EVERSOURCE ENERGY

56 Prospect Street
Hartford, CT 06103

David J. Burnham
Eversource ISO Policy and Economic Analysis
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September 16, 2020

Ms. Emily Laine
Chair, NEPOOL Reliability Committee
ISO New England, Inc.
One Sullivan Road
Holyoke, MA 01040-2841

Dear Ms. Laine,

In accordance with Schedule 12C of the ISO New England ("ISO-NE") Transmission, Markets & Services Tariff ("ISO-NE Tariff"), Eversource Energy Service Company ("Eversource") hereby submits the attached Transmission Cost Allocation ("TCA") application(s) reporting cost support information associated with the construction, retirement, or modification to facilities rated 69 kV and above that qualify as regional Pool Transmission Facilities ("PTF") for the following Eversource project:

ES-17-TCA-04-Rev.1 Greater Boston Projects

Eversource is requesting that ISO-NE submit this TCA to the NEPOOL Reliability Committee for review, in accordance with ISO-NE Planning Procedure No. 4 ("PP-4").

If you have any questions, I can be reached via the information listed above.

Sincerely,

David J. Burnham

David J. Burnham

cc: M. Drzewianowski

Attachment B
TCA Application Revision Form

1. Applicant:

Revised Application #: ES-17-TCA-04 Rev.1 Date: Sep-20

Original Application #: ES-17-TCA-04 Original Approval: RC approved in 2017

Contact Name: David Burnham
Company Name: Eversource Energy
Address 1: 56 Prospect Street
Address 2:
City, State, Zip: Hartford, CT 06103
Contact Phone #: 860-728-4506
Email Address: david.burnham@eversource.com

Include a copy of the prior Application. The revision was required because of:

a) a material change in design [ ]

b) a cost increase greater than 10% [X]

2. Project Description: In Service Date: Dec-23

a. **High Level Project Details:**

Project Name (If no formal name, then Substation Upgrade, Line Upgrade, etc. are acceptable): Greater Boston Projects

Project Location (State only): State: Massachusetts **County:** Various

a. Summary of PTF-related work for Project:

Numerous Upgrades and Rebuilds including new 115 kV transmission lines in the Greater Boston Area to include the installation of a 30 MVAR 115-kV shunt reactor to support the Sudbury to Hudson underground line. All project costs greater than 10% are listed (shown in red) in the attached revised project cost estimate and schedule sheet.

b. Summary of Non-PTF-related work for Project:

The Non-PTF project cost increased from $1.64M to $1.81M.

3. Was a revised transmission Proposed Plan Application required for this work? Yes [X] No [ ] PPA Number: ES-16-T07 Rev 1

4. Has a revised transmission Proposed Plan Application been approved? Yes [ ] No [X] N/A [ ] Approval Date:
If yes, attach a copy and reference Proposed Plan Application # and approval date. (Please check only one)

Need For Project:

5. Need Based On

a. Reliability [X]

b. Economic [ ]

c. Service to new load	☐
d. New generator interconnection	☐
Generator Proposed Plan Application Number Generator Proposed Plan Application Date (Attach copy of cover letter & Generator Proposed Plan Application)	_____ _____
e. Public Policy Transmission Upgrade (PPTU)	☐
f. Market Efficiency Transmission Upgrade (METU)	☐
g. Asset Condition	☐
h. Other (specify in line 6)	☐

7.

(Include available documentation relative to the need for this Project, explain the cost and/or material change difference here)

See attached presentation which explains the cost increases for each project that exceeded the 10% TCA requirement.

8. Provide a narrative description of the need for this Project.
(Include available documentation relative to the need for revisions to this Project. Explain the cost and/or material change differences.

See attached presentation which explains the cost increases for each project that exceeded the 10% TCA requirement.

