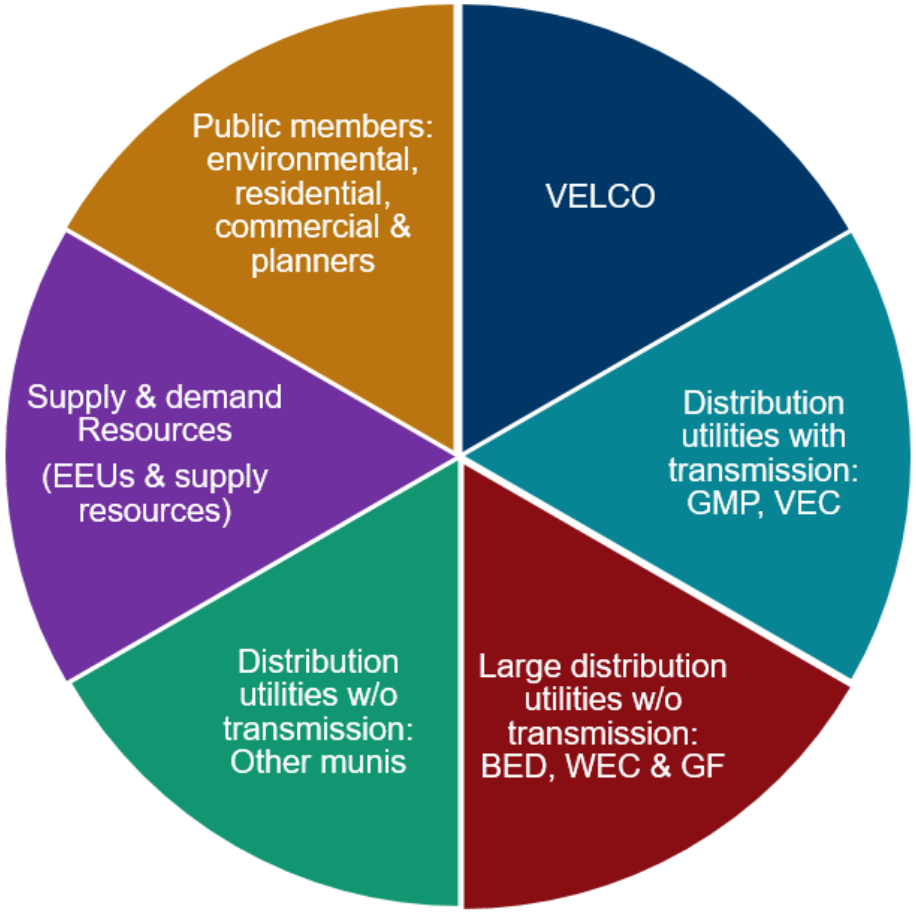
