

Thermal Energy Update

March 22, 2023

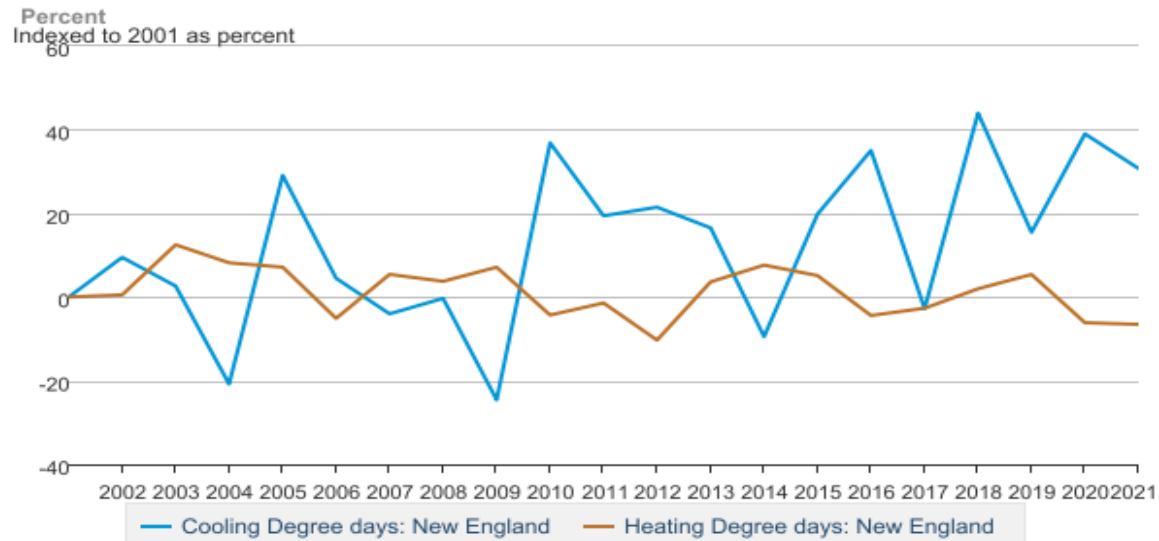
TJ POOR, DIRECTOR OF PLANNING
DEPARTMENT OF PUBLIC SERVICE
BEFORE HOUSE ENVIRONMENT & ENERGY



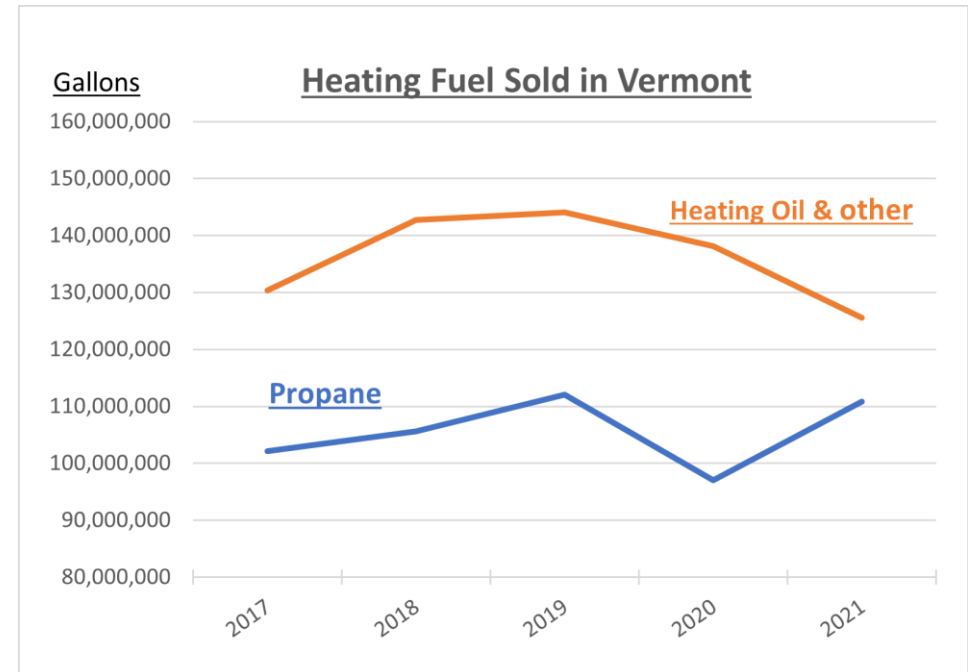
Topics Covered

- Thermal Fuels Demand
- Thermal Fuels Supply
- Fuels Pricing
- Program Updates
 - Weatherization
 - Advanced Wood Heat
 - Building Codes
 - Renewable Energy Standard Tier 3
- Status of ANR/PSD Thermal Policy Analysis

