# Regional System Plan

## Transmission Projects and Asset Condition

## March 2019 Update

*Planning Advisory Committee Meeting*

Jon Breard

ENGINEER, TRANSMISSION PLANNING

# TABLE OF CONTENTS

# Highlights of the RSP Project List Update

- **Major cost estimate changes that occurred between the October 2018 and March 2019 Project List**:
  (RI) Aquidneck Island Project – **Project 1671** – Convert lines 61/62 from 69 kV to 115 kV - cost increase (+$8.5M). Change in costs based on latest estimates.

- **Project Updates:**
  (ME) - MPRP – Project Complete
  (VT) - Connecticut River Valley – Project Complete

- **No New Projects**

- **10 Upgrades on the project list have been placed in-service since the October 2018 update**:
  (CT) SWCT- 2 projects in-service
  (CT) GHCC – 2 projects in-service
  (MA) Central W. MA upgrades – 1 project in-service – Adams install 2 new breakers and replace 2 in associated line relocations
  (MA) Southeast MA/RI Reliability - 1 project in-service – Reconductor 108 line from Bourne Substation #917 to Horse Pond Tap
  (VT) Connecticut River Valley Project – last project in-service – Install one +50/-25 MVAR dynamic voltage support device at Ascutney
  (ME) MPRP – 2 projects in-service
  (ME) Greater Boston – Stability – Install new +/- 200 MVAR STATCOM at Coopers Mills 345 kV Substation

# March 2019 Changes

## 0 New Projects and Corresponding Need

| Project ID # | Transmission System Upgrades | Cost (in millions $) | Improvement/Need |
|---|---|---|---|
| | | | |

# March 2019 Changes, *cont.*

## 10 Projects Placed In-Service and Corresponding Needs

| Project ID # | Transmission System Upgrades | Cost (in millions $) | Improvement/Need |
|---|---|---|---|
| 1380 | Baird to Congress 8809A - 8909B 115 kV Line Upgrades<br>(Connecticut) SWCT | 56.6 | Eliminate thermal overloads under contingency conditions |
| 1620 | Ansonia 115 kV Capacitor Bank Additions<br>(Connecticut) SWCT | 9.5 | Resolve voltage in the SWCT area |
| 1589 | Add a new control house at Southington 115 kV Substation<br>(Connecticut) GHCC | 22.6 | Improve load serving capability in the GHCC area |
| 1586 | Replace the existing 3% series reactors on the 115 kV lines between Southington and Todd (1910) and between Southington and Canal (1950) with 5% series reactors<br>(Connecticut) GHCC | 5.2 | Improve load serving capability in the GHCC area |
| 945 | Adams - install two new 115 kV breakers and replace two existing 115 kV breakers and associated line relocations<br>(Massachusetts) Central Western MA Upgrades | 16.9 | Improve load serving capability in the Western CT/MA area |

# March 2019 Changes, *cont.*

## 10 Projects Placed In-Service and Corresponding Needs

| Project ID # | Transmission System Upgrades | Cost (in millions $) | Improvement/Need |
|---|---|---|---|
| 1736 | Reconductor the 108 line from Bourne Substation #917 to Horse Pond Tap<br>(Massachusetts) Southeast MA/RI Reliability Project | 2.8 | Resolves thermal overloads |
| 1615 | Install one +50/-25 MVAR dynamic voltage support device at Ascutney<br>(Vermont) Connecticut River Valley | 32.0 | Resolve voltage issues in the Connecticut River Valley area |
| 1413 | Add a new 115 kV transmission line (256) between Middle Street and Lewiston Lower (Lewiston Loop)<br>(Maine) MPRP | 9.1 | Increase load serving capability in Maine |
| 1442 | Expand Lewiston Lower 115 kV Substation interconnecting lines 256 and 202 between stations Middle Street and Crowleys (Lewiston Loop)<br>(Maine) MPRP | 4.7 | Increase load serving capability in Maine |
| 1643 | Install a new +/- 200 MVAR STATCOM at Coopers Mills 345 kV Substation<br>(Maine) Greater Boston - Stability | 53.1 | Resolve stability concerns in the greater Boston area |

# March 2019 Changes, *cont.*

## Cost Estimate Comparisons of Reliability Projects
## October 2018 vs. March 2019 Update [1]

| | As of Oct 2018 Plan Update (in millions $) | As of Mar 2019 Plan Update (in millions $) | Change in Plan Estimate (in millions $) |
|---|---|---|---|
| **MAJOR PROJECTS** | | | |
| Maine Power Reliability Program (MPRP) | 1466 | 1466 | 0 |
| Greater Hartford & Central Connecticut (GHCC) | 307 | 307 | 0 |
| New England East - West Solution (NEEWS) | 1581 | 1581 | 0 |
| NEEWS (Greater Springfield Reliability Project) $676.0 | | | |
| NEEWS (Rhode Island Reliability Project) $362.3 | | | |
| NEEWS (Interstate Reliability Project) $482.3 | | | |
| NEEWS $59.6 | | | |
| Southeast Massachusetts/Rhode Island Reliability Project | 324 | 326 | 2 |
| Pittsfield/Greenfield Project | 179 | 179 | 0 |
| Greater Boston - North, South, Central, Western Suburbs | 828 | 838 | 10 |
| New Hampshire Solution - Southern, Central, Seacoast, Northern | 328 | 328 | 0 |
| Vermont Solution - Southeastern, Connecticut River | 82 | 82 | 0 |
| Southwest Connecticut (SWCT) | 399 | 399 | 0 |
| SUBTOTAL [2] | **5494** | **5506** | **12** |
| **OTHER PROJECTS** | 6781 | 6794 | 12 |
| **NEW PROJECTS** | | 0 | 0 |
| **PROJECTS WHOSE COST ESTIMATES WERE PREVIOUSLY REPORTED AS TO BE DETERMINED (TBD)** | | | |
| TOTAL [2] | **12275** | **12300** | **24** |
| Minus 'in-service' | -10696 | -10908 | |
| **Aggregate estimate of active projects in the Plan [2]** | **1580** | **1392** | |

