



2027 Long Range Transmission Plan (LRP) Study Scope

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Vermont System Planning Committee
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Outline

- 2027 LRP Study Scope
 - Case Setup & Loads
 - Analysis Scenarios
 - Resource Mix
 - Contingency Requirements
- Next Steps

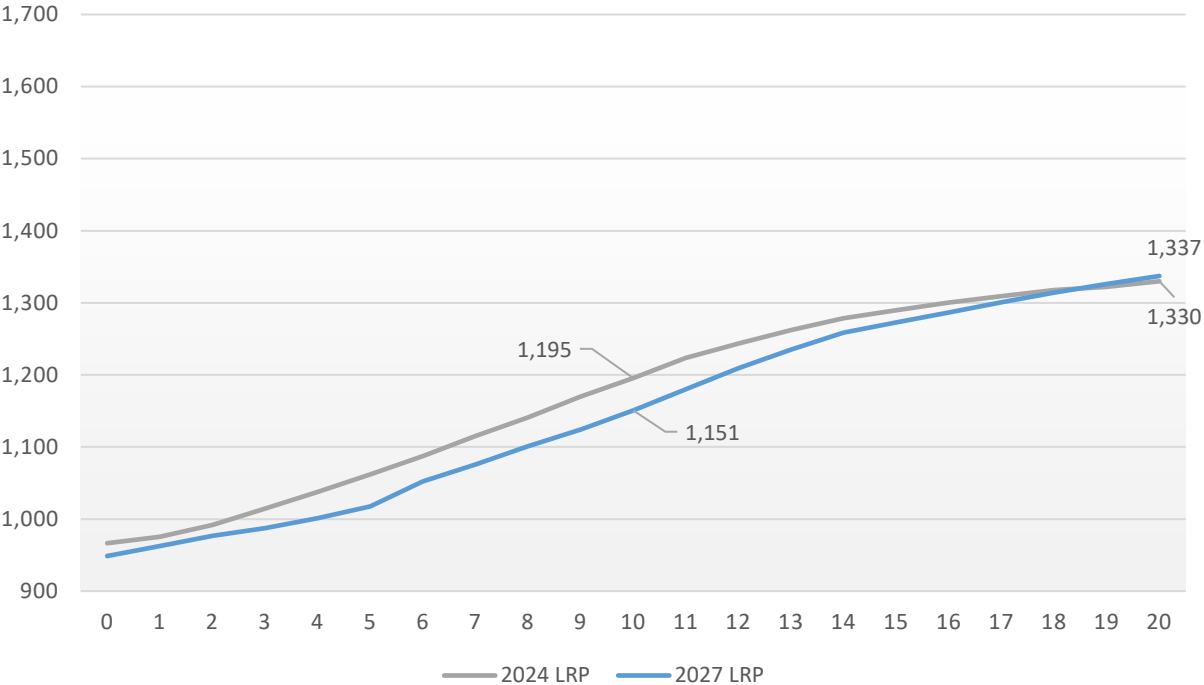


Case Setup

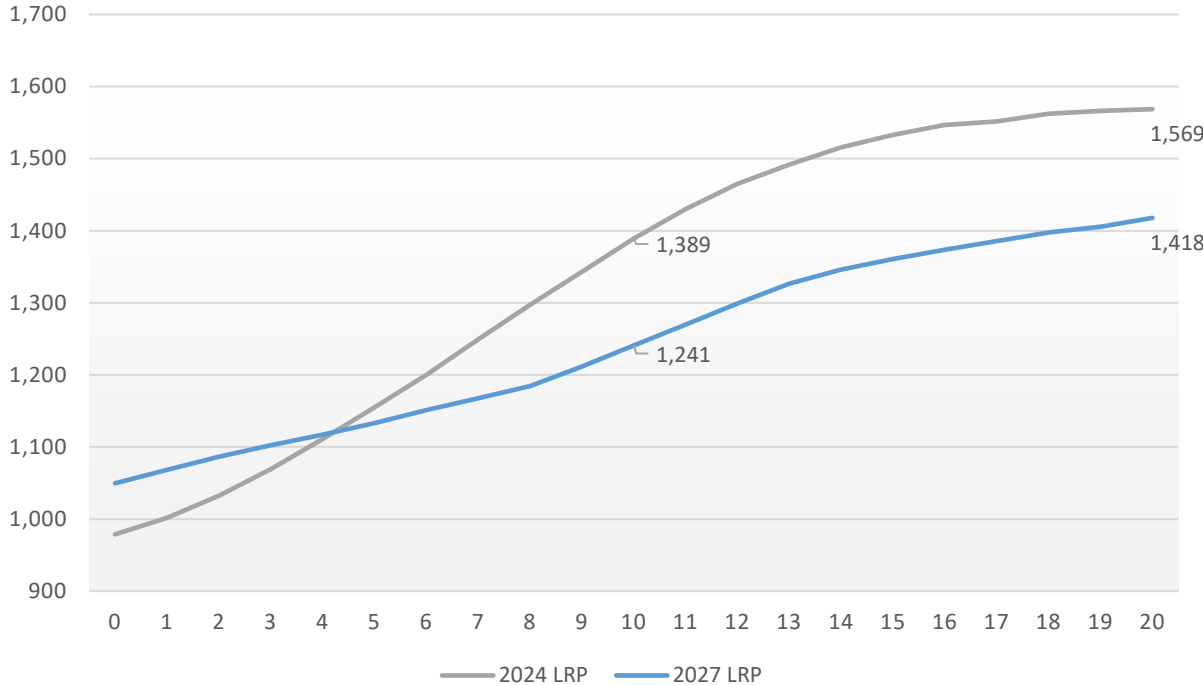
- Study Years
 - 2036 and 2046
 - Summer Peak
 - Winter Peak
 - Daytime Minimum Load – High DER
- System Topology
 - ISO-NE identified upgrades included
 - Projects with a Vermont section 248 approval included*
- Interregional System Transfers
 - NY-NE: 0 MW → PV20 0 MW
 - North-South: Reasonably Stressed
 - West-East: >2000 MW
 - NY-NE: >1000 MW
 - Highgate HVDC: Studied at 0 and 225 MW imports