Thermal Demand

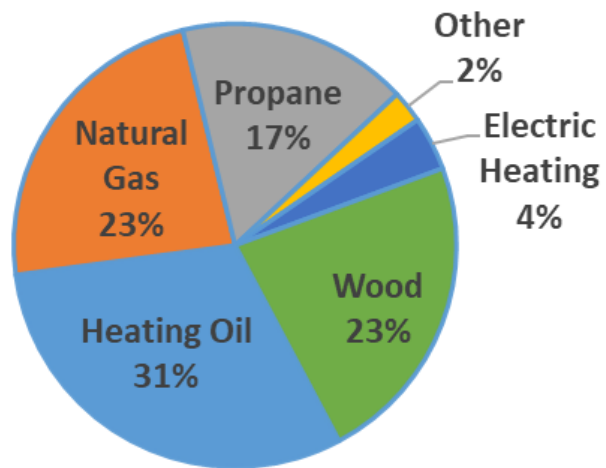


eia Source: U.S. Energy Information Administration

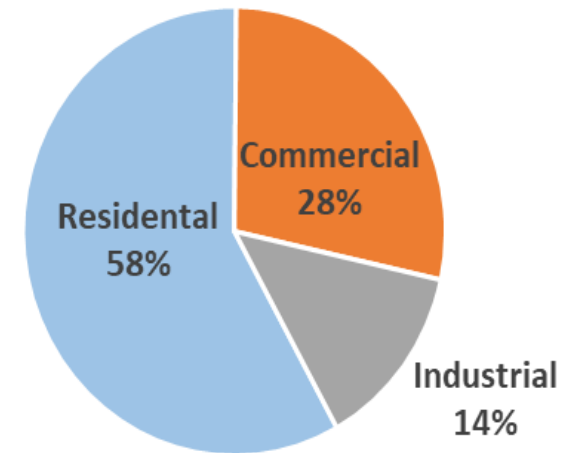


Thermal Sources and Use

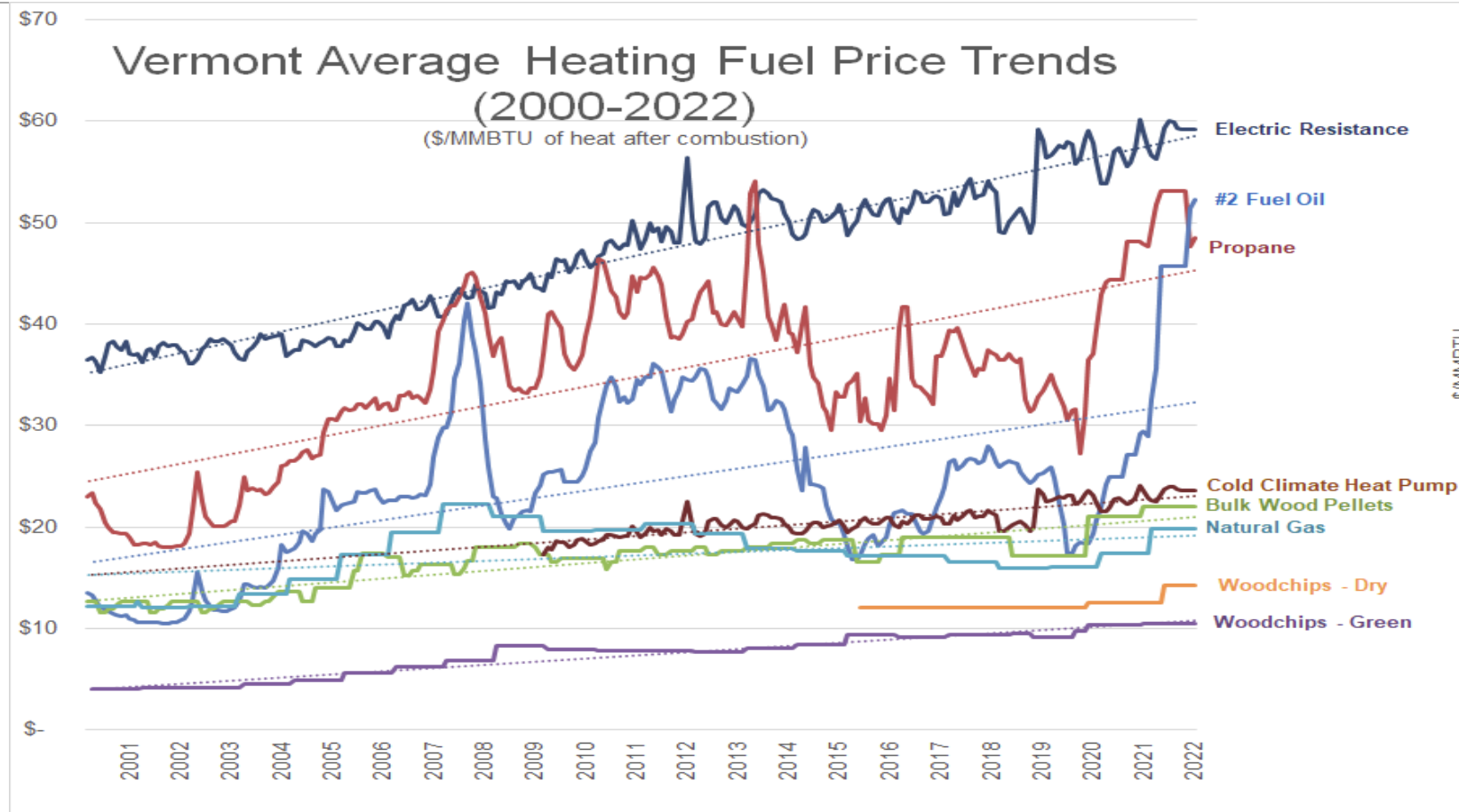
Thermal Sources Energy 2020



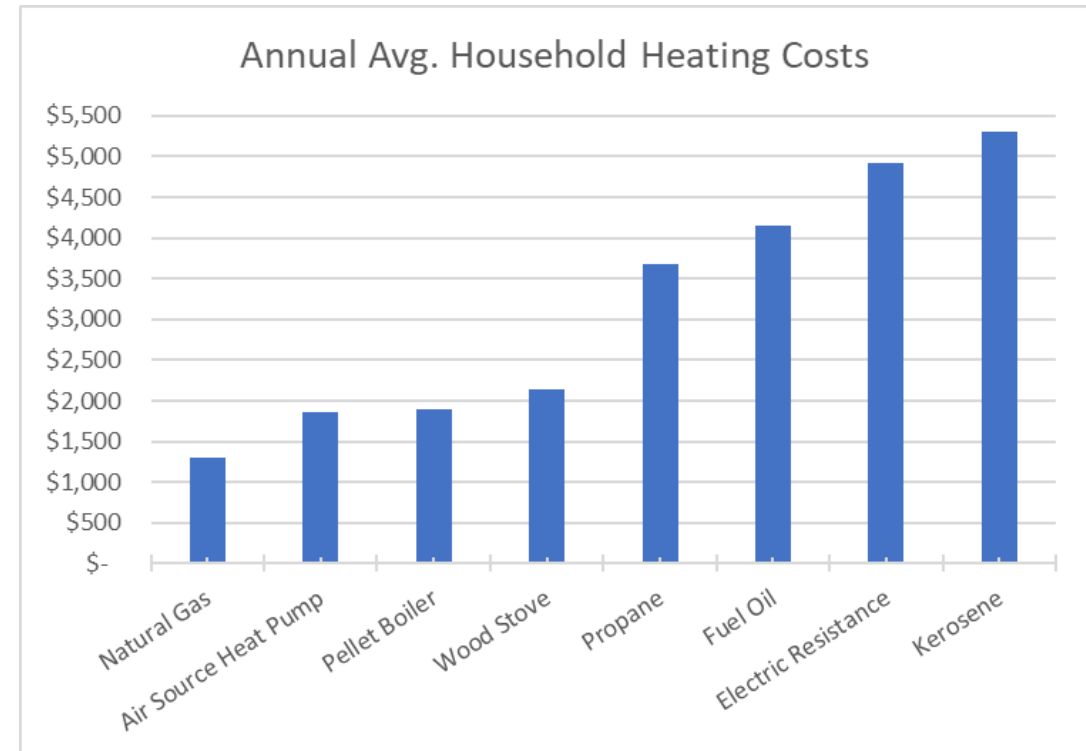
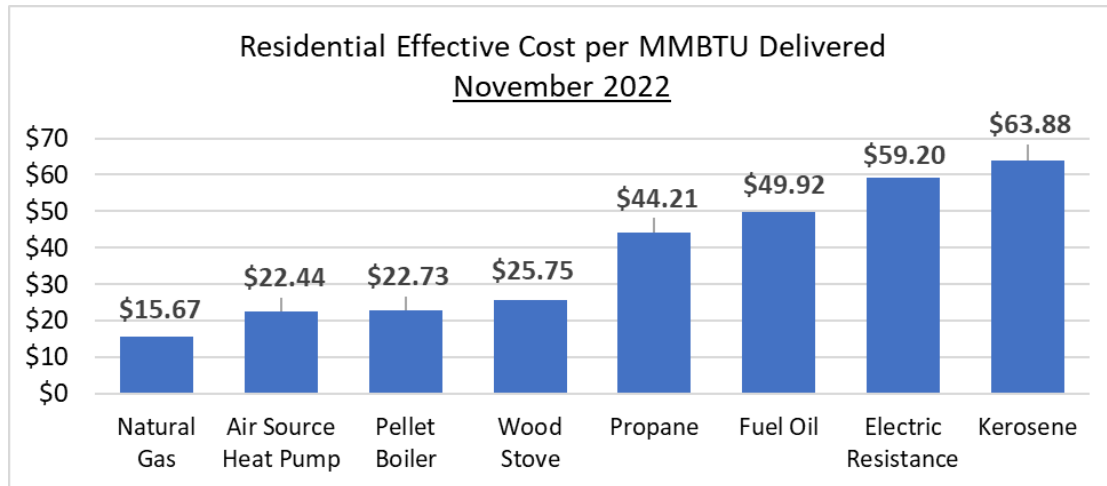
Thermal Energy Use by Sector 2020



Thermal Prices



Heating Costs (November 2022)



Program Updates

- Weatherization
- Building Codes
- Renewable Energy Standard Tier 3
- Advanced Wood Heat
- Federal Funds

Weatherization Program Implementation

Office of Economic Opportunity

- Base funding by Gross Receipts Tax
- 2023: Estimate 1436 units (fiscal year) – 39% increase
- ARPA Investments starting to pay off:
 - ARPA LIHEAP: \$2.1 million for single family home weatherization
 - ARPA SFR: \$4m for deferral issues, ccHP, MF Weatherization
 - ARPA SFR: \$45 million to support through 2026

Efficiency Vermont

- Base Funding from Regional Greenhouse Gas Initiative and Forward Capacity Market
- 2022: Less weatherization than projected 2023: Significant Ramp – 1400+ units forecast
- ARPA SFR: \$5million 2021 appropriation
- ARPA Revenue Loss Funds: \$35 million through 2026 (2023 start)
- IRA: Clean Homes Initiative: \$30 million (start late 2024/early 2025)

Vermont Gas Systems

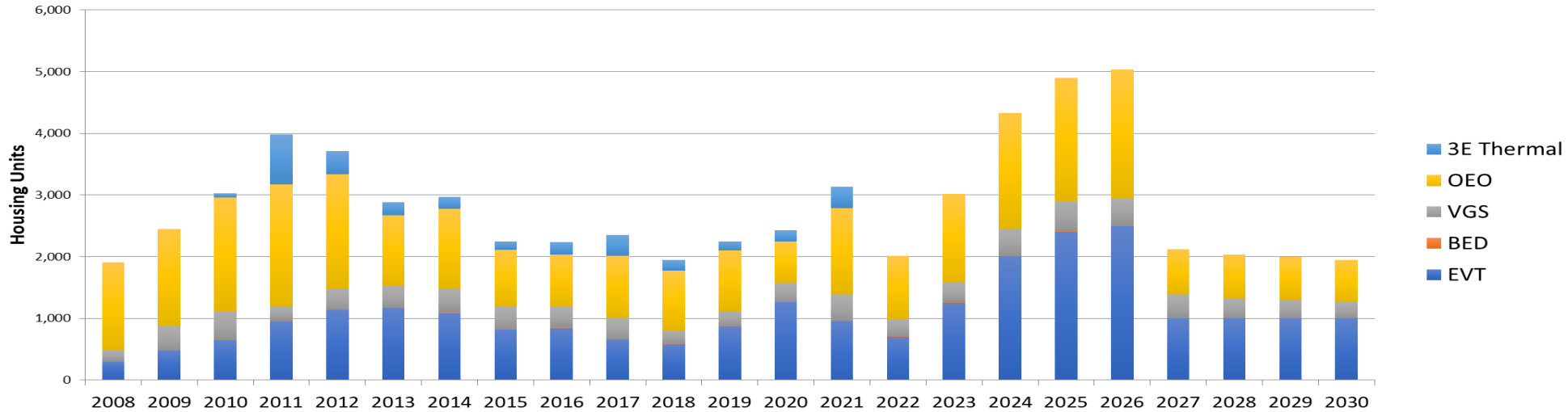
- Base Funding: Ratepayers via Efficiency Charge
 - Allowed to earn a return on shareholder investment in efficiency
- 2022 Less than projected, but expecting significant ramp in 2023