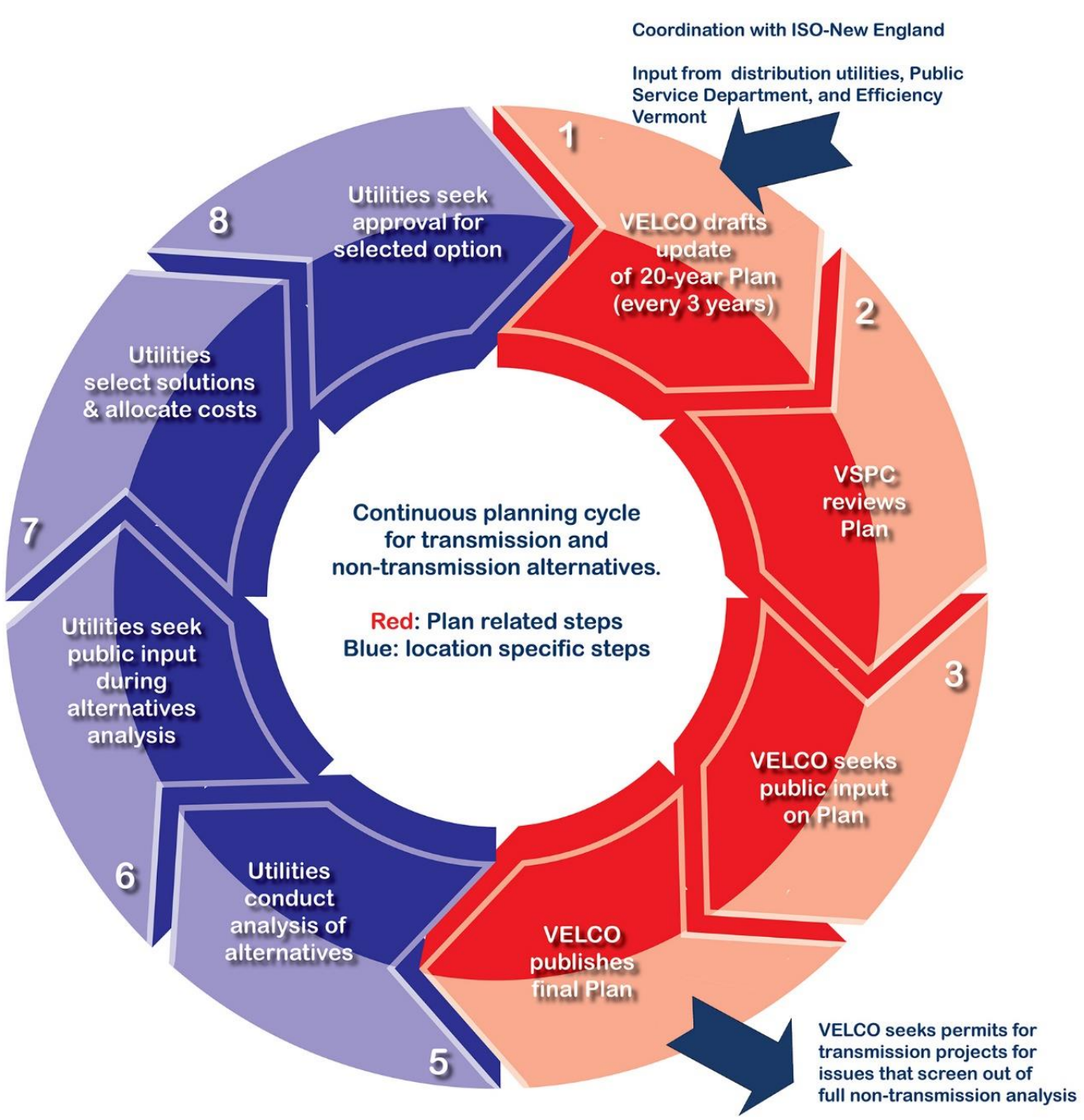
THANK YOU REV2024 SPONSORS!

