Vermont Electricity Policies and Programs Overview

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Senate Committee on Natural Resources and Energy

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Overview

PART ONE (Last Week)

1. Department of Public Service
2. Core Components of the Electric Grid
3. Vermont's Regulated Utilities & ISO-NE
4. Jurisdictional Oversight
5. Components of Electric Rates
6. Electric Cost Drivers
7. **Forecasted Load and Demand**
8. Electric Supply

PART TWO – Renewable Energy Programs, Deployment, Grid (TODAY)

1. Energy Efficiency
2. Renewable Energy Standard
3. Standard Offer Program
4. Net Metering
5. Grid Modernization: Rate Design, Load and Generation Management, and Resilience
6. Federally Funded Programs (if time)

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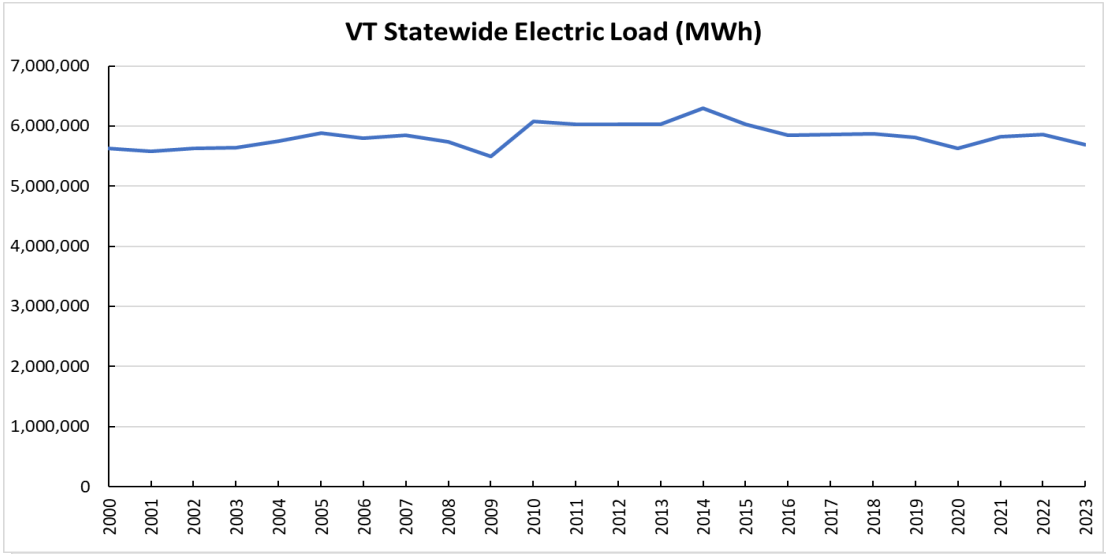
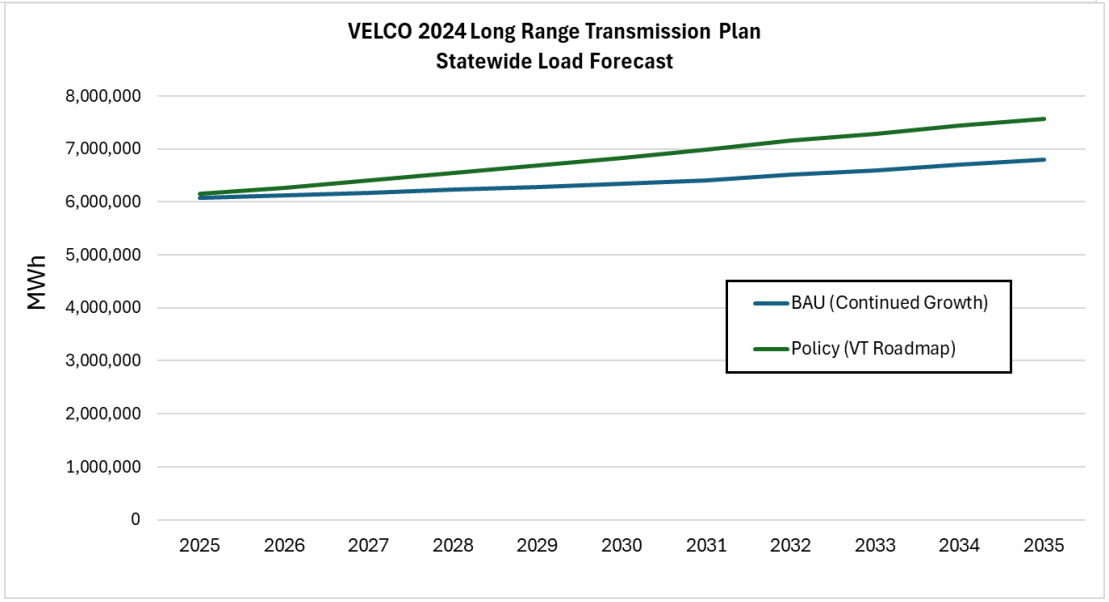
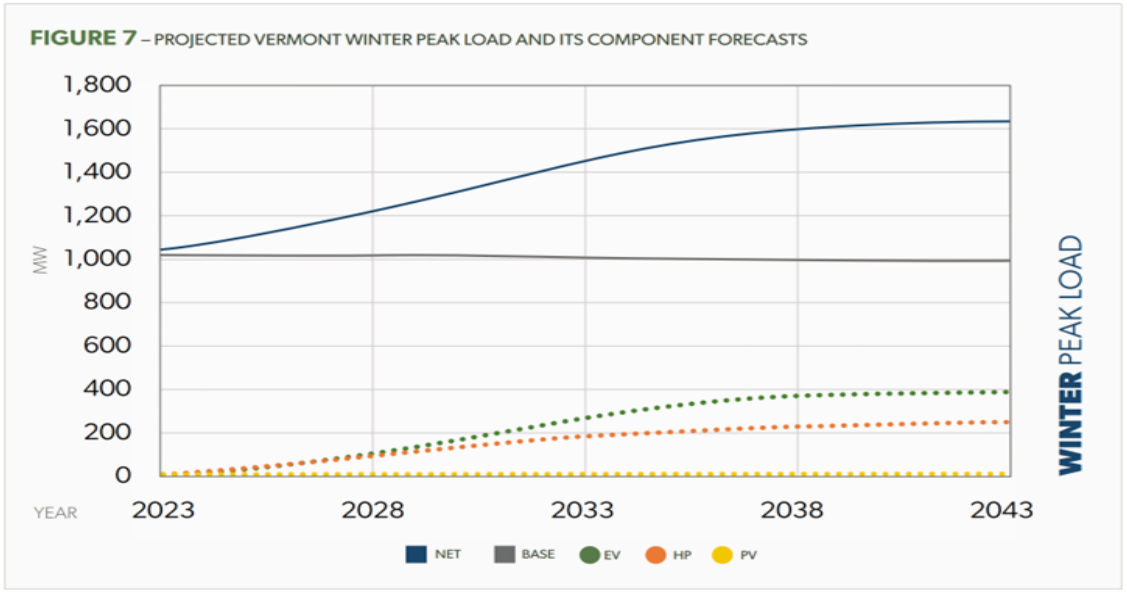
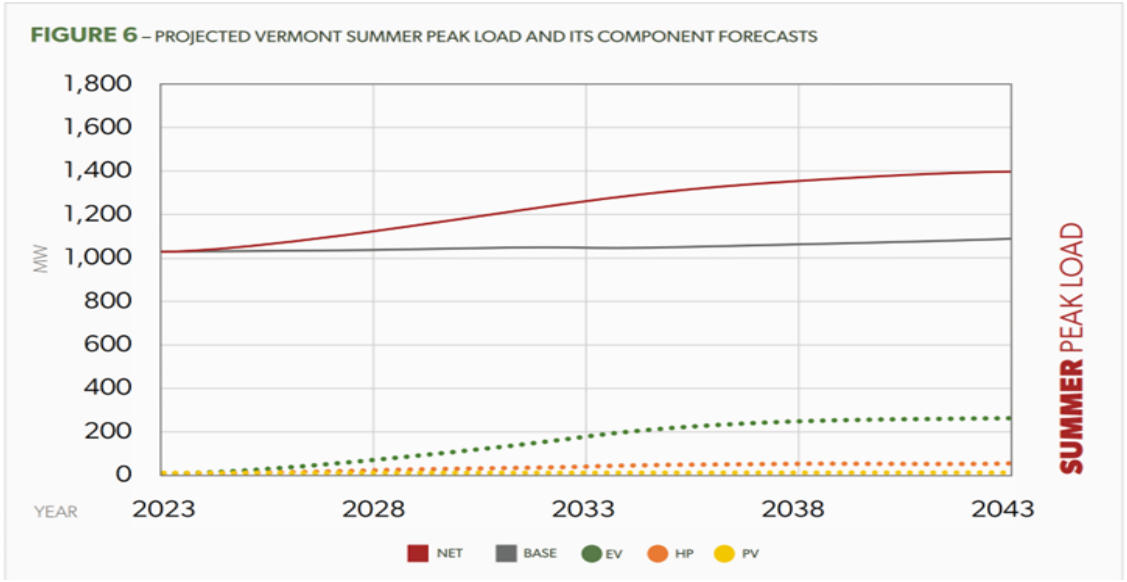
Electric Demand Has Been Stable; Expected to Grow









Demand Forecasts do NOT include expected reductions from load flexibility

Vermont's Energy Efficiency Utilities

Funded through an energy efficiency charge (EEC) on each customer's monthly bill

- Efficiency Vermont
- Burlington Electric Department
- Vermont Gas Systems (VGS)

Budgets are approved by the Public Utility Commission every 3 years through the **Demand Resources Plan Proceeding**

EEC is set to acquire "all reasonably available, cost-effective energy efficiency savings." 30 V.S.A. 209, consistent with "least cost planning" principles of 30 V.S.A. 218c

Primarily electric efficiency services with some funds explicitly available for **thermal and process fuel efficiency** (From Regional Greenhouse Gas Initiative and Forward Capacity Market revenues)

	2024	2025	2026	Total
EVT Electric Efficiency	$46,493,225	$47,684,264	$48,483,214	$142,615,704
BED Electric Efficiency	$2,662100	$2,705,101	$2,767,820	$8,135,821
Total	**$49,155,325**	**$50,389,365**	**$51,251,034**	**$150,751,525**

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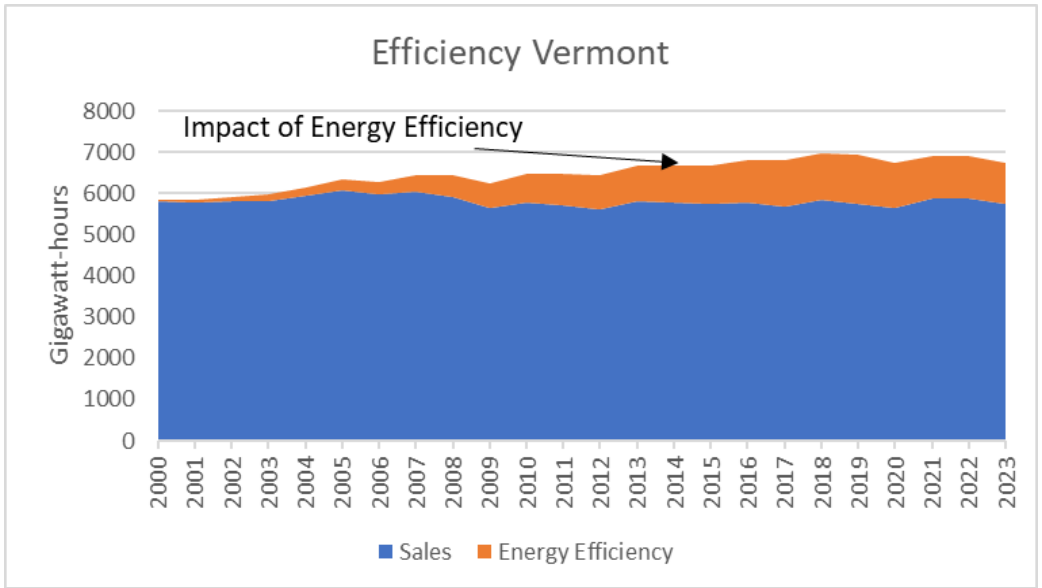
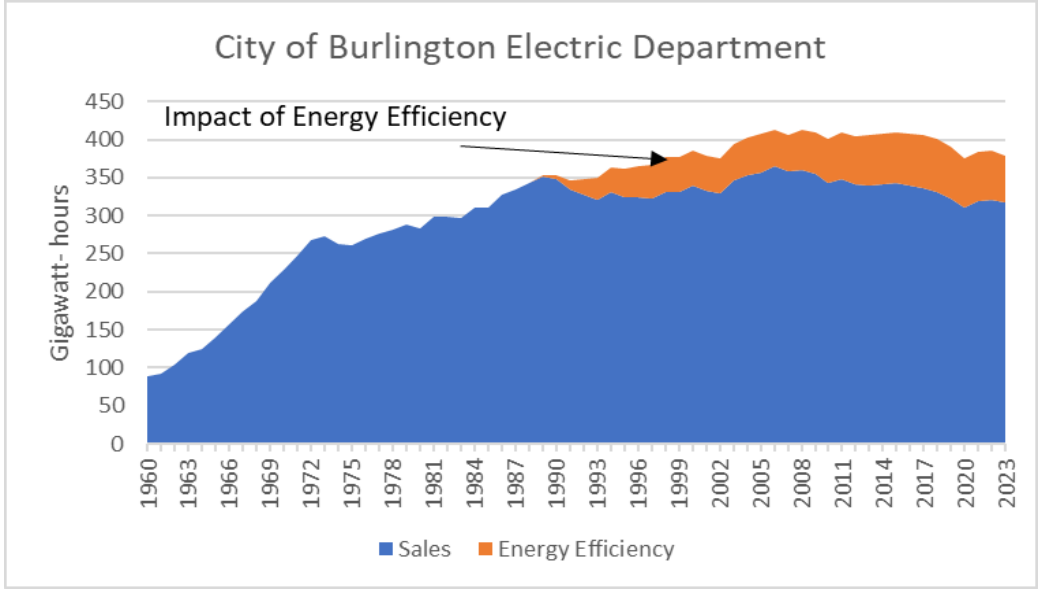
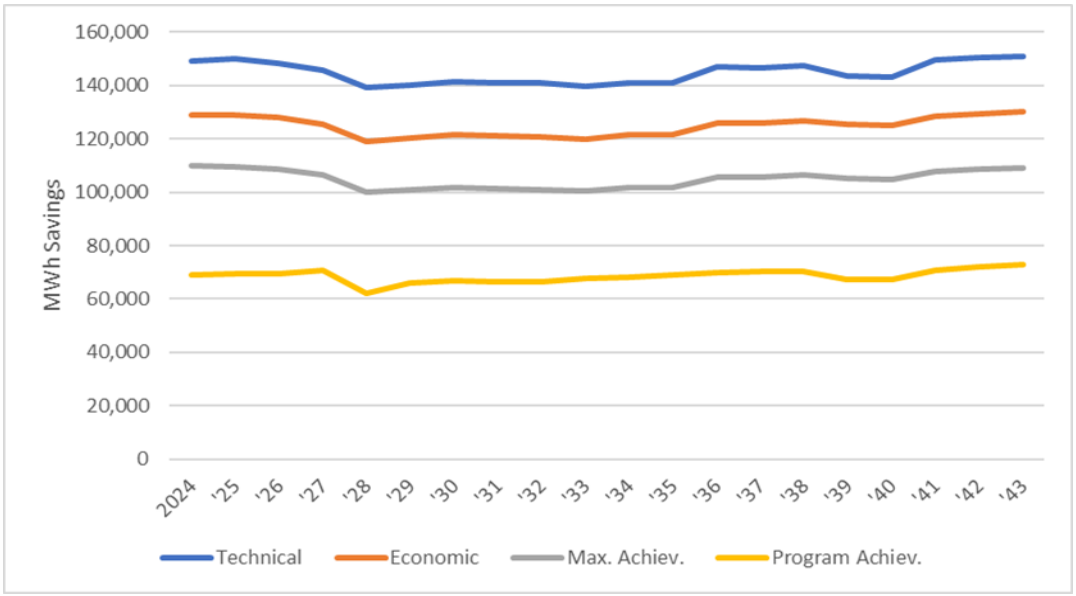
Electric Efficiency Has Helped Maintain Flat Load







EVT Potential Incremental Annual MWh Savings

The chart on the top left shows Efficiency Vermont (EVT) cumulative savings over time, while the chart on the right illustrates the results of Burlington Electric Department (BED) efforts. EVT serves all of Vermont except Burlington.

