

# NTA ANALYSIS

## Reliability Exposure

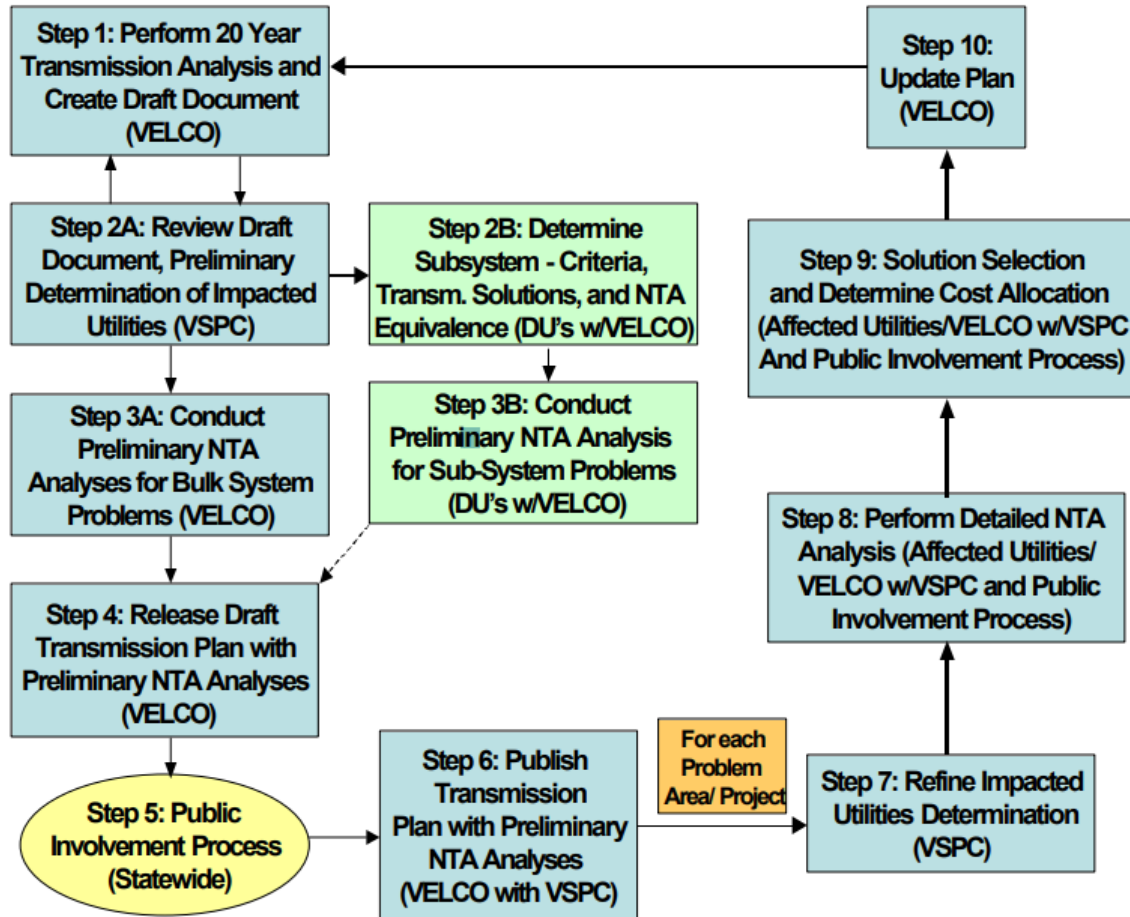
vermont electric power company



VSPC Meeting  
April 2025

# Background

## Transmission Planning Process Including Non-Transmission Alternatives

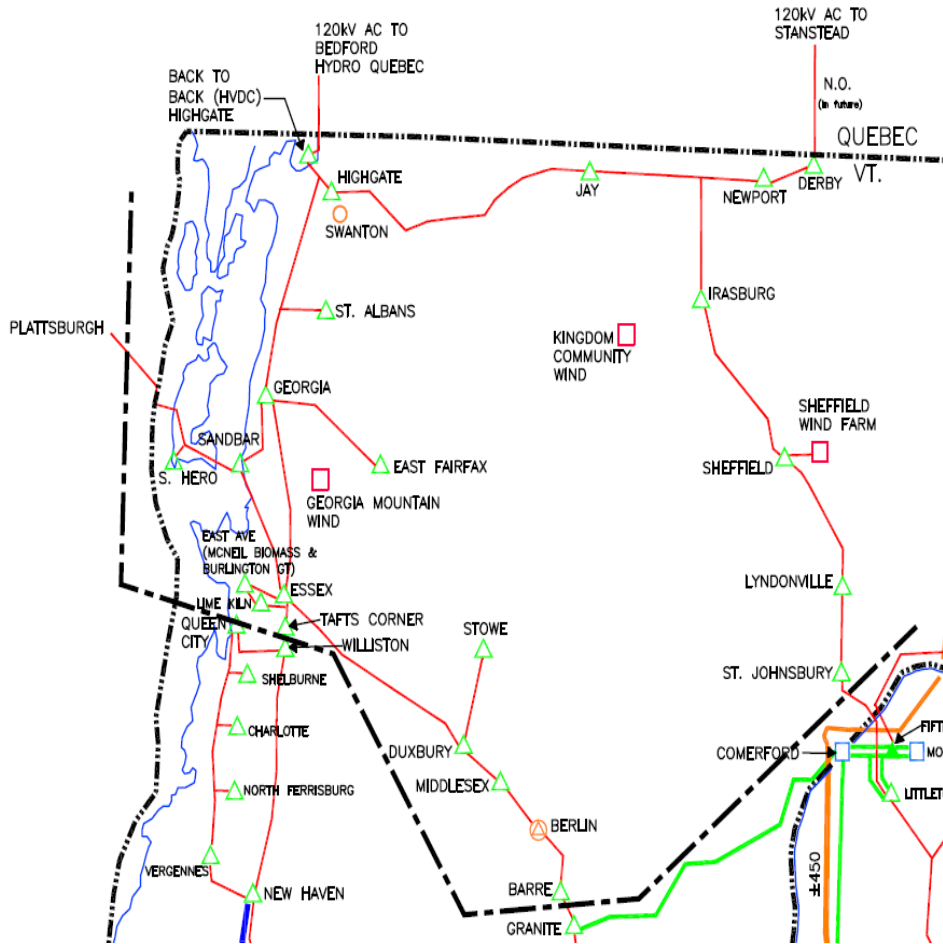


# 2024 LRP Result Summary

SUMMARY OF BULK SYSTEM REGIONAL GROUPING & TRANSMISSION SOLUTIONS	ESTIMATED TRANSMISSION PROJECT COST	LEAD & AFFECTED DISTRIBUTION UTILITIES	SCREENED IN OR OUT OF FULL NTA ANALYSIS
<b>Northern area</b> <ul style="list-style-type: none"> <li>N-1-1 contingencies causing overload &amp; voltage collapse exposure</li> <li>Install a new 115 kV line between Essex and Williston</li> <li>Affected transformers: Queen City, Tafts Corner, Barre</li> <li>Need date is 2032 based on winter expected forecast</li> </ul>	\$120M Three X \$11M	<i>Lead:</i> GMP <i>Affected:</i> All VT	In 75 MW of load reduction in northern area by 2033 Grows over time
<b>Northwest area – includes northern area</b> <ul style="list-style-type: none"> <li>N-1-1 contingencies causing thermal overload</li> <li>Rebuild West Rutland to Middlebury 115 kV line</li> <li>Affected transformer: Middlebury</li> <li>Need date is 2029 based on summer expected forecast</li> </ul>	\$215M \$13M	<i>Lead:</i> GMP <i>Affected:</i> All VT	In 80 MW of load reduction in northwest area by 2033 Grows over time
