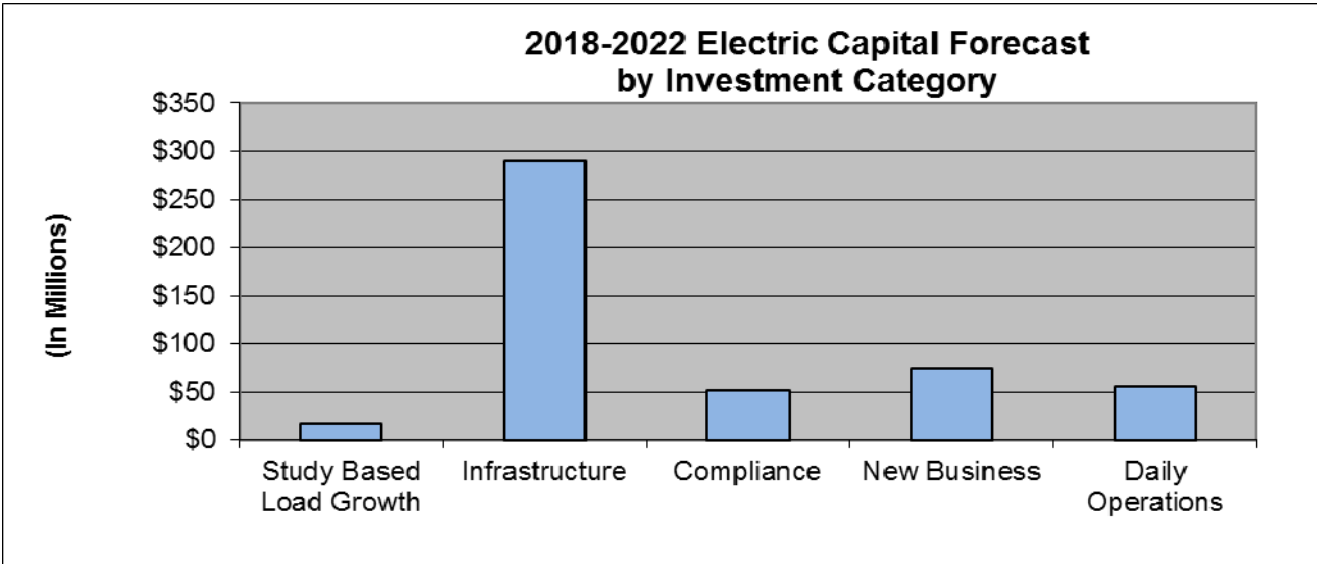
### *Electric Capital Forecast – Removal*

	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>TOTAL</u>
Production	\$ 128	\$ 209	\$ 133	\$ 120	\$ 638	\$ 1,228
Transmission	2,448	2,586	3,648	3,192	3,145	15,019
Substation	1,752	1,786	2,043	2,043	2,057	9,680
New Business	255	261	267	272	278	1,333
Distribution Improvements	2,351	2,406	2,639	2,624	2,680	12,699
Transformers	409	418	427	436	445	2,133
Meters	<u>10</u>	<u>10</u>	<u>11</u>	<u>11</u>	<u>11</u>	<u>53</u>
Total	<u>\$ 7,352</u>	<u>\$ 7,676</u>	<u>\$ 9,168</u>	<u>\$ 8,698</u>	<u>\$ 9,253</u>	<u>\$ 42,146</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 northern portion of the 69kV G line; rebuild of the 115kV EF line; rebuild of the 69kV CL line; reconductoring of the 69kV FV 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; A project that appeared in our previous 5-year forecast, 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.

All of the projects identified above are driven by infrastructure conditions. Included in the list above is rebuilding portion of the 69kV G Line. The G line, originally constructed in the 1920’s, is one of Central Hudson’s oldest wood pole transmission lines; inspections have identified more than 60% of the structures would need to be replaced. This finding has 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 in the mid Dutchess County area. The project has been split into two parts: the northern section and the southern section. The northern section will remain at 69kV and provide reserve for the Tinkertown substation by rebuilding from the Todd Hill Substation north and installing a 115/69 kV transformer at Todd Hill. This northern section of the project is expected to be constructed from 2017 through 2018 at a total cost of \$8.3M. The south section of the line will be retired.

<b>G 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 – Lagrangeville	6.6	101	4	69.2
Lagrangeville – Tinkertown	10.1	82	2	67.2
Tinkertown – PV	4.0	16	1	30.2
<b>Totals</b>	<b>20.7</b>	<b>199</b>	<b>7</b>	<b>62.0</b>
<b>Data Based on 1Q 2009 Assessment</b>				

The “EF” line rebuild is intended to address significant infrastructure issues on the line identified through our inspection program. The inspections identified that 82% of the structures on this 1.98 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 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 \$2.5M for 2018 with the majority of expenditures during the second half of the year.

The “CL” line rebuild is similar to the “EF” line project in that it 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.

The FV Line reconductoring project is associated with the ACSR conductor replacement program. 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 indicate corrosion of the steel core and evidence of annealing of aluminum strands and fatigue due to vibration. Based on these findings, reconductoring with 795ACSR and OPGW is planned to help maintain system reliability and to reduce system losses. This project addresses infrastructure concerns and is expected to cost \$1.7M at this time to complete.

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 from 2020 through 2021 at a total cost of approximately \$11.9M.

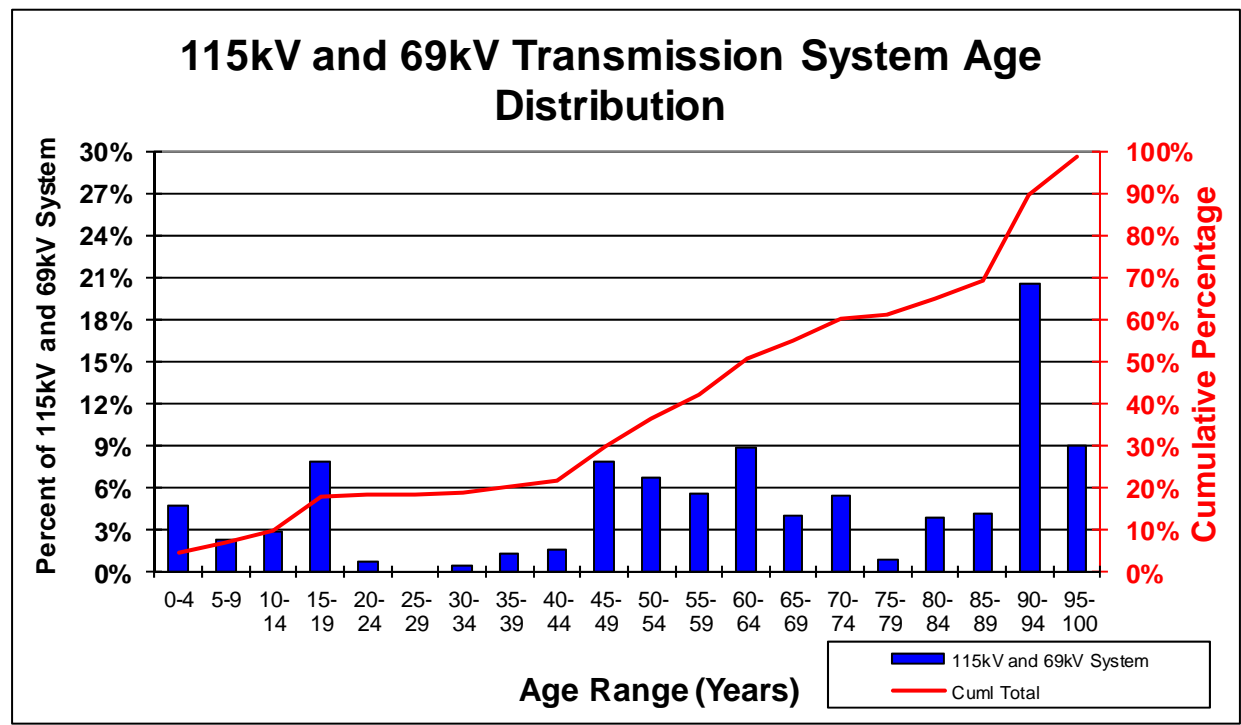
<b>KM Line Condition</b>				
<b><u>Section</u></b>	<b><u>Miles</u></b>	<b>Structures to</b>		<b><u>Probable Replacement Percentage</u></b>
		<b><u>Replace</u></b>	<b><u>Repair</u></b>	
Knapps Corners – P33581	1.0	10	5	65.2%
P33581 – P33591	0.5	9	5	60.8%
P33591 – P140218	0.35	0	0	0
P140218 - Myers Corners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

TV Line Condition				
		Structures to		
<u>Section</u>	<u>Miles</u>	<u>Replace</u>	<u>Repair</u>	<u>Probable Replacement Percentage</u>
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 \$34M.

H & SB Line Condition						
<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:

- Current/ thermal limits related to the ability of the facility to withstand load related heating without damage
- Protection requirements – 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 – proximity of solutions to load 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. Currently, the Maybrook Substation upgrade is the only major substation project in our five year forecast due primarily to load serving capability/growth. 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 (from 2018 until 2022) due to Non-Wires Alternative solutions.

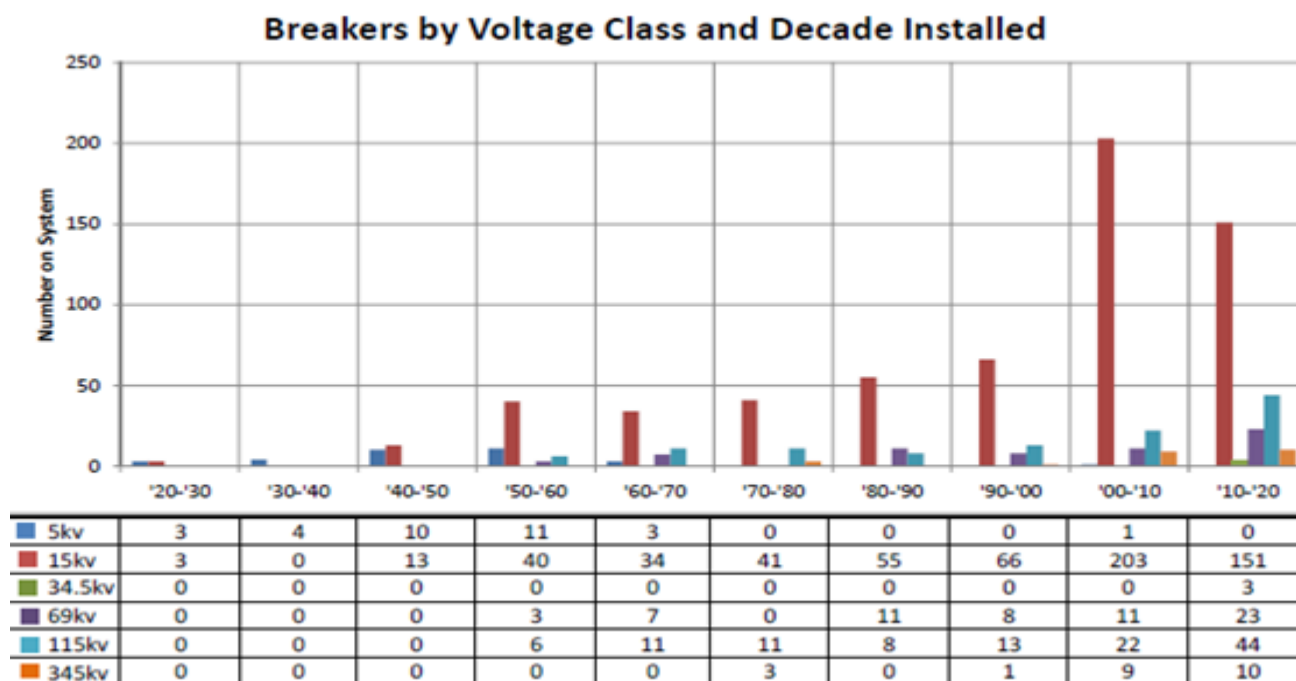
\$82.1M is allocated to infrastructure-related substation programs and projects within the five year forecast. Major substation rebuilds or partial rebuilds due to infrastructure considerations include work/upgrades at the following substations: Union Avenue, Knapps Corners, Hurley Avenue 115/69kV, Rock 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, 70 breakers have been identified for planned replacement in the 5-year forecast horizon, with a cost of \$7.5M. 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 2017.

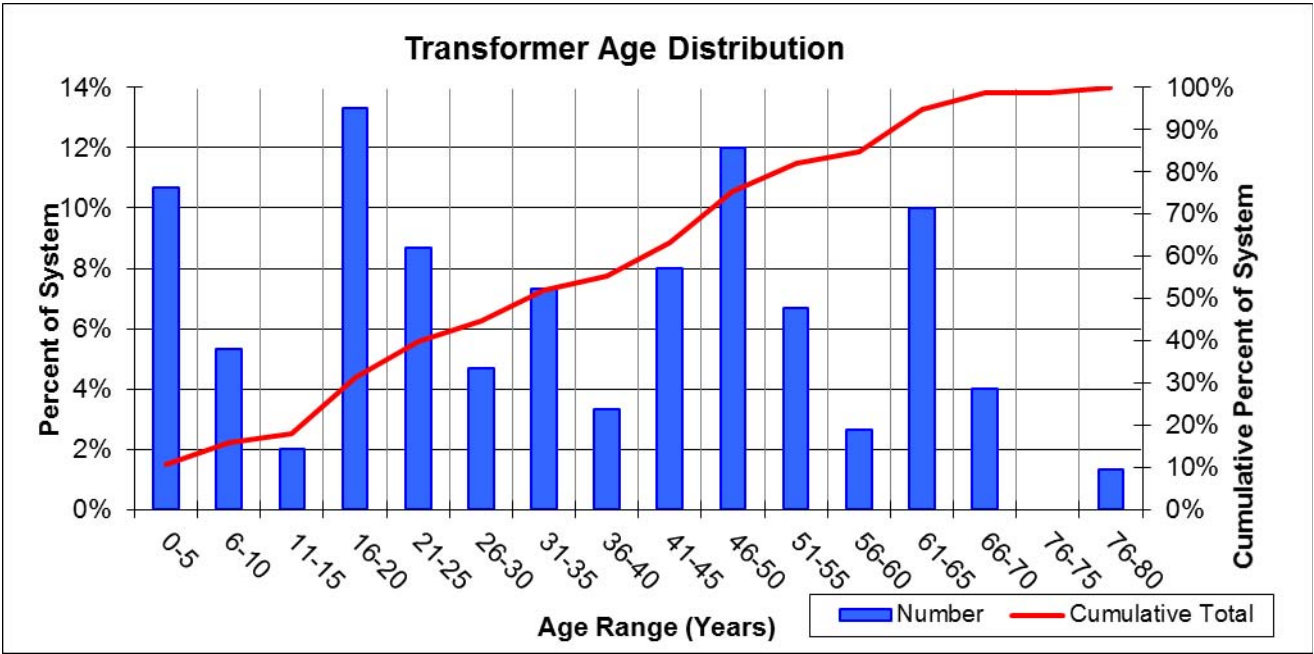


Additional major infrastructure replacement programs associated with substation equipment include the continued replacement of protective relaying equipment and substation power transformers. Circuit switchers, disconnect switches, and motor-operated switch (MOS), which have commenced based on feedback 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. In addition, first

generation microprocessor relays were manufactured in a time when technology was changing rapidly; this relay technology quickly was surpassed and is obsolete in many cases. Many of these relays are unsupported by the manufacturers and have limited parts available. The replacement program of these first generation microprocessor relays is nearing completion with \$0.2M in the 5-year forecast to conclude this program.

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, condition, and the ability to maintain the equipment. There are six substation 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, Union Avenue, and Smithfield. Additionally, there is the planned installation of two 115/69 kV transformers at the Kerhonkson Substation following the retirement of the Modena 115/69kV transformer and the upgrade of the P and MK Lines to 115kV operation.



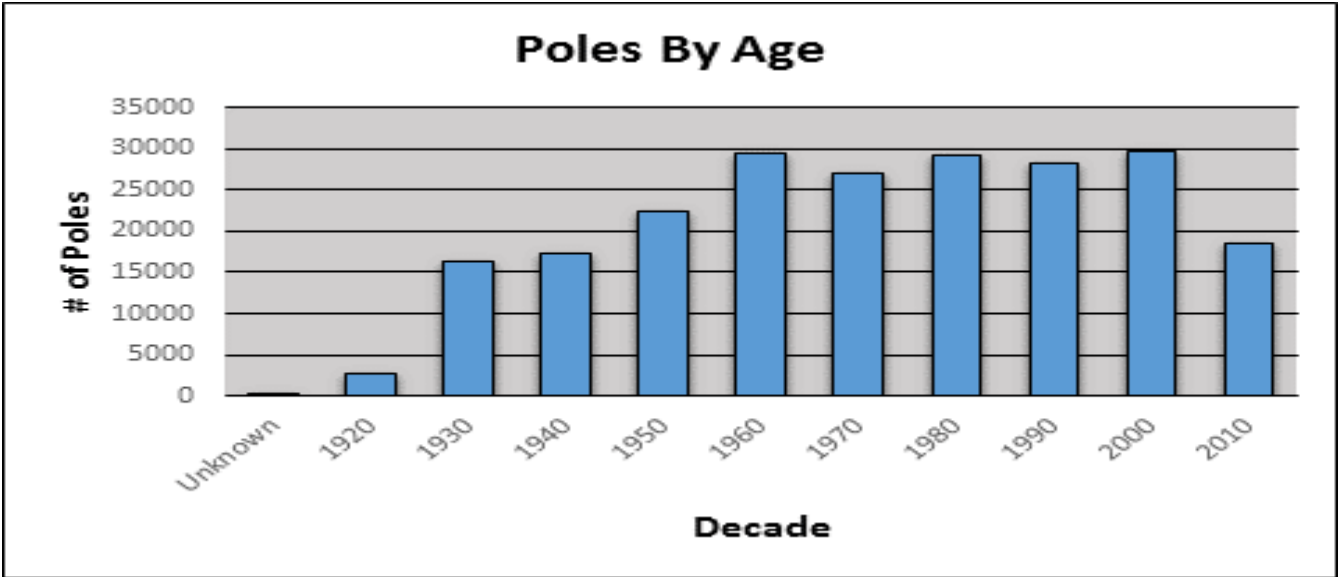
A condition based program has been created to identify and replace switchgear units that are in poor or deteriorating condition. There is \$5.7M in the 5 year forecast allotted to start these replacements.

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 \$10M of growth related projects in the five year forecast), 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 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/Worse Circuit program, the secondary network replacement program, the 5kV cable replacement program, the overhead secondary replacement program, the 4800V conversion program, the copper wire replacement program, the oil switch replacement program and the URD replacement program.

With regard to the distribution infrastructure, there are ongoing programs designed to replace proactively aging or failing equipment. 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 \$6 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 has been included in the 5 year forecast. Central Hudson will continue with the Automatic Load Transfer (ALT) switch and recloser replacement programs. Incremental in the 5 year forecast is advanced distribution automation. This program is developing a 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 dramatically 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 Automatic Load Transfer ALT switching schemes, 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 \$34 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.

# **GAS PROGRAM SUMMARY**

## **Gas System Overview**

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 and four gate 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 152 gas regulators stations are utilized to supply the distribution system. The stations either reduce transmission pressure to distribution pressure (66) or further reduce distribution pressure to a lower pressure (86).

The gas distribution system is comprised of 1,275 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 711 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 196 miles or 15% of the total distribution main inventory. The Company's gas service inventory totals 63,489 services of which 41,680 are plastic and 8,441 are protected steel. The remainder, excluding 72 copper services, are considered leak prone.

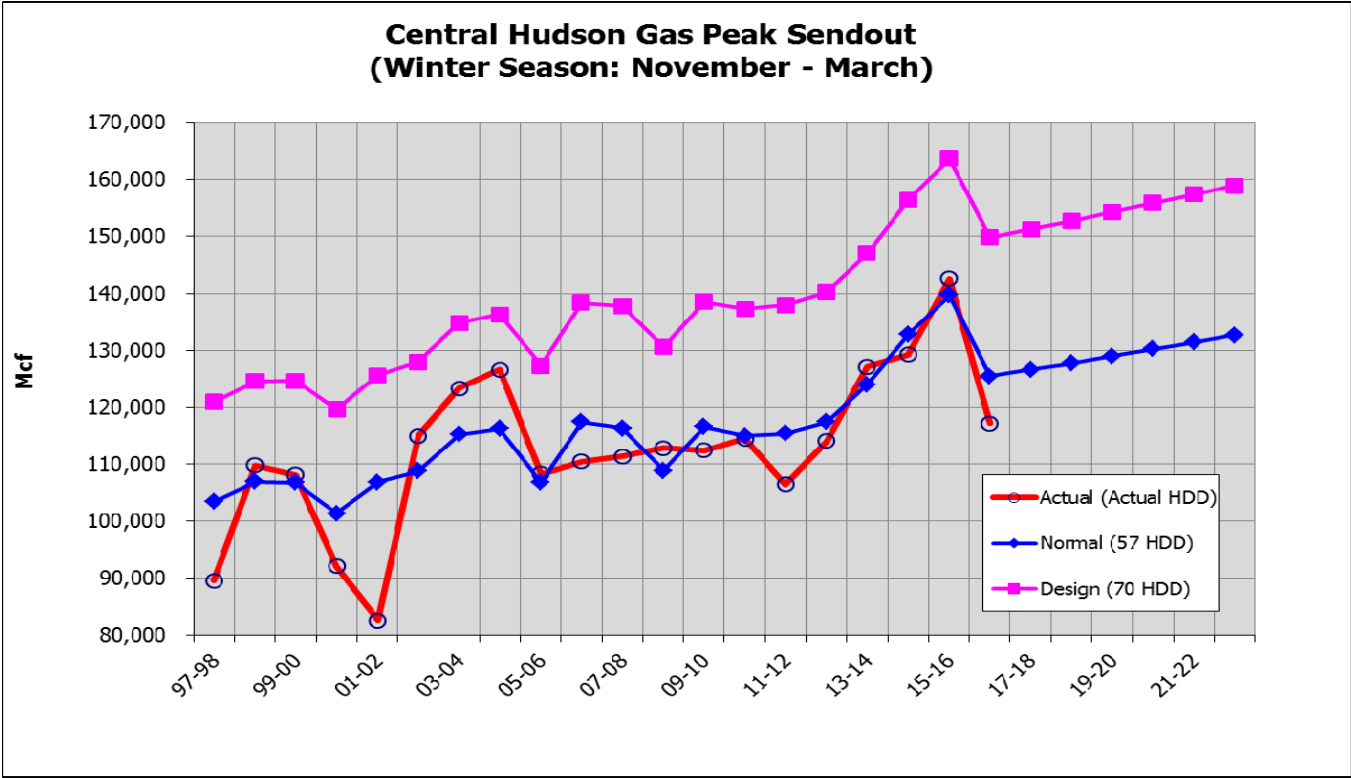
Low pressure systems exist in each of the larger Cities of Beacon, Newburgh, Poughkeepsie, Kingston, Saugerties, and Catskill. Construction on these systems started in the early 1900s and piping has been added and replaced regularly since that time. These systems contain significant lengths of cast iron, 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. 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.

