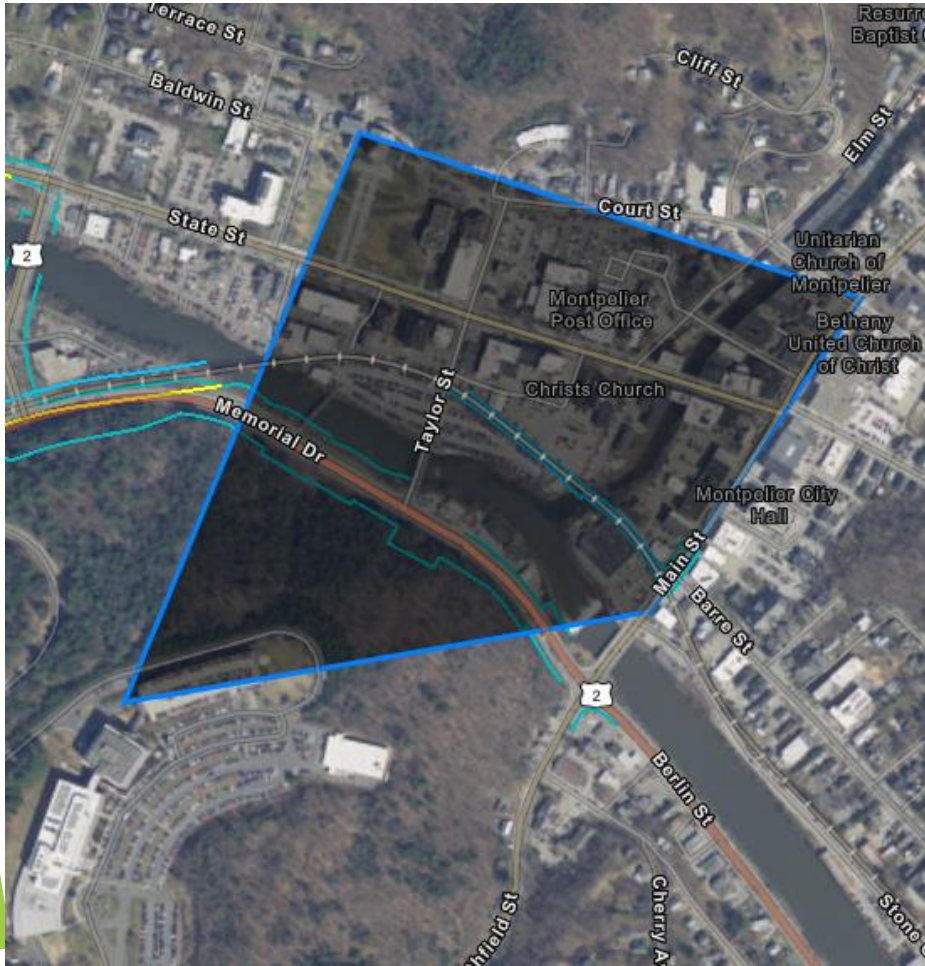


Updating Vermont's Renewable Energy Standard

Testimony on H.289
Peter Sterling, Renewable Energy Vermont
Testimony to Senate Finance Committee
April 25th, 2024



Why Vermont Needs RES Reform: Environmental Justice



Footprint of the 60 acre 360MW baseload natural gas facility in Dayville, CT superimposed on Montpelier

