

# Regional System Plan Transmission Projects October 2015 Update

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*Planning Advisory Committee Meeting*

**Brent Oberlin**

DIRECTOR, TRANSMISSION PLANNING



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# Highlights

- Major cost estimate changes that occurred between the June 2015 and October 2015 project list:
  - (MA and RI) NEEWS – Interstate Reliability Project – cost modifications were made due to less extensive ledge encountered during foundation installations than planned; in addition there were no significant outage reschedules or outage conflicts experienced that would have impacted the construction schedule. (decreased \$39.5M)
  - (MA) Greater Boston – Project costs were added to grandfathered projects -ID 1645 and 1646 (increased \$13.0M)
  - (MA) Salem Harbor Substation Rebuild – grandfathered project added (increased \$75.0M)
- SWCT - In-service dates for many projects move forward 1 year due to outage sequencing and coordination
- 3 LSP Asset Condition projects that were listed in the June 2015 project as concept were moved to cancelled
- 2 new projects were added to the Project List since the June 2015 update:
  - (MA) Salem Harbor Substation Rebuild – Asset Condition
  - (CT) SWCT - 1630 13M Terminal Upgrade
- 9 upgrades on the project list have been placed in-service since the June 2015 update:
  - (ME) MPRP - 2 projects were placed in-service during this period:
    - Addition of new Larrabee Road 345/115 kV substation interconnecting lines 3025, 3026, 200, 212, 251, 255 and 268
    - Re-rate the 115 kV line 83C between Sappi Hinckley Substation and 83C Tap
  - (ME) Lakewood Substation Expansion - Sectionalize section 241 by adding four 115 kV circuit breakers at Lakewood Substation and install a second 115/34.5 kV transformer. Construct 4 miles of new 115 kV line from the existing Section 83B Tap point to the Lakewood Substation and rebuild the existing 115 kV Section 83B
  - (NH) LSP – New Mill Pond Substation – Add three 115 kV switches associated with the new Mill Pond Substation
  - (NH) Merrimack Substation Q171 - replace one – 115 kV circuit breaker
  - (CT) NEEWS – Interstate Reliability Project – Build new 345 kV line 3271 Card – Lake Road
  - (CT) New Pootatuck 115/13.8 kV substation
  - (CT) SWCT - 1630 13M terminal upgrade
  - (RI) Reconductor G-1855 (Kent County – Davisville Tap)



# Asset Condition

- Asset Condition
  - ISO-NE has reviewed Attachment K related to the replacement of existing system equipment due to asset condition (example – replacement of leaking oil circuit breaker)
  - Asset condition is not an identified trigger for a Needs Assessment in Section 4.1(a)
  - Asset condition issues are issues that must be identified by the equipment owner and cannot be identified by ISO-NE
  - RSP Project List shall identify items as:
    - Reliability Transmission Upgrade
    - Market Efficiency Transmission Upgrade
    - Public Policy Transmission Upgrade
    - Elective Transmission Upgrade
    - New generation interconnection
  - ISO-NE will not be capturing asset condition projects on the Project List beyond the effective date of Order 1000 – May 18, 2015
  - Information will still be made available to stakeholders through equipment owner presentations at the PAC

# Local System Plan Projects

- Process for Local System Plan (LSP) is described in Appendix 1 to Attachment K
  - Projects needed to maintain the reliability of the non-PTF
- While LSP projects are designed to serve the needs of the non-PTF, they typically involve PTF components
- Under FERC Order 1000, projects that are eligible for regionalization of costs should be subject to a competitive solicitation, unless they are excluded by FERC (e.g. non-regionalized projects, although it can be others, for example: below 200 kV in CA, reliability projects in MISO, etc.)
- Currently, Appendix 1 does not have a list of excluded-from-competition type PTF projects or a mechanism for a competitive solicitation
- Until this concern is resolved, ISO-NE is no longer placing LSP projects on the project list as of the May 18, 2015 effective date
- Information will still be provided to stakeholders through the TOPAC



# October 2015 Changes

## 2 New Projects and Corresponding Need

Project ID #	Transmission System Upgrades	Cost (in millions \$)	Improvement/Need
1678	Salem Harbor Substation Rebuild (Massachusetts)	75.0	Resolves asset condition issues
1679	1630 13M Terminal Upgrade (Connecticut) SWCT	0.08	Resolve thermal overloads