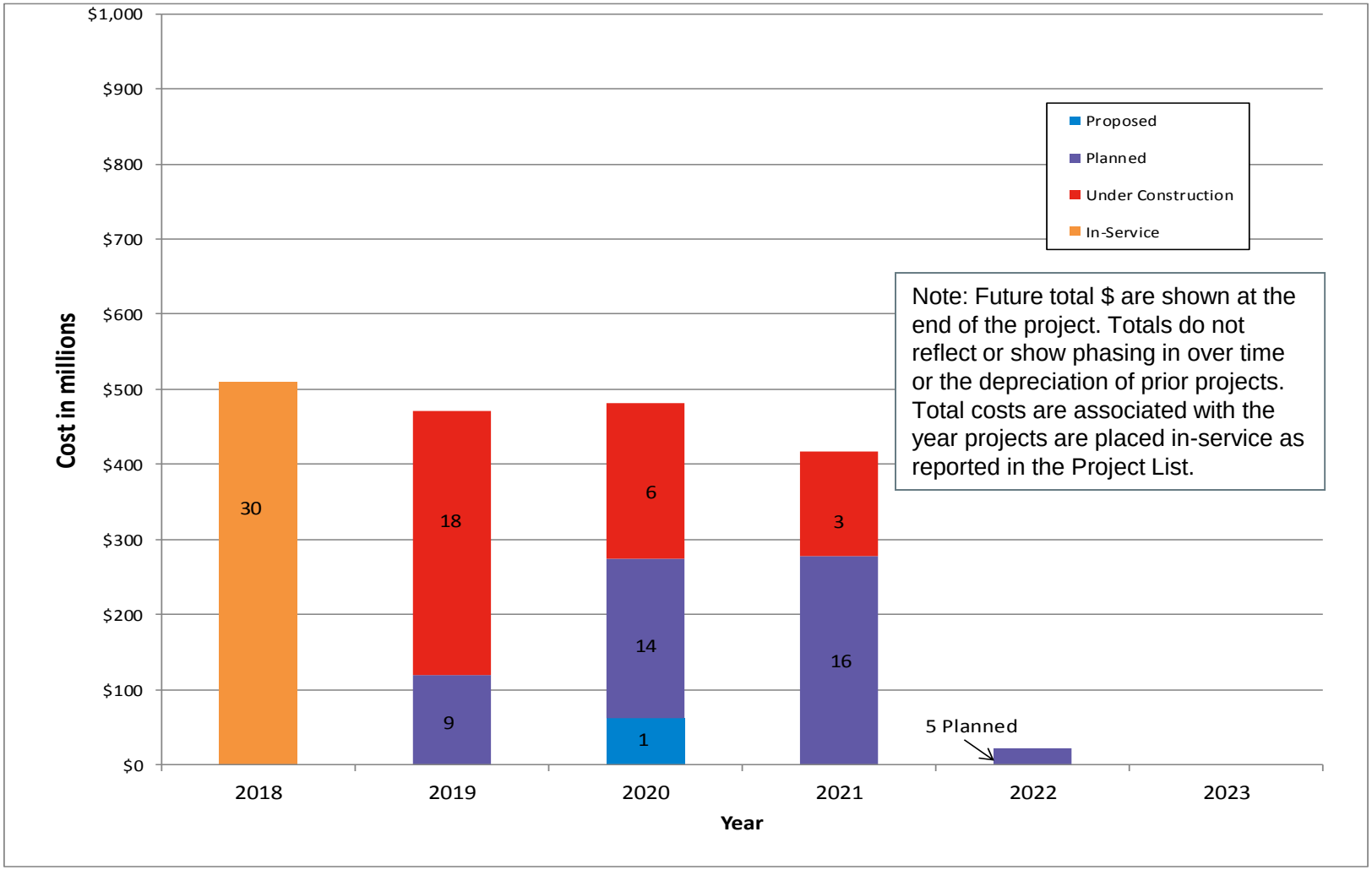
[1] Transmission Owners provided all estimated costs, which may not meet the guidelines described in Planning Procedure 4, Attachment D

[2] May not sum exactly due to rounding

[3] The cost estimates for projects in the "Major Projects" category are moved to the "Other Projects" category once they are fully completed.