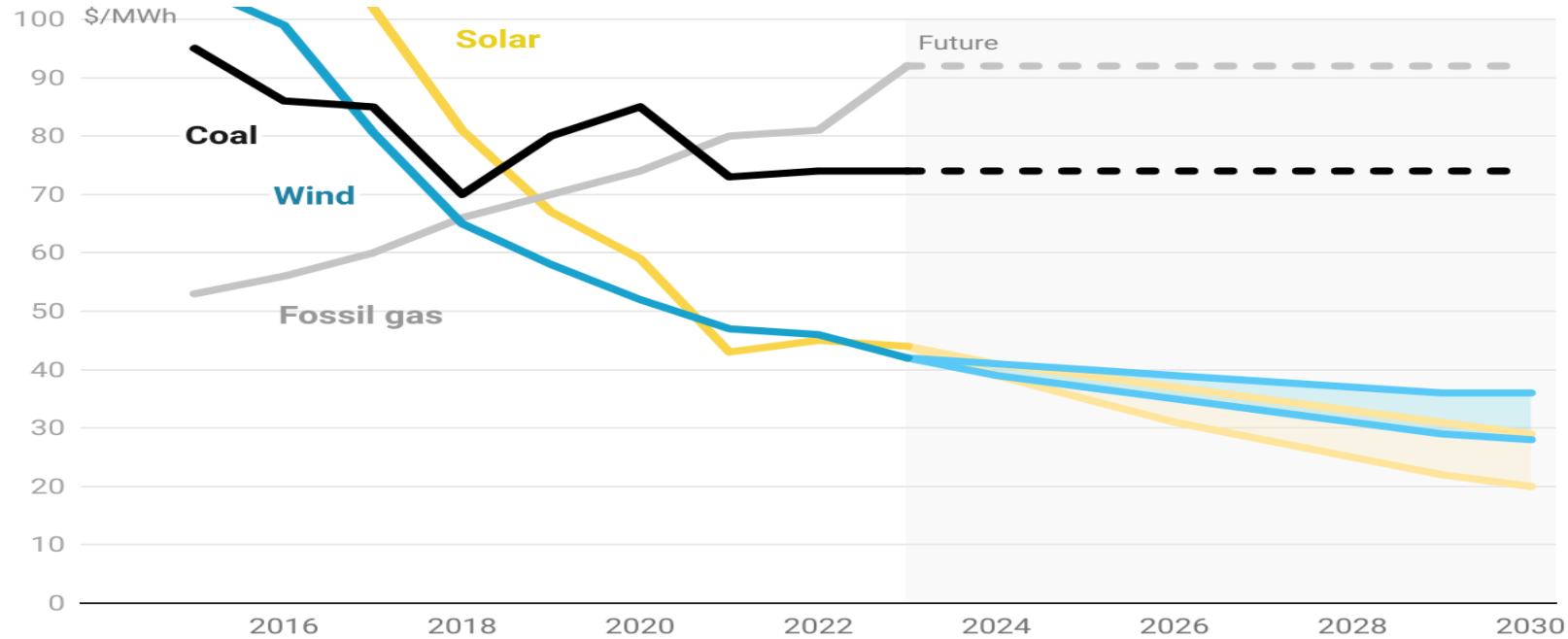
New England has 64 oil & gas fossil fuel plants larger than 50 MW

- 65% are located in communities with a higher than average share of people of color
- 60% in communities with a higher than average share of low-income residents
- 89% in communities with a higher than average share of kids under 5
- 44% are located in communities where all of these are true
- **None are located in Vermont!**

VT PSD: The Price of New Wind and Solar is Projected to Keep Decreasing

Renewables will keep beating fossil fuels on cost

Analysts project that wind and solar will continue to get cheaper, falling further below coal and gas costs globally this decade.



Note: Shown is the levelized cost of energy, or a power plant's lifetime costs divided by its energy production. (\$/MWh)

