

Study Scenarios

Peak Load

- VT Roadmap / Policy forecast scenario
- Continued Growth / Low forecast scenario
- Summer, Winter
- 2033, 2043

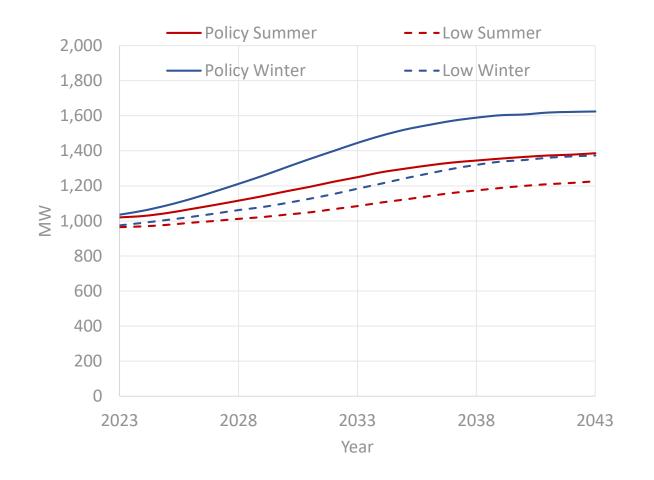
Spring Daytime Load

- Low load
- Solar PV: 500 1300 in 100 MW increments
- Other behind-the-meter generation resources at full capacity



VT Peak Load Forecasts

- VT Roadmap (Policy)
 - Annual sales of HP increase to 18k by 2029
 - Non-fleet EVs grow to 90% of vehicles by 2043
 - Fleet EVs 100% electrification between 2038 and 2045
- Continued Growth (Low)
 - Annual sales of HP remain at 10.5k
 - Non-fleet EVs grow to 60% of vehicles by 2043
 - Fleet EVs constant at 2032 level through 2043



