Better Understanding the Costs of H.289

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What's Behind the Department's $1 billion estimate of the cost of H.289

The Department's estimate of the cost H.289 is not based on any specific modeling of H.289. It includes two components:

- "Power supply costs" derived from a model created by SEA
- Transmissions costs derived from a worst-case study by VELCO

The Department did not make any changes to the SEA model or VELCO works to arrive at its cost estimates but applied what it termed "reasonable" and "conservative" adjustments to this work that are neither reasonable nor conservative.

Using the SEA Model to Estimate H.289 Costs

Department's SEA Model

- ***Statewide*** model that does not reflect the utility-specific provision included in H.289
- Has a finite number of scenarios with differing requirements for new regional and new in-state disturbed generation *none of which align with H.289*
- Cost outputs ***can be modified*** to approximate H.289. REV has made these modifications, the Department has not.

General Critique of the SEA Model

The scope of work that guided the model development lacked the ambition to understand what RES reform looks like as the power sector evolves:

- Excludes storage
- Excludes TOU rates to guide EV charging

Aligning the SEA Model with H.289

Modified the SEA Model to Align with H.289

- Converted the utility-specific provision in H.289 to statewide averages
- Identified the SEA scenario that aligned best with H.289 (excluded nuclear, no change to biomass, renewable requirements)
- Scaled costs to reflect the difference between the SEA scenario and H.289

Results:

- Given SEA model assumptions, H.289 has real but modest impacts on utility costs and rates:
  - $357 million over 10 years
  - The DPS Clean Energy proposal is $165 million
  - Difference of 28 cents/mo in 2025 and $1.87/mo in 2026 on an average utility bill

Department's Estimate of H.289 is *Higher* Than More Ambitious SEA Scenarios

	Scenario Modeled	Total Costs Over 10 Years*
REV Estimate of H.289	10 – 20% Tier IA by 2035 20% Tier II by 2035 New load for 100% renewable DUs	$357 million
SEA: Scenario 5	30% Regional Tier by 2035 20% Tier II by 2035	$403 million
Department Estimate of H.289	30% Regional Tier by 2035 30% Tier II by 2035	2/3 of Scenario 2 costs $500 million

*Costs are limited to market impacts and ignore climate/health benefits

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Transmission Costs

The Department's estimated cost of $500 million in additional transmission upgrades:

- Is not based on modeling by the Department or VELCO but rather estimated based on VELCO's worst-case scenario
- Assumed optimal siting of solar for the Department's proposal but not for H.289
- Ignores opportunities for innovative "non-wires" solutions
- Ignores overlapping upgrades for solar and electrification

Transmission Challenges: The Worst Case is Expensive

Brute force approach to a worst-case scenario

- Total upgrades cost: $1.4B
  - Conservative/order of magnitude
  - We will likely not resolve all overloads
  - Cluster studies required

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What is the worst case?

- Low demand
- High wind, solar, and hydro
- No flexibility in how we import our power
- No mitigation with storage
- A lot more transmission capacity
- Assume no additional transmission capacity to support electrification

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Transmission Challenges: More Wires Aren't the Only Solution

- Solution will be a hybrid solution
  - Real-time import adjustments
  - Real-time generation curtailments
  - Storage/Load management, etc.
  - Transmission

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Avoid the Worst Case:

- Geographically target solar development (as the Department assumed for its proposal)
- Recognize the overlapping transmission needs for electrification and solar
- Leverage innovative solutions