<b>Central area – includes northwest area</b> <ul style="list-style-type: none"> <li>N-1-1 contingencies causing thermal overload</li> <li>Rebuild Coolidge - Cold River - North Rutland 115 kV line</li> <li>Affected transformers: North Rutland, Cold River, Windsor</li> <li>Need date is 2034 based on summer expected forecast</li> </ul>	\$185M Three X \$13M	<i>Lead:</i> GMP <i>Affected:</i> All VT	In Keep load below 2033 load level in central area Grows over time
<b>Southern area – includes central area</b> <ul style="list-style-type: none"> <li>Rebuild NGRID Bellows Falls-Ascutney Tap 115 kV line and GMP Vernon Road to Newfane 46 kV</li> <li>N-1-1 contingency causing thermal overload</li> <li>Affected transformer: GMP Vernon Road 115/46 kV</li> <li>Need date is 2034 based on summer expected forecast</li> </ul>	No VELCO estimate	<i>Lead:</i> GMP <i>Affected:</i> All VT, NGRID	In Keep load below 2033 load level in southern area Grows over time
<b>State of Vermont</b> <ul style="list-style-type: none"> <li>N-1-1 contingency causing thermal overload</li> <li>Install new 345 kV line between Vernon &amp; Eversource Northfield, MA</li> <li>Affected transformers: Bennington</li> <li>Need date is 2034 based on summer expected forecast</li> </ul>	\$5M for VELCO portion \$13M	<i>Lead:</i> GMP <i>Affected:</i> All VT, Eversource	In Keep load below 2033 load level in Vermont Grows over time

# POLICY SCENARIO 2033

## Northern Vermont area of concern



- \* N-1-1 contingencies causing thermal overload 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 northern area by 2033. Grows over time.

# Step 8: NTA Analysis

- Reliability Exposure:
  - How often will the NTA be needed and for how long
  - Area focused: Northern area, Northwest area
  - Identify the frequency and duration of the issues identified in the LRP
  - Identify the critical load for summer and winter
  - Use sectionalizing of the subtransmission system

# Step 8: NTA Analysis

- Frequency

- How many days of the year will show an overload at the peak hour

Velco Load	Date
1388.95	1/18/33 6:00 PM
1365.73	1/19/33 6:00 PM
1344.83	1/12/33 6:00 PM
1337.73	1/20/33 6:00 PM
1327.33	1/13/33 6:00 PM
1316.82	1/14/33 6:00 PM
1304.44	1/21/33 6:00 PM
1302.55	1/24/33 6:00 PM
1294.45	1/28/33 6:00 PM
1293.33	1/17/33 6:00 PM
1291.74	1/25/33 6:00 PM

- Scale down the load for the target area until finding the critical load
- The worst contingency is simulated and the sub-transmission system sectionalized
- Compare critical load to forecasted load in summer/winter 2033

# Step 8: NTA Analysis

- Duration

Date	Gross_Load
1/18/2033 0:00	462.81
1/18/2033 1:00	444.6
1/18/2033 2:00	430.76
1/18/2033 3:00	424.19
1/18/2033 4:00	429.6
1/18/2033 5:00	444.58
1/18/2033 6:00	470.88
1/18/2033 7:00	500.83
1/18/2033 8:00	520.56
1/18/2033 9:00	534.09
1/18/2033 10:00	530.94
1/18/2033 11:00	522.2
1/18/2033 12:00	510.6
1/18/2033 13:00	497.89
1/18/2033 14:00	483
1/18/2033 15:00	481.57
1/18/2033 16:00	493.34
1/18/2033 17:00	539.5
1/18/2033 18:00	579.68
1/18/2033 19:00	566.56
1/18/2033 20:00	543.73
1/18/2033 21:00	524.1
1/18/2033 22:00	503.22
1/18/2033 23:00	484.31