# March 2019 Changes, *cont.*

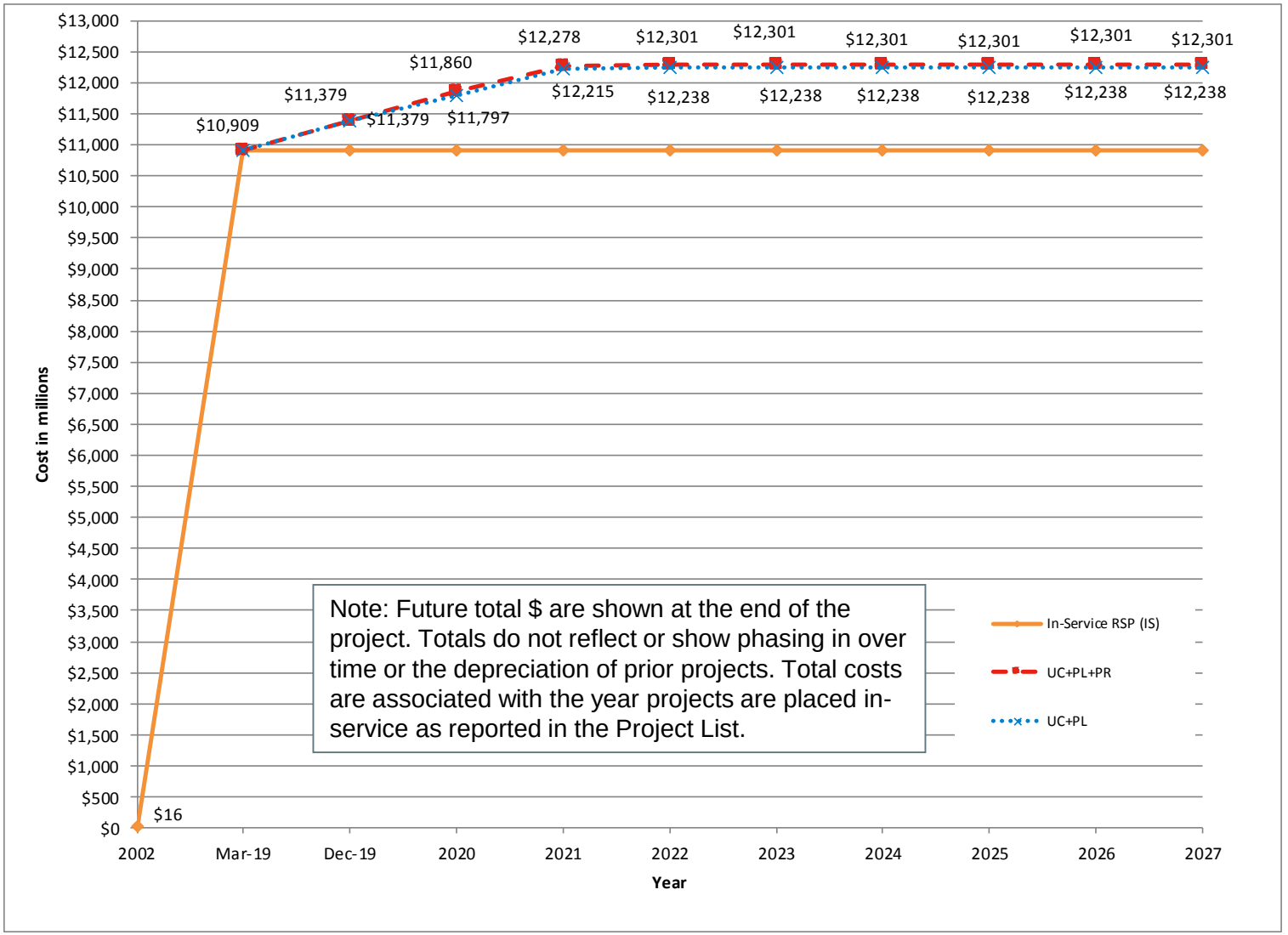
## Investment of New England Transmission Reliability Projects by Status through 2023




Note: Numbers shown represent project quantities

# March 2019 Changes, *cont.*

## Cumulative Investment of New England Transmission Reliability Projects through 2027




Note: UC – Under Construction, PL – Planned, PR – Proposed

# March 2019 Changes, *cont.*

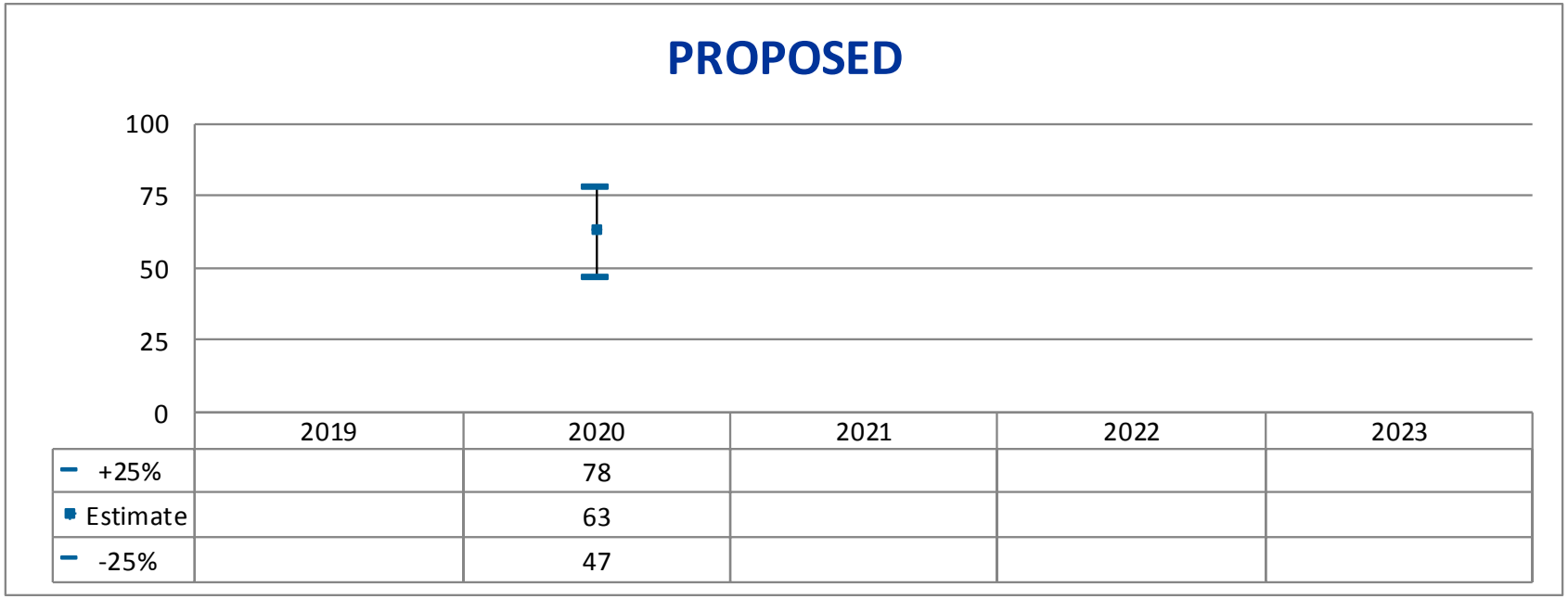
Reliability Project Counts and Aggregated Cost Estimates by Project Stage with Applied Accuracy Ranges (1)

| Project Stage (Status) | Component / Project / Plan Count (2) | Estimate Range Minimum | Estimate Range Maximum | Estimated Costs ($millions) | Range Minimum ($millions) | Range Maximum ($millions) |
|---|---|---|---|---|---|---|
| Proposed | 1 | -25% | 25% (3) | 63 | 47 | 78 |
| Planned | 44 | -25% | 25% | 632 | 474 | 790 |
| Under Construction | 27 | -10% | 10% | 697 | 625 | 768 |
| **Total Plan (excluding Concept)** | **72** | | | (5) **1392** | **1146** | **1636** |
| Concept | 0 | | | (4) 0 | | |
| In-Service | 10 | -10% | 10% | 213 | 192 | 234 |
| Cancelled | 0 | | | | | |