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.

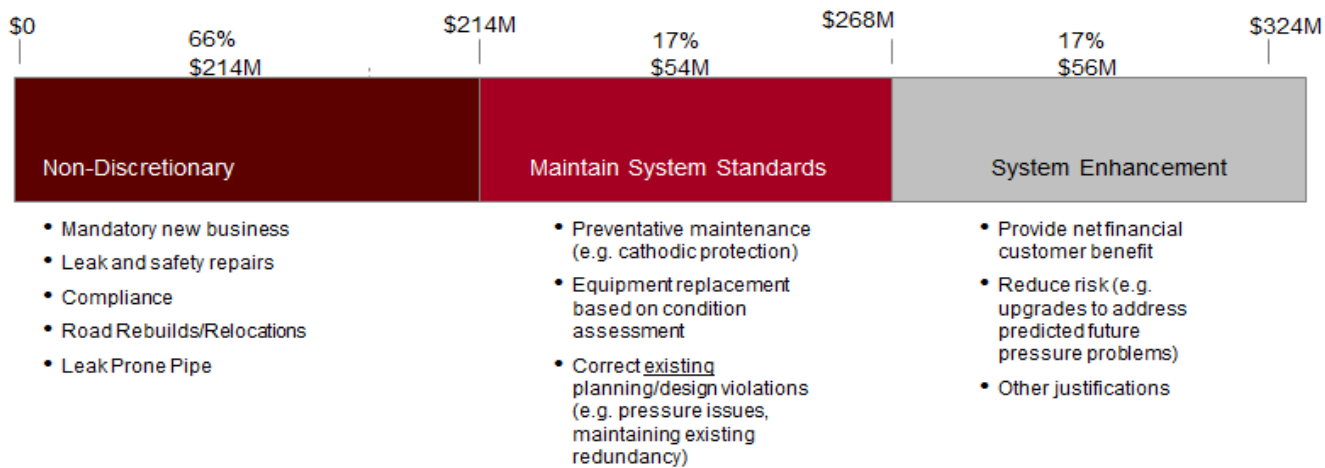
### *Gas Capital Forecast – Additions*

	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>TOTAL</u>
Production	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Transmission	2,954	1,686	1,517	2,326	2,419	10,901
Regulating Stations	2,557	2,556	2,744	2,941	2,515	13,314
New Business	12,754	12,619	12,934	13,212	13,355	64,874
Distribution Improvements	37,767	42,630	39,581	45,492	46,325	211,794
Meters	<u>3,041</u>	<u>3,008</u>	<u>2,870</u>	<u>2,505</u>	<u>2,546</u>	<u>13,970</u>
Total	<u>\$ 59,072</u>	<u>\$ 62,498</u>	<u>\$ 59,647</u>	<u>\$ 66,474</u>	<u>\$ 67,161</u>	<u>\$ 314,853</u>

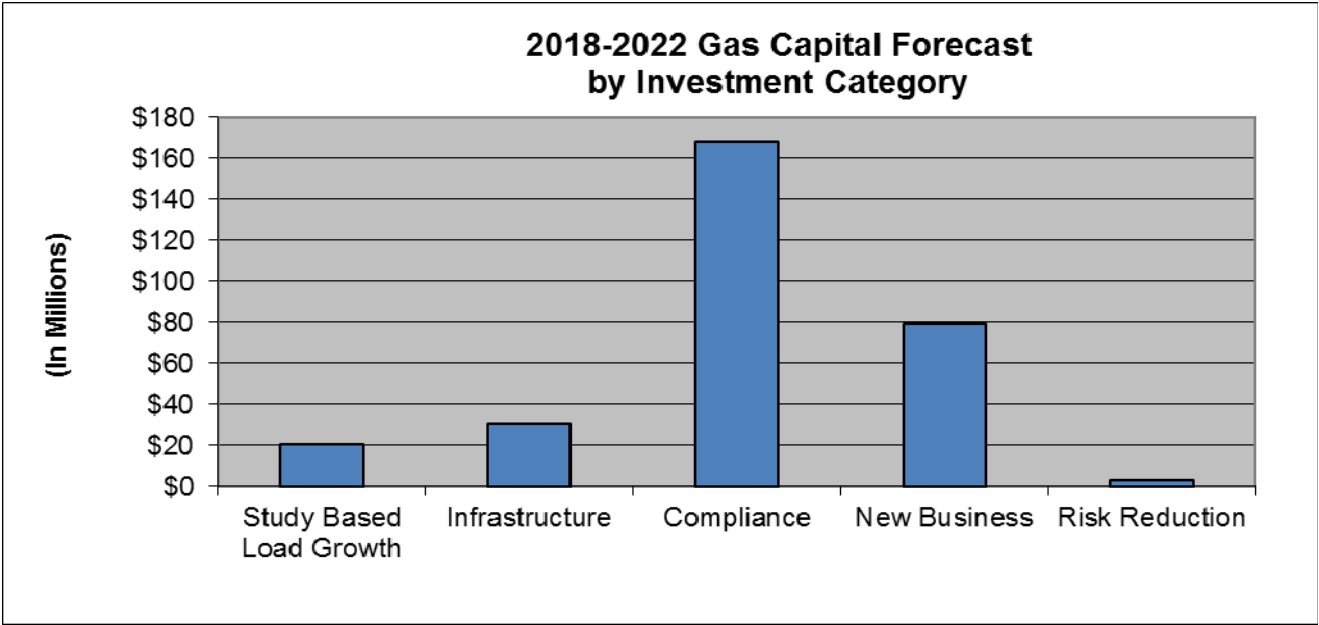
### *Gas Capital Forecast – Removal*

	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>TOTAL</u>
Production	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Transmission	123	125	64	65	89	466
Regulating Stations	102	104	133	169	100	609
New Business	511	522	533	544	556	2,667
Distribution Improvements	1,022	1,044	1,066	1,089	1,112	5,333
Meters	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>21</u>
Total	<u>\$ 1,762</u>	<u>\$ 1,801</u>	<u>\$ 1,801</u>	<u>\$ 1,872</u>	<u>\$ 1,861</u>	<u>\$ 9,096</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
- Inspection Results
- Municipal Projects

The Gas Distribution 5 Year Capital Forecast is driven primarily by the mandated replacement of Leak Prone Pipe (LPP). The table below details the Company's currently approved rate Order which specifies the minimum replacement quantities and the maximum capitalized cost per mile for LPP.

Year	LPP Eliminated (miles)	Cost per Mile (000)
2016	13	\$1,400
2017	14	\$1,500
2018	15	\$1,600

### 2015 Joint Proposal LPP Replacement Requirements

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 \$175 million in the 5 year forecast (average annual expenditure of \$35M). 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 10 – 12 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 SM line reinforcement project and the West Point bypass to Highland Falls. The SM line reinforcement project addresses the current and potential new growth in the Carmel and Mahopac Area. A total of \$5.2 million has been identified for this project. The West Point bypass to Highland Falls project would consist of constructing a bypass around West Point to serve customers in Highland Falls and avoiding relying in West Point's gas system to serve these customers. The current configuration of system that requires the reliance in the West Point gas system to serve our Highland Falls customers poses a significant 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 based on historical expenditure levels and historical and forecasted customer growth rates. The Gas New Business has forecast over \$61 million over the 5-year period for residential and commercial additions. An additional \$3.9 million has been identified for expansion to serve large commercial or industrial customers.

The Gas Meters capital forecast is based on the projected customer growth from the corporate forecast. The forecasted expenditure level is based on historical expenditure levels and historical and 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 3000 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 the Land and Buildings Capital Budget, the Office Furniture Capital Budget, the Tools & Equipment Capital Budget, the Transportation Capital Budget, 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>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>TOTAL</u>
Lands and Buildings	\$ 16,512	\$ 20,784	\$ 12,550	\$ 10,078	\$ 22,807	\$ 82,731
Office Equipment	20,999	26,943	20,329	20,572	24,562	113,405
Tools	1,666	1,666	1,447	1,394	1,445	7,618
Communication	8,250	9,142	6,645	2,408	222	26,667
Transportation	<u>9,431</u>	<u>10,687</u>	<u>11,344</u>	<u>11,037</u>	<u>10,849</u>	<u>53,348</u>
Total	<u>\$ 56,857</u>	<u>\$ 69,222</u>	<u>\$ 52,316</u>	<u>\$ 45,488</u>	<u>\$ 59,885</u>	<u>\$ 283,769</u>

### *Common Capital Forecast – Removal*

	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>TOTAL</u>
Lands and Buildings	\$ 665	\$ 307	\$ 300	\$ 280	\$ 325	\$ 1,876
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>\$ 216</u>	<u>\$ (142)</u>	<u>\$ (149)</u>	<u>\$ (169)</u>	<u>\$ (124)</u>	<u>\$ (368)</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 primarily associated with the replacement of existing minor capital components. In addition, the “Lands and Buildings” category includes some major capital replacements at our facilities, such as roofs, windows, and HVAC equipment. There are also three larger facility projects proposed during the period. The first is the expansion of office space and parking at our South Road headquarters. Several alternatives have been evaluated to increase office space including building at 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 \$10.5M with the majority of expenditures and project completion anticipated in 2019. The second project is the buildout of remaining office space at the Company's Kingston headquarters. There is remaining unoccupied space at the Kingston facility and the build out will leverage all remaining available space for anticipated staffing additions. In addition this facility will become the 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 \$3.4M with 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 are \$32.5M. Included in this planned facility is buildout of an integrated transmission and distribution system operations center. 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. The estimated cost within the five year forecast for the build out of this facility is \$5.7M. 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.

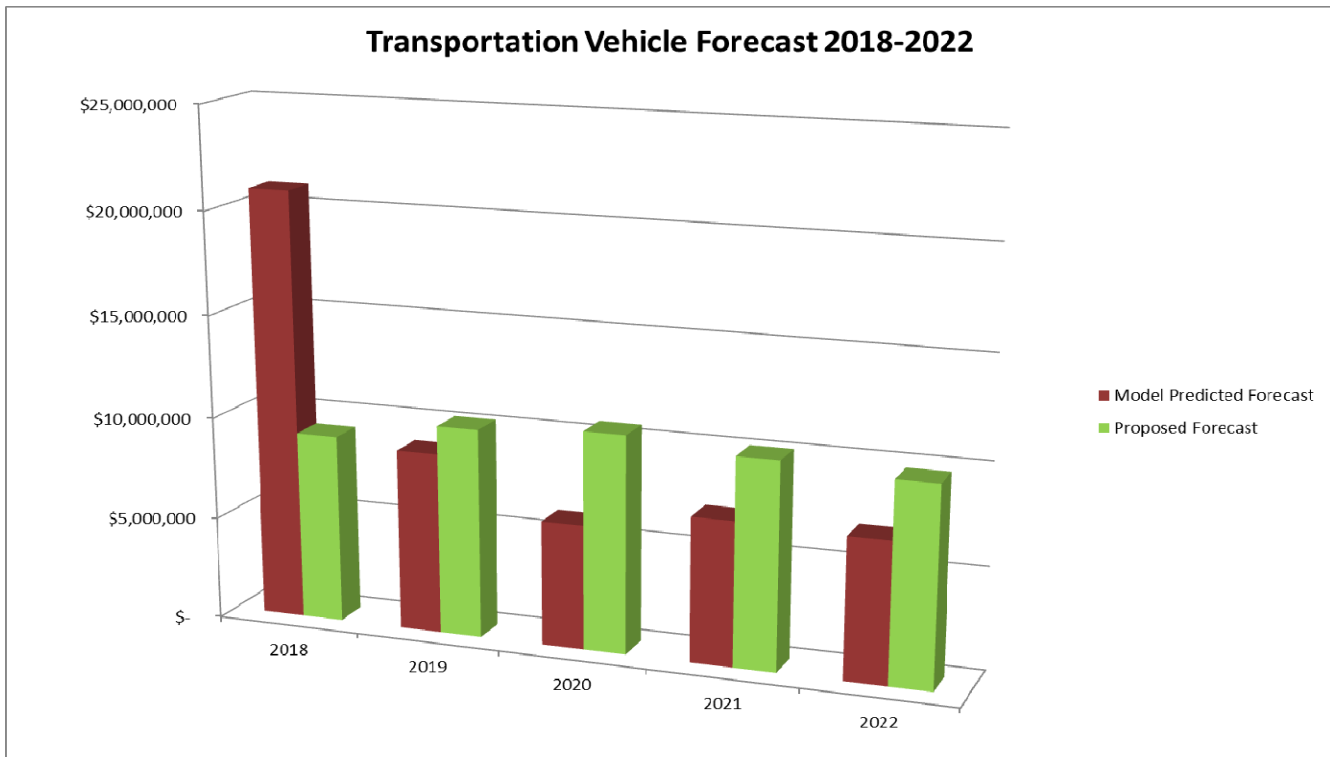
### **Transportation and Tools**

The Tools budget 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. Specialized tools required to accomplish new tasks or support the application of new techniques, are purchased after a trial use period.

The Transportation Capital Forecast is based primarily on the replacement of equipment. In the past, 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 was implemented based on industry benchmark information for each class of vehicle for a 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 aimed at increasing the reliability of the fleet and controlling expense, operating, and maintenance 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.

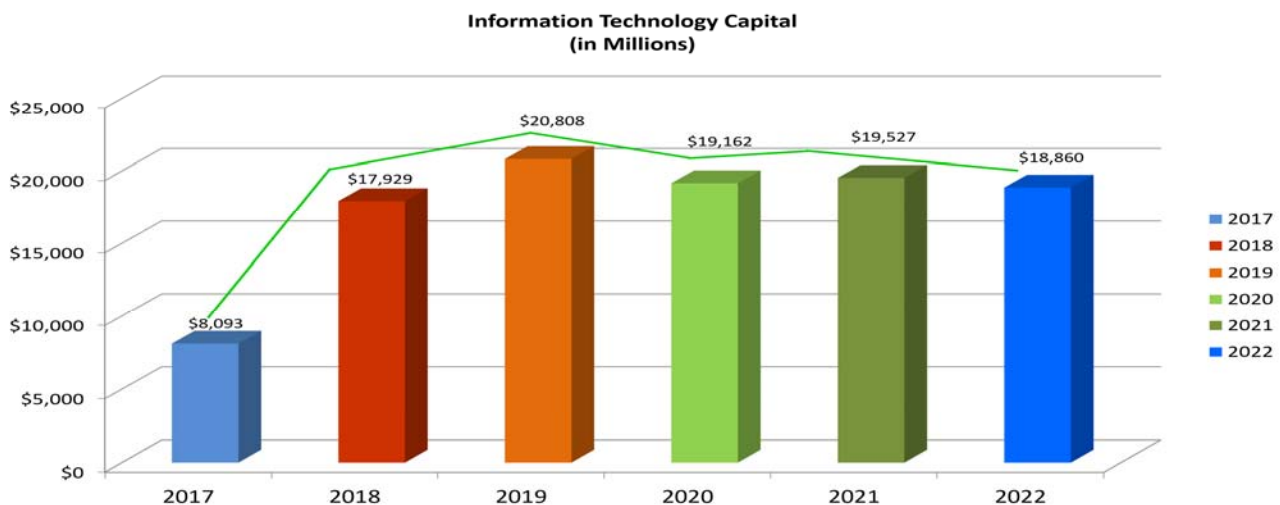
- Yielded a \$37M spend over 5 years to replace vehicles older than 10 years; heavily weighted to first year (\$18M)
- Added \$1.7M / year for replacing non-road equipment
- Added \$800K/year for replacing specialized track equipment
- Spend is proposed to be levelized over the next 5 years
- Reduces average fleet age and "caps" fleet age at 10 years

- Age is currently main driver of fleet replacement; this budget would “flush” the fleet
- 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



### Information Technology / Communications

The pace of change across the industry, regulatory, our business, and technology and the corresponding growth of expectations of our customers, partners, and other stakeholders combined with our historic IT investment that has been primarily focused on keeping the core systems running has led to the refresh of the five year IT capital plan. See the chart below that represents the growth from our 2017 capital plan to our forecasted 2018 – 2022 plan:



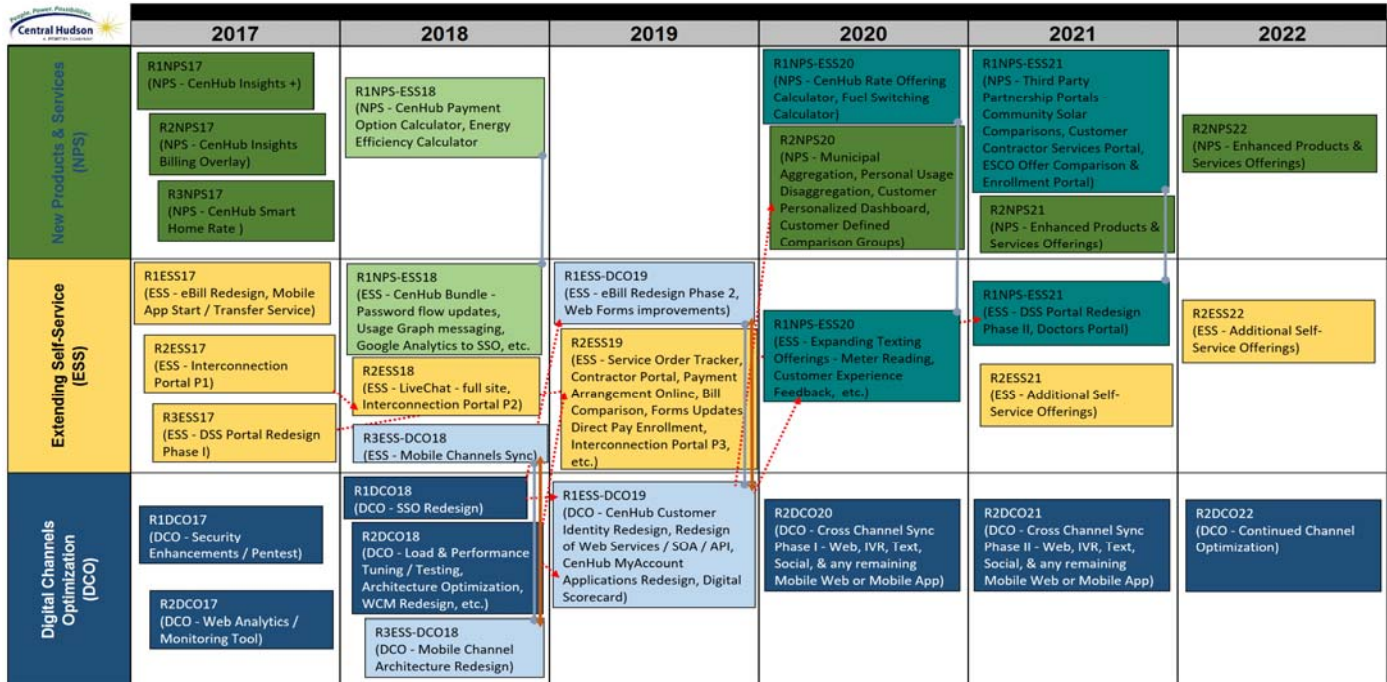
The IT Capital Budget consists of foundational investments to maintain, secure, and modernize systems and investments to enrich the customer experience. The foundational investments fall into two categories: 1) meeting expanding customer, regulatory, business, and industry driven demands; and 2) investments 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.

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.

The software investments include routine applications and upgrades related to providing a net business and customer benefit or reducing corporate risk combined with new investments to meet increasing customer, business, regulatory, and industry drivers. The major software application projects include further investments into Business Intelligence, Cybersecurity, Enterprise Content Management, Digital (Web/Mobile/Social) Initiatives for Customer Engagement (DICE), Modernization of CIS, Unified Communications / Voice over IP / IVR upgrades, Emergency Management & Mobility, Business Agility with an Enterprise Services Oriented Architecture (SOA) Framework, Increasing the Quality and Speed of Applications Testing, Human Resources System Replacement, Wiki Redesign, GIS extensions, and Financial Application upgrades. These software applications and upgrades are evaluated through the IT Steering Committee with alignment to strategy and financial analysis used as the criteria for approving the project.