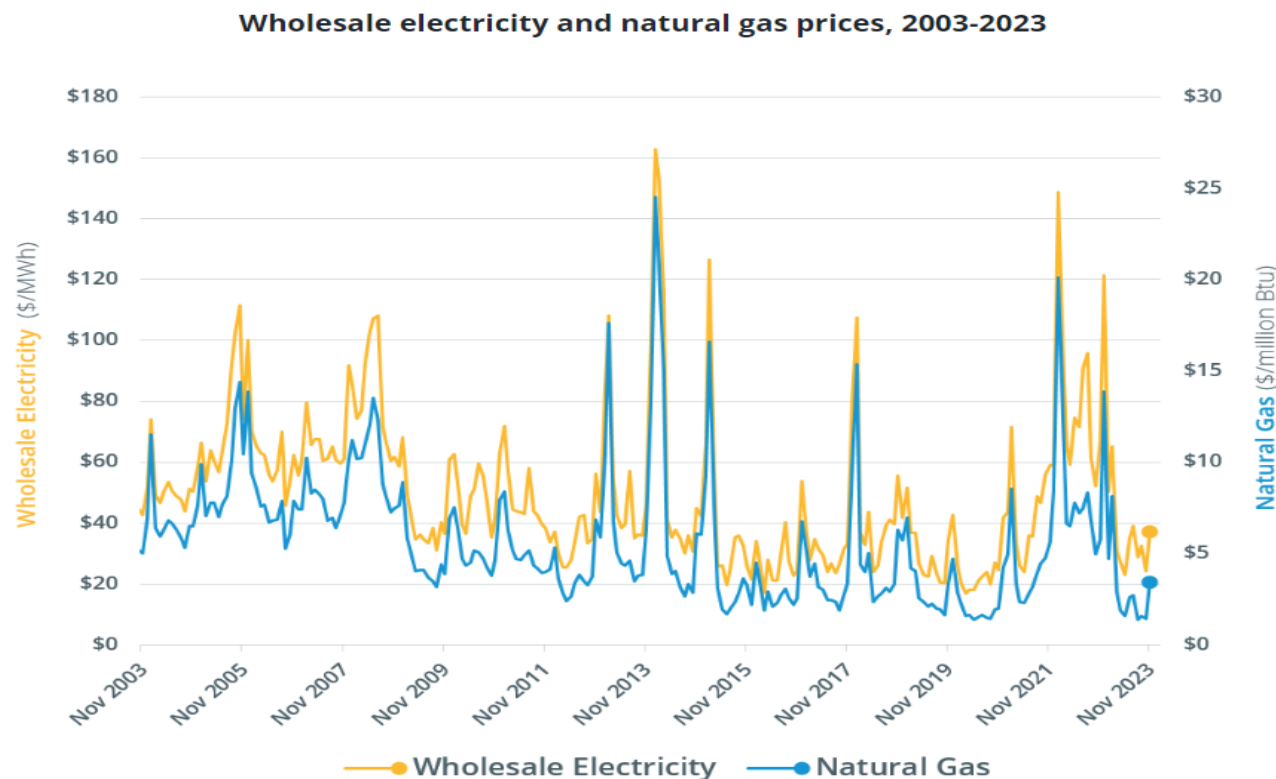
Chart: Canary Media • Source: BNEF, RMI X-Change: Electricity 2023