Revised Cost of Project:	**Original Application**	**Revision to Original Application**
10. Total Project Cost ($M) equals PTF + Non-PTF + all other Project Costs:	$613.320	$763.319
11. Total Proposed PTF Costs		
a. Total Proposed PTF Cost of this Project ($M):	$611.680	$763.319
b. Requested Pool-Supported PTF Costs associated with this Project ($M):	$611.680	$763.319
c. Breakdown of Requested Pool-Supported PTF Cost associated with this Project ($M): (Consistent with Table 1 and Appendix D of this Procedure)		
Material	$200.746	$197.002
Labor	$271.131	$428.006
ROW	$10.464	$3.627
Engineering/Permitting/Indirects	$66.921	$68.328
Escalation	$25.116	$11.225
AFUDC (or equivalent)	$4.097	$34.626
Contingency	$33.206	$21.506
d. Generator Supported PTF Costs* ($M):	$0.000	$0.000
If the costs in 7.b. plus 7.d. do not equal the total proposed PTF cost (7.a) explain and indicate who is responsible for the remaining costs.		
12. Total Proposed Non-PTF Cost of this Project ($M):	$0.00	$0.00
13. Proposed PTF Costs ($M) introduced as a result of local, state or other regulatory/legislative requirements, including costs identified pursuant to Section 1.6.3 of this PP-4.	$0.00	$0.00
a. Description of Proposed PTF Cost introduced as a result of local, state or other regulatory/legislative requirements as defined in question 8 above.		
14. All other Project Costs not captured in PTF Costs (8) or Non-PTF Costs (9)Total Non-PTF Cost ($M) associated with this Project:	$1.64	$1.81

15. Total PTF Cost based on: (check one)
    Actual Costs ☐
    OR
    Estimated Costs* ☒

16. Valuation Year of dollar amounts submitted above: __2020_____

17. If applicable, explain how the cost of common facilities were allocated between PTF and Non-PTF.

18. Does this Project result in a change of existing Non-PTF facilities to PTF?	Yes	No
	[ ]	[X]

* Pool-Supported PTF costs were determined pursuant to Schedule 11 of Section II of the Tariff.

PROJECT COST ESTIMATE & SCHEDULE SHEET

Transmission Owner: Eversource

RSP Project #: 965, 969, 1175, 1199, 1201, 1220, 1335, 1336, 1337, 1338, 1339, 1341, 1352, 1353, 1354, 1355, 1356, 1357, 1364, 1516, 1518, **1519**, 1520, 1522, 1552, 1553, 1554, 1558, 1640, 1645, 1646, 1647, 1738

Project Name: Greater Boston Projects

Date: Sep-20

1. Project Scope Summary

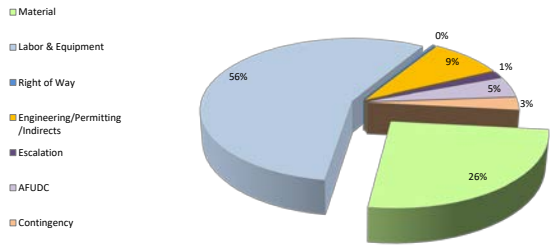
Numerous upgrades and rebuilds including new 115-kV transmission lines in the Greater Boston Area to include the installation of a 30 MVAR 115-kV shunt reactor to support the Sudbury to Hudson underground line. All project costs greater than 10% are listed (shown in red).

2. Project Cost Summary

($1000s)

2.1. Project Cost Summary

Cost Category	PTF	Non-PTF	Total
Material	$ 197,002	$ -	$ 197,002
Labor & Equipment	$ 428,006	$ -	$ 428,006
Right of Way	$ 2,627	$ -	$ 2,627
Engineering/Permitting /Indirects	$ 68,328	$ -	$ 68,328
Escalation	$ 11,225	$ -	$ 11,225
AFUDC	$ 34,626	$ -	$ 34,626
Contingency	$ 21,506	$ -	$ 21,506
Total Project Cost	**$ 763,319**	**$ -**	**$ 763,319**