*Burlington Electric Department offers services in its service territory, but mostly served by VGS

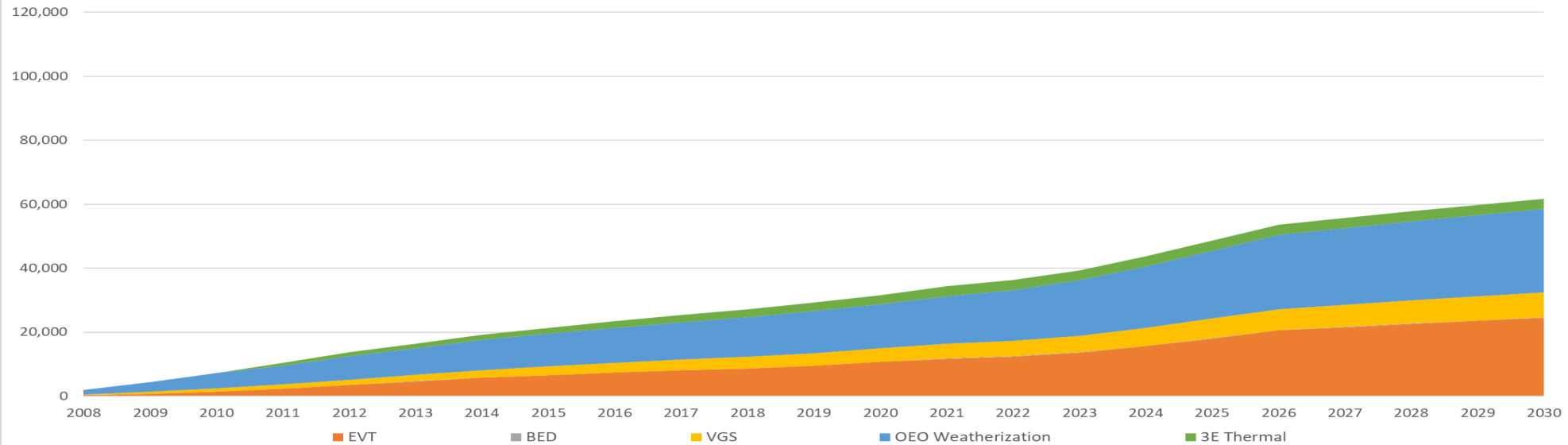
*3E Thermal provides multi-family weatherization services in partnership with OEO and EVT

Weatherization

Housing units receiving energy retrofit work



Cumulative Building Energy Retrofits by Provider



*Annual totals for forecast years provided for illustrative purposes only. They reflect PSD assumptions following discussions with implementers and estimates with the following caveats. Numbers are not exact, but provided to show magnitude of units weatherized.

- OEO Estimated FY – turned into calendar years
- Historical Data breaks out Multi-Family provider 3E Thermal, which is supported by both OEO and EVT. 3E is not separated in forecast
- VGS Demand Resources Plan Estimate

Weatherization supporting programs

Weatherization Repayment Assistance Program

- \$9m State appropriation (2021) to Vermont Housing Finance Agency
- VHFA provides capital and incentives for up front costs of Wx, repaid via on-bill repayment through utility
- Payment designed to be less than projected energy savings
- Targeted to LI households
- 5 utilities participating (GMP, VEC, BED, Ludlow, with VGS serving its customers)

Weatherization & Health Initiative

- Pilot to further prove the connection between weatherization and improved health, particularly in lower income households

Building Energy Standards

Residential Building Energy Standards (RBES) since 1997

Commercial Building Energy Standards (CBES) since 2007

Stretch codes – applies to residential Act 250 projects, can be adopted by municipalities

