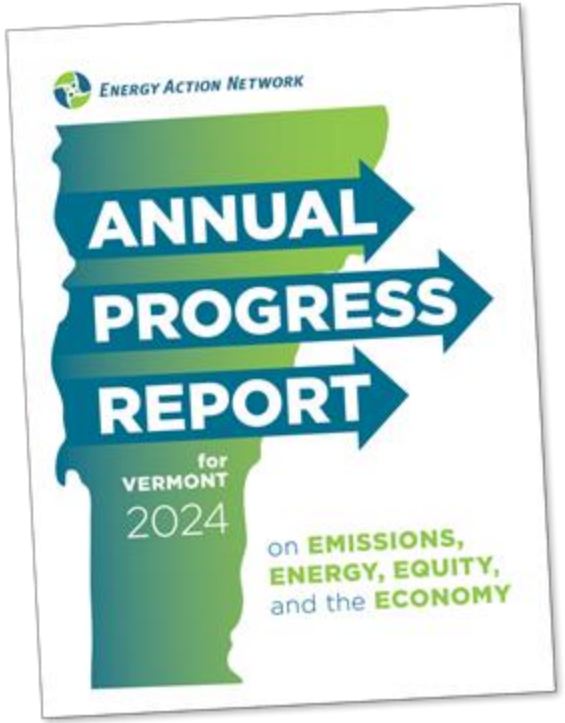
2024 Annual Progress Report for Vermont

on Emissions, Energy, Equity, and the Economy



Presentation for

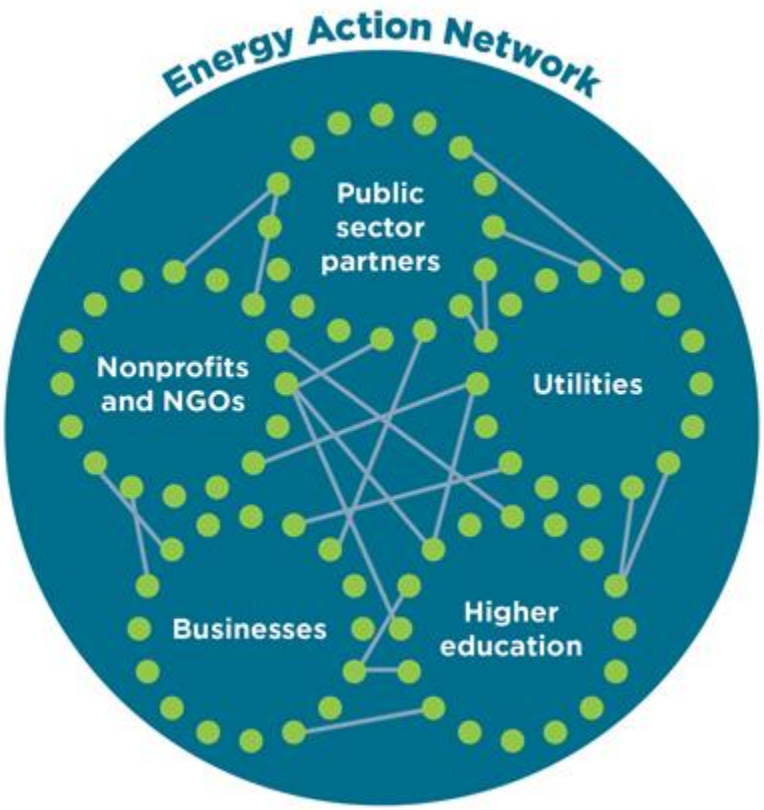
House Energy & Digital Infrastructure Committee

