RSP Project List and Asset Condition List October 2024 Update

Planning Advisory Committee Meeting

Andrew Kniska

PRINCIPAL ENGINEER, TRANSMISSION PLANNING

TABLE OF CONTENTS

	Slide
Highlights of the RSP Project List Update	*3*
October 2024 RSP Project List Update	*4 – 10*
Status of Major Transmission Projects	*11*
Highlights of the Asset Condition List Update	*12 – 13*
October 2024 Asset Condition List Update	*14 – 20*
Next Steps	*21*
Appendix	*22 – 28*

Highlights of the RSP Project List Update

- **Major cost estimate changes greater than $5M that occurred between the June and October 2024 Project List**
  - (ME) UME 2029 Solutions
    - Cost reduction of $14.1M for the upgrades at the Boggy Brook 115 kV substation (a +50/-25 MVAR synchronous condenser and a new 115 kV breaker to separate Line 67 from the proposed solution elements) due to lower than anticipated overhead values and no longer required contingency costs
- **No new projects**
- **Three upgrades have been placed in-service since the June 2024 update**
  - (MA) SEMA/RI – one project
  - (ME) UME 2029 Solutions – two projects
- **No cancelled projects since the June 2024 update**

October 2024 RSP Project List Update

- **No new projects**

October 2024 RSP Project List Update, cont.

- **Three Projects Placed In-Service and Corresponding Needs**

Project ID #	Transmission System Upgrades	Cost (in millions $)	Primary Equipment Owner	Improvement/Need
1725	Build a new Bourne #917 to West Barnstable #921 115 kV line and associated terminal work (Massachusetts) SEMA/RI	52.3	Eversource	Resolve thermal overloads and avoid voltage collapse
1882	Rebuild 21.7 miles of the existing 115 kV line Section 80 Highland – Coopers Mills 115 kV line (Maine) UME 2029 Solutions	63.6	Central Maine Power	Resolve thermal overloads
1888	Install a 10 MVAR reactor at Keene Road 115 kV substation (Maine) UME 2029 Solutions	4.7	Versant Power	Resolve high voltages

October 2024 RSP Project List Update, cont.

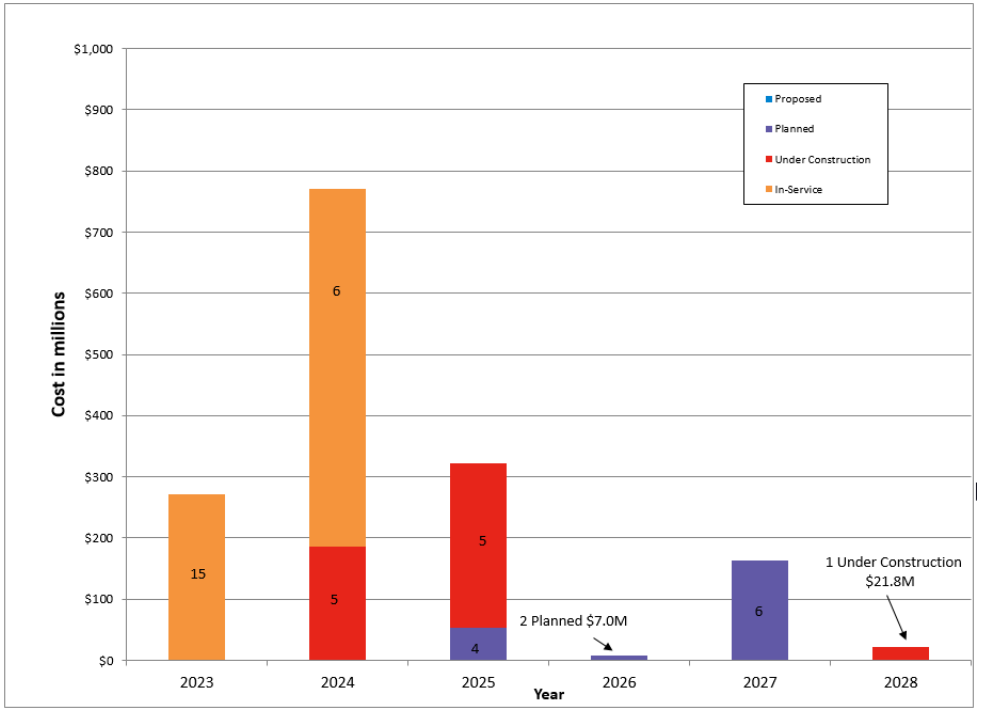
- **Cost Estimate Comparisons of Reliability Projects June vs. October 2024 Update***