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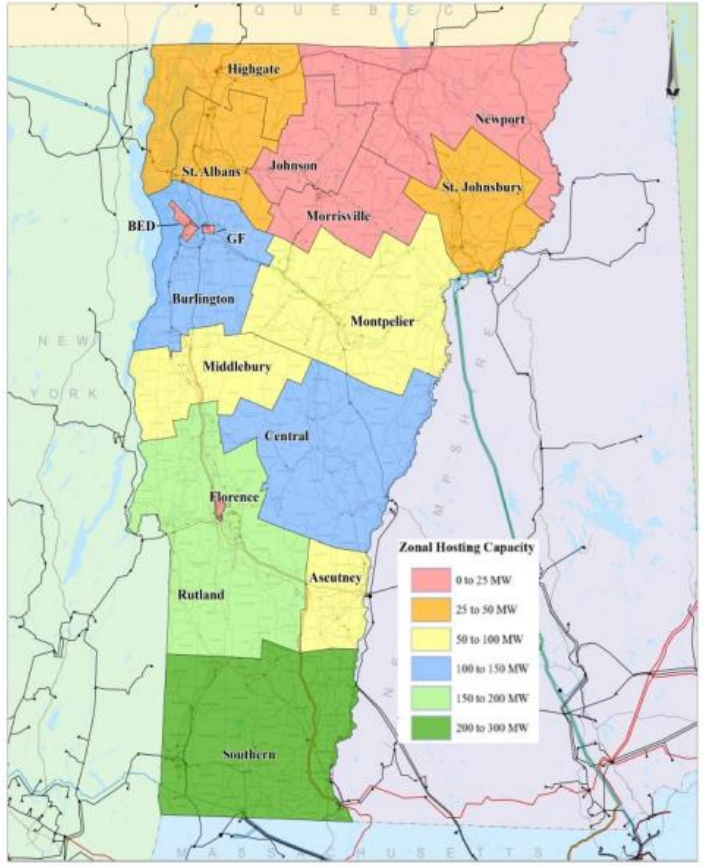
Avoid the Worst Case: Targeted Deployment

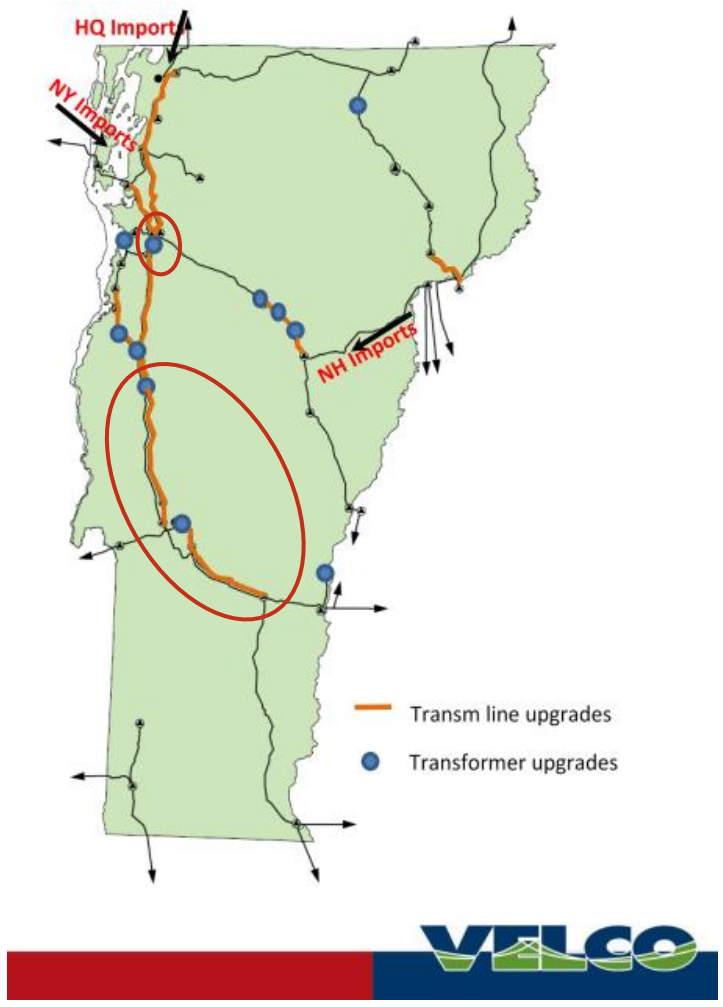
Location Matters

- 5% overload allowed
- 1053 MW Maximum solar
  - Considering transmission and subtransmission constraints

