EVERSOURCE

Project Title: Switch Gear Automation-21P1Kirkland P1

Project ID#: CD02107

Regulatory Category : Infrastructure Replacement

Approval Status: Full Funding

Estimated Project Cost : $683.1K

Estimated Start Year (Construction) : 2027

Estimated In Service Year (Energized): 2027

1. Executive Summary:

The existing PMH switch gear is live front and does not switch automatically leaving 121 customers out with the loss of the source feeder until the switchgear can be manually operated. The existing switch gear was installed in 1988. An additional padmount transformer will be installed to improve secondary voltage for customers supplied from the street secondary.

This project replaces a manual PMH switch gear, located on Kirtland Place, Meriden, with an automatic PME 5 pair. PMH gear is live front while PME switch gear is dead front and is DSCADA capable offering both safety and operational flexibility. The switch gear is fed by the East Meriden 21P1, and the backup is the 21P4. 121 customers are fed from this switch gear. There was one outage, non-storm tree related, affecting 754 customers including this switch gear.

2. Alternative Summary/Project Options Comparison:

Design Criteria	Option	
	1 – Repl PMH switch gear with PME 5 auto	**2 – Repl PMH switch gear with PME 5 auto & add additional padmount**
Automatic restoration to 121 customers for loos of source	Yes	Yes
Voltage Improvement	No	Yes
Authorization Type	Partial	Full
Capital Cost	$730K	$683K
Expense Cost	$29K	$27K
Total Cost	$759K	$710K
Cost / MVA added	$/MVA	$/MVA
Cost / CM Saved	$536/CM	$576/CM
Cost / CI Saved	$14,476/CI	$15,574/CI
Preferred option		X

Option 2 was chosen to add a second transformer pad to improve secondary voltage to customers which is currently at 115 volts and could drop below the allowable threshold. This option was chosen since the site will require excavation in either option, improving the secondary voltage at the same time will eliminate the need for future mobilization and restoration.
Doing nothing would put customers at risk of a long duration outage and potentially cause low voltage.

3. Project Relationships (if applicable):

EVERSOURCE

Project Title: 11C14 WPC Reliability Improvement

Project ID#: CD02207

Regulatory Category: Infrastructure Replacement

Approval Status: Partial Funding

Estimated Project Cost: $563K

Estimated Start Year (Construction): 2026

Estimated In Service Year (Energized): 2026

1. Executive Summary:

Benefit Cost Analysis initiative: In 2025 Distribution Design Engineering updated its design policy and adopted a systematic process and decision-making tool that quantifies outages and compare them against the financial benefits to determine the cost-effectiveness of projects. This new process is referred as the "Benefit Cost Analysis" or BCA.

The 11C14 circuit, a 23 kV line serving 3,052 customers across Chester, Haddam, Higganum, Killingworth, and Middletown, ranked #1 on Connecticut's worst-performing circuits list in 2022. CD02207 will address one of two high-impact zones where seven outages occurred in the past four years, replacing aging infrastructure and adding automation. The remaining zone was addressed under Project CD01956 and was completed in August 2025.

This project includes replacing three single-phase reclosers with a triple-single recloser at the top of Candlewood Hill Road and reconductoring approximately half a mile south to the highway underpass using 477 spacer cable. This approach balances cost with significant reliability improvements and positions the circuit for long-term resilience.

2. Alternative Summary/Project Options Comparison:

Design Criteria	Option				
	1 – Rescope (Replace 3 single-phase reclosers with SCADA Triple-Single)	**2 – Originally proposed**	**3 – NWS**	**4 – Replace 3 single-phase reclosers with Triple-Single SCADA recloser and Reconductor w/ 477 tree wire**	**5 – Replace 3 single-phase reclosers with Triple-Single SCADA recloser and Reconductor w/ 477 spacer cable**
Required to meet project need					
Improve Resiliency		X		X	X
Improve automation and visibility	X	X		X	X
Eliminate 39 splices		X		X	X
Improve tree clearance from primary conductor					X
Higher breaking strength of primary conductor					X
Authorization Type	Partial	Partial	Partial	Partial	Partial
Capital Cost	$118.3K	$5.4M	$31M	$455.8K	$563.3K
Expense Cost	$6.7K	$169K	$970K	$25.8K	$29.0K
Total Cost	$125.0K	$5.6M	$32.0M	$481.6K	$592.3K
Total Cost / CM Saved	$12.83/CMS	$47.95/CMS	$328.77/CMS	$6.18/CMS	$5.07/CMS
Total Cost / CI Saved	$3.1K/CIS	$11.7K/CIS	$80.5K/CIS	$1.5K/CIS	$1.2K/CIS
Preferred option					X