	As of June 2024 Plan Update (in millions $)	As of October 2024 Plan Update (in millions $)	Change in Plan Estimate (in millions $)
MAJOR PROJECTS ***			
Southeast Massachusetts/Rhode Island Reliability (SEMA/RI)	437	437	0
Greater Boston - North, South, Central, and Western Suburbs	1200	1200	0
Eastern CT 2029 Solutions	260	260	0
New Hampshire (NH) 2029 Solutions	159	161	2
Upper Maine (UME) 2029 Solutions	165	151	-14
SUBTOTAL**	2221	2208	-13
OTHER PROJECTS	11140	11159	19
NEW PROJECTS	19	0	-19
TOTAL**	**13380**	**13368**	**-12**
Minus 'in-service'	-12546	-12669	-122
Aggregate estimate of active projects in the Plan **	**834**	**699**	**-135**

* Transmission Owners provided all estimated costs, which may not meet the guidelines described in Planning Procedure 4, Attachment D.
** May not sum exactly due to rounding.
*** The cost estimates for projects in the "Major Projects" category are moved to the "Other Projects" category once they are fully completed.

October 2024 RSP Project List Update, cont.

- **Investment of New England Transmission Reliability Projects by Status through 2028**

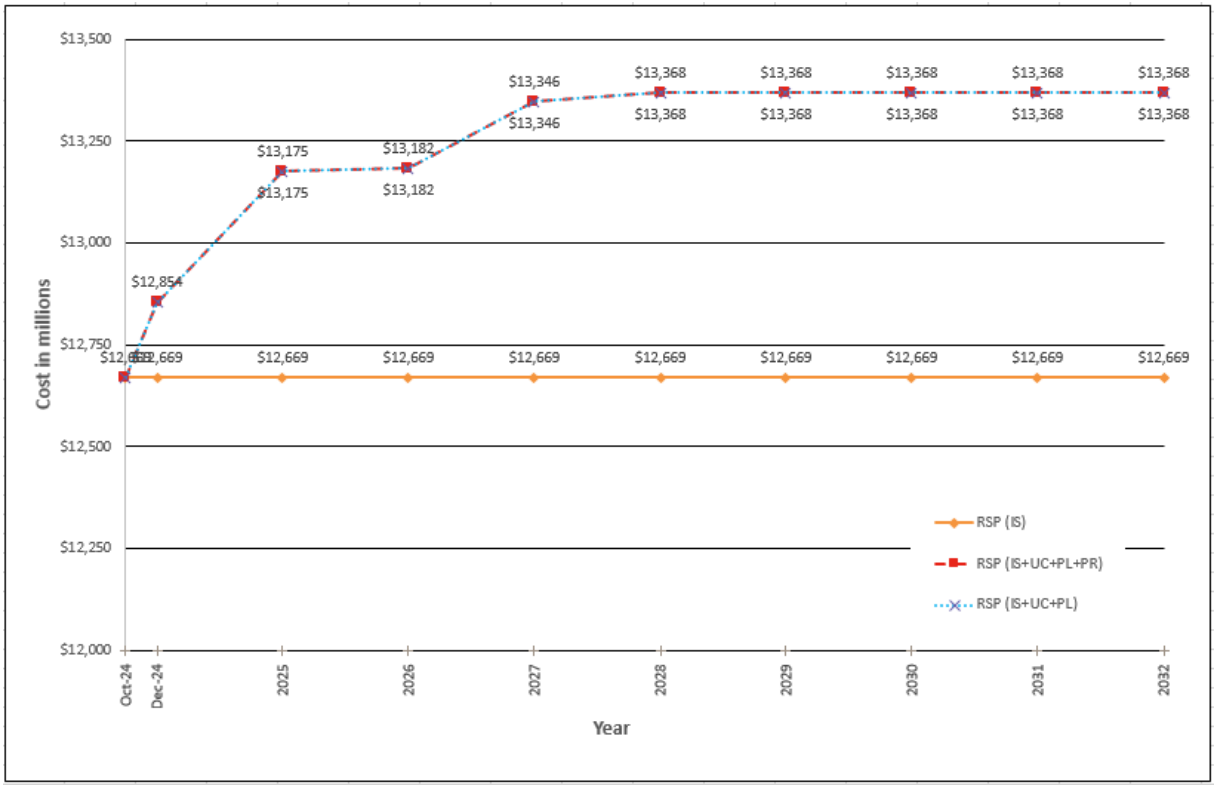


* Numbers shown represent project quantities.

** 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 2024 RSP Project List Update, cont.

- **Cumulative Investment of New England Transmission Reliability Projects through 2032**



* IS – In Service, UC – Under Construction, PL – Planned, PR – Proposed

** 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 2024 RSP Project List Update, cont.

- **Reliability Project Counts and Aggregated Cost Estimates by Project Stage with Applied Accuracy Ranges***

Project Stage (Status)	Component / Project / Plan Count	Estimate Range Minimum	Estimate Range Maximum	Estimated Costs ($millions)	Range Minimum ($millions)	Range Maximum
Proposed	0	-25%	25%**	0	0	0
Planned	12	-25%	25%	223	168	279
Under Construction	11	-10%	10%	476	428	523
Total Plan	**23**			*** **699**	**596**	**802**
In-Service ****	3	-10%	10%	121	109	133
Cancelled	0	-25%	25%	0	0	0

* All costs are provided by Transmission Owners. The costs in the table reflect all projected in-service dates.
** All estimates may not yet be at this level of accuracy; many estimates may be -25%/+50%.
*** May not add up due to rounding.
**** In-Service projects are those projects that went into service since the last update.

Status of Major Transmission Projects