Case Setup – Peak Loads

Summer Peak - 2024 LRP vs 2027 LRP
20 Year Horizon



Winter Peak - 2024 LRP vs 2027 LRP
20 Year Horizon



DER Assumptions

- DER modeling (DTM – High DER scenario)
 - 600 – 1400 MW, 100 MW increments (20% Tier II, PUC Renewable Energy Standard)
- Remove Solar PV Optimization analysis
 - Discuss the results we have identified from previous iterations of the plan
- Energy Storage
 - Not modeled in base scenarios (reserved for frequency/duration analysis)

Analysis Scenarios

- Reliability analysis utilizing projected load growth for the following scenarios:
 - Peak Loads – Summer, Winter
 - Daytime Minimum Load – High DER
 - Hold Gross load at this scenario constant - ~600 MW VT load
 - Incremental solar PV penetration utilizing today's distribution of DER
 - 600MW – 1400 MW
- Highgate Converter Contribution
 - 0 MW and 225 MW

Scenarios Matrix	Summer Peak	Winter Peak	Daytime Minimum Load
Load Forecast Scenario	Medium	Medium	600 MW Gross Load
Highgate (MW)	0 / 225	0 / 225	0 / 225
PV20 Imports (MW)	0	0	70

- Frequency/Duration Analysis on Constraints

Resource Mix

Resource	Summer Peak	Winter Peak	Daytime Min
Sandbar PST (MW)	0	0	70
Blissville PST (MW)	0	0	0
Highgate HVDC (MW)	0 / 225	0 / 225	0 / 225
Wind	5%	25%	65%
Hydro	10%	50%	90%
Solar	0%	0%	100% ¹
BESS ²	0%	0%	0%
Thermal Gens	80% ³	80% ³	0% ⁴

Notes:

1. Incremental 600 MW – 1400 MW
2. Not modeled (reserved for frequency/duration analysis)
3. Units modeled offline – McNeil, Gorge, Ascutney
4. McNeil and Ryegate biofuels on at 80% of nameplate. All other non-renewable thermals offline.

Contingency Requirements

- NERC - planning standard [TPL-001-5.1](#)
 - Category P0 (No outages – (N-0))
 - Category P1 (Outage of one element such as line, trsf, gen (N-1))
 - Categories P2 to P7 (Outage of two or more elements (N-1))
 - Categories P3/P6 (Two consecutive contingencies (N-1-1))
- ISO-NE - Planning Procedure No.3
- NPCC - Directory 1
- DU line outage (N-1) – Not required for regional planning
 - Entire line, breaker to breaker
 - Line end open
 - Radial lines
 - Pick up radial line, close N.O. switch

NERC = North American Electric Reliability Council

ISO-NE = Independent System Operator of the New England electric system

90/10 = 90% chance that the actual load will be at or lower than the forecast, 10% chance that it will exceed the forecast

Contingency Definitions

General Category	NERC TPL-001 Category*	Event Descriptions
N-0	NERC P0	All Lines in – No event
N-1	NERC P1 NERC P2 NERC P7	Gen, Line, XFMR, Shunt, Single Pole of a DC Line No Fault Sectioning, Bus Fault, Breaker Failure Lines sharing Common Structure**, Bipolar DC line
N-1-1	NERC P3, P6	Loss of a P1 element followed by another P1 element

*Applies to BES facilities

** Excludes circuits that share a common structure for 1 mile or less.

Next Steps

All feedback should be submitted to:
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