Vermont System Planning Committee

- **Act 61 of 2005 Legislature (30 V.S.A. § 218c)**
  - Prepare a 10-year transmission plan at least every three years beginning July 1, 2006
  - "Identify potential need for transmission system improvements ***as early as possible, in order to allow sufficient time to plan and implement more cost effective non transmission alternatives*** to meet reliability needs, wherever feasible."
- **Public Utility Commission Docket 7081 established VSPC in 2007**
  - Objective: Full, fair and timely consideration of cost-effective non-transmission alternatives
  - Process binding on all Vermont utilities
  - Requires 20-year long-range transmission plan



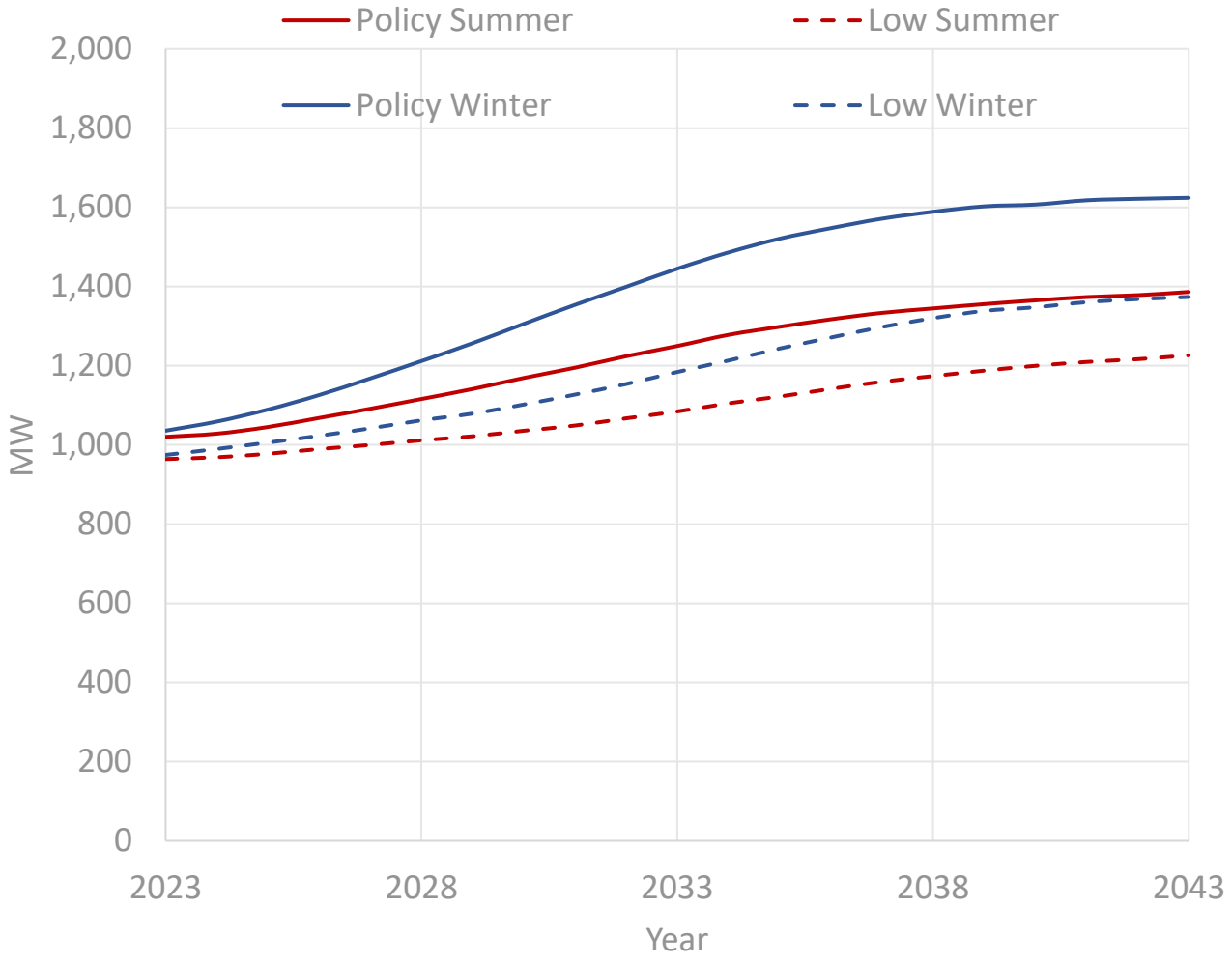


Vermont planning cycle

2024 VT Long-Range Transmission Plan Load Forecast