A key focus area is on enriching the overall customer experience and extending overall customer engagement. Another key initiative is the Customer Bill Redesign which aims to take our existing printed and e-Bill and completely redesign the format into a customer centric, easier to read, bill to include simplified billing information combined with key consumption and program offerings information to better help our customers manage and make informed decisions about their energy usage. The initiatives focused on the customer experience include the Digital (Web/Mobile/Social) Initiatives for Customer Engagement (DICE) which spans across New Products & Services, Extending Self-Service, and Digital Channels Optimization. As introduced, core foundational investments are required to meet anticipated needs of our customers and partners including the modernization of our core Customer Information System (CIS), extending our investments in Services Oriented Architecture (SOA) to better integrate solutions, and continued focus on compiling and enabling insights for and into our customers with extending Customer Analytics. See the Digital Roadmap below that depicts the DICE initiatives across the three core focus areas:

## Digital Initiatives for Customer Engagement (DICE) - Roadmap



### LEGEND

Items are bundled into multiple releases annually. Releases are numbered (R1, R2, R3, or R4) with the release number as a pre-fix and the year as the suffix. The included categories are noted within the release title with NPS = New Products & Services, ESS = Extending Self-Service, and DCO = Digital Channels Optimization. If the release only contains items within one category, the release box will match the color of the category - **NPS = Green**, **ESS = Yellow**, **DCO = Blue**. If the release contains items spanning multiple categories, the release box will be colored **Aqua for NPS & DCO** releases, **Light Green for ESS & NPS** releases, **Light Blue for ESS & DCO** releases, and **Orange for NPS, ESS, & DCO** releases. For example, R1NPS-ESS18 = Release 1 containing New Products & Services and Extending Self-Service items for 2018.

R1NPS-ESS18  
(NPS - Initiative 1, Initiative 2);  
(ESS - Initiative 1, Initiative 2)



**NOTE:** The above roadmap and associated estimated bundled releases are subject to change resulting from customer, business, industry, or regulatory drivers. All changes to the releases and/or the initiatives within the releases will be reviewed and prioritized by the Digital Interactive Working Group and subsequently presented to the IT Steering Committee.

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 the last 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 \$25.6M for this project.



## **SUMMARY SCHEDULES 2018-2022 FORECAST**

**2018- 2022 Construction Forecast (\$000's)**  
**INSTALLATION W/ AFUDC**  
(with inflation & OH adjustment)

Expenditures with AFUDC											
	2017	2018 Proposed Budget (1st Half)	2018 Proposed Budget (2nd Half)	2018 Proposed Budget	2019 Proposed Budget (1 <sup>st</sup> Half)	2019 Proposed Budget (2 <sup>nd</sup> Half)	2019 Proposed Budget	2020 Proposed Budget	2021 Proposed Budget	2022 Proposed Budget	2018-2022 Proposed Budget Total
<b>ELECTRIC PROGRAM</b>											
Hydro & Gas Turbines 11	2,006	768	1,143	1,911	1,037	10,368	2,075	1,545	1,639	1,448	8,618
Transmission 12	18,920	7,834	11,672	19,506	9,139	10,586	19,726	21,686	23,635	18,979	103,532
Substations 13	23,142	8,774	10,072	18,846	7,413	11,015	18,428	19,064	17,629	16,591	90,557
New Business 14	4,183	3,300	3,297	6,597	3,131	3,127	6,258	6,572	6,797	6,764	32,987
Dist. Improvements 15	29,656	16,922	22,117	39,040	18,741	23,704	42,445	45,313	41,493	35,940	204,231
Transformers 16	5,658	3,054	3,143	6,197	3,372	3,372	6,743	7,092	6,849	6,227	33,109
Meters 17	2,907	1,814	1,209	3,022	1,535	1,535	3,071	3,138	3,197	3,264	15,691
Total Electric Program	86,470	42,467	52,652	95,118	44,369	63,708	98,746	104,409	101,240	89,212	488,726
<b>GAS PROGRAM</b>											
Production 21	-	-	-	-	-	-	-	-	-	-	-
Transmission 22	1,678	667	2,287	2,954	435	1,251	1,686	1,517	2,326	2,419	10,901
Regulator Stations 23	1,212	1,019	1,538	2,557	1,179	1,377	2,556	2,744	2,941	2,515	13,314
New Business 24	14,075	6,375	6,378	12,754	6,301	6,318	12,619	12,934	13,212	13,355	64,874
Dist. Improvements 25	27,971	15,126	22,641	37,767	17,074	25,556	42,630	39,581	45,492	46,325	211,794
Meters 27	2,269	1,520	1,520	3,041	1,504	1,504	3,008	2,870	2,505	2,546	13,970
Total Gas Program	47,205	24,707	34,365	59,072	26,492	36,006	62,498	59,647	66,474	67,161	314,853
<b>COMMON PROGRAM</b>											
Buildings 41	3,947	1,927	14,585	16,512	10,341	10,443	20,784	12,550	10,078	22,807	82,731
Buildings Minors	3,947	1,927	1,946	3,873	2,099	2,120	4,219	4,263	4,449	4,292	21,096
Major Expansion	-	-	12,639	12,639	8,242	8,323	16,565	8,287	5,629	18,515	61,635
Office Equipment 42	10,262	8,092	12,906	20,999	13,331	13,617	26,943	20,329	20,572	24,562	113,405
General 421	204	153	153	307	104	104	209	320	218	267	1,320
EMS 423	2,349	1,105	954	2,058	2,613	2,697	5,305	218	179	4,991	12,750
EDP 4222	1,981	2,042	1,075	3,118	1,526	1,526	3,052	3,071	3,136	3,202	15,579
Software 4220	5,096	4,424	10,387	14,811	8,805	8,950	17,755	16,091	16,392	15,658	80,708
Security 424	632	368	337	705	282	339	621	629	648	445	3,048
Tools 43	1,071	833	833	1,666	833	833	1,666	1,447	1,394	1,445	7,618
Communication 44	4,648	4,413	3,836	8,250	5,047	4,095	9,142	6,645	2,408	222	26,667
Transportation 45	7,956	4,715	4,715	9,431	5,343	5,343	10,687	11,344	11,037	10,849	53,348
Total Common Program	27,883	19,982	36,876	56,857	34,895	34,332	69,222	52,316	45,488	59,885	283,769
<b>CORPORATE TOTAL</b>	161,559	87,156	123,892	211,048	105,756	134,046	230,466	216,372	213,203	216,259	1,087,348
<b>REMOVALS</b>	8,834	4,495	4,836	9,331	4,582	4,582	9,163	10,625	10,216	10,792	50,126
<b>TOTAL CAPITAL</b>	170,393	91,650	128,728	220,379	110,338	138,627	239,629	226,996	223,419	227,051	1,137,474

**2018- 2022 Construction Forecast (\$000's)**

**REMOVAL**  
(with inflation)

		Expenditures								2018-2022 Proposed Budget Total
		2017	2018 Proposed Budget (1st Half)	2018 Proposed Budget (2nd Half)	2018 Proposed Budget	2019 Proposed Budget	2020 Proposed Budget	2021 Proposed Budget	2022 Proposed Budget	
<b>ELECTRIC PROGRAM</b>										
Hydro & Gas Turbines	11	127	118	10	128	204	131	117	625	1,205
Transmission	12	1,403	1,323	1,124	2,448	2,530	3,573	3,127	3,080	14,758
Substations	13	2,038	756	995	1,752	1,748	2,001	2,001	2,014	9,515
New Business	14	177	128	128	255	255	261	267	272	1,311
Dist. Improvements	15	2,109	1,175	1,175	2,351	2,354	2,585	2,570	2,624	12,484
Transformers	16	311	204	204	409	409	418	427	436	2,097
Meters	17	297	5	5	10	10	10	11	11	52
Total Electric Program		6,463	3,710	3,642	7,352	7,511	8,979	8,519	9,062	41,423
<b>GAS PROGRAM</b>										
Production	21	-	-	-	-	-	-	-	-	-
Transmission	22	182	61	61	123	125	64	65	89	466
Regulator Stations	23	82	51	51	102	104	133	169	100	609
New Business	24	1,347	255	255	511	522	533	544	556	2,667
Dist. Improvements	25	837	511	511	1,022	1,044	1,066	1,089	1,112	5,333
Meters	27	4	2	2	4	4	4	4	4	21
Total Gas Program		2,452	881	881	1,762	1,801	1,801	1,872	1,861	9,096
<b>COMMON PROGRAM</b>										
Buildings	41	243	128	537	665	300	293	274	318	1,851
Buildings Minors		244	128	128	257	280	293	274	318	1,422
Major Expansion		-	-	409	409	20	-	-	-	429
Office Equipment	42	1	-	-	-	-	-	-	-	-
General	421	-	-	-	-	-	-	-	-	-
EMS	423	-	-	-	-	-	-	-	-	-
EDP	4222	-	-	-	-	-	-	-	-	-
Software	4220	-	-	-	-	-	-	-	-	-
Security	424	-	-	-	-	-	-	-	-	-
Tools	43	0	0	0	0	0	0	0	0	1
Communication	44	3	1	1	1	1	1	1	1	5
Transportation	45	(328)	(225)	(225)	(450)	(450)	(450)	(450)	(450)	(2,250)
Total Common Program		(81)	(96)	313	216	(148)	(155)	(175)	(131)	(393)
<b>CORPORATE TOTAL</b>		8,834	4,495	4,836	9,331	9,163	10,625	10,216	10,792	50,126

## **ELECTRIC PROGRAM INDIVIDUAL PROJECT SUBMITTAL FORMS**



# Budget Submittal Form for Electric Projects

Project Name:	Sturgeon Pool Unit 2 - New Wet Section		
Form submitted by:	Michael Hogan		
Budget Group:	11 - Hydro & Gas Turbines		
Summary Category:	Non-Discretionary		
Investment Category:	Daily Operations		
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="\$1,029,000"/>	<input type="text" value="\$1,029,000"/>	<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="\$ 50,000"/>	<input type="text" value="\$ 50,000"/>	<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

**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:	Non-Discretionary		
Investment Category:	Daily Operations		
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="\$1,062,000"/>	<input type="text" value="\$ 0"/>	<input type="text" value="\$1,062,000"/>	<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" value="\$ 50,000"/>	<input type="text" value="\$ 50,000"/>	<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

**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 "5" with "5" being in the most need of repair. Components with ratings of either "5" or "4" must be repaired or replaced within 1 and 3 years, respectively, after the date of the inspection.

## Solution

There is a need to provide funding to respond to the results of the inspection process described above. In some instances components simply can be replaced while in other instances an entire structure might need to be replaced. The design work is then completed and the materials ordered. Aside from emergency replacements, HPR are typically grouped in packages 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="\$25,224,000"/>	<input type="text" value="\$5,323,000"/>	<input type="text" value="\$6,111,000"/>	<input type="text" value="\$4,756,000"/>	<input type="text" value="\$4,752,000"/>	<input type="text" value="\$4,282,000"/>	<input type="text" value="\$3,947,000"/>
<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: Transmission Minor Projects

Form submitted by: K.Bragg

Budget Group: 12 - Transmission

Summary Category: Non-Discretionary

Investment Category: Daily Operations

Number of Customers Affected:

For Category 15 only:      Budget Year Submitted

Project ID (District-YYYY-ID)

## Description of Problem

Minor Transmission projects arise throughout the year. These projects are not large enough to warrant a line item in the capital budget/forecast. Typically these jobs include the need to update/replace equipment installed on a transmission line such as:

Failed/Damaged:

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

## Solution

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="\$1,220,000"/>	<input type="text" value="\$228,000"/>	<input type="text" value="\$230,000"/>	<input type="text" value="\$245,000"/>	<input type="text" value="\$271,000"/>	<input type="text" value="\$246,000"/>	<input type="text" value="\$227,000"/>
<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="4,375,000"/>	<input type="text" value="600,000"/>	<input type="text" value="1,162,000"/>	<input type="text" value="1,258,000"/>	<input type="text" value="1,355,000"/>	<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)  Improves Access to Structures
- ☒ Strategic Replacement  Acquire ROW essential to maintenance of existing facilities
- ☐ 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:	G Line North 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

The 17.799 mile 69 kV G line from Pleasant Valley to Knapps Corners was built in the 1920's with single pole double cross arm structures. Approximately 27.7% of the structures are in need of replacement due to the aging infrastructure and poor condition. The G line has experienced 50 trips outs over a 14 year period (1998 to 2011).

### Solution

The northern section of the G line will continue to operate at 69 kV with the installation of larger conductor. The northern section of the 69 kV G line would begin at Pleasant Valley, supply Tinkertown and terminate at the Todd Hill Substation. A 115/69 kV transformer will be installed at Todd Hill. The portion of the 7023 circuit that is currently double circuit with the G line will be rebuilt in a underbuild configuration on the new G line structures in that section. See EP2013-017 for Details.

**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	6,613,000	6,613,000					
Expense							

**Cost Risks**

- ☒ Environmental Matting, Agricultural land impacts
- ☒ Timing/Permitting Permitting needs to be completed prior to construction start.
- ☐ 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

EP#2013-017

Or

Project Alternatives Considered

Decision criteria for alternative selection



## Budget Submittal Form for Electric Projects

Project Name:	EF Line Rebuild - 115kV		
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

In 2015, a field inspection of the 1.98 mile 115kV "EF" Line (Shenandoah - East Fishkill) showed that 82% of the existing structure plant would require replacement due to component defects. There were also an additional 8% 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 all 1.98 miles of the existing 115kV "EF" 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.



**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="2,468,000"/>	<input type="text" value="2,468,000"/>	<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

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="CL Line Rebuild - 69kV"/>		
Form submitted by:	<input type="text" value="K.Bragg"/>		
Budget Group:	<input type="text" value="12 - Transmission"/>		
Summary Category:	<input type="text" value="Non-Discretionary"/>		
Investment Category:	<input type="text" value="Compliance"/>		
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, 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>
<b>Capital</b>	<input type="text" value="10,383,000"/>	<input type="text" value="2,270,00"/>	<input type="text" value="8,062,000"/>	<input type="text" value="51,000"/>	<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

Planning Memo in Progress

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 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 recondutored 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="\$1,655,000"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="\$1,655,000"/>	<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

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	69kV KM Line Rebuild - Knapps to Meyers - 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 17.799 mile 69 kV G line from Pleasant Valley to Knapps Corners was built in the 1920's with single pole double cross arm structures. Approximately 27.7% of the structures are in need of replacement due to the aging infrastructure and poor condition. The G line has experienced 50 trips outs over a 14 year period (1998 to 2011). 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

Central Hudson will be rebuilding the section of G Line for 69kV from Pleasant Valley South until it connects to the Todd Hill Substation. This rebuild (G Line North) is a separate budget item. The section of the G Line between Todd Hill and the Knapp's Corners substation will ultimately be de-energized and retired. This retirement is also listed a separate budget item. In order to maintain reliability and to provide sufficient load serving capability to the Meyer's Corners area, Central Hudson will be rebuilding the existing 69kV KM Line from Knapp's Corners to Meyers Corners.

**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="5,827,000"/>	<input type="text" value="247,000"/>	<input type="text" value="252,000"/>	<input type="text" value="4,120,000"/>	<input type="text" value="1,208,000"/>	<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**

Internal project alternatives analysis in progress

**Decision criteria for alternative selection**



# Budget Submittal Form for Electric Projects

**Project Name:** 69kV TV Line Rebuild - Knapps to Meyers - 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 17.799 mile 69 kV G line from Pleasant Valley to Knapps Corners was built in the 1920's with single pole double cross arm structures. Approximately 27.7% of the structures are in need of replacement due to the aging infrastructure and poor condition. The G line has experienced 50 trips outs over a 14 year period (1998 to 2011). 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

Central Hudson will be rebuilding the section of G Line for 69kV from Pleasant Valley South until it connects to the Todd Hill Substation. This rebuild (G Line North) is a separate budget item. The section of the G Line between Todd Hill and the Knapp's Corners substation will ultimately be de-energized and retired. This retirement is also listed a separate budget item. In order to maintain reliability and to provide sufficient load serving capability to the Meyer's Corners area, Central Hudson will be rebuilding the existing 69kV TV Line from Meyers Corners to North Chelsea.



**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="6,032,000"/>	<input type="text" value="247,000"/>	<input type="text" value="252,000"/>	<input type="text" value="1,030,000"/>	<input type="text" value="4,503,000"/>	<input type="text" value="0"/>	<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

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

**Project Name:** SB Line New 115kV Line Hurley Ave to Saugerties

**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 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>
<b>Capital</b>	<input type="text" value="16,260,000"/>	<input type="text" value="247,000"/>	<input type="text" value="407,000"/>	<input type="text" value="7,210,000"/>	<input type="text" value="8,128,000"/>	<input type="text" value="268,000"/>	<input type="text" value="247,000"/>
<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

EP2015-003

Or

Project Alternatives Considered

Decision criteria for alternative selection



Project ID (District-YYYY-ID)

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.

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>
<b>Capital</b>	<input type="text" value="17,446,000"/>	<input type="text" value="247,000"/>	<input type="text" value="407,000"/>	<input type="text" value="412,000"/>	<input type="text" value="2,197,000"/>	<input type="text" value="14,183,000"/>	<input type="text" value="13,075,000"/>
<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 

EP2015-003

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

**Project Name:** Substation Minor Projects

**Form submitted by:** Mason Mullamphy

**Budget Group:** 13 - Substations

**Summary Category:** Non-Discretionary

**Investment Category:** Daily Operations

**Number of Customers Affected:**

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

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

## 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="\$2,572,000"/>	<input type="text" value="\$553,000"/>	<input type="text" value="\$479,000"/>	<input type="text" value="\$503,000"/>	<input type="text" value="\$518,000"/>	<input type="text" value="\$518,000"/>	<input type="text" value="\$2,526,000"/>
<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:	Mason Mullamphy		
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="\$14,593,000"/>	<input type="text" value="\$1,893,000"/>	<input type="text" value="\$3,050,000"/>	<input type="text" value="\$1,695,000"/>	<input type="text" value="\$2,621,000"/>	<input type="text" value="\$5,334,000"/>	<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

**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:**

**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 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>
<b>Capital</b>	<input type="text" value="\$1,871,000"/>	<input type="text" value="\$121,000"/>	<input type="text" value="\$253,000"/>	<input type="text" value="\$618,000"/>	<input type="text" value="\$91,000"/>	<input type="text" value="\$790,000"/>	<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

**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

**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="\$2,231,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$728,000"/>	<input type="text" value="\$748,000"/>	<input type="text" value="\$755,000"/>	<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

Central Hudson's "BRP 2018-2022 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="\$5,269,000"/>	<input type="text" value="\$957,000"/>	<input type="text" value="\$2,474,000"/>	<input type="text" value="\$1,232,000"/>	<input type="text" value="\$221,000"/>	<input type="text" value="\$385,000"/>	<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

Central Hudson's "BRP 2018-2022 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:** Mason Mullamphy

**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="\$3,004,000"/>	<input type="text" value="\$613,000"/>	<input type="text" value="\$575,000"/>	<input type="text" value="\$604,000"/>	<input type="text" value="\$621,000"/>	<input type="text" value="\$592,000"/>	<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

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:** Mason Mullamphy

**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="\$2,276,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$486,000"/>	<input type="text" value="\$503,000"/>	<input type="text" value="\$547,000"/>	<input type="text" value="\$740,000"/>	<input type="text" value="5,250,000"/>
<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:

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

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

North Catskill Transformers # 4 & #5 (115/69 kV Autos)

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>
<b>Capital</b>	<input type="text" value="\$6,971,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$3,270,000"/>	<input type="text" value="\$3,701,000"/>	<input type="text" value="\$10,750,000"/>
<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:	Switchgear Condition-Based Replacements		
Form submitted by:	Mason Mullamphy		
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>
<b>Capital</b>	<input type="text" value="\$5,699,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>	<input type="text" value="\$1,258,000"/>	<input type="text" value="\$4,441,000"/>	<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

**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**

Due to asset condition and aging infrastructure it has been determined that the existing outdoor switchgear, control house, and RJ-52 115kV breaker in the lower yard of the Union Avenue Substation are nearing the end of their useful life.

**Solution**

A new Power Control Center will be installed to replace the aging control house and switchgear. The following breakers are to be replaced with switchgear enclosed in the PCC: TD-(4041-4047),TD-4049, UN-594,UW-1494, C-2551, W-1095, W-837, and C-2552 (many of which were identified through the breaker replacement program). All associated relaying will be replaced as well with the breakers. The RJ line relaying, transformer protection, and RJ-52 breaker failure relays will be replaced in the PCC as well. The RJ-52 breaker will be replaced with a new SF6 gas breaker as part of the 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="\$1,083,000"/>	<input type="text" value="\$1,083,000"/>	<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"/>	<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 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>
<b>Capital</b>	<input type="text" value="\$1,007,000"/>	<input type="text" value="\$1,007,000"/>	<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"/>	<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.

