ENERGY ACTION NETWORK

2026 Annual Progress Report

for VERMONT

on **Energy, Affordability,** and **Emissions**

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EAN is dedicated to providing the latest data and high quality analysis to ground and inform Vermont's energy and climate conversation. *We produce the Annual Progress Report for Vermont because we believe that achieving constructive progress toward Vermont's energy and climate commitments should begin with — and always return to — a careful, fact-based assessment of the latest evidence.*

This report includes the latest available data from many official sources, from local to international levels. Please note that the text in this report frequently references data and analysis from accompanying graphics on the same page. For readability, when a graph is already sourced we do not also footnote sources in the text. We are happy to share background data upon request.

Thank you to the broad and diverse array of data providers and reviewers whose generous collaboration makes this report possible. We welcome questions, constructive feedback, and suggestions.

Energy issues face ever-changing context, with a constant stream of new information. In this environment, doing high-quality and responsive energy analysis requires curiosity, open-mindedness, and a desire to always be learning.

That is why **our approach at EAN starts with two things: data and people.** We collect the latest and highest quality data to inform us, and then ground our analysis in human concerns around affordability, community, health, and resilience. In all we do, we strive to work with both deep humility and deep commitment.

Reflecting this approach, this report begins with the key questions that guided our analysis in 2026:

1. **How does energy affect affordability?**

2a. **How can we use less energy while getting the same output?**

2b. **How do different energy choices compare on mining and materials?**

3. **What degree of dependence vs. freedom do different energy choices provide?**

4. **How do different energy choices affect the Vermont economy?**

5. **What are the most significant impacts on human health and the environment of our current reliance on fossil fuels?**

We hope the answers we have found in this annual journey will deepen our shared understanding of Vermont's fast-changing energy landscape. Our goal is both to inform Vermont's energy conversation and to help to advance statewide energy progress toward a more just, thriving, and sustainable future.

In this work, one challenge stands out. **Energy costs — driven primarily by inefficient equipment reliant on expensive and price-volatile fossil fuels like gasoline, diesel, fuel oil, and propane — are a significant contributor to unaffordability in Vermont.**

With modern electric technology, from EVs to heat pump water heaters, many Vermont households have the opportunity to achieve ***durable energy affordability*** — paying lower costs month after month and over the lifetime of their vehicles and heating equipment. If Vermonters remain dependent on inefficient vehicles and equipment, they are likely to be saddled with high costs year after year, often paying far more over time. Instead, if we can help more Vermonters access efficient technologies that are more affordable to own, we can avoid locking in decades of higher costs and higher pollution for Vermont and Vermonters.

The challenges and opportunities before us are too great to think only narrowly, simplistically, or short term. This report is an invitation to come together, look at the bigger picture, think systemically, and work to achieve real, lasting, and sustainable progress for Vermont. We're glad to be on this journey with you — thank you for reading and for engaging with this report.

1. How does energy affect affordability?

Affordability is one of Vermonters' top concerns. Prices have risen sharply in recent years, causing strain on household and business budgets. While prices of goods and services in Vermont are similar to neighboring states, wages here are lower than regional averages — leaving many Vermonters with an especially challenging wage versus price gap.[1]

On average, housing is the single largest expense for households in the Northeast — with the cost of space and water heating making up a significant part of housing costs.[2] Transportation is the second largest average household expense.[3] This is especially true for households that rely on gasoline vehicles.

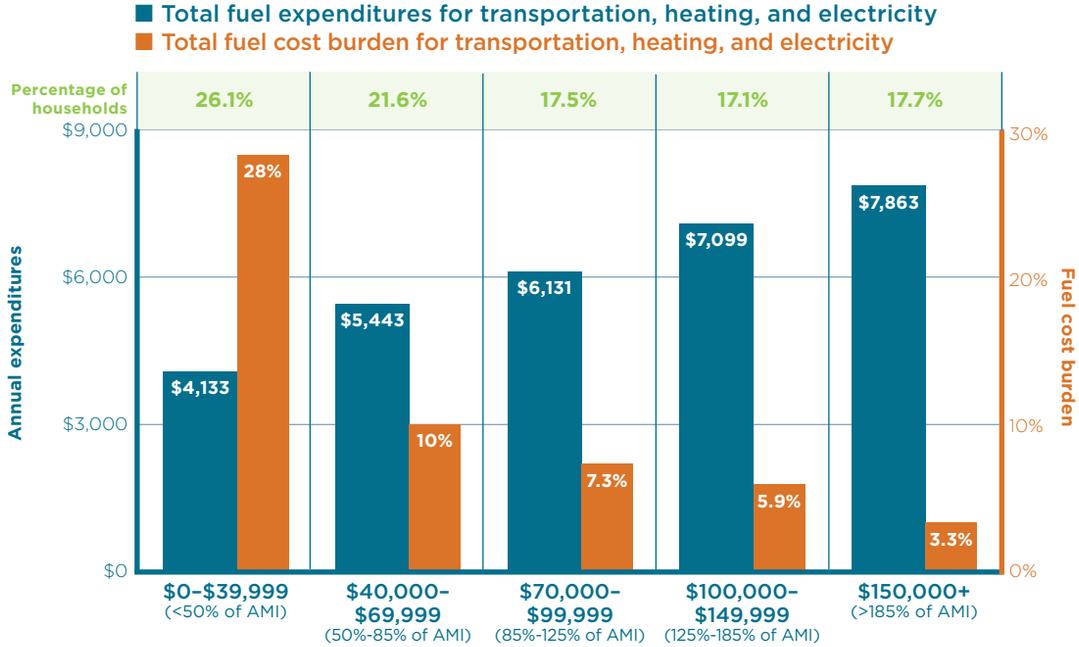
Vermont has the fourth highest household energy costs in the U.S.