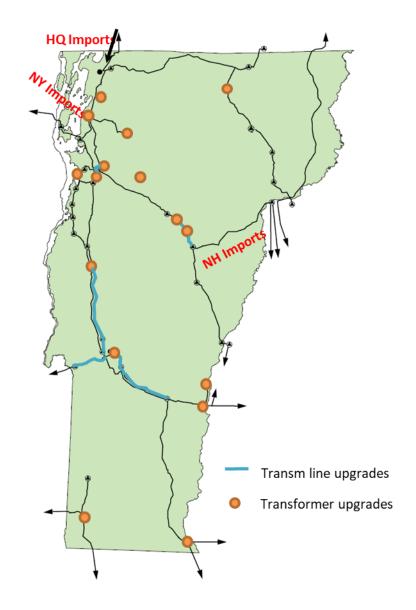


RESULTS VT ROADMAP LOAD GROWTH SCENARIO

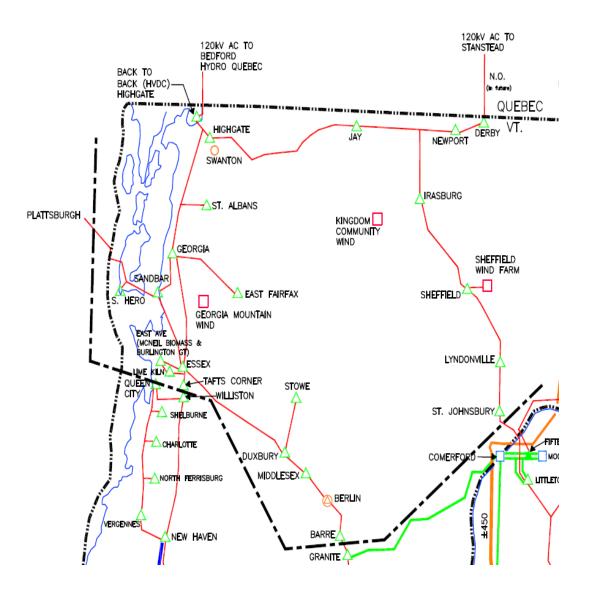


Policy Scenario 2043

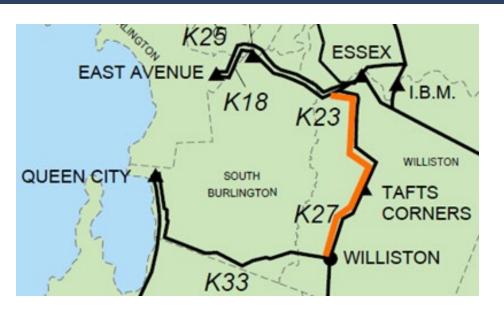
- 75 miles of overloaded transmission lines
- 19 overloaded transformers







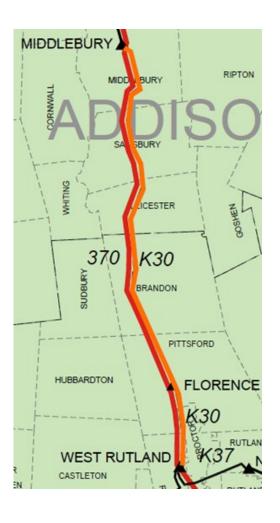
Northern Vermont area of concern



- N-1-1 contingencies causing thermal overloads and voltage collapse exposure
- Affected transformers: Queen City, Tafts Corner, Barre
- New 115 kV line between Essex and Williston
- Timing: 2032 based on winter forecast
- NTA: 75 MW of load reduction in the northern area by 2033. Grows over time.

120kV AC TO 120kV AC TO BEDFORD HYDRO QUEBEC BACK TO BACK (HVDC)-HIGHGATE QUEBEC NEWPORT DERBY VT. HIGHGATE SWANTON IRASBURG ✓ST. ALBANS PLATTSBURGH KINGDOM COMMUNITY GEORGIA SHEFFIELD WIND FARM SANDBAR SHEFFIELD HERO GEORGIA MOUNTAIN EAST AVE (MCNEL BIOMASS & BURLINGTON CT) (ESSEX LYNDONVILLE / LIME KEN TAFTS CORNER QUEEN STOWE ST. JOHNSBURY A SHELBURNE CHARLOTTE DUXBURY MIDDLESEX BERLIN NEW HAVEN MIDDLEBURY CHELSEA FLORENCE N.RUTLAND WILDER

POLICY SCENARIO 2033 Northwest Vermont area of concern

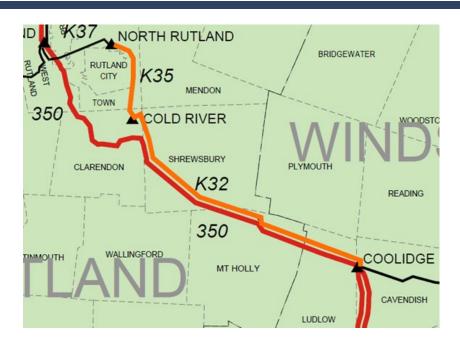


- N-1-1 contingencies causing thermal overload
- Affected transformer:
 Middlebury
- Rebuild West Rutland to Middlebury 115 kV line
- Timing is 2029 based on summer forecast
- NTA: 80 MW of load reduction in northwest area by 2033.
 Grows over time



120kV AC TO BEDFORD HYDRO QUEBEC BACK TO BACK (HVDC)-HIGHGATE QUEBEC HIGHGATE IRASBURG ✓ST. ALBANS PLATTSBURGH KINGDOM COMMUNITY WIND SHEFFIELD WIND FARM 📉 EAST FAIRFAX GEORGIA MOUNTAIN LYNDONVILLE LIVE KILK TAFTS CORNER WILLISTON DUXBURY MIDDLESEX MIDDLEBURY CHELSEA FLORENCE HARTFORD N.RUTLAND ASHL/ MT. SUPPORT COLD RIVE 115kV AC TO WINDSOR NORTH RD. ASCUTNEY BELLOWS FALLS

