

National Grid Local System Plan 2023

PAC Presentation
November 15th, 2023

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Purpose of Local System Plan

The Local System Plan (LSP) is a report that:

Describes:

- Non-PTF projects that are needed to maintain system reliability
- PTF project components of a locally driven project that are needed to maintain system reliability

Reflects:

- LSP Needs Assessments
- Corresponding transmission system planning and expansion studies

Identifies:

- Local Planning Process (See Appendix)
- Criteria, Data, and Assumptions (See Appendix)

LSP Communication

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LSP Communication Continued

- For ISO initiated projects that contain both regional and local components, the TO's LSP project is associated with the ISO-NE Regional System Plan Project list.
- For transmission asset driven projects that contain both regional and local components, the TO's LSP project is associated with the Asset Condition list.

National Grid's project list is located at:

http://www.nationalgridus.com/oasis/filings_studies.asp

- “LSP Project List 2023”

LSP Project List

- The LSP Project List is a cumulative listing of proposed regulated transmission solutions that may meet LSP needs
- Lower voltage facilities contained in the LSP Project List pertain to facilities supplying our wholesale customers

The LSP Project List contains the status of each project:

Project Status Descriptions <i>(may vary from RSP definitions)</i>	
Concept	Project is under consideration as possible solution to a need.
Proposed	National Grid has determined that the project is an appropriate solution to a need and has -25% to +50% target cost estimate accuracy/tolerance.
Planned	PPA has been approved (if required) and project has at least -25% to +25% target cost estimate accuracy/tolerance.
Under Construction	Project is under construction.
In Service	Project is complete

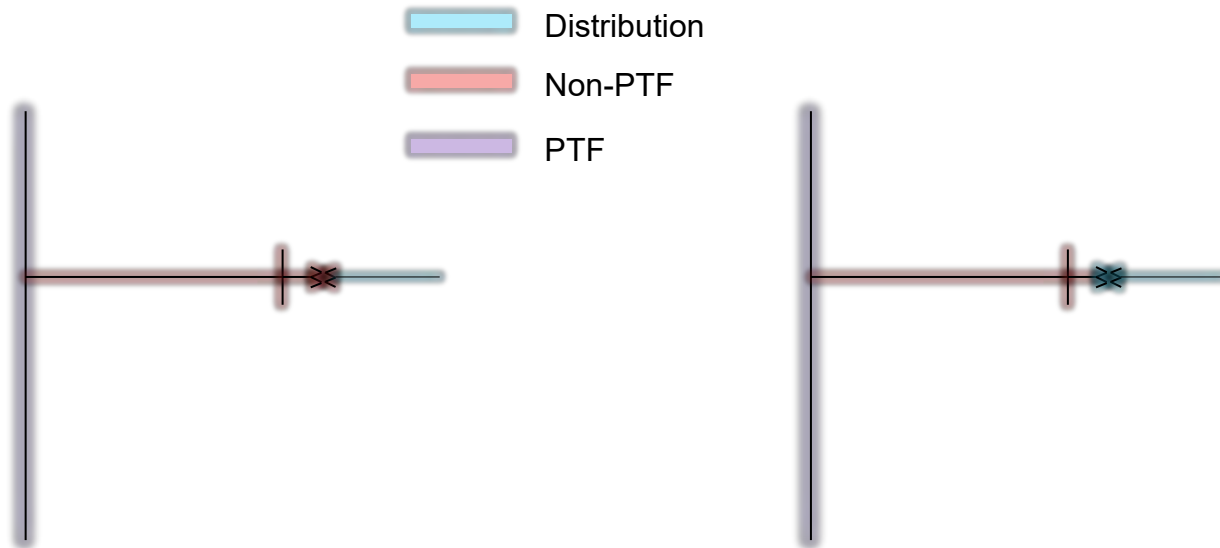
2023 LSP Projects



National Grid Operates Facilities in the following three states:

- Massachusetts
- New Hampshire
- Vermont

Classification of National Grid Step-Down Transformers



In Massachusetts, New Hampshire, and Vermont:

- For NEP assets, typically Distribution starts at low-side of step-down transformer
- For former EUA assets, Distribution starts at high-side of step-down transformer

Project Summary

National Grid LSP Project Summary	
Project Type	# of Projects
Reliability	2
Asset Condition	33
Load Growth	5
Point of Delivery Request	4
Electric Sector Modernization Plan	40
DG Group Study	10
Total	94

Massachusetts Local Projects (Planned, Under Construction, and In Service)

Install North Marlboro 2nd 115/13.8 kV Transformer

Remove Distribution Load from Tertiary Windings of Sandy Pond Substation Transformer and Install 115/23 kV Transformer

J-162 Install OPGW and Structure Replacements

East Tewksbury Transformer Upgrades

Replace N-192 Underground Cable

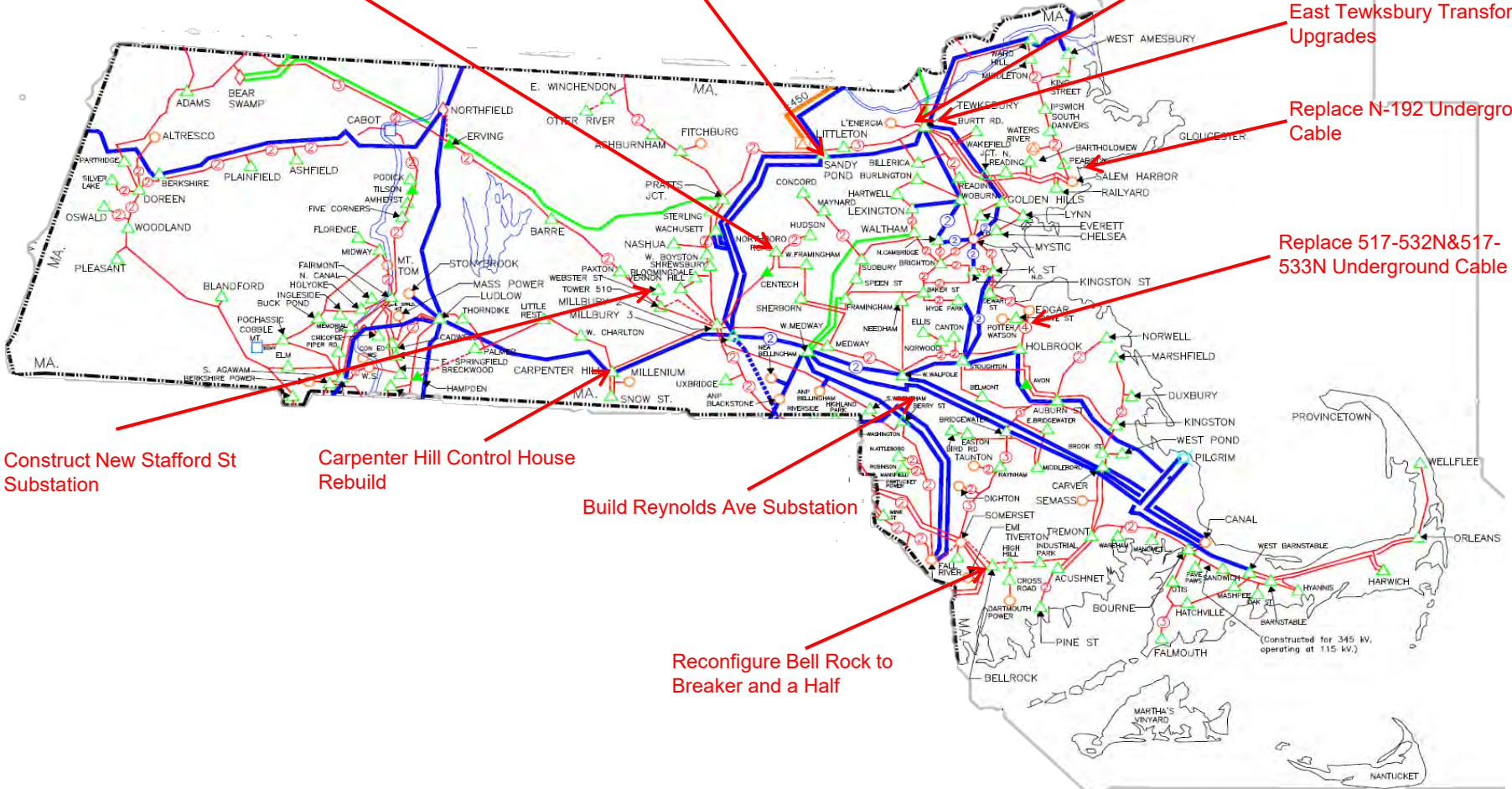
Replace 517-532N&517-533N Underground Cable