National rank	State	Average annual household energy expenditures, 2024
#1	Maine	$7,803
#2	New Hampshire	$7,541
#3	Alaska	$7,413
#4	**Vermont**	**$7,321**
#5	Connecticut	$7,162
	U.S. Average:	**$5,529**

Source: EPRI, The Energy Wallet, 2025.
Note: Household energy costs include transportation fuels, heating fuels, and electricity.

Reducing the amount of money spent on energy is crucial to affordability. Vermonters have the 4th highest average household energy costs of any state in the country, at over $7,300 per year going to transportation fuels, heating fuels, and electricity. These high household energy costs are driven by our over-reliance on expensive fossil fuels. Vermont has the lowest electricity rates in New England, but a higher percentage of our homes rely on expensive delivered heating fuels like fuel oil and propane.[4] Vermonters also drive more miles per capita than residents of any other New England state,[5] mostly in gasoline vehicles.

Vermont* combined average heating, electricity, and transportation fuel expenditures and burden by income level, 2020–2024

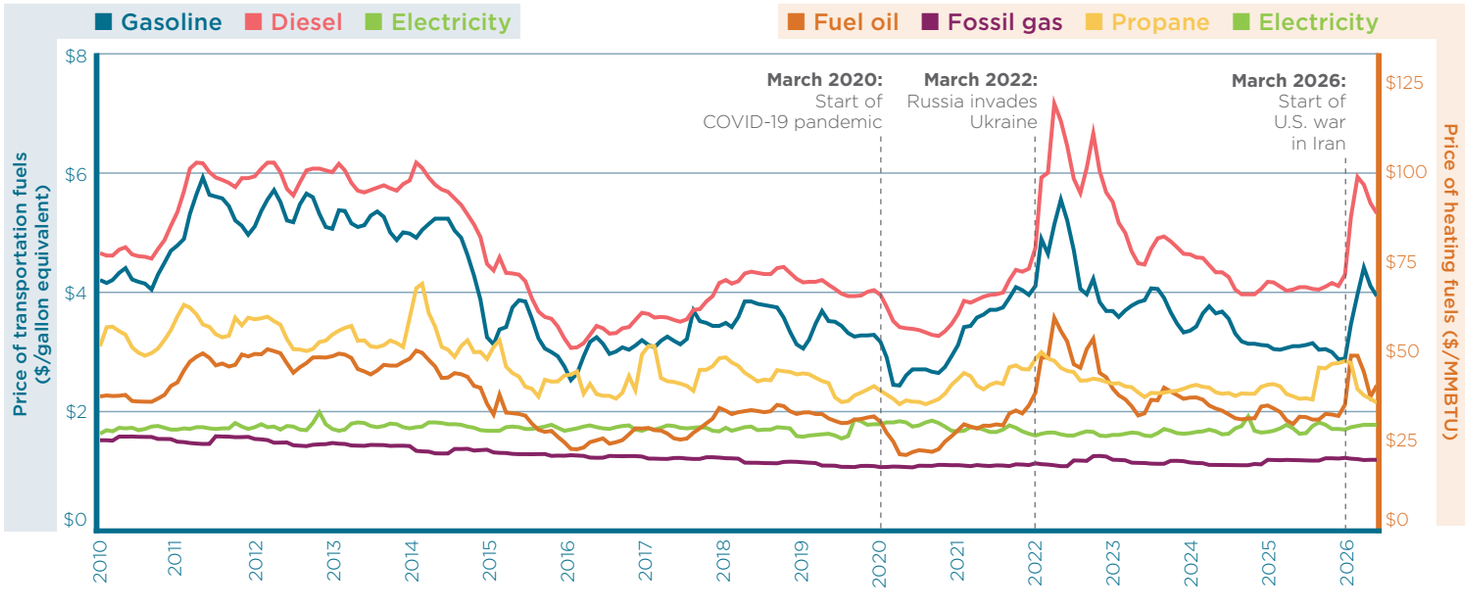


Sources: Heating and electricity: U.S. Census Bureau, 2020-2024 American Community Survey 5-year Public Use Microdata Samples for Vermont. Transportation: U.S. Bureau of Labor Statistics, Consumer Expenditure Surveys, average expenditures for the Northeastern U.S., 2023-2024.
***Notes:** Heating and electricity spending data is Vermont-specific. Due to data limitations, transportation cost and burden data represent averages for the Northeast United States; this almost certainly underrepresents the costs and burdens facing Vermonters. For example, Vermont has the highest per capita vehicle miles traveled (VMT) of all Northeast states. Fuel cost burden refers to the share of annual household pre-tax income spent on energy (fuels and electricity). This expenditure data is for fuels and electricity only and does not include equipment or maintenance costs. % of area median income (AMI) values are approximate.

Resulting energy cost burdens — the share of income spent on energy — are not felt equally. **For those with the lowest incomes, energy expenses often take up more than a *quarter* of household budgets.** And that is just for fuel — these numbers do not account for equipment and maintenance costs. Even though lower-income households spend less money on energy than upper-income households, their energy burdens are far higher because their household incomes are much lower.

1. Public Assets Institute, "State of Working Vermont 2024."
2. U.S. Bureau of Labor Statistics, Consumer Expenditure Surveys 2023-2024.
3. Ibid.
4. U.S. Energy Information Administration, "2020 Residential Energy Consumption Survey (RECS)." Atlas Buildings Hub, "Fuel Oil and Propane Space Heating Across the United States," 2023.
5. Federal Highway Administration, Highway Statistics 2024, Table PS-1.