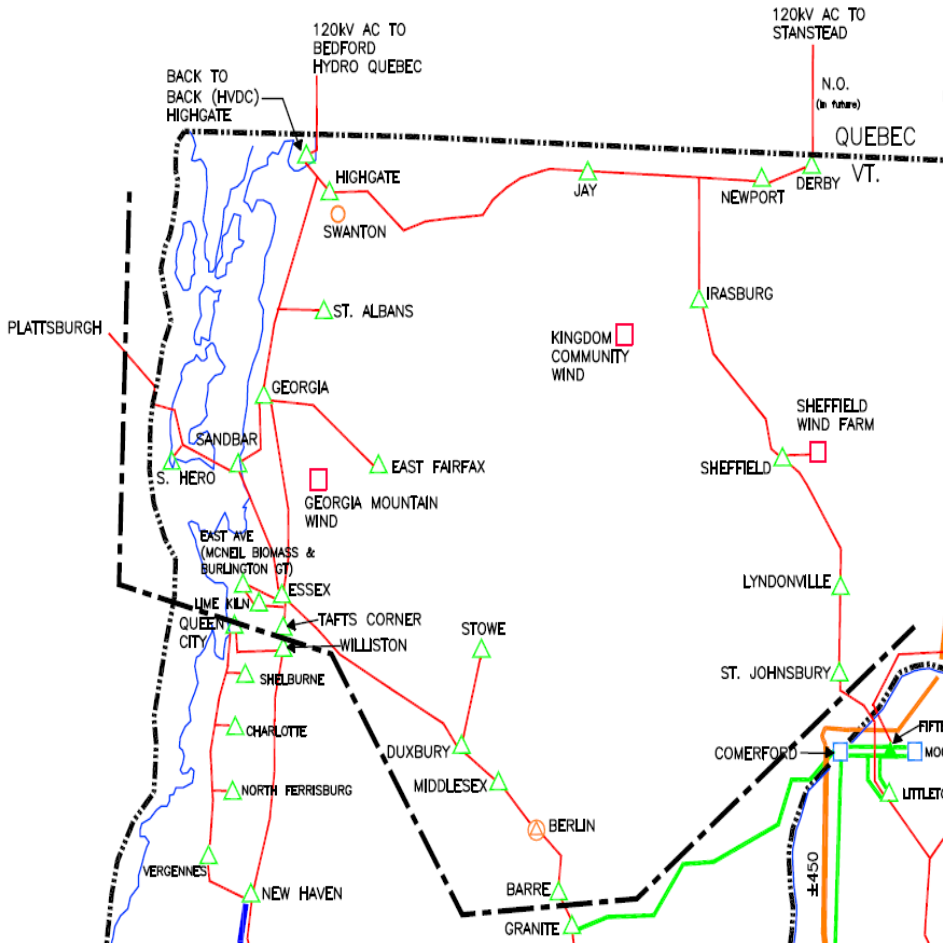
- How many additional hours of the day continue to show the overload
- Scale down the peak load for the target area until finding the critical load
- The worst contingency is simulated and the sub-transmission system sectionalized
- Compare critical load to forecasted load in summer/winter 2033
- Summer load is decreased to account for the DER contribution during daytime