On the right, EVT's future potential is expected to be declining in the near term before remaining relatively flat

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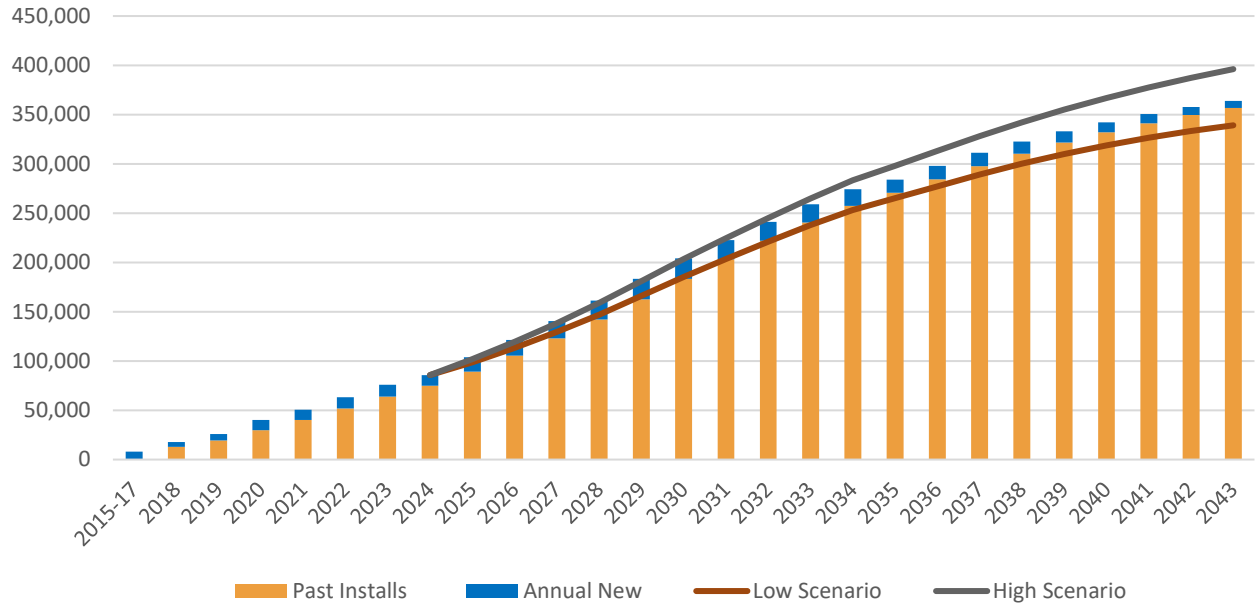
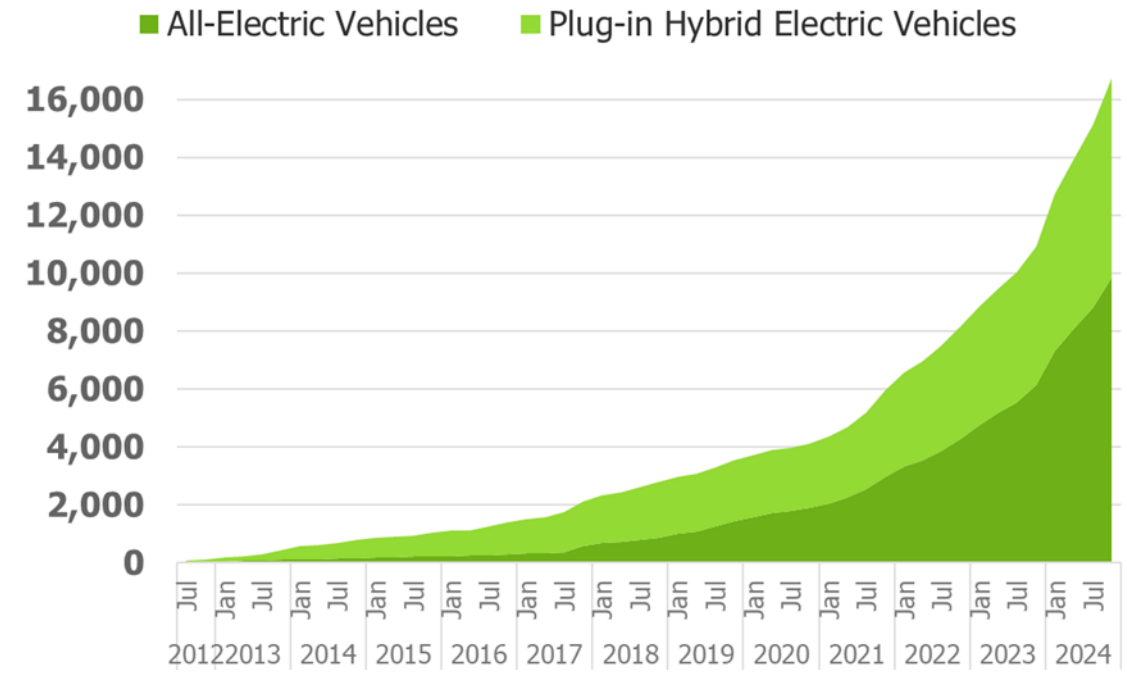
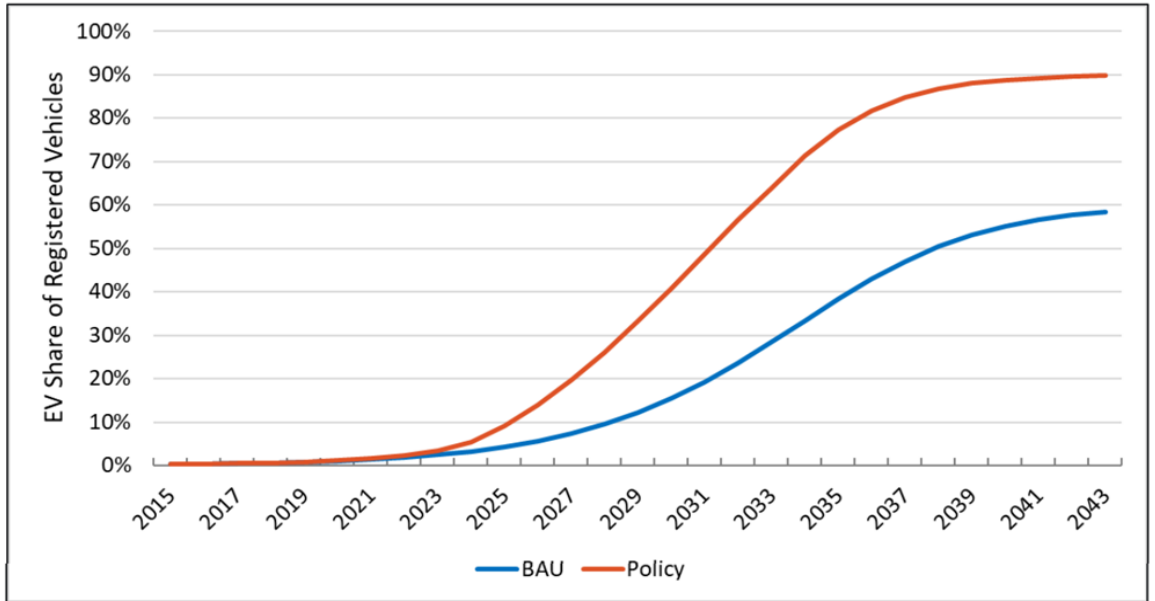
Electrification of Thermal and Transportation Loads Drives Growth





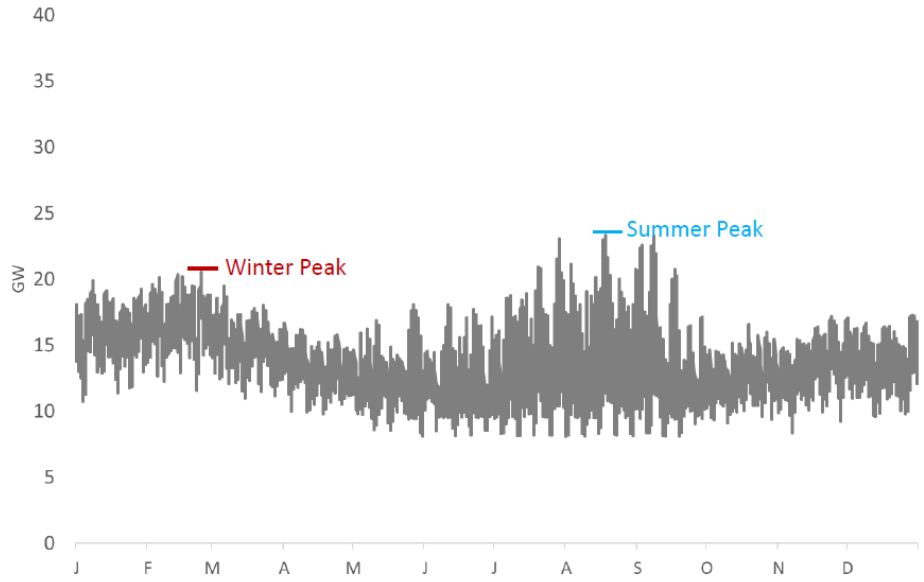


Heat Pumps and Electric Vehicles are the main drivers of increased demand for electricity.

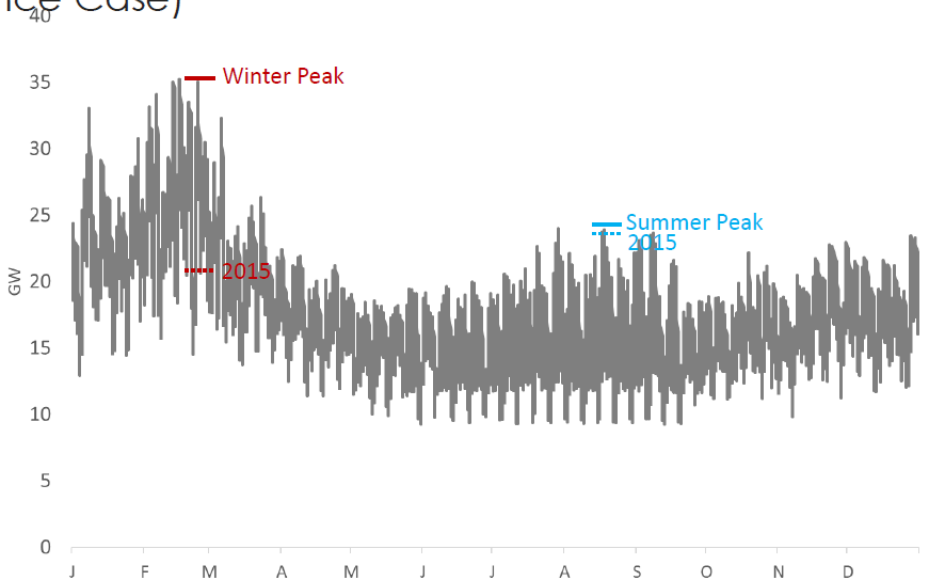
EV's now comprise 2.7% of all registered vehicles, 53% increase from the prior year. 16 models are priced under $40,000 at base trim level.

Electrification is expected to cause additional load growth primarily in winter months

New England 2015 Aggregate Load Profile



Potential New England 2050 Aggregate Load Profile
(Reference Case)



Source: Aidan Tuohy, EPRI: ISO-NE Grid Transformation Day, May 23, 2019: https://www.iso-ne.com/static-assets/documents/2019/05/a2_grid_transformation_solving_technical_challenges_tuohy_epri.pdf

Core Policies & Programs Supporting Renewable Electric Supply

Over the last 20+ years, Vermont has developed several policies and programs to support renewable electricity in the state. These include:

1999 – Net-Metering

Allows Vermont homes, businesses, and communities to generate their own power, such as by putting solar PV on their homes

2005 - SPEED

Sustainably Priced Energy Enterprise Development (SPEED) Program - Required utilities to sign long-term, stably priced contracts for renewable resources

2009 – Standard Offer

A program to deploy small-scale renewable energy by having State government manage purchasing of the energy

2017 – Renewable Energy Standard

Replaced the SPEED Program;

Requires electric distribution utilities to buy an increasing amount of electricity from renewable energy resources over time

In Vermont law, these programs are described in Title 30, Chapter 89 “Renewable Energy Programs”

The Five Tiers of the Renewable Energy Standard

The Renewable Energy Standard now includes five distinct categories ("tiers") of requirements. These tiers are described here. The next slide (Slide 21) illustrates how these requirements will impact Vermont's electricity supply by 2035.

Tier I: Total Renewable Energy

- **Previously** 75% of retail sales by 2032 for all utilities (Certain utilities already100% renewable)
- **Updated:**
  - 100% of total load by 2030 for Green Mountain Power ("GMP") & Vermont Electric Cooperative ("VEC")
  - 100% of total load by 2035 for municipal utilities and Global Foundries ("GF")
- **Eligible Resources** include wind, solar, hydropower, biomass, and landfill gas, among others

Tier II: Distributed Generation

- **Previously** 10% by 2032 for all utilities
  - 100% renewable utilities are exempt from Tier II
- **Updated:**
  - 20% by 2032 for GMP and VEC
  - 20% by 2035 for municipal utilities and GF
- **Eligible Resources** include new renewable energy plants that are 5MW or less, hydroelectric plants that are owned by municipal utilities and/or are Low Impact Hydropower Institute ("LIHI") certified, or net metering that are in Vermont

Tier III: Energy Transformation

- Encourages utilities to support additional distributed generation or other projects to reduce fossil fuels consumed by their customers
- Was not substantially changed by the reform to the RES

Tier IV: New Renewable Energy

- **New Category** Seeks to encourage the use a new renewable generation (developed after January 1, 2010) to support the reliability of the ISO-New England electric system.
- **Requirements:**
  - 20% of total load by 2035 for GMP
  - 10% of total load by 2035 for VEC, municipal utilities, and GF
  - 100% renewable utilities are exempt from Tier IV

Tier V: Load Growth for 100% Renewable Utilities

- **New Category** For utilities that are 100% renewable already (Burlington Electric Department, Swanton Electric Department, and, Washington Electric Cooperative), sets requirements for the percentage of the load growth above the 2024 baseline that must come from new or existing renewable energy.

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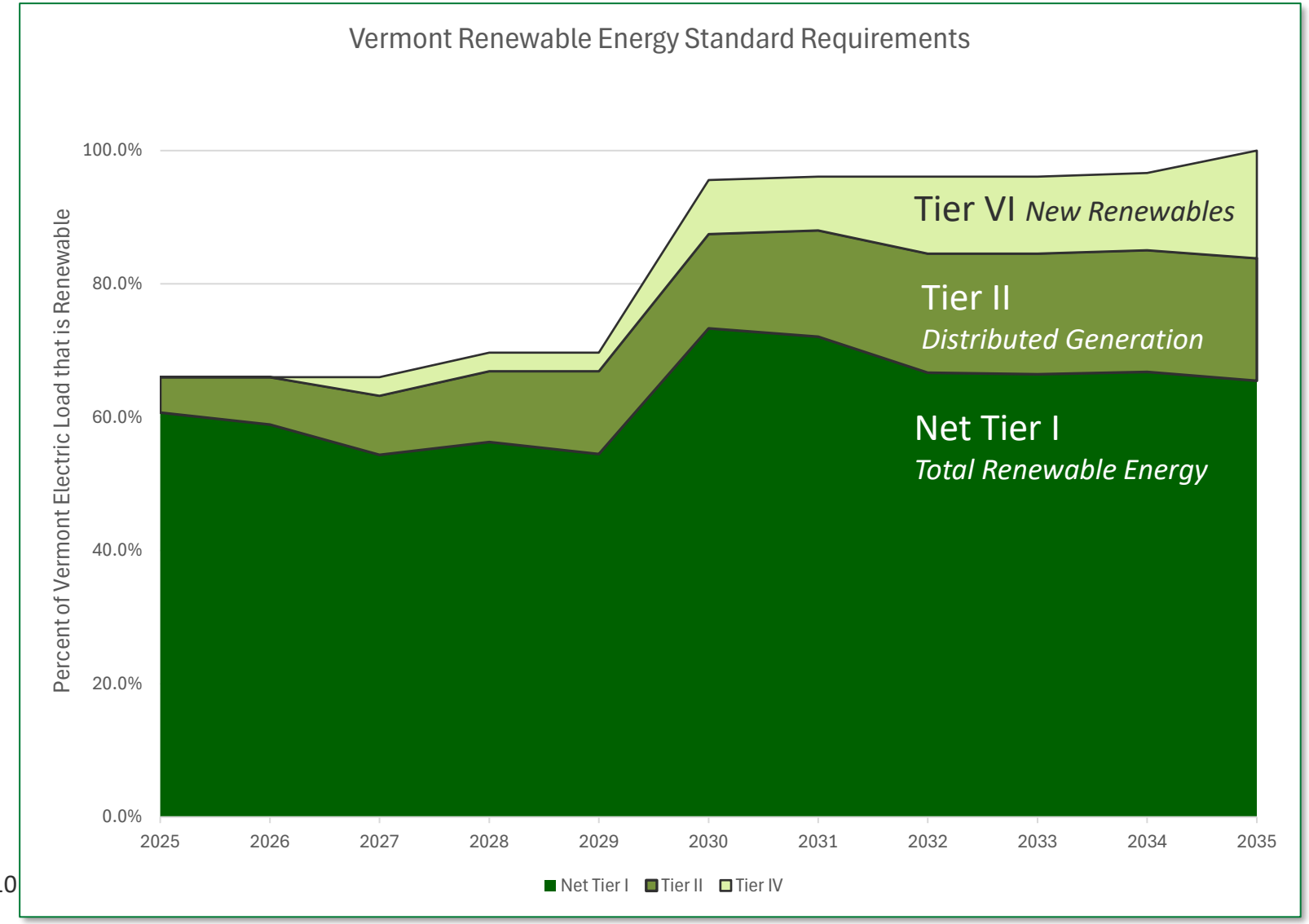
Renewable Energy Standard Requirements Now Reach 100% by 2035



This figure illustrates how Vermont's total electricity supply will likely change between 2025 and 2035 under the new RES. However, please note:

(1) This approximates the statewide requirements for Tiers I, II and IV under the RES. Actual requirements vary by utility and therefore actual percentages will vary based on an individual utility's proportional share of statewide load.

(2) Tier V load growth requirements are not projected here using a statewide load forecast because those requirements are dependent on each existing 100% renewable utility's individual load growth projections.