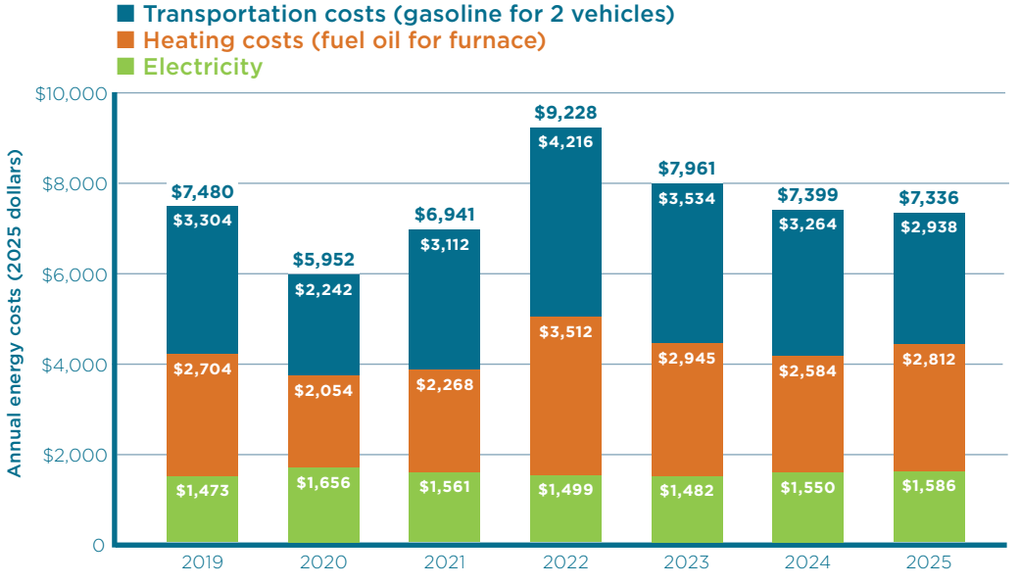
Vermont transportation and heating fuel prices, adjusted for inflation



Sources: Vermont electricity, gasoline, and diesel prices: U.S. Energy Information Administration, 2026; Fuel oil and propane prices: VT Department of Public Service, 2026. Fossil gas (residential rate): VGS, 2026.
Notes: Electricity prices presented here are representative of the statewide average residential rate but vary by utility territory. The electricity line represents both prices to charge an electric vehicle (on the left axis) and to heat a home using a heat pump (on the right axis). Prices are adjusted for inflation and shown in July 2026 dollars, using the U.S. BLS Consumer Price Index. Fossil gas is also referred to as "natural gas," "utility gas," "pipeline gas," "fracked gas," or "methane."

Achieving durable affordability requires access to lower cost and more price-stable energy sources, which often necessitates a transition to new equipment. **Currently, the most widely used energy sources by Vermont households — gasoline and diesel for transportation, and fuel oil and propane for heating — are some of the most expensive and price-volatile fuels.** In contrast, electricity, fossil gas, and wood are all energy sources that have historically been both lower cost and more price-stable.[1]

Annual energy costs for an example Vermont household, 2019–2025, adjusted for inflation



Sources: Transportation costs estimated for a household with 2 gasoline vehicles based on VT average annual VMT per capita (11,209) from the Federal Highway Administration, average MPG assumption (23.4 MPG) from the UVM Transportation Research Center and Vermont Agency of Transportation "Vermont Transportation Energy Profile 2021," and average annual gasoline prices for New England from EIA. Heating costs for a fuel oil furnace estimated based on average Vermont heating load of 83 MMBTU (adjusted based on annual heating degree days), average fuel oil furnace efficiency from the Efficiency Vermont "Technical Reference Manual (TRM), Program Year 2024," and average VT fuel oil prices from the Department of Public Service. Electricity costs estimated based on average monthly electricity consumption and average annual electricity prices from EIA. **Note:** Costs shown are adjusted for inflation and shown in 2025 dollars using the U.S. BLS Consumer Price Index.

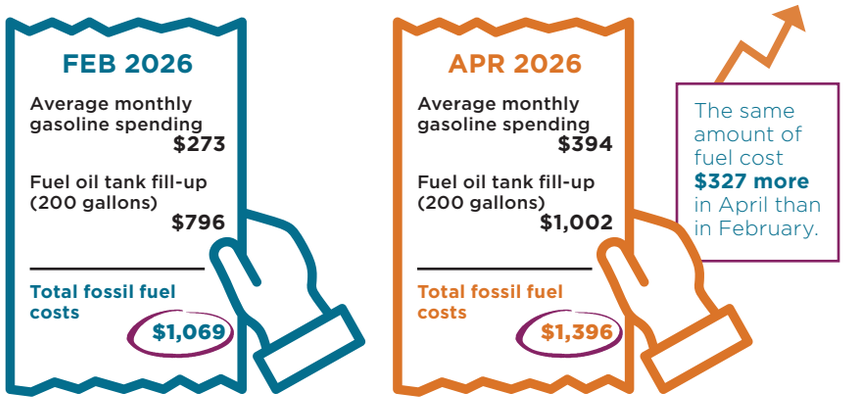
The effects of fossil fuel price spikes were especially evident from 2021 to 2022, when annual energy costs for many Vermont households increased by over $2,250 in a single year. Fuel use actually stayed level across those two years, with the cost increase for households driven by spiking gasoline and heating fuel costs following Russia's 2022 invasion of Ukraine.

