



**Greater Boston Project
Revised TCA
ES-17-TCA-04 Rev 1**

NEPOOL Reliability Committee Meeting
September 23, 2020

Agenda

- Project History
- Status
- Summary of Cost Estimate Changes
- Alternatives Summary and Cost Comparison
- Conclusion

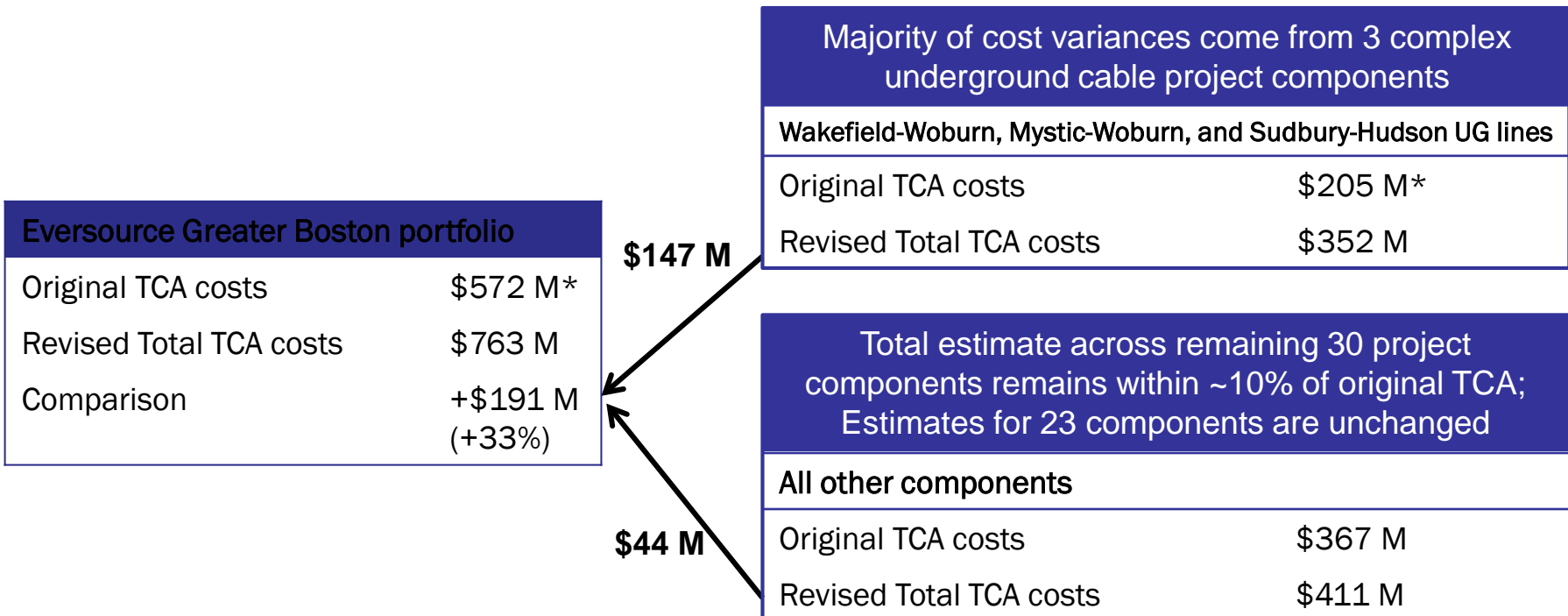
Background: Project History

- Needs Assessment PAC Presentation – July 2013
- Needs Assessment Report Published – January 2015
- Solution Study PAC Presentation – February 2015
- Solution Study Report Published – August 2015
- PPA (I.3.9) Study Presentation to RC – June 2016
 - PPA revision for Sudbury to Hudson 115 kV Line presented to RC on September 23, 2020.
- TCA Presentation to RC – May 2017
 - RC voted to support regional cost allocation in June 2017
 - Eversource portion approx. \$611.7 M (33 components)
- Updated cost estimates provided to PAC in October 2019 and March 2020

Cost estimates are unchanged for 21 project components, while 12 components have variances

Status of Eversource project components:

- 25 in-service
- 7 under construction (Wakefield-Woburn cable, Mystic-Woburn cable, Mystic-Chelsea cable, Chelsea BPS Upgrade, Sharon Switching Station, Split 110-522/240-510 DCT, W. Walpole-Holbrook Line)
- 1 completing final siting/permitting (Sudbury-Hudson line)



* \$611.7 M revised to \$572 M reflects transfer of costs associated with National Grid portion of Wakefield-Woburn cable from RSP#1552 to RSP#1551

Primary drivers of changes are two UG project components with unanticipated obstructions, scope changes, and construction restrictions

Project Component	Original	Revised	ISD
RSP#1552 – Wakefield to Woburn 345 kV cable	\$78.7 M*	\$121.8 M	May '22
RSP#1356 – Mystic to Woburn 115 kV cable	\$81.5 M	\$138.8 M	May '22