(1) All costs provided by Transmission Owners. The costs in the table reflect all projected in-service dates
(2) Efforts need to be made to describe projects on a more consistent basis
(3) All estimates may not yet be at this level of accuracy; many estimates may be -25%/+50%
(4) Not included here are the costs of reliability projects for which no estimates have been provided. **Estimates for these projects are noted as TBD in the Project Listing and are only Concept Projects.**
(5) May not add up due to rounding.

# March 2019 Changes, *cont.*

Project Cost Estimate Tolerances by Status and Year in Millions $

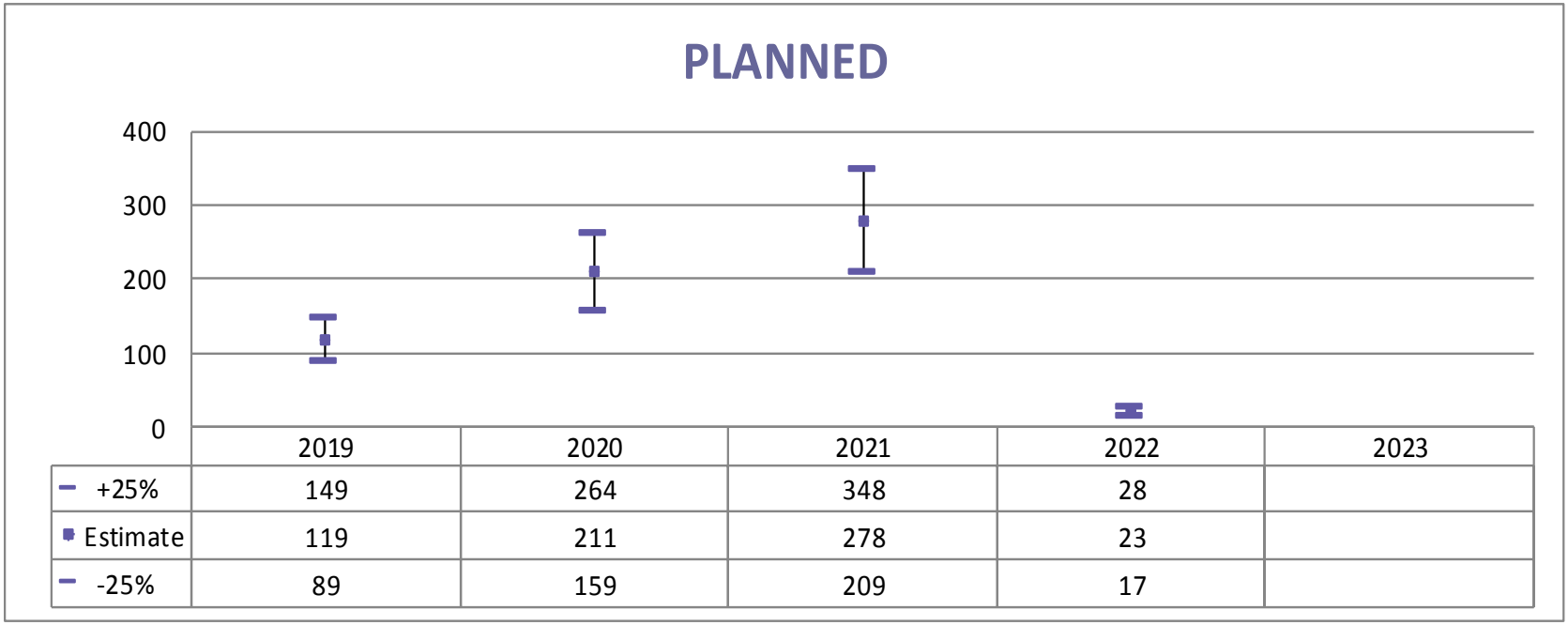



| | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| +25% | | 78 | | | |
| Estimate | | 63 | | | |
| -25% | | 47 | | | |

Note: Future total $ are shown at the end of the project. Totals do not reflect or show phasing in over time or the depreciation of prior projects. Total costs are associated with the year projects are placed in-service as reported in the Project List.