1. Fossil gas is also referred to as "natural gas," "utility gas," "pipeline gas," "fracked gas," or "methane."

Another fossil fuel price spike occurred after the start of the war in Iran in early 2026. **Prices rose dramatically, with gasoline increasing by an average of over 3¢ per day and diesel by more than 5¢ per day in March.**

Comparing prices at the end of February versus the end of April, an average Vermont household driving gasoline cars and heating their home with fuel oil would have paid $327 more for the same amount of fuel. These price spikes hit Vermonters at the end of a particularly cold heating season when many needed to buy more fuel than they had budgeted for, and many who had pre-buy contracts had already used up the lower-priced fuel in their contracts.[1]

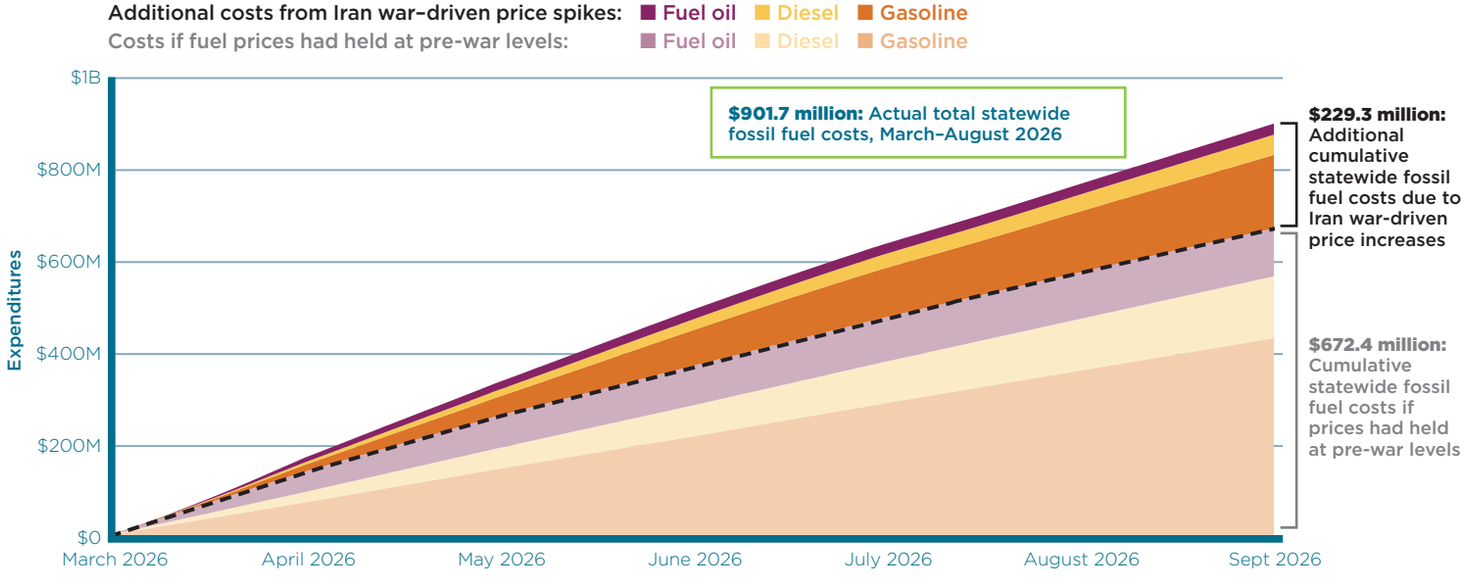
Average Vermont household fossil fuel expenses, February vs. April 2026



Sources: Average monthly gasoline costs based on average fuel efficiency (23.4 MPG) from UVM Transportation Research Center and Vermont Agency of Transportation, "Vermont Transportation Energy Profile 2021"; Vermont number of people per household (2.28): U.S. Census Bureau, American Community Survey, 2020-2024; Vermont regular gasoline prices: GasBuddy, 2026; Vermont average annual vehicle miles traveled (VMT) per capita (11,209): Federal Highway Administration, Highway Statistics 2024, Table PS-1 (11,209 in 2024); average Vermont fuel oil prices: Vermont Department of Public Service, 2026.

At the prices Vermonters were paying for fossil fuels before the war in Iran started, statewide costs would have been $672.4 million dollars for gasoline, diesel, and fuel oil in the six months from March through August. However, prices rose rapidly in March and April, and stayed high through the summer and beyond. **This increased the cost for Vermont purchasers of gasoline, diesel, and fuel oil by an additional $229.3 million for the six months of March through August** than would have been the case had prices for those fuels remained at pre-war levels. This was $229.3 million that could have been spent on other things, such as food, housing, and health care for Vermont residents. For Vermont businesses, these higher prices drove up their cost of doing business, eating into profit margins and/or forcing them to charge customers higher prices to make up for higher fuel expenses.

Cumulative fossil fuel costs in VT, pre-war price scenario vs. actual prices, March–August 2026



Sources: Daily gasoline and diesel prices: GasBuddy, 2026. Estimated statewide daily gallons of gasoline and diesel: Vermont Department of Taxes via Joint Fiscal Office, 2026. Fuel oil prices: U.S. Energy Information Administration (EIA). 2026; Vermont Department of Public Service, 2026. Estimated statewide fuel oil consumption: Vermont Department of Taxes, 2026. Heating degree days: NOAA, 2026.
Note: For additional data and analysis, please see EAN's blog on this topic: eanvt.org/blog/2026-fossil-fuel-price-increases.

1. Vermont Public, "Fuel prices are up, and so is need," March 2026.

2a. Efficiency: How can we use less energy while getting the same output?