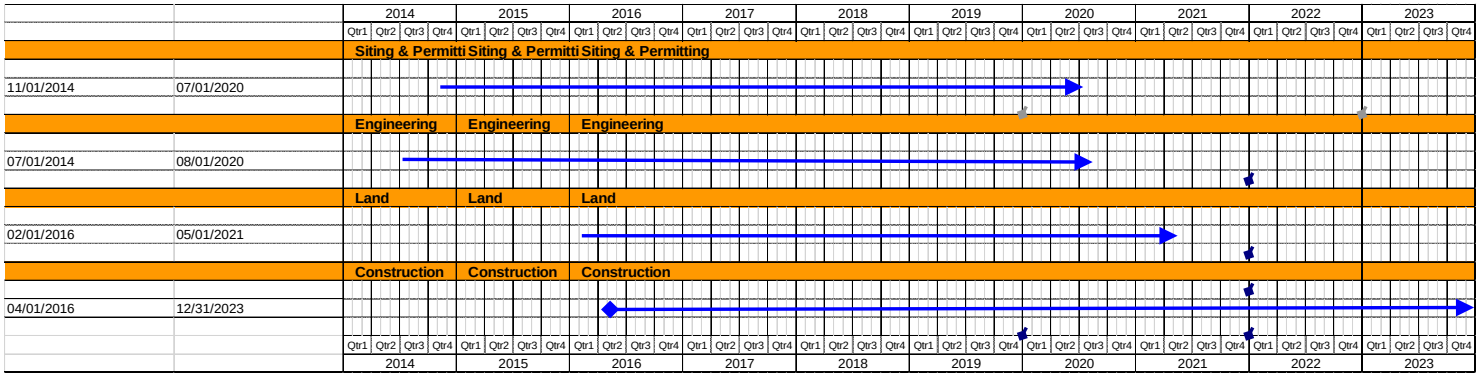


2.2 Detailed Cost Summary By Project Element

	Material	Labor & Equipment	Right of Way	Engineering/ Permitting/ Indirects	Escalation	AFUDC	Contingency	Total	PTF Amount
965 - Add third 115 kV line from W. Walpole to Holbrook.	**$ 5,948.000**	**$ 14,322.000**	**$ 344.000**	**$ 6,965.000**	**$ -**	**$ 2,298.000**	**$ -**	**$ 29,877.000**	**$ 29,877.000**
969 - Add a new 115 kV 36.7 MVAR capacitor bank at Chelsea.	$ 496.960	$ 801.138	$ -	$ 82.747		$ 4.293	$ -	**$ 1,385.138**	**$ 1,385.138**
1175 - Upgrade the 115 kV line 201-501 (Medway-Depot St.) and the 201-502 (Beaver Pond - Depot Street Tap) to a higher capacity line.	$ 867.868	$ 654.687	$ -	$ 2,996.443	$ -	$ 15.601	$ -	**$ 4,534.599**	**$ 4,534.599**
1199 - Install a new 230/115 kV autotransformer at Sudbury Loop 230 kV line 282-602 in and out of a new 230 kV switchyard at Sudbury.	$ 19,470.000	$ 8,200.000	$ -	$ 6,244.000	$ -	$ 104.000	$ -	**$ 34,018.000**	**$ 34,018.000**
1201 -115 kV line Reconductoring of the P168/128-518 Line between Chelsea and Revere (NSTAR Portion of the line).	$ 59.745	$ 633.210	$ -	$ 71.041	$ -	$ 2.376	$ -	**$ 766.372**	**$ 766.372**
1220 - Install a new 345 kV (3124) circuit between Scobie and Hudson NH (this is Eversource's portion of the new Scobie-Tewksbury circuit).	$ 8,363.000	$ 15,696.000	$ -	$ 9,301.000		$ 251.000	$ 3,305.000	**$ 36,916.000**	**$ 36,916.000**
1335 - Build a new 115 kV line from Sudbury Station 342 substation to Hudson substation.	**$ 23,773.000**	**$ 51,450.000**	**$ 1,154.000**	**$ 2,921.000**	**$ 3,686.000**	**$ 3,989.000**	**$ 4,003.000**	**$ 90,976.000**	**$ 90,976.000**
1336 - Replace the existing 345/115 kV autotransformer with a higher rating transformer and 345 kV and 115 kV switchgear and breakers at Woburn.	**$ 26,478.000**	**$ 21,701.000**	**$ -**	**$ 4,199.000**	**$ -**	**$ 5,141.000**	**$ -**	**$ 57,519.000**	**$ 57,519.000**
1337 - Reconfigure Waltham Substation and one (1) 115 kV breaker. Includes relocating terminations for PARs and 282-507 line.	$ 3,445.000	$ 8,107.000	$ -	$ 2,576.000		$ 353.000	$ 3,019.000	**$ 17,500.000**	**$ 17,500.000**
1338 - Reconductor of the 115 kV line 211-508 from Woburn-Burlington.	$ 739.000	$ 4,050.000	$ -	$ 590.000	$ -	$ 3.000	$ -	**$ 5,382.000**	**$ 5,382.000**
1339 - Upgrade 115 kV line 533-508 Lexington-Hartwell Ave by removing line clearance limitation and upgrading station equipment.	$ 69.000	$ 42.000	$ -	$ 42.000		$ 1.000		**$ 154.000**	**$ 154.000**
1341 - Add a new 115 kV 36.7 MVAR capacitor bank at Hartwell Ave.	$ 704.914	$ 317.731	$ -	$ 305.829	$ -	$ 4.030	$ -	**$ 1,332.504**	**$ 1,332.504**
1352 - Add a second Mystic 345/115 kV autotransformer and Mystic bus reconfiguration.	**$ 10,174.000**	**$ 12,635.000**	**$ -**	**$ 1,415.000**	**$ -**	**$ 1,290.000**	**$ -**	**$ 25,514.000**	**$ 25,514.000**
1353 - Install K St. tie breaker #33 on the East bus.	$ 786.000	$ 815.000	$ -	$ 346.000		$ 6.000	$ -	**$ 1,953.000**	**$ 1,953.000**
1354 - Add Mystic-Chelsea 115 kV cable	$ 13,968.000	$ 33,075.000	$ -	$ 4,126.000	$ 1,332.000	$ 175.000	$ 4,024.000	**$ 56,700.000**	**$ 56,700.000**