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="\$3,880,000"/>	<input type="text" value="\$3,880,000"/>	<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:**

**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>
<b>Capital</b>	<input type="text" value="\$1,596,000"/>	<input type="text" value="\$1,596,000"/>	<input type="text" value="\$"/>	<input type="text" value="\$"/>	<input type="text" value="\$"/>	<input type="text" value="\$"/>	<input type="text" value="\$"/>
<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:	Maybrook Substation Upgrades		
Form submitted by:	Dean Langseder		
Budget Group:	13 - Substations		
Summary Category:	Maintain System Standards		
Investment Category:	Growth		
Number of Customers Affected:			
For Category 15 only:	Budget Year Submitted		
	Project ID (District-YYYY-ID)		

## Description of Problem

The Montgomery and Maybrook area has experienced significant growth over the past decade. The Maybrook Substation transformers are approaching their firm ratings, and the four distribution circuits are running close to, at, or above their 6 MVA normal design criteria. As the economy is recovering, a number of larger industrial loads are coming on line, and a continued abundance of available land with proximity to I-84 will drive the continued growth of warehouses and the residential housing market in the long-term. This realized and potential growth has triggered the need to address the loading concerns in the area.

## Solution

Upgrade the Maybrook Substation by replacing the two 10 MVA transformers with two new 12 MVA (13.4 MVA) 69/13.8 kV transformers. Transfer the 10MVA transformers to the Montgomery 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="\$2,543,000"/>	<input type="text" value="\$2,519,000"/>	<input type="text" value="\$24,000"/>	<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

See below.

Or

Project Alternatives Considered

C. Ritacco, E.P. # 2011-012, "Montgomery/Maybrook Area Study" January 13, 2012.

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	<input type="text" value="Sand Dock Breaker and Door Replacements"/>		
Form submitted by:	<input type="text" value="Mason Mullamphy"/>		
Budget Group:	<input type="text" value="13 - Substations"/>		
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

Breakers have been identified for replacement in the Breaker Replacement Program for 2019.

## Solution

Replace ten 15 kV rollout circuits breakers and modernize existing relaying and switchgear doors.

**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="\$1,475,000"/>	<input type="text" value="\$504,000"/>	<input type="text" value="\$971,000"/>	<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:** Ivan Hojsak

**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>
<b>Capital</b>	<input type="text" value="\$3,036,000"/>	<input type="text" value="\$403,000"/>	<input type="text" value="\$2,234,000"/>	<input type="text" value="\$399,000"/>	<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

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. Six 115 kV circuit breakers and one 69 kV circuit breaker will be replaced along with Bus #1 and Bus #2 relays, Transformer #2 relays, RD Line 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>
<b>Capital</b>	<input type="text" value="\$1,798,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$959,000"/>	<input type="text" value="\$839,000"/>	<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

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name: Kerhonkson Substation Autotransformers

Form submitted by: Chris Gilbert

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 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>
<b>Capital</b>	<input type="text" value="\$4,921,000"/>	<input type="text" value="\$20,000"/>	<input type="text" value="\$3,157,000"/>	<input type="text" value="\$1,744,000"/>	<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

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:**

**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 12 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="\$1,717,000"/>	<input type="text" value="\$50,000"/>	<input type="text" value="\$930,000"/>	<input type="text" value="\$738,000"/>	<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

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 Montgomery transformer has reached the end of its useful life and requires replacement.

**Solution**

Remove existing 2 MVA 69/4.16 kV transformer at the Montgomery Substation and install two 10 MVA 69/13.8 kV transformers that were located previously at the Maybrook Substation. This work coincides with the distribution circuits upgrade from 4160 V to 13.8 kV.



**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="\$3,284,000"/>	<input type="text" value="\$252,000"/>	<input type="text" value="\$291,000"/>	<input type="text" value="\$2,741,000"/>	<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**

C. Ritacco, E.P. # 2011-012, "Montgomery-Maybrook Area Study" January 13, 2012

**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 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="\$8,493,000"/>	<input type="text" value="\$504,000"/>	<input type="text" value="\$486,000"/>	<input type="text" value="\$4,485,000"/>	<input type="text" value="\$3,018,000"/>	<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

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**

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="\$1,187,000"/>	<input type="text" value="\$50,000"/>	<input type="text" value="\$287,000"/>	<input type="text" value="\$797,000"/>	<input type="text" value="\$51,000"/>	<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

Project Name:	New Baltimore Add Second Transformer		
Form submitted by:	Mason Mullamphy		
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="\$1,362,000"/>	<input type="text" value="\$0"/>	<input type="text" value="\$50,000"/>	<input type="text" value="\$246,000"/>	<input type="text" value="\$1,016,000"/>	<input type="text" value="\$50,000"/>	<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

**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:	Tilcon Tap Station		
Form submitted by:	Chris Gilbert		
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 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="\$4,715,000"/>	<input type="text" value="\$201,000"/>	<input type="text" value="\$194,000"/>	<input type="text" value="\$748,000"/>	<input type="text" value="\$3,572,000"/>	<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**

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:	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 of 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.

### Solution

Replace the remaining Newburgh 14.4kV cables, as well as their associated infrastructure.

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

Type of estimate: Preliminary Estimate

	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Future
Capital	\$7,315,000	\$969,000	\$2,010,000	\$1,034,000	\$1,574,000	\$1,728,000	\$9,230,000
Expense							

**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

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	2018	
	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="\$10,846,000"/>	<input type="text" value="\$1,420,000"/>	<input type="text" value="\$1,957,000"/>	<input type="text" value="\$2,228,000"/>	<input type="text" value="\$2,099,000"/>	<input type="text" value="\$3,142,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**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:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2018	
	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="\$2,219,000"/>	<input type="text" value="\$199,000"/>	<input type="text" value="\$301,000"/>	<input type="text" value="\$776,000"/>	<input type="text" value="\$472,000"/>	<input type="text" value="\$471,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**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 of 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>
<b>Capital</b>	<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"/>
<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>	Circuit 2006 - Rebuild and Polyphase Route 9w - Schoharie Turnpike to Plank Road in Cocksackie, 3.3 Miles
<b>Form submitted by:</b>	Lawrence Saltis
<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> C-2017-01

### Description of Problem

The CSX access road to the double circuit parallel to the railroad tracks from Cocksackie to the Schoharie Turnpike in Athens will be eliminated when a second rail is installed during 2018. This will make patrolling and repairing of the circuitry difficult and time consuming.

### Solution

North Catskill circuit 2006 will be extended north along Route 9W from Leeds-Athens Road to the Schoharie Turnpike during 2018. Circuit 2006 can be extended an additional 3.3 miles north along Route 9W to Plank Road. This will provide the flexibility needed to switch should an outage occur to the double circuit parallel to the railroad tracks from Cocksackie to the Schoharie Turnpike in Athens.

**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="\$1,020,000"/>	<input type="text" value="\$1,020,000"/>	<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)  Elimination of CSX access road along off-road line
- ☐ 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:	Maintain System Standards
Investment Category:	Compliance
Number of Customers Affected:	Varies
For Category 15 only:	Budget Year Submitted 2018
	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 office broadband initiative, the volume of these projects is increasing significantly and can no longer be covered within the distribution improvement blankets.

### 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="\$6,154,000"/>	<input type="text" value="\$2,040,000"/>	<input type="text" value="\$1,507,000"/>	<input type="text" value="\$1,034,000"/>	<input type="text" value="\$1,049,000"/>	<input type="text" value="\$524,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**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	2018	
	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="\$5,073,000"/>	<input type="text" value="\$898,000"/>	<input type="text" value="\$1,045,000"/>	<input type="text" value="\$1,034,000"/>	<input type="text" value="\$1,049,000"/>	<input type="text" value="\$1,047,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**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 2018
	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="\$3,088,000"/>	<input type="text" value="607,000"/>	<input type="text" value="603,000"/>	<input type="text" value="620,000"/>	<input type="text" value="630,000"/>	<input type="text" value="628,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**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 2018
	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="\$1,289,000"/>	<input type="text" value="\$255,000"/>	<input type="text" value="\$251,000"/>	<input type="text" value="\$259,000"/>	<input type="text" value="\$262,000"/>	<input type="text" value="\$262,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**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 Enhancement		
Investment Category:	Infrastructure		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2018	
	Project ID (District-YYYY-ID)		

## Description of Problem

An aging infrastructure, an inefficient grid, rising energy costs, increased demand for uninterrupted service, clean energy goals, and increased adoption of technology (i.e. distributed generation and solar), 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="\$31,126,000"/>	<input type="text" value="\$6,732,000"/>	<input type="text" value="\$7,436,000"/>	<input type="text" value="\$9,823,000"/>	<input type="text" value="\$6,611,000"/>	<input type="text" value="\$524,000"/>	<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

**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

<b>Project Name:</b>	Distribution Improvement Blankets				
<b>Form submitted by:</b>	Chris Ritacco				
<b>Budget Group:</b>	15 - Distribution Improvements				
<b>Summary Category:</b>	Non-Discretionary				
<b>Investment Category:</b>	Daily Operations				
<b>Number of Customers Affected:</b>	Varies				
<b>For Category 15 only:</b>	<table><tr><td><b>Budget Year Submitted</b></td><td>2018</td></tr><tr><td><b>Project ID (District-YYYY-ID)</b></td><td></td></tr></table>	<b>Budget Year Submitted</b>	2018	<b>Project ID (District-YYYY-ID)</b>	
<b>Budget Year Submitted</b>	2018				
<b>Project ID (District-YYYY-ID)</b>					

### 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="\$46,399,000"/>	<input type="text" value="\$9,179,000"/>	<input type="text" value="\$9,044,000"/>	<input type="text" value="\$9,306,000"/>	<input type="text" value="\$9,445,000"/>	<input type="text" value="\$9,425,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**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	2018	
	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. 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="\$1,546,000"/>	<input type="text" value="\$306,000"/>	<input type="text" value="\$301,000"/>	<input type="text" value="\$310,000"/>	<input type="text" value="\$315,000"/>	<input type="text" value="\$314,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**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	2018	
	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="\$3,093,000"/>	<input type="text" value="\$612,000"/>	<input type="text" value="\$603,000"/>	<input type="text" value="\$620,000"/>	<input type="text" value="\$630,000"/>	<input type="text" value="\$628,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**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 Operating/Infrastructure		
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	2018	
	Project ID (District-YYYY-ID)	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.

## 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 aging 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="\$17,488,000"/>	<input type="text" value="\$2,519,000"/>	<input type="text" value="\$2,844,000"/>	<input type="text" value="\$3,927,000"/>	<input type="text" value="\$4,323,000"/>	<input type="text" value="\$3,875,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**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 - Reliability		
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	2018	
	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 electric service for Central Hudson's customers. The improvement in this category is focused primarily on the frequency of interruptions.

## 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="\$10,980,000"/>	<input type="text" value="\$1,453,000"/>	<input type="text" value="\$2,010,000"/>	<input type="text" value="\$2,275,000"/>	<input type="text" value="\$2,624,000"/>	<input type="text" value="\$2,618,000"/>	<input type="text" value="Varies"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**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 - Thermal/Voltage		
Form submitted by:	Chris Ritacco		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Maintain System Standards		
Investment Category:	Growth		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2018	
	Project ID (District-YYYY-ID)		

## 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="\$13,115,000"/>	<input type="text" value="\$2,353,000"/>	<input type="text" value="\$3,718,000"/>	<input type="text" value="\$2,327,000"/>	<input type="text" value="\$2,361,000"/>	<input type="text" value="\$2,356,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**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:	Non-Discretionary		
Investment Category:	Infrastructure		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2018	
	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 dramatically 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:

	<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="\$19,718,000"/>	<input type="text" value="\$2,652,000"/>	<input type="text" value="\$4,020,000"/>	<input type="text" value="\$4,136,000"/>	<input type="text" value="\$4,198,000"/>	<input type="text" value="\$4,712,000"/>	<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

**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:	Recloser 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	2018	
	Project ID (District-YYYY-ID)		

## 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="\$2,744,000"/>	<input type="text" value="\$357,000"/>	<input type="text" value="\$352,000"/>	<input type="text" value="\$672,000"/>	<input type="text" value="\$682,000"/>	<input type="text" value="\$681,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**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:	Conway Place - Beacon Infrastructure Improvements/Conversion (Phase IV of IV)		
Form submitted by:	Jennifer Paull		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:	1,070		
For Category 15 only:	Budget Year Submitted	2014	
	Project ID (District-YYYY-ID)	F-2014-03	

## Description of Problem

As per the Beacon Area Study completed in 2013, Beacon Substation exceeded its firm rating in recent years and the transformers at both Beacon and Conway Place Substations are nearing the end of their useful lives. With additional load growth on the horizon, a solution was developed to address both of these issues as well as to replace the aging infrastructure that is prevalent there. The ultimate goal is to convert the 4.16kV circuitry to 13.2kV, re-build/reclassify the local 14.4kV cables as 13.2kV and retire both Beacon and Conway Place Substations.

Phase I of this project was completed in 2013 to convert one load pocket previously fed by the 8087L and 803 circuits. Phase II was completed in 2014 to convert the remaining circuitry out of Beacon Substation to 13.2kV. Phase III, which is scheduled for completion in 2017, is to rebuild the BF Line as distribution circuit TD-8017 and take over load previously fed by the 801, 802 and 803 circuits.

## Solution

The last phase of this project is to complete conversion work for the 881 and 882 circuits out of Conway Place Substation. 1.5 miles of the NM line consist of paper and lead cable and must be rebuilt. It may then be combined with the CM line as a single distribution feeder (TD-8018) and take over load currently served by the 881 circuit. To avoid double-circuiting with the 8015 circuit, a normally-open point should be added near pole #134813 and the new TD-8018 circuit should feed the existing line off Wilkes Street up to the open point at pole #134827. The 8018 and 8051 will be double-circuited for several spans and continue down North Elm Street and up Oak Street to the existing normally-open point at pole #164667. The majority of the pole plant is in good condition. The 882 circuit should be converted and fed via the circuit replacing the BF cable (TD-8017) by closing the tie point at pole #P18149.

The final stage of Phase IV will be to convert portions of the 8015L and 8085L. The 8015L has 0.59 miles of three-phase which should be converted in order to create tie points with the 8018 at pole #P23259 and also the 8017 circuit at pole #P18169. The 8085L stepdown transformers at pole #121249 should be relocated to pole #134456. Afterwards, 0.24 miles of single phase and 0.62 miles of three-phase should be converted in order to create strong ties with the new 8017 circuit. Finally, an ALT team should be installed between the 8017 and 8018 circuits to maintain the current reliability level.

**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="\$1,116,000"/>	<input type="text" value="\$1,116,000"/>	<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

EP2013-008 Beacon Area Study

Or

Project Alternatives Considered

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

Project Name:	B, F, & R Cables		
Form submitted by:	N. Conza		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Maintain System Standards		
Investment Category:	Infrastructure		
Number of Customers Affected:			
For Category 15 only:	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

Project Name:	Union Avenue Circuit Exit Integration		
Form submitted by:	Ryan Yakush		
Budget Group:	15 - Distribution Improvements		
Summary Category:	System Enhancement		
Investment Category:	Infrastructure		
Number of Customers Affected:	18,432		
For Category 15 only:	Budget Year Submitted	2018	
	Project ID (District-YYYY-ID)	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="\$2,040,000"/>	<input type="text" value="\$2,040,000"/>	<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

Union Avenue Integration Study EP # 2017-09

Or

Project Alternatives Considered

Decision criteria for alternative selection



# Budget Submittal Form for Electric Projects

Project Name:	Overhead Secondary Replacement 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	2018	
	Project ID (District-YYYY-ID)		

## 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="\$1,031,000"/>	<input type="text" value="\$204,000"/>	<input type="text" value="\$201,000"/>	<input type="text" value="\$207,000"/>	<input type="text" value="\$210,000"/>	<input type="text" value="\$209,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**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>	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



## 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: 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>	\$2,003,000	\$204,000	\$754,000	\$259,000	\$262,000	\$524,000	
<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

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:	Relocation Blankets		
Form submitted by:	Chris Ritacco		
Budget Group:	15 - Distribution Improvements		
Summary Category:	Maintain System Standards		
Investment Category:	Compliance		
Number of Customers Affected:	Varies		
For Category 15 only:	Budget Year Submitted	2018	
	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="\$1,031,000"/>	<input type="text" value="\$204,000"/>	<input type="text" value="\$201,000"/>	<input type="text" value="\$207,000"/>	<input type="text" value="\$210,000"/>	<input type="text" value="\$209,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**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>	Road Rebuild Relocation Projects				
<b>Form submitted by:</b>	Chris Ritacco				
<b>Budget Group:</b>	15 - Distribution Improvements				
<b>Summary Category:</b>	Non-Discretionary				
<b>Investment Category:</b>	Compliance				
<b>Number of Customers Affected:</b>	Varies				
<b>For Category 15 only:</b>	<table><tr><td><b>Budget Year Submitted</b></td><td>2018</td></tr><tr><td><b>Project ID (District-YYYY-ID)</b></td><td>1531-0X</td></tr></table>	<b>Budget Year Submitted</b>	2018	<b>Project ID (District-YYYY-ID)</b>	1531-0X
<b>Budget Year Submitted</b>	2018				
<b>Project ID (District-YYYY-ID)</b>	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="\$3,867,000"/>	<input type="text" value="\$765,000"/>	<input type="text" value="\$754,000"/>	<input type="text" value="\$776,000"/>	<input type="text" value="\$787,000"/>	<input type="text" value="\$785,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**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:	URD 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	2018	
	Project ID (District-YYYY-ID)		

## Description of Problem

Many of the aged underground residential developments (URDs) are beginning to experience underground cable failures. When URD faults occur, they are particularly harmful to reliability due to the normally high customer count and extensive repair times.

## Solution

Central Hudson continues to pro-actively monitor and address URD replacements on a targeted basis. Aging URDs with higher customer counts or where multiple faults have occurred previously are primarily targeted in order to maximize the reliability improvement. The program will begin 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>
<b>Capital</b>	<input type="text" value="\$3,914,000"/>	<input type="text"/>	<input type="text" value="\$784,000"/>	<input type="text" value="\$1,034,000"/>	<input type="text" value="\$1,049,00"/>	<input type="text" value="\$1,047,000"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>	<input type="text" value="Varies"/>

**Cost Risks**

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

**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**

The use Imcorp's cable testing program is being evaluated for a more targeted replacement approach.

**Decision criteria for alternative selection**

## **GAS PROGRAM INDIVIDUAL PROJECT SUBMITTAL FORMS**



# Budget Submittal Form for Gas Projects

Project Name:	Mahopac Gate Station Rebuild Inlet Infrastructure Project 22-10
Form submitted by:	Tera Stoner
Recommended In-Service Year:	2018
Budget Group:	22 - Transmission
Summary Category:	System Enhancement
Investment Category:	Infrastructure
Number of Customers Affected:	0

## Description of Problem

Gas system:	MP Line
Gas pressure:	750 psi
Existing pipe size and material:	various
Proposed length replacement:	uncertain

Spectra Energy may increase the MAOP rating of their infrastructure in 2018. To coincide with these changes, the inlet piping at the Mahopac Gate Station will also likely need to be rated for higher MAOP. It was previously identified the heater at the station was intended for replacement in the near future.

## Solution

Proposed size:	uncertain
----------------	-----------

**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="\$1,026,000"/>	<input type="text" value="\$1,026,000"/>	<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"/>	<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:	AH Line Valves, Project 22-3
Form submitted by:	Tera Stoner
Recommended In-Service Year:	2018 through 2022
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
----------------	-----------

See above.

**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="\$2,491,000"/>	<input type="text" value="\$308,000"/>	<input type="text" value="\$302,000"/>	<input type="text" value="\$320,000"/>	<input type="text" value="\$694,0000"/>	<input type="text" value="\$867,000"/>	<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
- ☐ 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:	Remote Operated Valves, Project 22-4
Form submitted by:	Tera Stoner
Recommended In-Service Year:	2018 through 2022
Budget Group:	22 - Transmission
Summary Category:	System Enhancement
Investment Category:	Infrastructure
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
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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: 

	<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="\$2,792,000"/>	<input type="text" value="\$528,000"/>	<input type="text" value="\$515,000"/>	<input type="text" value="\$309,000"/>	<input type="text" value="\$714,000"/>	<input type="text" value="\$726,000"/>	<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
- ☐ 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 was 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.





# Budget Submittal Form for Gas Projects

Project Name:	Pig Launching Station for Internal Line Inspection, Project 22-9
Form submitted by:	Tera Stoner
Recommended In-Service Year:	2018 through 2022
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
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Each scenario will have to be analyzed separately given the internal inspection tool required.

**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="\$1,375,000"/>	<input type="text" value="\$ 0"/>	<input type="text" value="\$403,000"/>	<input type="text" value="\$412,000"/>	<input type="text" value="\$426,000"/>	<input type="text" value="\$434,000"/>	<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
- ☐ 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:	2018 through 2022
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.

## Solution

Proposed size:	uncertain
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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>
<b>Capital</b>	<input type="text" value="\$1,570,000"/>	<input type="text" value="\$309,000"/>	<input type="text" value="\$303,000"/>	<input type="text" value="\$310,000"/>	<input type="text" value="\$321,000"/>	<input type="text" value="\$327,000"/>	<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
- ☐ 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

1950-present 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: 2018

Budget Group: 23 - Regulator Stations

Summary Category: System Enhancement

Investment Category: Infrastructure

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. This rebuild must also coincide with remediation work of the former MGP site. Initial discussion with Environmental Services may require the station to be relocated to the eastern edge of the gas regulator yard to allow for remediation work to be conducted clear of piping. However, it may be more appropriate to relocate the station completely to the upper tier. 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: 

	<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="\$1,529,000"/>	<input type="text" value="\$ 0"/>	<input type="text" value="\$ 0"/>	<input type="text" value="\$783,000"/>	<input type="text" value="\$746,000"/>	<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
- ☒ 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**

As the work scope of this project shall be done in conjunction with the former MGP Site Remediation and MP Line - TP Line interconnect adjustment. Station layout and construction sequence will be analyzed to minimize any service interruption to the PN Line.