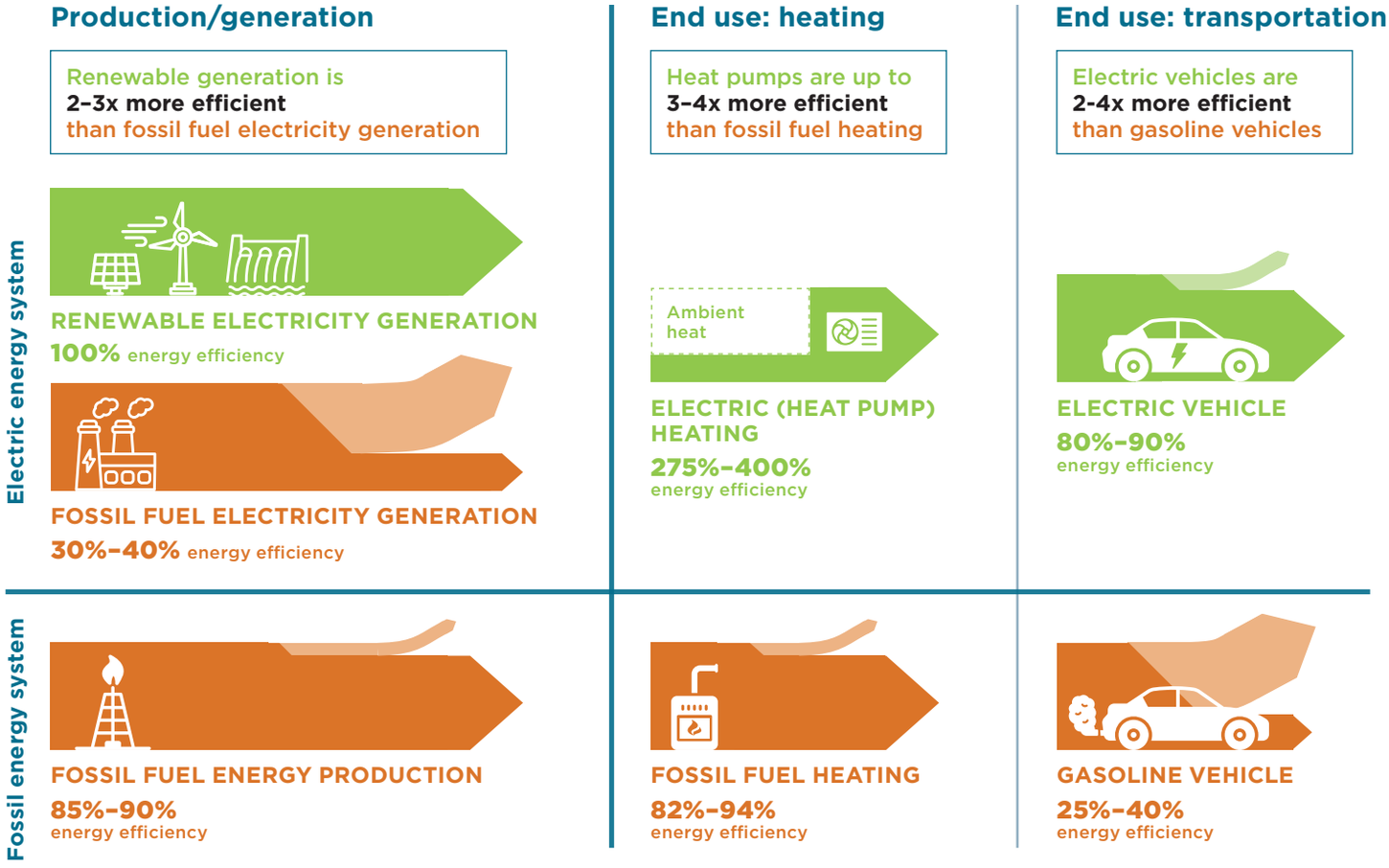
When thinking about efficiency in relation to energy, we tend to focus on end-use efficiency, or how much energy it takes to produce the same result, such as from a light bulb or an appliance. Vermont has made significant progress in this dimension of energy efficiency thanks to long-term investment in end-use energy efficiency programs. But the question of efficiency is relevant throughout the entire energy system, from material sourcing to energy production to energy end-uses. **Understanding the full impact of beginning-to-end efficiency reveals the hidden advantage of renewables and electrification.**

Renewables and electrification save energy at every step of our energy system. Renewable electricity generation can be considered 100% efficient in the sense that there is no extra cost to or waste from sunlight, wind, or water that is not converted to energy by a panel or a turbine. In contrast, fossil fuel electricity generators pay for 100% of the fuel they use, but only 30%–40% of it is converted to useful energy in the form of electricity and the other 60%–70% is lost as waste heat.

When it comes to the end use of energy for heating and transportation, heat pumps and EVs have major efficiency advantages over fossil fuel-based boilers, furnaces, and internal combustion engine vehicles. Specifically, heat pumps are up to 3–4 times more efficient than fossil-based heating and EVs are 2-4 times more efficient than gasoline and diesel vehicles.

Efficiency of fossil fuel vs. electricity-based energy systems

Each infographic in this table shows energy input on the left and energy output on the right, with useful energy shown in the darker color and waste heat in the lighter color.