SOURCE: PSD Biennial Net Metering Rate Filing April, 2024

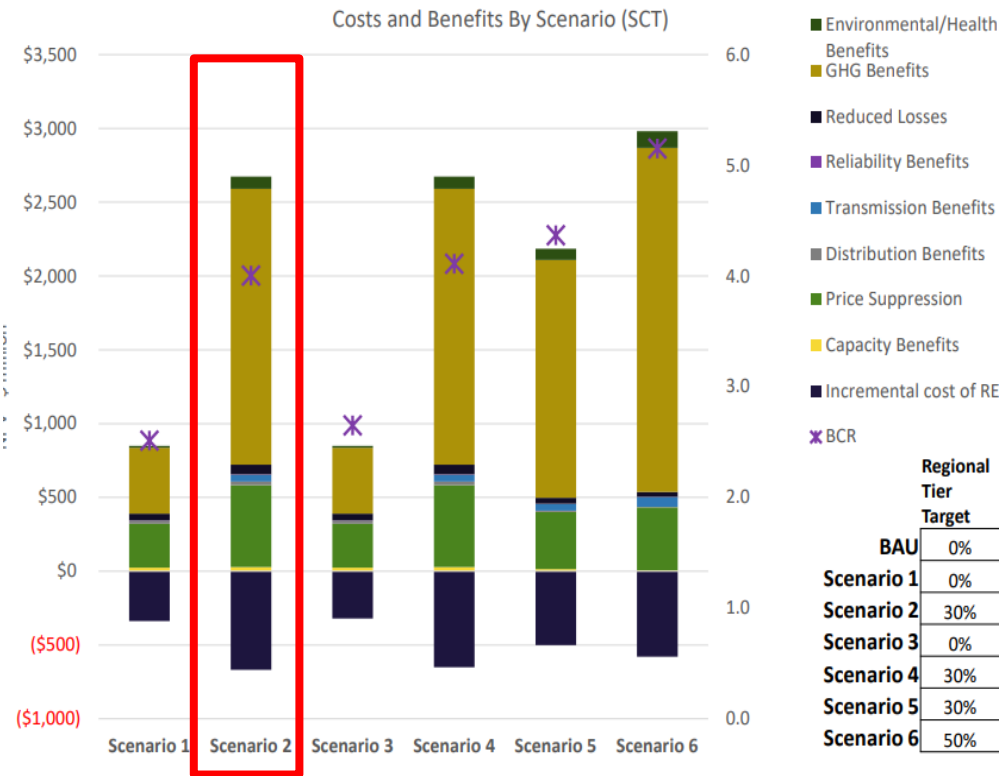
Fuel Cost Volatility is a Main Driver of Electricity Prices

- ▶ “The two main drivers of wholesale electricity prices in New England are the cost of fuel used to produce electricity and consumer demand.” [ISO New England](#)
- ▶ Renewable energy is a fixed cost and provides needed predictability for utilities

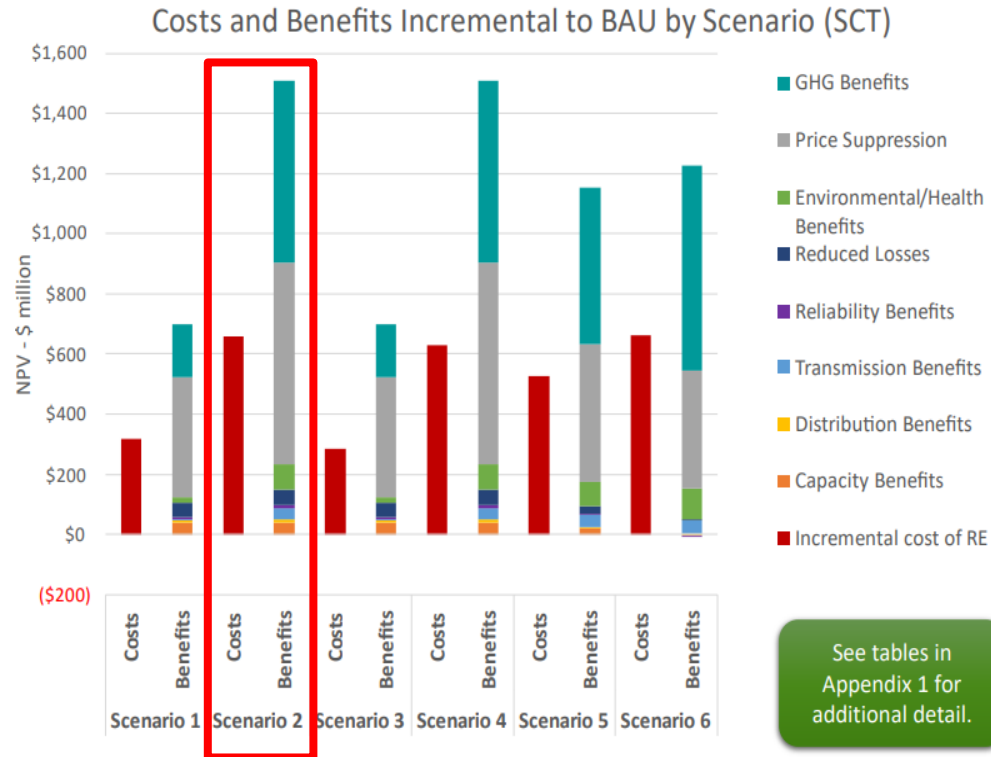


PSD Modeling: Societal Benefits of Renewables Far Outweigh the Costs

According to REV's analysis of PSD's modeling, H.289 provides \$400m in greenhouse gas reduction benefits & \$51m in health benefits from reduced local pollutants.