# October 2015 Changes, *cont.*

## 9 Projects Placed In-Service and Corresponding Needs

Project ID #	Transmission System Upgrades	Cost (in millions \$)	Improvement/Need
802	Build new 345 kV line 3271 Card - Lake Road (Connecticut) NEEWS (Interstate Reliability Project)	217.9	Increase E-W transfer capability
721	New Pootatuck 115/13.8 kV substation (formerly known as Shelton Substation) (Connecticut)	19.9	Increase load serving capability
1679	1630 13M Terminal Upgrade (Connecticut) SWCT	.08	Resolve thermal overloads
1241	Reconductor G-185S (Kent County - Davisville Tap) (Rhode Island)	6.0	Relieve contingency line loading by increasing capacity rating
1495	Merrimack Substation - replace (1) 115 kV circuit breaker (Q171). (This circuit breaker is a different breaker than identified in project 1312) (New Hampshire) Southern New Hampshire Solution	Part of RSP 1312 (\$15.5)	Addresses reliability concerns



# October 2015 Changes, *cont.*

## 9 Projects Placed In-Service and Corresponding Needs

Project ID #	Transmission System Upgrades	Cost (in millions \$)	Improvement/Need
1557	Add three 115 kV switches associated with the new Mill Pond Substation (New Hampshire) LSP - New Mill Pond Substation	2.8	Address local area reliability concerns
1434	Add a new Larrabee Road 345/115 kV substation interconnecting lines 3025, 3026, 200, 212, 251, 255 and 268 between substations Coopers Mills, Surowiec, Leeds, Monmouth, Livermore Falls, Middle Street and Gulf Island (Maine) Maine Power Reliability Program (MPRP)	Part of RSP 1411 (\$1,369.0)	Increase load serving capability in Maine
1454	Re-rate of the 115 kV Line 83C between Sappi Hinckley Substation and 83C Tap (Maine) Maine Power Reliability Program (MPRP)	Part of RSP 1411 (\$1,369.0)	Increase load serving capability in Maine
1251	Sectionalize Section 241 by adding four 115 kV circuit breakers at Lakewood Substation and install a second 115/34.5 kV transformer. Construct 4 miles of new 115 kV line from the existing Section 83B Tap point to the Lakewood Substation & rebuild the existing 115kV Section 83B (Maine) Lakewood Substation Expansion	17.1	Increase load serving capability in Maine





# October 2015 Changes, *cont.*

## Cost Estimate Comparisons of Reliability Projects

### June 2015 vs. October 2015 Update <sup>(1)</sup>

	As of June 2015 Plan Update (in millions \$)	As of October 2015 Plan Update (in millions \$)	Change in Plan Estimate (in millions \$)
<b>MAJOR PROJECTS</b>			
Maine Power Reliability Program (MPRP)	1459	1459	0
Greater Hartford & Central Connecticut (GHCC)	357	357	0
New England East - West Solution (NEEWS)	1620	1580	-40
NEEWS (Greater Springfield Reliability Project) \$676.0			
NEEWS (Rhode Island Reliability Project) \$362.3			
NEEWS (Interstate Reliability Project) \$482.3			
NEEWS \$59.7			
Pittsfield/Greenfield Project	208	208	0
Greater Boston - North, South, Central, Western Suburbs	795	808	13
New Hampshire Solution - Southern, Central, Seacoast, Northern	352	354	2
Vermont Solution - Southeastern, Connecticut River	134	134	0
Southwest Connecticut (SWCT)	430	429	-1
SUBTOTAL <sup>(2)</sup>	<b>5355</b>	<b>5329</b>	-26
<b>OTHER PROJECTS</b>	6536	6598	62
<b>NEW PROJECTS</b>		75	75
<b>PROJECTS WHOSE COST ESTIMATES WERE PREVIOUSLY REPORTED AS TO BE DETERMINED (TBD)</b>		13	13
TOTAL <sup>(2)</sup>	<b>11891</b>	<b>12015</b>	124
Minus 'concept'	0	0	
Minus 'in-service'	-7178	-7441	
<b>Aggregate estimate of active projects in the Plan <sup>(2)</sup></b>	<b>4713</b>	<b>4574</b>	