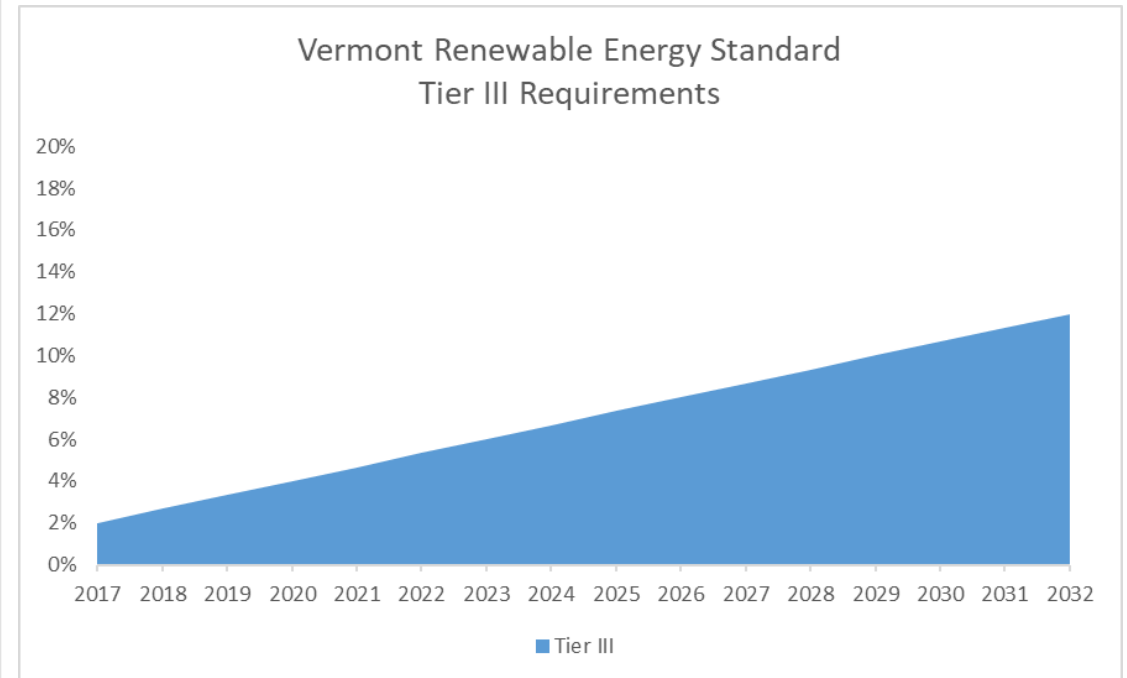
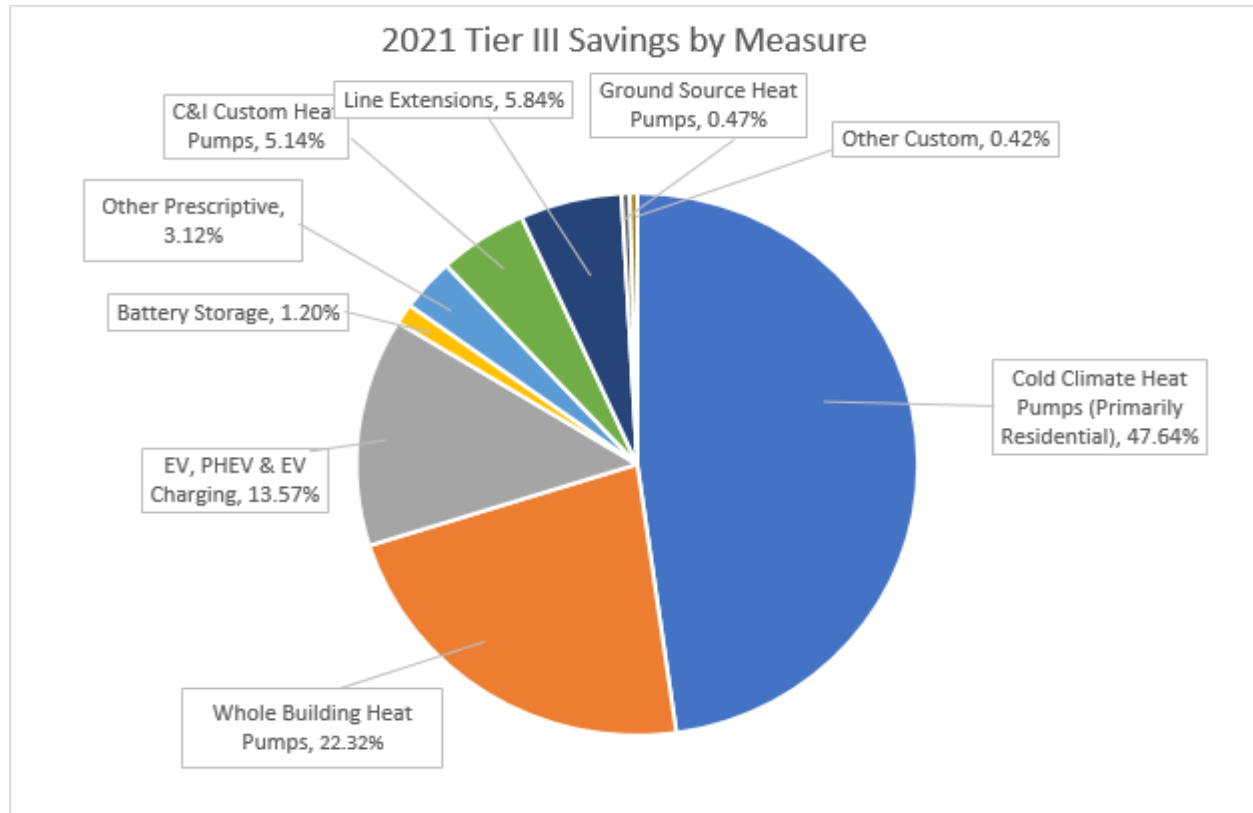
Updated every 3-years

- April 2022 initiated public stakeholder engagement process to update RBES & CBES. Expected to take effect in 2023.
- **Established a pathway to net zero ready over the next three code cycles.**