Construct New Stafford St Substation

Carpenter Hill Control House Rebuild

Build Reynolds Ave Substation

Reconfigure Bell Rock to Breaker and a Half



LSP – Massachusetts

(Fonts in *Red* are new or updates)

Primary Driver	Asset Owner by Company	2023 Projected In Service Date	Major Project	Project	Status Update for 2023	Estimated non-PTF Project Cost for 2023	Estimated Localized PTF Project Cost for 2023	PPA Approval	RSP ID/Asset List ID	Needs Assessment	Solutions
Massachusetts											
ESMP	New England Power	2032		Laurel Circle Second Transformer	Concept	TBD		No		ESMP	Add a new 115 to 13.8 kV 55 MVA transformer with four distribution feeders to support the distribution loads primarily in the Shirley area.
ESMP	New England Power	2029		East Winchendon Second Transformer	Concept	TBD		No		ESMP	Add a new 115 to 13.8 kV transform supplied by a new 115 kV transmission line extension and add four distribution feeders to support the distribution loads primarily in the Winchendon area.
ESMP	New England Power	2029		Westminster Second Transformer	Concept	TBD		No		ESMP	Add a new 69 to 13.8 kV transformer with four distribution feeders to support the distribution loads primarily in the Gardner and Hubbardston areas.
ESMP	New England Power	2029		East Westminster Rebuild	Concept	TBD		No		ESMP	Remove the existing modular substation and build a new 69/13.8kV low profile breaker-and-a-half (BAAH) substation to 115kV clearance. Relocate existing A1 and B2 Tap lines into the rebuild station.
ESMP	New England Power	2029		Pratts Junction Rebuild	Concept	TBD		No		ESMP	Build a new 115 to 13.8 kV with two 55 MVA transformers and eight distribution feeders to support distribution load primarily in the Leominster and Lancaster areas.
ESMP	New England Power	2029		North Grafton Second Transformer	Concept	TBD		No		ESMP	Add a new 69 to 13.8 kV 55 MVA transformer with four distribution feeders to support the distribution loads primarily in the Grafton area.
ESMP	New England Power	2034		New Substation Near Grafton	Concept	TBD		No		ESMP	Install a new 115 to 13.8 kV substation near the Sutton and Grafton border with two 55 MVA transformers, eight distribution feeders to support distribution load primarily to the southeast of the Millbury Substation.
ESMP	New England Power	2034		Pondville Rebuild	Concept	TBD		No		ESMP	The Pondville Substation will be upgraded, supplied by 69kV, and will include two 55 MVA transformers, with eight distribution feeders to support distribution load primarily in the Auburn area.
ESMP	New England Power	2029		North Oxford Second Transformer	Concept	TBD		No		ESMP	Add a 115kV 3000A in-line vacuum circuit breaker, a 115/13.2kV - 33/44/55MVA transformer and upgrade 13.2 kV switchyard.
ESMP	New England Power	2029		West Charlton Second Transformer	Concept	TBD		No		ESMP	Install a new 115/13.2kV 33/44/55MVA transformer, 115kV tie breaker, associated disconnects, and expand the 13.2kV substation. Add a second tap to loop the 115kV W175 Line through the station.

LSP – Massachusetts

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Massachusetts											
ESMP	New England Power	2034		New Substation Near Southbridge	Concept	TBD		No		ESMP	Build a new 115 to 13.2 kV substation near the Southbridge and Sturbridge border. Install two 55 MVA transformers with eight distribution feeders to support distribution load.
ESMP	New England Power	2034		New Substation Near Webster	Concept	TBD		No		ESMP	Build a new 69 to 13.2 kV substation near the Dudley and Webster border with two 55 MVA transformers will be installed, eight distribution feeders to support distribution load primarily to the west of the Company's existing East Webster substation.
ESMP	New England Power	2034		Charlton EV Highway Charging Station	Concept	TBD		No		ESMP	Install a new 115/34.5 kV BAAH substation with 115/34.5 kV, 33/44/55 MVA transformers, 115 kV inline circuit breaker, and four 34.5 kV feeders.
ESMP	New England Power	2034		New Substation Near Greendale	Concept	TBD		No		ESMP	Build a new 115 to 13.8 kV substation in the northern part of Worcester with two 55 MVA transformers and eight distribution feeders to support distribution load primarily to the south of the Company's existing Greendale substation.
ESMP	New England Power	2034		Grafton Street Rebuild	Concept	TBD		No		ESMP	The Grafton St substation will be rebuilt and supplied by a new 115 kV transmission lines and two 55 MVA transformers installed, with eight distribution feeders to support distribution load
ESMP	New England Power	2033		Groton Street Rebuild	Concept	TBD		No		ESMP	The existing Groton St Substation will be upgraded to 69kV and will be upgraded to include two 40 MVA transformers, with six distribution feeders
ESMP	New England Power	2032		West Amesbury Second Transformer	Concept	TBD		No		ESMP	Add a second 115/13.2 kV 55MVA transformer to the existing West Amesbury substation with four new distribution feeders.
ESMP	New England Power	2034		South Billerica 18 Rebuild	Concept	TBD		No		ESMP	Rebuild to 115kV with two 33/44/55 MVA – 115/13.8 kV LTC transformers and metalclad 13.8 kV switchgear. Station will be fed by new 3.74 mile double-circuit 115 kV underground cable system from South Billerica Station to Billerica Station
ESMP	New England Power	2034		Perry Street 3 Expansion	Concept	TBD		No		ESMP	Rebuild Perry Street Substation 115kV Yard with 2 55MVA transformers and expand 13.2 kV yard with eight distribution feeder bays. Install new 3.56 mile single-circuit 115 kV underground cable from transition station to Perry Street