Option Summary

Preferred: Option 5 was selected because it delivers the greatest reliability improvement by introducing SCADA automation for faster response times and visibility, and better resiliency by reconductoring the 336 tree wire primary conductor with 477 spacer cable which has a smaller profile and is a more resilient construction in heavily treed areas. Although its total cost is higher than Option 1, the added benefit of reconductoring with 477 spacer cable and eliminating the existing 336 tree wire that is compromised with 39 splices significantly strengthens system resiliency and long-term performance. Compared to other alternatives, Option 5 offers a balanced trade-off between cost and impact, making it the most effective solution for meeting project needs and enhancing service reliability.

Other(s): The remaining options were not selected because they offered a poor balance between cost and reliability benefits.

- Option 1, although the least expensive at $125K, provides far fewer reliability gains, making it less effective in meeting project objectives. Replacing the existing non-SCADA recloser with a SCADA recloser and leaving the 336 AAC TW primary conductor with 39 splices and excess slack will not be effective for improving reliability when a tree takes down the existing primary conductor.
- Option 2 is the original project scope and is cost prohibitive using benefit cost analysis, being a significantly higher estimate. This option lacks cost efficiency.
- Option 3 addresses a non-wire solution, estimated for a 4-hour restoration time while repairs are being made. This option is significantly higher in cost, lacks cost efficiency, and doesn't address the condition of the primary conductor with 39 splices.
- Option 4 is similar to option 5, but instead of spacer cable, this option calls for tree wire. In heavily treed areas, tree wire is not as resilient as spacer cable/messenger construction and has higher risk of a tree taking it down.

NWS estimate was calculated at $2M per MWh based on the two lowest of three contractor bids received in Connecticut.

3. **Project Relationships (if applicable):**

EVERSOURCE

Project Title: 15L68 15L69 WPC Reliability Improvement

Project ID#: CD02208

Regulatory Category: Infrastructure Replacement

Approval Status: Partial Funding

Estimated Project Cost: $1,725K

Estimated Start Year (Construction): 2026

Estimated In Service Year (Energized): 2026

1. Executive Summary:

As part of Eversource's plan to address some of the worst performing circuits (WPC), project CD02208 was created to address the high impact zones on the 15L68 circuit.

To ensure only the most cost-effective solutions were utilized, a benefit cost analysis (BCA) was performed to identify recommended solutions. As a result of the BCA, the solutions were determined based on the number of outages experienced within the past four years. The BCA recommends improved sectionalization for the high impact zones on the now 15L69 circuit. This project proposes installing new sectionalizing devices on the backbone to reduce customer zones and increase reliability in the area for the first two zones. The third zone on Hamburg Rd is to be reconductored.

2. Alternative Summary/Project Options Comparison:

Design Criteria	Option		
	1 – Original Scope	2 – Descope	3 – NWS
Required to meet project need			
Increase reliability of the 15L69-82M zone	X	X	X
Increase reliability of the 130-customer radial tap on Lynn Rd	X	X	X
Increase reliability of the 15L68-4000 zone	X	X	X
Resolves the existing contingency overload in the 15L68-4000 zone	X	X	X
Additional Benefits (not required to meet scope of project)			
Reduces customer zones		X	
Total reconductoring	13,770'	7,120'	N/A
Coverts 4.8 kV to 23 kV	X		
No automatic circuit ties with circuits emanating from the same bus	X	X	X
Authorization Type	Partial	Partial	Partial
Capital Cost	$3,220.8k	$1,725.4k	$20.06M
Expense Cost	$182.9k	$97.9k	$1.14M
Total Cost	$3,403.7k	$1,823.3k	$21.2M
Total Cost / CM Saved	$74.49 /CMS	$53.31 /CMS	$686.07 /CMS
Total Cost / CI Saved	$20,621 /CIS	$11,375 /CIS	$113,067 /CIS
Preferred option		X	

Option Summary

Preferred:

Option 2: Descope

This option aims to install two new devices to sectionalize the high impact zones into smaller customer zones to improve reliability and restoration efforts. The 15L69-82M zone experienced multiple outages in the last 4 years. The introduction of the additional sectionalizing device in the 15L69-82M zone ($6.71/CMS; $1,413/CIS) and filling in the gap from E Pond Meadow Rd to Lynn Rd ($4.17/CMS; $3,285/CIS), the two new zones of 261 and 173 customers will have improved reliability.