Act 182 of 2022 established a Vermont Builder Registry

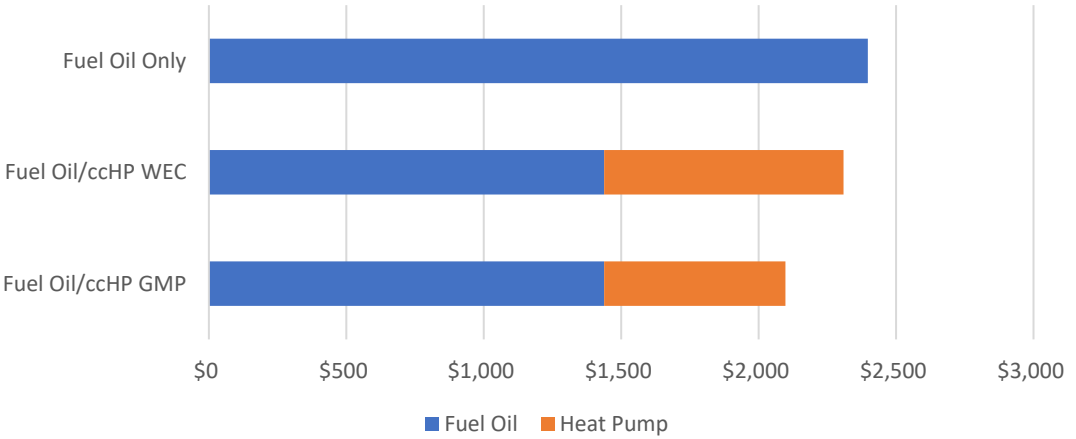


Renewable Energy Standard – Tier 3

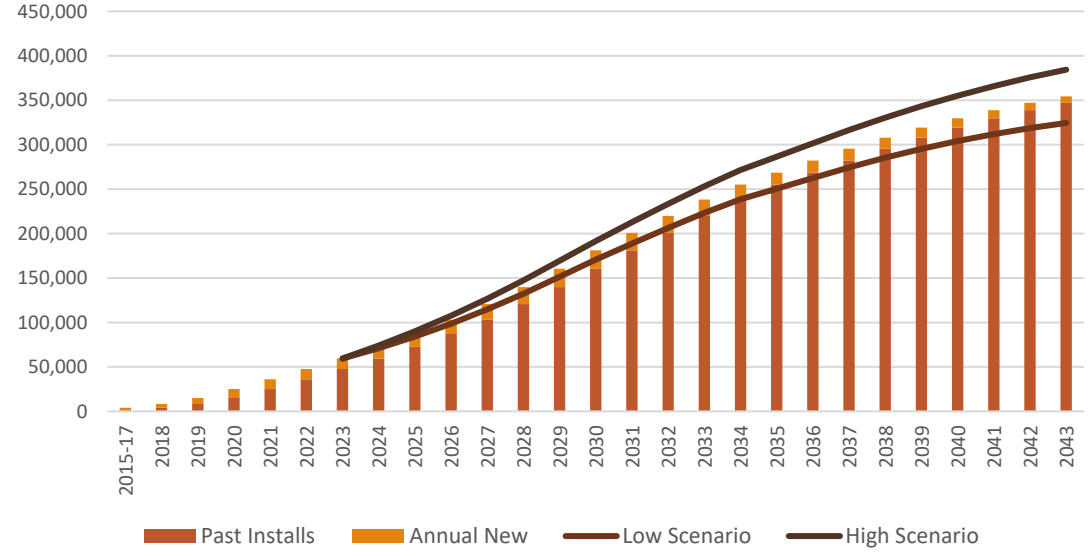


Heat Pumps

Illustration of Single Zone ccHP Homeowner Annual Cost Comparison

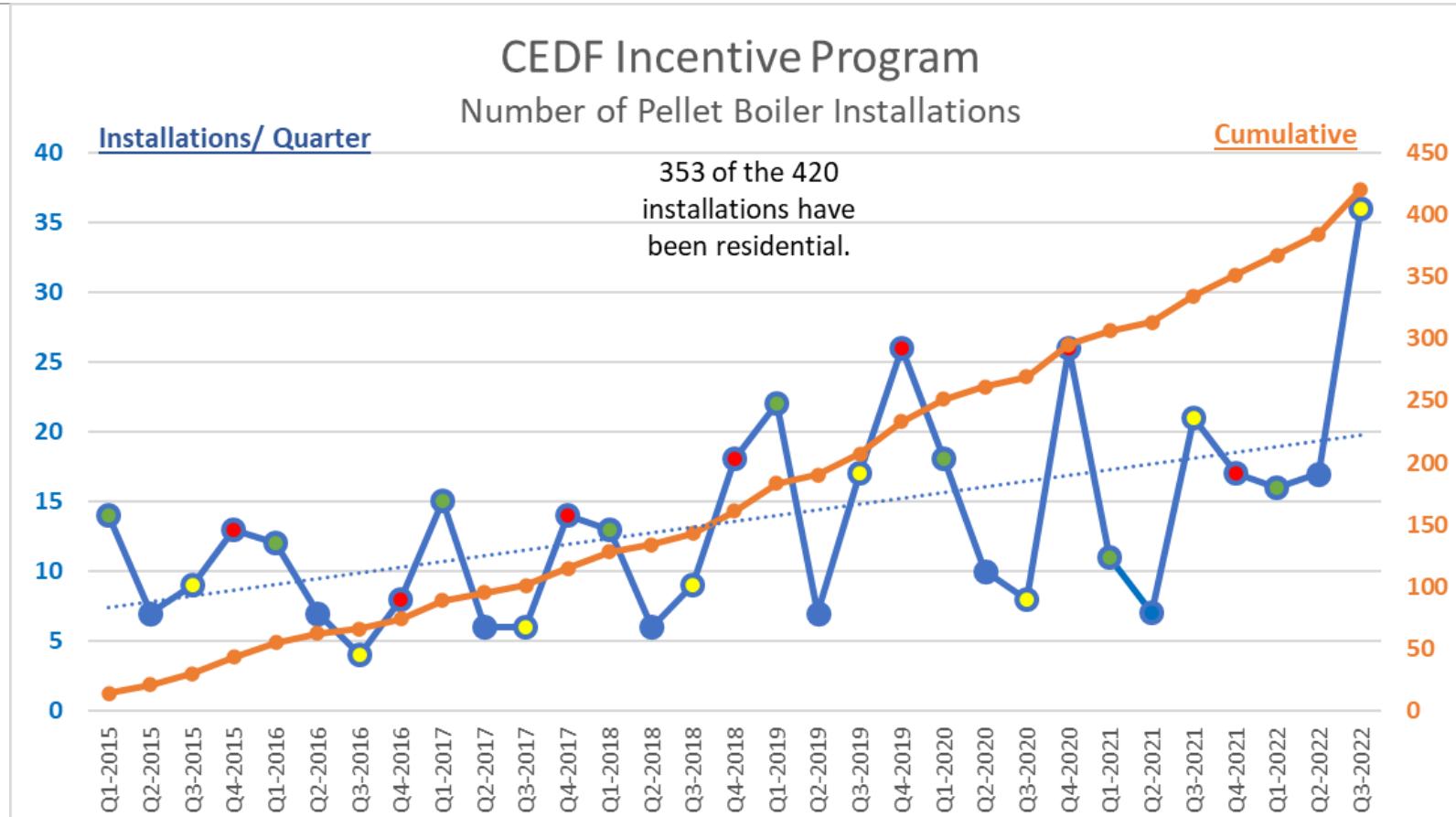


Forecast Installed Heat Pumps



- \$4.00/gal assumed, 240% COP. Single ccHP installed
- Heat Pump forecast a product of PSD Efficiency Potential Study (mid 2022)