\$1.8b in net savings through 2035
Using a 1% discount rate for the social cost of carbon



See tables in Appendix 1 for additional detail.

\$900m in net savings through 2035
Using a 2% discount rate for the social cost of carbon

Projected Costs of H.289- Should Go Down, Unlikely to Go Up

All projections are based on PSD's modeling which undervalues distributed generation by not considering scenarios for additional battery storage, implementation of time of use rates, a potential increase in natural gas prices and no decrease in net metering compensation.

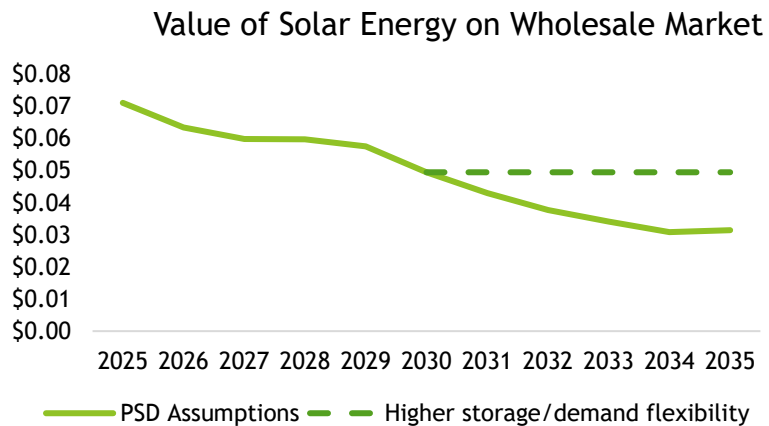
- ▶ Using PSD modeling, JFO estimates energy costs from bill at \$150m-\$250m between 2025-2035. REV used PSD's model to calculate the rate impact of the additional cost energy cost outlined in JFO's fiscal note and found:
 - no rate impact 2025 with 75% of energy costs occur after 2030
 - a monthly rate impact of \$2.24-\$3.73 to the average bill in 2030
- ▶ REV estimates the energy cost of H.289 at \$187m or \$2.79/mo. PSD says their proposal costs \$110m
- ▶ **Any cost increase from moving to 100% renewable energy under H.289 occurs in the context of the \$14.5 billion PSD projects Vermonters will spend on electricity between 2025-2035**



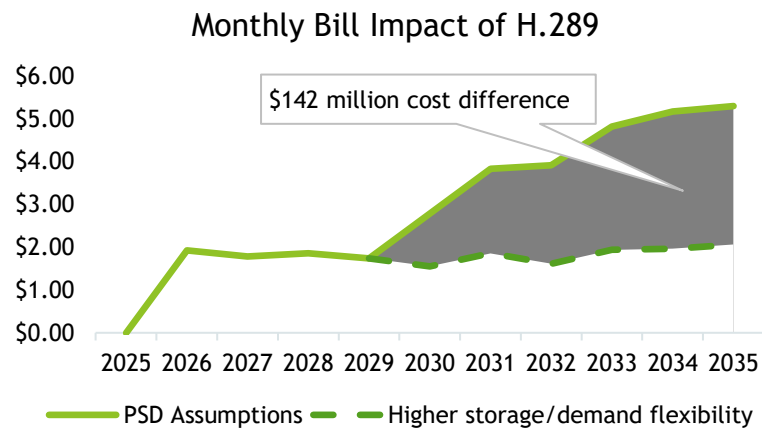
Flaws in PSD Model Causing Increased Energy Cost Estimates of H.289: Decreasing Solar Electricity Prices During Peak Solar Hours