**Decision criteria for alternative selection**



# Budget Submittal Form for Gas Projects

Project Name:	Regulator Station Rebuild - Build New Distribution Improvement, Project 23-27
Form submitted by:	Tera Stoner
Recommended In-Service Year:	2022
Budget Group:	23 - Regulator Stations
Summary Category:	System Enhancement
Investment Category:	Infrastructure
Number of Customers Affected:	0

## Description of Problem

Gas system:	various
Gas pressure:	various
Existing pipe size and material:	various
Proposed length replacement:	various

Funds are reserved for the reconstruction of an existing regulator station or constructing a new regulator station. These projects are to keep pace with improvements to the natural gas distribution system by Distribution Improvement Projects or Leak Prone Pipe Replacement Projects.

## Solution

Proposed size:	uncertain
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Each situation will be analyzed uniquely as there will be various load and pressure variables and location characteristics to consider. In some situations, new property may need to be purchased.

**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="\$1,078,000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="\$1,078,000"/>	<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:	Carmel SM Line Gas Reinforcement
Form submitted by:	K. Reer
Recommended In-Service Year:	2018
Budget Group:	25 - Distribution Improvements
Summary Category:	Maintain System Standards
Investment Category:	Growth
Number of Customers Affected:	1,300

## Description of Problem

Gas system:	SM
Gas pressure:	120 Psig
Existing pipe size and material:	None - Reinforcement Loop
Proposed length replacement:	Install 20,500 feet of 10 inch steel main

The Carmel and Lake Mahopac area is currently supplied by a radially configured 6 inch plastic main. The system has a single supply point; the Stillwater Road Gas Regulator Station. Growth on the system has been substantial since its construction in 1988 and has been steady over the past 5 years. Recorded pressures and planning models show that the line is at or over its rated capacity.

## Solution

Proposed size:	Install 20500 feet of 120 psig 10 inch steel and a transmission regulator station
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This solution will serve anticipated load growth out to the end of a planning horizon of 25 years, while providing redundancy to the system supply assuring system reliability. Service and buildout of Stoneleigh Woods, Hillcrest Commons, Carmel Retreat and a 50 unit residential complex at the old Homeland Security Training Facility will be assured. In service data is expected to be November 1, 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="\$4,636,000"/>	<input type="text" value="\$4,636,000"/>	<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" 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 4 different line routes, initiating a gas supply moratorium, and building a compressed natural gas decompression station at the north end of the system.

**Decision criteria for alternative selection**

The proposed project was the least cost alternative that provided the most benefit to the Mahopac area customers.



# 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:	System Enhancement
Investment Category:	Infrastructure
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="\$5,766,000"/>	<input type="text" value="\$100,000"/>	<input type="text" value="\$5,666,000"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Expense	<input type="text" 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:	2018 to 2022
Budget Group:	25 - Distribution Improvements
Summary Category:	Non-Discretionary
Investment Category:	Compliance
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 Company agrees to capital expenditures for the replacement or elimination of Leak Prone Pipe at a cost of \$1.4 million per mile for 2016; \$1.5 million per mile for 2017; and \$1.6 million per mile for 2018. The Company further agrees to the following targets for the replacement or elimination of Leak Prone Pipe: a) 13 miles for 2016; b) 14 miles for 2017; and c) 15 miles for 2018. The Company shall maintain the 2018 pipe target until such time as it is changed by the Commission."

## Solution

Proposed size:	This funding project is for Blankets and Service Replacement Limited Terms.
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2018: Service replacements - normal operational needs: \$1,820, Service replacements - associated with pipeline replacement work (LPP): \$6,914, Service replacements - isolated steel services: \$515, Blanket work orders - minor units; \$521. Total 2018 funding; \$9,770.

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

Type of estimate: Preliminary Estimate

	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Future
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:	2018 to 2022
Budget Group:	25 - Distribution Improvements
Summary Category:	Non-Discretionary
Investment Category:	Compliance
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

Central Hudson has an inventory of approximately 200 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 Company agrees to capital expenditures for the replacement or elimination of Leak Prone Pipe at a cost of \$1.4 million per mile for 2016; \$1.5 million per mile for 2017; and \$1.6 million per mile for 2018. The Company further agrees to the following targets for the replacement or elimination of Leak Prone Pipe: a) 13 miles for 2016; b) 14 miles for 2017; and c) 15 miles for 2018. The Company shall maintain the 2018 pipe target until such time as it is changed by the Commission."

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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2018: Roosevelt Park: \$4,847(k), South Wall St.: \$2,905, Mansion Violet Hamilton: \$3,073, Kingston and Wilbur Backyards: \$3,283, Cornwall 3 - Hasbrouck and Union Ave: \$2,570, North Clanceyville: \$2,105, East Newburgh Broadway to Third: \$1,978.

Projects for years 2019 to 2022 have been tentatively identified and required funding detail provided in the gas detail project 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>	\$175,304,000	\$30,482,000	\$31,279,000	\$34,839,000	\$38,950,000	\$39,753,000	\$240,000,000
<b>Expense</b>	\$3,250,000	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000	\$7,200,000

**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

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



**COMMON PROGRAM INDIVIDUAL PROJECT SUBMITTAL FORMS**



# 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="3,407,000"/>	<input type="text" value="1,657,000"/>	<input type="text" value="1,751,000"/>	<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:	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>
<b>Capital</b>	<input type="text" value="38,686,000"/>	<input type="text" value="9,258,000"/>	<input type="text" value="10,142,000"/>	<input type="text" value="6,536,000"/>	<input type="text" value="5,629,000"/>	<input type="text" value="7,121,000"/>	<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:	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="38,686,000"/>	<input type="text" value="9,258,000"/>	<input type="text" value="10,142,000"/>	<input type="text" value="6,536,000"/>	<input type="text" value="5,629,000"/>	<input type="text" value="7,121,000"/>	<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

--

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:	System Enhancement
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 late 2018 and the commissioning will occur in 2019.

The upgrade addresses replacement of end of life Windows operating systems and also addresses several OMS issues. First 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.

**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="\$3,241,000"/>	<input type="text" value="\$ 102,000"/>	<input type="text" value="\$3,138,000"/>	<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



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:	System Enhancement
Investment Category:	Daily Operations

## Description of Problem

The GE Joint Utility Maintenance Program was part of a 2012 initiative which provided six years of support, including 2 upgrades, for the Energy Management System (EMS.) With the expiration of this contract in 2018, the EMS will no longer have scheduled software/hardware upgrades. This critical control system requires latest security patches and updates to maintain strict compliance with the NERC Critical Infrastructure Protection standards and the existing system will be at end of life for workstations and some critical servers, meaning security patches will no longer be provided by vendors.

## Solution

An evaluation will be made of the existing GE/Alstom EMS solutions and all other available EMS alternatives. Based on this evaluation a determination will be made to either stay with a GE/Alstom solution or to replace the existing EMS with a new vendor. Evaluation of EMS systems will be completed in 2021 with the system updated or new EMS implemented 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="\$5,048,000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="\$ 119,000"/>	<input type="text" value="\$4,929,000"/>	<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 

Upgrading the EMS reduces the risk of declining reliability of the system critical to the monitoring and operation of the Electric and Gas Transmission systems. Additionally, maintaining updated hardware and software on the EMS allows for necessary security updates and patching to maintain strict compliance with the NERC Critical Infrastructure Protection Standards.
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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

	<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>	\$6,525,000	\$1,249,000	\$1,273,000	\$1,300,000	\$1,331,000	\$1,372,000	TBD
<b>Expense</b>	\$135,000	0	0	\$45,000	\$45,000	\$45,000	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

Project Name:	CIS / REV Modernization
Form submitted by:	Vicki Wheeler
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Daily Operations

## 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

	<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>	\$13,084,000	\$1,717,000	\$2,864,000	\$2,870,000	\$2,774,000	\$2,859,000	TBD
<b>Expense</b>							

**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

	<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>	\$2,719,000	\$520,000	\$530,000	\$542,000	\$555,000	\$572,000	
<b>Expense</b>							

**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:	Bill Redsign - OT Streamserve
Form submitted by:	Jordan Randall
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Daily Operations

## Description of Problem

Currently our bills have multiple inserts and are complex making it difficult for the customers to understand their billing and consumption information.

## Solution

Currently owned software that enables CH to develop and redesign an electronic and paper bill; the redesigned bill could be given to Kubra or any other print vendor for the paper mailings. Otherwise, based on the need to improve the overall look and flow of the bill coupled with new business models that translate to displaying new information on the bill, ensuring customers that their billing and consumption information is clear and digestible. Evaluation will be performed against other possible alternatives including leveraging Kubra to do the bill redesign.

**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>	\$1,657,000	\$520,000	\$636,000	\$162,000	\$166,000	\$172,000	
<b>Expense</b>							

**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
- ☐ 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 Framework
Form submitted by:	Jordan Randall
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Daily Operations

## Description of Problem

Existing aging technology makes it costly - in terms of time and money, to make changes that the regulators / customers expect in a timely manner.

## Solution

Fully implement SOA across entire application portfolio. 2017 continued with limited incremental progress, outer years investment to increase progress thru full implementation and will be continuous extension of portfolio. Proposing increased budget to continue progress on SOA and to retain knowledged resources / not to have a lost investment in anticipation of expanding this initiative.

**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>	\$6,160,000	\$937,000	\$1,220,000	\$1,300,000	\$1,331,000	\$1,372,000	
<b>Expense</b>							

**Cost Risks**

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

**Primary Project Objective** Service

**Benefits:**

**Economic**

- ☒ Reduced O&M
- ☐ Reduced Customer Bill
- ☒ Other Modular design allows changes to be made quickly compared to the older technologies

**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 (part of CIS)
- ☐ 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:	System Enhancement
Investment Category:	Daily Operations

### 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

	<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>	\$1,363,000	\$677,000	\$0	\$0	\$0	\$686,000	
<b>Expense</b>							

**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:	Clarity Replacement/Upgrades Enhancements
Form submitted by:	Jordan Randall
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Daily Operations

## 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

	<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>	\$1,363,000	\$677,000	\$0	\$0	\$0	\$686,000	
<b>Expense</b>							

**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:	Emergent Software Package/Upgrades
Form submitted by:	Jordan Randall
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Daily Operations

## 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

	<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>	\$6,368,000	\$625,000	\$1,061,000	\$1,300,000	\$1,553,000	\$1,830,000	
<b>Expense</b>							

**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:	Unified Comm. VOIP, IVR Upgrades/Enhancements & Extending Collaboration
Form submitted by:	Jordan Randall
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Daily Operations

## 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

	<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>	\$3,372,000	\$416,000	\$955,000	\$650,000	\$666,000	\$686,000	
<b>Expense</b>							

**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:	Vicki Wheeler
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
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

	<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>	\$6,332,00	\$1,327,000	\$1,352,000	\$1,381,000	\$1,415,000	\$858,000	TBD
<b>Expense</b>	\$135,000	0	0	\$45,000	\$45,000	\$45,000	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:	Vicki Wheeler
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

	<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>	\$2,179,000	\$437,000	\$583,000	\$596,000	\$277,000	\$286,000	TBD
<b>Expense</b>							

**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:	Nicole Tancredi
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>
<b>Capital</b>	<input type="text" value="\$11,026,000"/>	<input type="text" value="\$1,353,000"/>	<input type="text" value="\$2,333,000"/>	<input type="text" value="\$2,383,000"/>	<input type="text" value="\$2,441,000"/>	<input type="text" value="\$2,516,000"/>	<input type="text" value="TBD"/>
<b>Expense</b>	<input type="text" value="\$1,792,000"/>	<input type="text" value="0"/>	<input type="text" value="\$118,000"/>	<input type="text" value="\$338,000"/>	<input type="text" value="\$558,000"/>	<input type="text" value="\$778,000"/>	<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:	Business Agility with Enterprise SOA
Form submitted by:	Nicole Tancredi
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>
<b>Capital</b>	<input type="text" value="\$6,160,000"/>	<input type="text" value="\$937,000"/>	<input type="text" value="\$1,220,000"/>	<input type="text" value="\$1,300,000"/>	<input type="text" value="\$1,331,000"/>	<input type="text" value="\$1,372,000"/>	<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

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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:	Mainframe Bundled Releases
Form submitted by:	Nicole Tancredi
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Daily Operations

## 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>
<b>Capital</b>	<input type="text" value="\$1,631,000"/>	<input type="text" value="\$312,000"/>	<input type="text" value="\$318,000"/>	<input type="text" value="\$325,000"/>	<input type="text" value="\$333,000"/>	<input type="text" value="\$343,000"/>	<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

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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:	Power Plant Upgrade
Form submitted by:	Nicole Tancredi
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Daily Operations

## Description of Problem

In order to receive continued support, we need to continue to keep our version of PowerPlant current.

## Solution

An upgrade of the PowerPlant system will provide expected enhancements, extended functionality and will allow for continuation of vendor support.

**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="\$1,041,000"/>	<input type="text" value="\$1,041,000"/>	<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

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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 Enhancement
Investment Category:	Daily Operations

## 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>
<b>Capital</b>	<input type="text" value="\$2,310,000"/>	<input type="text" value="\$520,000"/>	<input type="text" value="\$742,000"/>	<input type="text" value="\$542,000"/>	<input type="text" value="\$277,000"/>	<input type="text" value="\$229,000"/>	<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:	EAM - Enterprise Asset Management
Form submitted by:	Surekha Jadhav
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Infrastructure

## Description of Problem

Our current EAM solution doesn't cover all assets.

## Solution

Exploration of a solution that will centrally improve overall asset management for T&D maintenace including warehouse management, materials management, workfore management, and overall asset maintenance.

**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="\$1,269,000"/>	<input type="text" value="\$416,000"/>	<input type="text" value="\$636,000"/>	<input type="text" value="\$217,000"/>	<input type="text" value="\$100,000"/>	<input type="text"/>	<input type="text"/>
<b>Expense</b>	<input type="text" value="\$300,000"/>	<input type="text"/>	<input type="text" value="\$40,000"/>	<input type="text" value="\$120,000"/>	<input type="text" value="\$140,000"/>	<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:	Emergency Management Software Upgrade
Form submitted by:	Surekha Jadhav
Budget Group:	42 - Office Equipment
Summary Category:	System Enhancement
Investment Category:	Infrastructure

## 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="\$1,571,000"/>	<input type="text" value="\$307,000"/>	<input type="text" value="\$345,000"/>	<input type="text" value="\$244,000"/>	<input type="text" value="\$333,000"/>	<input type="text" value="\$343,000"/>	<input type="text" value="TBD"/>
<b>Expense</b>	<input type="text" value="\$450,000"/>	<input type="text" value="0"/>	<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="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:	Surekha Jadhav
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>
<b>Capital</b>	<input type="text" value="\$1,550,000"/>	<input type="text" value="\$364,000"/>	<input type="text" value="\$345,000"/>	<input type="text"/>	<input type="text" value="\$555,000"/>	<input type="text" value="\$286,000"/>	<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

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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:	System Enhancement
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.

**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="\$2,121,000"/>	<input type="text" value="\$1,721,000"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="\$444,000"/>	<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

**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:	Surekha Jadhav
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>
<b>Capital</b>	<input type="text" value="\$1,092,000"/>	<input type="text" value="\$212,000"/>	<input type="text" value="\$212,000"/>	<input type="text" value="\$217,000"/>	<input type="text" value="\$222,000"/>	<input type="text" value="\$229,000"/>	<input type="text"/>
<b>Expense</b>	<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:	Network Strategy Project
Form submitted by:	Erica Tyler
Budget Group:	44 - Communication
Summary Category:	System Enhancement
Investment Category:	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. 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>	\$24,567,000	\$7,534,000	\$8,411,000	\$6,432,000	\$2,190,000	\$0	\$0
<b>Expense</b>	3,534,909	\$651,837	\$836,227	\$880,719	\$899,214	\$918,097	TBD

**Cost Risks**

- ☐ Environmental
- ☐ Timing/Permitting
- ☒ Manpower Limited manpower has slowed implementation, will increase as operational responsibilities grow
- ☐ Other

**Primary Project Objective** Service

**Benefits:**

**Economic**

- ☒ Reduced O&M operational costs are projected to decrease
- ☒ Reduced Customer Bill This project supports the DMS/DA implementation and resulting 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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## **DETAIL SCHEDULES 2018-2022 FORECAST**

ELECTRIC ADDITIONS						W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Growth vs. Sustaining	Discretion Level	Investment Type	Preliminary In-Service Date	2018	2019	2020	2021	2022	5-Year Total
Production	Hydro Minor Projects	G-Sustaining	Maintain Standards	Infrastructure	On-going	106	161	166	173	176	782
Production	GT Minor Projects	G-Sustaining	Maintain Standards	Infrastructure	On-going	106	161	166	173	176	782
Production	Sturgeon Pool Rotor Unit#2	G-Sustaining	Non Discretionary	Daily Operations	12/31/2018	670	-	-	-	-	670
Production	Sturgeon Pool Wet Section Unit#2	G-Sustaining	Non Discretionary	Daily Operations	12/31/2018	1,029	-	-	-	-	1,029
Production	Sturgeon Pool Wet Section Unit#3	G-Sustaining	Non Discretionary	Daily Operations	12/31/2019	-	1,062	-	-	-	1,062
Production	Dashville Rotor Unit#1	G-Sustaining	Non Discretionary	Daily Operations	12/31/2019	-	691	-	-	-	691
Production	Dashville Rotor Unit#2	G-Sustaining	Non Discretionary	Daily Operations	12/31/2020	-	-	714	-	-	714
Production	Sturgeon Pool Dam Camara System	G-Sustaining	Non Discretionary	Compliance	12/31/2020	-	-	222	-	-	222
Production	High Falls Facility Camara System	G-Sustaining	Non Discretionary	Daily Operations	12/31/2020	-	-	222	-	-	222
Production	Dashville Facility Camara System	G-Sustaining	Non Discretionary	Daily Operations	12/31/2021	-	-	-	230	-	230
Production	Dashville Rubber Gate Replacement	G-Sustaining	Non Discretionary	Daily Operations	12/31/2021	-	-	55	925	-	980
Production	Hydro SCADA - New Com Link	G-Sustaining	Non Discretionary	Daily Operations	12/31/2021	-	-	-	138	-	138
Production	Dashville Remote Start	G-Sustaining	Non Discretionary	Compliance	12/31/2022	-	-	-	-	288	288
Production	Dashville Window Replacements	G-Sustaining	Maintain Standards	Infrastructure	12/31/2022	-	-	-	-	358	358
Production	Sturgeon Pool Window Replacements	G-Sustaining	Maintain Standards	Infrastructure	12/31/2022	-	-	-	-	449	449
Production	Subtotal - Electric Production					1,911	2,075	1,545	1,639	1,448	8,618
Transmission	High Priority Replacements	T-Sustaining	Non Discretionary	Compliance	On-going	5,323	6,111	4,756	4,752	4,282	25,224
Transmission	Transmission Minor Projects	T-Sustaining	Non Discretionary	Daily Operations	On-going	228	230	245	271	246	1,220
Transmission	- FK Line (Kerhonkson - High Falls) - OPGW	T-Sustaining	Maintain Standards	Infrastructure	12/31/2019	-	1,088	-	-	-	1,088
Transmission	- P Line (High Falls - Sturgeon Pool) - OPGW	T-Sustaining	Maintain Standards	Infrastructure	12/31/2019	-	656	-	-	-	656
Transmission	- MK or HK Line (Honk Falls - Kerhonkson) - OPGW	T-Sustaining	Maintain Standards	Infrastructure	12/31/2019	-	544	-	-	-	544
Transmission	- MG Line (Modena - Galeville) - OPGW	T-Sustaining	Maintain Standards	Infrastructure	12/31/2020	-	504	530	-	-	1,034
Transmission	- WH Line (Neversink Tap - Neversink)	T-Sustaining	Maintain Standards	Infrastructure	12/31/2021	-	-	-	939	-	939
Transmission	ROW Repair Project (Deficiencies)	T-Sustaining	Maintain Standards	Risk Reduction	On-going	600	1,162	1,258	1,355	-	4,375
Transmission	ACSR Conductor Replacement Program, WH1 and WH2 Lines - Part 102C: 13.8 miles each	T-Sustaining	Maintain Standards	Infrastructure	12/31/2017	20	-	-	-	-	20
Transmission	G Line - North Section - 7.83 miles at 69 kV	T-Sustaining	Maintain Standards	Infrastructure	07/31/2018	6,613	-	-	-	-	6,613
Transmission	EF Line: 115kV Line Rebuild - East Fishkill - Shenandoah	T-Sustaining	Non Discretionary	Compliance	09/30/2018	2,468	-	-	-	-	2,468
Transmission	HR/DR Bulkhead	T-Sustaining	Maintain Standards	Infrastructure	12/01/2018	987	-	-	-	-	987
Transmission	A & C Lines - Article VII Environmental Monitoring	T-Sustaining	Maintain Standards	Infrastructure	06/30/2016	10	-	-	-	-	10
Transmission	CL Line: 69kV Line Rebuild - North Catskill - Cairo	T-Sustaining	Non Discretionary	Compliance	12/01/2019	2,270	8,062	51	-	-	10,384
Transmission	Honk Falls Substation Tie-in (Kerhonkson Autotransformers)	T-Sustaining	Maintain Standards	Infrastructure	12/01/2020	-	50	206	-	-	256
Transmission	ACSR Conductor Replacement Program, FV - Part 102C	T-Sustaining	Maintain Standards	Infrastructure	12/01/2020	-	-	1,655	-	-	1,655
Transmission	Knapps Corners Substation Tie-in (115kV KB & SK Lines)	T-Sustaining	Maintain Standards	Infrastructure	06/01/2021	-	-	103	165	-	268
Transmission	Trap Rock Substation Tie-in and TR Line retirement	T-Sustaining	Maintain Standards	Infrastructure	06/01/2021	-	-	109	116	-	226
Transmission	69kV KM Line Rebuild - Knapps to Myers - 102C	T-Sustaining	Maintain Standards	Infrastructure	12/01/2021	247	252	4,120	1,208	-	5,827
Transmission	69kV TV Line Rebuild - Myers to North Chelsea - 102C	T-Sustaining	Maintain Standards	Infrastructure	12/01/2021	247	252	1,030	4,503	-	6,032
Transmission	SB Line: New 115kV Line - Hurley Ave. to Saugerties - Article VII: 11.11 miles	T-Sustaining	Maintain Standards	Infrastructure	12/01/2021	247	407	7,210	8,128	268	16,259
Transmission	H Line: New 115kV Line - Saugerties to N.Catskill - Article VII: 12.25 miles	T-Sustaining	Maintain Standards	Infrastructure	12/01/2022	247	407	412	2,197	14,183	17,446
Transmission	Subtotal - Electric Transmission					19,506	19,726	21,686	23,635	18,979	103,532
Substation	Substation Minor Projects	D-Sustaining	Non Discretionary	Daily Operations	On-going	553	479	503	518	518	2,572
Substation	Substation Battery Replacement Program	D-Sustaining	Maintain Standards	Infrastructure	On-going	96	24	25	70	39	255
Substation	ESP Infrastructure Repl. (relays, meters, data transfer equip, etc.).	D-Sustaining	Maintain Standards	Infrastructure	On-going	1,893	3,050	1,695	2,621	5,334	14,593
Substation	Generation 1 Relay Replacement Program	D-Sustaining	Maintain Standards	Infrastructure	On-going	201	-	-	-	-	201
Substation	RTU Replacement Program	D-Sustaining	Maintain Standards	Infrastructure	On-going	121	253	618	91	790	1,871
Substation	Breaker Replacement Program (345kV)	D-Sustaining	Maintain Standards	Infrastructure	On-going	-	728	748	755	-	2,231
Substation	Breaker Replacement Program (115kV, 69kV, 13.8kV)	D-Sustaining	Maintain Standards	Infrastructure	On-going	957	2,474	1,232	221	385	5,269
Substation	345kV Switch Replacement Program	T-Sustaining	Maintain Standards	Infrastructure	On-going	613	575	604	621	592	3,004
Substation	115kV Switch Replacement Program	T-Sustaining	Maintain Standards	Infrastructure	On-going	-	486	503	547	740	2,276
Substation	DA Program LTC Automation	D-Sustaining	System Enhancements	Customer Benefit	On-going	630	-	-	-	-	630
Substation	Transformer Condition-based Replacements	D-Sustaining	Maintain Standards	Infrastructure	Future	-	-	-	3,270	3,701	6,971
Substation	Switchgear Condition-based Replacements	D-Sustaining	Maintain Standards	Infrastructure	Future	-	-	-	1,258	4,441	5,699
Substation	Montgomery Street - Transformer Replacements	D-Sustaining	Maintain Standards	Infrastructure	12/31/2017	50	-	-	-	-	50
Substation	Reynolds Hill - Transformer Replacements	D-Sustaining	Maintain Standards	Infrastructure	12/01/2017	20	-	-	-	-	20
Substation	Todd Hill ("G" line 115kV - Add 115/69kV Tr and 69kV Bkr)	D-Sustaining	Maintain Standards	Infrastructure	03/01/2018	756	-	-	-	-	756
Substation	Union Avenue - Station Upgrade (New Switchgear)	D-Sustaining	Maintain Standards	Infrastructure	06/01/2018	1,083	-	-	-	-	1,083
Substation	Coldenham Substation Modernization	D-Sustaining	Maintain Standards	Infrastructure	06/01/2018	1,007	-	-	-	-	1,007