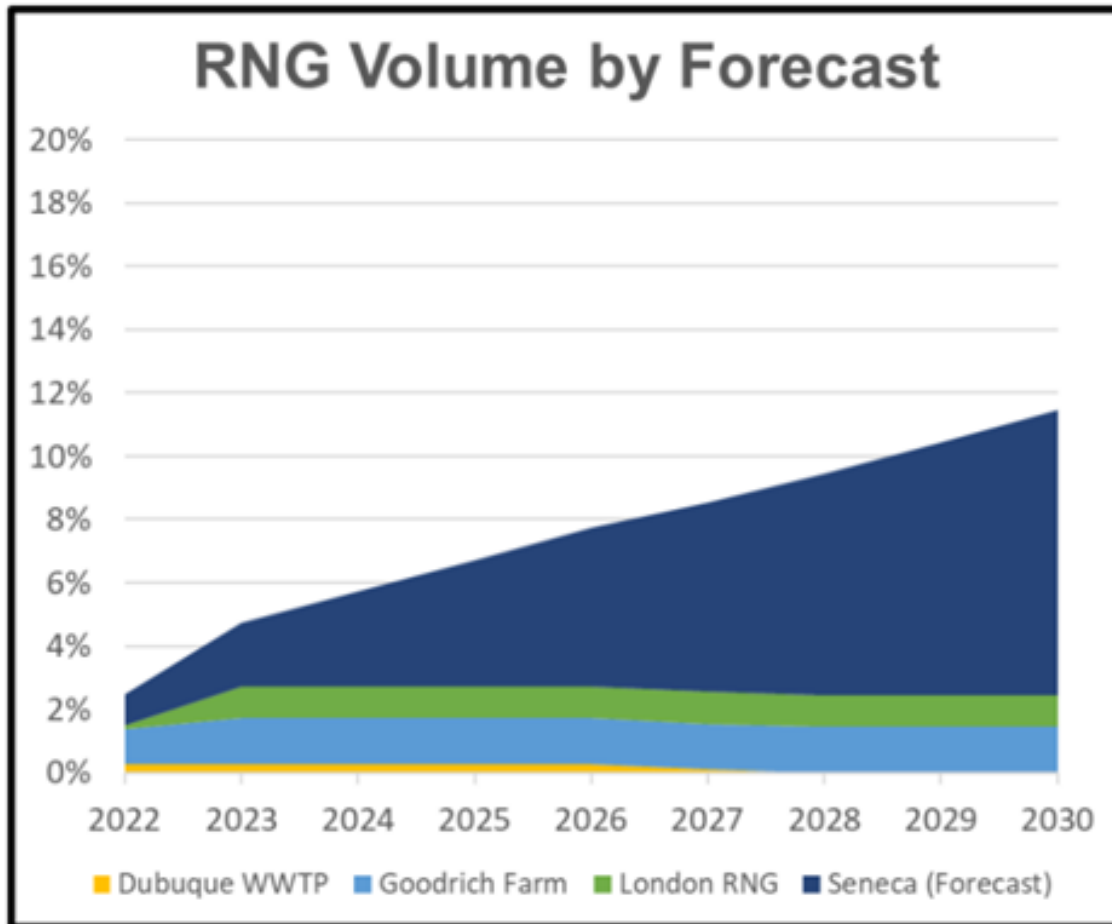
Advanced Wood Heat



Renewable Natural Gas

Renewable Natural Gas (RNG)

- Alternative Regulation Plan allows for the procurement of RNG. Must be no more costly than the Social Cost of Carbon and must consider rate impacts.
- Carbon Intensity of the resource (each resource has a varying carbon intensity)
- Vermont Gas has several RNG contracts both in and out-of-state and is pursuing further RNG



Federal Funding

\$67 Million ARPA Funds allocated to PSD through 2023 Budget

- Deployment awaited Revenue Loss designation as many activities contemplated were ineligible uses of ARPA funding
- Now have approval of design and is developing agreements and solicitations to deploy
 - \$35million to EVT for moderate income weatherization (~3600 units)
 - \$20million to support home electric upgrades for low and moderate income (LMI) households (~5,000)
 - \$5 million to install heat pump hot water heaters for LMI
 - \$7 million for Energy Storage Access Program for storage systems in VT homes, municipal buildings, support muni/coop software solutions

\$3 million IJA funds through State Energy Program (5 years) to be used for workforce training; innovation grants to RPCs, munis, energy committees, and small utilities; assistance for PSD to apply for other, competitive funding opportunities

\$2.2 million IJA Funds directed to BGS State Energy Management Program for Municipal Energy projects

\$58 million IRA funds through PSD - \$29 million each for weatherization (to EVT, likely), and point of sale rebates for appliances

Climate Pollution Reduction Grants under **IRA**

- VT to receive **\$3 million** in formula funding for GHG Mitigation Planning. Climate Office to opt in and funding summer 2023
- EPA will then award \$4.6 billion (competitively) to implement priority and Comprehensive Climate Action Plans delivered pursuant to the Planning grant . Via Climate Office at ANR

*Non-thermal federal opportunities also being pursued, such as responses to competitive solicitations for grid resilience under **IJA** (**\$450** million in applications being developed)and other opportunities through Environmental Protection Agency under **IRA**

Thermal Analysis

Climate Action Office and Public Service Department are managing work to understand the cost implications of policy strategies to meet thermal sector share of GWSA requirements

Qualitative analysis completed by contractor (Energy Futures Group) has narrowed down policy sets to five for quantitative analysis