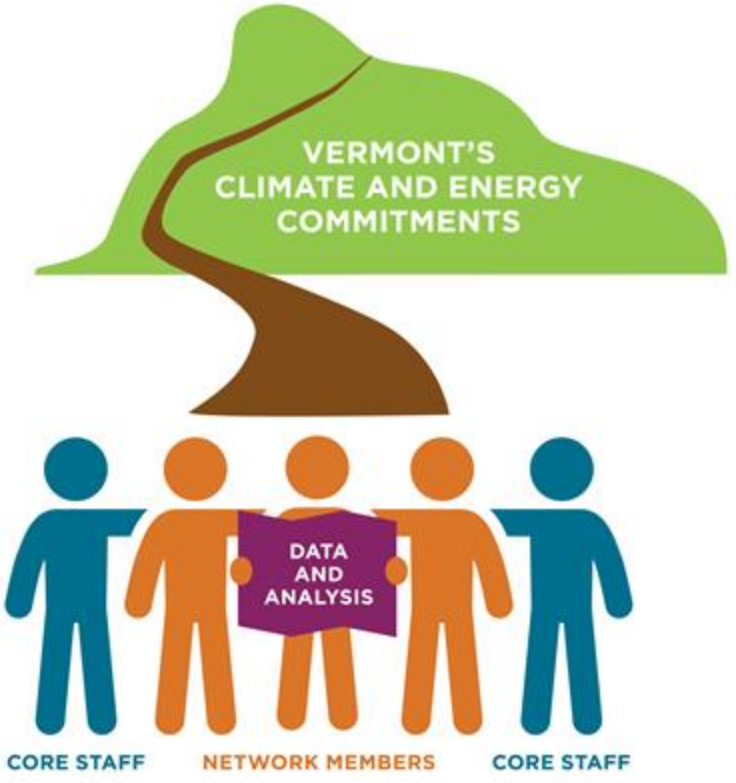
Jared Duval, Executive Director

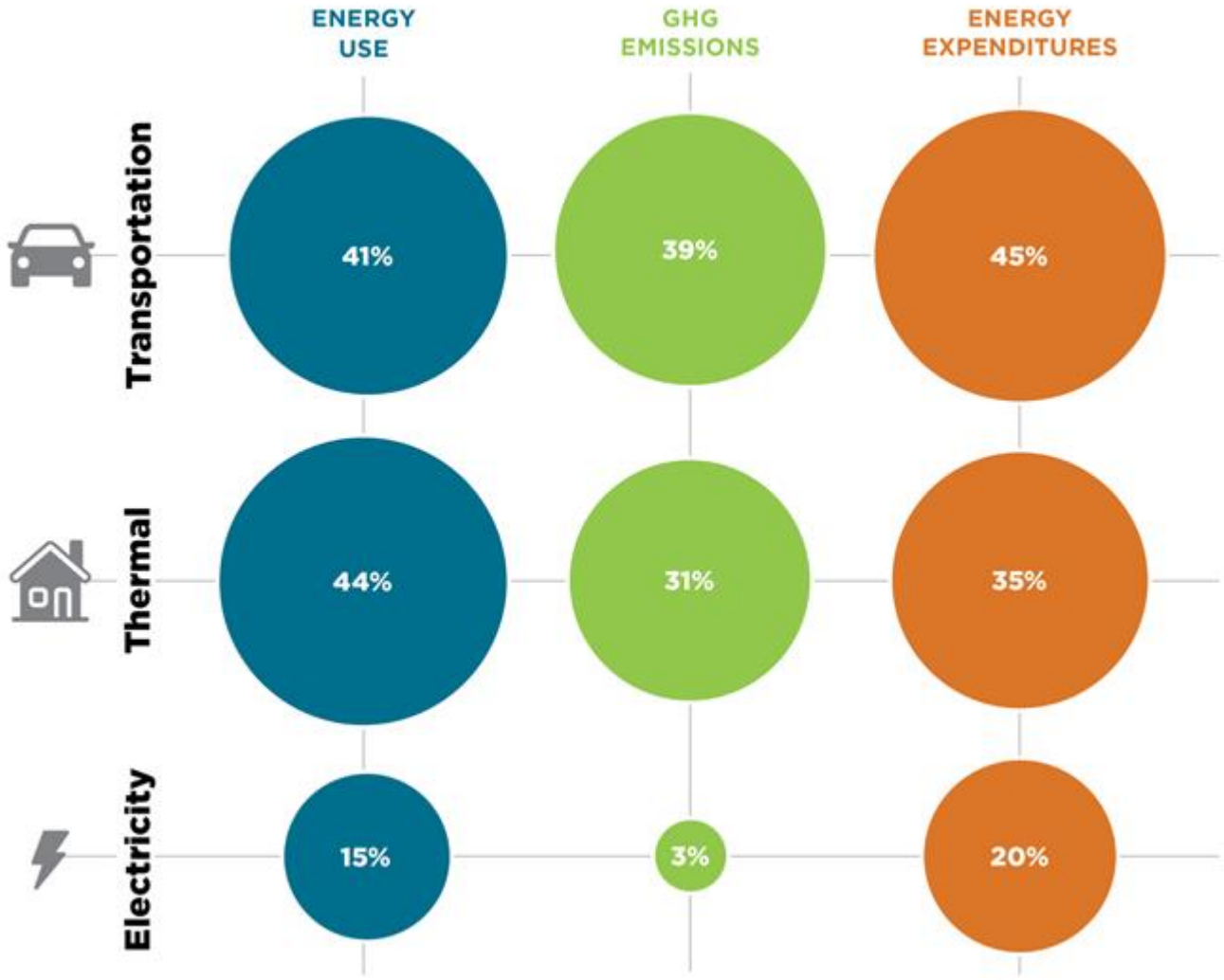
Energy Action Network

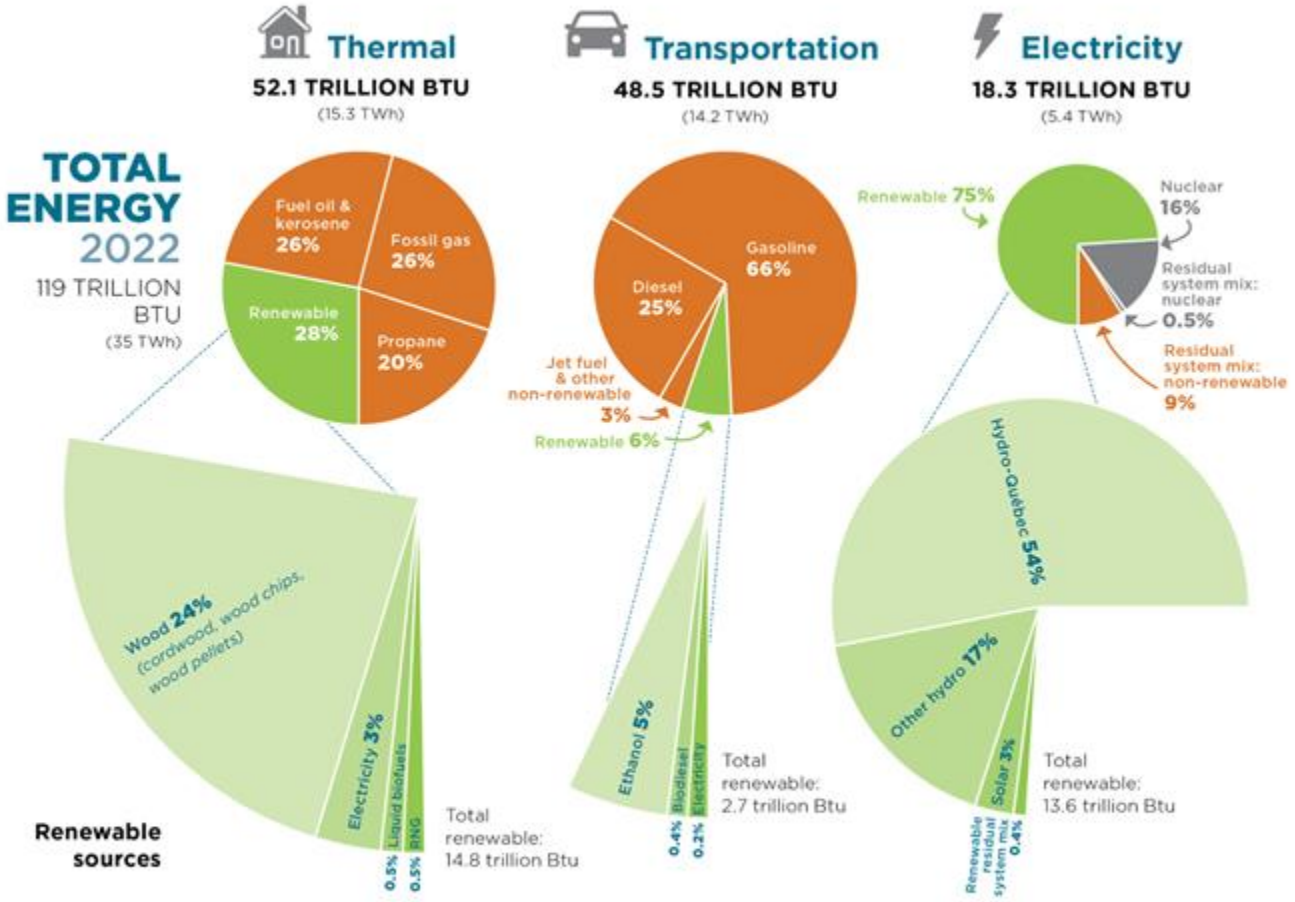
January 16, 2025

About Energy Action Network





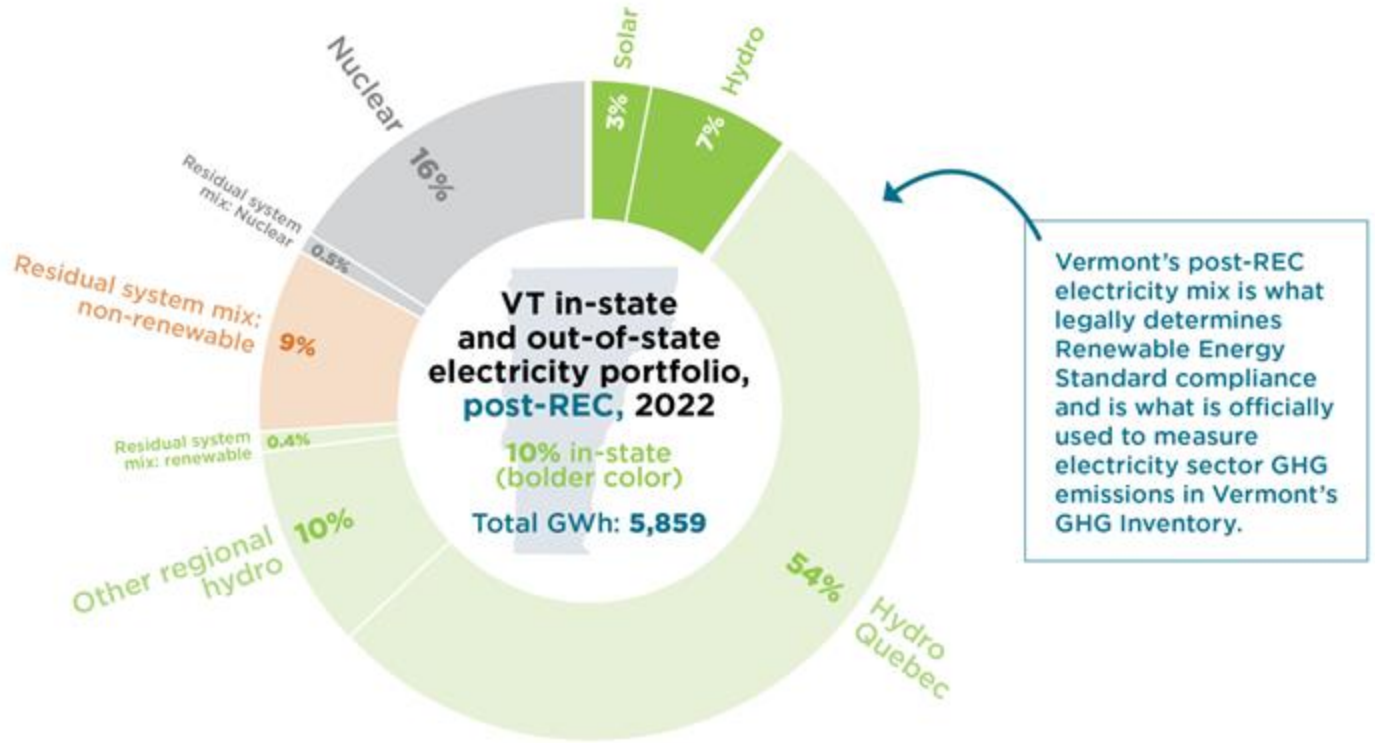

ENERGY USE
GHG EMISSIONS
ENERGY EXPENDITURES
Transportation
41%
39%
45%
Thermal
44%
31%
35%
Electricity
15%
3%
20%



Sources: Energy Information Administration, 2024; Efficiency Vermont, 2024; Vermont Department of Public Service, 2024; Vermont Department of Taxes, 2024; EAN, 2024. **Notes:** The electricity pie chart does not include electricity used for thermal and transportation purposes, as that electricity usage is shown in the respective thermal and transportation pie charts. Percentages may not sum exactly to 100% due to independent rounding. The electricity pie chart shows Vermont's electricity portfolio after accounting for RECs. One result of this is that wind and biomass generation in Vermont do not show up as electricity resources, since RECs from those resources are primarily sold out of state. Fuel oil includes a small amount of kerosene, which accounts for 0.6% of total thermal energy use.