POLICY SCENARIO 2033 Central Vermont area of concern



- N-1-1 contingencies causing thermal overload
- Affected transformers: North Rutland, Cold River, Windsor
- Rebuild Coolidge Cold River North Rutland 115 kV line
- Timing: 2034 based on summer forecast
- NTA: Keep load below 2033 load level in central area



PLATTSBURGH LYNDONMILLE WILLISTON DUXBURY MIDDLESEX CHELSEA

Southern Vermont area of concern

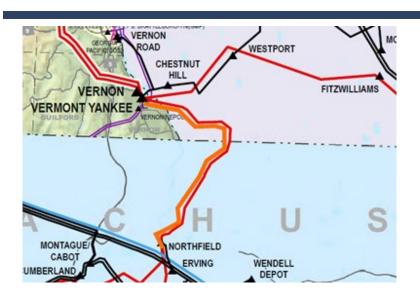


- N-1-1 contingencies causing thermal overload
- Affected transformer: GMP
 Vernon Road 115/46 kV
- Rebuild NGRID Bellows
 Falls-Ascutney Tap 115 kV
 line and GMP Vernon Road
 to Newfane 46 kV
- Timing: 2034 based on summer expected forecast
- NTA: Keep load below 2033 load level in central area



CHELSEA

POLICY SCENARIO 2033 Vermont area of concern



- N-1-1 contingencies causing thermal overload
- Install a new 345 kV line between Vernon and Eversource Northfield, MA
- Timing: 2034 based on summer forecast
- NTA: Keep Vermont load below 2033 load level



Bulk System result summary – Policy Scenario

SUMMARY OF BULK SYSTEM REGIONAL GROUPING & TRANSMISSION SOLUTIONS	TRANSMISSION PROJECT ESTIMATED COST	SCREENED IN OR OUT OF FULL NTA ANALYSIS	LEAD & AFFECTED DISTRIBUTION UTILITIES
Northern area		Screened In	
 N-1-1 contingencies causing overload & voltage collapse exposure Install a new 115 kV line between Essex and Williston 	\$120M	75 MW of load reduction in	Lead: GMP
 Affected transformers: Queen City, Tafts Corner, Barre Need date is 2032 based on winter expected forecast 	Three X \$11M	northern area by 2033 Grows over time	Affected: All VT
Northwest area – includes northern area		Screened In	
 N-1-1 contingencies causing thermal overload Rebuild West Rutland to Middlebury 115 kV line 	\$215M	80 MW of load reduction in northwest area by 2033	Lead: GMP
 Affected transformer: Middlebury Need date is 2029 based on summer expected forecast 	\$13M	Grows over time	Affected: All VT
Central area – includes northwest area		Screened In	
 N-1-1 contingency causing thermal overload Rebuild Coolidge - Cold River - North Rutland 115 kV line Affected transformers: North Rutland, Cold River, Windsor Need date is 2034 based on summer expected forecast 	\$185M Three X \$13M	Keep load below 2033 load level in central area Grows over time	Lead: GMP Affected: All VT
Southern area – includes central area		Screened In	
 N-1-1 contingency causing thermal overload Rebuild NGRID Bellows Falls-Ascutney Tap 115 kV line and GMP Vernon Road to Newfane 46 kV Affected transformer: GMP Vernon Road 115/46 kV Need date is 2034 based on summer expected forecast 	No VELCO estimate	Keep load below 2033 load level in southern area Grows over time	Lead: GMP Affected: All VT, NGRID
State of Vermont		Screened In	Lead: GMP
 N-1-1 contingency causing thermal overload Install new 345 kV line between Vernon & Eversource Northfield, MA Affected transformers: Bennington Need date is 2034 based on summer expected forecast 	\$5M for VELCO portion \$13M	Keep load below 2033 load level in Vermont Grows over time	Affected: All VT. Eversource