1355 - Split existing 110-522/240-510 DCT from Baker St. Station to Needham for a portion of the way and then install a new underground 115 kV line for the remainder of the way.	**$ 6,324.000**	**$ 35,509.000**	**$ 794.000**	**$ 820.000**	**$ -**	**$ 2,241.000**	**$ -**	**$ 45,688.000**	**$ 45,688.000**
1356 - Add a 2nd Mystic-Woburn 115 kV cable to create a bifurcated 211-514 Mystic-Woburn 115 kV circuit.	**$ 20,251.000**	**$ 99,906.000**	**$ 35.000**	**$ 3,800.000**	**$ -**	**$ 9,200.000**	**$ 5,595.000**	**$ 138,787.000**	**$ 138,787.000**
1357 - Open up lines 329-510/511 and 250-516/517 at Mystic and Chatham respectively. Operate K Street as Normally Closed station.	**$ 608.000**	**$ 400.000**	**$ -**	**$ 418.000**	**$ -**	**$ 37.000**	**$ -**	**$ 1,463.000**	**$ 1,463.000**
1364 - Reconductoring Eversource's portion of Y-151 between Hudson and Power Street	$ 843.000	$ 1,588.000	$ -	$ 807.000	$ -	$ 12.000	$ 50.000	**$ 3,300.000**	**$ 3,300.000**
1516 - Construct a new 115 KV three breaker switching station in Sharon MA to segment the three 115 kV circuits that extend from West Walpole to Holbrook.	**$ 8,014.000**	**$ 9,780.000**	**$ -**	**$ 1,421.000**	**$ -**	**$ 1,070.000**	**$ -**	**$ 20,285.000**	**$ 20,285.000**
1518 - Station upgrades to create a second normally closed 115 kV bus tie at Kingston Station and reconfigure the 345 kV switchyard	$ 7,539.000	$ 2,100.000	$ -	$ 3,900.000	$ -	$ 42.000	$ 919.000	**$ 14,500.000**	**$ 14,500.000**
1519 - Relocate Chelsea capacitor bank 128-518 termination position	**$ 90.000**	**$ 1,138.000**	**$ -**	**$ 225.000**	**$ -**	**$ 25.000**	**$ -**	**$ 1,478.000**	**$ 1,478.000**
1520 - Equipment termination changes at North Cambridge Station to mitigate 115 kV stuck breaker 5 and 10 contingencies	$ 478.000	$ 6,476.000	$ -	$ 1,719.000	$ -	$ 27.000	$ -	**$ 8,700.000**	**$ 8,700.000**
1522 - Add a new 115 kV 36.7 MVAR capacitor bank at Sudbury Station	$ 720.000	$ 546.000	$ -	$ 562.000	$ -	$ 6.000	$ -	**$ 1,834.000**	**$ 1,834.000**
1552 - Add a new 345 kV cable from Woburn substation to the Wakefield substation and terminal equipment at Woburn including a 160 MVAR 345 kV reactor	**$ 20,688.000**	**$ 84,682.000**	**$ -**	**$ 3,585.000**	**$ 5,487.000**	**$ 7,327.000**	**$ -**	**$ 121,769.000**	**$ 121,769.000**
1553 - Add a breaker in series with breaker 104 At Woburn 345 kV switchyard	$ 4,210.000	$ 1,033.000	$ -	$ 1,703.000	$ -	$ 21.500	$ -	**$ 6,967.500**	**$ 6,967.500**
1554 - Add one 115 kV breaker at K street in series with the 29 breaker	$ 387.000	$ 592.000	$ -	$ 340.000	$ -	$ 4.000	$ -	**$ 1,323.000**	**$ 1,323.000**
1558 - Add a new 345 kV breaker in series with the 104 breaker at Stoughton	$ 368.000	$ 354.000	$ -	$ 211.000	$ -	$ 3.000	$ -	**$ 936.000**	**$ 936.000**
1640 - Reconductor the Eversource portion of the M-139/211-503 and N-140/211-504 115 kV lines between Pinehurst – North Woburn tap	$ 656.000	$ 1,940.000	$ 300.000	$ 1,342.000	$ 494.000	$ 16.000	$ -	**$ 4,748.000**	**$ 4,748.000**