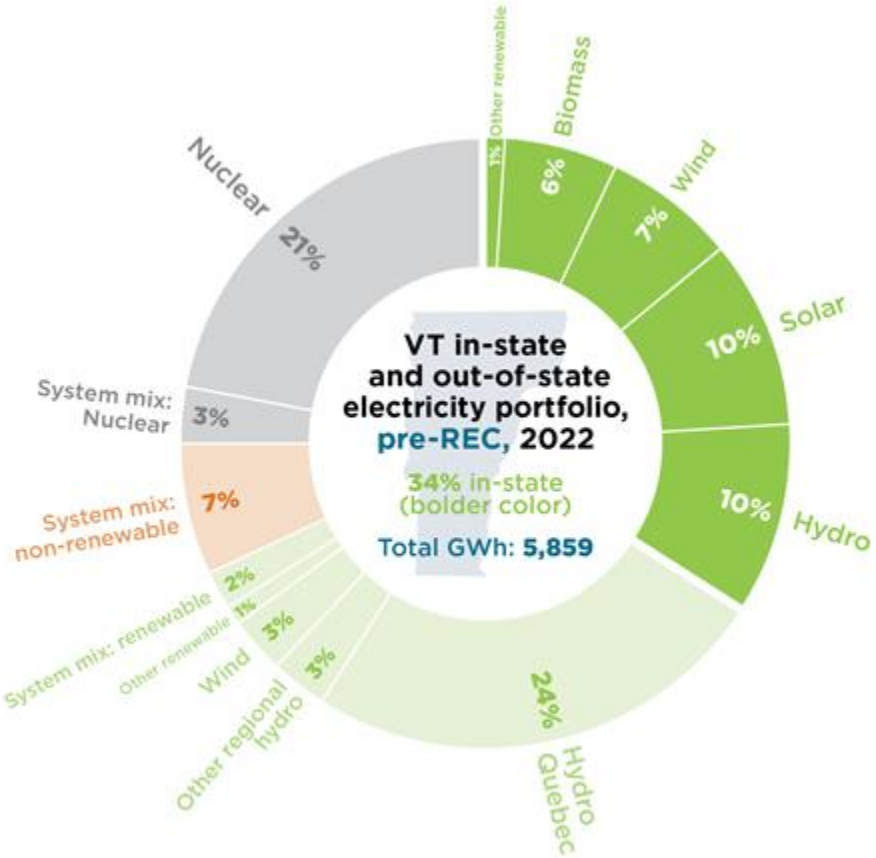
ENERGY ACTION NETWORK

Vermont's electricity sector GHG emissions are based on retirements of Renewable Energy Credits (RECs)



Sources: Vermont Department of Public Service, 2022 Electric Utility Resource Survey; NEPOOL GIS Residual Mix, 2022.
Notes: Non-renewable is primarily energy from fossil fuels. Totals do not add up to 100% due to independent rounding.

ENERGY ACTION NETWORK

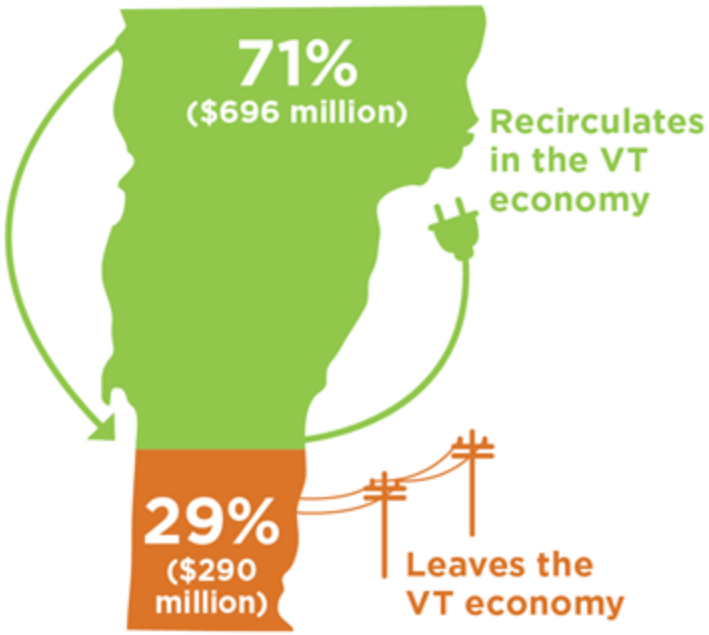


Sources: Vermont Department of Public Service, 2022 Electric Utility Resource Survey; ISO-NE, "Net Energy and Peak Load by Source Report," 2023. **Notes:** Non-renewable is primarily energy from fossil fuels. Totals do not add up to 100% due to independent rounding.