- 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

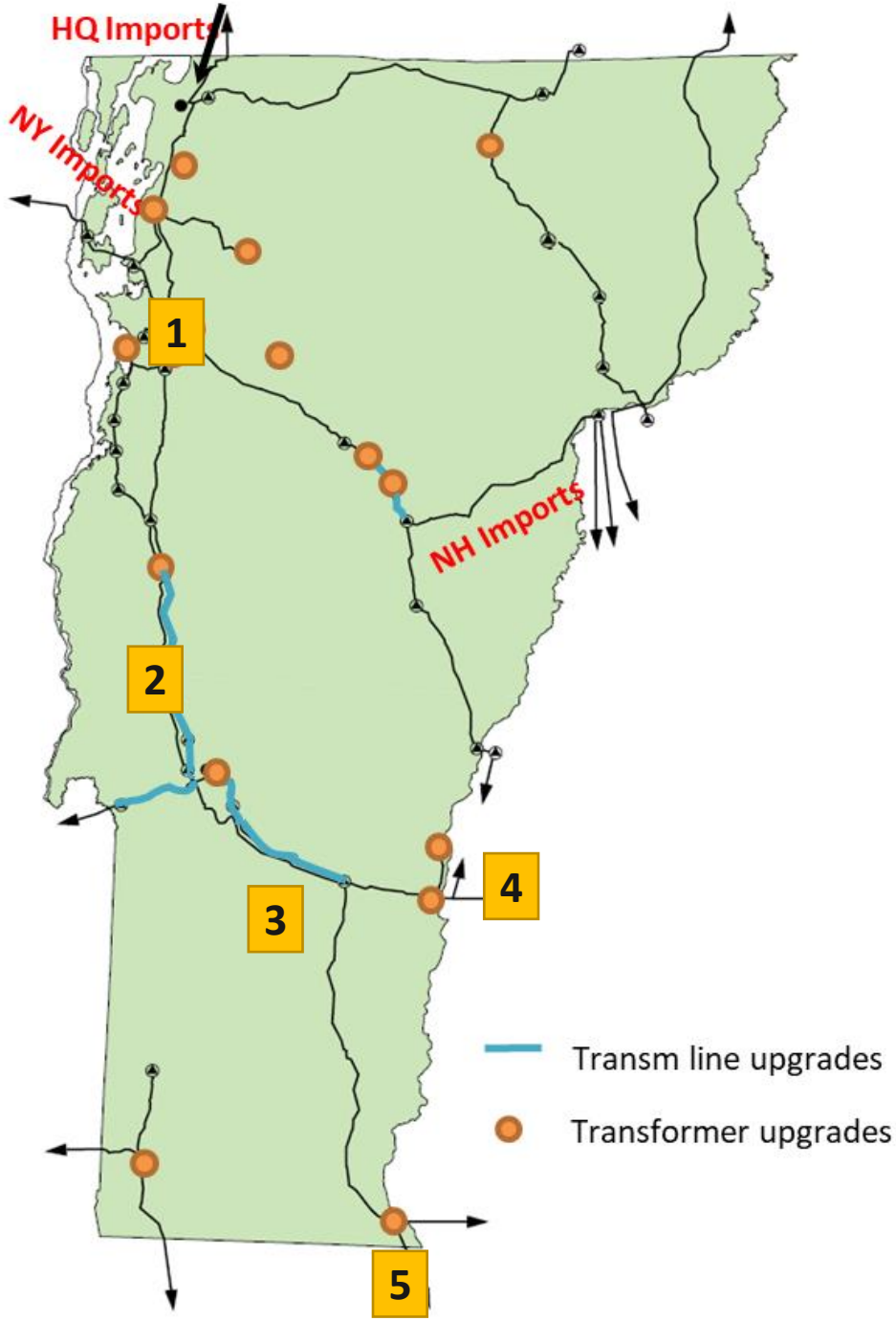


Policy Scenario 2043

- 75 miles of overloaded transmission lines
- 19 overloaded transformers

Areas of Concern & transmission solutions

1. **Northern VT**
   New 115 kV line between Essex & Williston
   NTA: 75 MW of load reduction by 2033
2. **Northwest VT**
   Rebuild 115 kV between West Rutland - Middlebury
   NTA: 80 MW of load reduction by 2033
3. **Central VT**
   Rebuild 115 kV line between Coolidge - North Rutland
   NTA: Keep load below 2033 load level in Central area
4. **Southern Vermont**
   Rebuild Bellows Falls-Ascutney Tap 115 kV & GMP Vernon - Newfane 46 kV
   NTA: Keep load below 2033 load level in central area
5. **Vermont**
   New 345 kV line between Vernon - Eversource Northfield, MA
   NTA: Keep VT load below 2033 load level