ELECTRIC ADDITIONS						W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Growth vs. Sustaining	Discretion Level	Investment Type	Preliminary In-Service Date	2018	2019	2020	2021	2022	5-Year Total
Substation	Rock Tavern J Line (DLP Replacement)	D-Sustaining	Maintain Standards	Infrastructure	06/01/2018	141	-	-	-	-	141
Substation	East Walden CW Line (DLP & E/M Replacements)	D-Sustaining	Maintain Standards	Infrastructure	06/01/2018	141	-	-	-	-	141
Substation	Boulevard - Transformer Replacements	D-Sustaining	Maintain Standards	Infrastructure	12/01/2018	3,880	-	-	0	-	3,880
Substation	Hurley Ave 115kV Substation Modernization	D-Sustaining	Maintain Standards	Infrastructure	12/01/2018	1,596	-	-	-	-	1,596
Substation	Maybrook - Substation Upgrades (2 New 12 MVA 69-13.8kV Transformers)	D-Sustaining	Maintain Standards	Study Based Load G	12/30/2018	2,519	24	-	-	-	2,543
Substation	Honk Falls Breaker Replacements	D-Sustaining	Maintain Standards	Infrastructure	12/01/2018	504	-	-	-	-	504
Substation	North Chelsea - Single Phase Transformers Replacement	D-Sustaining	Maintain Standards	Infrastructure	06/30/2019	50	291	-	-	-	342
Substation	Sand Dock - Breaker & Door Replacements	D-Sustaining	Maintain Standards	Infrastructure	06/01/2019	504	971	-	-	-	1,475
Substation	Woodstock - Switchgear Replacement	D-Sustaining	Maintain Standards	Infrastructure	12/01/2019	403	2,234	399	-	-	3,036
Substation	Rock Tavern 115kV Modernization	D-Sustaining	Maintain Standards	Infrastructure	06/01/2020	-	959	839	-	-	1,798
Substation	Hurley Ave. SDU Utility 25%	D-Sustaining	Maintain Standards	Infrastructure	06/01/2019	-	-	-	-	-	-
Substation	Kerhonkson Autotransformers (formerly New Honk Falls Sub)	D-Sustaining	Maintain Standards	Infrastructure	03/31/2020	20	3,157	1,744	-	-	4,921
Substation	Modena - Add 3rd Bkr to complete 115kV Ring Bus (see P&MK memo)	D-Sustaining	System Enhancements	Reliability	06/01/2020	-	97	199	-	-	296
Substation	Terminal upgrade work for 115kV (High Falls, Galeville, Sturgeon Pool, and Modena)	D-Sustaining	Maintain Standards	Infrastructure	12/01/2020	-	-	199	-	-	199
Substation	Honk Falls Bus Tie (69kV Bus reconfiguration)	D-Sustaining	Maintain Standards	Infrastructure	12/01/2020	-	194	-	-	-	194
Substation	Stanfordville - Replace Transformer (12MVA)	D-Sustaining	Maintain Standards	Infrastructure	06/01/2020	50	930	738	-	-	1,717
Substation	Montgomery - Transformer Replacement (Reuse one 12MVA from Maybrook)	D-Sustaining	Maintain Standards	Infrastructure	06/01/2020	252	291	2,741	-	-	3,284
Substation	Knappps Corners - New Substation	D-Sustaining	Maintain Standards	Infrastructure	06/01/2021	504	486	4,485	3,018	-	8,493
Substation	Greenfield Rd. - Substation Upgrade (Reuse Kerhonkson xfmr )	D-Sustaining	Maintain Standards	Infrastructure	12/01/2020	50	287	797	51	-	1,187
Substation	New Baltimore - Add 12MVA Transformer (Reuse a bank or buy new)	D-Sustaining	Maintain Standards	Infrastructure	12/01/2021	-	50	246	1,016	50	1,362
Substation	Tilcon - Tap Station	T-Sustaining	Maintain Standards	Infrastructure	06/01/2021	201	194	748	3,572	-	4,715
Substation	Sand Dock - Add Breaker For Tilcon	D-Sustaining	Maintain Standards	Infrastructure	06/01/2019	50	194	-	-	-	245
Substation	Subtotal - Electric Substation					18,846	18,428	19,064	17,629	16,591	90,557
New Business	New Business	D-Growth	Non Discretionary	New Business	On-going	1,764	1,673	1,757	1,817	1,809	8,820
New Business	New Business - Blanket OH	D-Growth	Non Discretionary	New Business	On-going	3,988	3,783	3,973	4,109	4,089	19,942
New Business	New Business - Blanket URD Combo	D-Growth	Non Discretionary	New Business	On-going	736	698	733	758	754	3,679
New Business	New Business - Blanket URD	D-Growth	Non Discretionary	New Business	On-going	109	104	109	112	112	546
New Business	Subtotal - Electric New Business					6,597	6,258	6,572	6,797	6,764	32,987
Distribution	Distribution Improvement Blankets (15BL-01)	D-Sustaining	Non Discretionary	Daily Operations	On-going	9,179	9,044	9,306	9,445	9,425	46,399
Distribution	Relocation Blankets (15BL-02)	D-Sustaining	Non Discretionary	Compliance	On-going	204	201	207	210	209	1,031
Distribution	Distribution Improvement Minors (1511-0X)	D-Sustaining	Non Discretionary	Infrastructure	On-going	612	603	620	630	628	3,093
Distribution	Distribution Improvement Conversions (1521-0X)	D-Growth	Non Discretionary	Infrastructure	On-going	306	301	310	315	314	1,547
Distribution	Road/Bridge Rebuild Relocation Projects (1531-0X)	D-Sustaining	Non Discretionary	Compliance	On-going	765	754	776	787	785	3,867
Distribution	CATV Make-ready	D-Sustaining	Non Discretionary	Compliance	On-going	2,040	1,507	1,034	1,049	524	6,154
Distribution	Distribution Improvement (1551-0X) - Thermal / Voltage	D-Growth	Non Discretionary	Study Based Load G	On-going	2,353	3,718	2,327	2,361	2,356	13,115
Distribution	Distribution Improvement (1551-0X) - Reliability	D-Sustaining	Non Discretionary	Infrastructure	On-going	1,453	2,010	2,275	2,624	2,618	10,980
Distribution	CEMI/Worst Circuit Reliability Program	D-Sustaining	Non Discretionary	Infrastructure	On-going	898	1,045	1,034	1,049	1,047	5,073
Distribution	Cutout Replacement Program - lower threshold	D-Sustaining	Non Discretionary	Infrastructure	On-going	255	251	259	262	262	1,289
Distribution	Distribution Improvement (1551-0X) - Operating/ Infrastructure	D-Sustaining	Non Discretionary	Infrastructure	On-going	2,519	2,844	3,927	4,323	3,875	17,488
Distribution	5kV Aerial Cable Replacement Program	D-Sustaining	Non Discretionary	Infrastructure	On-going	199	301	776	472	471	2,219
Distribution	Overhead Secondary Replacement Program	D-Sustaining	Non Discretionary	Infrastructure	On-going	204	201	207	210	209	1,031
Distribution	Distribution Pole Replacement Program	D-Sustaining	Non Discretionary	Infrastructure	On-going	2,652	4,020	4,136	4,198	4,712	19,718
Distribution	Copper Wire Replacement Program	D-Sustaining	Non Discretionary	Infrastructure	On-going	607	603	620	630	628	3,088
Distribution	4800 V Conversion/Infrastructure Program	D-Sustaining	Non Discretionary	Infrastructure	On-going	1,420	1,957	2,228	2,099	3,142	10,845
Distribution	14.4 kV Cable Rejuvenation	D-Sustaining	Non Discretionary	Infrastructure	On-going	969	2,010	1,034	1,574	1,728	7,315
Distribution	Oil Switch Replacement	D-Sustaining	Non Discretionary	Infrastructure	On-going	102	100	103	105	105	516
Distribution	CE Mesh / Protector Relays	D-Sustaining	Non Discretionary	Infrastructure	On-going	122	90	124	126	126	589
Distribution	Secondary Network Upgrade Program (All Districts)	D-Sustaining	Non Discretionary	Infrastructure	On-going	204	754	259	262	524	2,002
Distribution	URD replacement	D-Sustaining	Non Discretionary	Infrastructure	On-going	-	784	1,034	1,049	1,047	3,914
Distribution	801/802/803/881/882 - Beacon Area (Ph 4 of 4)	D-Sustaining	Non Discretionary	Infrastructure	12/01/2017	1,166	-	-	-	-	1,166
Distribution	Maybrook Substation Circuit Exits	D-Sustaining	Non Discretionary	Study Based Load G	12/01/2018	816	-	-	-	-	816
Distribution	Montgomery Substation Circuit Exits	D-Sustaining	Non Discretionary	Infrastructure	06/01/2020	-	301	-	-	-	301
Distribution	Boulevard Substation Integration	D-Sustaining	Non Discretionary	Infrastructure	12/01/2018	612	-	-	-	-	612
Distribution	Union Avenue Integration	D-Sustaining	Non Discretionary	Infrastructure	06/01/2018	2,040	-	-	-	-	2,040
Distribution	Stanfordville Integration	D-Sustaining	Non Discretionary	Infrastructure	06/01/2019	-	402	-	-	-	402

ELECTRIC ADDITIONS						W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Growth vs. Sustaining	Discretion Level	Investment Type	Preliminary In-Service Date	2018	2019	2020	2021	2022	5-Year Total
Distribution	Greenfield Road Substation Integration	D-Sustaining	Non Discretionary	Infrastructure	12/01/2020	-	-	931	-	-	931
Distribution	Clinton Avenue Retirement	D-Sustaining	Non Discretionary	Infrastructure	12/01/2021	-	-	-	420	-	420
Distribution	Knapps Corners circuit exits	D-Sustaining	Non Discretionary	Infrastructure	06/01/2020	-	-	827	-	-	827
Distribution	Coxsackie Circuit exits	D-Sustaining	Non Discretionary	Infrastructure	12/31/2019	-	603	-	-	-	603
Distribution	New Baltimore Circuit exits	D-Sustaining	Non Discretionary	Infrastructure	12/01/2020	-	-	465	-	-	465
Distribution	Distribution Automation - Major Program	D-Sustaining	Non Discretionary	Infrastructure	On-going	6,732	7,436	9,823	6,611	524	31,126
Distribution	Electronic Recloser Replacement Program	D-Sustaining	Non Discretionary	Infrastructure	On-going	357	352	672	682	681	2,744
Distribution	Distribution Automation - ALT Program	D-Sustaining	Non Discretionary	Infrastructure	On-going	255	251	-	-	-	506
Distribution	Subtotal - Electric Distribution Improvements					39,040	42,445	45,313	41,493	35,940	204,231
Transformer	Transformers - New Business	D-Sustaining	Non Discretionary	New Business	On-going	5,095	5,619	5,944	5,912	5,667	28,237
Transformer	Capacitors	D-Sustaining	Non Discretionary	Infrastructure	On-going	147	150	153	156	111	718
Transformer	Regulators	D-Sustaining	Non Discretionary	Infrastructure	On-going	911	929	949	734	402	3,926
Transformer	Network Protectors	D-Sustaining	Non Discretionary	Infrastructure	On-going	44	45	46	47	48	229
Transformer	Subtotal - Electric Transformers					6,197	6,743	7,092	6,849	6,227	33,109
Meter	X041A - Special Meter Installations	D-Sustaining	Non Discretionary	Compliance	On-going	158	161	164	162	171	817
Meter	X042A - Instrument Transformers	D-Sustaining	Non Discretionary	Compliance	On-going	269	273	279	285	290	1,395
Meter	X043A - Electric Meters	D-Sustaining	Non Discretionary	New Business	On-going	2,595	2,637	2,695	2,750	2,803	13,480
Meter	Subtotal - Electric Meters					3,022	3,071	3,138	3,197	3,264	15,691
	Total - Electric					95,118	98,746	104,409	101,240	89,212	488,726

GAS ADDITIONS						W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Growth vs. Sustaining	Discretion Level	Investment Type	Preliminary In-Service Date	2018	2019	2020	2021	2022	5-Year Total
Transmission	Prior Year Projects	D-Sustaining	Maintain Standards	Infrastructure	12/01/2018	26	-	-	-	-	26
Transmission	Cathodic Test Stations	D-Sustaining	Maintain Standards	Infrastructure	12/01/2018	36	-	-	-	-	36
Transmission	Pipeline Integrity	D-Sustaining	Maintain Standards	Infrastructure	12/01/2018	309	-	-	-	-	309
Transmission	Remote Operated Valves	D-Sustaining	System Enhancements	Risk Reduction	12/01/2018	528	-	-	-	-	528
Transmission	Mahopac Gate Station Rebuild Inlet Infrastructure	D-Sustaining	System Enhancements	Reliability	12/01/2018	1,026	-	-	-	-	1026
Transmission	Gas Chromatographs	D-Sustaining	System Enhancements	Customer Benefit	12/01/2018	103	-	-	-	-	103
Transmission	AH Line Valve #1 Replacement	D-Sustaining	Maintain Standards	Infrastructure	12/01/2018	308	-	-	-	-	308
Transmission	TP Rose Place TP Line Replacement	D-Sustaining	Maintain Standards	Infrastructure	12/01/2018	308	-	-	-	-	308
Transmission	New MP-2A Line Valve	T-Growth	System Enhancements	Risk Reduction	12/01/2018	308	-	-	-	-	308
Transmission	Prior Year Projects	T-Sustaining	Maintain Standards	Infrastructure	12/01/2019	-	25	-	-	-	25
Transmission	Cathodic Test Stations	T-Sustaining	Maintain Standards	Infrastructure	12/01/2019	-	35	-	-	-	35
Transmission	Pipeline Integrity	T-Sustaining	Maintain Standards	Infrastructure	12/01/2019	-	303	-	-	-	303
Transmission	Remote Operated Valves	T-Sustaining	System Enhancements	Risk Reduction	12/01/2019	-	515	-	-	-	515
Transmission	Pig Launching Station(s) for Internal Line Inspection	T-Sustaining	Maintain Standards	Infrastructure	12/01/2019	-	403	-	-	-	403
Transmission	AH Line Valve #2 Replacement	T-Sustaining	Maintain Standards	Infrastructure	12/01/2019	-	302	-	-	-	302
Transmission	Gas Chromatographs	T-Sustaining	System Enhancements	Customer Benefit	12/01/2019	-	101	-	-	-	101
Transmission	Prior Year Projects	T-Sustaining	Maintain Standards	Infrastructure	12/01/2020	-	-	26	-	-	26
Transmission	Cathodic Test Stations	T-Sustaining	Maintain Standards	Infrastructure	12/01/2020	-	-	36	-	-	36
Transmission	Pipeline Integrity	T-Sustaining	Maintain Standards	Infrastructure	12/01/2020	-	-	310	-	-	310
Transmission	Remote Operated Valves	T-Sustaining	System Enhancements	Risk Reduction	12/01/2020	-	-	309	-	-	309
Transmission	AH Line Valve #3 Replacement	T-Sustaining	Maintain Standards	Infrastructure	12/01/2020	-	-	320	-	-	320
Transmission	Pig Launching Station(s) for Internal Line Inspection	T-Sustaining	Maintain Standards	Infrastructure	12/01/2020	-	-	412	-	-	412
Transmission	Gas Chromatographs	T-Sustaining	System Enhancements	Customer Benefit	12/01/2020	-	-	104	-	-	104
Transmission	Prior Year Projects	T-Sustaining	Maintain Standards	Infrastructure	12/01/2021	-	-	-	27	-	27
Transmission	Cathodic Test Stations	T-Sustaining	Maintain Standards	Infrastructure	12/01/2021	-	-	-	38	-	38
Transmission	Pipeline Integrity	T-Sustaining	Maintain Standards	Infrastructure	12/01/2021	-	-	-	321	-	321
Transmission	Remote Operated Valves	T-Sustaining	System Enhancements	Risk Reduction	12/01/2021	-	-	-	714	-	714
Transmission	AH Line Valve #4 Replacement	T-Sustaining	Maintain Standards	Infrastructure	12/01/2021	-	-	-	347	-	347
Transmission	AH Line Valve #5 Replacement	T-Sustaining	Maintain Standards	Infrastructure	12/01/2021	-	-	-	347	-	347
Transmission	Pig Launching Station(s) for Internal Line Inspection	T-Sustaining	Maintain Standards	Infrastructure	12/01/2021	-	-	-	426	-	426
Transmission	Gas Chromatographs	T-Sustaining	System Enhancements	Customer Benefit	12/01/2021	-	-	-	107	-	107
Transmission	Prior Year Projects	T-Sustaining	Maintain Standards	Infrastructure	12/01/2022	-	-	-	-	27	27
Transmission	Cathodic Test Stations	T-Sustaining	Maintain Standards	Infrastructure	12/01/2022	-	-	-	-	38	38
Transmission	Pipeline Integrity	T-Sustaining	Maintain Standards	Infrastructure	12/01/2022	-	-	-	-	327	327
Transmission	Remote Operated Valves	T-Sustaining	System Enhancements	Risk Reduction	12/01/2022	-	-	-	-	726	726
Transmission	Kingston Receival AH Line Valves	T-Sustaining	Maintain Standards	Infrastructure	12/01/2022	-	-	-	-	867	867
Transmission	Pig Launching Station(s) for Internal Line Inspection	T-Sustaining	Maintain Standards	Infrastructure	12/01/2022	-	-	-	-	434	434
Transmission	Subtotal Transmission					2954	1686	1517	2326	2419	10901
Regulator Station	Bullet Hole Regulator Station	D-Growth	System Enhancements	Reliability	12/01/2018	607	-	-	-	-	607
Regulator Station	Cannon St. Regulator Station	D-Sustaining	System Enhancements	Reliability	12/01/2018	884	-	-	-	-	884
Regulator Station	South St. Regulator Station Purchase Property	D-Sustaining	System Enhancements	Reliability	12/01/2018	152	-	-	-	-	152
Regulator Station	Broadway Regulator Station Purchase Property	D-Sustaining	System Enhancements	Reliability	12/01/2018	152	-	-	-	-	152
Regulator Station	Clark St. Regulator Station Purchase Property	D-Sustaining	System Enhancements	Reliability	12/01/2018	152	-	-	-	-	152
Regulator Station	Emerson Regulator Station Rebuild	D-Sustaining	System Enhancements	Reliability	12/01/2018	279	-	-	-	-	279
Regulator Station	Pressure Recording Chart Replacements	D-Sustaining	Maintain Standards	Time Based Replacem	12/01/2018	153	-	-	-	-	153
Regulator Station	Pressure Control Improvements	D-Sustaining	Maintain Standards	Time Based Replacem	12/01/2018	153	-	-	-	-	153
Regulator Station	Prior Year Projects	D-Sustaining	Maintain Standards	Infrastructure	12/01/2018	25	-	-	-	-	25
Regulator Station	South St. Regulator Station Rebuild	D-Sustaining	System Enhancements	Reliability	12/01/2019	-	530	-	-	-	530
Regulator Station	Osborne Hill Heater Install 385	D-Sustaining	System Enhancements	Reliability	12/01/2019	-	204	-	-	-	204
Regulator Station	Lake Katrine Heater Install 385	D-Sustaining	System Enhancements	Reliability	12/01/2019	-	204	-	-	-	204