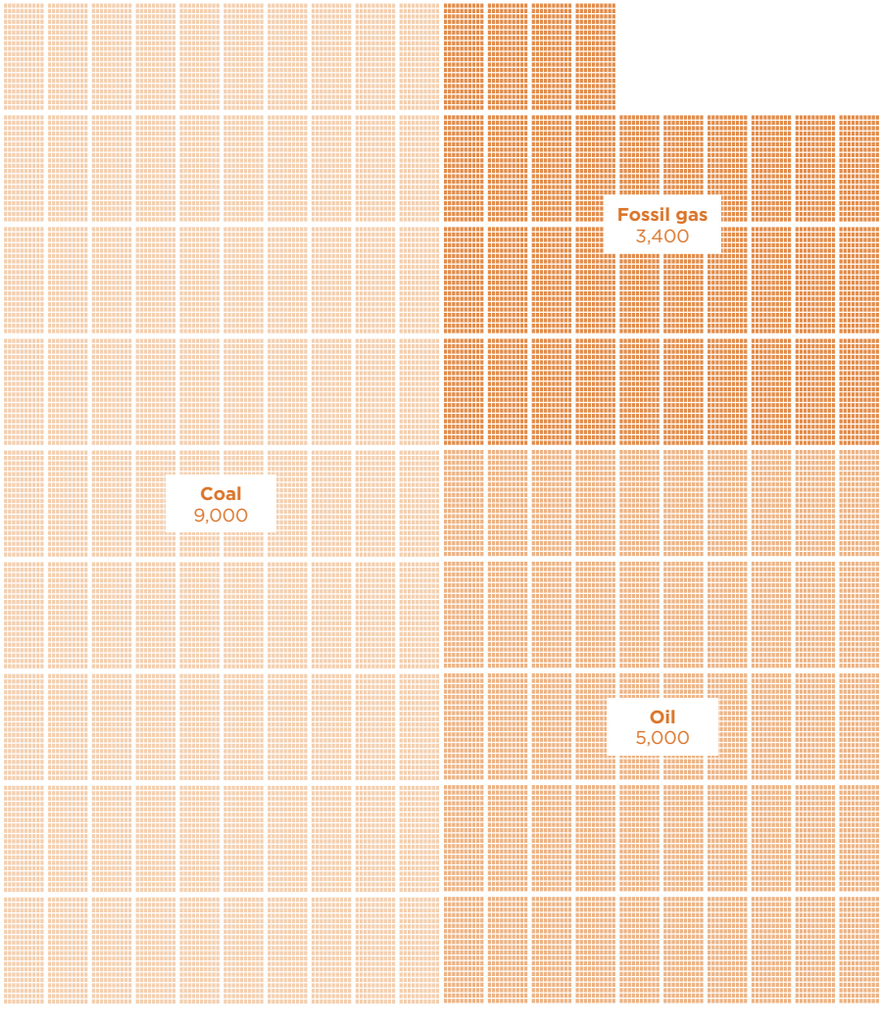
Sources: RMI, "The Incredible Inefficiency of the Fossil Energy System," 2024; fossil fuel heating efficiency: NMR Group, "Vermont Single-Family Existing Homes Baseline Study," 2023.
Notes: For sake of simplicity, this table does not show transportation or transmission losses. Transportation losses from fossil production to combustion are estimated to be 2.3%; electricity transmission and distribution losses are estimated to be approximately 5%, and up to 8% at times of peak demand.

2b. Efficiency: How do different energy choices compare on mining and materials?

It is less common to look at efficiency in relation to materials and mining, but here too there are large differences between a fossil fuel and an electricity-based energy system. A fully electrified system would require mining of many materials, especially steel, aluminum, copper, nickel, graphite, silicon, lithium, and cobalt. While there are fair questions about these materials needed for batteries and renewable energy generation, it is important to ask the question: compared to what? **The total material needs in tons extracted — including materials needed to build all new generation, storage, and transmission infrastructure for a fully electrified economy — would be over 60 times lower annually than the amount of fossil fuels extracted each year to support the current fossil fuel economy.**

The beginning-to-end efficiency advantage of renewables and electrification provides a massive opportunity to lower energy use, energy costs, and energy pollution all at once. **These modern technologies allow us to have the things we actually want from energy — comfort, convenience, and prosperity — while reducing the harms of expensive, wasteful, material-intensive, and heavily polluting fossil fuels.**

Global material intensity: fossil fuel vs. electricity-based energy system



17,400 million metric tons of material extracted per year, **current fossil fuel global energy system**

The fossil fuel system requires over **60x more material extraction by weight** than an electrified energy system.

vs.

278 million metric tons of material extracted per year, **fully electrified global energy system**

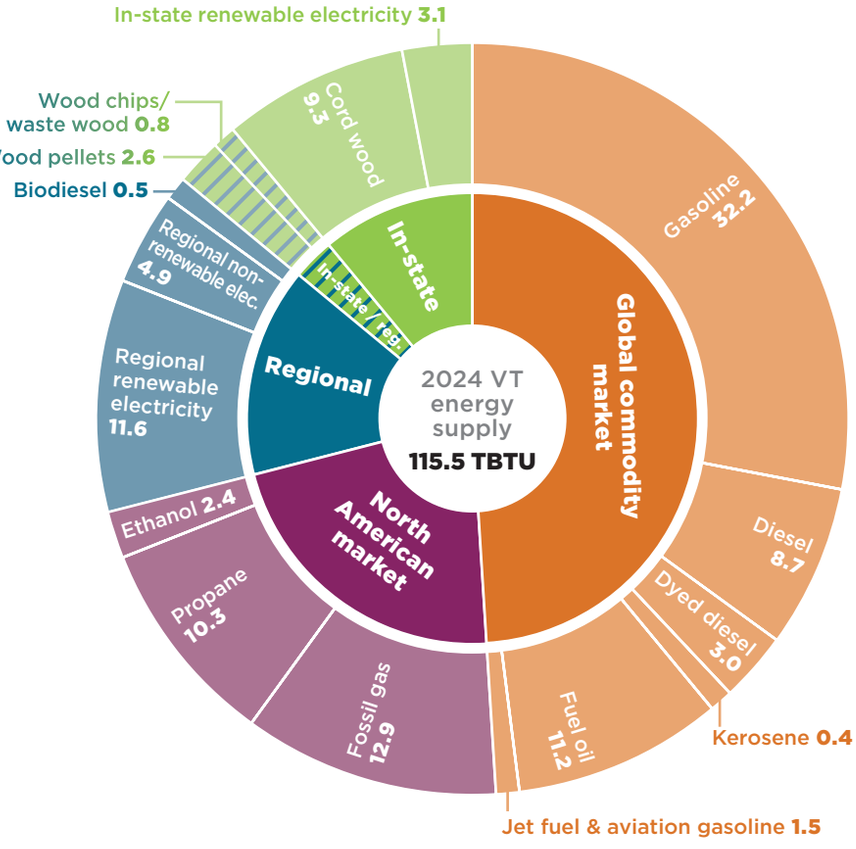
Cobalt: 0.24
Lithium: 0.8
Silicon: 2.6
Nickel: 4
Graphite: 6.8
Copper: 26
Aluminium: 38
Steel: 200