Additionally, this option proposes reconductoring 7,120' of #4 CU in the 15L68-4000 zone ($292.36/CMS; $27,827/CIS) to replace aging infrastructure that is leading to poor reliability. Resolving the identified contingent overload is an added benefit.

This option was selected as the preferred option because this option is 29% more cost effective versus option 1, the original scope option.

Other Options:

Option 1: Original Scope

This option focuses on reconductoring the backbone with larger covered conductor and the design is focused on maximizing the system resiliency through spacer cable construction on Dennison Rd in the 15L69-82M zone. The scope of work for this zone comes a cost of ~$1.19M with $41.18/CMS and $13,576/CIS.

The Lynn Rd zone scope of work focuses on converting Lynn Rd to 23 kV and connecting the tap to E Pond Meadow Rd. This scope of work comes at a cost of ~$551k with $50.10/CMS and $31,563/CIS.

Additionally, this option proposes reconductoring 7,120' of #4 CU in the 15L68-4000 zone ($292.36/CMS; $27,827/CIS) to improve reliability and resolve an existing contingency overload.

While this option does address the aging infrastructure in the backbone area, this option was not selected because it is the second least cost-effective option. This option has some increased benefits over option 2, such as converting Lynn Rd, but is less cost effective. This option was created to address the original 4-year outage history. This option is not justifiable with the recent outage history.

Option 3: Non-Wire Solution (NWS)

The NWS will install a combination of batteries capable of providing 2.65 MW for 4 hours or about 10.6 MWh to restore customers in the 15L69-82M and 15L68-4000 zones and the Lynn Rd radial tap in case of upstream outages. The battery installed in the 15L68-4000 zone will solve the overload. The NWS has an estimated cost of $21.2M*.

This solution was not selected as the preferred option because it is by far the least cost-effective option. This option has varied reliability improvement depending on the outage location. In

addition, the NWS has diminished reliability improvements with extended outages. Once the battery is depleted, the customers will not have any increase in reliability. Additionally, the 15L68-4000 zone and 15L69-82M zone have a source from two directions because of an automatic loop scheme. As a result of this automatic loop scheme, the NWS solution does not provide additional benefits to restore customers within this zone and provides no benefit if a fault is located within this zone of the circuit.

*NWS estimate was calculated at $2M per MWh based on the lowest two of three contractor bids received in Connecticut.

3. **Project Relationships (if applicable):**

EVERSOURCE

Project Title: Campville 14R31ROW Rebuild

Project ID#: CD02440

Regulatory Category: Infrastructure Replacement

Approval Status: Full Funding

Estimated Project Cost: $19,796K

Estimated Start Year (Construction): 2026

Estimated In Service Year (Energized): 2027

1. Executive Summary:

CD02440 seeks to address contingent loading limitations and aging infrastructure on the 14R31 ROW near Goshen, CT. The 14R31 is a 27.6kV sub-transmission line which originates at the Campville 14R substation in Harwinton CT. This circuit is responsible for feeding three smaller distribution substations: West Goshen 33M, Cornwall 37J1, & North Litchfield 42J1 circuits. In total, over 3,100 customers and 11 critical facilities are supplied from this normal feed. The identified portion of the 14R31 is comprised of roughly 39,000' of 3-ph 1/0 ACSR conductor. The identified segment includes 152 poles with an average age of 45 years. The 14R31 ROW has experienced 8 reliability related outages in the last 15 years and has seen 3 instances where the segment of 1/0 ACSR was burnt down due to overload under contingency due to switching. To prevent future asset damage due to switching and to address the aging infrastructure within this ROW, this ROW will be rebuilt to modern distribution standards, and the entirety of the existing 1/0 ACSR backbone be reconductored. This would result in the reconductoring of 39,000' of 1/0 ACSR backbone, the installation of 99 new steel/composite distribution poles within the ROW, and 80 new wood poles along road-side segments