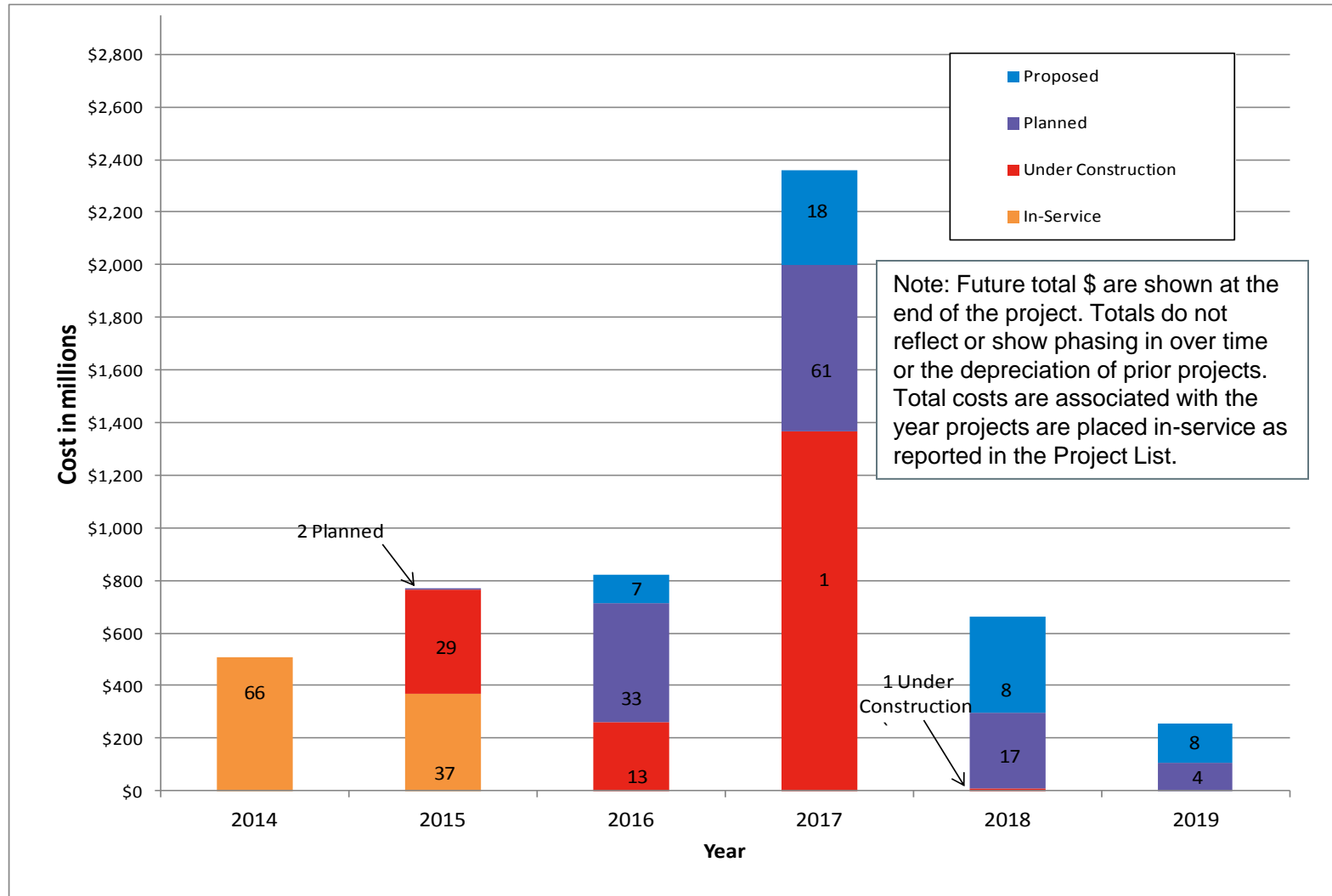
<sup>(1)</sup> Transmission Owners provided all estimated costs, which may not meet the guidelines described in Planning Procedure 4, Attachment D

<sup>(2)</sup> May not sum exactly due to rounding

<sup>(3)</sup> The cost estimates for projects in the "Major Projects" category are moved to the "Other Projects" category once they are fully completed.