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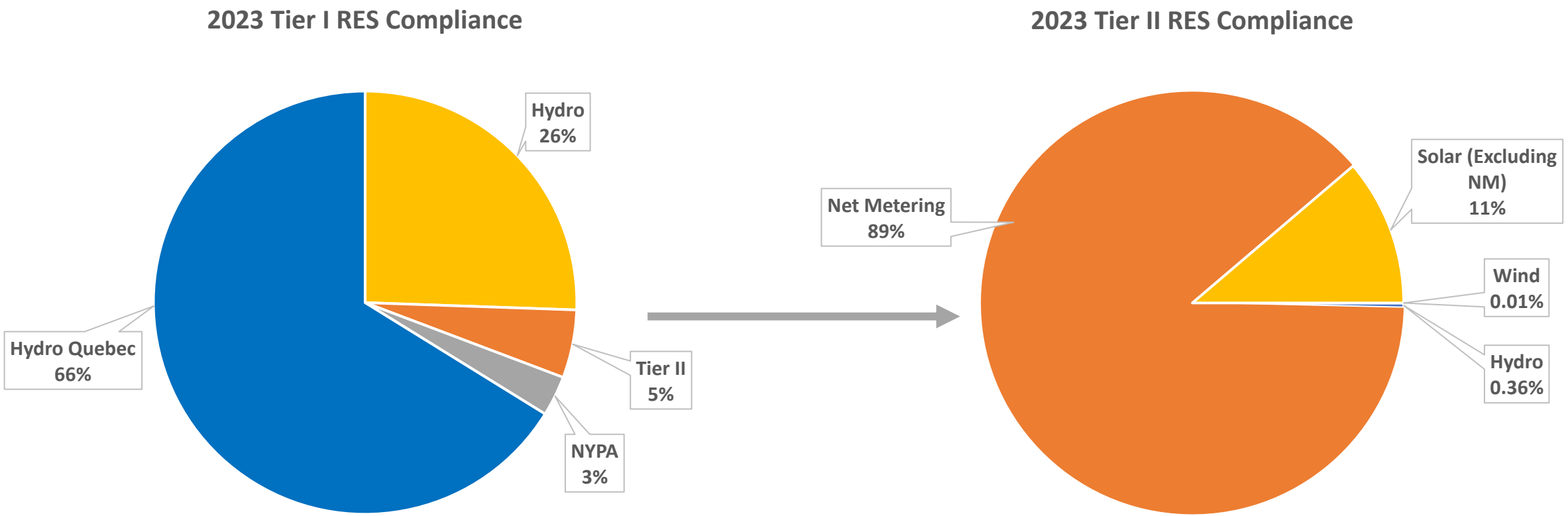
2023 Renewable Energy Standard (RES) Compliance

In 2023 the RES required that Tier I renewable energy sources be at least 63% of the total for all electric distribution utilities' sales. For 2023, Tier I renewable energy credits totaled 80.5% of the State-wide power mix. The types of renewable energy that make up that 80.5% are in the chart below on the left. The chart on the right shows the types of Tier II in-state credits, which were almost all solar.



Source: 2023 Utility RES Compliance fillings with the PUC. Note 2023 RES Compliance is based on *Retail Sales*, while after 2025 Compliance will be based on Total Load

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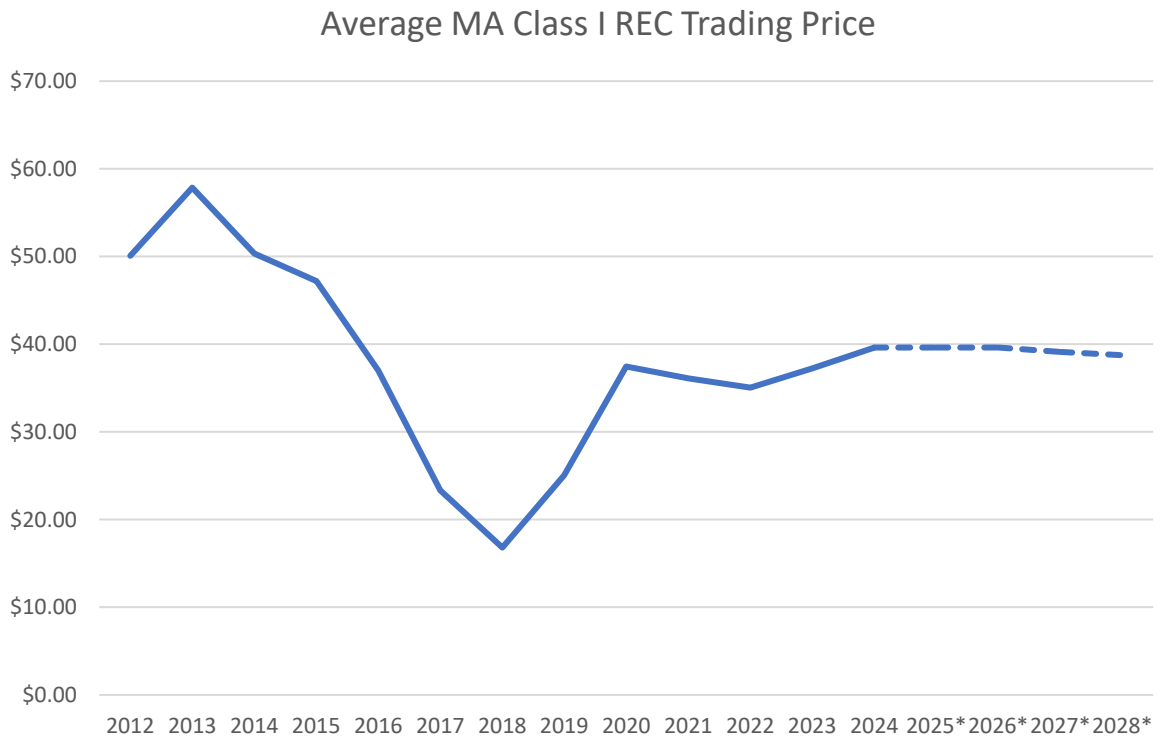
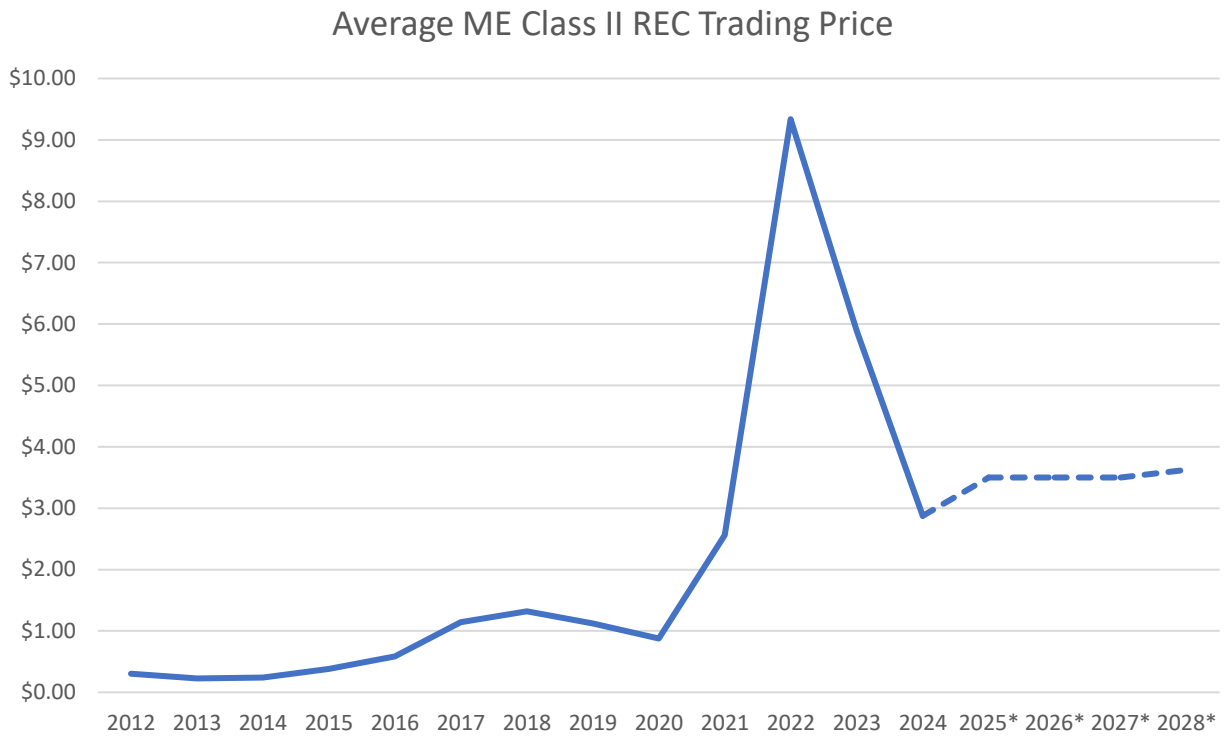
Renewable Energy Credit (REC) Prices Vary by Tier, Reflecting Market Conditions



Massachusetts Class I REC prices are a useful measure of the cost Vermont utilities will incur to fulfill their Tier II and Tier IV Distributed Generation requirements. Prices have stabilized near the Massachusetts Alternative Compliance Payment.



Maine Class II REC prices are a useful measure of the value of Tier I RECs from existing renewable generation. Prices saw a significant spike in 2022 but have since stabilized at a new, higher level.

(*) Prices for 2025-2028 based on broker quotes available as of late 2024.

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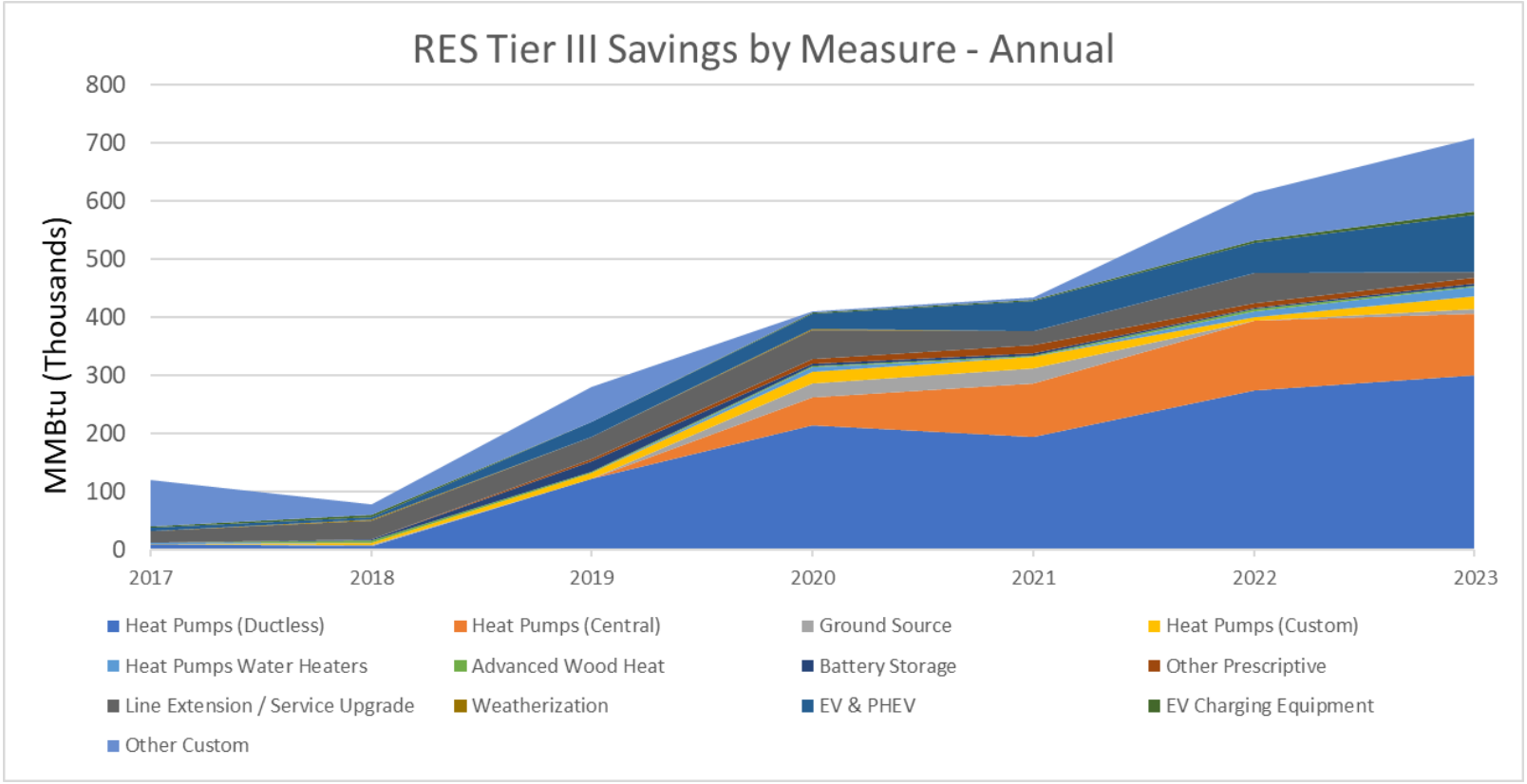
Renewable Energy Standard Tier III

Tier III of the Renewable Energy Standard requires utilities to cause fossil fuel reductions for their customers. Many of the measures taken by utilities electrify fossil fuel end uses, such as thermal demand, water heat demand, or maple sugaring operations. Measures implemented have changed over time, with the more recent mix dominated by cold climate heat pumps.



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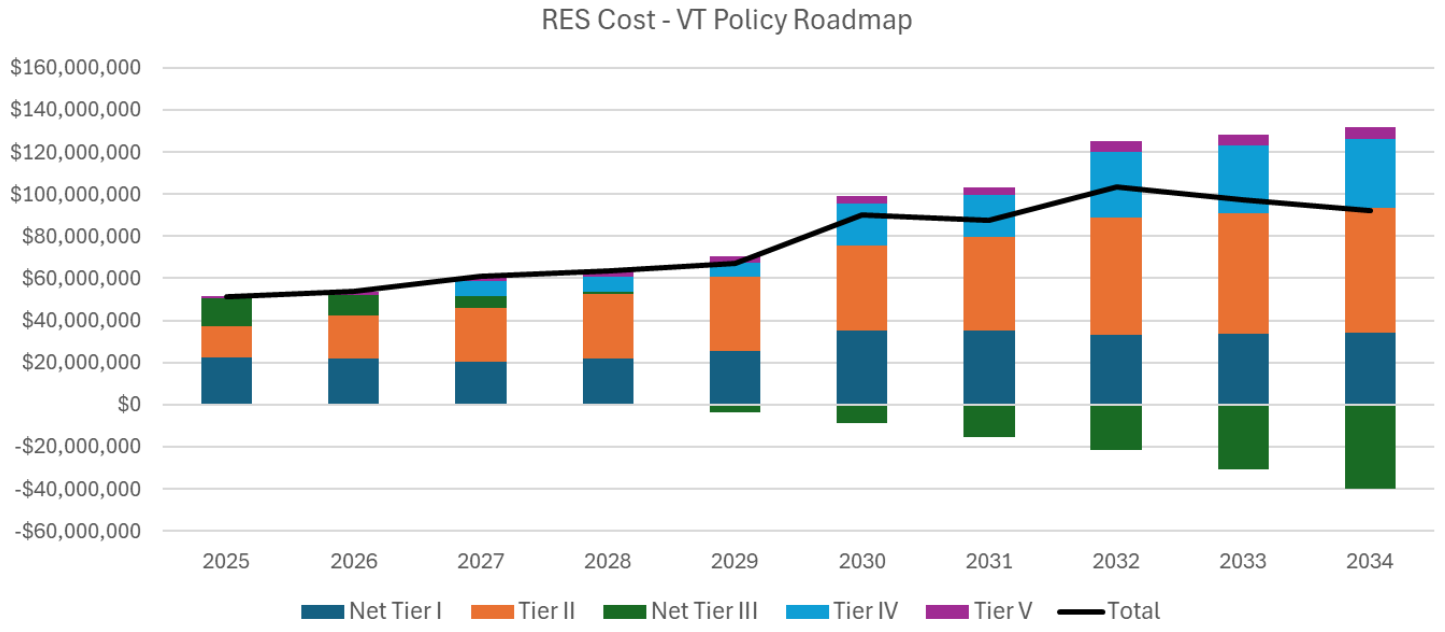
Renewable Energy Standard (RES) Costs Expected to Increase Over Time as Requirements Grow

30 V.S.A. § 202b (e)(7)(B) calls for the Department of Public Service to complete a "Consolidated Model" that projects the impacts of the RES at least 10 years ahead, including three scenarios of results based on high, mid-range, and low energy price forecasts. The results show a 6-8% rate impact from the RES.

As a refence point, 2023 RES costs have been calculated to be $32 million.