	PPA	TCA	Construction
Southeast MA/RI Reliability (SEMA/RI)	Approved 5/2017, 4/2018	Submitted	Project completion 2018-2027
Greater Boston – North, South, Central and Western Suburbs	Approved 4/2015, 5/2015, 6/2016, 7/2019, 10/2020	Submitted	Project completion 2010-2025
Eastern CT 2029 Solutions	Approved 6/2021	Submitted	Project completion 2021-2024
New Hampshire (NH) 2029 Solutions	Approved 1/2022, 6/2022	7/16/2024	Project completion 2023 - 2025
Upper Maine (UME) 2029 Solutions	Approved 2/2022 (Versant Power) Approved 5/2022, 8/2023 (Avangrid)	Submitted (Versant Power) Not Submitted (Avangrid)	Project completion 2024-2027

ASSET CONDITION LIST UPDATE

Highlights of the Asset Condition List Update

- **Major cost estimate changes greater than $5M that occurred between the June and October 2024 Asset Condition List**
  - (CT) 1704 Underground Cable Rebuild Project (ACL 412)
    - Cost increase of $8.7M is a result of refined engineering, presented at the June 2023 PAC
  - (CT) Railroad Corridor Transmission Line Asset Condition Upgrades (ACLs 91, 151-154)
    - Cost increase of $217.8M due to increased cost of labor and equipment along with relocating portions of project due to CT Siting Council decision, presented at the August 2024 PAC
  - (CT) 345 kV Structure Replacements - 3041 Line (ACL 358)
    - Cost increase of $20.6M is a result of permitting delays/NDDB mitigation plan delays resulting in increase in labor rates and material costs due to extended project duration, presented at the July 2024 PAC
  - (CT) Millstone Substation 345 kV Breaker Replacements (ACL 338)
    - Cost increase of $8.4M is a result of more refined scheduling and coordination with the Millstone generating unit, presented at the May 2022 PAC
  - (MA) Tewksbury #22 Substation Asset Condition Replacements (ACL 336)
    - Cost increase of $11.8M is a result of more detailed scope development, construction sequencing, cost estimate, and material cost increases, presented at the August 2022 PAC
  - (NH, VT) W-149 115 kV Line Asset Condition Refurbishment (ACLs 440, 447)
    - Cost reduction of $151.2M based on preliminary engineering and field survey result

Highlights of the Asset Condition List Update, cont.