1645 - Add a new 115 kV 36.7 MVAR capacitor bank at Hartwell Station	$ 816.000	$ 1,108.000	$ -	$ 264.000	$ -	$ 67.000	$ -	$ 2,255.000	$ 2,255.000
1646 - Add a new 345 kV 160 MVAR shunt reactor at K Street	$ 6,123.085	$ 3,366.100	$ -	$ 1,819.232	$ -	$ 175.784	$ 515.799	$ 12,000.000	$ 12,000.000
1647 - Add a new 115 kV breaker in series with breaker 5 at Framingham	$ 227.000	$ 607.000	$ -	$ 366.000	$ -	$ 25.000	$ 75.000	$ 1,300.000	$ 1,300.000
1738 - Chelsea BPS Upgrade	$ 3,317.000	$ 4,381.000	$ -	$ 2,845.000	$ 226.000	$ 689.000	$ -	$ 11,458.000	$ 11,458.000
Total	$ 197,001.572	$ 428,005.866	$ 2,627.000	$ 68,328.292	$ 11,225.000	$ 34,625.584	$ 21,505.799	$ 763,319.113	$ 763,319.113

3. Project Milestone Schedule



Greater Boston
Correlation Table

TCA	RSP	Study	PPA Application:		PAC/RC Meeting	TCA Applications	
Item	Project ID #	Reliability Issues Requiring Action	PPA No.	Preferred Solution Description	Presentation Reference	PTF Estimate	Non-PTF Estimate
1	965	Greater Boston Projects	ES-16-T10	Add third 115 kV line from W. Walpole to Holbrook	PAC - The Greater Boston Area Transmission Solution Study Dated 08-12-2015 RC - Presented PPA's on 06-09-2016	$29.9M	
1	696		NSTAR-11-T04	Add a new 115 kV 36.7 MVAR capacitor bank at Chelsea		$1.385M	
1	1175		NSTAR-11-T11	Upgrade the 115 kV line 201-501 (Medway-Depot St.) and the 201-502 (Beaver Pond - Depot Street Tap) to a higher capacity line.		$4.535M	
1	1199		ES-15-T76	Install a new 230/115 kV autotransformer at Sudbury Loop 230 kV line 282-602 in and out of a new 230 kV switchyard at Sudbury.		$34.018M	
1	1201		NSTAR-11-T03	115 kV line Reconductoring of the P168/128-518 Line between Chelsea and Revere (NSTAR Portion of the line).		$0.766M	
1	1220		ES-16-T05	Install a new 345 kV (3124) circuit between Scobie and HudsonNH (this is Eversource's portiono f the new Scobie-Tewksbury circuit).		$36.916M	
1	1335		ES-16-T07	Build a new 115 kV line from Sudbury Station 342 substation to Hudson substation.		$91M	
1	1336		ES-16-T21	Replace the existing 345/115 kV autotransformer with a higher rating transformer and 345 kV and 115 kV switchgear and breakers at Woburn.		$57.5M	
1	1337		ES-16-T125	Reconfigure Waltham Substation and one (1) 115 kV breaker. Includes relocating terminations for PARS and 282-507 line.		$17.5M	
1	1338		NSTAR-12-T09	Reconductor of the 115 kV line 211-508 from Woburn-Burlington		$5.382M	
1	1339		ES-15-T60	Upgrade 115 kV line 533-508 Lexington-Hartwell Ave by removing line clearance limitation and upgrading station equipment		$0.154M	
1	1341		NSTAR-12-T06	Add a new 115 kV 36.7 MVAR capacitor bank at Hartwell Ave.		$1.333M	