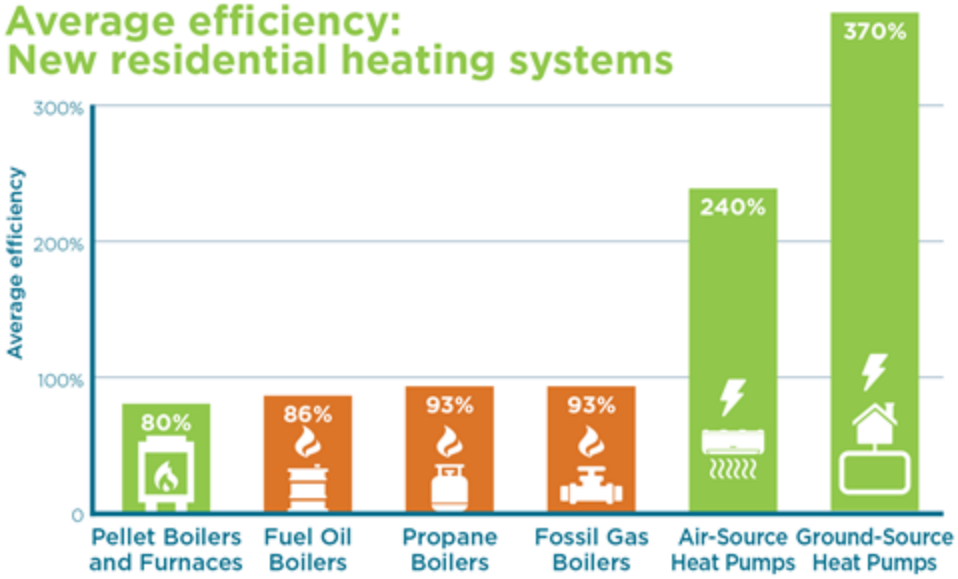
ENERGY ACTION NETWORK

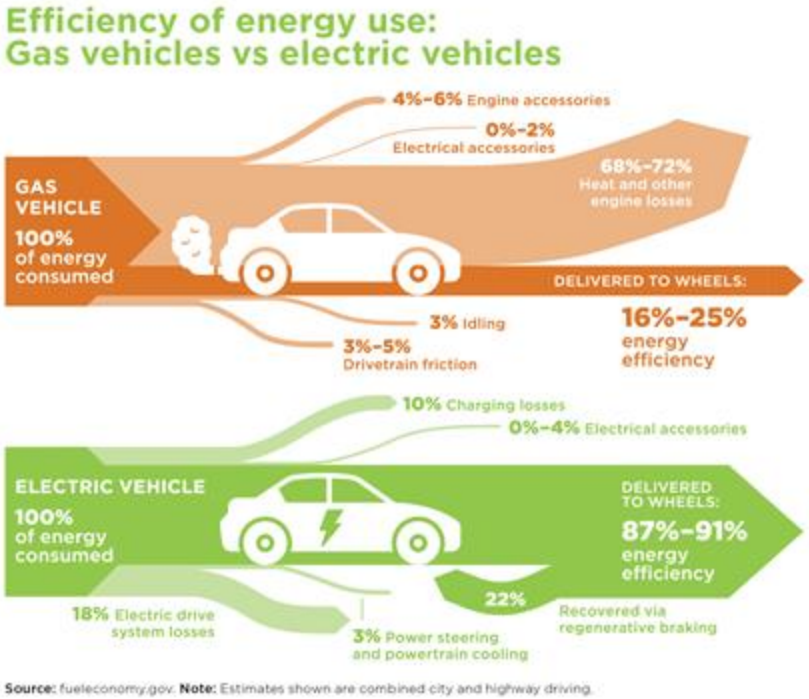
Vermont fossil fuel spending, 2023

Vermont electricity spending, 2023



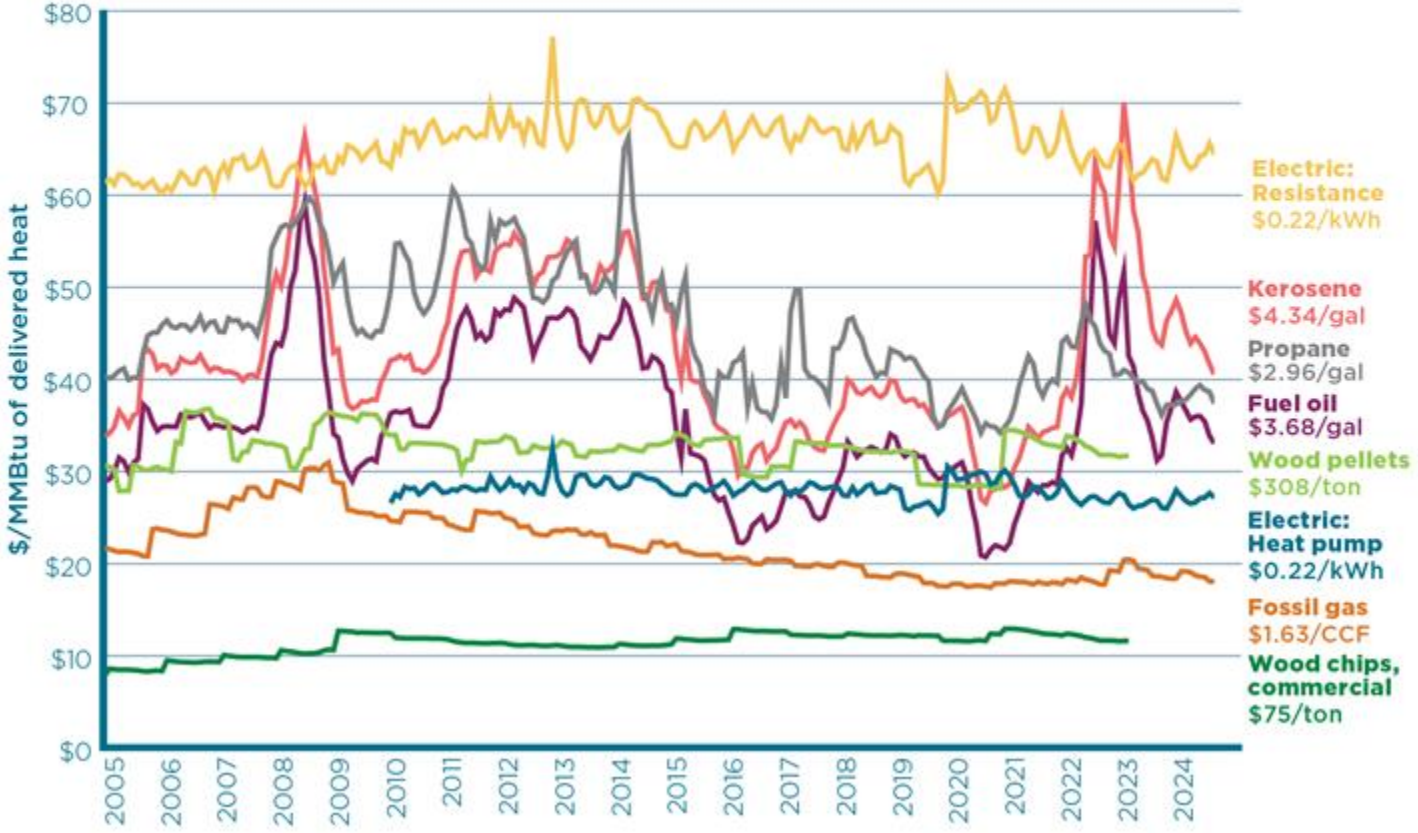
Modern electric equipment is more energy efficient



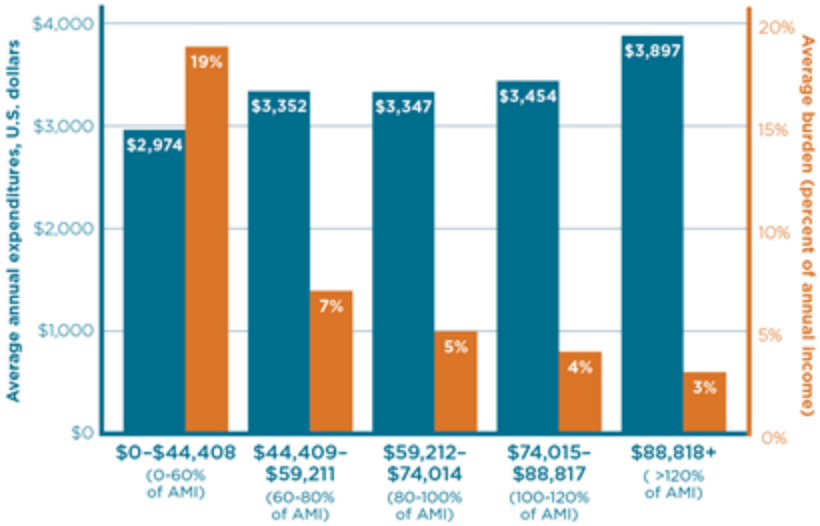


Cost comparison of different transportation fuels over time in VT (adjusted for inflation, June 2024 dollars)

Cost comparison of different heating fuel options over time (adjusted for inflation, June 2024 dollars)



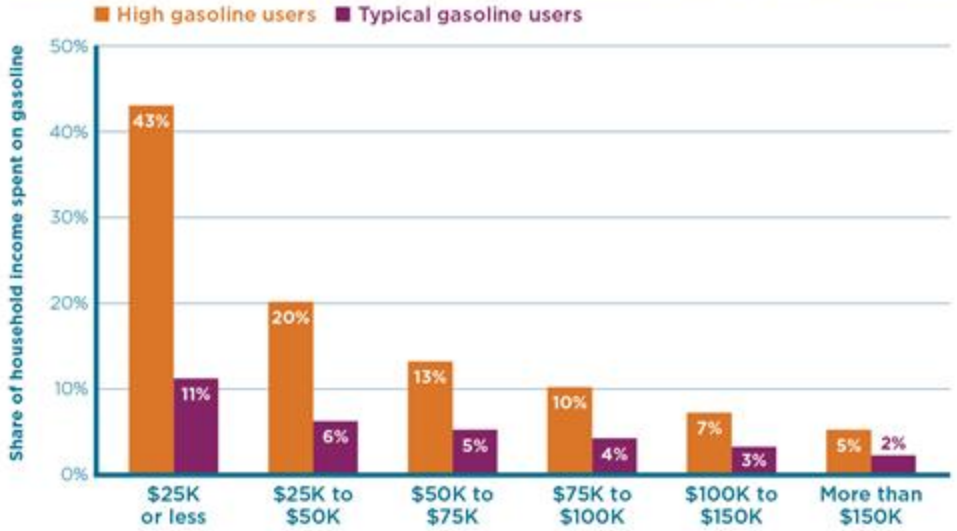
Vermont combined average household heating and electricity fuel costs and burden by income level, 2018–2022



Source: U.S. Census Bureau, 2018-2022 American Community Survey 5-year Public Use Microdata Samples. **Notes:** Income categories are based on 2018-2022 median household income in Vermont of $74,014. Energy burden refers to the share of annual household income spent on energy. Costs include fuel only and are not inclusive of equipment and maintenance costs.

ENERGY ACTION NETWORK

Gasoline energy burden by income in Vermont



Source: Coltura, Gasoline Data Center, 2024. **Note:** Data include only expenditures on gasoline and are not inclusive of other transportation or vehicle ownership costs. "High gasoline users," which Coltura refers to as "Superusers," are the top 10% of light-duty vehicle drivers in the U.S. in terms of gasoline consumption. 14% of Vermont drivers fall into this category.

ENERGY ACTION NETWORK

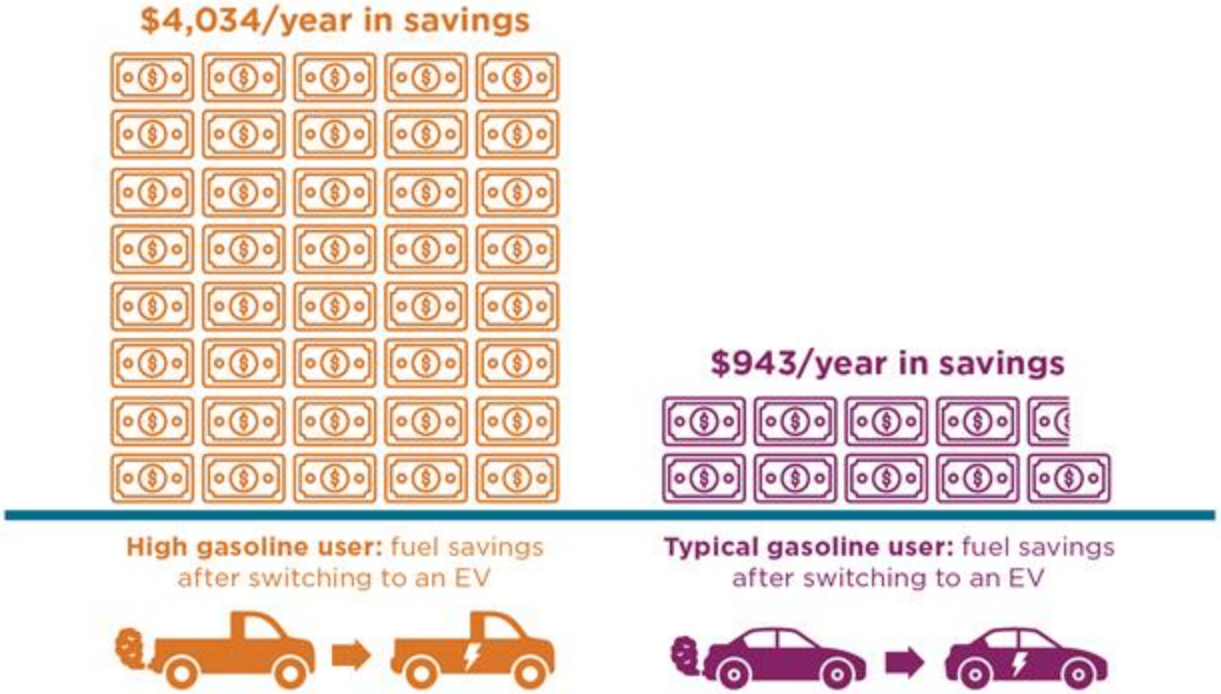
Lifetime cost savings of switching to an electric vehicle