# October 2015 Changes, *cont.*

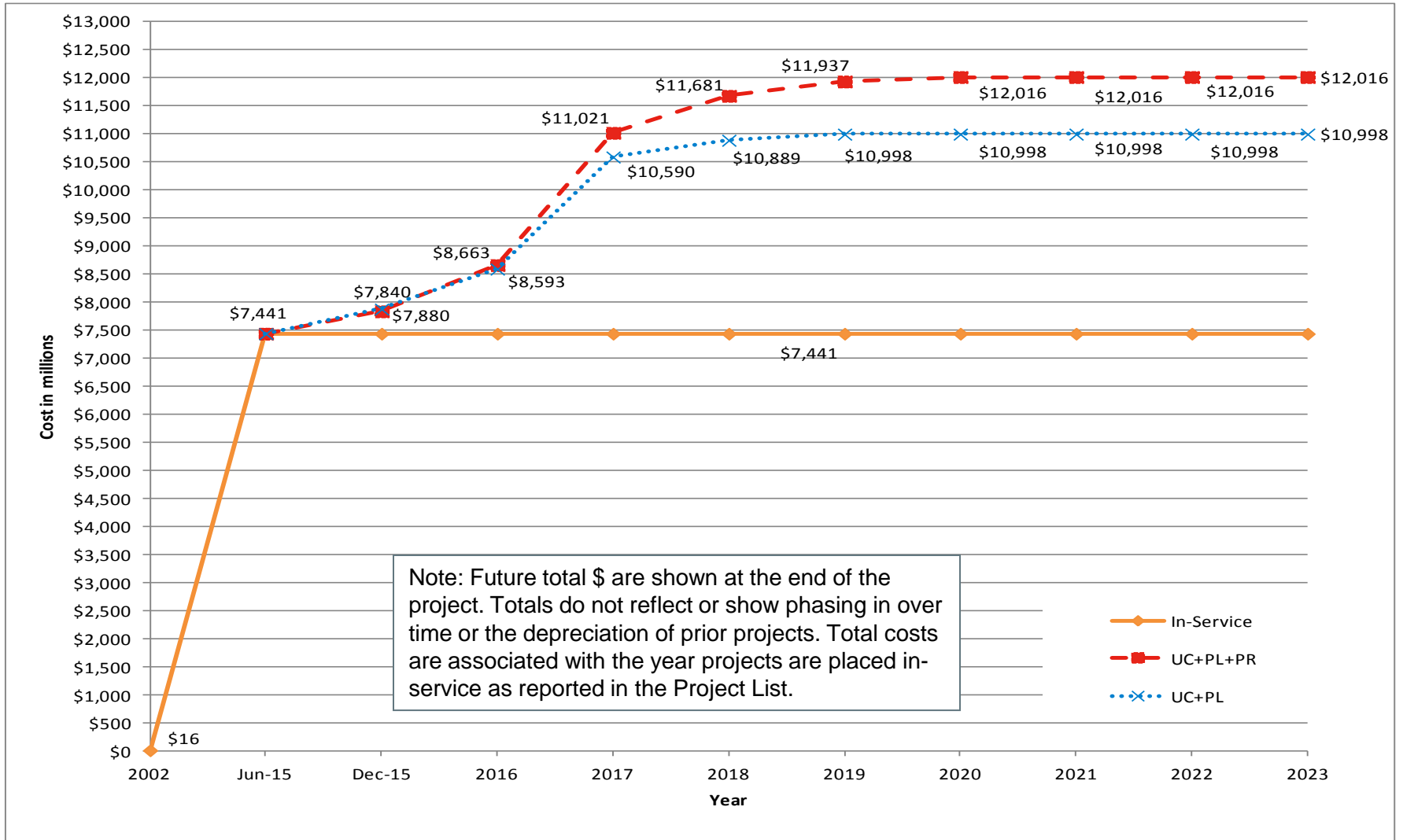
## Investment of New England Transmission Reliability Projects by Status through 2019



Note: Numbers shown represent project quantities

# October 2015 Changes, *cont.*

## Cumulative Investment of New England Transmission Reliability Projects through 2023



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

# October 2015 Changes, *cont.*

## Reliability Project Counts and Aggregated Cost Estimates by Project Stage with Applied Accuracy Ranges <sup>(1)</sup>

Project Stage (Status)	Component / Project / Plan Count <sup>(2)</sup>	Estimate Range		Estimated Costs (\$millions)	Range	
		Minimum	Maximum		Minimum	Maximum
Proposed	43	-25%	25% <sup>(3)</sup>	1057	793	1321
Planned	118	-25%	25%	1481	1111	1851
Under Construction	44	-10%	10%	2036	1832	2240
<b>Total Plan (excluding Concept)</b>	<b>205</b>			<sup>(5)</sup> <b>4574</b>	<b>3736</b>	<b>5412</b>
Concept	0			<sup>(4)</sup> 0		
In-Service	9	-10%	10%	264	238	290
Cancelled	3			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.