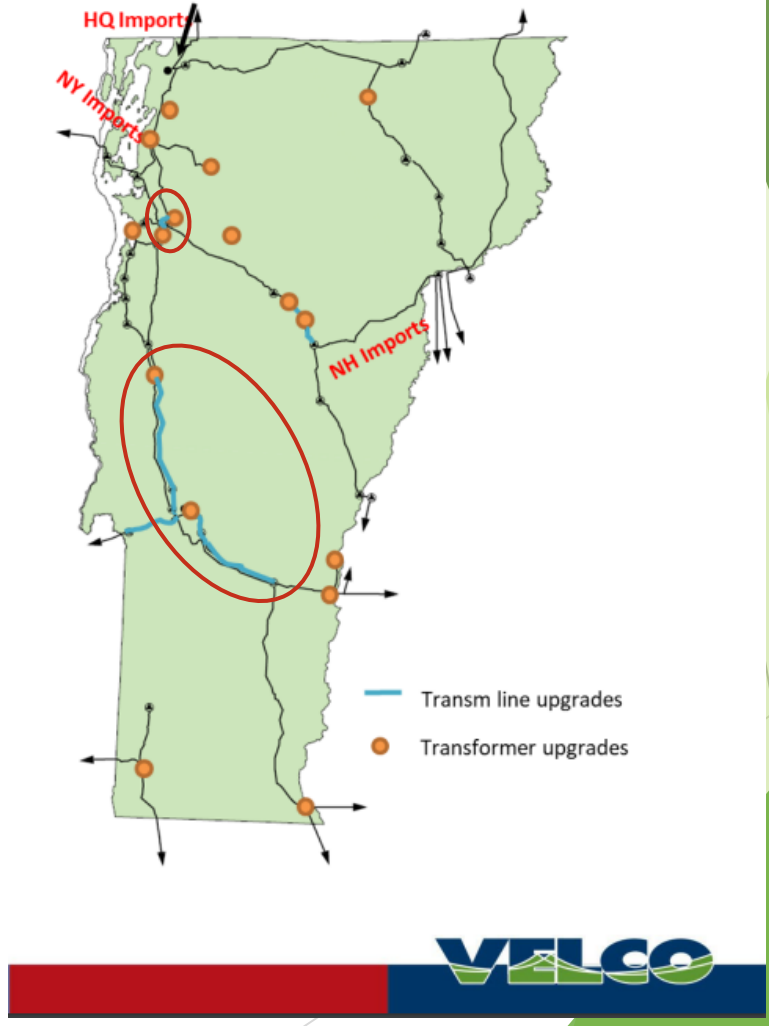


Electrification and Renewables Require Overlapping Upgrades

Upgrades required for 20% Tier II



Upgrades required for electrification



Electrification and Renewables Require Overlapping Upgrades

Bulk System result summary – Policy Scenario

Summary of Bulk System Regional Grouping & Transmission Solutions	Lead & Affected Distribution Utilities	Estimated Transmission Project Cost	Screened In or Out of Full NTA Analysis
Northern area • Install a new 115 kV line between Essex and Williston • N-1-1 contingency causing overload & voltage collapse exposure • Affected transformers: Queen City, Tafts Corner, Barre • Need date is 2032 based on winter expected forecast	*Lead*: GMP Affected: All VT	$100M Three X $11M	In 75 MW of load reduction in northern area by 2033 Grows over time
Northwest area – includes northern area • Rebuild West Rutland to Middlebury 115 kV line • N-1-1 contingency causing thermal overload • Affected transformer: Middlebury • Need date is 2029 based on summer expected forecast	*Lead*: GMP Affected: All VT	$215M $13M	In 80 MW of load reduction in northwest area by 2033 Grows over time
Central area – includes northwest area • Rebuild Coolidge - Cold River - North Rutland 115 kV line • N-1-1 contingency causing thermal overload • Affected transformers: North Rutland, Cold River, Windsor • Need date is 2034 based on summer expected forecast	*Lead*: GMP Affected: All VT	$185M Three X $13M	In Keep load below 2033 load level in central area Grows over time
Southern area – includes central area • Rebuild NGRID Bellows Falls-Ascutney Tap 115 kV line and GMP Vernon Road to Newfane 46 kV • N-1-1 contingency causing thermal overload • Affected transformer: GMP Vernon Road 115/46 kV • Need date is 2034 based on summer expected forecast	*Lead*: GMP Affected: All VT, NGRID	No VELCO estimate	In Keep load below 2033 load level in southern area Grows over time
State of Vermont • Install new 345 kV line between Vernon & Eversource Northfield, MA • N-1-1 contingency causing thermal overload • Affected transformers: Bennington • Need date is 2034 based on summer expected forecast	*Lead*: GMP Affected: All VT, Eversource	$5M for VELCO portion $13M	In Keep load below 2033 load level in Vermont Grows over time

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$500 million in upgrades for electrification *regardless* of the status of the RES

Employ Innovative Solutions

- Add flexibility to our power imports
- Incentivize EV charging during periods with high solar generation
- Take advantage of storage
- Curtail renewables as needed