These two project components account for approximately 50% of the overall variance

Primary reasons for cost changes:

- Additional restrictions imposed on design and construction
 - Shifts in alignment of underground construction within roadways to avoid interference with existing and/or uncharted utilities, or replacement of existing utilities
 - Restrictions on work hours & number of concurrent crews increased cost of construction bids
- Underground interferences and work hour restrictions are common on underground projects, but magnitude of challenges exceeded those encountered on prior projects in the Boston area
- High demand for construction labor in Boston area increased construction bids

* Original TCA cost of \$117.1 M revised to \$78.7 M in 2017 reflects transfer of costs associated with National Grid portion of Wakefield-Woburn cable from RSP#1552 to RSP#1551

Design change from overhead to underground construction for the Sudbury-Hudson project component also contributed to overall variance

Project Component	Original	Revised	ISD
RSP#1335 – Build new Sudbury to Hudson 115 kV Line	\$45.3 M	\$91 M	Dec '23

This projects accounts for approximately 25% of the overall variance

- **Primary reasons for cost change:**
 - Change from overhead to underground design along ROW leased from MBTA
 - Eversource unable to secure lease for property rights to construct overhead design
- **Updated alternatives analysis demonstrates underground cable along MBTA ROW was most cost-effective and constructible alternative**
 - Proposed project (\$91.0 M): 9.0 mile new 115-kV UG transmission line, primarily within an MBTA ROW
 - Noticed alternative (\$110.4 M): 10.3 mile new 115-kV UG transmission line, entirely in roadways
 - Project alternative (\$116.1 M): Multiple upgrades, including converting 14.5-mile 69 kV line to 115 kV, reconductoring 11.6 miles of other 115 kV lines, and upgrades at seven substations
 - See MA Energy Facilities Siting Board Docket No. 17-2 (D.P.U. 17-82/17-83) for more information
- Revised PPA presented to RC on September 23, 2020.

Smaller cost variances for other substation project components contributed to a portion of the remaining cost change...

Project component	Original	Revised	ISD	Cost variance drivers
RSP#1336 – Replace Woburn 345/115 kV autotransformer and associated Substation equipment	\$49.1 M	\$57.5 M	In-service	<ul style="list-style-type: none"> Below grade obstructions identified during construction resulted in scope and engineering changes Outage schedules delayed due to coordination with other projects
RSP#1352 – Second Mystic 345/115 kV autotransformer and bus reconfiguration	\$19.4 M	\$25.5 M	In-service	
RSP#1738 – Chelsea Station #488 BPS Upgrade	\$7.5 M	\$11.5 M	May '21	<ul style="list-style-type: none"> Updated flood analysis required control house to be installed on a raised foundation Complex installation and outage sequencing
RSP#1516 – New Sharon Switching Station to segment three 115 kV circuits	\$18.1 M	\$20.3 M	Oct '20	<ul style="list-style-type: none"> More elaborate ground grid required due to high soil resistivity Longer duct bank increased construction and environmental support costs Additional wetland matting required due to unusually wet weather
RSP#1357 – Open 115 kV 329-510/511 and 250-516/517 lines at Mystic and Chatham	\$0.3 M	\$1.4 M	In-service	<ul style="list-style-type: none"> Advances in design, refinement of scope
RSP#1645 – Add a new 115 kV 36.7 MVAR capacitor bank at Hartwell Station	\$1.3 M	\$2.3 M	In-service	
RSP#1519 – Relocate Chelsea capacity 128-518 terminal position	\$1.3 M	\$1.5 M	In-service	

....as did a few other line project components

Project component	Original	Revised	ISD	Cost variance drivers
RSP#1355 – Split 110-522/240-510 DCT including new 115 kV cable	\$38.0 M	\$45.7 M	Dec '20	<ul style="list-style-type: none"> • Additional restrictions imposed that were not encountered on prior underground projects <ul style="list-style-type: none"> • Shifts in alignment of underground construction within roadways to avoid interference with existing utilities, or replacement of existing utilities • Restrictions on work hours and number of concurrent crews increased cost of construction bids • High demand for construction labor in Boston area increased construction bids
RSP#965 - Add third 115 kV line from W. Walpole to Holbrook	\$16.5 M	\$29.9 M	Oct '20	<ul style="list-style-type: none"> • Lengthy siting/permitting process resulted in additional environmental, siting, legal, and outreach costs • New control houses required at West Walpole and Holbrook substations to accommodate new protection • Additional wetland matting required and unanticipated rock encountered during structure installations

Conclusion

- With one exception, project components have been constructed, or are expected to be constructed, consistent with the PPAs and TCA previously supported by the Reliability Committee and approved by ISO-NE
- Sudbury-Hudson 115 kV line is sole exception
 - Planned to be constructed underground instead of overhead
 - Underground line determined to be most feasible and cost-effective alternative