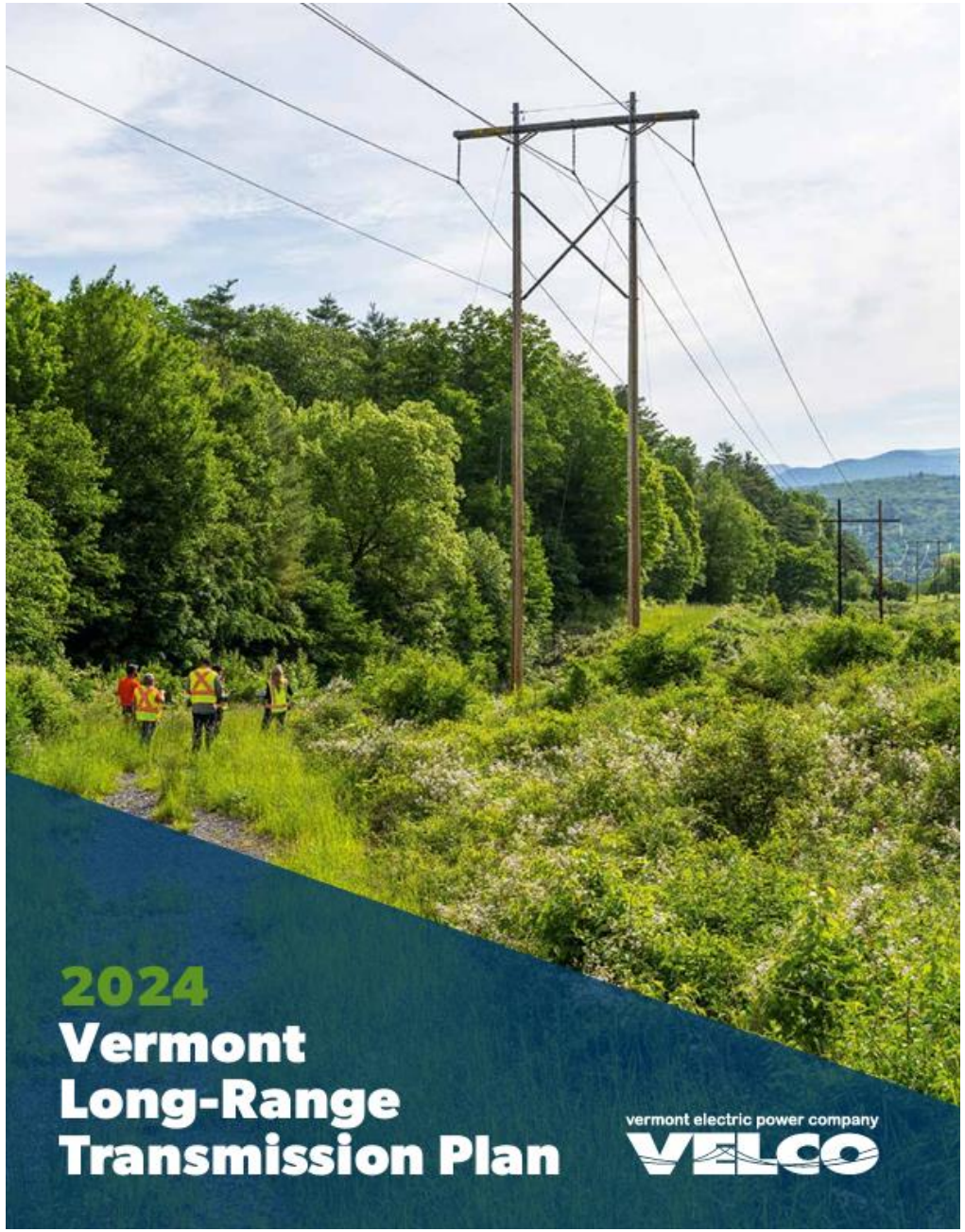
Load reductions to address peak load issues

Policy Peak N-1-1, 2043

Total Load Reduction(*) Needed in MW

	Winter Peak	Summer Peak
GMP	394	365
VEC	20	10
BED	25	25
Total	439	400

(*) this could be demand response, load reduction, battery production, microgrid solutions etc…