# Northern Vermont Area 2033

## Northern Vermont area of concern

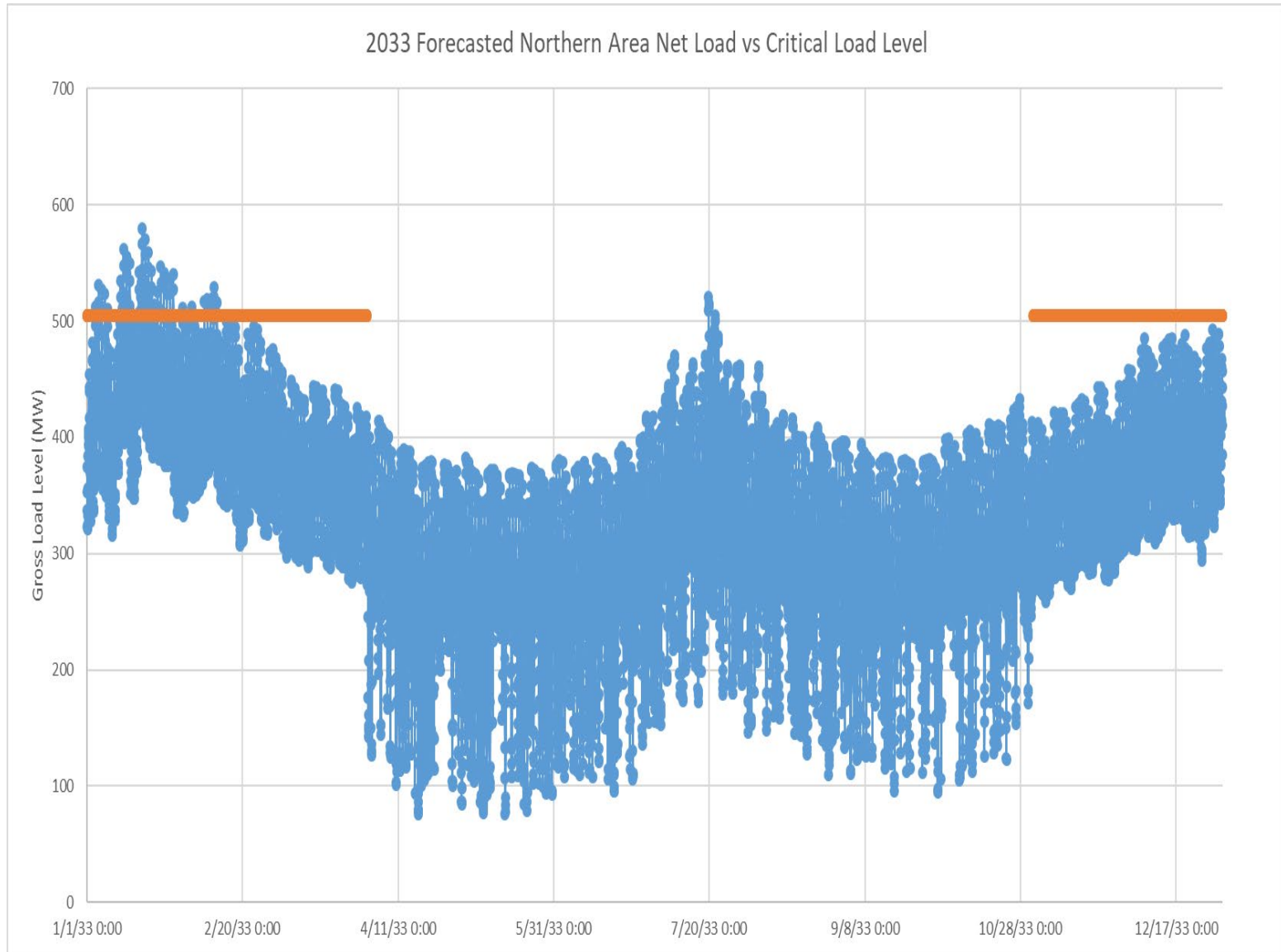
- Winter case

- K54/K27 N-1-1 scenario
- Overload: Queen City T2 115/34.5kV transformer
- Sub-transmission lines opened