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ESMP	New England Power	2029		Woodchuck Hill Rebuild	Concept	TBD		No		ESMP	The existing Woodchuck Hill 56 substation will be upgraded with two 55 MVA transformers and eight distribution feeders that will primarily supply distribution load in the North Andover Area. A new 115kV transmission tap off of the C155N line will be needed to supply the added transformer.
ESMP	New England Power	2031		New Substation Near Malden	Concept	TBD		No		ESMP	Build a new 115 to 13.8 kV substation near Squire Road in east Malden with two 55 MVA transformers and eight distribution feeders that will primarily supply distribution load in the Malden and relieve loading on the existing Maplewood substation.
ESMP	New England Power	2034		New Substation Near Saugus	Concept	TBD		No		ESMP	Build a new 115 to 13.8 kV substation in Saugus with two 55 MVA transformers and eight distribution feeders that will primarily supply distribution load in the Saugus and Revere areas.
ESMP	New England Power	2034		New Substation Near Grand Army Highway	Concept	TBD		No		ESMP	Build a new 115 to 13.8 kV substation near Grand Army Highway in Fall River with two 55 MVA transformers and eight distribution feeders to support the distribution load center primarily to the northeast of the existing Hathaway Substation.
ESMP	New England Power	2029		Beaver Pond Substation Upgrade	Concept	TBD		No		ESMP	Replace the 24/32/40 MVA transformers with units rated 33/44/55 MVA.
ESMP	New England Power	2034		New North Foxboro Substation	Concept	TBD		No		ESMP	Install MCSPC with eight feeders in BAAH configuration supplied by two new 115-13.8kV 55MVA transformers. Install new 3.1 mile double-circuit 115 kV underground cable system from the North Foxboro Station
ESMP	New England Power	2031		New Substation Near Northbridge and Uxbridge	Concept	TBD		No		ESMP	Build a new 115 to 13.8 kV substation near the Northbridge and Uxbridge border with two 55 MVA transformers will be installed, with eight distribution feeders to support distribution load primarily to the northeast of the Whitins Pond Substation.
ESMP	New England Power	2034		Westborough EV Highway Charging Station	Concept	TBD		No		ESMP	New 115kv to 34.5kv station tapping off 115kV transmission line E157. Loop the 115kV E157 into proposed station near Westboro westbound service plaza.
ESMP	New England Power	2031		New Riverside Substation	Concept	TBD		No		ESMP	Install two (2) 115/13.8kV 33/44/55MVA LTC transformers, one (1) new 13.8kV eight (8) feeder Breaker-and-a-Half (BAAH) Metal-Clad Switchgear Power Center (MCSPC). Install taps off of the T7 and S8 Lines to proposed station.
ESMP	New England Power	2034		Bridgewater EV Highway Charging Station	Concept	TBD		No		ESMP	Add a new greenfield substation for EV charging in Bridgewater MA. Tap E1 Line through proposed station

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Massachusetts											
ESMP	New England Power	2031		Mill St Rebuild	Concept	TBD		No		ESMP	Install two (2) 115/13.8kV 22/44/55MVA LTC transformers, one (1) new 13.8kV eight (8) feeder Breaker-and-a-Half (BAAH) Metal-Clad Switchgear Power Center (MCSPC). Loop the M1 Line through the rebuilt Station.
ESMP	New England Power	2029		Belmont Second Transformer	Concept	TBD		No		ESMP	Add a 33/44/55 MVA - 115/13.8 kV LTC Transformer and a 2nd 13.8 kV Metalclad Switchgear.
ESMP	New England Power	2034		New Substation Near Brockton and West Bridgewater	Concept	TBD		No		ESMP	Build a new 115 to 13.8 kV substation south of the current Belmont Substation near the West Bridgewater and Brockton border with two 55 MVA transformers with eight distribution feeders to support distribution loads primarily located in the southern portion of the Brockton and Easton areas.
ESMP	New England Power	2029		Norwell Substation Upgrades	Concept	TBD		No		ESMP	Replace 1T with a 55MVA transformer and add two new distribution UG feeders.
ESMP	New England Power	2034		New Substation Near South Weymouth	Concept	TBD		No		ESMP	Build a new 115 to 13.8 kV substation south of the current Mid Weymouth substation with two 55MVA transformers and eight distribution feeders to support distribution loads primarily located in the southern Weymouth area.
ESMP	New England Power	2032		Little Rest Road Second Transformer	Concept	TBD		No		ESMP	Add a new 115 to 13.2 kV 55MVA transformer to the Little Rest Rd substation.
ESMP	New England Power	2029		Palmer Second Transformer	Concept	TBD		No		ESMP	Install second 115/13.2kV (55MVA) transformer and three new regulated feeders, total six feeder buildout. Install new distribution control enclosure.
ESMP	New England Power	2029		Thorndike Second Transformer	Concept	TBD		No		ESMP	Add an in-line breaker and install a second 115/13.2 55 MVA transformer. Build out 8 feederd with tie breakers.
ESMP	New England Power	2032		West Hampden Second Transformer	Concept	TBD		No		ESMP	A new 115 to 13.2 kV 55MVA transformer to the West Hampden substation with four distribution feeders to support the distribution loads primarily in the East Longmeadow and Hampden areas.
ESMP	New England Power	2032		Wilbraham Second Transformer	Concept	TBD		No		ESMP	Add a new 69 to 13.2 kV 55MVA transformer to the Wilbraham substation with four distribution feeders to support the distribution loads primarily in the Wilbraham area.
ESMP	New England Power	2034		Lenox Depot Rebuild	Concept	TBD		No		ESMP	Rebuild the Lenox substation to 11kV and install two 55 MVA transformers and eight distribution feeders to support the distribution loads primarily in the Lenox area.

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Massachusetts											
Asset Condition	New England Power	Mar-27		Deerfield 4 Short Term Asset Work	Concept	TBD		No		Asset Condition	Replace assets at Deerfield 4 station to address poor condition and provide improved reliability and mitigate environmental risk
Point of Delivery Request from Customer	New England Power	Mar-25		Prysmian Cust conn at 115kV Bus 1	Concept	TBD		No		Interconnection Request from Customer	Build new 115kV tap from Brayton Point Bus 1 to serve Prysmian's 115kV/13.8kV substation.
Asset Condition	New England Power	Sep-30		Adams Transmsion Substation Removal	Concept	TBD		No		Asset Condition	Remove Old T-Sub assets after substation relocation.
Asset Condition	New England Power	May-28		478-503/478-508 Asset Condition Refurbishment	Concept	TBD		No		Asset Condition	Repair all structure defects. Replace shieldwires with 2 OPGW. Install 795 KCMIL ACSS conductor. Replace all hardware, including insulators. Confirm accuracy of structure numbering and signage, correct if necessary
Asset Condition	New England Power	Dec-29		Replace Ward Hill Assets	Concept	TBD		No		Various Asset Condition issues at Ward Hill Substation. Originally driven by ARP Breaker Replacement program but expanded in scope due to GCB failures not originally covered.	Ward Hill asset replacement - Purchase and install of a new 115 – 13.2kV 33/44/55 MVA transformer. - Addition of Substation Monitoring for all Transmission owned transformers, circuit breakers, batteries, and backup generators - Replacement of 23kV yard assets
Asset Condition	New England Power	Jan-29		Palmer Asset Upgrades	Concept	TBD		No		Asset Condition	Replace the #2, #5, and #6 115kV transformers. Replace five 115kV motorized air-breaks with circuit switchers. Replace twenty-five 115kV, nine 69kV and thirteen 23kV relays. Replace five 23kV circuit breakers. Replace twenty-five 23kV disconnects. Replace three 23kV CTs and three 23kV PTs. Install substation online monitoring.
Asset Condition	New England Power	Aug-28		Replace/Remove Hathaway 63TR Transformer	Concept	TBD		No		The project is an asset condition driven project (transmission and distribution assets). Looking to remove 23/13.8kV yard due to aging and inefficient use of station equipment. Poor physical condition of 23kV control house is a safety concern for workers.	Install a new 115/13.8kV 40MVA transformer including provisions for 3V0 protection, Remove 115/23kV transformer (TR63) and all 115kV associated equipment and bus.