- A driver of the rate increases in PSD’s model is the assumption that the price utilities will have to pay for electricity during peak solar generating hours will fall dramatically after 2029
- PSD did not consider how battery storage or time of use rates could increase demand for electricity during these hours to take advantage of increased solar generation
- Even a modestly slower decrease in the price of electricity during these hours would reduce the energy cost of H.289 significantly to a little as \$45m over 10 years as in the example below

PSD model says electricity will get cheaper during peak solar hours...



...but if prices stay flat because of increased storage & TOU rates means big cost reduction of H.289



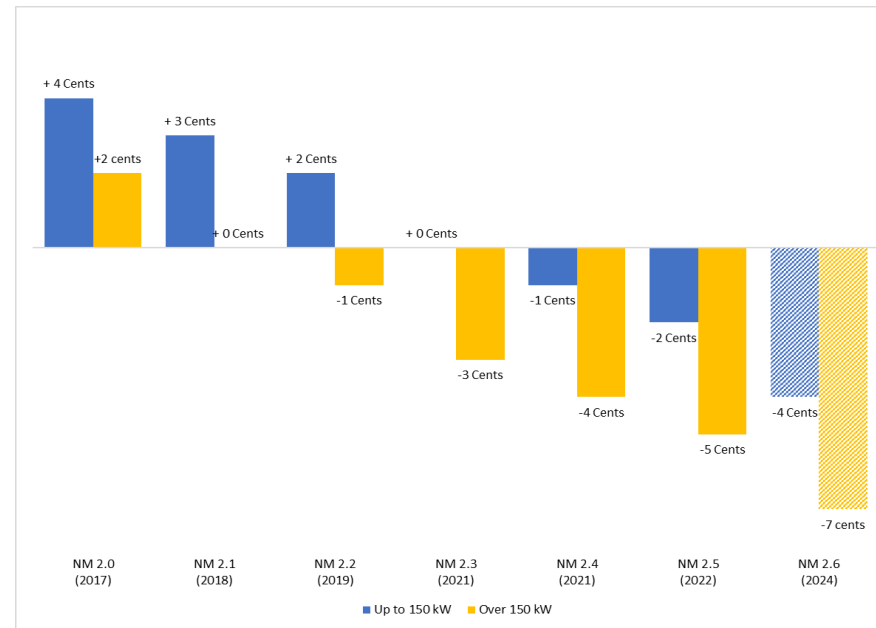
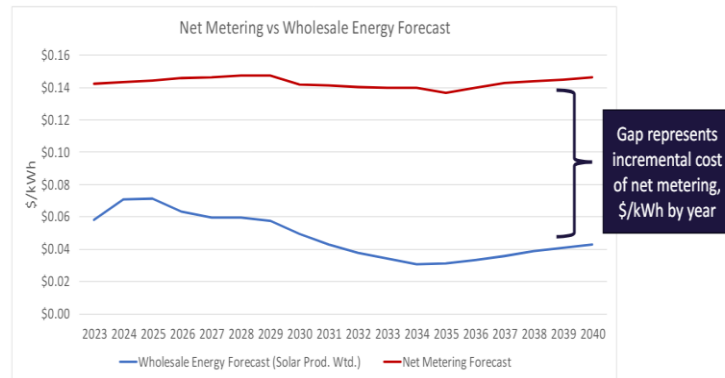
Flaws in PSD Model Causing Increased Energy Cost Estimates of H.289: Assuming NM Compensation Stays Level

PSD model is based on a level cost of net metering over the next 10 years

PSD has recommended cutting NM rates 7x in the last 7yrs- including earlier this month!

Approach to Net Metering Cost Modeling

- Incremental cost = net metering rate forecast minus solar production-weighted wholesale value of energy
- See chart below. The 'gap' represents incremental cost of RES compliance via net metering.