2. Alternative Summary/Project Options Comparison:

3. Design Criteria	Option				
	1 – 14R31 ROW Rebuild	2 – Aerial Cable Bypass	3 – Aerial Cable Bypass & 19U1/42J1 Tie	4 – 14R31 ROW "Transmission-Style" Rebuild	5 – NWS & Trouble Pole Removal
	Required to meet project need				
Contingent Loads < 100%	X	X	X	X	X
Eliminates 1/0 ACSR Backbone Limitation	X	X	X	X	
	Additional Benefits (not required to meet scope of project)				
Maintains existing ROW Corridor	X			X	X
Eliminates Need for Track Vehicle & Drone Surveying		X	X		
Improves existing road-side infrastructure		X	X		
Reduces Roadside Exposure	X			X	X
Number of New Ties Created	0	0	1	0	0
Authorization Type	Full	Partial	Partial	Partial	Partial
Capital Cost	$19.795M	$19.651M	$21.306M	$27.972M	$25.1M
Expense Cost	$615k	$612.9k	$662.9k	$872.41k	$0.85M
Total Cost	$20.410M	$20.264M	$21.969M	$28.844M	$28.1M
Total Cost / MVA added	$2,096/MVA	$2,088/MVA	$2,265/MVA	$2,974/MVA	$18,733/MVA
Total Cost / CM Saved	$904.27/CM	$388.30/CM	$264.68/CM	$2,467.94/CM	$1,388.20/CM
Preferred option	X				

Option Summary

Preferred:

Option 1 suggests eliminating 39,000' of existing 1/0 ACSR with a combination of 477 AL TW and 795 AL TW. Roughly 26,000' of the 1/0 ACSR will be reconductored with 795 TW within the ROW. This reconductoring would also include the replacement of 99 existing wood poles with new weathered steel or composite poles. The roadside segments, roughly 13,000' of 1/0 ACSR, would be reconductored with 477 TW. This would require the replacement of roughly 80 wood poles. Upon completion, the existing ROW 113 would be retained, and there would be no change to the OH configuration. The cost for this option is $19.795M.

This option is preferred as it resolves the contingent overload while also addressing the aging infrastructure throughout the ROW. Under this option, the ROW is retained, which reduces road-side exposure.

Other(s):

There were three alternate options considered for this project. They are as follows:

Option 2 suggests eliminating ROW 113 and re-locating the line roadside via an aerial-cable under-build. This option would require removal of structures from P#1336 near Milton Rd, Litchfield to P#750 on Beach St., Goshen. Roughly 33,500' of new 750 AL aerial cable would be installed from P#1336 to P#750 by way of Beach St. An additional segment of 750 AL AC would be installed on Brooks Rd, to feed the 42J1 substation. In order to retain the existing auto-loop, two new reclosers would be installed near the intersection of Brooks Rd & Beach St. Due to the scope of work required to run the aerial cable bypass, an opportunity to convert a lateral segment of the 19U2 would also be made possible. This conversion would involve the removal of an existing 23/8.32kV step XFMR on Beach St and the replacement of 24 OH transformers & 8 UG transformers. Additionally, 11,460' of 1-ph 477 AAC TW would be installed along Beach St under the conversion work. After this work is complete, ROW 113 will be eliminated and repositioned as a new aerial cable bypass and the identified lateral on the 19U2 would be converted from 8.32kV to 23kV. The cost for this option is $19.651M.

This option is not preferred because, despite offering significant accessibility improvements, this option would introduce significant reliability concerns via roadside relocation. In addition, there are concerns with public reception surrounding the larger poles and number of lines that would need to be installed along these residential roads. Currently, Option 1 offers a better design solution.

Option 3 includes all the work from option 2, but with modification to incorporate a new auto-tie between the 42J1 and 19U2. Under this option, the scope of work surrounding the aerial cable bypass remains the same. The addition of a new 2-way tie between the 42J1 & 19U2 is planned within this option. To make this possible, the conversion of the 19U2 lateral would include an additional line extension for 2 new phases comprised of 477 AAC TW along Beach St. in Litchfield. A separate extension would be required on the 42J1 side to make this possible, as well. Finally, three new reclosers would be installed to ensure correct operation of the new auto-loop. This would involve a new SR and MR on the 19U2, and one new SR on the 42J1. After completion ROW 113 would be eliminated, a new aerial cable bypass would be created along the 14R31 backbone. A lateral tap on the 19U2 would be converted from 8.32kV to 23kV, and a new two-way autoloop would be created between the 42J1 and the 19U2. The cost for this option is $21.306M

This option is not preferred. While this option offers significant benefits to the reliability of the 14R31, 19U2, & 42J1, it does so at a significant cost. Additionally, the scope of work under this option is well outside the minimum requirements for solving the load and reliability issues outlined for this project's minimum requirements.