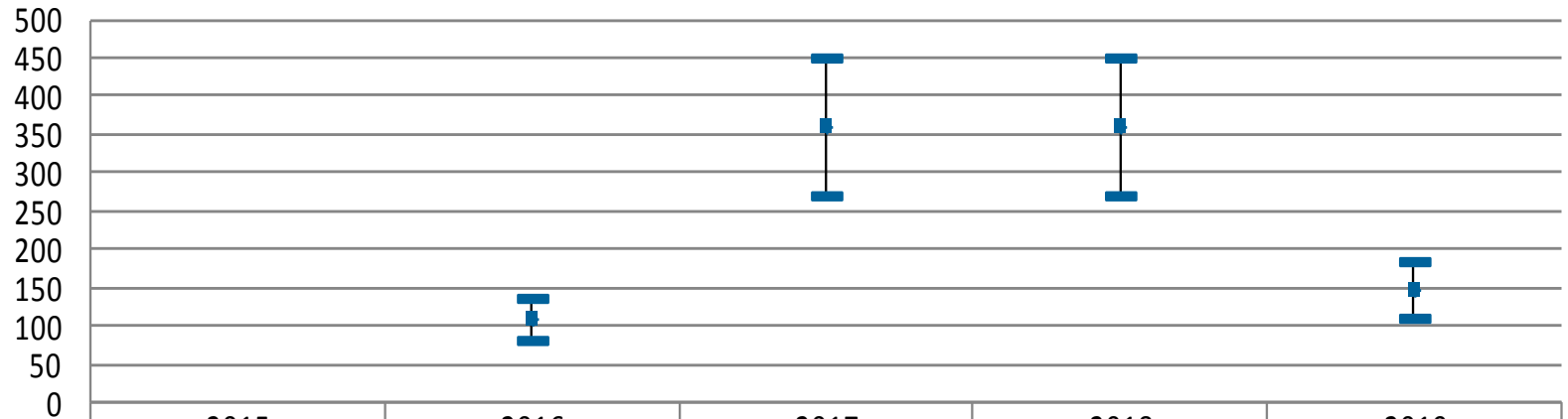
**Estimates for these projects are noted as TBD in the Project Listing and are only Concept Projects.**

(5) May not add up due to rounding.