Flaws in PSD Model: 69 Scenarios Considered But All Used the Same Natural Gas Price Forecast

Best practice would have been to include some price sensitivity analysis

As part of PSD's Technical Advisory Group, REV asked for natural gas price sensitivity to be included but it was not.

Calculating the potential rate decreases from higher than predicted natural gas prices is useful and necessary information for decision making

If fossil fuel prices (mostly natural gas) increase faster than the model projects, that would also make the model's cost projections too high. If renewable prices drop faster than the model projects (historically prices have dropped faster than expected) that would also lower costs.

Case #	Case Name	Target %	Target Date	Parameters...				Regional Tier		Other Variables
				Tier I, Net	Eligibility Changes	Tier II	Eligibility Changes	Target %	Target Date	
1	BAU	65%	2032		None	10%	2032	None	N/A	N/A
2	Scenario 1	70%	2035		None	30%	2035	None	0%	None
3	Variant 1	80%	2035		None	20%	2035	None	0%	None
4	Variant 2	90%	2035		None	10%	2035	None	0%	None
5	Variant 3	70%	2035		None	30%	2035	None	0%	None
6	Variant 4	80%	2035		None	20%	2035	None	0%	None
7	Variant 5	90%	2035		None	10%	2035	None	0%	None
8	Scenario 2	40%	2035		None	30%	2035	None	30%	2035
9	Variant 1	50%	2035		None	20%	2035	None	30%	2035
10	Variant 2	60%	2035		None	10%	2035	None	30%	2035
11	Variant 3	50%	2035		None	30%	2035	None	20%	2035
12	Variant 4	30%	2035		None	30%	2035	None	40%	2035
13	Variant 5	60%	2035		None	20%	2035	None	20%	2035
14	Variant 6	40%	2035		None	20%	2035	None	40%	2035
15	Variant 7	70%	2035		None	10%	2035	None	20%	2035
16	Variant 8	50%	2035		None	10%	2035	None	40%	2035
17	Variant 9	40%	2035		None	30%	2035	None	30%	2035
18	Variant 10	50%	2035		None	20%	2035	None	30%	2035
19	Variant 11	60%	2035		None	30%	2035	None	30%	2035
20	Variant 12	30%	2035		None	30%	2035	None	20%	2035
21	Variant 13	30%	2035		None	30%	2035	None	40%	2035
22	Variant 14	60%	2035		None	20%	2035	None	20%	2035
23	Variant 15	40%	2035		None	20%	2035	None	40%	2035
24	Variant 16	70%	2035		None	10%	2035	None	20%	2035
25	Variant 17	50%	2035		None	10%	2035	None	40%	2035
26	Scenario 3	70%	2035		Add nuclear	30%	2035	None	0%	None
27	Variant 1	80%	2035		Add nuclear	20%	2035	None	0%	None
28	Variant 2	90%	2035		Add nuclear	10%	2035	None	0%	None
29	Variant 3	70%	2035		Add nuclear	30%	2035	None	0%	None
30	Variant 4	80%	2035		Add nuclear	20%	2035	None	0%	None
31	Variant 5	90%	2035		Add nuclear	10%	2035	None	0%	None
32	Scenario 4	40%	2035		Add nuclear	30%	2035	None	30%	2035
33	Variant 1	50%	2035		Add nuclear	20%	2035	None	30%	2035
34	Variant 2	60%	2035		Add nuclear	10%	2035	None	30%	2035
35	Variant 3	50%	2035		Add nuclear	30%	2035	None	20%	2035
36	Variant 4	30%	2035		Add nuclear	30%	2035	None	40%	2035



Projected Transmission Costs of H.289

JFO's Fiscal Note now includes a zero-dollar possibility for transmission costs associated with the requirements of H.289 ranging up to \$200m between 2025-2035

The Fiscal Note adds important context to their cost estimate: unknowns may drive their cost projections down including, “potential technological advances, changes in demand for electricity, adaptations in ISO-NE grid, actions by VT utilities in future years, etc”