Note – Tier III programs build load and generate additional retail sales revenues leading to a net cost reduction over time

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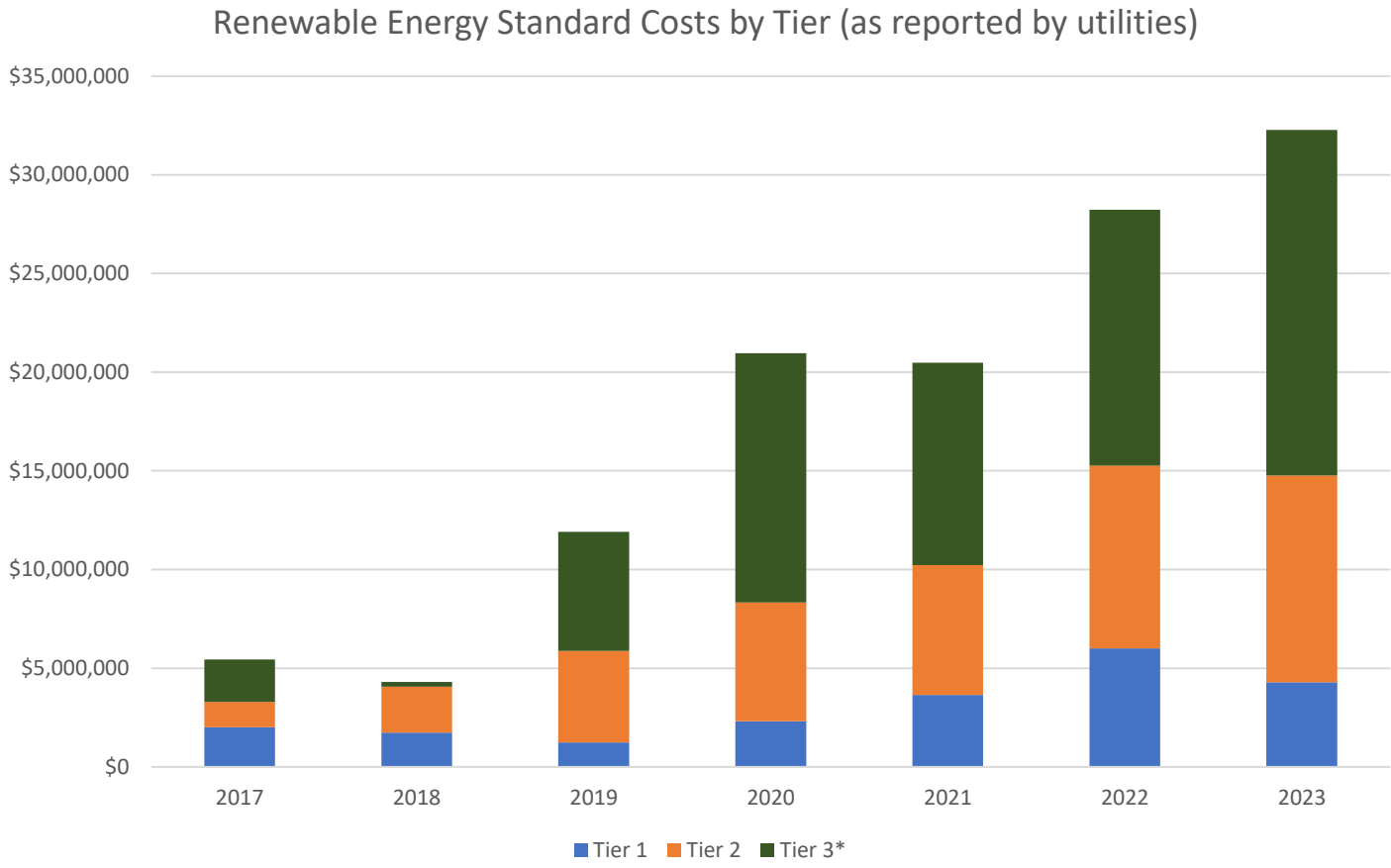
Distribution Utility Reported Costs 2017-2023



*Tier 3 Costs are “gross” costs – they do not reflect the impact of additional kWh sales and revenues (or associated cost)

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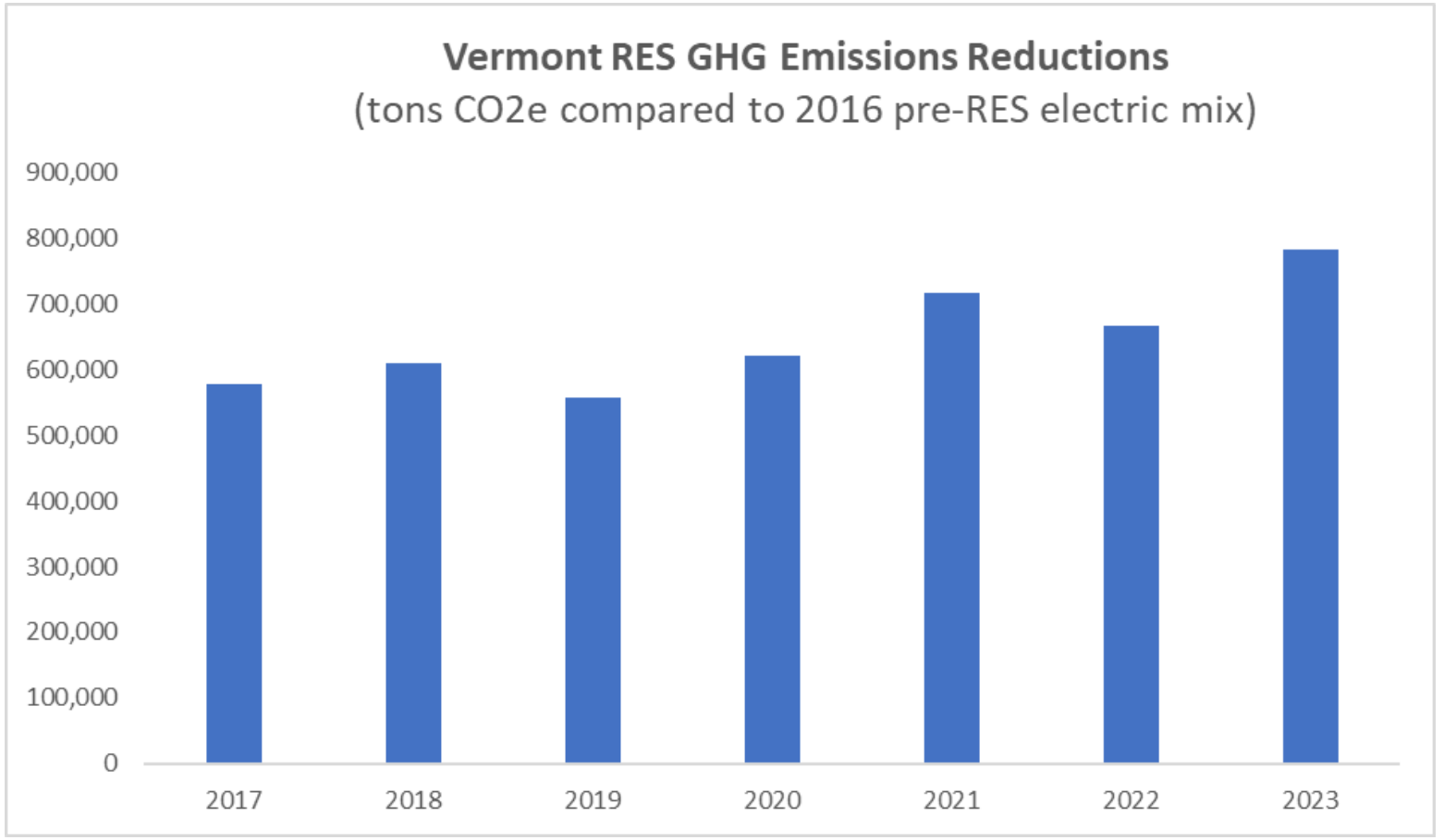
Carbon Savings of the Renewable Energy Standard



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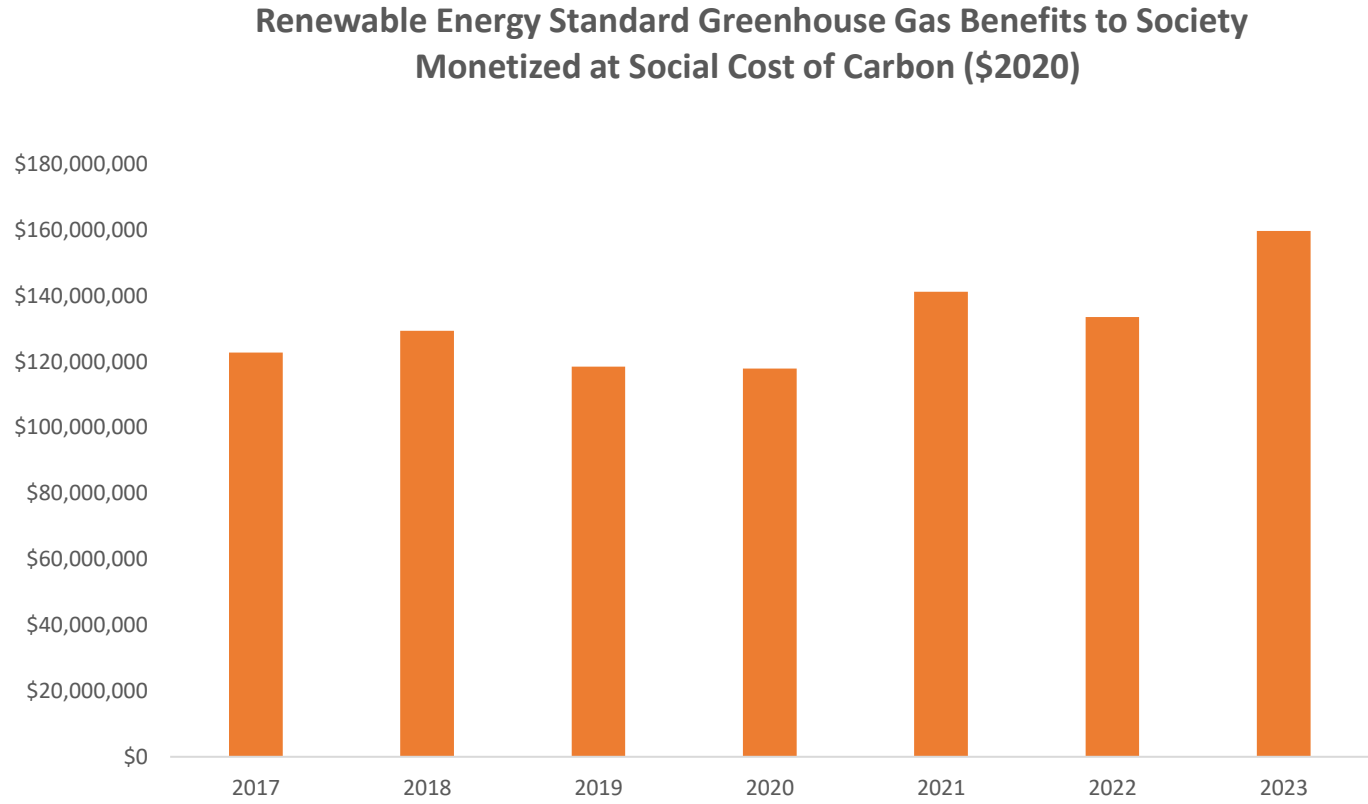
Social Cost of Carbon (SCC)

The National Academy of Sciences defines the Social Cost of Carbon as “an estimate, in dollars, of the present discounted value of the future damage caused by a metric ton increase in carbon dioxide (CO2) emissions into the atmosphere in that year or, equivalently, the benefits of reducing CO2 emissions by the same amount in that year.”

The Climate Council adopted the SCC based on Environmental Protection Agency Estimates

Monetized Greenhouse Gas Emissions Benefits to Society using SCC are substantial



Source for SCC: Environmental Protection Agency (2020-2023), 2017-2020 Estimated using backward trend. All values in $2020

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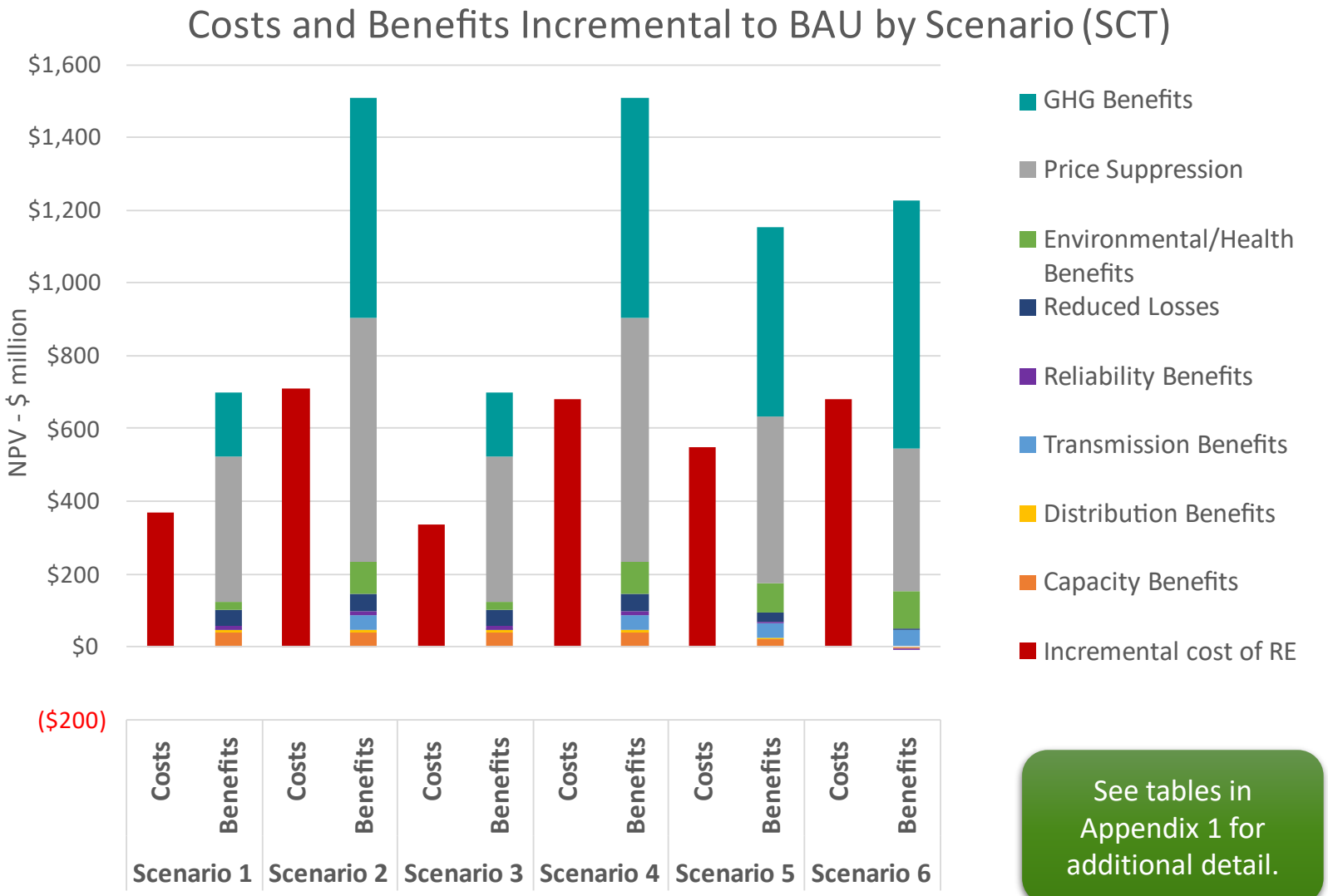
Costs & Benefits by Scenario: Incremental, SCT

Observations:

- Positive net benefits in all scenarios
- GHG and price suppression (all types) drive majority of benefit stack
- Tier I is not assigned any benefits, given absence of "additionality" for legacy resources

Scenario Definitions

	Reg. Tier Target	Tier II Target	Tier I Target	Target Date	Nuclear Tier I Eligible	Biomass Tier I Eligible
BAU	0%	10%	BAU	2032	No	Yes
Scenario 1	0%	30%	100% by 2030	2035	No	Yes
Scenario 2	30%	30%	100% by 2030	2035	No	Yes
Scenario 3	0%	30%	100% by 2030	2035	Yes	Yes
Scenario 4	30%	30%	100% by 2030	2035	Yes	Yes
Scenario 5	30%	20%	100% by 2030	2035	No	No
Scenario 6	50%	10%	100% by 2030	2035	Yes	No



See tables in Appendix 1 for additional detail.

Costs & Benefits by Scenario: Incremental, RIM

Observations:

- RIM focuses exclusively on items impacting VT bills
- Excludes GHG benefits
- Price suppression benefits limited to in-state (~4% of regional benefits)
- RIM approach yields net costs under every scenario

Scenario Definitions

	Reg. Tier Target	Tier II Target	Tier I Target	Target Date	Nuclear Tier I Eligible	Biomass Tier I Eligible
BAU	0%	10%	BAU	2032	No	Yes
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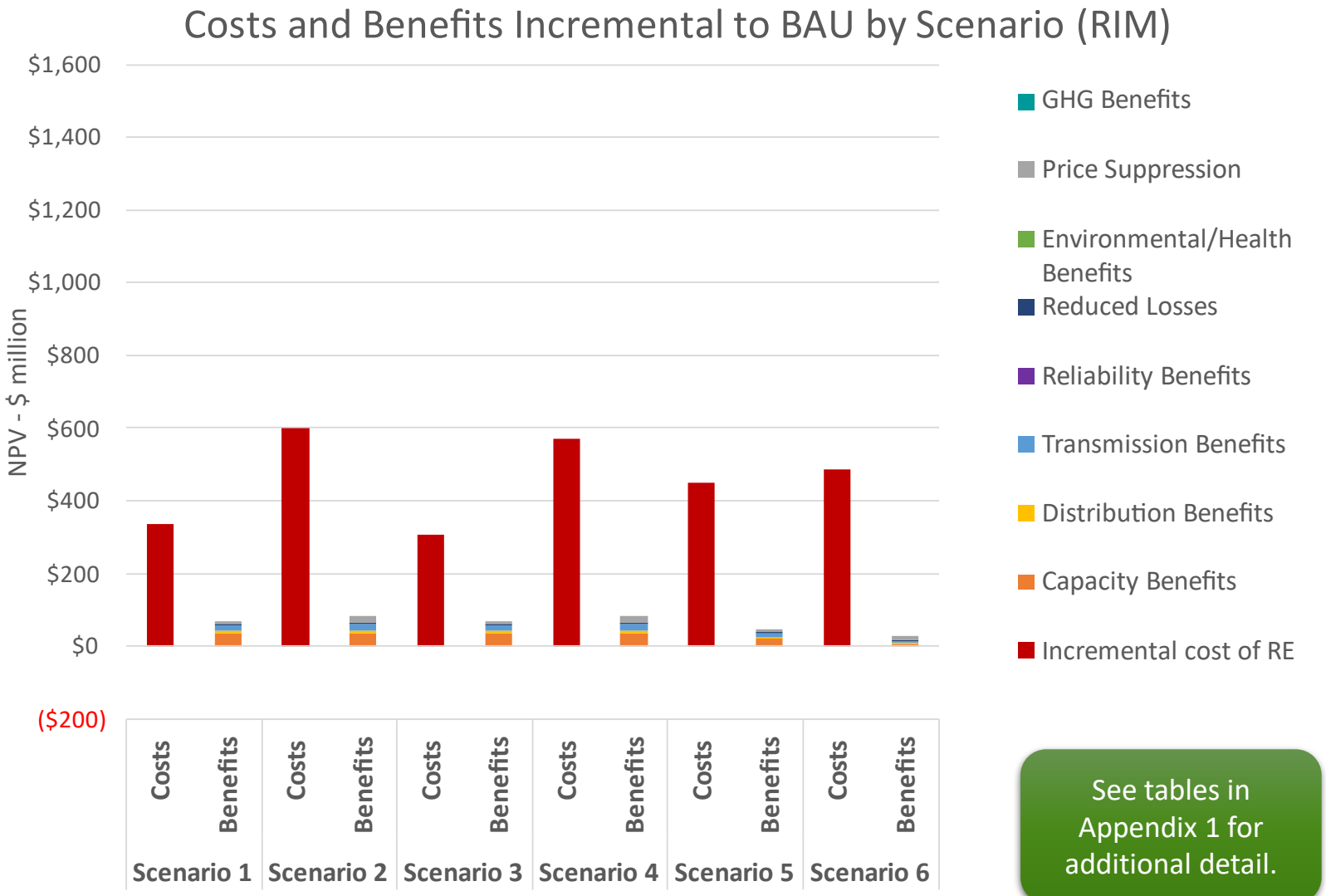