- **14 new projects totaling $976.7M***
  - Details on the next few slides
- **17 upgrades have been placed in-service since the June 2024 update totaling $315.7M**
  - Details on the next few slides
- **Three cancelled projects since the June 2024 update**
  - NPCC Directory #1 Protection Modifications - Phase 3 in MA and NH, and Phase 5 in MA (ACLs 94, 96, 97)
    - National Grid cancelled these projects since the cost estimates are less than $5M
      - These projects will be presented to PAC if the PTF costs become greater than or equal to $5M, before they are added back to the Asset Condition List as new projects

* Avangrid presented the MEPCO Section 396/3001 End of Life Strategy Project at the August 2024 PAC but decided not to include the Project to the October 2024 Asset Condition List update.

October 2024 Asset Condition List Update

- **14 New Projects**

Project ID #	Transmission System Upgrades	Cost (in millions $)	Primary Equipment Owner
441	NERC CIP-014 - Physical Security Upgrades – Round 2/Site 3 (Connecticut)	2.2	Eversource
442	NERC CIP-014 - Physical Security Upgrades – Round 2/Site 2 (Connecticut)	2.2	Eversource
443	Line N133 Structure Replacement Project (New Hampshire)	5.5	Eversource
444	Line X-178 115 kV Line Rebuild (New Hampshire)	384.6	Eversource
445	Campville 115 kV Substation Relay Upgrades (Connecticut)	5.1	Eversource
446	345 kV Line Structure Replacements Project - Line 3754 (Connecticut)	7.4	Eversource
447	W-149 115 kV Line Asset Condition Refurbishment - NH portion* (New Hampshire)	339.0	National Grid, USA
448	Brayton Point Substation Asset Replacements (Massachusetts)	46.6	National Grid, USA

* This is a split of the existing Asset Condition project 440 to separate the project by states to NH and VT portions.

October 2024 Asset Condition List Update, cont.

- **14 New Projects**

Project ID #	Transmission System Upgrades	Cost (in millions $)	Primary Equipment Owner
449	313/343 345 kV Line Asset Condition Refurbishment (Massachusetts)	79.8	National Grid, USA
450	345 kV breaker replacements at Manchester station (Connecticut)	16.4	Eversource
451	345 kV breaker replacements at Amherst station (New Hampshire)	9.3	Eversource
452	302 345 kV Line Asset Condition Refurbishment (Massachusetts)	19.4	National Grid, USA
453	A-1 & B-2 69 kV Line Asset Condition Project - NH Portion* (New Hampshire)	36.7	National Grid, USA
454	A-1 & B-2 69 kV Line Asset Condition Project - VT Portion* (Vermont)	22.7	National Grid, USA

* This is a split of the existing Asset Condition project 237 to separate the project by states to MA, NH and VT portions.

October 2024 Asset Condition List Update, cont.

- **17 Projects Placed In-Service**

Project ID #	Transmission System Upgrades	Cost (in millions $)	Primary Equipment Owner
19	Congress 115 kV Substation Flood Wall (Connecticut)	48.1	United Illuminating Company
145	Carpenter Hill Control House Rebuild (Massachusetts)	14.5	National Grid, USA
259	Copper Conductor and Shield Wire Replacement - Line 1163/1550 (Connecticut)	34.5	Eversource
339	Northfield Mountain Substation 345 kV Breaker Replacements (Massachusetts)	9.0	Eversource
360	East Devon 345/115 kV Relay Upgrades (Connecticut)	6.7	Eversource
364	High Hill Station 644 Control House Replacement (Massachusetts)	19.3	Eversource
367	115 kV Structure Replacements and OPGW Installation - P106 Line (New Hampshire)	5.6	Eversource
368	115 kV Structure Replacements and OPGW Installation - Q171 Line (New Hampshire)	15.0	Eversource

October 2024 Asset Condition List Update, cont.