Option 4 includes an identical scope of work for segments 1 & 4 as shown in option 1. The suggested work for Segment 2 & 3 is larger in scope. Under this option, ROW 113 would be entirely rebuilt using approximately 86 light duty steel transmission style poles and Davit arms. A total of 25,000' of 3 phase 795 ACSR and 1 phase OPGW Fiber Optic Neutral. After completion, ROW 113 would be significantly less susceptible to reliability related incidents and the capacity of the overhead line would be increased greatly. These improvements would work to help limit the need to access the ROW in the future. The total cost for this option is $27.972M

This option presents a significant improvement over the current ROW construction, but at a significant expense. This option was not selected as the preferred because, despite being incredibly robust, the design does not offer enough benefit over the distribution style construction proposed in option 1 for the cost.

Option 5 suggests a Non-Wires Solution via installation of a 7.5MWh Battery. To eliminate the overload condition under contingency between the 14R31 when supporting the 11M62 & 11M3 load, a minimum of 1.5MVA is required. Assuming a 5-hour duration of overload, a 10-year growth rate of ~0.43%, and a power factor of 0.9, a 7.5MWh battery would be needed. Based on this the total cost for the battery would be $15Million. NWS estimate was calculated at $2M per MWh based on the two lowest of three contractor bids received in Connecticut. The NWS estimate is an all in cost assuming land purchase and interconnection costs of the battery. The cost of option 5 includes addressing the aging infrastructure in the ROW in order to compare the options equally in terms of resolving the overload and aging infrastructure. Total cost of addressing the aging infrastructure within the ROW and installing a battery is estimated to be $28.1M.

This option is not preferred because of the cost and time of procurement of property and materials.

3. Project Relationships (if applicable):

EVERSOURCE

Project Title: 15L69/ 11C12 Contingency Overload

Project ID#: CD02618

Regulatory Category : Capacity

Approval Status: Partial Funding

Estimated Project Cost : $594.3K

Estimated Start Year (Construction) : 2026

Estimated In Service Year (Energized): 2027

1. Executive Summary:

This project proposes to solve a contingent overload on the Bokum 15L69 ROW when picking up the Haddam 11C12 circuit. A load study showed that under contingency when the 15L69 is picking up the 11C12-70S and 11C12-71S zone, this will add 277 amps and will cause the Bokum 15L69 to experience a 120% overload of the normal limit and 100% of the emergency limit.

The scope of the project is to modify the 11C12 loop scheme and have the 11C14 pick up more of the 11C12 load. This will cause the 11C14 to experience a 115% overload at normal and would require reconductoring of 2,580 feet of 2/0 Cu and 336 AL TW with 477 AL TW beyond the 11C14-71S.

2. Alternative Summary/Project Options Comparison:

Design Criteria	Option		
	1 – 11C12 Loop Scheme Change & Reconductor 11C14	2 – Reconductor Bokum 15L69 ROW with Necessary Pole Replacement	3 – NWS for Bokum 15L69
	Required to meet project need		
Contingent loads < 100% of OH rating	X	X	X
	Additional Benefits (not required to meet scope of project)		
Increases capacity on 11C14 circuit	X		
Reduce Load on the 15L69 ROW	X		X
Increases capacity on Bokum 15L69 ROW		X	
Keeps existing Bokum 15L69 ROW infrastructure	X		X
Improves Bokum 15L69 ROW infrastructure		X	
Authorization Type	Partial	Partial	Partial
Capital Cost	$594.3K	$2.95M	$23.6M
Expense Cost	$18.5K	$0.09M	$0.75M
*Total Cost	$612.8K	$3.04M	$24.35M
Total Cost / MVA added	$83.1K/MVA	$254.3K/MVA	$8.03M/MVA
Preferred option	X		

Doing nothing would violate the Eversource planning criteria by exceeding normal ratings under contingency.

Option Summary

Preferred: Option 1 will reduce the load that the Bokum 15L69 will see when picking up the 11C12. This is accomplished by changing the settings on the 11C12-81M to an SR and replacing the 11C12-71S with a Viper SS. This solution causes an overload on the 11C14 circuit and will require 2,580 feet of reconductoring. This option was selected because it offers a quick and cost-effective solution.

Others:

Option 2 will solve the contingent overload on the Bokum 15L69 ROW by reconductoring 12,380 feet of 2/0 Cu and 336 AL to 795 AL TW. 20 wooden poles along the ROW section will also be replaced with self-weathering steel poles. This option was not selected because of the long construction time and high cost.