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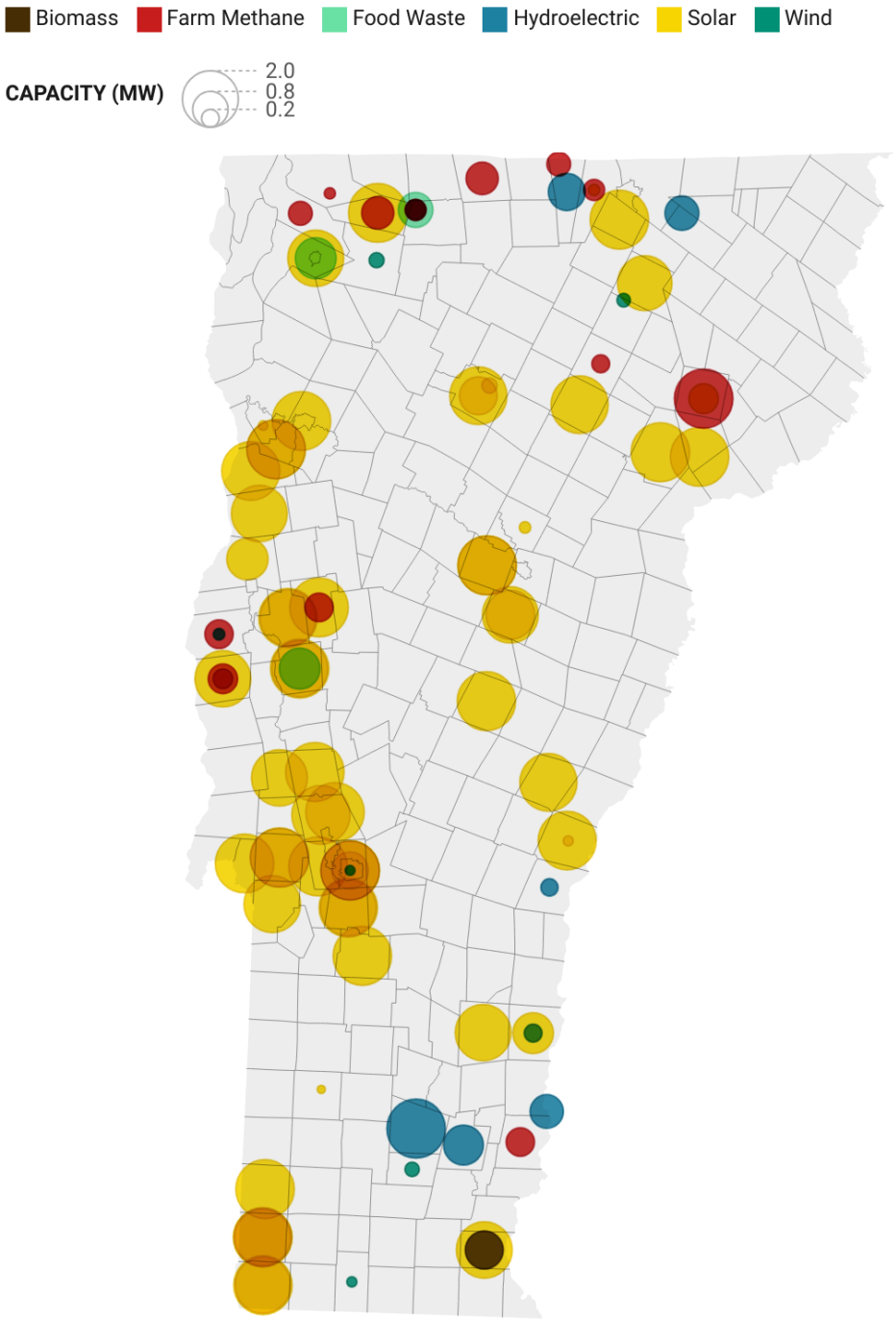

Standard Offer Program

The Standard Offer program aimed to stimulate **small (≤ 2.2 MW), in-state** renewable energy development.

These resources were developed through a centralized solicitation process overseen by the Public Utilities Commission. Originally a lottery system, the program evolved to an annual solicitation for projects.

Projects were selected based on **least-cost** and **resource diversity** criteria and provides long-term, fixed price contracts for resources paid by utilities

The program had a cap of 127.5 MW, which has now all been awarded in contracts. **This means that as of 2023 no new solicitations are scheduled.**

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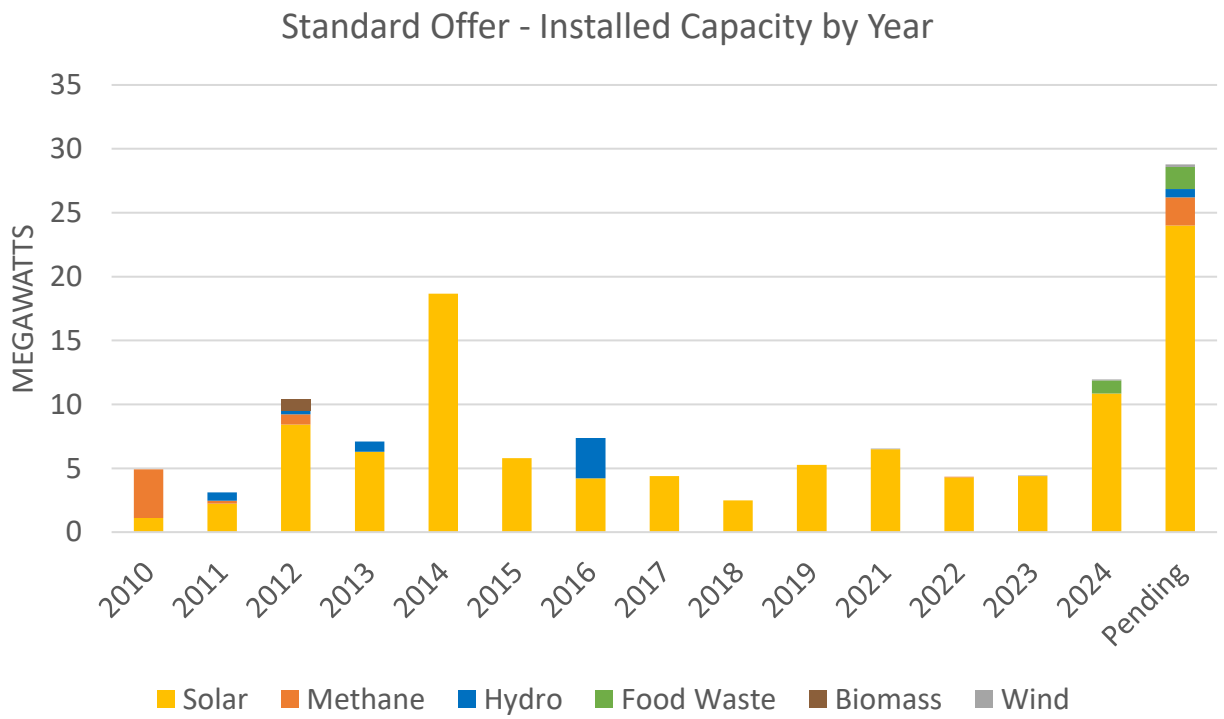
Standard Offer Deployment

The Standard Offer program began in 2009 and has facilitated contracts for its statutory program capacity of 127.5 megawatts (“MW”) of renewable energy. This program underwent several changes since its implementation, with the most notable being an expansion of the initial 50 MW cap and a transition to a competitive procurement process.



Current Deployment:

- **76 Plants (97 MW) Online as of 12/31/24**
- **18 Plants (29 MW) Pending**
- **Estimated Annual Output: 173,532 MWH**

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Standard Offer Program – Base Load

30 V.S.A. § 8009 Baseload renewable power portfolio requirement

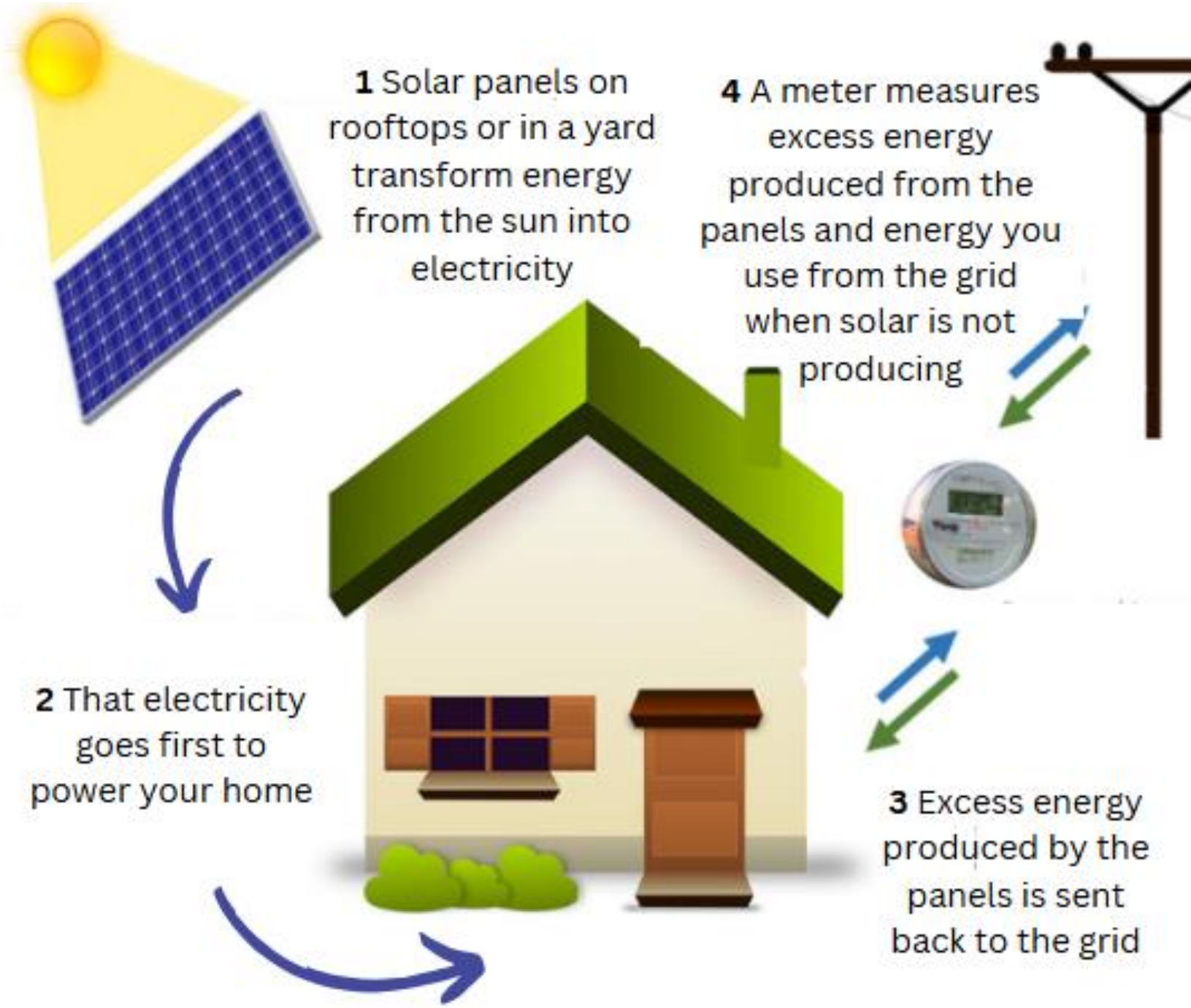
- Encourages plants that "produces electricity essentially continuously at a constant rate"
- Specific to one biomass facility in Vermont: **Ryegate Biomass Facility**
- Fixed price contract, through 2032 if meets certain contract milestones to increase efficiency of the plant
- The Public Utility Commission has a contract with the facility and the Vermont distribution utilities are required to purchase the energy and Renewable Energy Credits from the contract

Net-Metering

Provides a way for Vermont homes and businesses to **self-generate electricity** and **supports in-state renewable energy generation**.

The program has existed since 1999, and the current version ("**Net-Metering 2.0**") started January 2017.

The Public Utility Commission reviews the compensation rates in the program every two years, and is currently on the sixth rate revision, effective July 1, 2024 ("**Net-Metering 2.6**")



Net-Metering Program – Compensation Structure

In the current program, net-metering systems are compensated for their production based on:

Generation → How much electricity did your system generate each month and how did that compare to your electric usage? Is the system offsetting consumption?

Category (Capacity x Location) →
Category I: smaller than 15 kW
Category II: 15 -150 kW on a preferred site*
Category III: 150-500 kW on a preferred site
Category IV: 15-150 kW not on a preferred site

REC Disposition → Did you keep the Renewable Energy Certificate or assign it to the utility?

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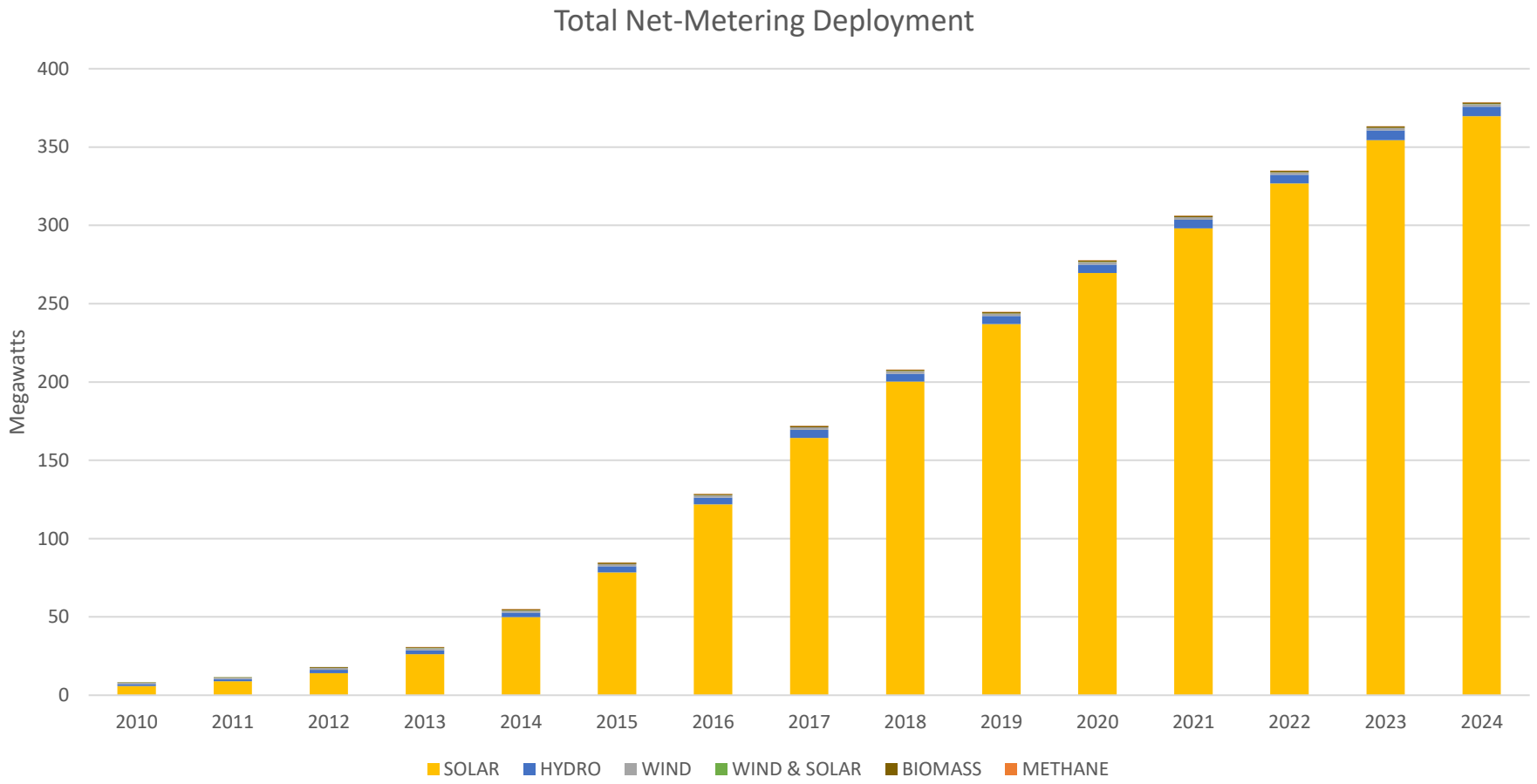
*Preferred sites include pre-existing structures, parking lot canopies, previously developed land, brownfields, landfills, gravel pits, town-designated sites, Superfund sites, on the same parcel as a customer taking at least 50% of output

Net-Metering Compensation

- For projects up to 500 kW, including group/virtual projects until December 31, 2024 (until December 31, 2025 for systems serving low-income multifamily affordable housing; otherwise must be located on or adjacent to customer parcel)
- Customer can only net out energy portion of bill, can carry credits forward for 12 months
- Each kWh generated credited at retail (or blended, e.g., $0.18398/kWh) rate with adjustors for REC disposition and siting
- Updated every two years; next biennial review in 2026