- **17 Projects Placed In-Service**

Project ID #	Transmission System Upgrades	Cost (in millions $)	Primary Equipment Owner
370	Line 381/379 Optical Ground Wire Upgrade (New Hampshire)	8.3	Eversource
372	South Naugatuck to Devon Rebuild - Segment 2 (Pootatuck substation - West Devon Jct.) (Connecticut)	52.2	Eversource
376	CT Asset Condition Project - Card to Montville Corridor (Reconductor/OPGW lines 1000 and 1090, OPGW lines 1070, 1080, 1490) (Connecticut)	37.2	Eversource
389	NH Wood Structure Replacements - 391 Line (New Hampshire)	12.4	Eversource
391	NH Wood Structure Replacements - R193 Line (New Hampshire)	7.7	Eversource
399	NH Wood Structure Replacements and OPGW Installation - J114 Line (New Hampshire)	9.7	Eversource
405	Laminated Wood Structure Replacement Program Phase III (New Hampshire)	18.8	Eversource
417	Northboro Road Substation Breaker Replacements (Massachusetts)	7.0	National Grid, USA

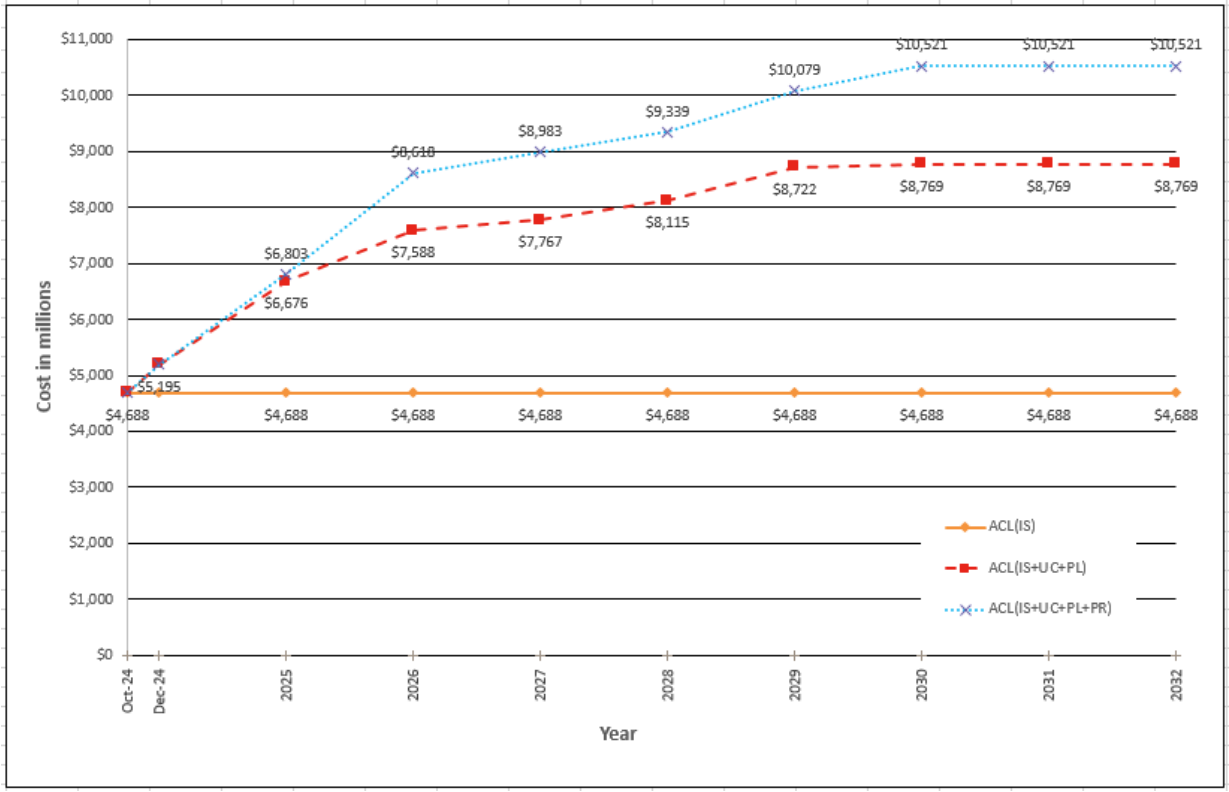
October 2024 Asset Condition List Update, cont.