# October 2015 Changes, *cont.*

## Project Cost Estimate Tolerances by Status and Year in Millions \$

### PROPOSED

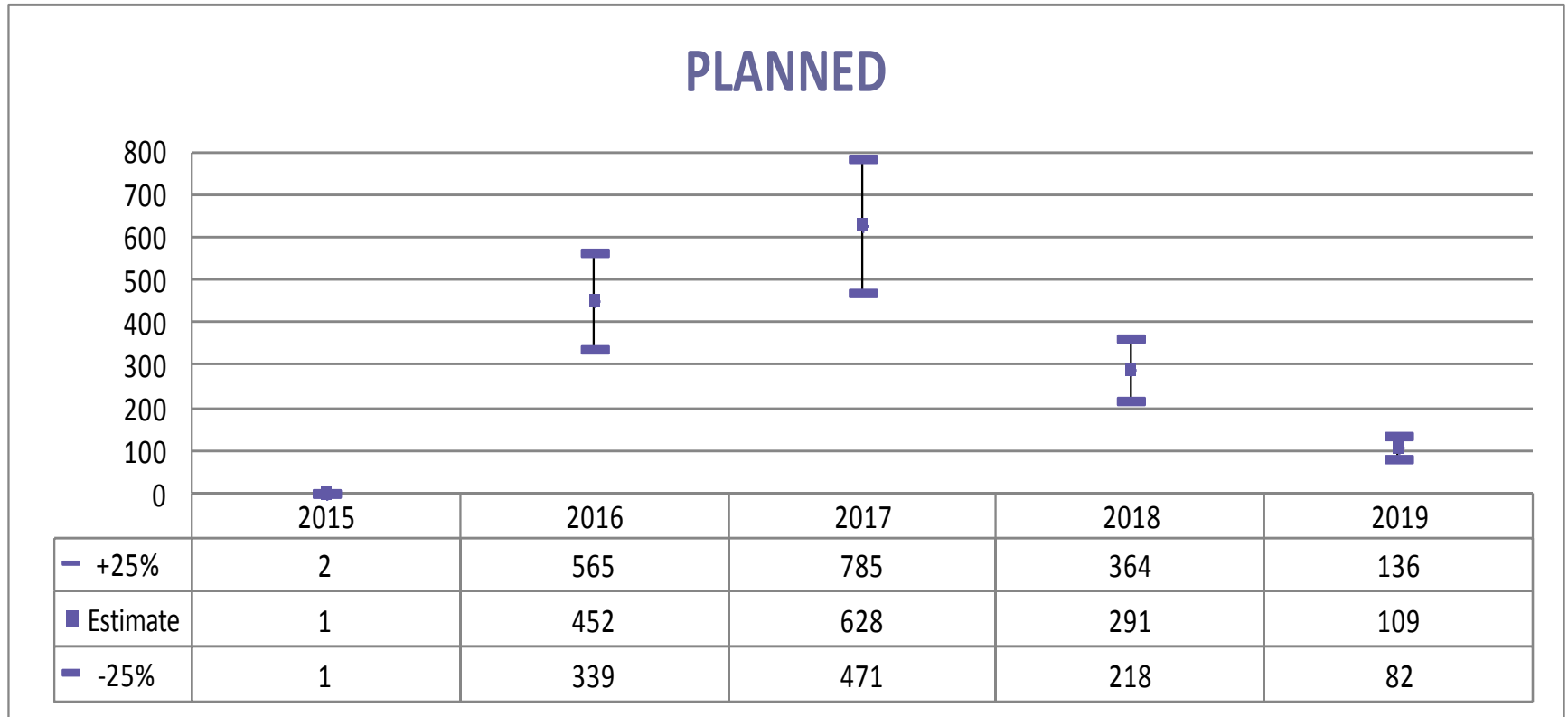


	2015	2016	2017	2018	2019
— +25%		137	451	451	185
■ Estimate		110	361	361	148
— -25%		82	271	271	111

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.

# October 2015 Changes, *cont.*

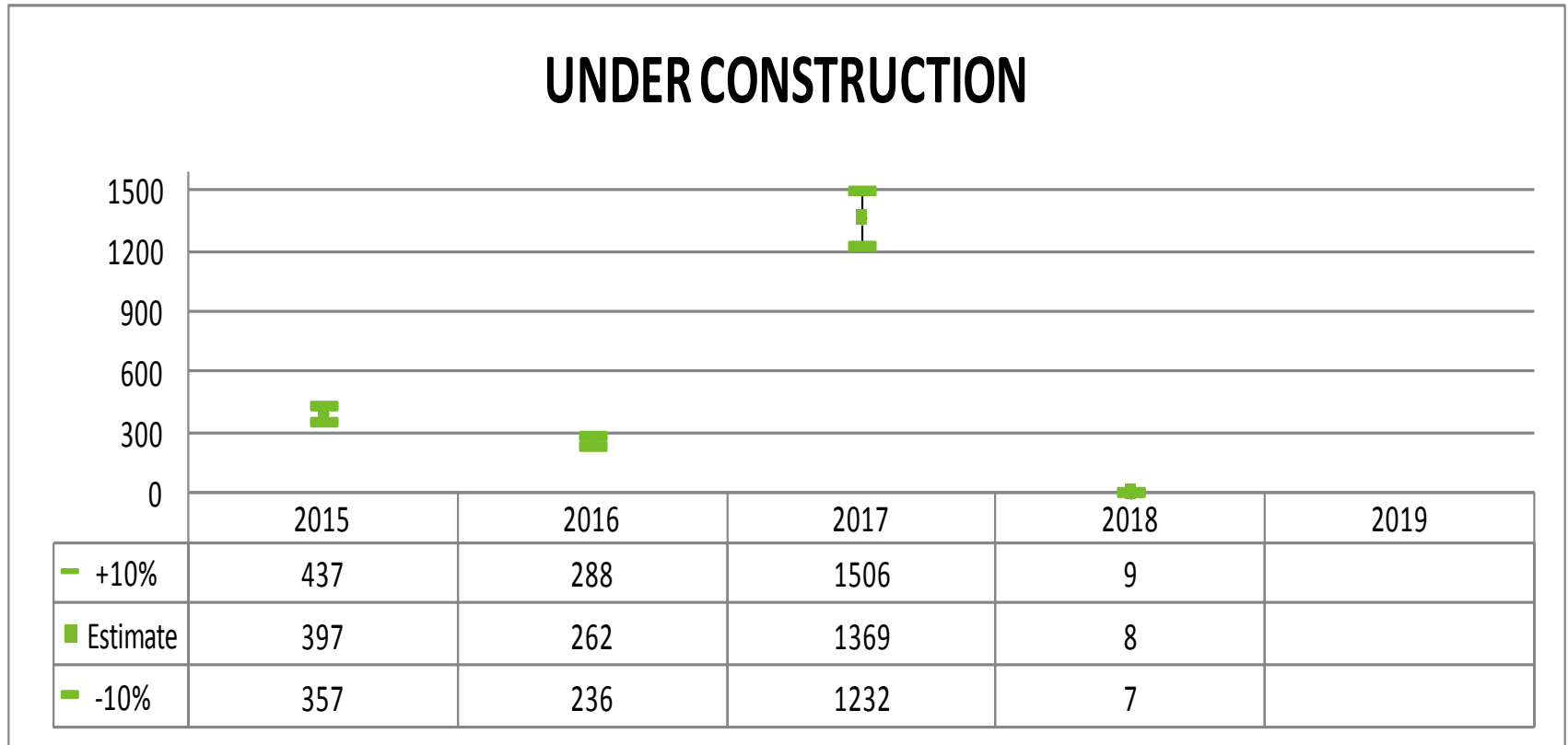
## Project Cost Estimate Tolerances by Status and Year in Millions \$