		RECs			CATEGORY				
Program	CPG Application Date	Statewide	Transfer to Utility	Retain Ownership	I	II	III	IV	Hydro
NM 1.0	before 1/1/2017	$0.149	n/a		n/a				
NM 2.0	1/1/17-6/30/18	$0.149	$0.03	($0.03)	$0.01	$0.01	($0.01)	($0.03)	$0.00
NM 2.1	7/1/18-6/30/19	$0.154	$0.02	($0.03)	$0.01	$0.01	($0.02)	($0.03)	$0.00
NM 2.2	7/1/19-2/1/21	$0.154	$0.01	($0.03)	$0.01	$0.01	($0.02)	($0.03)	$0.00
NM 2.3	9/1/21-8/31/22	$0.164	$0.00	($0.04)	$0.00	$0.00	($0.03)	($0.04)	$0.00
NM 2.4	9/1/21-8/31/22	$0.164	$0.00	($0.04)	($0.01)	($0.01)	($0.04)	($0.05)	$0.00
NM 2.5	9/1/22-6/30/24	$0.17141	$0.00	($0.04)	($0.02)	($0.02)	($0.05)	($0.06)	$0.00
NM 2.6	**7/1/24-7/31-26**	**$0.18398**	**$0.00**	**($0.04)**	**($0.04)**	**($0.04)**	**($0.07)**	**($0.08)**	**$0.00**

Cumulative Net-Metering Deployment: ~375MW



**Derived from utility monthly DG resource surveys to ISO-NE and includes data for GMP through Dec. VEC, WEC & BED through Nov. 2024; VPPSA through August 2024; Hyde Park though Aug. 2022; and Stowe through Dec. 2021"*

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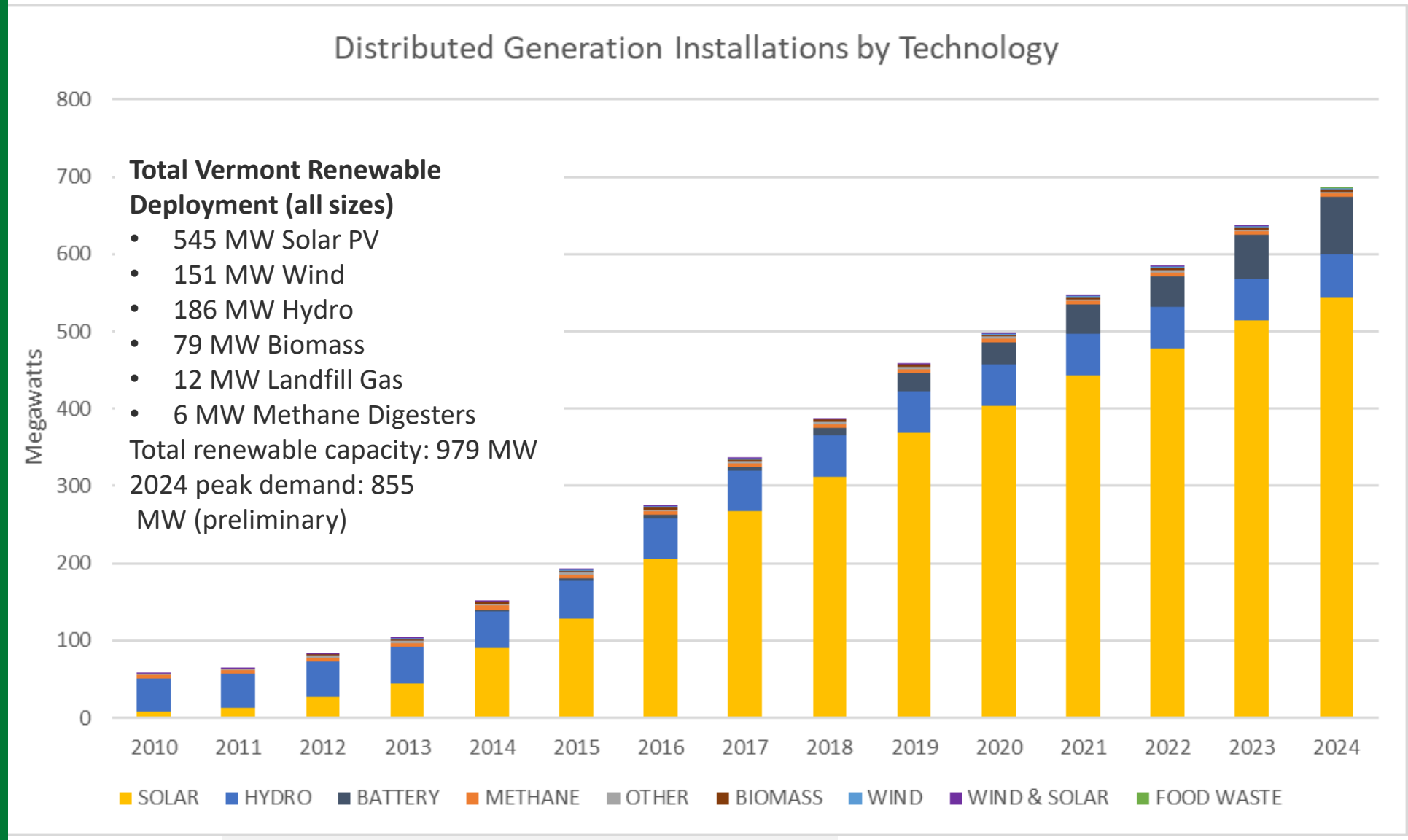
Net-Metering 2023 Cost

- Based on data collected from each utility, the cost of net-metering in 2023 was more than $55 million higher than the market value of the products provided resulting in an inequitable cost-shift from participating net-metering customers to non-participating customers. This includes the cost associated with all net metering since the program's inception.

- Each biennial review by the Commission has resulted in gradual decreases to the compensation rate for new net-metering systems, which is somewhat offset by increases in utility retail rates. Net-metering remains one of the highest-cost renewable resources.

Utility	Reduced Retail Sales (kWh)	Excess Generation (kWh)*	Gross Generation (kWh)	Above-market Cost ($)
BED	1,614,957	4,345,540	5,959,307	$472,138
GMP	80,802,313	285,735,687	366,538,000	$47,295,367
HPE	1,543,371	92,602	-	$36,749
SED	2,245,726	235,583	-	$337,663
VEC	16,782,961	18,348,409	35,131,370	$4,319,498
VPPSA	3,534,413	10,554,004	14,097,989	$1,508,566
WEC	6,252,059	1,436,720	7,675,669	$1,931,079
TOTAL	**112,775,800**	**320,748,545**	**429,402,335**	**$55,901,060**

Vermont currently has significant penetration of renewables, especially Distributed Energy Resources.



VT now has 686 MW of operational supply side DERs including 74 MW of battery storage

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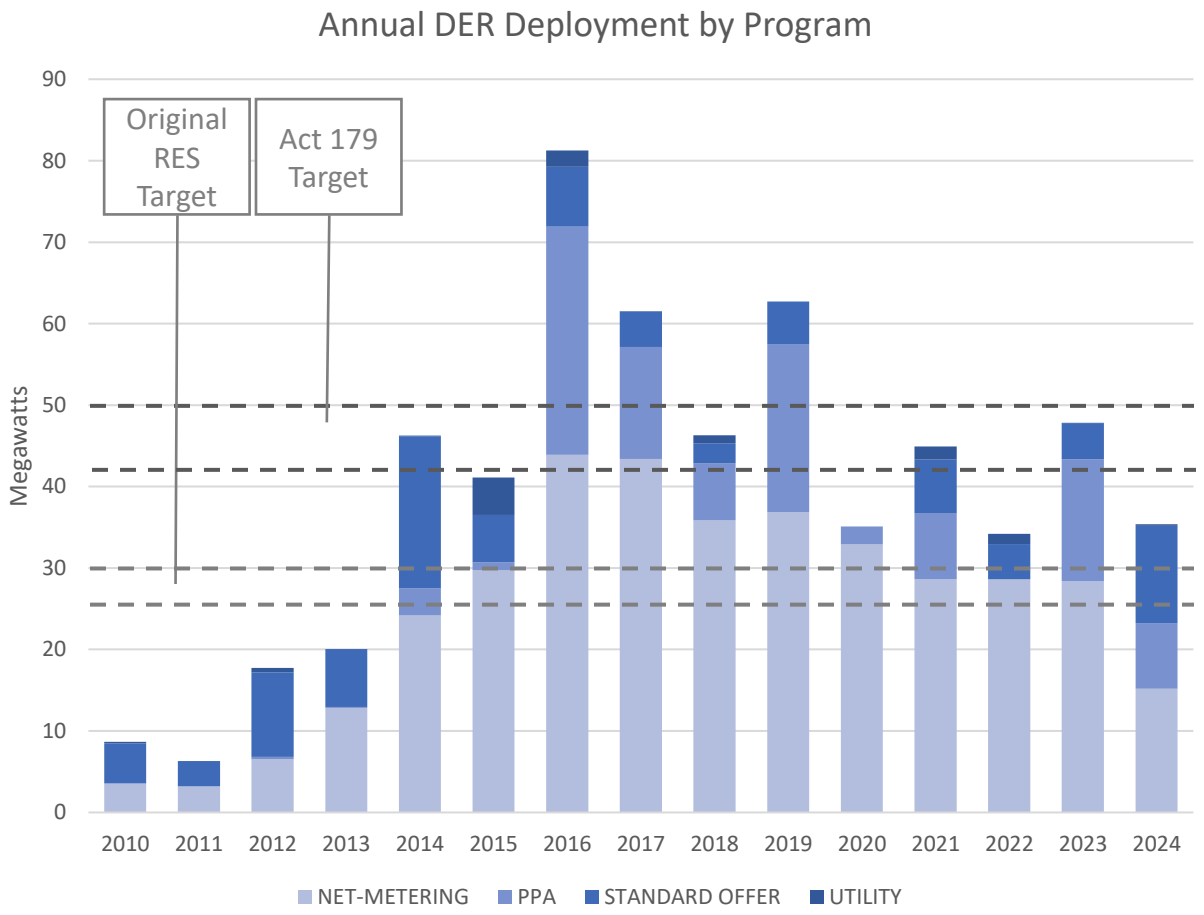
Statewide Distributed Energy Resource(DER) Deployment

Approximately 25-30 MW per year of distributed generation (DG) was needed to meet requirements under Tier II of the previous Renewable Energy Standard (RES).

With the passage of Act 179, RES requirements have increased, requiring approximately **42-50 MW** per year of new DG from 2025-2034, depending on loads.

Tier II resources are likely to come from net-metering, Standard Offer, and resources owned by, or under contract to, utilities.

30.4 MW of new solar DG installed in 2024 as of December. Vermont utilities sold ~125,000 excess Tier II eligible RECs (~95 MW of solar) into other regional compliance markets and banked an additional 20,000 Tier II RECs (~15 MW of solar) given current oversupply. As Tier II requirements increase and these excess supplies are used for Vermont's compliance with Tier II (reducing revenue gained from selling the RECs), new DG development is expected to ramp up to meet that new demand. Many utilities have already submitted contracts for review for new, utility scale projects.



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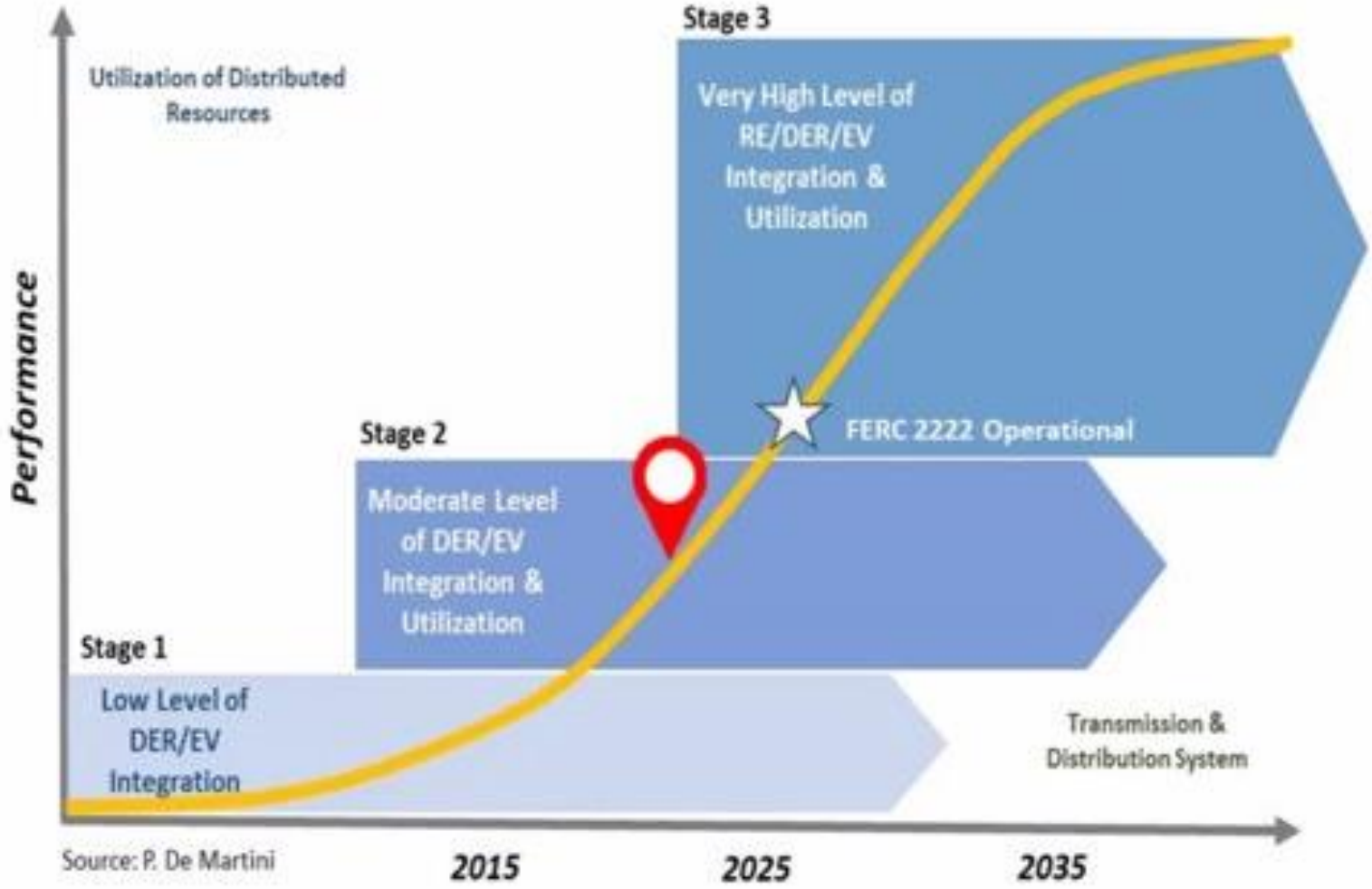
Planning for the Future Grid

Increased use of distributed energy resources means additional complexity in grid planning and operations

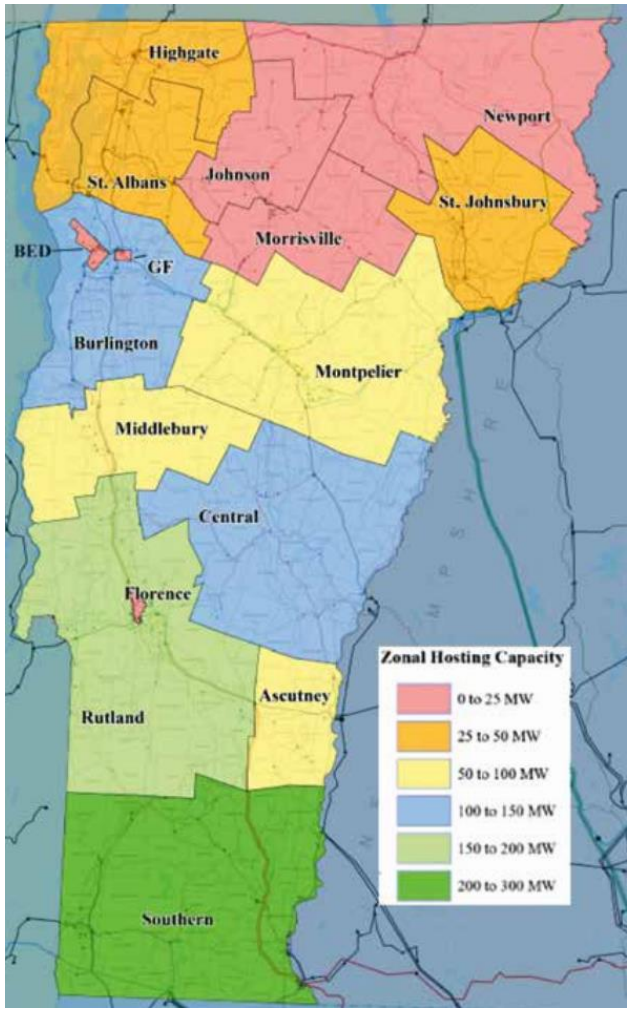


Stage 3: High DER/EV adoption; optimization and orchestration of DERs for the provision of grid services; alternative grid and ownership structures, including community microgrids; interjurisdictional coordination of markets, planning, and operations

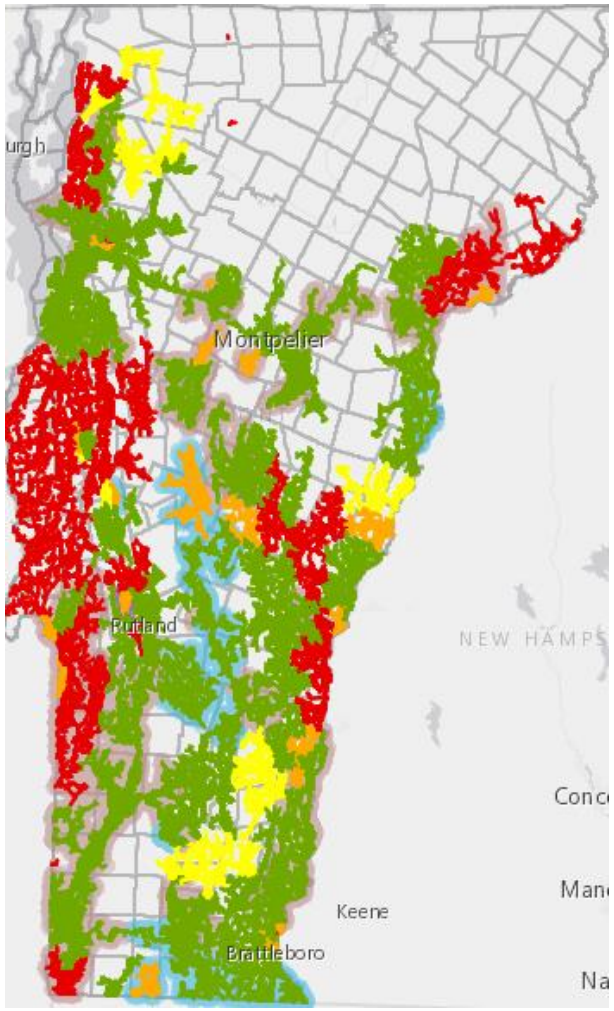
Stage 2: Moderate DER adoption; emphasis on use of DERs as load-modifying and energy resources; IDP and grid modernization required to enable real-time visibility and operational use of DERs

Stage 1: Low DER adoption; emphasis on reliability, resilience, and operational efficiency; no material change to infrastructure, planning, and operations

Generation Constraints



Transmission hosting capacity by region from 2024 VELCO Long-Range Transmission Plan



GMP distribution system hosting capacity from Green Mountain Power Solar Map

Vermont has experienced a high rate of growth in distributed energy resources, specifically in the deployment of solar installations. Having seen almost 50 megawatts (MW) of small-scale solar installations each year for the better part of the past decade, and with total Distributed Energy Resource (DER) capacity close to 600 MW, there are certain parts of the Vermont grid that are saturated with generation resources. Particularly in western Vermont, several distribution substations are no longer able to accommodate the connection of additional distributed generation resources above a certain size. Reverse power flow from these resources would exceed utility system equipment ratings. Additionally, a transmission constraint in the northern part of Vermont, in an area referred to as the Sheffield-Highgate Export Interface, means that utility-scale generation within this area is subject to limits and curtailment by the ISO-NE system operator to maintain system reliability. The curtailment events have been lessened in the past year due to lower import levels from Hydro Québec over the Highgate converter. For how long this trend will continue depends largely on prevailing regional market factors.