20-year outlook

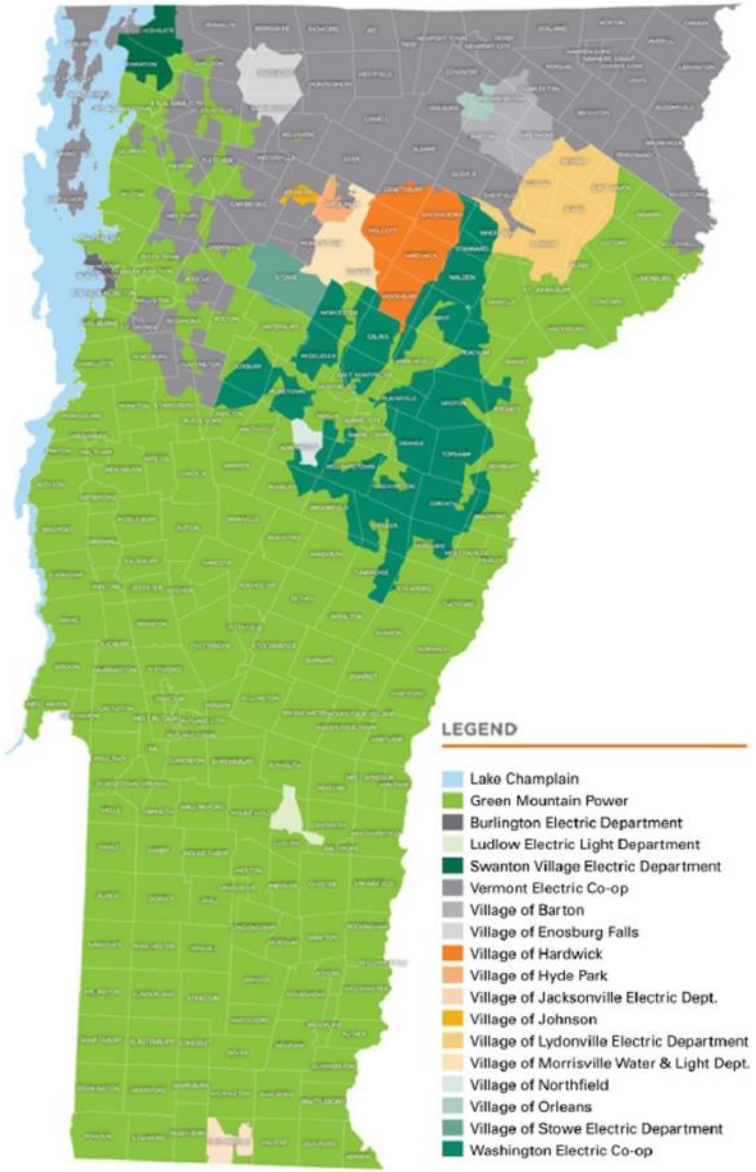
- Vermont will continue to depend on transmission
- Vermont Roadmap forecast scenario will lead to reliability concerns in about 10 years
- Significant DG growth in the same historical pattern will exceed system capacity
- Collaboration and innovation needed to achieve renewable energy goals
  - Storage
  - Grid upgrades
  - Curtailment
  - Grid support from inverters
  - Load management
  - Statewide coordinated planning
- **Non-transmission alternatives study needs to be performed within two years**

Green Mountain Power: Reliable, Resilient, Renewable

REV October 2024

GREEN MOUNTAIN POWER
Generating Possibilities Together

Green Mountain Power: Who We Are



- GMP serves 275,000 customers, covering 77% of Vermont
  - 85% residential customers, 15% businesses
  - 12,500 miles of distribution lines
  - 1,011 miles of sub-transmission
  - 15 district offices with teams across Vermont
  - About 510 employees, 285 are members of the IBEW Local 300
  - Annual energy mix is 100% carbon free, 80% renewable
  - 100% renewable by 2030
  - Certified B Corp

Certified B Corporation

GMP: Resiliency & Energy Storage for Customers

Installed Energy Storage Across Vermont

- GMP's Home Battery Programs (BYOD & ESS)
  - About 7000 batteries in 4150 homes and growing!
- GMP's Utility Scale Batteries
  - Example: Panton Microgrid, first microgrid with no fossil fuel back up to power the village and town hall
- NOMAD Mobile Energy Storage
  - Made in Waterbury & GMP the first customer
  - Example: Twincraft in Winooski, production line kept running & GMP performed necessary work
  - $9.5M grant from the US Dept. of Energy to deploy mobile units in 5 communities over next few years