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.

# October 2015 Changes, *cont.*

## Project Cost Estimate Tolerances by Status and Year in Millions \$



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
Auburn Area Transmission System Upgrades	Approved 1/08, 2/10	Approved 10/13, 2/14	Project completion 2013-2015
Pittsfield/Greenfield Project	Approved 12/12	Not Submitted	Project completion 2014-2016
Maine Power Reliability Program (MPRP)	Approved 7/08, 2/09, 11/10	Approved 1/29/10	Project completion 2014-2017
Vermont Solution – Connecticut River Valley	Approved 4/15	Not Submitted	Project completion 2017
Southwest Connecticut (SWCT)	Approved 4/15	Partially 7/23/15	Project completion 2013-2019



# Status of Major Transmission Projects, *cont.*

	PPA	TCA	Construction
Central/Western MA Reinforcements	Approved 12/07, 3/11	Group 1 2/29/2012	Project completion 2009-2017
New England East-West Solution (NEEWS)	Approved 9/08, 5/12	Greater Springfield Reliability Project (GSRP) Approved 2/24/2014	Rhode Island Reliability Project and GSRP are completed; Projected completion of other components 2013-2015
Greater Boston – North, South, Central and Suburbs	Approved 4/15, 5/15	Not Submitted	Project completion 2013-2019
New Hampshire Solution – Western, Northern, Southern and Seacoast	3/13	Seacoast 7/9/5 Southern 6/17/15 Western 10/2/15 Central 5/5/15	Project completion 2013-2020
Greater Hartford & Central Connecticut (GHCC)	4/15	Partially 7/16/15	Project completion 2018

# Appendix



# Summary: Project Listing Definitions

- **ISO New England Inc. Transmission, Markets and Services Tariff Section II**
  - **Attachment K, Regional System Planning Process**
    - Definition Of Needs Assessment
    - Definition of Solution Studies
  - **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 on the RSP and has been evaluated or further defined and developed in a Solutions Study 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
- Merchant Projects
- Projects In-Service
- Cancelled 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: Conceptual or Proposed

Part 2 – These projects are Generator Interconnection Upgrades.

2a: Proposed (I.3.9 approval but without Generator Interconnection Agreement), Planned (I.3.9 approval with Generator Interconnection Agreement), or Under Construction

2b: Conceptual or Proposed

Part 3 – These projects are Market Efficiency Upgrades.

3a: Planned or Under Construction

3b: Conceptual or Proposed

Part 4,5 – 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.

4,5a: Planned or Under Construction

4,5b: Conceptual 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 (+/-25%),

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

TCA-Approved Project (+/-10%)