LSP – Massachusetts

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Massachusetts											
DG Group Study	New England Power	2027	DG Group Study	Ware 69/13.2 kV Transformer Replacement and Transformer Addition	Proposed	\$21,797,222		05/31/22		Accommodate Distributed Energy Resources	Add a new 69/13.2 kV, 24/32/40 MVA transformer with associated distribution equipment.
DG Group Study	New England Power	2027	DG Group Study	Lashaway 69 kV Transformer Replacements	Proposed	\$17,775,441		05/31/22		Accommodate Distributed Energy Resources	Replace T2 (69/13.2 kV) with 24/32/40 MVA unit; replace 69 kV transformer airbreak switch with circuit switcher. Replace T1 (69/23 kV) with 69/13.2 kV 24/32/40 MVA unit; replace 69 kV transformer airbreak switch with circuit switch.
DG Group Study	New England Power	2027	DG Group Study	Wendell Depot Transformer Addition and Replacement	Proposed	\$15,214,446		05/31/22		Accommodate Distributed Energy Resources	Replace T1 with 33/44/55 MVA unit as well as add T2 (33/44/55 MVA unit) and associated distribution equipment
DG Group Study	New England Power	2027	DG Group Study	Barre Transformer Replacements	Proposed	\$13,609,429		05/31/22		Accommodate Distributed Energy Resources	Replace 115 / 13.8 kV transformers T1 and T2 with 33/44/55 MVA units
DG Group Study	New England Power	2027	DG Group Study	Meadow Street 69 kV Breaker and Transformer Addition	Proposed	\$10,074,162		05/31/22		Accommodate Distributed Energy Resources	Add a new 69/13.2 kV, 24/32/40 MVA transformer with associated distribution equipment. Install a new 69 kV circuit breaker at Meadow Street substation
DG Group Study	New England Power	2027	DG Group Study	Royalston Transformer Replacement	Proposed	\$9,788,275		05/31/22		Accommodate Distributed Energy Resources	Replace existing 69/4.16 kV with a 69/13.8 kV transformer (24/32/40 MVA) and replace associated distribution equipment.
DG Group Study	New England Power	2027	DG Group Study	East Winchendon Transformer Replacement	Proposed	\$9,626,762		05/31/22		Accommodate Distributed Energy Resources	Replace T1 (115/13.8 kV) with a 33/44/55 MVA unit
DG Group Study	New England Power	2027	DG Group Study	Shutesbury Transformer Replacement	Proposed	\$4,420,000			TBD	Accommodate Distributed Energy Resources	Replace 6.75MVA Transformer 1 TRF with 40MVA.
DG Group Study	New England Power	2027	DG Group Study	Ware Substation In-Line Breaker	Proposed		\$1,688,000 Reimbursed	06/02/20		Accommodate Distributed Energy Resources	Install a new 69kV in line breaker on the O-15N. (Associated with Ware transformer LSP project)
DG Group Study	New England Power	2027	DG Group Study	Leicester Substation Retirement	Proposed	\$1,004,616		05/31/22		Accommodate Distributed Energy Resources	Retire Leicester substation after installation of Stafford St substation. Remove 69 kV taps from Lines E-5E / F-6E to station. Remove 69 / 13.8 kV transformers.

LSP – Massachusetts

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Massachusetts											
Asset Condition	New England Power	Nov-30		T20 Asset Condition Refurbishment	Proposed	\$66,670,000		No		Asset Condition	Rebuild T2 line to 115kV standard with steel structures and OPGW.
Asset Condition	New England Power	Jul-27		Replace Ayer Substation Asset Replacement	Proposed	\$50,810,000	-	No		Asset condition issues with majority of assets in the control house with limited space.	Replace 115kV and 69kV assets, add substation monitoring for transmission and distribution equipment, make substation BPS & OPGW ready, Build a new control house.
Asset Condition	New England Power	May-27		Salem Harbor - 115kV - 23kV Rebuild	Proposed	\$46,197,000		No	-	Asset Condition replacement at Salem Harbor substation based on testing and trouble history	Replace nine single-phase GSU transformers with two new three-phase 45/60/75 MVA 115-23 kV transformers. Replace the existing 23 kV modular station with a new breaker-and-a-half design and metalclad switchgear building. Online monitoring will be installed on the new transformers and the existing 115kV breakers. Alternative 1: Leave as-is – asset condition, reliability, safety and environmental issues. Alternative 2: Replace existing 23 kV assets in place – constructability, clearance, outage and safety concerns. Alternative 3: Replace transformers and build new 23 kV low profile station – space constraint issues, also more expensive.
Asset Condition	New England Power	Sep-28		South Wrentham Asset Replacements	Proposed	\$28,632,515	\$1,038,485	05/06/22		Asset Condition	Replace the #1, #2 and #7 Transformers. Refurbish the 8229 GCB (unless a higher interrupting kA is required). Replace the 129-3 and 182-3 gang operated disconnects. Replace the C-129S, D-182N and C-181N CCVTs. Install a new control enclosure to IEC61850 standards. Install and connect OPGW from the existing fiber on the C181N line. Install substation online monitoring.
Asset Condition	New England Power	Sep-29		Chestnut Hill Asset Condition	Proposed	\$29,370,000		No		The substation built in the 1960's is showing signs of deterioration and approaching the end of its useful life.	Preferred: Installation of a new open-air station with two 69/13.8kV transformers feeding two 13.8kV bays as well as the removal of all existing equipment at the current site Optional: Installation of a new open-air station with three 69kV breakers and two 69/13.8kV transformers feeding two 13.8kV bays as well as the removal of all existing equipment at the current site.
Point of Delivery Request from Customer	New England Power	Apr-28		New Snake Hill #2235 Substation	Proposed	\$28,951,000		No		Services upgrade request from Amazon Charlton	Build a 115/13.2kV substation served by one 33/44/55 MVA transformer tapped from the U-175 line to serve area load via a single feeder.

LSP – Massachusetts

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Massachusetts											
Asset Condition	New England Power	Mar-30		Relocate-Rebuild Adams Substation 23 kV	Proposed	\$25,650,000		No		Three significant equipment failures occurred at the 23 kV yard of the Adams substation, which has resulted in the loss of load.	Moving 23kV/13.8kV assets at Adams substations to a different location outside of floodplain, leave space for future 115kV and 69kV assets.
Asset Condition	New England Power	Jun-25		Upgrade Revere Substation 55 MVA 115/23 kV Transformers	Proposed	\$23,863,000		No		The 115/23 kV transformers need replacement due to asset conditions.	Upgrade of the Revere 7 T3 and T4 115-23 kV transformers to 55MVA.
Asset Condition	Massachusetts Electric Company	Nov-27		U-173 & W-123 Asset Condition Refurbishment	Proposed	\$22,800,000		NR		Asset Condition	Replace all wood pole structures with steel pole structures. Install (1) OPGW on the U173 from Carpenter Hill to Snow Street including a termination at Millennium
Asset Condition	New England Power	May-28		Water St. Sub #910 (Hanover, MA) Asset Replacements	Proposed	\$19,408,000		No		Asset condition. Water St. 115-13.8kV 33 MVA transformer is leaking and has aged insulation. Repair does not stop it.	Replace 115kV/13.8kV 40MVA transformer with 55MVA, high-side circuit switcher. Replace 115kV line assets and install conductor west location.
Asset Condition	New England Power	Sep-25		Chartley Pond Asset Upgrades	Proposed	\$19,400,000		No		Asset Condition	Install a new 115kV CCVT, wave-trap and OPGW make-ready on the C181 line to support the Directory 1 effort. Temporary relays to be installed in the existing control house to meet NPCC Directory 1 deadline of 9/2025. Replace the existing (C181) oil circuit breaker and disconnects with a new 115kV VCB and disconnects. A new conventional control enclosure will be installed (together with dual high speed protection relays) to support the replacement of the transmission relaying and controls. Replace the 115kV surge arresters on the No. 2 transformer. Replace the existing stand-by generator. Extend the substation yard and security perimeter fence to the East
Load Growth	New England Power	Oct-25		3000 Minuteman Rd project	Proposed	\$15,075,000		No		Customer load growth at the West Andover Substation	Replace existing 30/40/50 MVA, 115/34.5/13.8 kV Delta-Wye-Wye transformers and install two 45/60/75 MVA, 115/34.5/13.8kV Delta-Wye-Wye transformers with LTCs and online monitoring equipment. Replace the existing 115kV circuit switches, 34.5kV airbreak switches and 13.8kV cable riser structures. Replace the existing 115kV circuit brake switches and new 13.8kV cable riser structures. Install one (1) 34.5 kV breaker and a half bay B with one (1) feeder positions.
Asset Condition	New England Power	Jun-26		S19 Asset Condition Refurbishment	Proposed	\$12,980,000		No		Asset Condition	Targeted Refurbishment of S19 line.