- **17 Projects Placed In-Service**

Project ID #	Transmission System Upgrades	Cost (in millions $)	Primary Equipment Owner
425	M127 Structure Replacement Project (New Hampshire)	9.8	Eversource

October 2024 Update, cont.

- **Cumulative Investment of New England Asset Condition Projects through 2032**

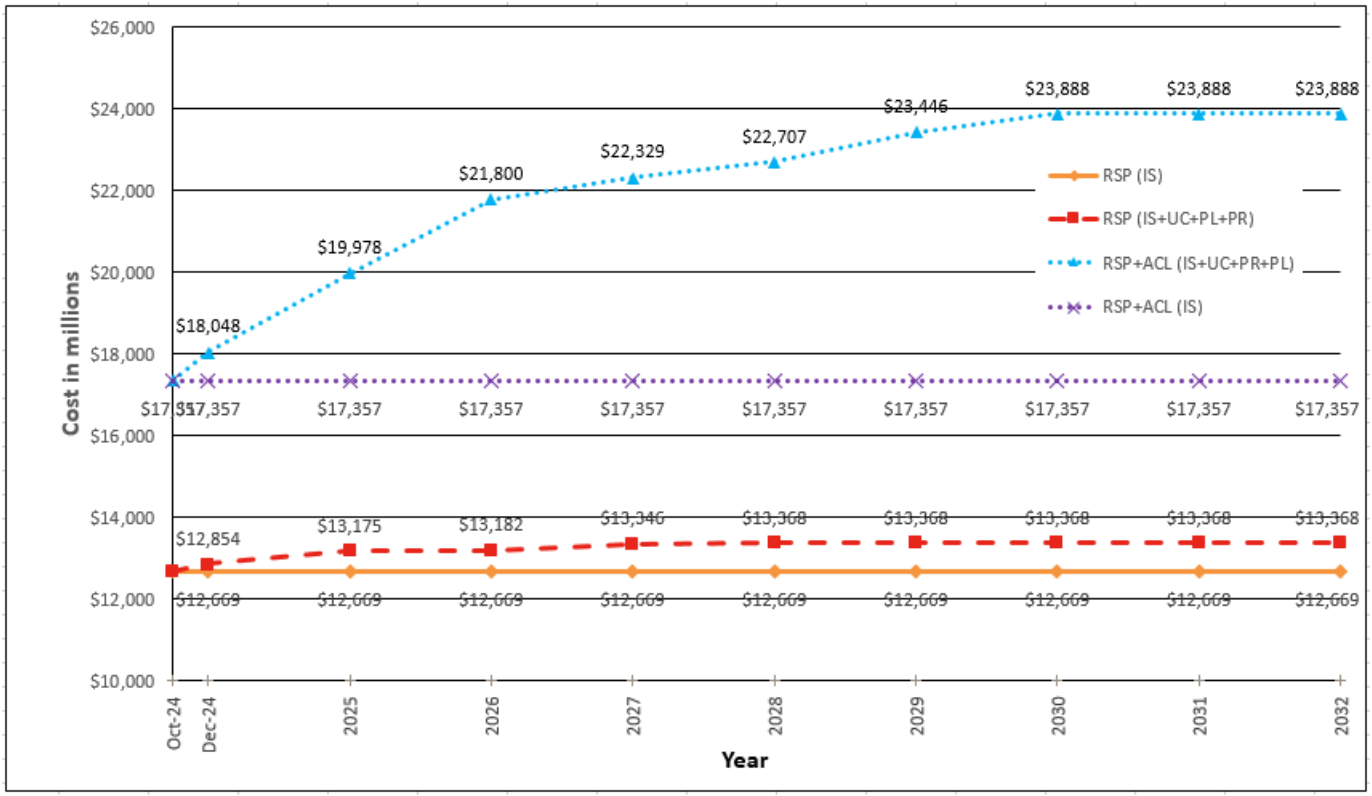


* IS – In Service, UC – Under Construction, PL – Planned, PR – Proposed

** 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 2024 Asset Condition List Update, cont.

- **Cumulative Investment of New England Transmission Reliability Projects and Asset Condition through 2032**



* IS – In Service, UC – Under Construction, PL – Planned, PR – Proposed

** 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.

Next Steps

- Please provide comments related to the project lists to pacmatters@iso-ne.com by November 7, 2024
- The final version of the RSP Project list, Asset Condition list, and the presentation will be posted on the RSP Project List and the Asset Condition List website, along with responses to any written stakeholder feedback received, following the comment period

Questions

APPENDIX

RSP Project Listing

- **Project Listing Column Definitions for**
  - Reliability Projects
  - Interconnection Projects
  - Market Efficiency Upgrades
  - Elective Projects

RSP Project Listing – Column Definitions, cont.

- **Part Number (Part #)**
  - The Part #'s designate the 'need' category of the project*
    - Part 1: these projects are Reliability Upgrades
      - 1a Planned (must be the preferred solution to solve the needs and if required, have I.3.9 approval) or Under Construction
      - 1b Proposed (is supported by a Solutions Study or a Competitive Solution Process)
    - Part 2: these projects are Generator Interconnection Upgrades
      - 2a Planned (I.3.9 approval with Interconnection Agreement including FCM related transmission upgrades to meet the Capacity Capability Interconnection Standard), or Under Construction
      - 2b Proposed (at a minimum, a completed System Impact Study and I.3.9 approval but no Interconnection Agreement)
    - Part 3: these projects are Market Efficiency Upgrades