Sources: "Material and Resource Requirements for the Energy Transition," Energy Transitions Committee, July 2023. "The Electrotech Revolution," Ember, 2025.
Notes: The materials estimate for the electricity-based energy system accounts for all elements of the system that would need to be built out, including generation (e.g., solar panels, wind turbines), transmission upgrades, storage, and end-use technologies (e.g., heat pumps, electric vehicles). The fossil fuel extraction only accounts for units of fuel — not any of the requisite infrastructure, pipeline maintenance and repairs, or end-use technologies. If fossil fuel system extraction were accounted in the same way as the electricity-based system, the total amount of extraction for the fossil fuel system would be even larger.

3. What degree of dependence vs. freedom do different energy choices provide?

Vermont's energy sources vary widely in terms of where they come from and how exposed they are to global supply and price shocks. Fossil fuels such as gasoline, diesel, and fuel oil are part of a global commodity market. Vermont households, businesses, and industry relying on these fossil fuels are particularly susceptible to events and price spikes beyond the reach of national and state policy and regulation, with extremely limited local or regional alternatives available. **As of 2024, 49% of Vermont's energy supply was globally exposed.**

Where Vermont's energy supply comes from



Sources: Gasoline and diesel consumption from Vermont Joint Fiscal Office, 2026; ethanol consumption estimate derived from Vermont Joint Fiscal Office, 2026, and U.S. EIA; fuel oil, kerosene, dyed diesel, and propane consumption from Vermont Department of Taxes, 2026; fossil gas consumption from VGS, 2026; electricity consumption from Vermont Department of Public Service; wood consumption from VEIC, "Wood Fuels Report," 2022; biodiesel, jet fuel, and aviation gasoline consumption from EIA.
Note: "Regional" is defined as originating from the northeastern U.S. or eastern Canada.

Fossil gas and propane are subject to some of the same uncertainties, but, being part of a more North America–specific market, they have tended to be more price stable than other fossil fuels. Wood and electricity are the two main energy sources that are widely produced in Vermont, providing Vermonters with a greater degree of energy independence, resilience, and price stability. Even when electricity or wood do not come from Vermont, they tend to come from our neighbors, especially other New England states, Québec, and New York.

Across all statewide energy use, 10.8% of Vermont's energy supply is produced in-state, with another 17.6% coming from a combination of state and regional sources.

Another key factor for different energy sources is the degree of price transparency and choice Vermonters have. Electricity, fossil gas, diesel, and gasoline all have a high degree of price transparency, which makes it easier for customers to make informed purchasing choices. Electricity and fossil gas are regulated fuels, with rates that must be approved by the Public Utility Commission, and which are stable for longer periods of time. Though gasoline and diesel prices are more volatile, they are easy to understand because they are highly visible on roadside signs and fuel pumps, and are reported regularly in the press. In contrast, **fuel oil and propane dealers are largely unregulated and their pricing is highly variable** — some customers can lock in pre-buy or bulk purchase rates on these fuels, but others cannot due to their lack of cash-on-hand, credit history, geographical location, or other circumstances.

Another challenge to informed consumer choice is the little-known fact that propane has only two-thirds the heat content per gallon compared to fuel oil. This means the price per gallon can create confusion, because a customer dependent on propane needs more gallons of fuel to produce the same amount of heat.