GMP: Resiliency & Energy Storage for Customers

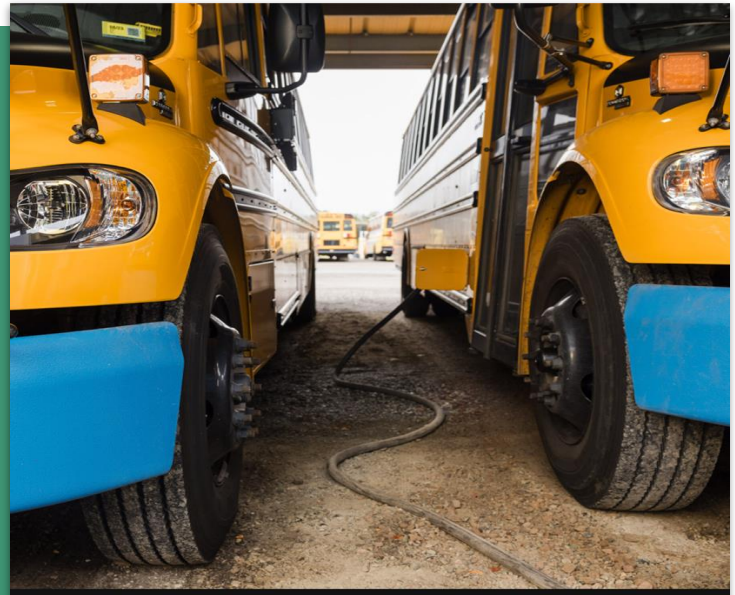
GMP's Virtual Power Plant – VPP (aka RPP)

- 70 MW of residential and utility scale batteries
  - Our VPP (aka RPP) is now Vermont's largest source of power
- Enough to power 25,000 homes for days
- This includes EV chargers with our two EV rates 72 & & 74
- Batteries strengthen the greater grid, add resiliency, and are key in face of climate change:
  - Cuts costs during peak energy times
  - Enables more local renewables, more electrification, and adds flexibility
  - Frequency regulation for ISO-NE

GMP: Resiliency & Energy Storage for Customers

What's Next?

- More resiliency through energy storage in remote areas
- More microgrids in communities
- More V2G & V2X
  - Vehicles to power homes during outages like the Ford Lightning which = 10 Powerwalls in your home
  - Tremendous opportunity and actively engaging with car manufacturers to deliver for customers
  - Buses as a battery = more mobile storage
    - Partnered with South Burlington and our work was featured in the NYT



School buses in Vermont are part of an experiment to test the idea that electric vehicles could be vital in the transition to clean energy. Oliver Parini for The New York Times

How Your Child's School Bus Might Prevent Blackouts

When not driving around, electric buses and other vehicles could help utilities by storing their solar and wind energy and releasing it to meet surges in demand.

suncommon®

Distributed Storage

The little discussed game changer

Oct 16, 2024

Distributed storage will help save the day

Distributed resources at our fingertips

- Residential Storage
- Commercial Storage
- EV Storage

What day are we saving?

- 50-100% more load
- 100% renewable generation
- Moment to moment, day to day, seasonal fluctuations
- The health of our planet

Residential Storage

- GMP has led the nation, and we are scratching the surface.
  - Served 2-3% of customers to date

- Non GMP is close to non-existent (that is a fixable problem)

Vermont's model vs California's model

- Utility driven, outside of rate, successful, but limited.
- Market driven, huge rate signals, pretty complicated and untested.

Commercial Storage

No real price signals or programs to drive this forward in Vermont.

For the customer the financial benefit is about demand charges, and peak vs non peak rates. There is not enough there right now.

Utility timing doesn’t always line up with the customer timing and there is no real utility program to capture the value they could access.

suncommon

EV's are the hidden giant

Current average EV battery: 75 kWh

Future EV battery average: 150 kWh

- F150, 131kWh
- R1S, 141 kWh
- Silverado, 209 kWh
- Top 4 selling vehicles in VT: F150, Silverado, Tacoma, Sierra

- Current 9000 EV's = 675,000 kWh = ~5% of average daily consumption for the entire state

- None of this is available to support our grid and the clean energy transition right now.

EV's are the hidden giant

Vermont's Clean Cars program

- All new cars, trucks and SUVs will be zero emission by 2035. EV's will make up a large majority of used vehicles by 2035.
- 250,000 vehicles x 150kWh = 37,500,000 kWh, > 2X Vermont's current avg. daily consumption
- If each vehicle has even 25 kWac capacity > 6000 MW of capacity
- How to leverage this huge asset?
  - It will require standards, payment/ customer signals, and the time is now.

Change is coming fast…

FERC regulations

State regulations: California, CO, MD…

- Utility requirements
  - Rate structures
- Manufacturer requirements

Ford, Nissan, Tesla, Hyundai, Genesis, Kia, GM, VW…

THANK YOU REV2024 SPONSORS!