Estimated savings on fuel and maintenance: ~ $9,500

+

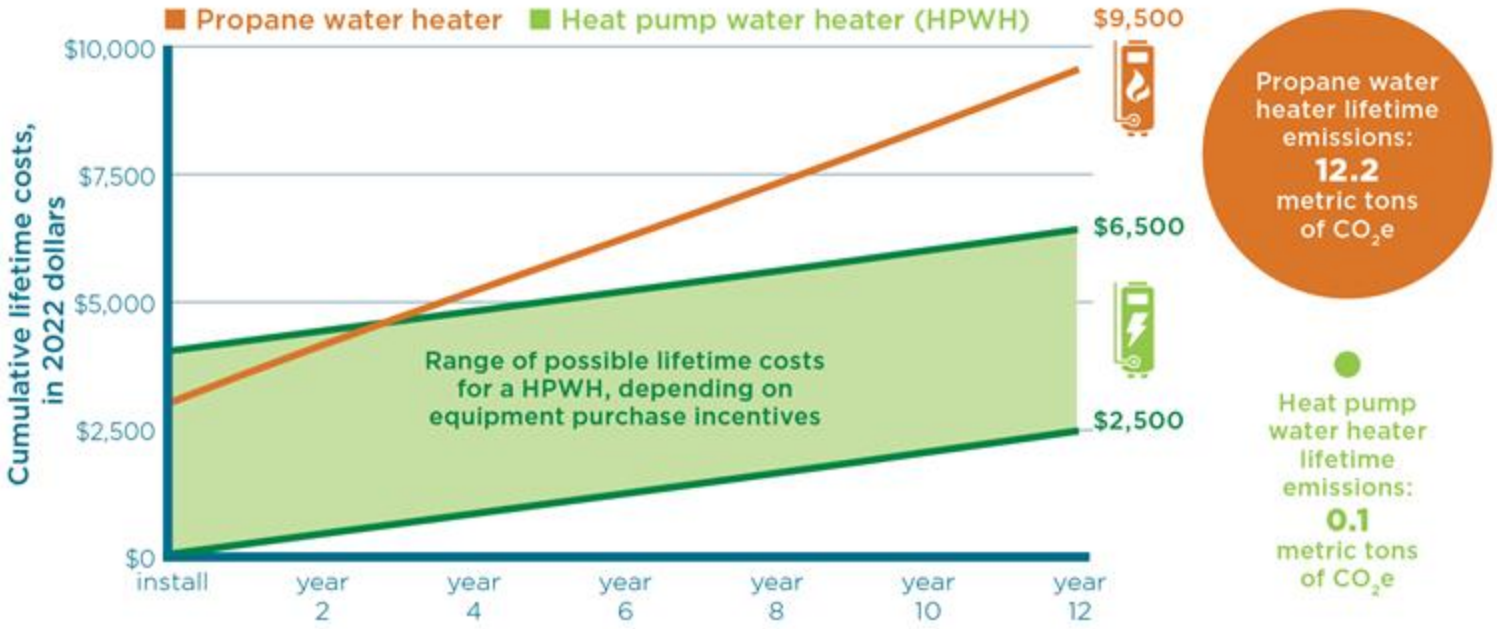
Avoided social costs from reduced fuel-related GHG emissions over the life of the vehicle: ~ $7,000

Average annual fuel savings from switching to an EV: Vermont high gasoline users vs. typical gasoline users

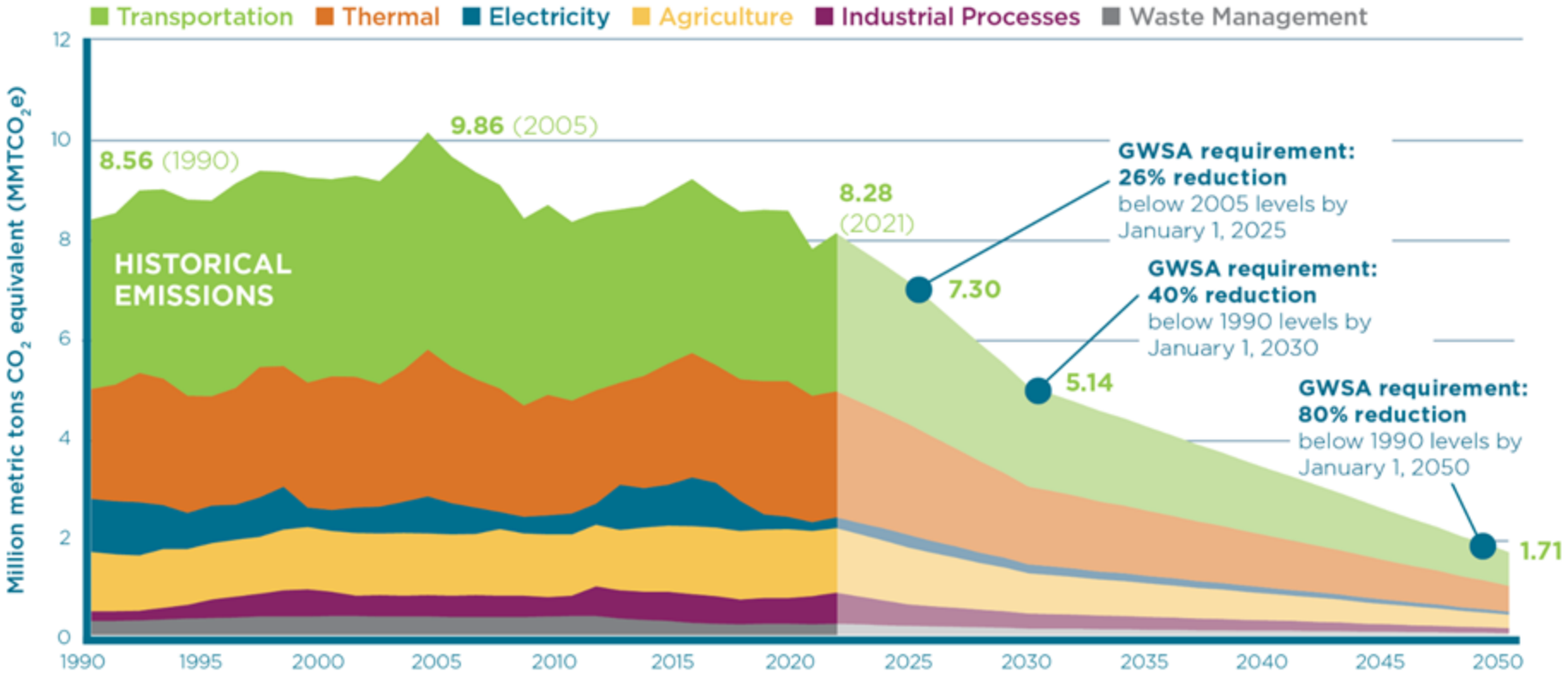


Analysis by Coltura

Lifetime costs of propane water heater vs. heat pump water heater (installed cost + fuel)