GAS ADDITIONS						W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Growth vs. Sustaining	Discretion Level	Investment Type	Preliminary In-Service Date	2018	2019	2020	2021	2022	5-Year Total
Regulator Station	Clark St. Regulator Station Rebuild	D-Sustaining	System Enhancements	Reliability	12/01/2019	-	530	-	-	-	530
Regulator Station	Union Ave. Regulator Station Rebuild	D-Sustaining	System Enhancements	Reliability	12/01/2019	-	755	-	-	-	755
Regulator Station	Pressure Recording Chart Replacements	D-Sustaining	Maintain Standards	Time Based Replacem	12/01/2019	-	154	-	-	-	154
Regulator Station	Pressure Control Improvements	D-Sustaining	Maintain Standards	Time Based Replacem	12/01/2019	-	154	-	-	-	154
Regulator Station	Prior Year Projects	D-Sustaining	Maintain Standards	Infrastructure	12/01/2019	-	26	-	-	-	26
Regulator Station	All Angels Heater Install 385	D-Sustaining	System Enhancements	Reliability	12/01/2020	-	-	262	-	-	262
Regulator Station	First St. Regulator Station Rebuild	D-Sustaining	System Enhancements	Reliability	12/01/2020	-	-	313	-	-	313
Regulator Station	Broadway Regulator Station Build	D-Sustaining	System Enhancements	Reliability	12/01/2020	-	-	574	-	-	574
Regulator Station	Poughkeepsie Receival 60 psig regulators/ heater/ filter rebuild	D-Sustaining	System Enhancements	Reliability	12/01/2020	-	-	783	-	-	783
Regulator Station	Marist Heater Install	D-Sustaining	System Enhancements	Reliability	12/01/2020	-	-	261	-	-	261
Regulator Station	Pressure Recording Chart Replacements	D-Sustaining	Maintain Standards	Time Based Replacem	12/01/2020	-	-	158	-	-	158
Regulator Station	Pressure Control Improvements	D-Sustaining	Maintain Standards	Time Based Replacem	12/01/2020	-	-	158	-	-	158
Regulator Station	Regulator Station SCADA Implementation	D-Sustaining	System Enhancements	Reliability	12/01/2020	-	-	210	-	-	210
Regulator Station	Prior Year Projects	D-Sustaining	Maintain Standards	Infrastructure	12/01/2020	-	-	26	-	-	26
Regulator Station	Poughkeepsie Receival Medium Pressure Rebuild	D-Sustaining	System Enhancements	Reliability	12/01/2021	-	-	-	373	-	373
Regulator Station	Poughkeepsie Receival Low Pressure Rebuild	D-Sustaining	System Enhancements	Reliability	12/01/2021	-	-	-	373	-	373
Regulator Station	Coxsacki Regulator Station Rebuild	D-Sustaining	System Enhancements	Reliability	12/01/2021	-	-	-	789	-	789
Regulator Station	KS System Additional Feed, New Regulator Station Build	D-Growth	System Enhancements	Reliability	12/01/2021	-	-	-	309	-	309
Regulator Station	Central Valley Heater Install	D-Sustaining	System Enhancements	Reliability	12/01/2021	-	-	-	266	-	266
Regulator Station	Highland Mills Heater Install	D-Sustaining	System Enhancements	Reliability	12/01/2021	-	-	-	266	-	266
Regulator Station	Pressure Recording Chart Replacements	D-Sustaining	Maintain Standards	Time Based Replacem	12/01/2021	-	-	-	161	-	161
Regulator Station	Pressure Control Improvements	D-Sustaining	Maintain Standards	Time Based Replacem	12/01/2021	-	-	-	161	-	161
Regulator Station	Regulator Station SCADA Implementation	D-Sustaining	System Enhancements	Reliability	12/01/2021	-	-	-	215	-	215
Regulator Station	Prior Year Projects	D-Sustaining	Maintain Standards	Infrastructure	12/01/2021	-	-	-	27	-	27
Regulator Station	Vail Road Heater Install	D-Sustaining	System Enhancements	Reliability	12/01/2022	-	-	-	-	271	271
Regulator Station	Cochecton Heater Install	D-Sustaining	System Enhancements	Reliability	12/01/2022	-	-	-	-	271	271
Regulator Station	Blue Point Heater Install	D-Sustaining	System Enhancements	Reliability	12/01/2022	-	-	-	-	325	325
Regulator Station	Regulator Station Rebuild/ Build New Distribution Improvement	D-Sustaining	System Enhancements	Reliability	12/01/2022	-	-	-	-	1,078	1078
Regulator Station	Pressure Recording Chart Replacements	D-Sustaining	Maintain Standards	Time Based Replacem	12/01/2022	-	-	-	-	163	163
Regulator Station	Pressure Control Improvements	D-Sustaining	Maintain Standards	Time Based Replacem	12/01/2022	-	-	-	-	163	163
Regulator Station	Regulator Station SCADA Implementation	D-Sustaining	System Enhancements	Reliability	12/01/2022	-	-	-	-	217	217
Regulator Station	Prior Year Projects	D-Sustaining	Maintain Standards	Infrastructure	12/01/2022	-	-	-	-	27	27
Regulator Station	Subtotal Regulator Stations					2557	2556	2744	2941	2515	13314
New Business	Residential Conversion	D-Growth	System Enhancements	New Business	Multiple	5,867	5,603	5,432	5,549	5,609	28060
New Business	Commercial Conversion	D-Growth	System Enhancements	New Business	Multiple	1,275	1,262	1,293	1,321	1,336	6487
New Business	New Franchise / Large C&I Proj.	D-Growth	System Enhancements	New Business	Multiple	765	757	776	793	801	3892
New Business	Traditional NB Res/Comm	D-Sustaining	Non Discretionary	New Business	Multiple	1,786	1,767	2,069	2,114	2,137	9872
New Business	URD	D-Sustaining	Non Discretionary	New Business	Multiple	3,061	3,230	3,363	3,435	3,472	16562
New Business	Subtotal New Business					12,754	12,619	12,934	13,212	13,355	64,874
Distribution	Corrosion Control	D-Sustaining	Maintain Standards	Infrastructure	Multiple	136	157	160	164	168	786
Distribution	Unidentified Road Rebuild - Replacing Leak Prone Pipe	D-Sustaining	Maintain Standards	Infrastructure	Multiple	155	786	802	822	840	3406
Distribution	Unidentified Road Rebuild - Plas or Prot Stil	D-Sustaining	Maintain Standards	Infrastructure	Multiple	52	52	53	55	56	268
Distribution	Unident Cast Iron	D-Sustaining	Non Discretionary	Compliance	Multiple	206	210	187	192	196	991
Distribution	Unident Leaking	D-Sustaining	Maintain Standards	Infrastructure	Multiple	180	786	802	1,644	1,681	5094
Distribution	Service Replacement Blankets - Leak Prone Pipe - Emergent	D-Sustaining	Non Discretionary	Compliance	Multiple	1,339	1,573	1,605	1,644	1,681	7842
Distribution	Service Partial Replacement Expense	D-Sustaining	Non Discretionary	Compliance	Multiple	480	385	491	587	605	2548
Distribution	DIP Svce Repl Blankets	D-Sustaining	Non Discretionary	Compliance	Multiple	6,914	5,685	5,620	6,069	5,658	29946
Distribution	Isolated Service Replacement Blankets	D-Sustaining	Non Discretionary	Compliance	Multiple	515	419	214	219	224	1592
Distribution	Local Orders -	D-Sustaining	Maintain Standards	Infrastructure	Multiple	412	393	374	384	392	1955
Distribution	Local Orders - Associated with Protected Steel or Plastic	D-Sustaining	Maintain Standards	Infrastructure	Multiple	109	131	134	137	140	651



GAS ADDITIONS						W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Growth vs. Sustaining	Discretion Level	Investment Type	Preliminary In-Service Date	2018	2019	2020	2021	2022	5-Year Total
Distribution	Uptown Kingston	D-Sustaining	Maintain Standards	Infrastructure	2018	665	-	-	-	-	665
Distribution	Wappingers - PN Line	D-Sustaining	Maintain Standards	Infrastructure	2019	-	2,621	-	-	-	2621
Distribution	PN - Near South Road	D-Sustaining	Maintain Standards	Infrastructure	2020	-	-	2,675	-	-	2675
Distribution	PN - Next mile south	D-Sustaining	Maintain Standards	Infrastructure	2021	-	-	-	2,740	-	2740
Distribution	PE Line move off 9W	D-Sustaining	Maintain Standards	Infrastructure	2022	-	-	-	-	2,801	2801
Distribution	SM Line Carmel	D-Sustaining	Maintain Standards	Study Based Load Gro	2018	4,636	-	-	-	-	4636
Distribution	South Wall Street	D-Sustaining	Maintain Standards	Study Based Load Gro	2018	232	-	-	-	-	232
Distribution	Mansion Violet Hamilton	D-Sustaining	Maintain Standards	Study Based Load Gro	2018	809	-	-	-	-	809
Distribution	North Clanceyville	D-Sustaining	Maintain Standards	Study Based Load Gro	2018	166	-	-	-	-	166
Distribution	Uptown Kingston	D-Sustaining	Maintain Standards	Study Based Load Gro	2019	-	199	-	-	-	199
Distribution	Fullerton to West St Newburgh	D-Sustaining	Maintain Standards	Study Based Load Gro	2019	-	173	-	-	-	173
Distribution	Kings Street	D-Sustaining	Maintain Standards	Study Based Load Gro	2019	-	294	-	-	-	294
Distribution	TV Line - Station Outlet	D-Sustaining	Maintain Standards	Study Based Load Gro	2019	-	1,573	-	-	-	1573
Distribution	Cedar Avenue Neighborhood	D-Sustaining	Maintain Standards	Study Based Load Gro	2020	-	-	491	-	-	491
Distribution	Mailer and Main - Cornwall	D-Sustaining	Maintain Standards	Study Based Load Gro	2020	-	-	293	-	-	293
Distribution	Main Mill Bridge	D-Sustaining	Maintain Standards	Study Based Load Gro	2020	-	-	232	-	-	232
Distribution	Fairview and Quarry	D-Sustaining	Maintain Standards	Study Based Load Gro	2020	-	-	40	-	-	40
Distribution	Randolph	D-Sustaining	Maintain Standards	Study Based Load Gro	2020	-	-	171	-	-	171
Distribution	NLP/NM South Clarke Street Area	D-Sustaining	Maintain Standards	Study Based Load Gro	2021	-	-	-	896	-	896
Distribution	Lower Broadway/Spring Street	D-Sustaining	Maintain Standards	Study Based Load Gro	2021	-	-	-	643	-	643
Distribution	E. Poughkeepsie College/Hooker	D-Sustaining	Maintain Standards	Study Based Load Gro	2021	-	-	-	837	-	837
Distribution	Cornwall Hudson/Academy	D-Sustaining	Maintain Standards	Study Based Load Gro	2021	-	-	-	53	-	53
Distribution	Parker Avenue	D-Sustaining	Maintain Standards	Study Based Load Gro	2021	-	-	-	27	-	27
Distribution	Cornell Foxhall Grand	D-Sustaining	Maintain Standards	Study Based Load Gro	2021	-	-	-	35	-	35
Distribution	West Saugerties	D-Sustaining	Maintain Standards	Study Based Load Gro	2021	-	-	-	369	-	369
Distribution	Place Holder - 2022	D-Sustaining	Maintain Standards	Study Based Load Gro	2022	-	-	-	-	2,801	2801
Distribution	West Point and Highland Falls	D-Sustaining	Maintain Standards	Study Based Load Gro	2019	-	5,766	-	-	-	5766
Distribution	Roosevelt Park	D-Sustaining	Non Discretionary	Compliance	2018	4,847	-	-	-	-	4847
Distribution	South Wall Street	D-Sustaining	Non Discretionary	Compliance	2018	2,905	-	-	-	-	2905
Distribution	Mansion Violet Hamilton	D-Sustaining	Non Discretionary	Compliance	2018	3,073	-	-	-	-	3073
Distribution	Kingston and Wilbur Backyards	D-Sustaining	Non Discretionary	Compliance	2018	3,283	-	-	-	-	3283
Distribution	Cornwall 3 - Hasbrouck and Union Area	D-Sustaining	Non Discretionary	Compliance	2018	2,570	-	-	-	-	2570
Distribution	North Clanceyville	D-Sustaining	Non Discretionary	Compliance	2018	2,105	-	-	-	-	2105
Distribution	East Newburgh Broadway to Third	D-Sustaining	Non Discretionary	Compliance	2018	1,978	-	-	-	-	1978
Distribution	Albany Foxhall Manor Madison	D-Sustaining	Non Discretionary	Compliance	2019	-	2,400	-	-	-	2400
Distribution	West Saugerties	D-Sustaining	Non Discretionary	Compliance	2019	-	4,384	-	-	-	4384
Distribution	Uptown Kingston	D-Sustaining	Non Discretionary	Compliance	2019	-	1,529	-	-	-	1529
Distribution	Kings Street	D-Sustaining	Non Discretionary	Compliance	2019	-	4,191	-	-	-	4191
Distribution	SW Poughkeepsie Hooker/Hamilton	D-Sustaining	Non Discretionary	Compliance	2019	-	3,127	-	-	-	3127
Distribution	Fullerton to West St - Newburgh	D-Sustaining	Non Discretionary	Compliance	2019	-	3,430	-	-	-	3430
Distribution	Cornwall 4 - Main and Hudson	D-Sustaining	Non Discretionary	Compliance	2019	-	2,364	-	-	-	2364
Distribution	Clifton East Chester Neighborhood	D-Sustaining	Non Discretionary	Compliance	2020	-	-	3,023	-	-	3023
Distribution	Fairview/Quarry Street Area	D-Sustaining	Non Discretionary	Compliance	2020	-	-	3,122	-	-	3122
Distribution	East Saugerties	D-Sustaining	Non Discretionary	Compliance	2020	-	-	3,327	-	-	3327
Distribution	Randolph Ferris Beechwood Neighborhood	D-Sustaining	Non Discretionary	Compliance	2020	-	-	3,411	-	-	3411
Distribution	Main Mill Bridge	D-Sustaining	Non Discretionary	Compliance	2020	-	-	3,235	-	-	3235
Distribution	Cedar Avenue Neighborhood	D-Sustaining	Non Discretionary	Compliance	2020	-	-	2,162	-	-	2162
Distribution	Cornwall - Mailer Ave/Mill Street	D-Sustaining	Non Discretionary	Compliance	2020	-	-	2,329	-	-	2329
Distribution	West Newburgh Area	D-Sustaining	Non Discretionary	Compliance	2020	-	-	4,624	-	-	4624
Distribution	NLP/NM South Clarke Street Area	D-Sustaining	Non Discretionary	Compliance	2021	-	-	-	1,713	-	1713

	GAS ADDITIONS					W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Growth vs. Sustaining	Discretion Level	Investment Type	Preliminary In-Service Date	2018	2019	2020	2021	2022	5-Year Total
Distribution	Lower Broadway/Spring Street	D-Sustaining	Non Discretionary	Compliance	2021	-	-	-	3,367	-	3367
Distribution	E Poughkeepsie College to Hooker	D-Sustaining	Non Discretionary	Compliance	2021	-	-	-	2,515	-	2515
Distribution	Cornwall Hudson/Academy	D-Sustaining	Non Discretionary	Compliance	2021	-	-	-	1,394	-	1394
Distribution	Parker Avenue	D-Sustaining	Non Discretionary	Compliance	2021	-	-	-	1,838	-	1838
Distribution	Cornell/Foxhall/Grand	D-Sustaining	Non Discretionary	Compliance	2021	-	-	-	2,877	-	2877
Distribution	West Saugerties	D-Sustaining	Non Discretionary	Compliance	2021	-	-	-	3,373	-	3373
Distribution	Creek Run NM	D-Sustaining	Non Discretionary	Compliance	2021	-	-	-	2,311	-	2311
Distribution	Place Holder	D-Sustaining	Non Discretionary	Compliance	2021	-	-	-	8,588	-	8588
Distribution	Place Holder	D-Sustaining	Non Discretionary	Compliance	2022	-	-	-	-	29,082	29082
Distribution	Subtotal Distribution Improvements					37,767	42,630	39,581	45,492	46,325	211,794
Meter	X081A - Gas Meters	D-Sustaining	Non Discretionary	New Business		1,869.27	1,890.98	1,931.93	1,967.78	2,000.44	9660
Meter	X084A - Special Meter Installation	D-Sustaining	Non Discretionary	New Business		510.17	516.10	527.27	537.06	545.97	2637
Meter	X084A - Special Meter Installation Time Tests	D-Sustaining	Non Discretionary	New Business		661.18	600.74	411.27	-	-	1673
Meter	Subtotal Gas Meters					3,041	3,008	2,870	2,505	2,546	13,970
	Total - Gas					59,072	62,498	59,647	66,474	67,161	314,853

COMMON ADDITIONS				W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Discretion Level	Preliminary In-Service Date	2018	2019	2020	2021	2022	5-Year Total
Land & Buildings	Daily Operations - Electric	System Enhancements	on going	52	55	58	63	57	285
Land & Buildings	Daily Operations - Flooring	Maintain Standards	on going	52	55	58	63	57	285
Land & Buildings	Daily Operations - HVAC	Maintain Standards	on going	52	55	58	63	57	285
Land & Buildings	Daily Operations - Unidentified	System Enhancements	on going	515	552	584	625	570	2,846
Land & Buildings	Repave Parking Lot (Multi Year) (Kingston)	System Enhancements	on going	258	276	292	313	285	1,423
Land & Buildings	Repave Parking Lots (Multi Year)	Maintain Standards	on going	258	276	292	313	285	1,423
Land & Buildings	Enlarge Transformer Dock & Replace Roof (Ellenville)	System Enhancements	2018	32	-	-	-	-	32
Land & Buildings	Replace Roof - 1/3 Back Building	Maintain Standards	2018	515	-	-	-	-	515
Land & Buildings	Build Pole Barn for Transformers (Newburgh)	System Enhancements	2018	124	-	-	-	-	124
Land & Buildings	Window Replacements - Front and North Side	System Enhancements	2018	134	-	-	-	-	134
Land & Buildings	Improve Drainage around Newburgh Building	System Enhancements	2018	155	-	-	-	-	155
Land & Buildings	Building 802 - Replace Roof	Maintain Standards	2018	82	-	-	-	-	82
Land & Buildings	Replace Street Light Poles	Maintain Standards	2018	60	-	-	-	-	60
Land & Buildings	South Road Complex - Install New Curbing	System Enhancements	2018	60	-	-	-	-	60
Land & Buildings	Building 806 Resurface and Restripe Garage Floors	Maintain Standards	2018	93	-	-	-	-	93
Land & Buildings	Building 808 - Replace Windows	System Enhancements	2018	103	-	-	-	-	103
Land & Buildings	Building 807 - Replace Windows	System Enhancements	2018	155	-	-	-	-	155
Land & Buildings	Building 804 - Renovate OMS Office Area	Maintain Standards	2018	52	-	-	-	-	52
Land & Buildings	Enlarge Loading Dock / Install Leveler (Ellenville)	System Enhancements	2018	103	-	-	-	-	103
Land & Buildings	Renovate Restrooms and Locker Room, Create Drug Test Rm	Maintain Standards	2018	155	-	-	-	-	155
Land & Buildings	Install Generator at Storeroom	System Enhancements	2018	57	-	-	-	-	57
Land & Buildings	Renovate Restroom / Locker Room	Maintain Standards	2018	52	-	-	-	-	52
Land & Buildings	Install Showers back bldg	System Enhancements	2018	103	-	-	-	-	103
Land & Buildings	Build Additional Office/Cubical Space	System Enhancements	2018	258	-	-	-	-	258
Land & Buildings	Install Dual Wall Waste Tanks and Berms	Maintain Standards	2018	103	-	-	-	-	103
Land & Buildings	Controls System HVAC	System Enhancements	2018	103	-	-	-	-	103
Land & Buildings	Municipal Water to site - Storeroom	System Enhancements	2018	206	-	-	-	-	206
Land & Buildings	Building 807 Relocate Transformers and Replace Steps	Maintain Standards	2019	-	331	-	-	-	331
Land & Buildings	Repave Back Parking Lot near Line Garage (Newburgh)	Maintain Standards	2019	-	88	-	-	-	88
Land & Buildings	Renovate Cottage for Additional Meeting Space	System Enhancements	2019	-	221	-	-	-	221
Land & Buildings	Paving front of Lodge and roadway into site	Maintain Standards	2019	-	221	-	-	-	221
Land & Buildings	Replace Ice Machine	Maintain Standards	2019	-	6	-	-	-	6
Land & Buildings	Building 802 - Install Awning @ Drafting Entrance	System Enhancements	2019	-	11	-	-	-	11
Land & Buildings	Building 807 - Customer Service Entrance Awning	System Enhancements	2019	-	11	-	-	-	11
Land & Buildings	Building 810 - Install Awning @ Back Entrance	System Enhancements	2019	-	11	-	-	-	11
Land & Buildings	Building 808 Fluid Containment Mechanics Garage	System Enhancements	2019	-	55	-	-	-	55
Land & Buildings	Building 801 Replace 50 Ton RTU	System Enhancements	2019	-	144	-	-	-	144
Land & Buildings	Building 803 - Call Center Break Room Renovation	System Enhancements	2019	-	55	-	-	-	55
Land & Buildings	Building 810 - Replace Roof	Maintain Standards	2019	-	276	-	-	-	276
Land & Buildings	Replace Roof - 1/3 Back Building	Maintain Standards	2019	-	552	-	-	-	552