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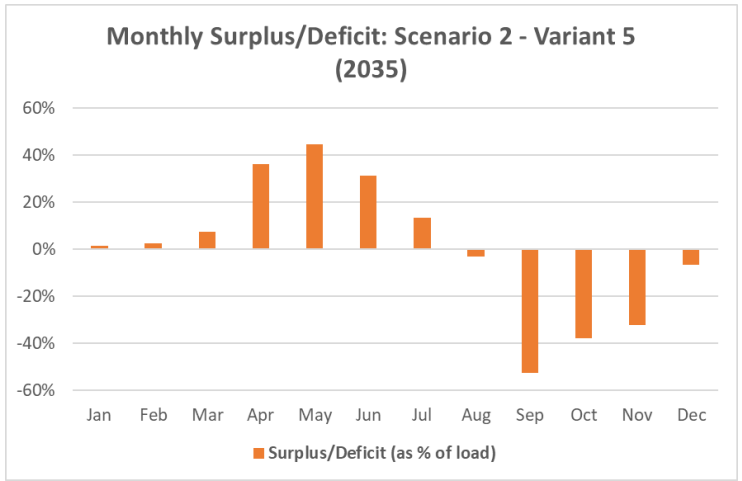
Variability of Load and Generation Creates New Challenges that underscore need for flexibility mechanisms

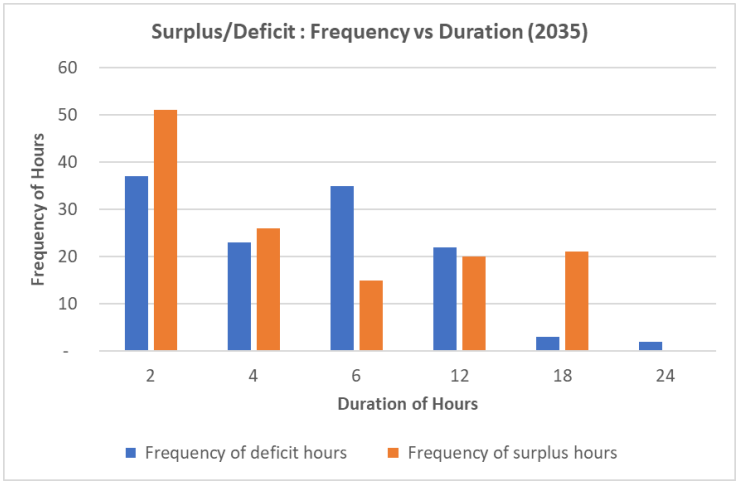
Vermont's Renewable Energy Standard (and all regional RPS) compliance is currently demonstrated on an annual basis, meaning that load that occurs when renewables aren't producing is often still being physically supported with non-renewable resources.

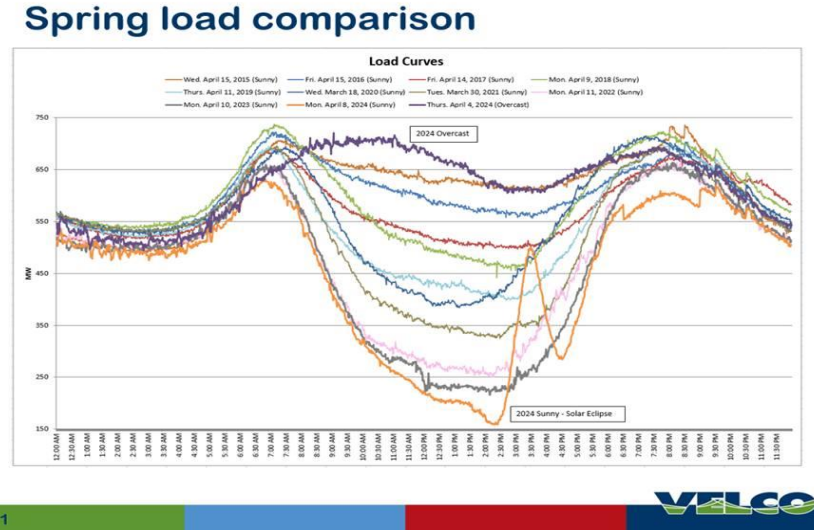
As policymakers consider quarterly, monthly, or hourly compliance, storage and load management options will be required to align generation and load.

The bar charts on the left show an example from the Public Service Department's technical analysis, showing significant monthly energy surplus/deficit in the year 2035, assuming a 20% Tier II plus a 20% Regional Tier. The second bar chart shows the frequency of different surplus/duration deficits.

The line chart shows data from VELCO highlighting the impact of solar on load during the day, comparing a 2023 overcast spring day to sunny spring days from the last several years. The map shows Green Mountain Power's distribution circuits that have headroom to support additional solar (green) and those that don't (red).







Reliability and Resilience

- Utilities improving resilience planning including evaluating threats, hazards, and system vulnerabilities, then evaluating solutions
  - **PSD to pursue resilience proceeding at PUC with technical assistance from national labs**
- Utilities continue to implement reliability & resilience solutions by planning for and implementing least-cost solutions including:
  - Undergrounding lines
  - Relocating lines to roadside
  - Line hardening (i.e. tree wire)
  - Vegetation management
  - Islandable energy storage
- Utilities continuing/improving short/mid-term winter weather forecasting efforts, preparatory exercises, and response practices
- Coordination between State Energy and Security Plan and State Hazard Mitigation Plan, participation in state Resilience Implementation strategy and on Climate Action Plan Rural Resilience & Adaptation Subcommittee

Credits from top, clockwise: VTDigger, David Young/WEC, GMP, GMP, VTDigger

Energy Storage and Other Flexible Resources

Energy storage

- 74 MW operational, distributed batteries
- Another 38 MW permitted or in permitting
- Additional 255 MW transmission-scale batteries in the ISO-NE active interconnection queue

Other flexible load management

- Time-of-use rates
- EV rates
- Programs
  - Heat pump peak hour reduction (GMP/BED)
  - Critical peak water heater interruption (GMP)
  - Voluntary conservation – Defeat the Peak (BED) / Beat the Peak (VEC)

Vermont Storage Deployment in New England Context

State	Goal*	Milestone	2024 summer peak (MW)**	Goal as % of 2024 summer peak	2024 deployed storage (MW)	Current % of peak
CT	1000 MW x 2030	300 MW x 2024	5962	17	18.5	0.3
ME	400 MW x 2030	300 MW x 2025	1919	21	64	3.3
MA	1000 MWh x 2025	N/A	11470	2***	307	2.7
NH	N/A	N/A	2440			
RI	N/A	N/A	1719			
VT	N/A	N/A	855		74	8.7 (13.1 including under construction/in permitting; note these does not include proposals for transmission-level storage)

The above table shows New England State's storage deployment targets. While three states have targets, those same states are currently at far lower levels of storage deployment relative to Vermont, as measured by percent of peak load. Vermont is already on pace to exceed the targets set in other states.

*MA and CT storage goals apply just to Investor-Owned Utilities ("IOUs"). ME's is unclear.

** Preliminary 2024 summer peak contribution values

***Assumes all batteries are 4 hours in duration

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Electric Vehicle Rates

Act 55 of 2021, the Transportation Bill, required each distribution utility to offer electric vehicle rates by June 30, 2024. The rates must encourage EV adoption without adversely impacting other ratepayers.

Access to EV rates typically requires a special Level 2 charger that communicates with the utility via third-party software provider.

Utility	EV Rate Now Available?	Summary
Green Mountain Power	Yes	Offers time-based and peak event-based rates, and a demand charge exemption for high-speed public chargers
Burlington Electric Dept.	Yes	Offers time-based and peak event-based rate options
VPPSA Representing 11 Municipal Utilities	Under Development	Developing varying price program based on electricity market conditions
Vermont Electric Coop.	Yes	Offers $8 bill credit each month that charging occurs entirely outside peak demand events; also offers time-based rates for residential and commercial customers
Stowe Electric Dept.	No	PUC granted extension to 2025 for technical reasons
Village of Hyde Park	No	PUC granted extension to 2026 for technical reasons
Washington Elec. Coop.	No	PUC granted extension to 2027 pending AMI deployment
GF Power	No	PUC granted general exemption as a non-retail utility

Grid Resilience and Reducing Outages Program

- PSD is the recipient of ~$15 million over four years via the US Department of Energy's (DOE) Grid Resilience State Formula Grant Program
- Received allocations for year 1-3 (combined) in two tranches totaling $8.4 million – Tranche 1 inclusive of year 1 & 2 allocations
- Additional expected allocations: $2-4million in '25, '26*
- Eligible measures reduce duration and frequency of electric outages, with focus on disadvantaged communities
- PSD expects Distribution Utilities will be the likely subrecipients of this funding

*Pending allocation of funding in future federal budgets

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Affordable Community Renewable Energy (ACRE) Program

$10 million for “the Affordable Community-Scale Renewable Energy (ACRE) Program…to support the creation of renewable energy projects for Vermonters with low-income”

- Distribution Utilities (DU) developed four subprograms: Green Mountain Power, Vermont Public Power Supply Authority, Vermont Electric and Washington Electric Cooperatives, and Stowe Electric Department
- Benefits delivered as monthly on-bill credit to eligible customers – 185% Federal Poverty Guideline
- Credits range $12-45 monthly savings each of the 8,000 participants for 5-10 years - $240-500 annual savings
- Each DU subprogram serves as a pilot, ideally leading to a future statewide low-income energy assistance program
- Provides a model for alternative to net-metering
- Currently providing benefits to more than 1,600 participants with other projects coming on-line to deliver more energy burden reductions for Vermonters

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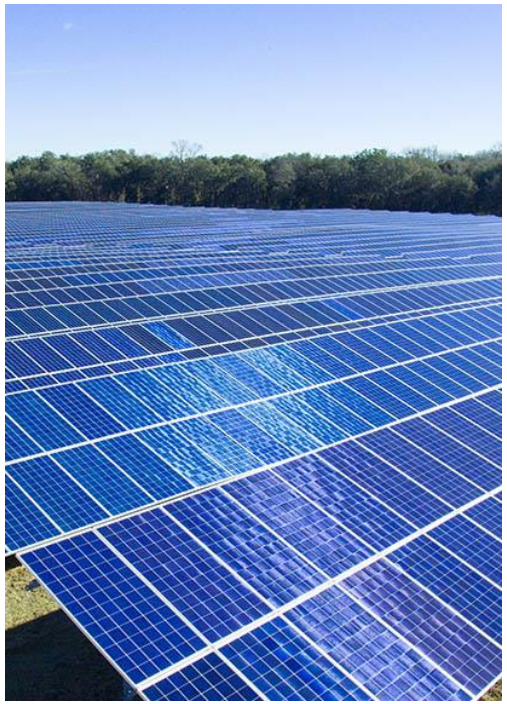
Solar For All



- PSD received an award of $62 million from EPA's Greenhouse Gas Reduction Fund (GGRF) Solar For All (SFA) Competition (IRA Funding)
  - $14.6 million - Residential Assistance In Solar Energy (RAISE) Program – for single-family homes
  - $22.3 million – Multifamily Affordable Solar Housing (MASH) Program - for MFAH developments
  - $20.5 million – Affordable Community Renewable Energy (ACRE) Program – expansion of ACRE
- Each subprogram designed to offer participants the benefits of solar providing a >20% electrical bill reduction up to 20 years

July 2023 EPA Opened Competition → **July – October '23** PSD Developed Proposal → **October '23** PSD Submitted Proposal → **April 2024** EPA Funding **Announcement** → **July** - December **'24 Agreements** w/ EPA finalized → January – December **2025** Planning Year → 2025 Programs **Rollout** as Finalized → **September 2029** - Expenditure Deadline

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Thank You

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Appendix

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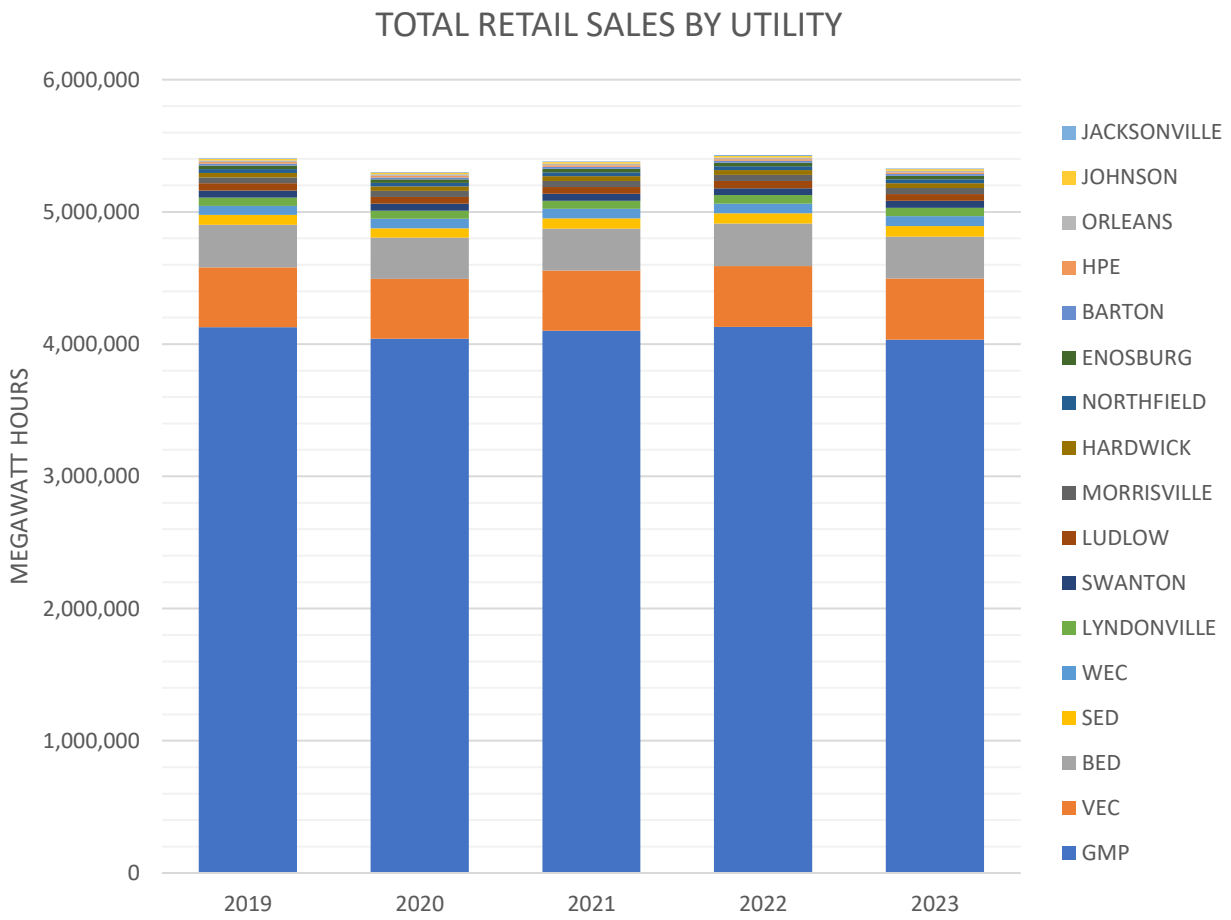
Retail Sales by Utility (in MWh)

Utility	2019	2020	2021	2022	2023
BARTON	13,565	14,024	14,232	14,174	14,506
BED	323,108	311,298	318,397	320,613	318,589
ENOSBURG	26,262	26,393	26,602	26,812	26,920
GMP	4,128,426	4,040,762	4,100,502	4,129,431	4,033,028
HARDWICK	33,785	34,606	35,488	35,253	35,170
HPE	11,998	12,334	12,442	12,912	13,288
JACKSONVILLE	4,906	4,966	5,195	5,263	5,374
JOHNSON	12,583	11,553	12,099	12,138	12,051
LUDLOW	55,340	50,521	51,379	54,765	49,788
LYNDONVILLE	61,855	59,985	62,077	64,826	64,441
MORRISVILLE	45,180	46,065	46,390	46,532	46,761
NORTHFIELD	28,824	26,929	28,363	29,372	29,116
ORLEANS	12,688	11,949	12,859	12,835	11,931
SED	74,798	70,121	76,965	76,965	79,920
SWANTON	53,139	53,737	52,571	52,383	52,243
VEC	451,381	453,300	455,401	461,974	462,308
WEC	68,358	73,165	71,503	72,593	73,651
Total	**5,406,194**	**5,301,708**	**5,382,464**	**5,428,841**	**5,329,084**



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2023 Renewable Energy Standard Compliance (continued)

Each distribution utility has complied with requirements under the RES.