      - 3a Planned (must be the preferred solution to solve the needs and have I.3.9 approval) or Under Construction
      - 3b Proposed (is supported by a Competitive Solution Process)
    - 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 (I.3.9 approval with Interconnection Agreement) or Under Construction
      - 4b Proposed (I.3.9 approval but without Interconnection Agreement)

* Original categories are not changed when a project is placed 'In-Service' or 'Cancelled'.

RSP Project Listing – Column Definitions, cont.

- **Project ID**
  - The Project ID is generated by ISO-NE System Planning
- **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 is given to a project that consists of smaller subprojects
- **Project/Project Component**
  - The month/year entered is the date the project is expected to be placed in service
  - A brief, high-level description of the project is entered here
    - Includes major pieces of substation equipment and/or types of line work to be performed

RSP 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
    - A regulated transmission solution upgrade that has been approved by the ISO pursuant to Section I.3.9 of the Tariff if required, or
    - An interconnection related transmission upgrade that has been approved by the ISO pursuant to Section I.3.9 of the Tariff with Interconnection Agreement
  - Proposed
    - A regulated transmission solution that has been selected by the ISO in response to a Needs Assessment and communicated to PAC, or
    - An interconnection related transmission upgrade that has been approved by the ISO pursuant to Section I.3.9 of the Tariff, but without Interconnection Agreement
  - Cancelled
    - Project has been cancelled

* On December 10, 2019, FERC accepted Tariff changes that removed the 'Concept' category.

RSP 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 because the project has been cancelled, has no/minimal PTF cost, or is associated with the interconnection of a resource or Elective Transmission Upgrade
- **Estimated Costs**
  - The PTF 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:
    - 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%)
  - An "NR" indicates that the project cost is not eligible for regionalization