Option 3 offers a Non-Wires Solution by installing a 12.12MWh battery. The battery needs to support 76 amps of load to lower the 120% contingency to 100% at the 15L69-80M. The MW needed to accomplish this is 3.03MW. The expected duration of the battery is 4 hours. The expected growth rate of the Bokum 15L substation is 0.44% over a ten-year period. NWS estimate was calculated at $2M per MWh based on the two lowest of three contractor bids received in Connecticut. This results in a total cost of $24.35M. This option was not selected due to the cost being very high.

3. Project Relationships (if applicable):

EVERSOURCE

Project Title: 11Y2 Contingency Overload

Project ID#: CD02654

Regulatory Category: Capacity

Approval Status: Partial Funding

Estimated Project Cost: $696K

Estimated Start Year (Construction): 2028

Estimated In Service Year (Energized): 2028

1. Executive Summary:

The Flanders 11Y2 has a contingent overload while carrying the 11Y8-71S zone. The 11Y2 also has a contingent overload during a #2 Bus fault within the Flanders 11Y substation while picking up the 11Y8-71S and 11Y7-70S zones. This project addresses both contingent overloads.

The scope of the project consists of reconductoring the 11Y2 backbone along Flanders Rd to resolve the overload.

2. Alternative Summary/Project Options Comparison:

Design Criteria	Option				
	1 – Reconductor from 11Y2 riser to Society Rd (Segments 1 and 2)	2 – NWS for 11Y8 Contingency	3 – Reconductor from 11Y2 riser to Roxbury Rd (All 3 Segments)	4 – NWS for #2 Bus Fault Contingency	5 - Reconductor from 11Y2 riser to Society Rd (Segments 1 and 2) + NWS for #2 Bus Fault Contingency
	Required to meet project need				
Normal loads < 80% of UG rating	X	X	X	X	X
Normal loads < 90% of OH rating	X	X	X	X	X
Contingent loads < 100% of rating	X	X	X	X	X
	Additional Benefits (not required to meet scope of project)				
Solves Bus fault contingency			X	X	X
Additional ties created	0	0	0	0	0
Increases capacity on the circuit	X	X	X	X	X
No automatic circuit ties with circuits emanating from the same bus	X	N/A	X	N/A	N/A
Authorization Type	Partial	Partial	Partial	Partial	Partial
Capital Cost	$695.7k	$17.5M	$1,520.9k	$43.1M	$12.3M
Expense Cost	$21.7k	$0.5M	$47.4k	$1.3M	$0.4M
Total Cost	$717.4k	$18M	$1,568.3k	$44.4M	$12.7M
Total Cost / MVA added	$159.4k/MVA	$12M/MVA	$348.5k/MVA	$12M/MVA	$3.4M/MVA
Preferred option	X				

If this project does not move forward and nothing is done, the overload violates the planning criteria, could damage equipment potentially failing and causing long duration outages to customers.

Option Summary

Preferred:
Option 1 of reconductoring only up to Society Rd, solving the 11Y8 contingency, is preferred due to its lower cost, and that it reduces the severity of the #2 Bus fault contingency overload. The #2 Bus fault contingency overload will be reviewed under a separate project.

Others:
Option 2 – NWS: The 9 MWh battery size was estimated based on the 1.5 MVA needed to bring the load on the 11Y2 overloaded conductors down below 100% rating during contingency with the 11Y8-71S zone. This reduction would be required during the 6-hour peak load period of 2PM and 8PM for this area. This comes at a cost of $18M for the 9 MWh battery.

Option 3 – extending the reconductoring down to Roxbury Rd is not preferred due to the increased costs, and that Option 1 reduces the severity of the #2 Bus Fault contingency overload. The #2 Bus fault contingency will be reviewed under a separate project.

Option 4 - NWS: The 22.2 MWh battery size was estimated based on the 3.7 MVA needed to bring the load on the 11Y2 overloaded conductors down below 100% rating on contingency with the #2 Bus fault. This reduction would be required during the 6-hour peak load period of 2PM and 8PM for this area. This comes at a cost of $44.4M for the 22.2 MWh battery.

Option 5 – This combines option 1 with an additional NWS segment of a 6 MWh battery to resolve the contingency with the #2 Bus fault left over by option 1. The 6 MWh battery size was estimated based on the 1 MVA needed to bring the load on the 11Y2 overloaded conductors down below 100% rating on contingency with the #2 Bus fault. This reduction would be required during the 6-hour peak load period of 2PM and 8PM for this area. This comes at an additional cost of $12M for the 6MWh battery.