In addition to Tier II, Washington Electric Cooperative and Hyde Park used Tier II Renewable Energy Credits (RECs) for part or all of their Tier III compliance. These RECs are counted towards their Tier III obligation and not their overall renewability as measured in Tier I/II.

Utility	2023 REC Retirements and Tier III Savings as Percent of Sales		
	Tier I	Tier II	Tier III
Barton	63.0%	4.6%	4.7%
Burlington	100.0%	0.0%	6.0%
Enosburg Falls	63.0%	4.6%	4.7%
Green Mountain Power	82.0%	4.6%	6.0%
Hardwick	63.0%	4.6%	4.7%
Hyde Park	63.0%	4.6%	4.7%
Jacksonville	63.0%	4.6%	4.7%
Johnson	63.0%	4.6%	4.7%
Ludlow	63.0%	4.6%	4.7%
Lyndonville	63.0%	4.6%	4.7%
Morrisville	63.0%	4.6%	4.7%
Northfield	63.0%	4.6%	4.7%
Orleans	63.0%	4.6%	4.7%
Stowe	63.0%	4.6%	4.7%
Swanton	100.0%	0.0%	4.0%
Vermont Electric Cooperative	63.5%	4.6%	6.0%
Washington Electric Coop	100.0%	4.6%	6.0%
Vermont Total	**80.5%**	**4.3%**	**5.9%**

Source: 2023 Utility RES Compliance fillings with the PUC under Docket 24-0775-INV

Standard Offer Prices Paid

2022 Award Group

Technology Diversity Developer Block

	Project Name	Technology	Price	MW
1.	Walnut Lane Wind	Small Wind	0.2540	0.022
2.	Alburgh Wind A	Small Wind	0.2540	0.050
3.	Alburgh Wind B	Small Wind	0.2540	0.050
4.	Alburgh Wind C	Small Wind	0.2540	0.050
5.	West Wind A	Small Wind	0.2540	0.075
6.	West Wind B	Small Wind	0.2540	0.075
7.	Stamford Main 4597	Large Wind	0.1150	2.200
8.	Bellows Falls Minimum Flow	New Hydro	0.1300	0.650

Price Competitive Developer Block

	Project Name	Technology	Price	MW
1.	Steinberg Road Solar	Solar	0.0818	2.20
2.	Midway Ave. Solar	Solar	0.0819	2.20

- Pre-2012 Procurement: fixed prices for technology categories – e.g., $0.30/kWh for early projects.
- Market-based mechanism for setting contract prices with technology-specific price caps introduced in 2012, this competitive solicitation substantially lowered prices.
- 2022 Award Group – the most recent solicitation - included prices as low as $0.0818/kWh.
- 22 proposals were submitted in the 2022 solicitation. Of those, 10 projects (left) were awarded contracts and 8 were placed in the Reserve Group.
- **The standard offer program solicitations are complete, no further solicitations are expected unless awarded projects are not built.**

Source: Investigation to review the 2022 implementation of the standard-offer program https://vermontstandardoffer.com/wp-content/uploads/2022/06/Case-No.-21-4085-INV-Investigation-to-review-the-2022-implementation-of-the-standard-offer-program.pdf

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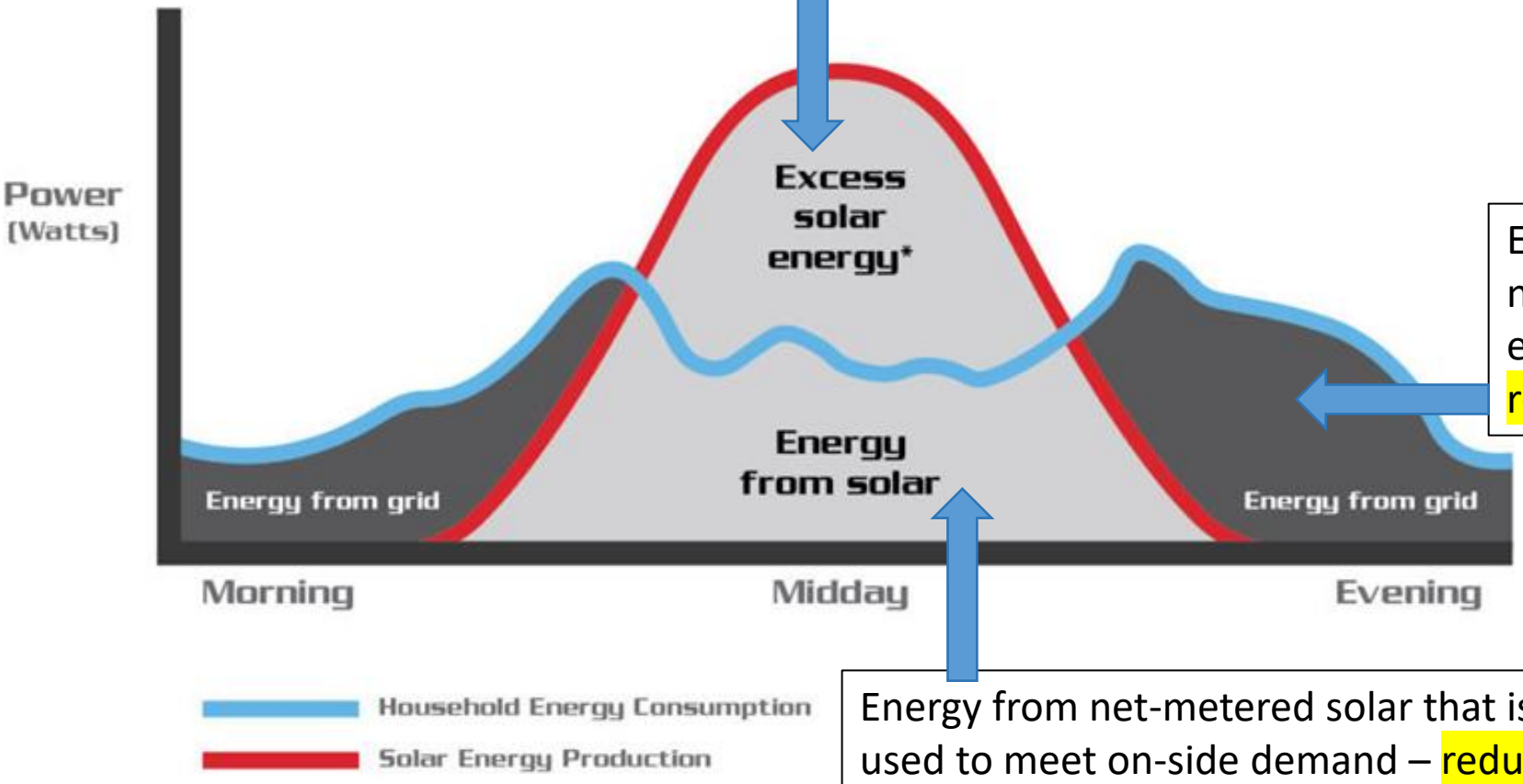
Net-Metering Program

Energy from net-metered solar that is solar back to the grid – customer is paid 0.XX cents/kWh by the utility for the power



Electricity the customer uses when the net-metered solar is not produces electricity – customer pays the utility's retail rate for this electricity

Energy from net-metered solar that is used to meet on-side demand – reduces a customer's electric bill

2023 Net-Metering Deployment

Utility	Total Installed NM (kW)	2023 Non-Coincident Peak	NM as % of Peak Load	% of NM Capacity	% of Retail Sales
GMP	302,619	704,492	43.0%	83.3%	75.7%
VEC	30,873	88,247	35.0%	8.5%	8.7%
VPPSA	13,289	71,783	18.5%	3.7%	6.5%
BED	6,015	63,372	9.5%	1.7%	6.0%
WEC	8,140	17,382	46.8%	2.2%	1.4%
SED	1,746	19,049	9.2%	0.5%	1.5%
HPE	530	2,899	18.3%	0.1%	0.2%

Statewide 2023 Total Net-Metering: 363 MW

	MW	NM % of Peak
VT 9/7/2023 Coincident Peak	735	49%
VT 2/3/2023 Non-coincident Peak	910	40%

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Net-Metering Renewable Energy Credit (REC) Transfers

57 MW of net metering RECs were transferred to utilities in 2022-2023, according to utility filings in the 2024 Net-Metering Biennial Review.

Net Metering customers have the option to either retain their RECs, or transfer them to the utility, who is required to retire them for compliance with the Renewable Energy Standard. If a customer retains their RECs, their compensation under the net metering program is lower. Nearly all net-metering RECs available are transferred to the utility.

REC Disposition in Capacity (MW) by Net-Metering Vintage

REC DISPOSITION	NM 1.0	NM 2.0	NM 2.1	NM 2.2	NM 2.3	NM 2.4	NM 2.5	Total
RETAINED	**0.19**					**0.67**	**0.22**	**1.08**
2022	0.19					0.02		**0.20**
2023						0.65	0.22	**0.87**
TRANSFERRED	**0.00**	**2.02**	**0.00**	**8.40**	**8.23**	**24.24**	**13.12**	**56.02**
2022	0.00	0.52	0.00	5.96	5.96	14.99	0.82	**28.25**
2023		1.50	0.00	2.44	2.27	9.25	12.30	**27.76**
Total	**0.19**	**2.02**	**0.00**	**8.40**	**8.23**	**24.91**	**13.35**	**57.09**

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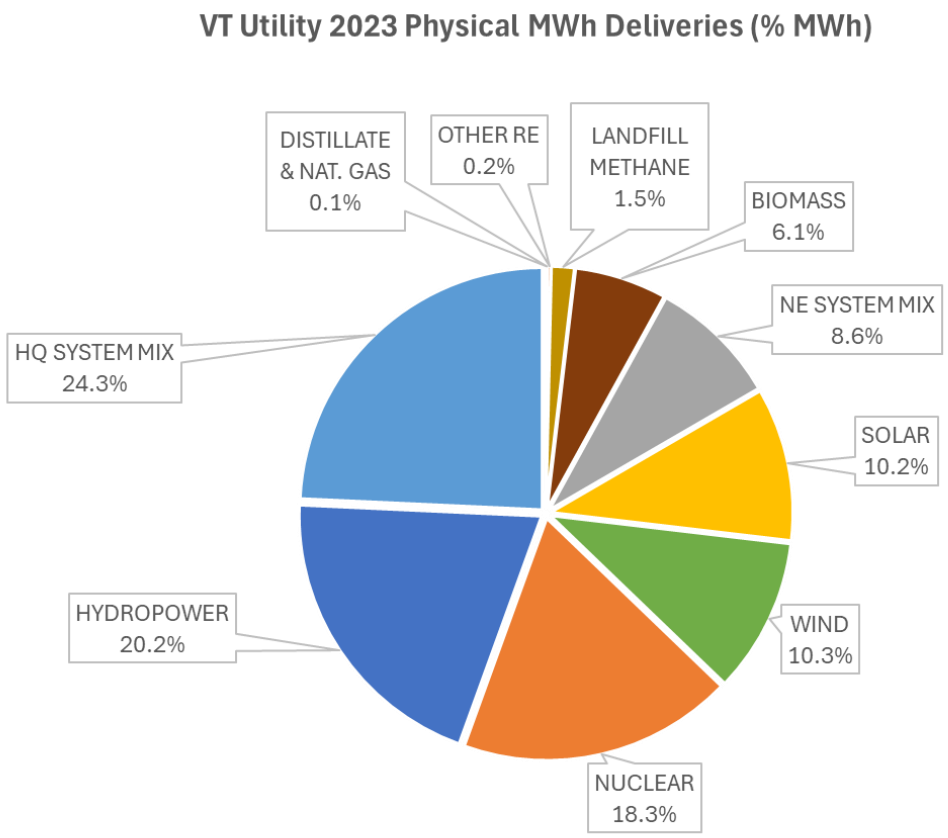
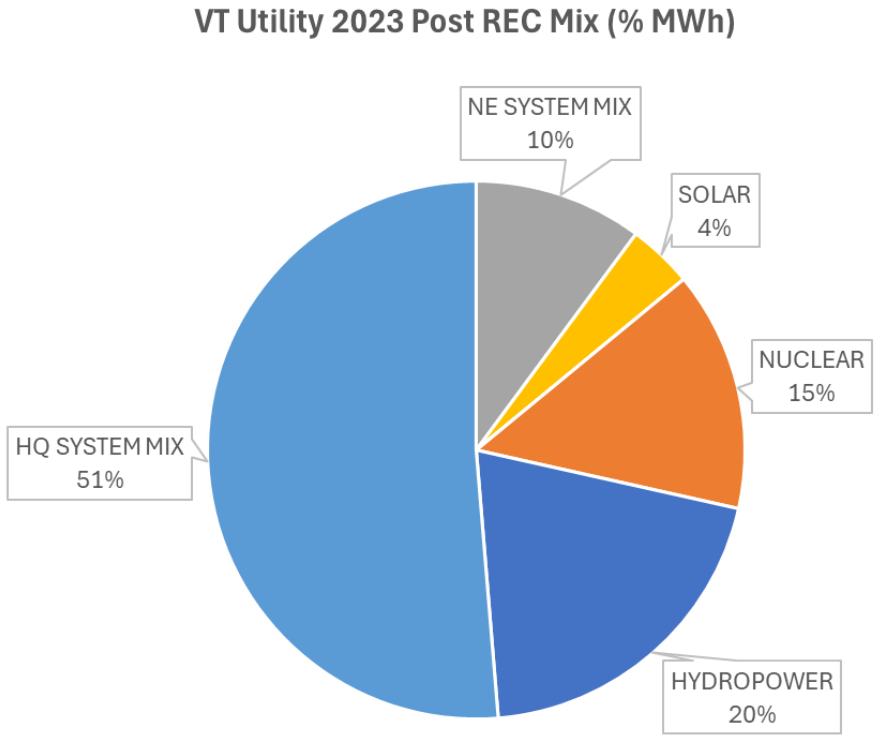
Comparison: Physical Deliveries vs. RECs Retired

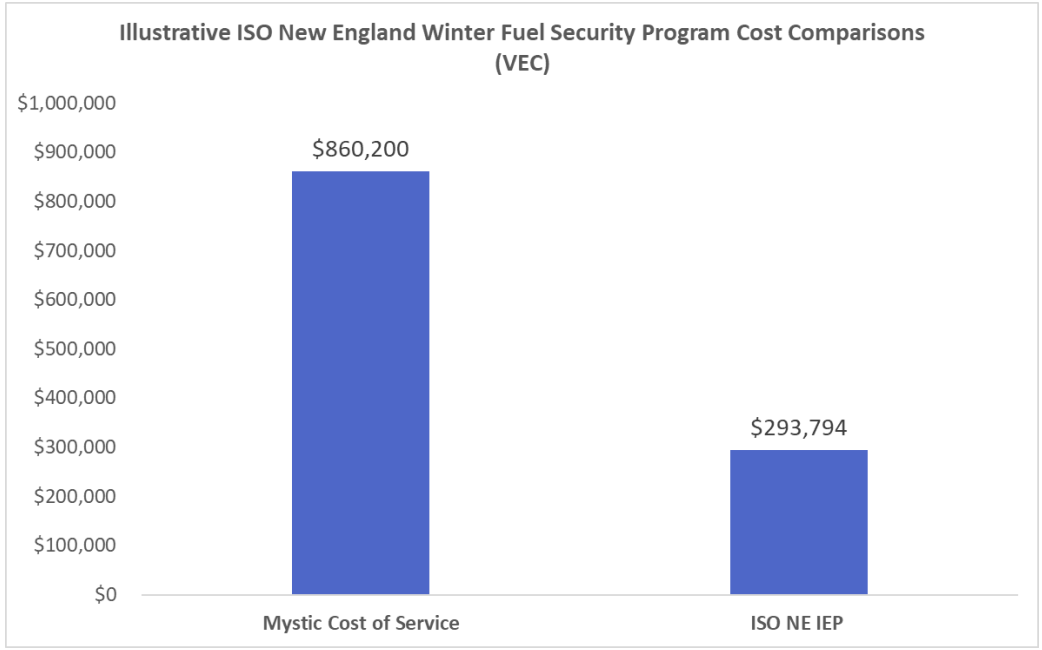




Vermonters Pay for Winter Reliability

Over the past decade, many fossil and nuclear generating units have been retired from ISO New England's system, increasing the reliance on natural gas as a generating resource. Natural gas pipeline import capability in New England can become constrained in the winter as gas for electricity generation competes with demand for heating purposes in other New England states. (Vermont Gas is supplied by a Canadian pipeline and its load does not impact the New England electricity prices.) As a result, when there is a prolonged cold snap and home heating requires more natural gas, New England risks electric supply shortages. With milder temperatures projected for this winter, the likelihood of such an event is greatly diminished.

ISO New England published its seasonal outlook for the 2024-2025 winter regarding system readiness. ISO-NE anticipates that there will be sufficient generation resources to meet consumer demand this winter with forecasts slightly above average temperatures and normal precipitation in the region. Utilizing its rolling 21-day energy supply forecast, the ISO Operations team will monitor resource availability and fuel supply levels to ensure adequate transmission service. This winter will be the first with the Mystic generating station having fully retired, and the second winter with the Inventoried Energy Program in place. This program provides incremental compensation to certain resources that maintain fuel reserves on site in reserve for an emergency. It is expected to cost substantially less than previous support for the Mystic Generating Station.



From: case 24-3432-TF, VEC Rate Case Test Year Actuals 7/1/23-6/30/24

Mystic Generating Station in Everett, MA