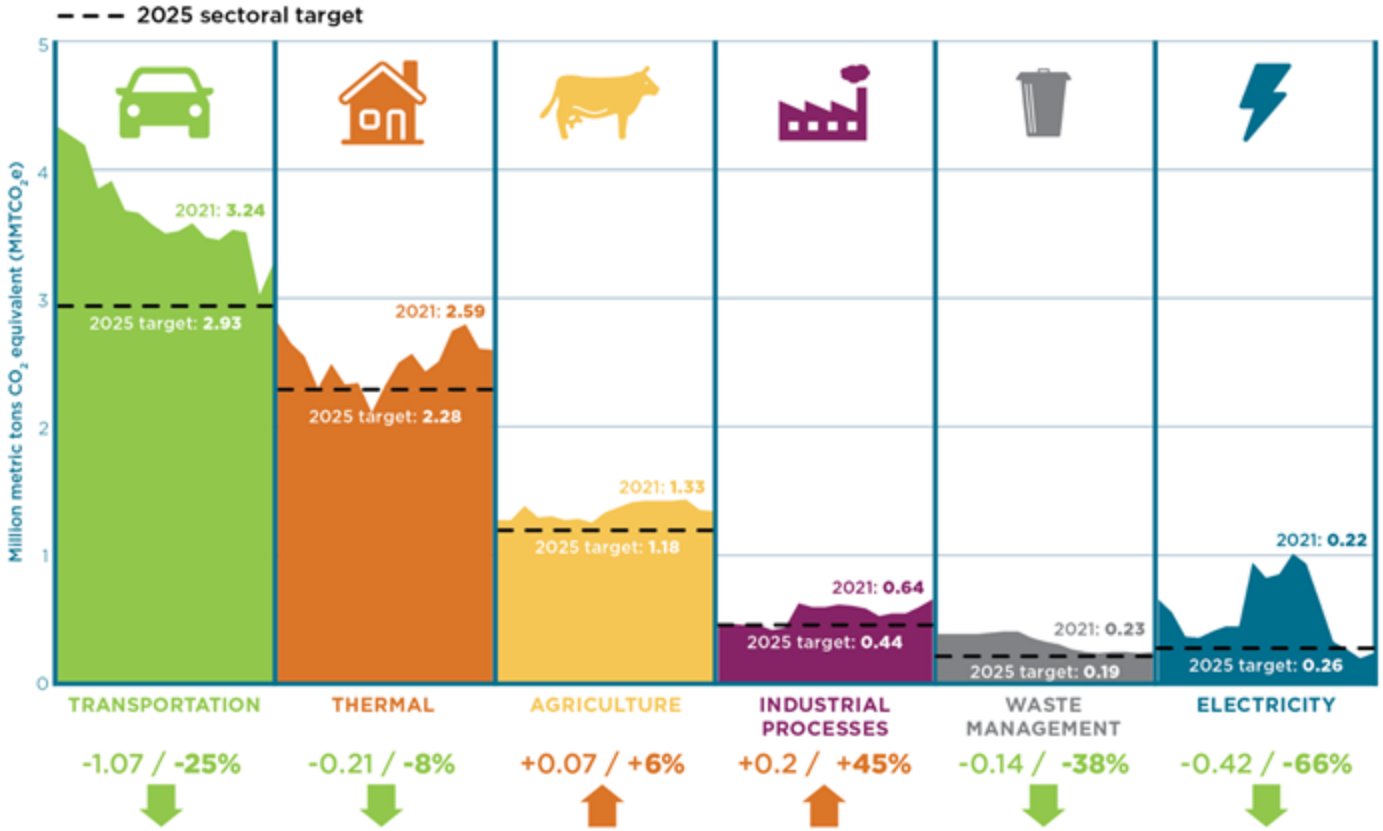


Vermont's historical GHG emissions and future requirements

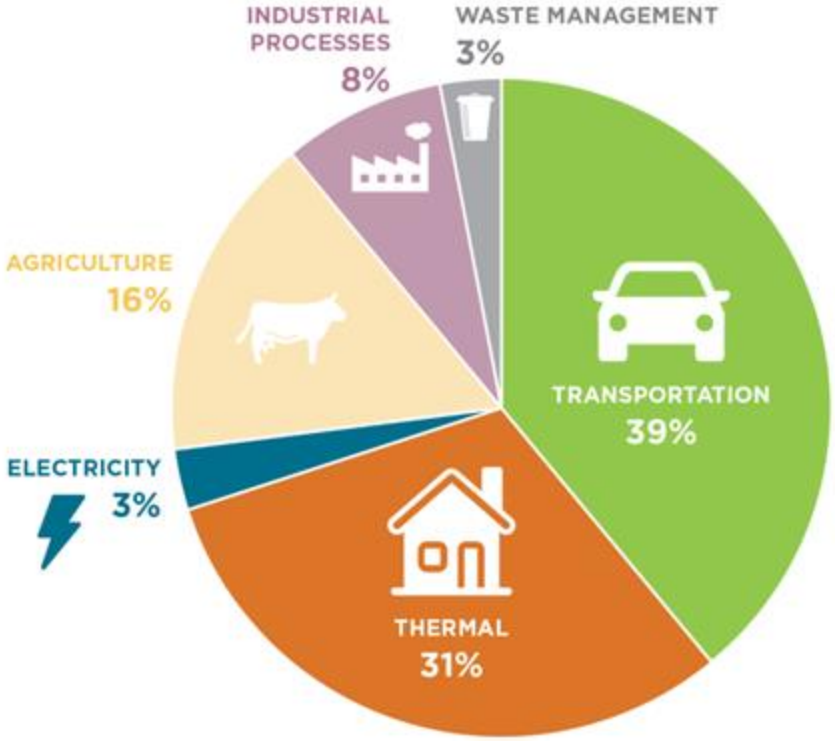


Emissions data from VT ANR

Vermont GHG emissions by sector, 2005–2021



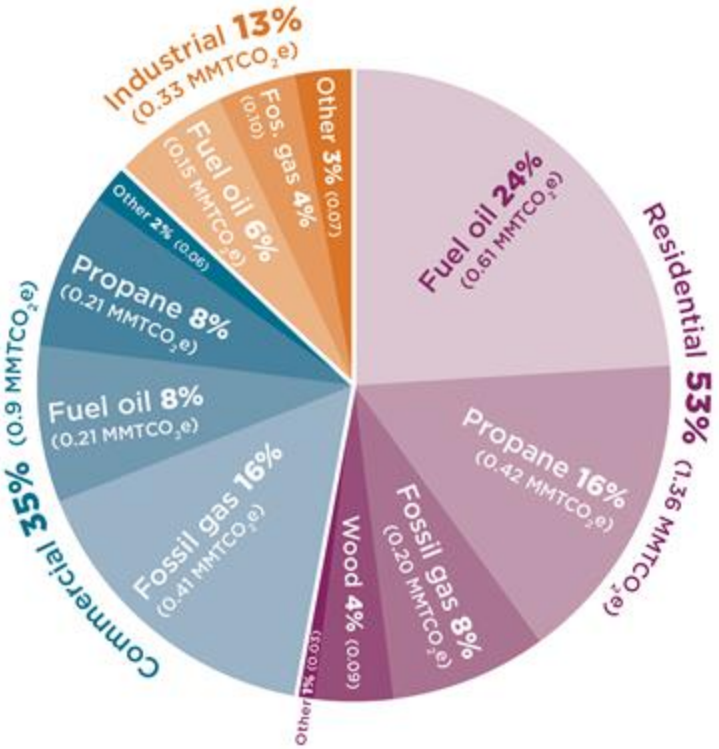
Vermont's GHG emissions by sector, 2021



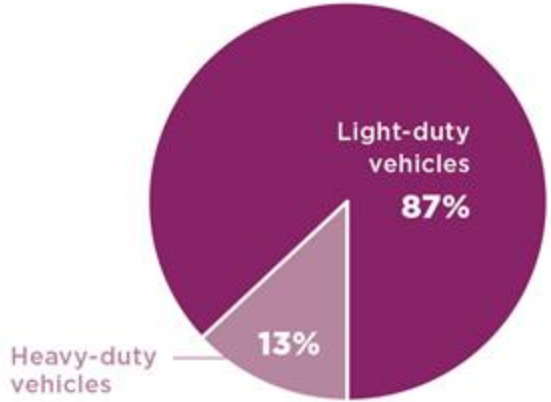
Sources: Vermont Agency of Natural Resources, Vermont GHG Emissions Inventory and Forecast: 1990-2021, 2024. **Note:** There is a small amount of emissions from the "fossil fuel industry" category (i.e. fugitive emissions from fossil gas pipelines in VT), accounting for 0.4% of Vermont's overall emissions in 2021, that does not show up on this graph.

Vermont thermal GHG emissions by sector and fuel type, 2021

TOTAL THERMAL EMISSIONS 2.59 $MMTCO_2e$

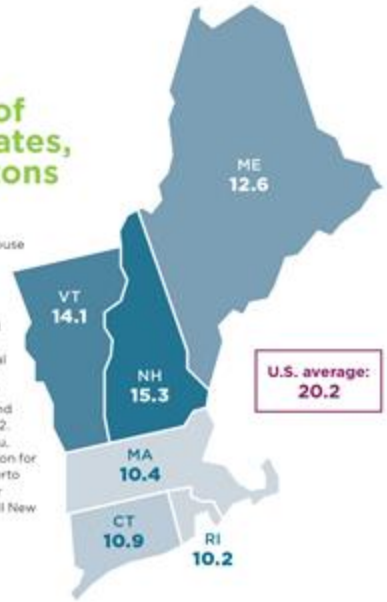


On-road transportation emissions by vehicle weight class



Source: U.S. EPA, National Emissions Inventory, 2020.