NWS estimates were calculated at $2M per MWh based on the two lowest of three contractor bids received in Connecticut.

3. **Project Relationships (if applicable):**

EVERSOURCE

Project Title: G1BCA Western Backbone Sectionalizing-18Z-19R

Project ID#: CD02701

Regulatory Category: Enhancement Programs

Approval Status: Partial Funding

Estimated Project Cost: $2,193.3K

Estimated Start Year (Construction): 2027

Estimated In Service Year (Energized): 2027

1. Executive Summary:

The Smart Switch program now analyzes circuit zones throughout Eversource and ranks them based on their impact on SAIDA and SAIFI across the company. The Smart Switch Program is a continuation of an Eversource initiative of a multi-year program to improve circuit reliability by adding automatic or SCADA sectionalizing devices on overhead distribution circuits. The Smart Switch Program focuses on breaking up customer zones and lowering the average number of customers impacted by a backbone interruption. Under this project, 18 circuit zones will be addressed with the installation of 19 reclosers in the Western region of Connecticut.

2. Alternative Summary/Project Options Comparison:

Design Criteria	Option	
	1 – Western Reclosers	2 – NWS
All Zone below 500 customers	X	X
Sectionalizes zones to limit customers interrupted	X	X
Battery storage to provide external power during an outage		X
Authorization Type	Partial	Partial
Capital Cost	$2,193.3K	$324,433.8K
Expense Cost	$96.1K	$14,215.1K
Total Cost	$2,289.4,K	$338,648.9K
Total Cost / CM Saved	$2.87	$424.13
Total Cost/ CI saved	$393.2	$58.17K
Preferred option	X	

The NWS option was not chosen because Option 1 provides comparable customer minutes savings at a much lower cost. It was assumed that each battery would provide up to four hours of support at a cost of $2M per MWH. In addition, adding a battery would still require the sectionalizing reclosers included in option 1.

3. Project Relationships (if applicable):

EVERSOURCE

Project Title: Town Scorecard – Eastern Region

Project ID#: CD02723

Regulatory Category: Infrastructure Replacement

Approval Status: Partial Funding

Estimated Project Cost: $1454K

Estimated Start Year (Construction): 2026

Estimated In Service Year (Energized): 2026

1. Executive Summary:

This project addresses the Town Scorecard Initiative which identifies the top 10 worst performing towns in Eversource, CT for SAIDI and SAIFI. Project CD02723 addresses the worst performing SAIDI and SAIFI towns in the Eastern Region. There are separate projects to address the Western Region (Sherman) and Central Region (Union) towns.

The worst performing towns on the top 10 list in the Eastern Region are: Chaplin, East Haddam, Franklin, Haddam, North Branford, Salem, Sterling, Voluntown, Woodstock.

Reliability initiatives to install reclosers will improve circuit performance by reducing the number of customers interrupted.

Using Cost Benefit Analysis, the most cost-effective solutions will be proposed.

2. Alternative Summary/Project Options Comparison:

Design Criteria	Option		
	1 – Reduce Cust Zones	2 – Reconductor & Trim	3 – NWS
Required to meet project need			
Normal loads < 80% of UG rating	X	X	X
Normal loads < 90% of OH rating	X	X	X
Contingent loads < 100% of rating	X	X	X
Additional Benefits (not required to meet scope of project)			
All zones < 500 customers	X		
Authorization Type	Partial	Partial	Partial
Capital Cost	$1.45M	$23.0M	$169.3M
Expense Cost	$0.09M	$1.3M	$9.6M
Total Cost	$1.54M	$24.3M	$178.9M
Total Cost / CM Saved	$5.02/CMS	$79.24/CMS	$583.51/CMS
Total Cost / CI Saved	$625.28/CIS	$9,864.39/CIS	$72,650/CIS
Preferred option	X		

Doing nothing could result in more customer outages increasing the number of interruptions.

Option Summary

Option 1: Preferred – addresses reducing the number of customers in zones which will reduce the number of customers impacted for a fault condition. Using Cost Benefit Analysis, this option is preferred because this is the cheapest cost benefit solution while providing reliability improvement.

Option 2: Not preferred – reconductor backbone segments and tree trim, a total of 22.3 miles. Using Benefit Cost Analysis, this option is not recommended because this cost is 16 times higher than the preferred option and the reliability metrics ($/CM Saved, $/CI Saved) are very high.