# March 2019 Changes, *cont.*

Project Cost Estimate Tolerances by Status and Year in Millions $

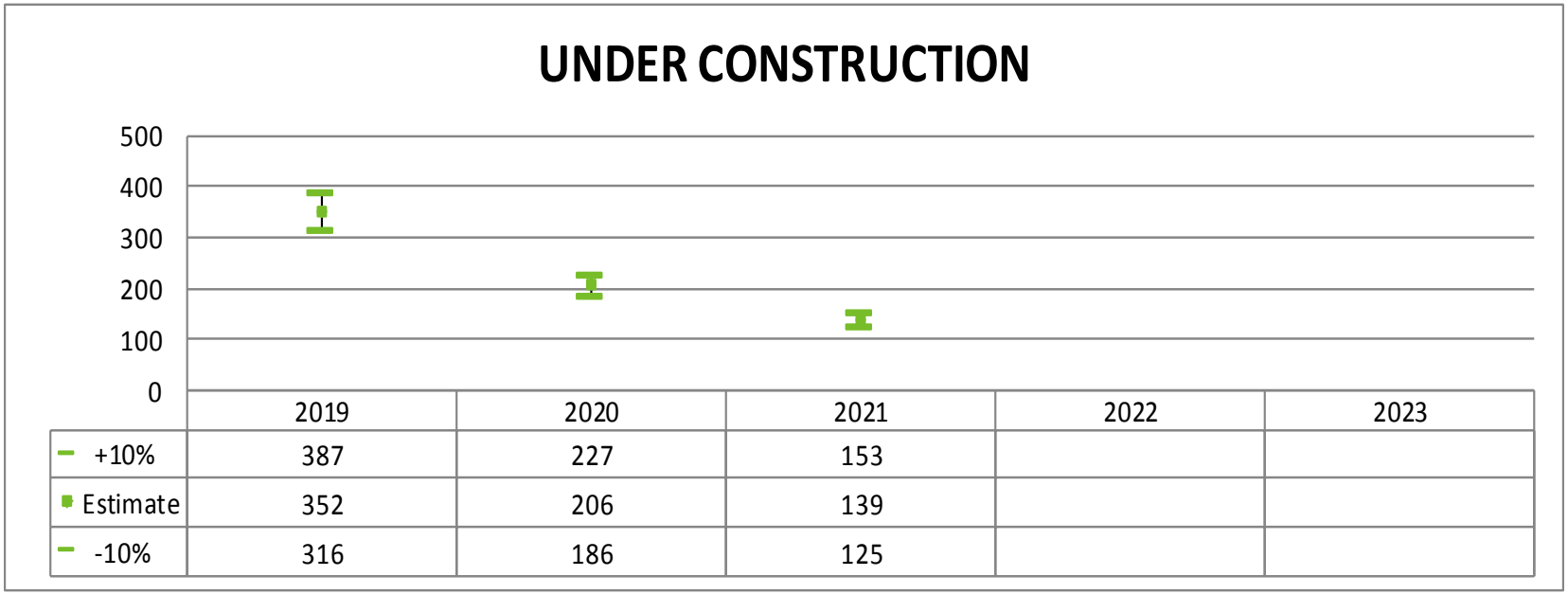



| | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| +25% | 149 | 264 | 348 | 28 | |
| Estimate | 119 | 211 | 278 | 23 | |
| -25% | 89 | 159 | 209 | 17 | |

Note: Future total $ are shown at the end of the project. Totals do not reflect or show phasing in over time or the depreciation of prior projects. Total costs are associated with the year projects are placed in-service as reported in the Project List.

# March 2019 Changes, *cont.*

Project Cost Estimate Tolerances by Status and Year in Millions $




| | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| +10% | 387 | 227 | 153 | | |
| Estimate | 352 | 206 | 139 | | |
| -10% | 316 | 186 | 125 | | |

Note: Future total $ are shown at the end of the project. Totals do not reflect or show phasing in over time or the depreciation of prior projects. Total costs are associated with the year projects are placed in-service as reported in the Project List.

# Status of Major Transmission Projects

| | PPA | TCA | Construction |
|---|---|---|---|
| Pittsfield/Greenfield Project | Approved 12/12, 01/16, 05/16 | Partial 2/11/16, 7/17/17, 2/15/19 | Project completion 2014-2020 |
| Maine Power Reliability Program (MPRP) | Approved 7/08, 2/09, 11/10 | Approved 1/29/10 | Project completion 2014-2018 |
| Vermont Solution – Connecticut River Valley | Approved 4/15 | Approved 12/1/17 | Project completion 2016-2018 |
| Southwest Connecticut (SWCT) | Approved 4/15 | Complete 7/16/15, 4/15/16, 5/13/16, 1/3/18, 2/15/19 | Project completion 2013-2020 |
| Southeast MA/RI Reliability | Approved 5/17, 4/18 | Not Submitted | Project completion 2017-2021 |

# Status of Major Transmission Projects, *cont.*

| | PPA | TCA | Construction |
|---|---|---|---|
| Central/Western MA Reinforcements | Approved<br>12/07, 3/11 | Group 1<br>2/29/2012 | Project completion<br>2009-2019 |
| Greater Boston – North, South, Central and Suburbs | Approved<br>4/15, 5/15, 6/16 | TCA Submitted | Project completion<br>2013-2021 |
| New Hampshire Solution – Western, Central, Southern and Seacoast | 3/13 | Seacoast 11/5/15<br>Southern 1/7/16<br>Western 12/17/15<br>Central 11/25/15 | Project completion<br>2013-2020 |
| Greater Hartford & Central Connecticut (GHCC) | 4/15 | Partial 10/4/2016 | Project completion<br>2015-2019 |

# March 2019 Asset Condition
## 51 New Projects

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 100 | Eversource 115 kV Structure Replacement Project - Line A126 (New Hampshire) | 8.3 |
| 101 | Eversource 115 kV Structure Replacement Project - Line H123 (New Hampshire) | 6.0 |
| 102 | Eversource 115 kV Structure Replacement Project - Line H141 (New Hampshire) | 7.7 |
| 103 | Eversource 115 kV Structure Replacement Project - Line K174 (New Hampshire) | 8.7 |
| 104 | Eversource 115 kV Structure Replacement Project - Line L163 (New Hampshire) | 14.0 |

# March 2019 Asset Condition, *cont.*
51 New Projects

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 105 | Eversource 115 kV Structure Replacement Project - Line A152 (New Hampshire) | 6.1 |
| 106 | Eversource 115 kV Structure Replacement Project - Line X178 (New Hampshire) | 11.2 |
| 107 | 349X/Y 345 kV Cable Replacement (Massachusetts) | 72.4 |
| 108 | Eversource 115 kV Structure Replacement Project - Line 65-508 (Massachusetts) | 19.5 |
| 109 | Eversource 115 kV Structure Replacement Project - Line 1327 (Massachusetts) | 7.8 |

# March 2019 Asset Condition, *cont.*
51 New Projects

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 110 | Oil Circuit Breaker Replacement Project at the Agawam Substation (Massachusetts) | 12.1 |
| 111 | Eversource 115 kV Structure Replacement Project - Line 1447 (Massachusetts) | 6.6 |
| 112 | Eversource 115 kV Structure Replacement Project - Line 1962 (Massachusetts) | 20.3 |
| 113 | Eversource 115 kV Structure Replacement Project - Line 1768-MA (Massachusetts) | 3.0 |
| 114 | Eversource 115 kV Structure Replacement Project - Line F132 (Massachusetts) | 11.0 |