LSP – Massachusetts

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Massachusetts											
Load Growth	New England Power	Jul-26		Install Pembroke Substation and Plymouth Street 2nd Transformer	Proposed	\$10,029,000		No		Load growth in the Hanover area around the following 115 kV stations: North Abington, Phillips Lane, Plymouth St, and Water St.	<p>Alternative 1: Install a second 115/13.8 kV transformer at Plymouth St and replace existing 25/33/42 MVA transformer with new 33/44/55 MVA transformer, and construct a new one transformer substation at Pembroke tapping off of 191 115 kV circuit.</p> <p>Alternative 2: Install a second 115/13.8 kV transformer at Phillips Lane, and construct a new one transformer substation at Pembroke tapping off of 191 115 kV circuit.</p> <p>Alternative 3: Install second 115/13.8 kV transformers at both Phillips Lane and Plymouth St.</p>
Asset Condition	New England Power	Aug-25		Maplewood Substation Asset Condition NPCC Directory 1 Phase 5 (ACL 94)	Proposed	\$9,170,000		No	354	Asset condition and upgrade of control house due to space constraints. T4 has oil leaks and frequently overloaded. NPCC Directory Phase 5	Replace #4 transformer with a 55MVA transformer. Upgrade control house to IEC61850 standard with online monitoring and NERC CIP security. Upgrade T3 and T4 relaying with the F-158N NPCC Directory 1 Phase 5 upgrade.
Asset Condition	New England Power	Dec-24		Replace East Methuen Substation Assets	Proposed	\$8,509,000		No		G-133 GCB showing signs of gasket failure and is obsolete. T1 and T2 transformers have asset concerns.	Replace both 115-13.2 kV 40 MVA transformers with two 115-13.2 kV 55 MVA transformers. Replace 115 kV circuit switchers, replace G-133 GCB, Install substation monitoring, and enhanced substation security.
Asset Condition	New England Power	Aug-30		Refurbish H-160/N-166 Lines	Proposed	\$8,288,000		NR		Asset Condition and reliability of shielding, insulators, and OPGW	<p>Refurbishment Project Options</p> <p>Targeted: replace older wood str, all insulators older than 2006 removal of polymer.</p> <p>Larger scope: replace all wood structures to improve shielding angle</p> <p>Possibly display replacements as a table to show more options.</p> <p>OPGW to be included pending investigation for either option</p> <p>Full rebuild to investigate going to 10 bell insulation for entire circuit on both sides. If going to toughened glass then worth it to not leave porcelain in the air and might eliminate lowest option.</p>
Load Growth	New England Power	Mar-28	Attleboro Area Capacity Upgrades	Replace Mink Street T1 & T2 Transformers	Proposed	\$7,867,000		No		Addresses the existing summer normal and emergency loading problems of T2 transformer & summer emergency loading problems of T1 transformer at Mink Street substation.	Replace the Mink St. #7 T1 and T2 transformers with 24/32/40 MVA, 115/13.2 kV units.

LSP – Massachusetts

(Fonts in *Red* are new or updates)

Primary Driver	Asset Owner by Company	2023 Projected In Service Date	Major Project	Project	Status Update for 2023	Estimated non-PTF Project Cost for 2023	Estimated Localized PTF Project Cost for 2023	PPA Approval	RSP ID/Asset List ID	Needs Assessment	Solutions
Massachusetts											
Asset Condition	New England Power	Feb-27		Dunstable Asset Replacement	Proposed	\$6,835,000		No		Asset Condition	Rebuild substation in existing footprint with a new control house built in an expanded substation footprint.
Asset Condition	New England Power	Nov-25		Refurbish Q-169 and A-179 Line	Proposed	\$750,000		NR		Structure clearance and asset condition at Saugus River in Revere, MA.	Refurbishment of A-179 and Q-169 lines and replace shieldwire with OPGW.
Asset Condition		Jul-28		Tewksbury 22 Asset Upgrades	Proposed	\$450,000		No		Asset Condition	Asset replacement for end of life equipment in 230kV, 115kV, and 13.8kV assets. Install OPGW on the M-139, N-140, and J-162 115kV lines to support NPCC Directory 1 relay projects. Install online monitoring for transmission assets.
Asset Condition	New England Power	Dec-24		Remove Distribution Load from Tertiary Windings of Sandy Pond Substation Transformer and Install 115/23 kV Transformer	Planned	\$9,105,000		11/09/16		Reliability concern (transformer failure because of a 23 kV circuit fault) of serving 23 kV off of 345/115/23 kV transformer tertiary	Install a 115/23 kV transformer at Sandy Pond and transfer the 23 kV circuit from the tertiary of T2 (345/115/23 kV) to the new transformer. Add a 115 kV breaker in a spare 115 kV bay at Sandy Pond to feed the new transformer and one 23 kV bay and feeder position. Alternative 1: Second spare 345/115/23 kV transformer at Sandy Pond - exposure to a failure of T2 from a 23 kV sub-transmission fault. Alternative 2 - Construct a new 115/13.2 kV substation at Turnpike Road, Chelmsford MA - significantly higher cost.
Load Growth	New England Power	Mar-26		Install North Marlboro 2nd 115/13.8 kV Transformer	Planned	\$5,000,000		11/10/20		Driven by local needs to accommodate load growth in the Marlboro area.	Tap H-160 and install 2nd 40MVA 115/13.8kV transformer T2 at N Marlboro #318 Substation

LSP – Massachusetts

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Primary Driver	Asset Owner by Company	2023 Projected In Service Date	Major Project	Project	Status Update for 2023	Estimated non-PTF Project Cost for 2023	Estimated Localized PTF Project Cost for 2023	PPA Approval	RSP ID/Asset List ID	Needs Assessment	Solutions
Massachusetts											
Asset Condition	New England Power	Mar-24		Replace 517-532N&517-533N Underground Cable	Under Construction	\$92,696,000		1/19/22		Asset condition issues and reliability concerns due to a leak. The type of cable is obsolete. Cables have had multiple leaks as a result of corrosion and mechanical fatigue and need to be replaced.	Replace and relocate 517-532N and 517-533N circuits (3.3 miles of direct buried cables in Quincy, MA) with solid dielectric cables in a duct bank and manhole system. Install new solid dielectric cable in the existing route with capacity for North Quincy and Field St.
Asset Condition	New England Power	Mar-25		Replace N-192 Underground Cable	Under Construction	\$67,211,000		03/24/20		The N-192 is a 3.6 mile underground cable with a 0.5 mile submarine section installed in 1970. The N-192 has reached its end of life based on a condition assessment performed which highlights increased oil leaks and outage durations.	A project has been initiated to replace and relocate the 115 kV underground cable system. The cable system will be replaced with a solid dielectric cable system (which does not contain any fluid and require less maintenance) between the North River Terminal and the East Beverly substation.
Asset Condition	New England Power	Dec-23		East Tewksbury Transformer Upgrades	Under Construction	\$19,188,000		03/05/20		Asset Condition	Replace the existing transformers. Install concrete basin type oil containment. Install substation monitoring. Make the substation fiber ready.
Load Growth	New England Power	Nov-23	Attleboro Area Capacity Upgrades	Build Reynolds Avenue Substation	Under Construction	\$19,207,000		07/09/19		Addresses several thermal loading and asset conditions issues identified in the following areas: Chartley Pond (115/23 kV transformer and 13 kV feeders), Norton, Read St., Mink St. (13 kV feeders), S. Attleboro (23/4 kV transformer), and Clara St. (23/4 kV transformer)	Tap the C-181S and D-182S transmission lines, adding load breaks, raising structures, to install a new 115/13.2 kV substation off of Reynolds Ave in Rehoboth, with two 33/44/55 MVA transformers.
Asset Condition	New England Power	May-24		Carpenter Hill #435 Control House Rebuild	Under Construction	\$6,371,000		NR	145	Asset condition issues at the Carpenter Hill control house.	Rebuild the control house. Will modernize the facility and incorporate initiatives including Directory 1 - ISO-NE NPCC Directory 1 (Dual High Speed Protection) and NERC PRC-002 (Disturbance Monitoring and Reporting). The existing control house will be removed. Alternative: Expand the existing control house - higher cost driven by complexities associated with working on/in close proximity to the existing (in-service) control building.