- Quantitative analysis will provide estimates of relative cost from Vermonter, Societal, and Customer (both participant and not participant) perspectives

Final Report late May/Early June

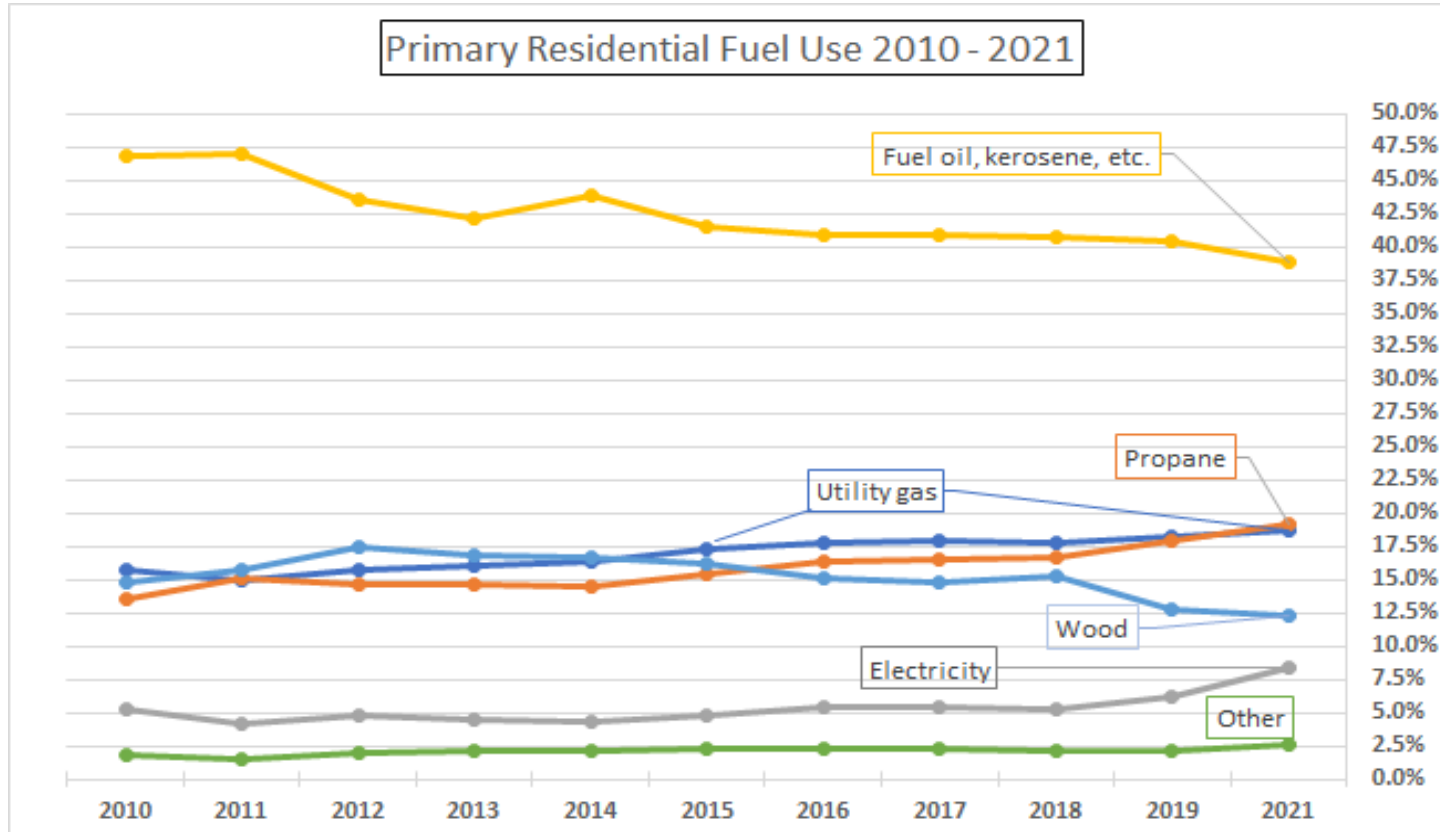
- Significant Climate Council involvement (task group and Cross Sector Mitigation Subcommittee)
- Revised Business-As-Usual forecast expected in April
- LEAP policy draft results due late April/early May



Thank You

Appendix

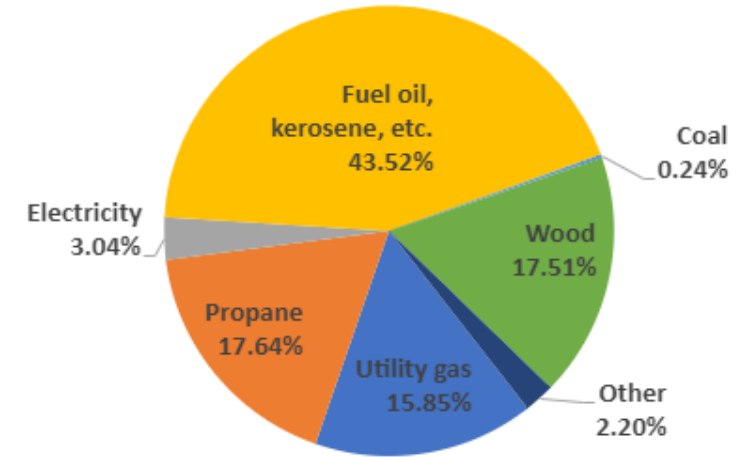
Fuel Usage by Type (%households)



American Communities Survey (ACS)

[https://data.census.gov/table?q=Vermont/heating&t=Heating+and+Air+Conditioning+\(HVAC\)&y=2021&tid=ACSDT1Y2021.B25040](https://data.census.gov/table?q=Vermont/heating&t=Heating+and+Air+Conditioning+(HVAC)&y=2021&tid=ACSDT1Y2021.B25040)

**Owner Occupied Heating Fuel Use
2017 - 2021 Estimate**



**Renter Occupied Heating Fuel Use
2017 - 2021 Estimate**