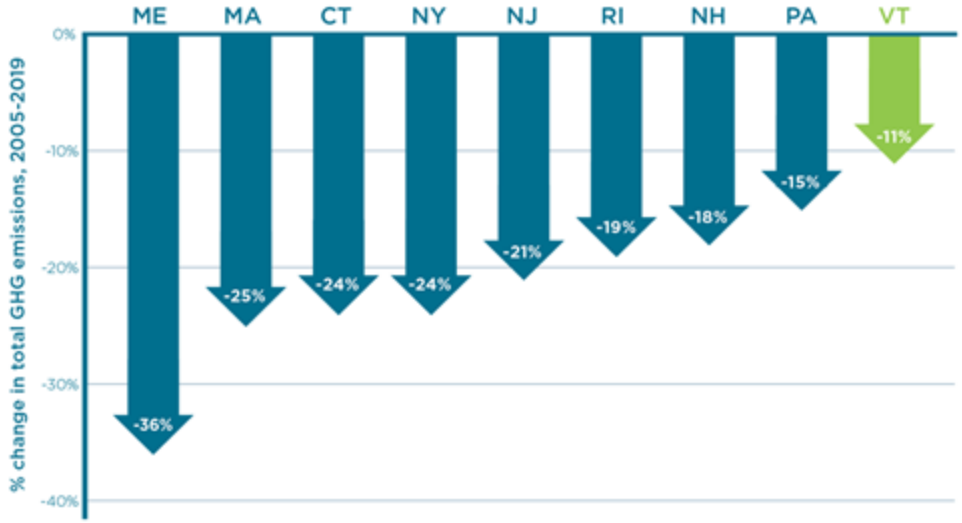
GHG emissions of New England states, 2019, in metric tons per capita



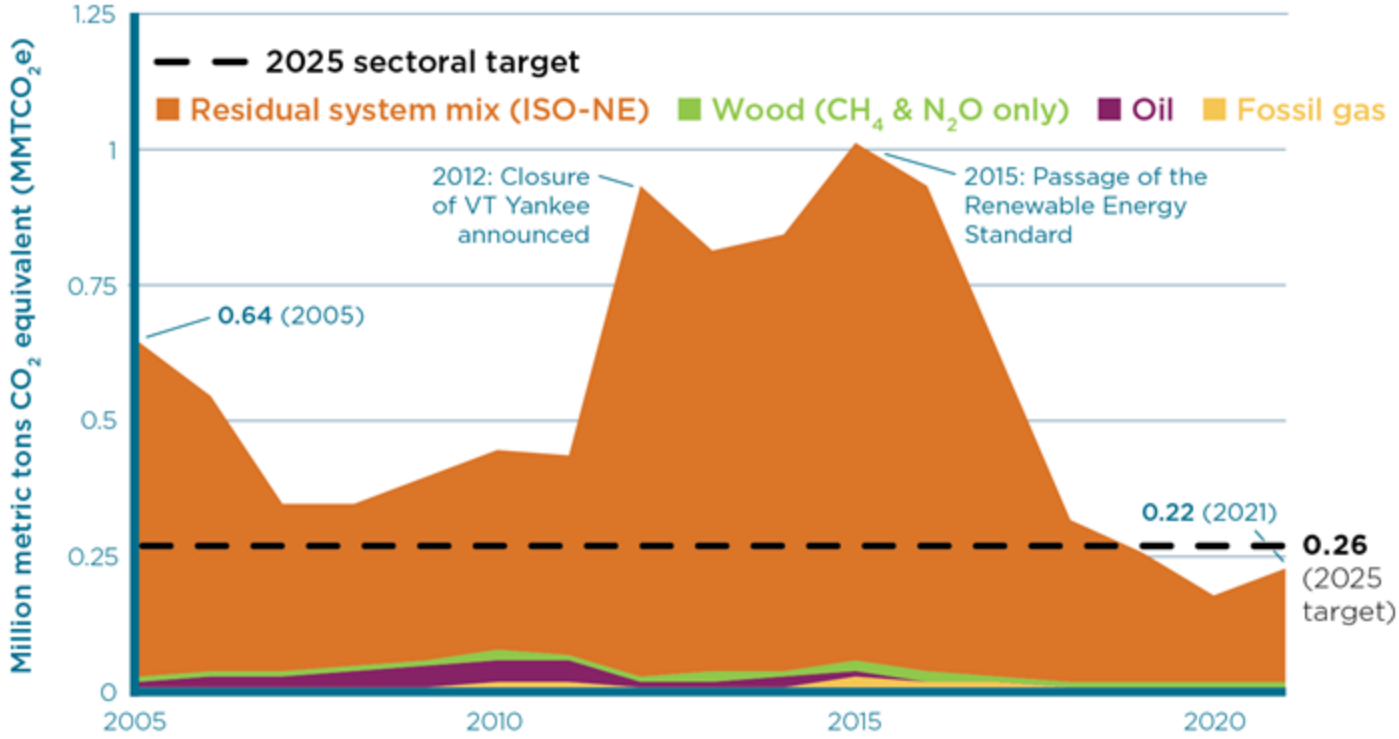
Sources: Vermont ANR, "Vermont Greenhouse Gas Emissions Inventory and Forecast: 1990 - 2020," 2023; Connecticut DEEP, "Connecticut Greenhouse Gas Emissions Inventory: 1990-2021," 2023; Maine DEP, "Ninth Biennial Report on Progress Toward Greenhouse Gas Reduction Goals," 2022; Massachusetts DEP, "Massachusetts Annual Greenhouse Gas Emissions Inventory: 1990-2020, with Partial 2021 & 2022 Data," 2022; Rhode Island DEM, "2019 Rhode Island Greenhouse Gas Emissions Inventory," 2022. Clean Energy NH, 2023; U.S. Census Bureau, "Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico," 2019. **Note:** 2019 is the latest year for which comparative data is available from all New England states.

ENERGY ACTION NETWORK

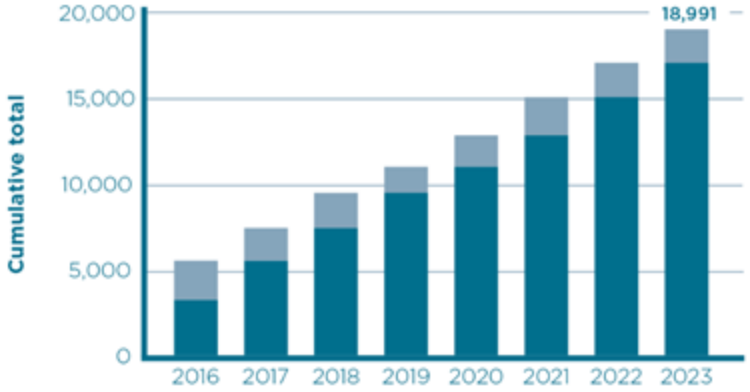
Percent reduction in total GHG emissions, 2005–2019