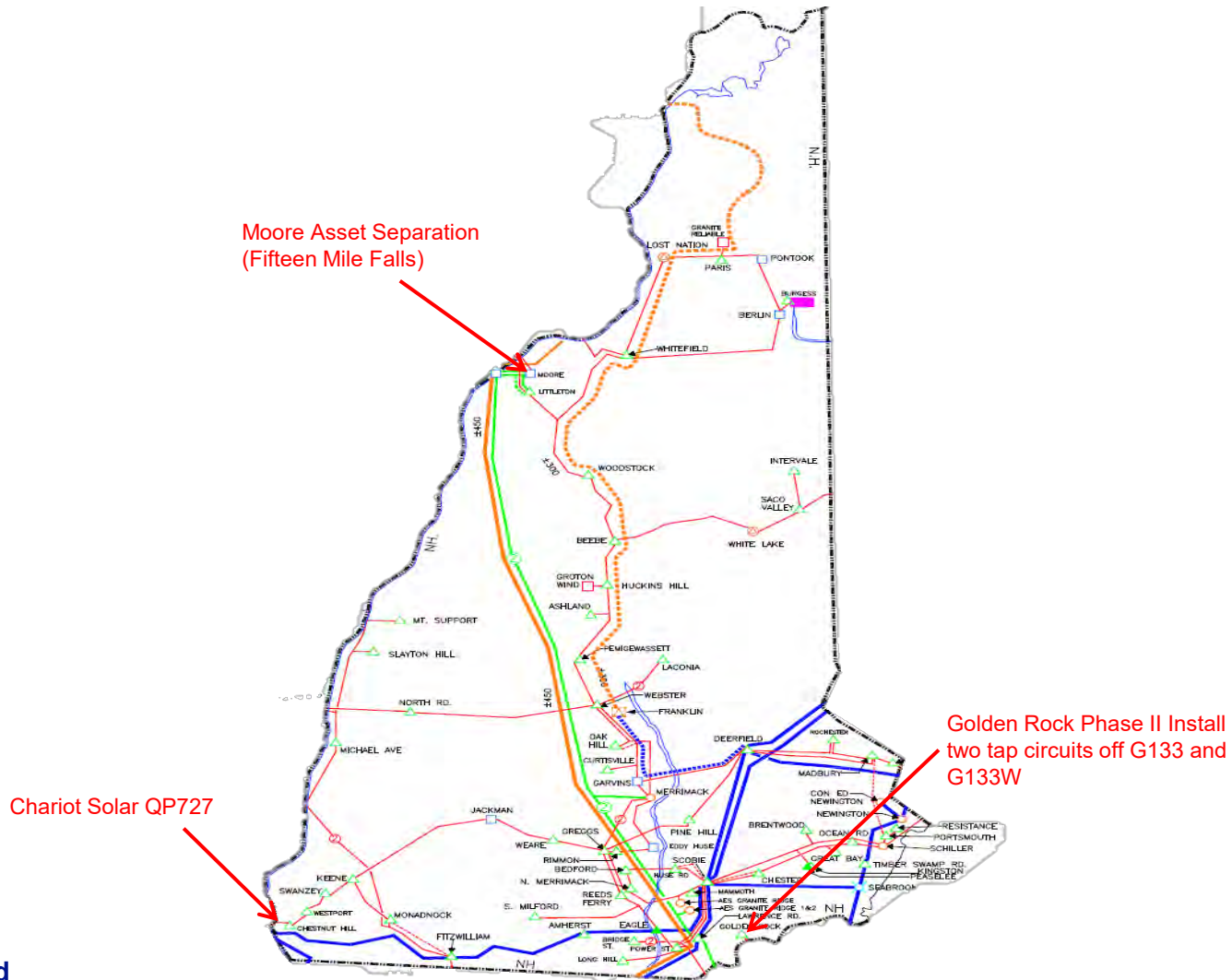
LSP – Massachusetts

(Fonts in *Red* are new or updates)

Primary Driver	Asset Owner by Company	2023 Projected In Service Date	Major Project	Project	Status Update for 2023	Estimated non-PTF Project Cost for 2023	Estimated Localized PTF Project Cost for 2023	PPA Approval	RSP ID/Asset List ID	Needs Assessment	Solutions
Massachusetts											
Asset Condition	New England Power	Aug-25		Construct New Stafford St Substation	Under Construction	\$830,000		06/02/20	333	Asset Condition	Construct New 115kV /13.8kV Stafford St Substation with NPCC Directory 1 dual pilot protection.

New Hampshire Local Projects

(Planned, Under Construction, and In Service)



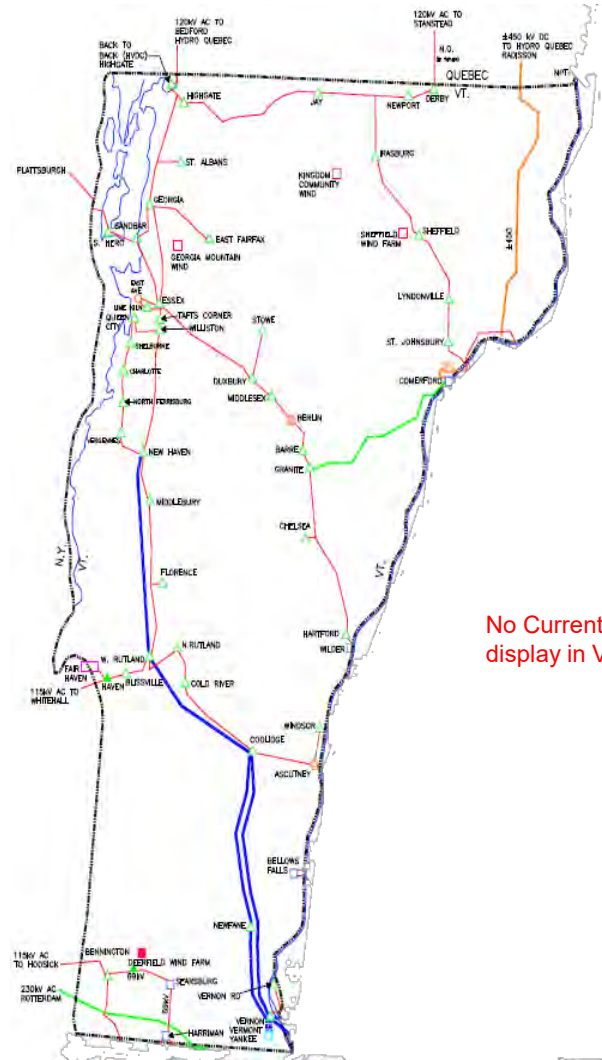
LSP – New Hampshire

(Fonts in Red are new or updates)