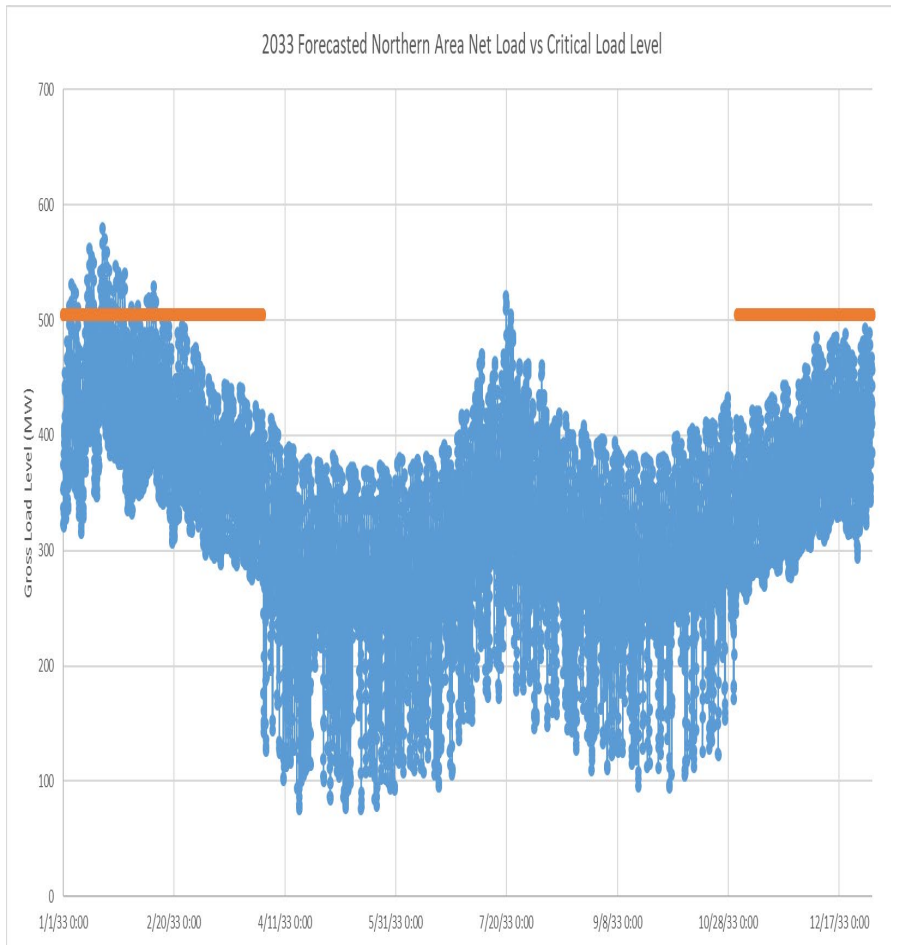




# Northern Vermont Area 2033



# Northern Vermont Reliability Exposure



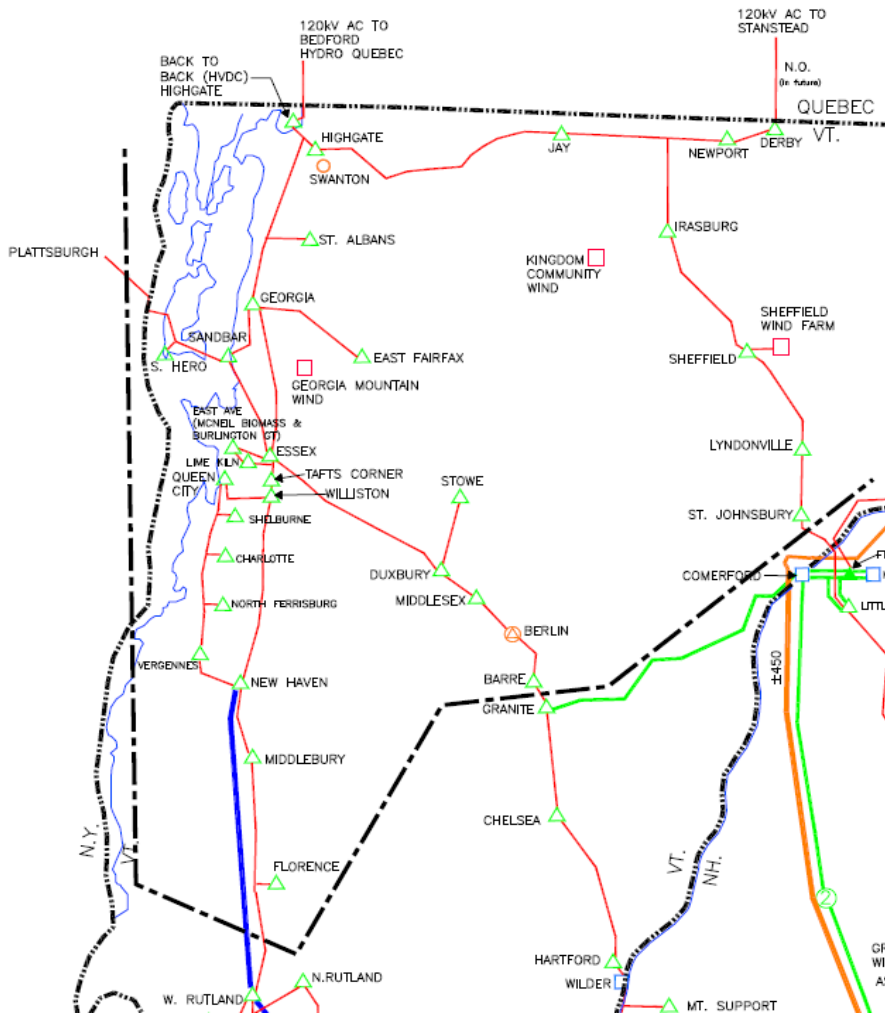
## Northern Vermont area of concern

- Frequency:
  - Load reduction needed 29 days of the year
- Daily Duration:
  - Longest duration: 5h
  - Worst day: load reduction needed twice (2\*5h)
- Total duration: 87h