	COMMON ADDITIONS			W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Discretion Level	Preliminary In-Service Date	2018	2019	2020	2021	2022	5-Year Total
Land & Buildings	Remove Steam / Water Pipes - Main Building (Asbestos)	System Enhancements	2019	-	88	-	-	-	88
Land & Buildings	Install Roof over wire storage area (Fishkill)	System Enhancements	2019	-	133	-	-	-	133
Land & Buildings	Transformer Shop Upgrade	System Enhancements	2019	-	166	-	-	-	166
Land & Buildings	Replace Storm Drains	Maintain Standards	2019	-	55	-	-	-	55
Land & Buildings	Pedestrian Entrance Doors - Main Building & Garage	Maintain Standards	2019	-	39	-	-	-	39
Land & Buildings	Swing Arm for Transformer Platform (Greenville)	System Enhancements	2019	-	44	-	-	-	44
Land & Buildings	Bldg 810 - Replace Cooling Towers	Maintain Standards	2019	-	221	-	-	-	221
Land & Buildings	Municipal water to site - Extend to Main Office and Service Bldgs	System Enhancements	2019	-	221	-	-	-	221
Land & Buildings	Pave Portion of Parking Lot	Maintain Standards	2020	-	-	175	-	-	175
Land & Buildings	Install Backup Generator	System Enhancements	2020	-	-	58	-	-	58
Land & Buildings	Lighting Upgrade - Storeroom	System Enhancements	2020	-	-	47	-	-	47
Land & Buildings	Replace Exhaust Fan in Lineman's garage	Maintain Standards	2020	-	-	29	-	-	29
Land & Buildings	Replace Pavillion & Bath House Roof	Maintain Standards	2020	-	-	82	-	-	82
Land & Buildings	Lighting Upgrade - Storeroom	System Enhancements	2020	-	-	47	-	-	47
Land & Buildings	Replace/Upgrade 803 RTU CHAZ Unit Main Floor	Maintain Standards	2020	-	-	233	-	-	233
Land & Buildings	Replace Training Room HVAC Unit hook up to new controls	Maintain Standards	2020	-	-	70	-	-	70
Land & Buildings	Pave Pole & Equipment area	Maintain Standards	2020	-	-	93	-	-	93
Land & Buildings	Replace Carpeting - Call Centers	Maintain Standards	2020	-	-	88	-	-	88
Land & Buildings	Bldg 810 - Install fire protection under raised floor	System Enhancements	2020	-	-	107	-	-	107
Land & Buildings	Bldg 807 - Dispatch Center Renovation	System Enhancements	2020	-	-	88	-	-	88
Land & Buildings	Upgrade Lighting - Mechanics Garage	System Enhancements	2020	-	-	12	-	-	12
Land & Buildings	Replace Roof - 1/3 Back Building	Maintain Standards	2020	-	-	584	-	-	584
Land & Buildings	Install fire protection @ EC Lineman's, Transformer, Storeroom	System Enhancements	2020	-	-	210	-	-	210
Land & Buildings	Renovate Restrooms	Maintain Standards	2020	-	-	233	-	-	233
Land & Buildings	Bldg 810 - Replace leibert units in Computer Room	Maintain Standards	2020	-	-	210	-	-	210
Land & Buildings	Bldg 803 - Replace HVAC Units S1 & S2 level	Maintain Standards	2020	-	-	292	-	-	292
Land & Buildings	Bldg 801 - Replace Windows 2nd Floor	Maintain Standards	2020	-	-	263	-	-	263
Land & Buildings	Controls System HVAC	System Enhancements	2021	-	-	-	375	-	375
Land & Buildings	Resurface Gas Garage Floors - Linemen's Garage	Maintain Standards	2021	-	-	-	63	-	63
Land & Buildings	Resurface Gas Garage Floors - Gas Garage	Maintain Standards	2021	-	-	-	63	-	63
Land & Buildings	Building 803 - Replace Asbestos Tile	System Enhancements	2021	-	-	-	63	-	63
Land & Buildings	Building 800 - Create Women's Rest Room 1st Floor	System Enhancements	2021	-	-	-	75	-	75
Land & Buildings	Building 805 Resurface and Restripe Garage Floors	Maintain Standards	2021	-	-	-	75	-	75
Land & Buildings	Building 808 - Roof Replacement	System Enhancements	2021	-	-	-	313	-	313
Land & Buildings	Bldg 807 - Credit Union Roof Replacement	Maintain Standards	2021	-	-	-	313	-	313
Land & Buildings	Replace Carpeting - Main Bldg and Training Room (Fishkill)	Maintain Standards	2021	-	-	-	103	-	103
Land & Buildings	Replace Sidewalks	Maintain Standards	2021	-	-	-	69	-	69
Land & Buildings	Replace Roof Front Bldg	Maintain Standards	2021	-	-	-	175	-	175
Land & Buildings	Replace Carpet in Auditorium with VCT	Maintain Standards	2021	-	-	-	63	-	63
Land & Buildings	Replace Sloped Roof - Front Annex Bldg	Maintain Standards	2021	-	-	-	438	-	438

COMMON ADDITIONS				W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Discretion Level	Preliminary In-Service Date	2018	2019	2020	2021	2022	5-Year Total
Land & Buildings	Replace lighting in the garge areas	Maintain Standards	2021	-	-	-	38	-	38
Land & Buildings	Pole Racks	System Enhancements	2021	-	-	-	188	-	188
Land & Buildings	Replace Roof Transformer Shop	Maintain Standards	2021	-	-	-	600	-	600
Land & Buildings	Replace lighting throughout storeroom	Maintain Standards	2022	-	-	-	-	228	228
Land & Buildings	Replace lighting throughout storeroom	Maintain Standards	2022	-	-	-	-	114	114
Land & Buildings	Replace HVAC Units	Maintain Standards	2022	-	-	-	-	171	171
Land & Buildings	Roof Replacement	Maintain Standards	2022	-	-	-	-	148	148
Land & Buildings	Replace Storeroom roof	Maintain Standards	2022	-	-	-	-	570	570
Land & Buildings	Renovate Restrooms in Storeroom	Maintain Standards	2022	-	-	-	-	171	171
Land & Buildings	Replace Roof - Linemens Bldg	Maintain Standards	2022	-	-	-	-	549	549
Land & Buildings	Restroom Renovations	Maintain Standards	2022	-	-	-	-	256	256
Land & Buildings	Raise Roof Height Fishkill Transportation	System Enhancements	2022	-	-	-	-	262	262
Land & Buildings	Hook up to municipal sewer	System Enhancements	2022	-	-	-	-	256	256
Land & Buildings	Replace Windows	Maintain Standards	2022	-	-	-	-	256	256
Land & Buildings	Kingston Build Out - 1st Floor	System Enhancements	2020	-	-	1,751	-	-	1,751
Land & Buildings	Kingston Build Out - 2nd Floor	System Enhancements	2019	-	1,657	-	-	-	1,657
Land & Buildings	System Operations Build Out	System Enhancements	2019	2,164	1,657	-	-	-	3,821
Land & Buildings	Linemen and Gas Training Centers	System Enhancements	Multiple	6,596	6,626	6,536	5,629	7,121	32,508
Land & Buildings	Parking Lot & Office Bldg	System Enhancements	2019	3,865	6,626	-	-	-	10,491
Land & Buildings	Newburgh - New Facility	System Enhancements	2022	-	-	-	-	11,394	11,394
Land & Buildings				16,512	20,784	12,550	10,078	22,807	82,731
Office Equipment	South Road - Daily Operations - Larger Projects	Maintain Standards	on going	66	68	69	71	72	347
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	187
Office Equipment	Upgrade Office Furniture - Fishkill	Maintain Standards	2019	-	21	-	-	-	21
Office Equipment	Additional Cubicles - Lake Katrine	Maintain Standards	2021	-	-	43	65	-	108
Office Equipment	New Office Furniture (Stanfordville)	Maintain Standards	2018	61	-	-	-	-	61
Office Equipment	Bldg 807 - Dispatch Office	Maintain Standards	2020	-	-	21	-	-	21
Office Equipment	Bldg 810 - System Operations New Furniture	Maintain Standards	2018	102	-	-	-	-	102
Office Equipment	Rifton - Cottage Meeting Room	Maintain Standards	2019	-	42	-	-	-	42
Office Equipment	New Line & Gas Training Facility	Maintain Standards	2020	-	-	107	-	-	107
Office Equipment	Place Holder	Maintain Standards	2022	-	-	-	-	111	111
Office Equipment				307	209	320	218	267	1,320
EMS	Miscellaneous Hardware and Software Failures	Non Discretionary	on going	53	55	58	60	62	288
EMS	ACC Video Wall	System Enhancements	06/01/2018	588	-	-	-	-	588
EMS	Compliance Automation Tools	System Enhancements	12/01/2018	409	-	-	-	-	409
EMS	DMS - Retrofits for Existing DA Devices	System Enhancements	12/01/2018	409	-	-	-	-	409
EMS	Building 810 Renovations to support DMS / DSO - Console and Casework	System Enhancements	06/01/2019	344	1,494	-	-	-	1,838
EMS	PCC Video Wall Situational Awareness Software Solution	System Enhancements	06/01/2019	153	366	-	-	-	519
EMS	EMS eDNA Historian Upgrade	Non Discretionary	06/01/2019	-	100	-	-	-	100
EMS	DMS Upgrade and OMS Implementation	Non Discretionary	12/01/2019	102	3,138	-	-	-	3,241
EMS	EMS Windows Server/Workstation Replacement	Non Discretionary	06/01/2020	-	151	160	-	-	311
EMS	EMS Software Upgrade (non-JUMP)	Non Discretionary	12/01/2022	-	-	-	119	4,929	5,048
EMS				2,058	5,305	218	179	4,991	12,750

COMMON ADDITIONS				W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Discretion Level	Preliminary In-Service Date	2018	2019	2020	2021	2022	5-Year Total
Hardware	Hardware Minors	Maintain Standards	Annual	241	150	160	163	167	881
Hardware	PC and Laptop Replacements	Maintain Standards	Annual	643	578	533	544	556	2,854
Hardware	Mobile (Pen) Computing Replacements	Maintain Standards	Annual	205	231	267	272	278	1,252
Hardware	Monitors, Network Printers-Adds/Repl.	Maintain Standards	Annual	162	116	133	136	139	686
Hardware	Server Replacements and Storage Upgrades	Maintain Standards	Annual	1,239	866	906	925	945	4,882
Hardware	Network Infrastructure Upgrades/Replacements	Maintain Standards	Annual	430	347	373	381	389	1,920
Hardware	Cyber Security	Reduces Risk	Annual	118	81	107	109	111	525
Hardware	Copiers (new budget line item requested by Tim B)	Maintain Standards	Annual	81	58	59	60	61	318
Hardware	IT Strategic Initiatives Hardware	Maintain Standards	12/31/2019	-	627	533	544	556	2,260
Software	Business Intelligence (Cognos) - Upgrades & Enhancements	System Enhancements	Annual	416	424	433	444	457	2,175
Software	Business Intelligence (Cognos) - New Development	System Enhancements	Annual	833	848	866	888	915	4,350
Software	Enterprise Content Management - future Phases	System Enhancements	Annual	1,327	1,352	1,381	1,415	858	6,332
Software	Cyber Security	Reduces Risk	Annual	416	424	433	444	457	2,175
Software	PPM - Project Portfolio Management Solution	System Enhancements	12/31/2016	212	212	217	222	229	1,092
Software	Mainframe Bundled Releases	System Enhancements	Annual	312	318	325	333	343	1,631
Software	Wiki/CentralHudson.com Redesign - WCM	System Enhancements	12/31/2016	437	583	596	277	286	2,179
Software	Increase the Quality & Speed of Delivery of Application Testing	System Enhancements	Annual Bundled Re	520	530	542	555	572	2,719
Software	Emergent Software Packages/Upgrades	Maintain Standards	Annual	625	1,061	1,300	1,553	1,830	6,368
Software	Unified Communications, VoIP, IVR - Upgrades & Enhancements	Maintain Standards	Annual	208	212	217	222	229	1,087
Software	Unified Communications, VoIP, IVR - Extending Collaboration	Maintain Standards	Annual	208	742	433	444	457	2,285
Software	Business Agility with an Enterprise SOA Framework	System Enhancements	Annual Bundled Re	937	1,220	1,300	1,331	1,372	6,160
Software	CIS / REV Modernization	System Enhancements	Annual	1,717	2,864	2,870	2,774	2,859	13,084
Software	Digital Initiatives for Customer Engagement (DICE)(Includes all Web, Mobile, Social initi	System Enhancements	Annual Bundled Re	1,353	2,333	2,383	2,441	2,516	11,026
Software	Bill Redesign - OT Streamserve	System Enhancements	Annual	520	636	162	166	172	1,657
Software	Mobility Upgrade - (Tim H)*	System Enhancements	12/01/2017	-	-	-	444	-	444
Software	Emergency Management Software - Upgrades & Enhancements	System Enhancements	Annual	307	345	244	333	343	1,571
Software	ARCOS Upgrades & Enhancements	System Enhancements	Multiple	125	-	43	166	-	335
Software	OMS - GE PowerOn Upgrade (contingent on OMS replacement)	Maintain Standards	12/31/2018	130	-	-	-	-	130
Software	HRIS - TotalHR Replacement	System Enhancements	12/31/2019	520	742	542	277	229	2,310
Software	EmpCenter Upgrades & Enhancements	System Enhancements	12/31/2015	78	159	162	166	172	738
Software	Electric GIS- Estimating Design (Frank B)	Improve Reliability	06/01/2017	364	345	-	-	-	709
Software	Electric GIS - Upgrades & Enhancements (Frank B)	Improve Reliability	12/31/2022	-	-	-	555	286	841
Software	UG Network Management GIS Solution	Improve Reliability	12/31/2021	-	-	271	277	-	548
Software	Field Modeling for ESRI/GIS	Improve Reliability	Annual	104	106	108	111	-	429
Software	Interconnection Portal	System Enhancements	Annual	156	159	162	166	-	644
Software	Hosting Capacity Module - Millsoft/ESRI Map	System Enhancements	12/31/2018	104	-	-	-	-	104
Software	Gas Transmission Integrity Management Software	System Enhancements	12/31/2019	-	692	-	-	-	692
Software	ESRI GIS 10.2 Upgrade	System Enhancements	12/31/2018	26	-	-	-	-	26
Software	Taurigma Automated Fault Location and Event Retriever (Eric L)	System Enhancements	Annual	71	75	-	-	-	147
Software	CYME (Adams)	Improve Reliability	12/31/2018	104	-	-	-	-	104
Software	Control Room Managmeent (CRM - Time Reporting)	Maintain Standards	12/31/2018	146	-	-	55	-	201

COMMON ADDITIONS				W/ AFUDC, Inflated & OH Adjustments					
CAT.	Description	Discretion Level	Preliminary In-Service Date	2018	2019	2020	2021	2022	5-Year Total
Software	TOA Upgrades & Enhancements	Maintain Standards	12/31/2018	156	-	-	166	-	323
Software	GL Essentials Upgrades & Enhancements	Maintain Standards	Annual	33	258	73	-	278	641
Software	EAM - Enterprise Asset Mgmt	Maintain Standards	12/31/2019	416	636	217	-	-	1,269
Software	Chevin - Fleetwave Upgrades & Enhancements	System Enhancements	12/31/2015	104	212	108	111	114	650
Software	Claims System Replacement	System Enhancements	Multiple	104	-	-	55	-	160
Software	CDM - Financial Reporting	System Enhancements	12/31/2020	-	-	54	-	-	54
Software	AP Automation System Upgrade	System Enhancements	12/01/2015	-	265	-	-	-	265
Software	PowerPlan - Upgrades & Enhancements	System Enhancements	12/01/2018	-	-	650	-	-	650
Software	PowerPlan - Construction Budgeting upgrades (Mike R)	System Enhancements	12/31/2018	1,041	-	-	-	-	1,041
Software	Clarity Replacement/Upgrade & Enhancements	System Enhancements	12/31/2019	677	-	-	-	686	1,363
Software				17,929	20,808	19,162	19,528	18,860	96,286
Security	Fishkill Plains Sub Cameras/Intrusion detection	System Enhancements	2018	133	-	-	-	-	133
Security	Todd Hill Sub Cameras/Intrusion Detection	System Enhancements	2018	133	-	-	-	-	133
Security	Rhinebeck Sub Cameras/Intrusion Detection	System Enhancements	2018	102	-	-	-	-	102
Security	Knapps Corners Sub Cameras/Intrusion Detection	System Enhancements	2018	133	-	-	-	-	133
Security	Manchester Sub Cameras/Intrusion Detection	System Enhancements	2018	102	-	-	-	-	102
Security	License Plate Cameras District Offices	System Enhancements	2018	102	-	-	-	-	102
Security	Spackenkill Sub Cameras/Intrusion Detection	System Enhancements	2019	-	136	-	-	-	136
Security	Poughkeepsie River Crossing Pump House/Intrusion detection	System Enhancements	2019	-	146	-	-	-	146
Security	Hurley Ave Sub Thermal Security Cameras	System Enhancements	2019	-	183	-	-	-	183
Security	Hudson Crossing Cameras/Intrusion Detection	System Enhancements	2019	-	157	-	-	-	157
Security	Myers Corners Sub Cameras/Intrusion Detection	System Enhancements	2020	-	-	139	-	-	139
Security	Napanoch Sub Cameras/Intrusion Detection	System Enhancements	2020	-	-	107	-	-	107
Security	Substation Gunshot Detection System	System Enhancements	2020	-	-	107	-	-	107
Security	Rifton - Cameras/Intrusion Detection	System Enhancements	2020	-	-	139	-	-	139
Security	North Chelsea Sub Cameras/Intrusion Detection	System Enhancements	2020	-	-	139	-	-	139
Security	Mahopac Gas Sub Cameras/Intrusion detection	System Enhancements	2021	-	-	-	87	-	87
Security	Pleasant Valley Sub Additional Cameras/Intrusion detection	System Enhancements	2021	-	-	-	65	-	65
Security	Rock Tavern Sub Thermal Security Cameras	System Enhancements	2021	-	-	-	191	-	191
Security	Roseton Sub Thermal Security Cameras	System Enhancements	2021	-	-	-	87	-	87
Security	Smithfield Sub Cameras/Intrusion detection	System Enhancements	2021	-	-	-	109	-	109
Security	Highland Sub Cameras/Intrusion Detection	System Enhancements	2021	-	-	-	109	-	109
Security	Poughkeepsie Gas Cameras/Intrusion detection	System Enhancements	2022	-	-	-	-	111	111
Security	Upgrade Servers, Cameras, DVRS Critical Facilities	System Enhancements	2022	-	-	-	-	333	333
Security				705	621	629	648	445	3,048
Tools	Small Tools	Maintain Standards	0	1,666	1,666	1,447	1,394	1,445	7,618
Tools	Tools								
Communication	Network Strategy Pilot Project - Phase 2	System Enhancements	Ongoing	7,534	8,411	6,432	2,190	-	24,567
Communication	South Loop Project (Mahopac and Tuxedo)	System Enhancements	06/01/2019	511	522	-	-	-	1,033
Communication	Radio Minor	System Enhancements	Ongoing	204	209	213	218	222	1,067
Communication	Communication			8,250	9,142	6,645	2,408	222	26,667
Transportation	Transportaion	Maintain Standards		9,431	10,687	11,344	11,037	10,849	53,348
	Total - Common			56,857	69,222	52,316	45,488	59,885	283,769