Primary Driver	Asset Owner by Company	2023 Projected In Service Date	Major Project	Project	Status Update for 2023	Estimated non-PTF Project Cost for 2023	Estimated Localized PTF Project Cost for 2023	PPA Approval	RSP ID/Asset List ID	Needs Assessment	Solutions
New Hampshire											
Asset Condition	New England Power	Oct-26		3386 ACR	Proposed	\$6,250,000		No		Line 3386 has asset condition issues and was built in the 1940's.	Replace 15 wood structures with steel structures. Replace mainline and DC tap of shieldwire with OPGW and reconductor (.4 miles).
Asset Condition	New England Power	May-28		Separate Moore #20 Assets Moore Asset Separation (Fifteen Mile Falls)	Planned	\$14,300,000		12/14/22	308	Asset Separation from Great River Hydro due to shared control house being at max capacity.	Rebuild Moore No.20 substation on land purchased from Great River Hydro. Building a new Fifteen Mile Falls substation and decommissioning the existing Moore No. 20 assets, separating assets from Great River Hydro. New control house and substation monitoring.
Point of Delivery Request from Customer	New England Power	Mar-26		Chariot Solar QP727	Planned	\$4,598,000		08/26/19	1812	Generator interconnection (QP 727)	Install new ring bus substation on the N-186 line to Vernon Rd
Point of Delivery Request from Customer	New England Power	Dec-23		Golden Rock Phase II - Addition of two 115 kV tap circuits off G-133 and G-133W circuits	Under Construction	\$4,579,000		12/20/19		This is Phase II of the Golden Rock project to address Liberty Utilities' load growth needs.	Install a new double ended 115/13.2kV substation. The station will be tapped off the G-133W and G-133 circuits after Phase I splits the existing G-133W circuit into two 115 kV lines. This project constructs two new 115 kV tap circuits off the G-133W and G-133 circuits from the Golden Rock substation to the NG/LU border in Salem, NH. National Grid work complete but not in service pending remaining Liberty Utilities distribution work with November 2022 In-Service date.

Vermont Local Projects

(Planned, Under Construction, and In Service)



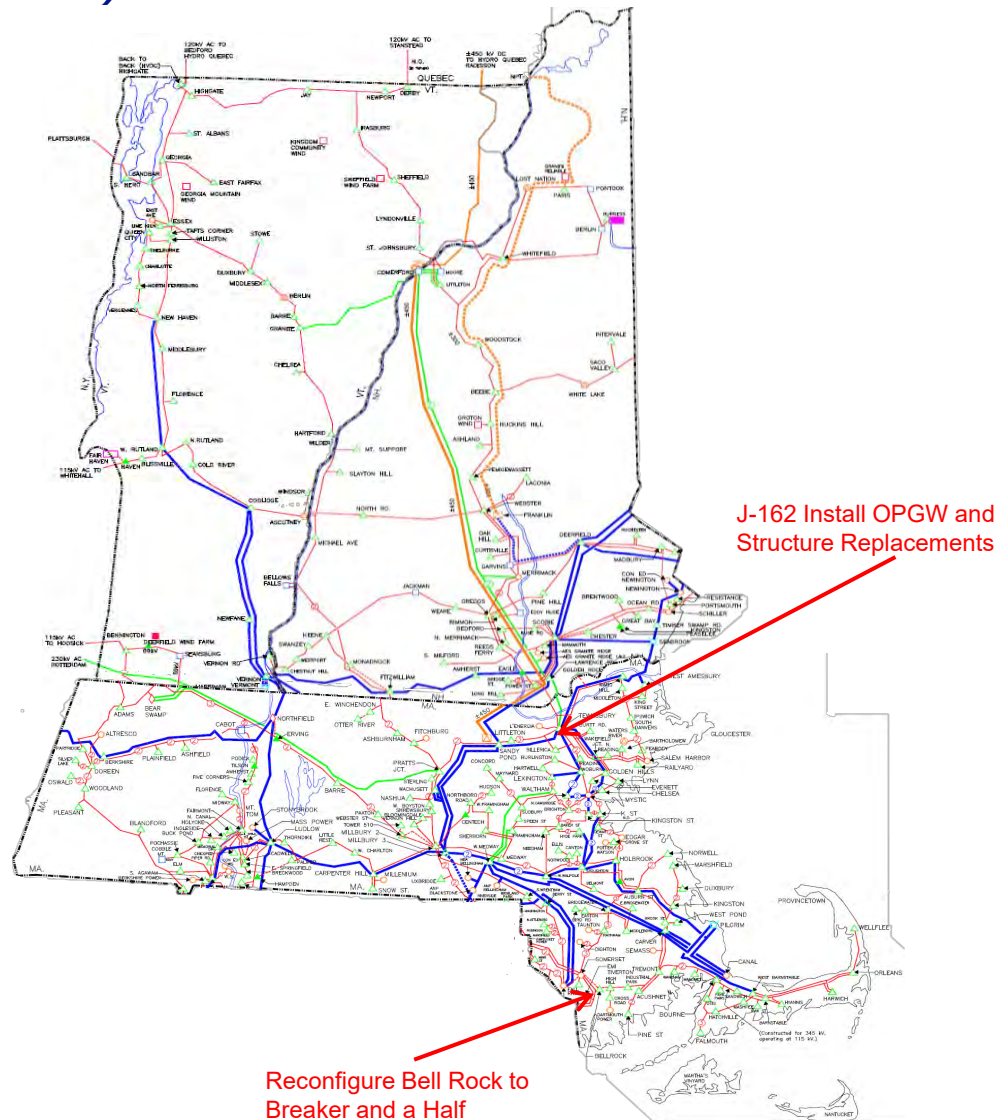
No Current Planned, Under Construction, or In Service work to display in VT

LSP – Vermont

(Fonts in Red are new or updates)

Primary Driver	Asset Owner by Company	2023 Projected In Service Date	Major Project	Project	Status Update for 2023	Estimated non-PTF Project Cost for 2023	Estimated Localized PTF Project Cost for 2023	PPA Approval	RSP ID/Asset List ID	Needs Assessment	Solutions
Vermont											
Asset Condition	New England Power	Oct-28		Separate Wilder Assets Wilder Asset Separation	Proposed	\$41,970,000		No		Asset separation from Great River Hydro at Wilder Substation, VT due to shared control house being at max capacity.	Rebuild 13.8kV and 46kV yard equipment and control house at a new location. Transfer ownership of the T3 and associated equipment to GRH.
Asset Condition	New England Power	May-27		Vernon Asset Separation (Huntington Substation) Rebuild Vernon Station 13	Proposed	\$9,747,600		07/20/22	235	Asset Separation	Building a new Huntington substation and decommissioning the existing NEP Vernon assets, separating assets from GRH. Replace assets at Vernon Station 13 – This will include in-line disconnects – recent failures – other asset replacements will be determined.

