

# VT's Transmission Grid Reliability, Capability and Recommended Investments

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# Roles & responsibilities

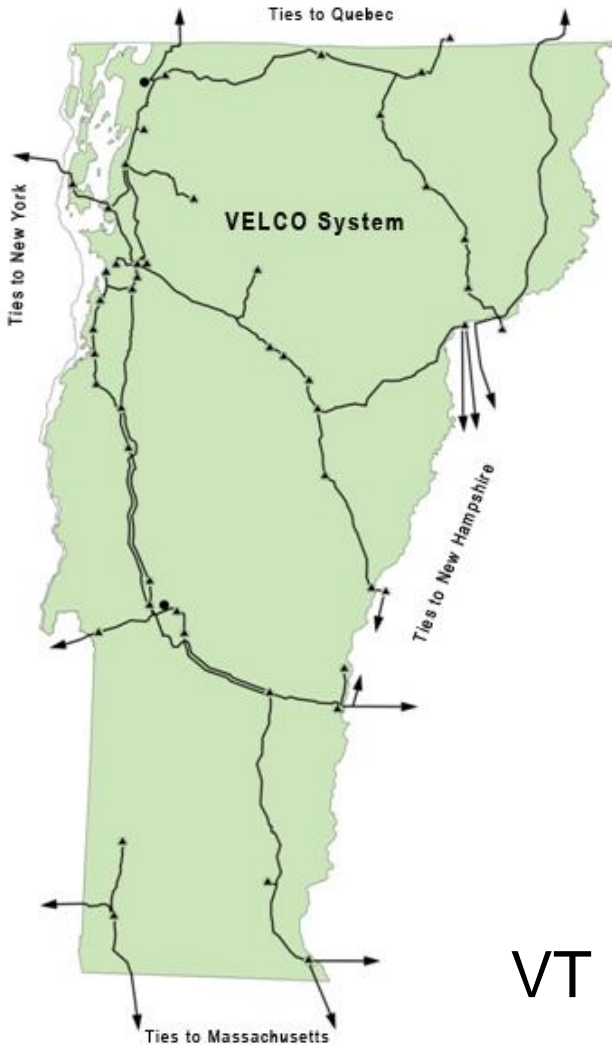
**VELCO's vision** is to create a sustainable Vermont through our people, assets, relationships and operating model.

**VELCO's role** is to ensure transmission system reliability by planning, constructing and maintaining the state's high-voltage electric grid.

## Related responsibilities

- Serve as Local Control Center for Vermont grid operations
- Manage the Vermont System Planning Committee
- Develop and submit Vermont's Long-Range Transmission Plan

# Generation mostly renewable and intermittent



Type		MW
Fossil (fast start units)	Winter	188
	Summer	138
Hydro		152
Wind		151
Landfill gas		9
Biomass (wood)		72
Utility scale solar PV		20
Small scale solar PV		400 and growing
Small scale farm methane, wind, hydro		63 and growing
<b>TOTAL IN-STATE GENERATION SUMMER NAMEPLATE CAPACITY</b>		<b>~ 1005</b>

VT Peak load 1000 MW (winter and summer)

# 2021 VT Long-Range Transmission Plan

- Plan and associated public outreach required by Vermont statute and Public Utility Commission order
- To support full, fair and timely consideration of all cost-effective non-wires solutions to growth-related issues
- To inform utilities, regulators, generation/storage developers and other stakeholders in development of projects and policy



[www.velco.com/longrangeplan](http://www.velco.com/longrangeplan)

# What's important to remember

- System reliability will be maintained
- Vermont is a transmission-dependent state
- Significant load growth expected – winter peaking
- No major upgrades needed to serve load within the 10-year horizon
  - Presumes additional load management capability
  - Does not resolve all local concerns
- Incremental solar does not reduce load at peak hour
  - Efficiency and solar PV have provided great value
- VT utilities continue to implement innovative programs
- Further collaboration and innovation needed to achieve renewable and climate-driven requirements

# No major upgrades needed to serve load within the 10-year horizon

## **Bulk system**

- No peak load concerns. Issues addressed with tie line adjustments

## **Predominantly bulk system**

- No peak load concerns. Issues addressed by tie line adjustments and operator actions
- Acceptable loss of load (5-150 MW). As a direct consequence of outage and operator actions.

## **Subtransmission issues**

- Flagged some issues to be evaluated by distribution utilities

## **High-load scenario**

- Minimal effect within 10 years
- After 10 years, requires non-transmission solutions to avoid transmission upgrades: load management, energy efficiency, storage, generation, ...

# Recommendations

- Give greater weight to grid impacts when siting generation
- Bring to scale flexible load management
  - Enable inverter grid support functionality, i.e., voltage control and ride through capability
  - Enable utility management of distributed generation
  - Continue to evolve with storage
  - Establish data organizational architecture
  - Deepen/broaden fiber communications network
- Grid reinforcements – reliability, resilience & clean energy
  - Transmission and subtransmission
  - Flexible load management
  - Utility-scale and customer-located storage

# Potential federally funded grid reinforcements

- Enables significant in-state renewable energy growth