VELCO's draft Long Range Transmission Plan Bulk Transmission Solutions Scenario estimates \$505m in transmission upgrades needed by 2033 **without any changes to the RES.**

VELCO acknowledges that some portion of these upgrades to support electrification offset any additional transmission costs associated with H.289

VELCO testified to HEE that 1050MW of solar can be sited with no additional transmission costs through optimal siting. By the end of 2024, Vermont will have about 570 MW of solar. REV estimates that H.289 will require an additional 500 - 800MW of solar by 2035 depending on the rate of load growth and other factors



Transmission Alternatives to Lower Costs

Several “non-wires” solutions could also reduce or eliminate the need for transmission upgrades:

- ▶ Time of use rates
- ▶ Storage - GMP recently highlighted the ability of its 50MW of energy storage capacity to offset lost solar production during the eclipse and to offset peak energy costs.
- ▶ Grid enhancement technologies
- ▶ Curtailment

Curtailment (deliberately reducing the output of a facility) is a perfectly viable and relatively low-cost option. REV modeling shows that H.289 might require an additional 600 MW of solar in the 2032-2034 timeframe. Our modeling shows that in 2032, factoring in flexible power imports and without transmission upgrades or flexible load management:

- ▶ these new solar facilities would only be curtailed for 5% of the year
- ▶ the cumulative cost of curtailment by 2035 would be approximately \$25 million

Fossil fuel power plants are routinely curtailed. The grid is designed so that it can produce enough power to meet peak demand, as we transition to 100% renewable energy, renewables will inevitably need to be curtailed too.



H.289 Eliminates Off Site Net Metering But NOT Community Solar

PUC has radically limited off site net metering since 2022

- ▶ Since the NM 2.5 rates took effect on 9/22 there have been applications for just nine group net metering projects and only four CPGs granted.
- ▶ Just one of these four projects has been built. Under NM 2.4 there were 21 applications with 18 CPGs granted and 13 projects built.
- ▶ The PSD's proposal to lower NM 2.6 compensation is almost 3x larger than the drop from NM2.4 to NM2.5 for projects 150kW-500kW

PSD Solar for All includes 13MW of non net metered Community Solar enough for 6,000 households

Concord Monitor, April 12th: 1.3MW Community Solar Array Being Proposed in NH

“Members work with ReVision to determine how much of a share of the farm would cover their usual electrical needs, and can purchase that percentage of the farm. The percentage of the kilowatt-hours produced by the farm would then show up as a credit on their electricity bill.”

“This model allows the shareholders the benefits of solar, including the full federal tax credit and net-metering benefits, as if they had the panels on their property.”



H.289 Has Broad Support From Environmental Groups & Utilities Because it:

- ✓ Gets Vermont to a 100% Renewable Energy Future- Vermont would be tied with Rhode Island as the first states in the nation to achieve this
- ✓ Helps Fight Climate Change by Decarbonizing the Electric Sector- REV estimates the GHG reduction from H.289 is the equivalent of taking up to 240,000 cars off the road by 2035
- ✓ Enhances Grid Reliability & Resilience
- ✓ Helps Vermont Take Control of its Energy Future
- ✓ Has a Small Impact on Electric Rates
- ✓ Gives Needed Flexibility to Vermont Utilities

Supporting H.289

Hardwick Electric Department
Burlington Electric Department
Green Mountain Power
Vermont Electric Co-Op
Washington Electric Co-Op
Global Foundries
Swanton Village
Town Of Northfield Electric Dept
Stowe Electric Dept

Village of Jacksonville
Village of Johnson
Village of Ludlow Electric Light Dept
Lyndon Electric Dept
Village of Orleans
Barton Village
Village of Enosburg Falls
Village of Morrisville Electric Light Dept

VPIRG
350VT
CLF
VCV
VNRC
VBSR
Sierra Club
REV