1	1352		ES-16-T20	Add a second Mystic 345/115 kV autotransformer and Mystic bus reconfiguration.		$25.5M	
1	1353		ES-15-T81 / ES-16-T18	Install K St. tie breaker #33 on the East bus.		$1.953M	
1	1354		ES-16-T12	Add Mystic-Chelsea 115 kV cable.		$56.7M	
1	1355		ES-16-T14	Split existing 110-522/240-510 DCT from Baker St. Station to Needham for a portion of the way and then install a new underground 115 kV line for the remainder of the way.		$45.7M	
1	1356		ES-16-T19	Add a 2nd Mystic-Woburn 115 kV cable to create a bifurcated 211-514 Mystic-Woburn 115 kV circuit.		$138.8M	
1	1357		ES-16-T23	Open up lines 329-510/511 and 250-516/517 at Mystic and Chatham respectively. Operate K Street as a Normally Closed station.		$1.5M	
1	1364		ES-16-T17	Reconductoring Eversource's portion of Y-151 between Hudson and Power Street		$3.3M	
1	1516		ES-16-T09	Construct a new 115 kV three breaker switching station in Sharon MA to segment the three 115 kV circuits that extend from West Walpole to Holbrook.		$20.3M	
1	1518		ES-16-T22	Station upgrades to create a second normally closed 115 kV bus tie at Kingston Station and reconfigure the 345 kV switchyard		$14.5M	
1	1519		ES-15-T66	Relocate Chelsea capacitor bank 128-518 termination position		$1.5M	
1	1520		ES-15-T61	Equipment termination changes at North Cambridge Station to mitigate 115 kV stuck breaker 5 and 10 contingencies.		$8.7M	
1	1522		ES-16-T24	Add a new 115 kV 36.7 MVAR capacitor bank at Sudbury Station		$1.834M	
1	1552		ES-16-T06	Add a new 345 kV cable from Woburn substation to the Wakefield substation and terminal equipment at Woburn including a 160 MVAR 345 kV reactor.		$121.8M	
1	1553		ES-15-T64	Add a breaker in series with breaker 104 at Woburn 345 kV switchyard.		$6.967M	
1	1554		ES-15-T63 / ES-16-T18	Add one 115 kV breaker at K Street in series with the 29 breaker.		$1.323M	
1	1558		ES-15-T62	Add a new 345 kV breaker in series with the 104 breaker at Soughton.		$0.936M	
1	1640		ES-15-T59	Reconductor the Eversource portion of the M-139/211-503 and N-140/211-504 115 kV lines between Pinehurst - NorthWoburn tap.		$4.748M	
1	1645		ES-16-T11	Add a new 115 kV 36.7 MVAR capacitor bank at Hartwell Station.		$2.3M	
1	1646		ES-16-T08	Add a new 345 kV 160 MVAR shunt reactor at K Street.		$12.0M	
1	1647		ES-15-T65	Add a new 115 kV breaker in series with breaker 5 at Framingham.		$1.3M	
1	1738		N/A	Chelsea BPS Upgrades.		$11.5M	
1	N/A		N/A	Add a new 115 kV 54 MVAR capacitor bank at Newton Highlands Station 292.			$1.81M
						Application PTF Total $763.3M	**Application Non-PTF Total $1.81M**