Option 3: Not preferred – install Non-Wires Solution for all 10 segments. The total aggregate MWh needed for these segments is 89.47 MWh. The average battery size is 8.947 MWh for each segment. This will provide an alternate source during interruptions depending on the fault location. The expected duration of each battery is 4 hours. NWS estimate was calculated at $2M per MWh based on the two lowest of three contractor bids received in Connecticut. This option is not recommended because it is the least cost-effective option, and the fault must occur in a specific zone to provide a benefit.

3. **Project Relationships (if applicable):**

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Project Title: Westbrook 20S Conversion

Project ID#: CS00703

Regulatory Category : Capacity

Approval Status: Initial Funding

Estimated Project Cost : $1,306K

Estimated Start Year (Construction) : 2026

Estimated In Service Year (Energized): 2026

1. **Executive Summary:**

   The Westbrook 20S non-bulk substation is fed by the 15L46 feeder which is the source of the 27.6kV feed originating from the Bokum 15L substation, located in Old Saybrook, CT. Project CS00365 - Bokum 15L Distribution Transformer Replacement/Addition and Station Reconfiguration was approved for full funding on April 27, 2023, and has a current in-service date (ISD) of August 2026. The scope of that project is to increase the substation capacity of Bokum 15L and convert the distribution voltage from 27.6kV to 23kV to improve reliability. The 15L46 feeder leaves Bokum 15L substation and then runs express (no taps or customers directly fed at 27.6kV) approximately five (5) miles southwest to Westbrook 20S substation. The distribution line work to convert the 15L46 feeder will be done under project CD02381 – Convert 15L46 to 23kV. To support the conversion of the 15L46 feeder, the 20S-1X transformer at Westbrook will need to have the primary taps changed from 27.6kV to 23kV. In addition, lightning arrestors on the 20S-1X will be replaced. A mobile transformer will be on standby during construction to mitigate any single contingency load loss scenarios. All construction efforts on this project will be coordinated with the conversion of the 15L46 feeder in project CS00365 and CD02381.

2. **Alternative Summary/Project Options Comparison:**

   There is currently a distribution line project being developed to eliminate/ retire the Westbrook 20S non-bulk substation by the end of 2027. This project contains four separate alternatives to how the substation can be eliminated.

   Due to the May 2026 need to convert the 15L46 distribution line to 23kV, making use of the existing transformer by changing its internal taps was the only viable alternative. The only other alternative to be considered for this project to support the conversion work of 15L46 would be to replace the existing transformer. This would be a much more expensive and timely solution for an interim project.

CD02381 Options Table:

Design Criteria	Option		
	1 – Convert 15L46 to 23kV and remove all de-energized conductors	**2 – Convert 15L46 to 23 kV, do not remove de-energized conductors**	**3 - NWS**
Total Cost	$3,476.2K	$1,680K	$102.4M

Option Summary

Option 1 - is selected as the preferred option because the conversion will create double- and triple-circuit conductor to become de-energized and will serve no purpose. The de-energized conductor, constructed on a single pole line, will be removed, along with existing out-of-service and de-energized primary conductor. Removing all unused conductor (3.5 miles) is beneficial because if any of this conductor comes down during a storm event or for any reason, restoration will be prolonged.

Option 2 – is not selected because it leaves all de-energized conductor (3.5 miles) on the poles, which could lead to confusion and prolonged restoration during a storm event or for any reason the conductor comes down.

Option 3 – A non-wires alternative Battery Energy Storage System (BESS) is not recommended due to the following:

A BESS with a capacity of 51.2 MWh would be required to serve the 15L46 circuit. This battery is good for only 4 hours.

The Bokum 15L substation is being converted to 23 kV; leaving the 15L46 circuit at 27.6 kV would limit switching options when all surrounding circuits are 23 kV.

A BESS will not provide any of the benefits received when converting the 27.6kV voltage to 23kV.

The cost is prohibitive compared to other more traditional options.

NWS estimate was calculated at $2M per MWh based on the two lowest of three contractor bids received in Connecticut.

3. Project Relationships (if applicable):

This project's need is driven by two other distribution related projects. Substation project CS00365 – "Bokum 15L Distribution Transformer Replacement/ Addition and Station Reconfiguration" will increase capacity of the substation and convert the operating voltage from 27.6kV to 23kV. Distribution line project CD02381 – "Convert 15L46 to 23kV" will construct all line work outside the substation to enable the voltage conversion of the 15L46 feeder from 27.6kV to 23kV out to the Westbrook 20S non-bulk substation.