# March 2019 Asset Condition, *cont.*

51 New Projects

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 115 | 1608 115 kV Line Cable Replacement (Connecticut) | 11.3 |
| 116 | 1880 115 kV Line Cable Replacement (Connecticut) | 7.2 |
| 117 | Eversource 115 kV Structure Replacement Project - Line 1050 (Connecticut) | 7.3 |
| 118 | Eversource 115 kV Structure Replacement Project - Line 1191 (Connecticut) | 8.3 |
| 119 | Eversource 115 kV Structure Replacement Project - Line 1256 (Connecticut) | 12.2 |

# March 2019 Asset Condition, *cont.*
51 New Projects

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 120 | Eversource 115 kV Structure Replacement Project - Line 1261 (Connecticut) | 18.3 |
| 121 | Eversource 115 kV Structure Replacement Project - Line 1280 (Connecticut) | 7.5 |
| 122 | Eversource 115 kV Structure Replacement Project - Line 1310 (Connecticut) | 8.3 |
| 123 | Eversource 115 kV Structure Replacement Project - Line 1410 (Connecticut) | 5.8 |
| 124 | Eversource 115 kV Structure Replacement Project - Line 1448 (Connecticut) | 6.9 |

# March 2019 Asset Condition, *cont.*
51 New Projects

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 125 | Eversource 115 kV Structure Replacement Project - Line 1565 (Connecticut) | 11.5 |
| 126 | Eversource 115 kV Structure Replacement Project - Line 1620 (Connecticut) | 10.0 |
| 127 | Eversource 115 kV Structure Replacement Project - Line 1635 (Connecticut) | 5.7 |
| 128 | Eversource 115 kV Structure Replacement Project - Line 1675 (Connecticut) | 7.3 |
| 129 | Eversource 115 kV Structure Replacement Project - Line 1726 (Connecticut) | 16.3 |

# March 2019 Asset Condition, *cont.*

51 New Projects

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 130 | Eversource 115 kV Structure Replacement Project - Line 1465 (Connecticut) | 7.0 |
| 131 | Eversource 115 kV Structure Replacement Project - Line 175 (Connecticut) | 12.5 |
| 132 | Eversource 115 kV Structure Replacement Project - Line 1756 (Connecticut) | 7.0 |
| 133 | Eversource 115 kV Structure Replacement Project - Line 1759 (Connecticut) | 7.3 |
| 134 | Eversource 115 kV Structure Replacement Project - Line 1765 (Connecticut) | 12.3 |

# March 2019 Asset Condition, *cont.*
51 New Projects

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 135 | Eversource 115 kV Structure Replacement Project - Line 1766 (Connecticut) | 5.8 |
| 136 | Eversource 115 kV Structure Replacement Project - Line 1767 (Connecticut) | 5.4 |
| 137 | Eversource 115 kV Structure Replacement Project - Line 1769 (Connecticut) | 8.2 |
| 138 | Eversource 115 kV Structure Replacement Project - Line 1770 (Connecticut) | 16.3 |
| 139 | Eversource 115 kV Structure Replacement Project - Line 1772 (Connecticut) | 10.0 |

# March 2019 Asset Condition, *cont.*
51 New Projects

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 140 | Eversource 115 kV Structure Replacement Project - Line 1783 (Connecticut) | 8.2 |
| 141 | Eversource 115 kV Structure Replacement Project - Line 1785 (Connecticut) | 9.0. |
| 142 | Eversource 115 kV Structure Replacement Project - Line 1768-CT (Connecticut) | 5.2 |
| 143 | Eversource 115 kV Structure Replacement Project - Line 1910 (Connecticut) | 5.8 |
| 144 | Millstone Substation 15G High Creep Insulator Replacement (Connecticut) | 11.5 |

# March 2019 Asset Condition, *cont.*
51 New Projects

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 145 | Carpenter Hill Control House Rebuild (Massachusetts) | 6.9 |
| 146 | 327 Line Asset Condition Refurbishments (Massachusetts) | 60.4 |
| 147 | 303 Line Asset Condition Refurbishments (Massachusetts) | 24.7 |
| 148 | 3520 Line Asset Condition Refurbishments (Massachusetts) | 6.9 |
| 149 | 315 Line Asset Condition Refurbishments - MA Portion (Massachusetts) | 53.5 |

# March 2019 Asset Condition, *cont.*

51 New Projects

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 150 | 315 Line Asset Condition Refurbishments - RI Portion (Rhode Island) | 16.5 |

# March 2019 Asset Condition, *cont.*

## 32 Projects Placed In-Service

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 11 | Replacement of 115 kV, 230 kV and 345 kV structures as part of the VELCO asset maintenance activities addressing the aging and degrading transmission line infrastructure. 100 to 300 structures will be replaced every year based on outage availability<br>(Vermont) Structure Condition Improvement | 158.0 |
| 52 | Replace the Littleton TB-41 autotransformer and bus upgrades to accommodate new transformer specifications<br>(New Hampshire) Autotransformer Replacement Plan | 4.3 |
| 55 | Eversource 345 kV Structure Replacement Project - Line 307<br>(New Hampshire) | 12.9 |
| 56 | Eversource 345 kV Structure Replacement Project - Line 326<br>(New Hampshire) | 12.3 |
| 57 | Eversource 345 kV Structure Replacement Project - Line 367<br>(New Hampshire) | 15.8 |

# March 2019 Asset Condition, *cont.*

## 32 Projects Placed In-Service

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 58 | Eversource 345 kV Structure Replacement Project - Line 379 (New Hampshire) | 14.8 |
| 59 | Eversource 345 kV Structure Replacement Project - Line 381 (New Hampshire) | 13.6 |
| 60 | Eversource 345 kV Structure Replacement Project - Line 391 (New Hampshire) | 19.6 |
| 34 | Devon Control House Modifications (Connecticut) | 9.4 |
| 69 | Oil Circuit Breaker Replacement Project at the Frost Bridge Substation (Connecticut) | 6.4 |