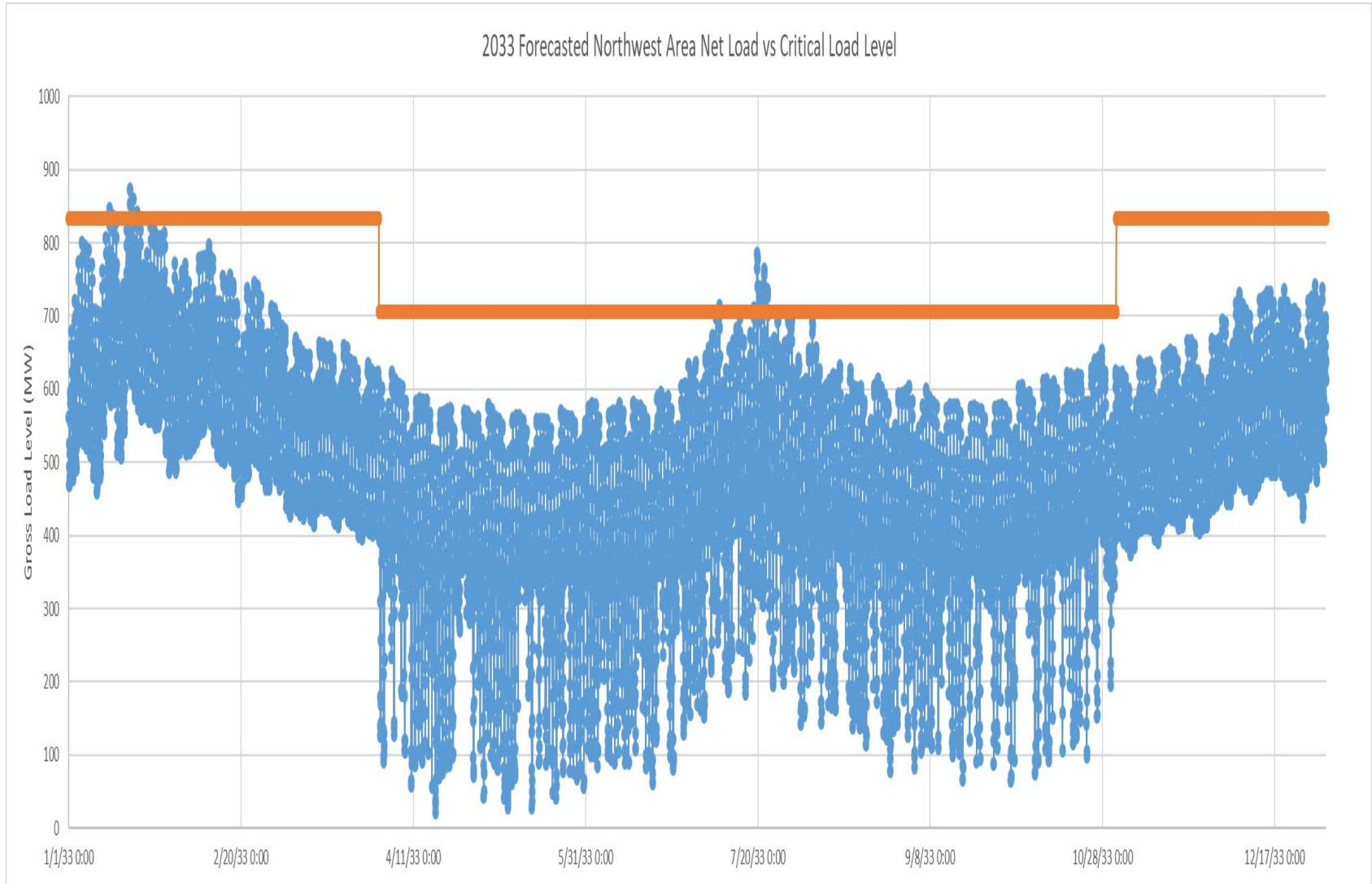
# POLICY SCENARIO 2033

## Northwest Vermont area of concern



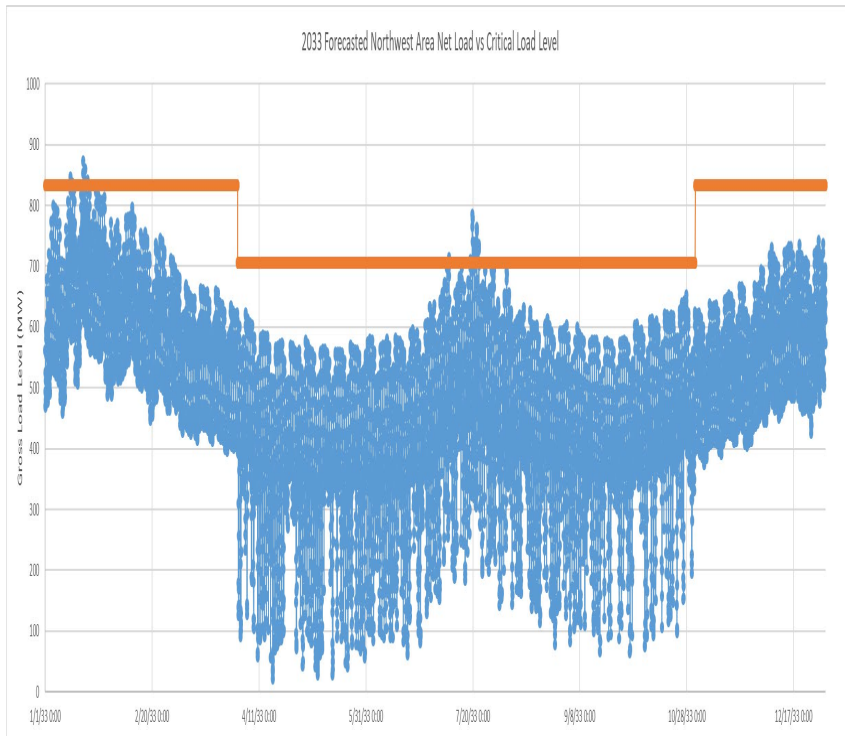
- Summer/Winter case
- K370/K42 N-1-1 scenario
- Overload: K30 West Rutland to Florence to Middlebury 115 kV line
- Subtransmission lines opened

# Northwest Vermont Area 2033



# POLICY SCENARIO 2033

## Northwest Vermont area of concern



### -Frequency:

- Load reduction needed 11 days of the year

### -Daily Duration:

- Longest duration: 5h

- Worst day: load reduction needed once (1\*5h)

- Total duration: 30h