Local System Plan Projects Removed from List (Cancelled and In Service)



LSP – Removed From List

(Fonts in *Red* are new or updates)

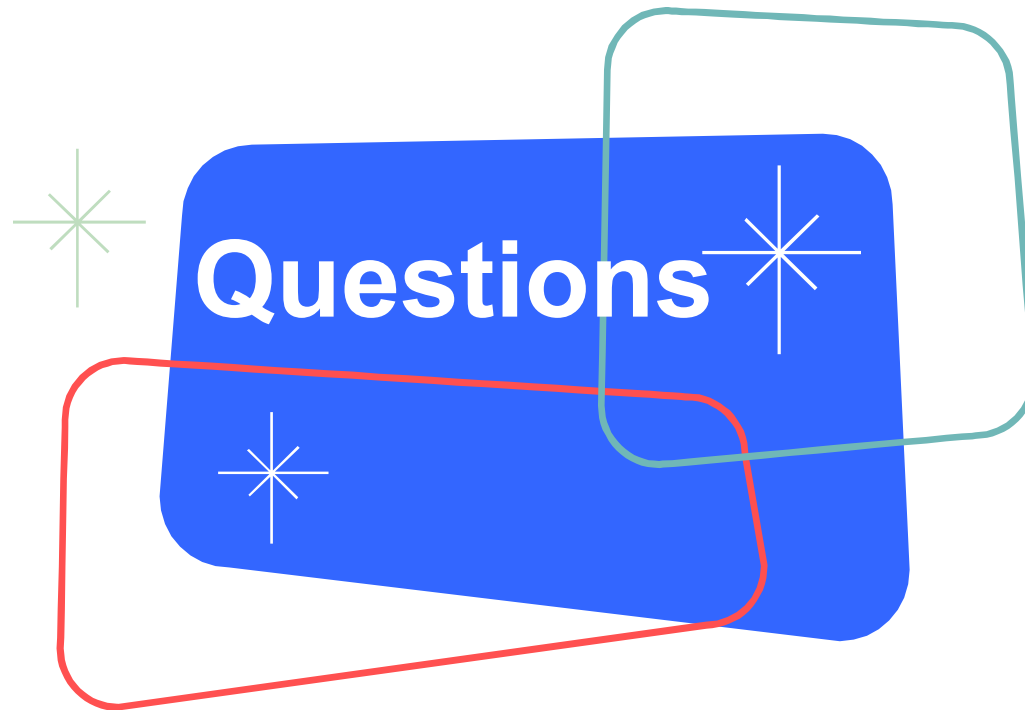
Primary Driver	Asset Owner by Company	2023 Projected In Service Date	Major Project	Project	Status Update for 2023	Estimated non-PTF Project Cost for 2023	Estimated Localized PTF Project Cost for 2023	PPA Approval	RSP ID/Asset List ID	Needs Assessment	Solutions
Removed From LSP											
Area Reliability Assessment	New England Power	Jun-23	NPCC Directory #1 Protection Modifications	NPCC Directory #1 Protection Modifications - Phase 3 (ACL 96) J-162 Pilot Scheme	In Service	\$13,235,000		NR	96	NPCC Pilot Scheme	Install OPGW and replace structures on J-162 line from Tewksbury to Perry Street and tap to L'Energia Project
Area Reliability Assessment	New England Power	Aug-23	Southeast Massachusetts/Rhode Island Reliability Project	Reconfigure Bell Rock to breaker and a half station, split M13 line at Bell Rock and terminate 114 line at Bell Rock. Install new breaker in series with N12/D21 tie breaker, upgrade D21 line switch and install 37.5 MVAR capacitor.	In Service	\$230,000		04/30/18	1721 1722	Southeast Massachusetts/Rhode Island Reliability Project	Connect the existing two load serving transformers at Bell Rock to the new bay position.

LSP Public Policy

- A notice was posted on September 9, 2023 to the PAC website for input regarding state and federal Public Policy Requirements identified as driving needs on non-PTF elements and local Transmission facilities by Public Policy Requirements.
- In 2023, National Grid did not receive any input from NESCOE, stakeholders, or any state regarding public policy requirements driving a Transmission need on the non-PTF elements.
- In 2023, NESCOE communicated to ISO-NE that there were no state or federal Public Policy Requirements “driving transmission needs relating to the New England Transmission System”
- In 2023, ISO-NE communicated that it was not aware of any local Public Policy Requirements.
- Thus, National Grid determined there were no Public Policy Requirements identified in the ISO-NE PPTU that are driving needs on National Grid’s Non-PTF system.

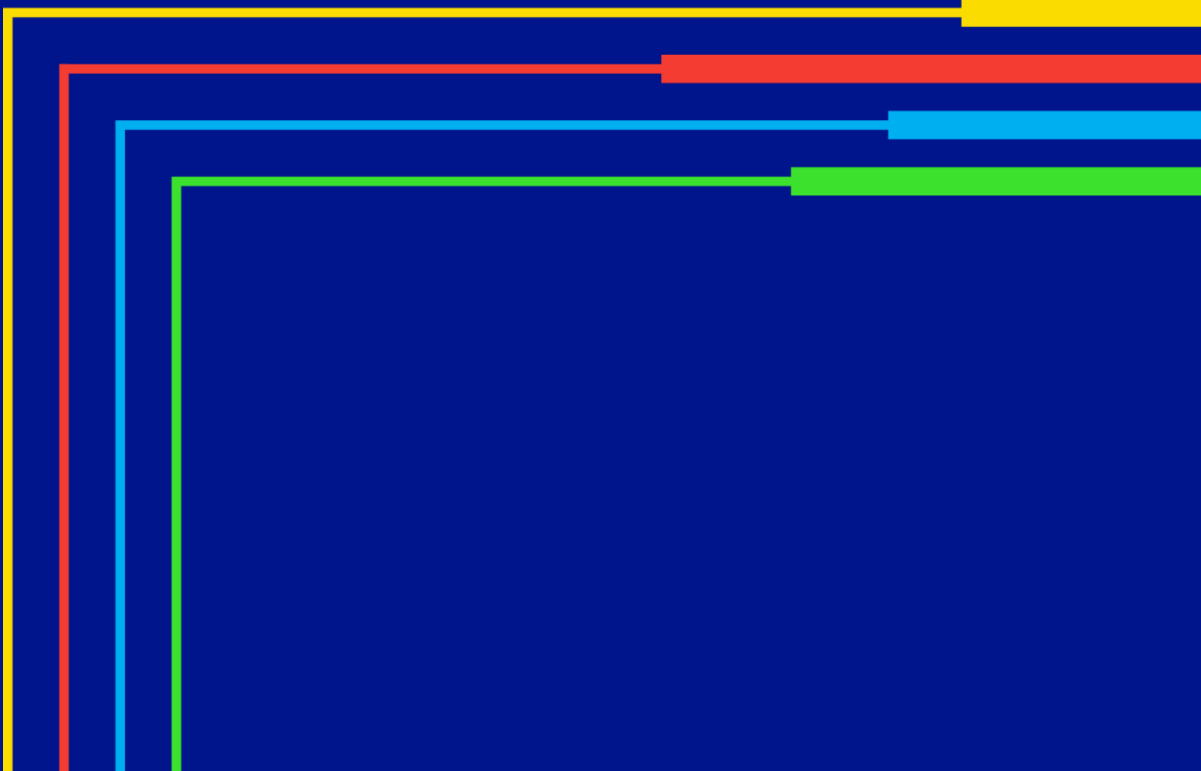
Questions

PAC, Transmission Customers, and other Stakeholders have 30 days to provide any written comments for consideration by National Grid.



Appendix

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Criteria

All National Grid facilities that are part of the interconnected National Grid system shall be designed in accordance with the National Grid Transmission Planning Guide (TGP28)

The National Grid Transmission Planning Guide is posted on our website under:

https://www9.nationalgridus.com/oasis/filings_studies.asp

“Corporate, [TGP28 Issue 6 Final_050923](#)”

Local System Planning Process

Local studies can result from:

- Load Growth
- Area Reliability Assessment
- Point of Delivery Request from Customer
- Asset Replacement

Local System Planning Process

A Planner:

- summarizes the results from the needs assessment and provides: *criteria, data* and *assumptions used in study*
- builds study cases with proposed alternatives
- determines the most effective solution
- summarizes the results of the solutions study

Data and Assumptions

Resources for studies:

- ISO-NE Library cases for load flow, Stability, and ASPEN short circuit studies
- CELT Report Load forecasts for NE wide loads
- Customer provided forecasted loads for local areas

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