VT electricity GHG emissions (2005–2021) vs 2025 sectoral target

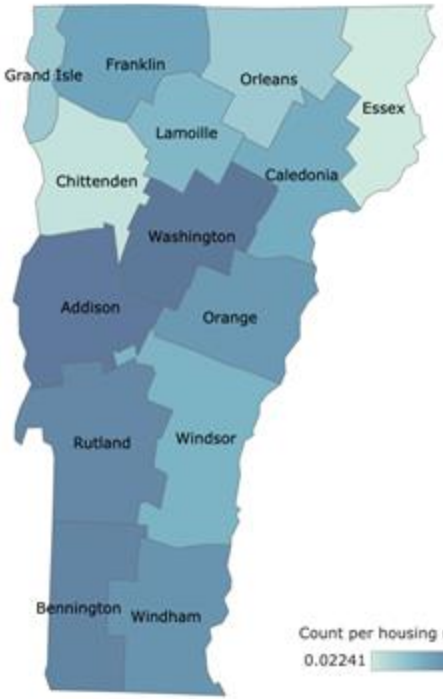


Residential heat pump water heaters

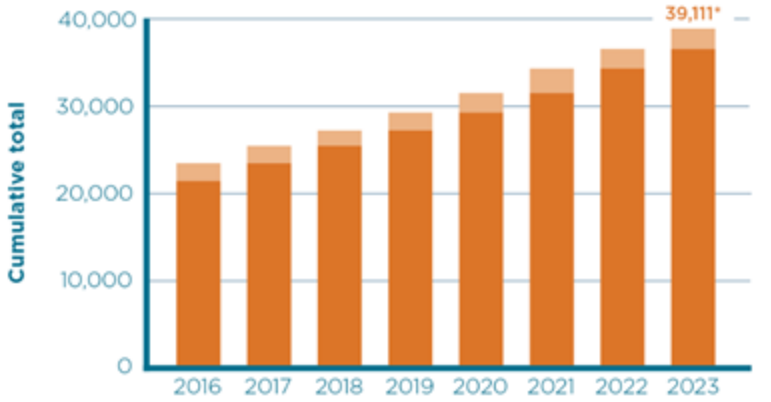


Heat pump water heaters by county as of 2022

Click on a county to filter

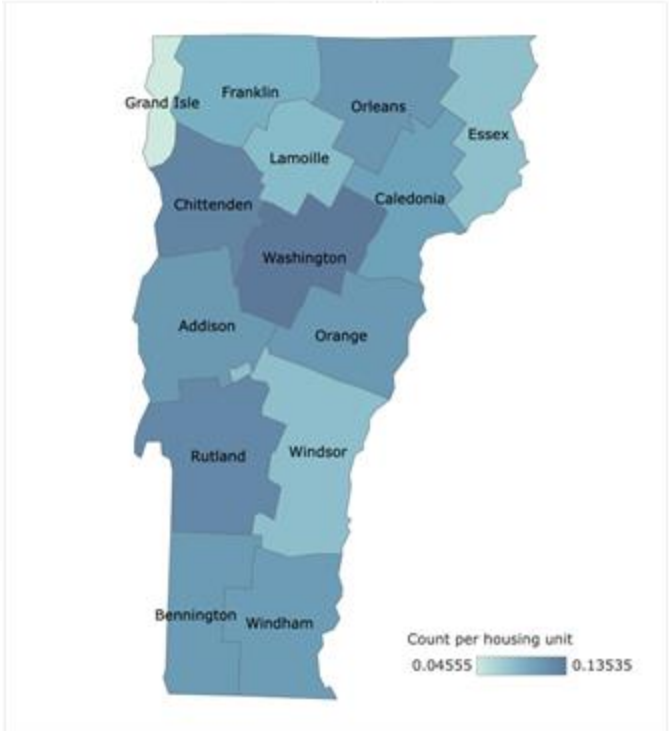


Housing units comprehensively weatherized

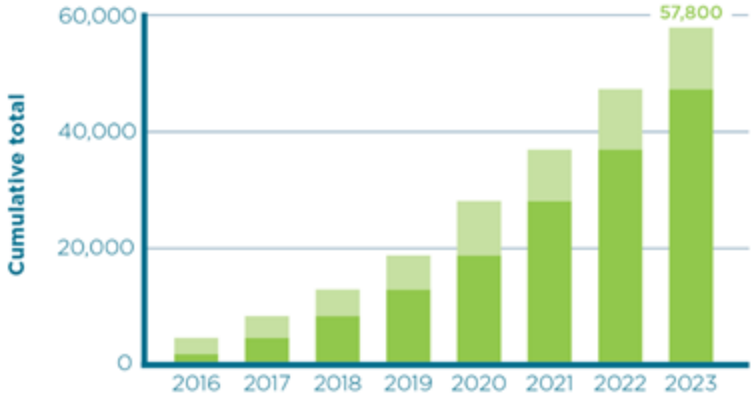


Weatherization by county as of 2022

Click on a county to filter



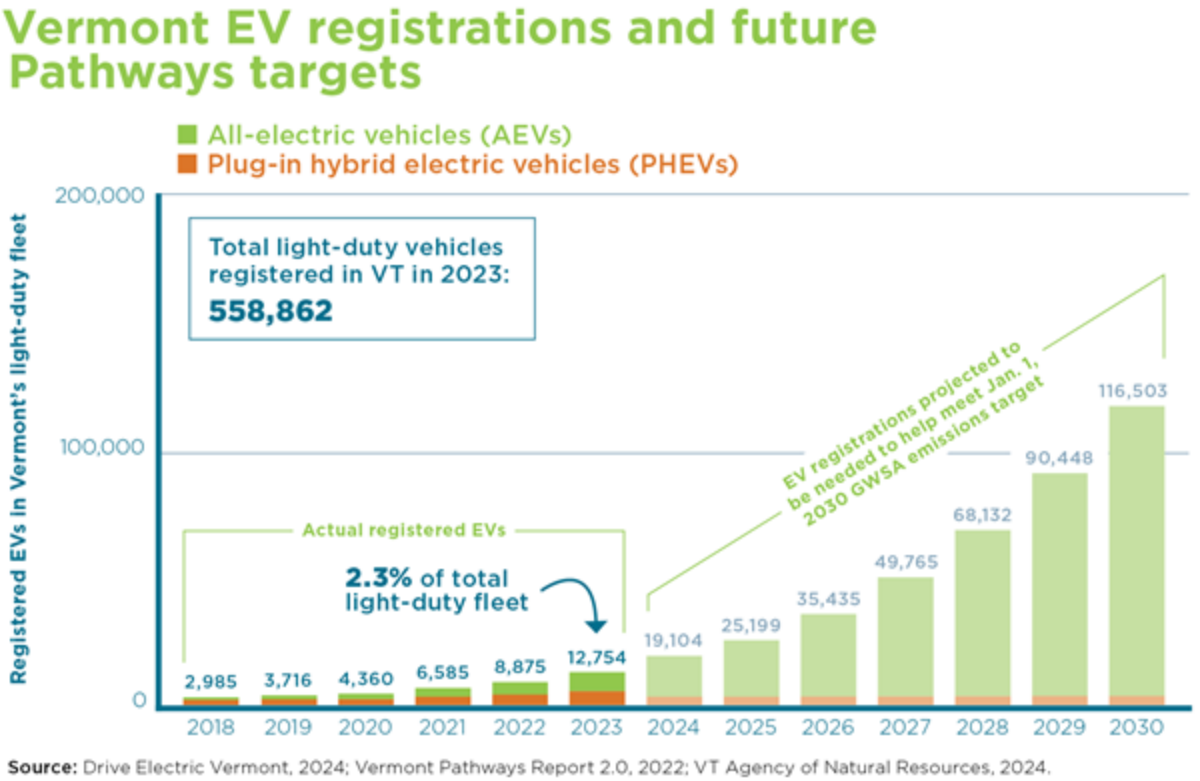
Residential cold-climate heat pumps



Cold-climate heat pumps by county as of 2022

Click on a county to filter

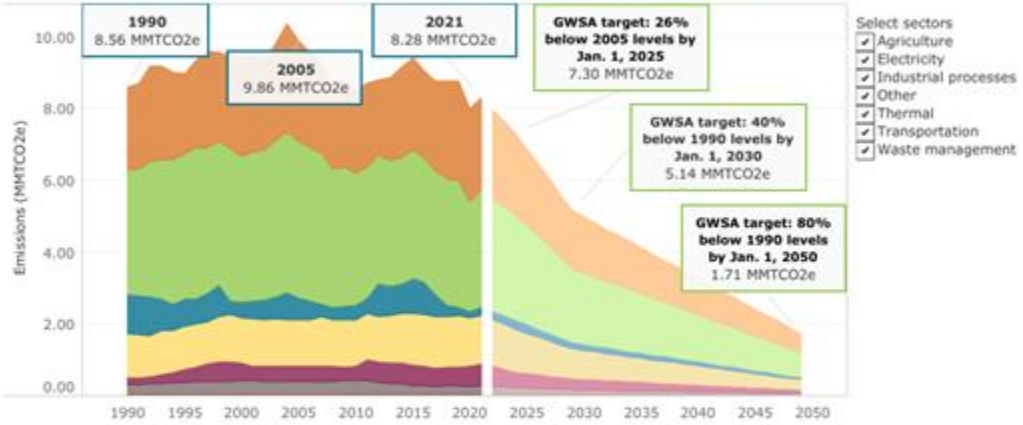
- VT has the highest number of EVs per capita in New England
- **15,144** plug-in EVs in VT as of July 2024
  - **58%** all-electric



Vermont GHG emissions dashboard

Overall | Thermal | Transportation | Electricity | Progress by sector

VT historical GHG emissions and future requirements



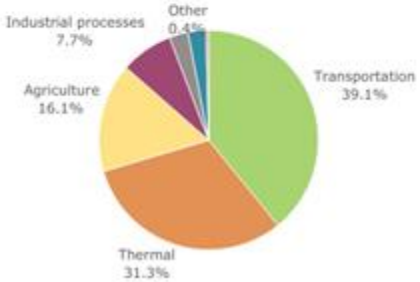
What is the GWSA? The GWSA (Global Warming Solutions Act) was passed by the Vermont Legislature in 2020 and established legally binding emissions reduction obligations for Vermont. The Act requires:

- 26% reduction below 2005 levels by Jan. 1, 2025
- 40% reduction below 1990 levels by Jan. 1, 2030
- 80% reduction below 1990 levels by Jan. 1, 2050

In 2021, Vermont's GHG emissions were 8.28 million metric tons of CO2 equivalent, just **16%** below 2005 levels.

VT GHG emissions by sector, 2021

Click on a sector to highlight in the graph above



Source: *Vermont Agency of Natural Resources, Vermont Greenhouse Gas Emissions Inventory and Forecast: 1990-2021, 2024 (https://climatechange.vermont.gov/climateactionoffice/greenhouse-gas-inventory).*

https://eanvt.org/emissions-dashboard/

Thank you!

Questions?

Report available online at www.eanvt.org/annual-report

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