# March 2019 Asset Condition, *cont.*

## 32 Projects Placed In-Service

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 71 | Eversource 345 kV Structure Replacement Project - Line 310 (Connecticut) | 15.0 |
| 72 | Eversource 345 kV Structure Replacement Project - Line 321 (Connecticut) | 5.8 |
| 75 | Eversource 345 kV Structure Replacement Project - Line 364 (Connecticut) | 14.2 |
| 76 | Eversource 345 kV Structure Replacement Project - Line 371 (Connecticut) | 11.5 |
| 74 | Eversource 345 kV Structure Replacement Project - Line 348 (Connecticut) | 16.0 |

# March 2019 Asset Condition, *cont.*

## 32 Projects Placed In-Service

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 77 | Eversource 345 kV Structure Replacement Project - Line 383 (Connecticut) | 13.5 |
| 78 | Eversource 345 kV Structure Replacement Project - Line 387 (Connecticut) | 13.8 |
| 80 | Eversource 345 kV Structure Replacement Project - Line 3401 (Connecticut) | 8.3 |
| 81 | Eversource 345 kV Structure Replacement Project - Line 3642 (Connecticut) | 10.2 |
| 125 | Eversource 115 kV Structure Replacement Project - Line 1565 (Connecticut) | 11.5 |

# March 2019 Asset Condition, *cont.*

## 32 Projects Placed In-Service

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 131 | Eversource 115 kV Structure Replacement Project - Line 1751 (Connecticut) | 12.5 |
| 133 | Eversource 115 kV Structure Replacement Project - Line 1759 (Connecticut) | 7.3 |
| 136 | Eversource 115 kV Structure Replacement Project - Line 1767 (Connecticut) | 5.4 |
| 138 | Eversource 115 kV Structure Replacement Project - Line 1770 (Connecticut) | 16.3 |
| 139 | Eversource 115 kV Structure Replacement Project - Line 1772 (Connecticut) | 10.0 |

# March 2019 Asset Condition, *cont.*

## 32 Projects Placed In-Service

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 142 | Eversource 115 kV Structure Replacement Project - Line 1768-CT (Connecticut) | 5.2 |
| 143 | Eversource 115 kV Structure Replacement Project - Line 1910 (Connecticut) | 5.8 |
| 37 | New Mt. Tom protection system control house (Massachusetts) | 6.7 |
| 62 | Oil Circuit Breaker Replacement Project at the Agawam Substation (Massachusetts) | 4.7 |
| 64 | Eversource 345 kV Structure Replacement Project - Line 393 (Massachusetts) | 10.0 |

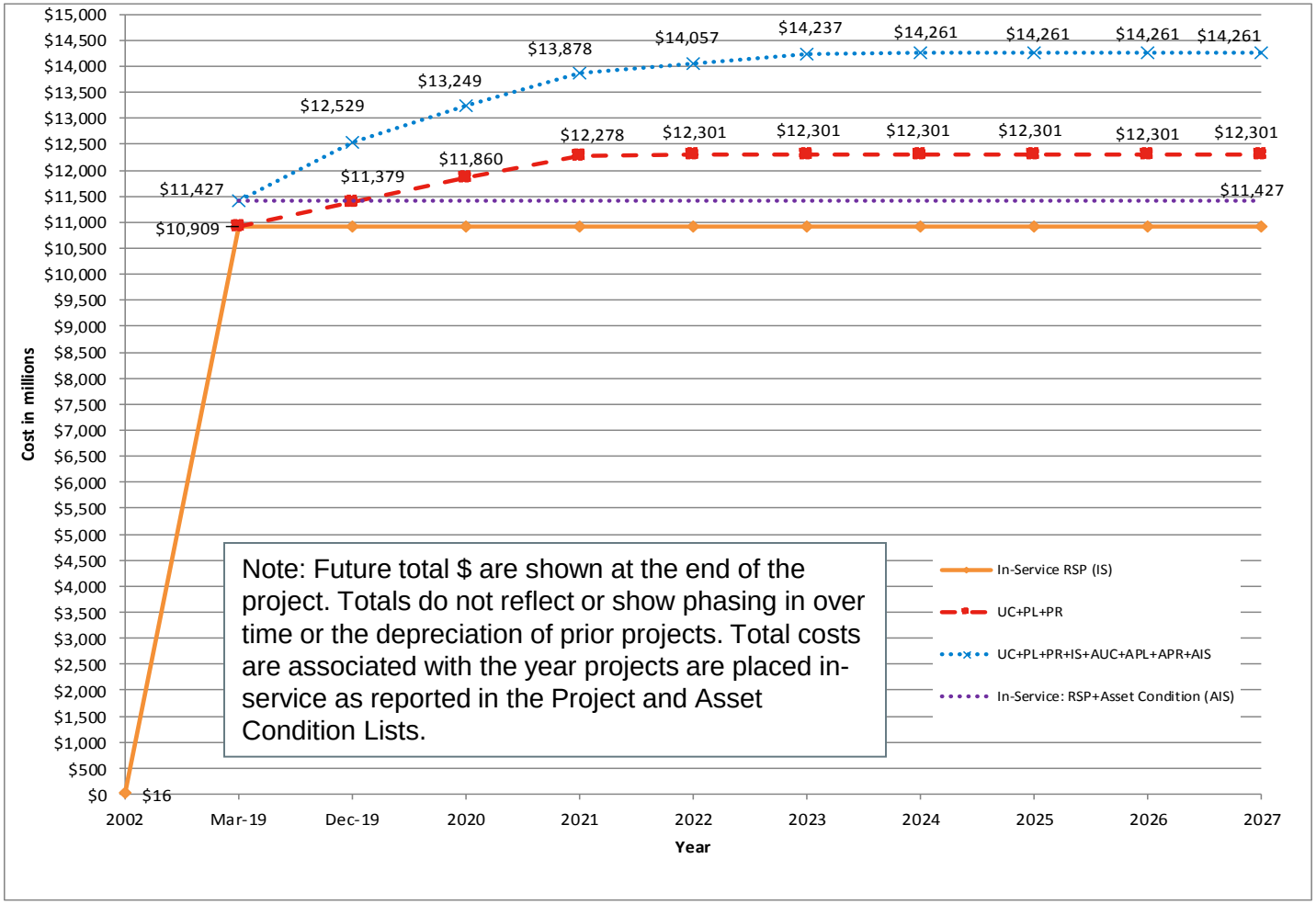
# March 2019 Asset Condition, *cont.*

## 32 Projects Placed In-Service

| Project ID # | Transmission System Upgrades | Cost (in millions $) |
|---|---|---|
| 111 | Replace the Deerfield TB-14 autotransformer and bus upgrades to accommodate new transformer specifications (Massachusetts) | 6.6 |
| 113 | Eversource 115 kV Structure Replacement Project - Line 1768-MA (Massachusetts) | 3.0 |

# March 2019 Changes, *cont.*

## Cumulative Investment of New England Transmission Reliability Projects and Asset Condition through 2027




Note: RSP - UC – Under Construction, PL – Planned, PR – Proposed, IS – In-service
Asset Condition - AUC – Under Construction, APL – Planned, APR – Proposed, AIS – In-service

# Appendix

# Summary: Project Listing Definitions

- **ISO New England Inc. Transmission, Markets and Services Tariff Section II**
  **Attachment K, Regional System Planning Process**
  **Project Listing Subcategories**
    - **Concept:** shall include a transmission project that is being considered by its proponent as a potential solution to meet a need identified by the ISO in a Needs Assessment or the RSP, but for which there is little or no analysis available to support the transmission project. (Project not well-defined, costs not well-defined, solution implementation not supportable).
    - **Proposed:** The project will include a regulated transmission solution that has been proposed in response to a specific Needs Assessment or the RSP and has been evaluated or further defined and developed in a Solutions Study or in the competitive solutions process and communicated to PAC. (Project well-defined, cost estimate quality sufficient for comparison of alternatives).
    - **Planned:** The project will include a Transmission upgrade that has been approved by the ISO, pursuant to Section I.3.9 (presumes Needs Assessment and Solutions Study have been completed). (Still subject to Schedule 12C review for Transmission Cost Allocation)

# Project Listing

Project Listing Column Definitions for:

- Reliability Projects
- Interconnection Projects
- Market Efficiency Upgrades
- Elective Projects

# Project Listing – Column Definitions

**Part Number (Part #)**

The Part #'s designate the 'need' category of the project. Original categories are not changed when a project is placed 'In-Service' or 'Cancelled'.

Part 1 – These projects are Reliability Upgrades.

- 1a: Planned or Under Construction
- 1b: Concept or Proposed

Part 2 – These projects are Generator Interconnection Upgrades.

- 2a: Planned (I.3.9 approval with Generator Interconnection Agreement including FCM related transmission upgrades to meet the Capacity Capability Interconnection Standard), or Under Construction
- 2b: Concept or Proposed (at a minimum, a completed System Impact Study and I.3.9 approval but no Generator Interconnection Agreement)

Part 3 – These projects are Market Efficiency Upgrades.

- 3a: Planned or Under Construction
- 3b: Concept or Proposed

Part 4 – These projects may be promoted by any entity electing to support the cost of transmission changes. The entity sponsoring the changes will have their own justification for their actions.

- 4a: Planned or Under Construction
- 4b: Concept or Proposed

# Project Listing – Column Definitions, *cont.*

**Project ID**

This number is generated from ISO-NE System Planning Information Tracking System. It may change in the future as the tracking system evolves.

**Primary Equipment Owner**

The company listed here is the responsible equipment owner / provider designated to design and implement the project.

**Other Equipment Owner**

For projects that involve multiple Transmission Owners, the company listed here is also a responsible equipment owner / provider designated to design and implement the project.

**Projected Month/Year of In-Service**

The month/year entered is the date the project is expected to be placed in service.

**Major Project**

Name given to a project that consists of smaller subprojects.

**Project / Project Component**

A brief, high-level description of the project is entered here. It will either include major pieces of substation equipment and/or types of line work to be performed.

# Project Listing – Column Definitions, *cont.*

## Status

**In Service**: The project has been placed in operation.

**Under Construction**: The project has received necessary approvals and a significant level of engineering or construction is underway.

**Planned:** The project will include a Transmission upgrade that has been approved by the ISO.

**Proposed:** The project will include a regulated transmission solution that has been proposed in response to a specific Needs Assessment on the RSP and has been evaluated or further defined and developed in a Solutions Study and communicated to PAC.

**Concept:** Shall include a transmission project that is being considered by its proponent as a potential solution to meet a need identified by the ISO in a Needs Assessment or the RSP, but for which there is little or no analysis available to support the transmission project.

**Cancelled:** Project has been cancelled.

# Project Listing – Column Definitions, *cont.*

**PPA Approval (Review of Market Participant's Proposed Plans)**

A date in this column signifies when the project received approval pursuant to Section I.3.9 of the ISO-New England Tariff. This approval indicates that the project will have no adverse impact on the stability, reliability, or operating characteristics of the system. A 'no' indicates that an approval is required, but has not been received yet. An 'NR' indicates that an I.3.9 approval is not required.

**TCA Approval (Transmission Cost Allocation)**

A date in this column signifies when the project PTF costs were reviewed and approved. This approval indicates that it has been agreed whether, and by how much, the scope of the project and associated costs exceed regional needs. An 'NR' indicates that a TCA approval is not applicable either because the project has been cancelled or no/very minimal PTF costs are involved.

**Estimated Costs**

The pool-supported project cost estimate presented here should be the best estimate available. It is understood that the estimate accuracy may vary dependent on the maturity of the project.

Accuracy tolerances for these estimates are targeted as follows:

Concept Project

Proposed Project that has been reviewed and approved to proceed by ISO-NE (+50%/-25%),

I.3.9-Approved Project (+/-25%), and

TCA-Approved Project (+/-10%)