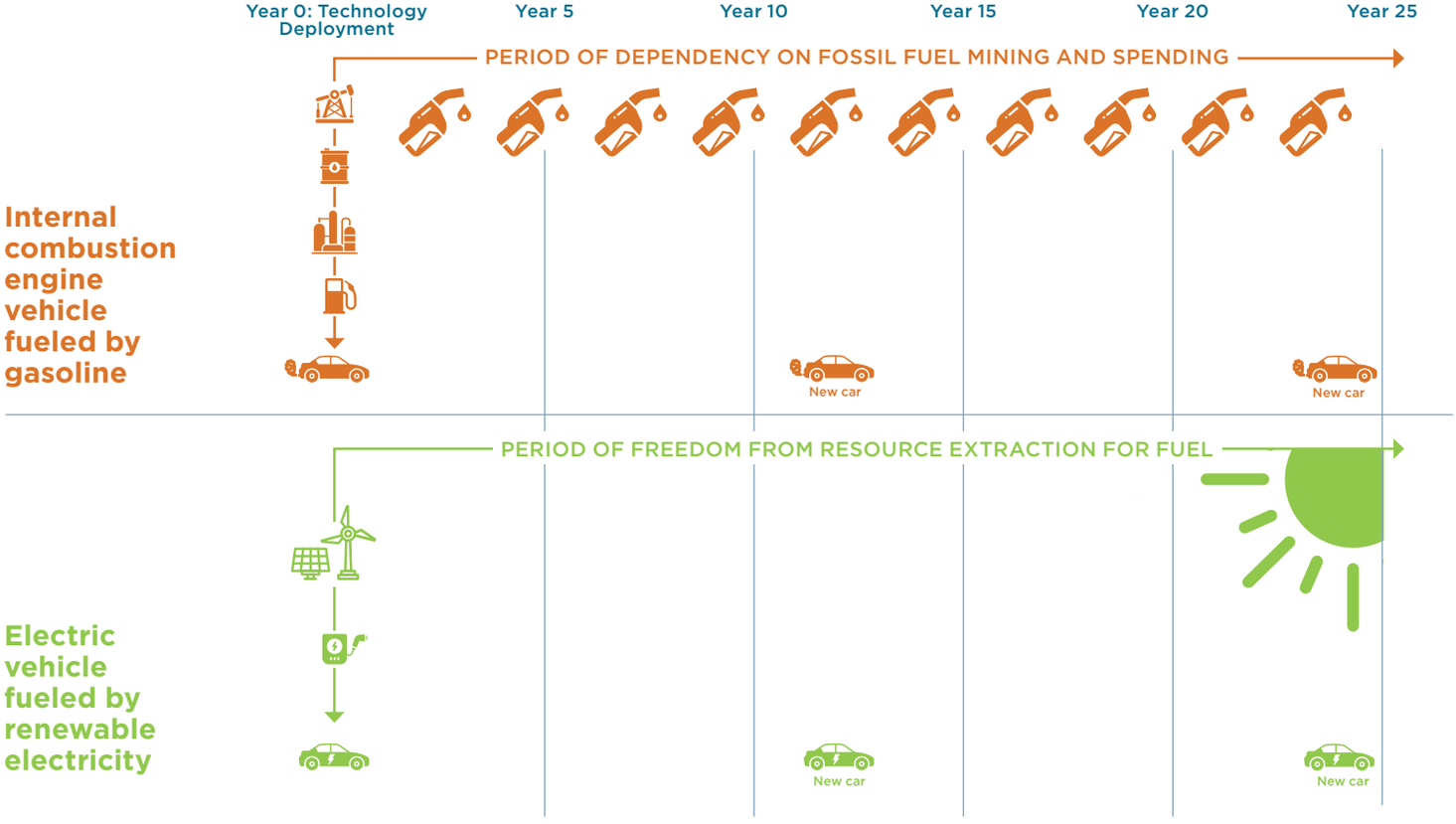
Generating energy, be it fossil fuel or renewable, requires upfront investment in extraction and refining infrastructure and power plants, or in renewable generation technologies. However, the ongoing material needs of different types of energy vary widely after the initial upfront cost.

Fossil fuel users must rely on the continuous extraction and use of fossil fuels — which are subject to the volatility of global commodity markets — in order to heat their homes and use their vehicles. Fossil fuel power plants are also subject to similar pressures when they use North American commodity fuels like natural gas to generate electricity. Fossil fuel consumers are locked into this need for constant fuel input over the lifetimes of their gasoline vehicles and other end-use technologies, leading to continued exposure to volatile fuel prices for multiple years. In times of global supply disruptions, access to these fuels can become more expensive or limited, and for owners of fossil fuel technologies, there are limited alternatives: they are usually stuck depending on one type of fuel.

In contrast, **once renewable generation technologies are built, the fuel source (e.g., sunlight, wind, water) needed to keep electricity flowing is cost- and pollution-free.** The fuel to power this generation is also highly abundant and accessible in most locations. This insulates renewable electricity users from geopolitical tensions and market fluctuations. The main cost for renewable generation is tied to the initial installation. Ongoing operational costs are minimal, especially in comparison to the fossil fuel system. Once installed, electric technology provides years of energy independence thanks to free and broadly accessible renewable energy inputs (e.g., sunlight, wind, water). In contrast, combustion equipment requires constant fossil fuel input, creating years of ongoing mining and refining, along with all of their associated economic and environmental costs.

Fossil fuel dependency vs. renewable energy freedom

After deployment, electric technology powered by renewables provides years of energy freedom; fossil fuel equipment requires constant mining and expenditure on fuel



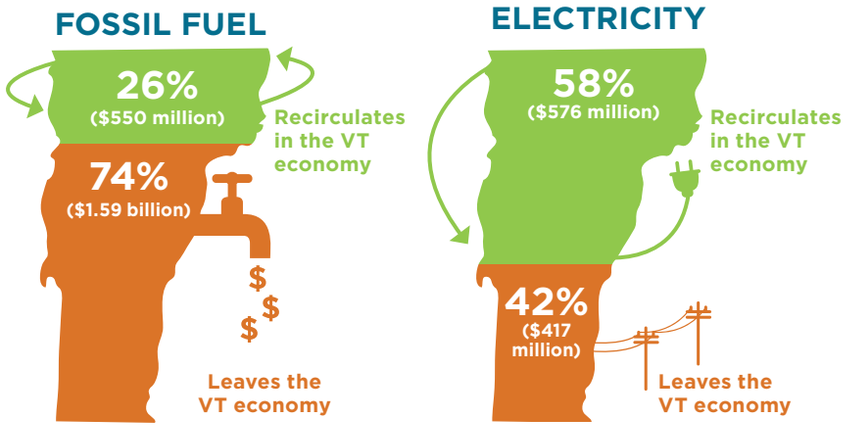
Source: "The Electrotech Revolution," Ember, 2025.

4. How do different energy choices affect the Vermont economy?

100% of fossil fuels used in Vermont are imported into the state, and the majority of the money we pay for these fuels leaves the Vermont economy to pay their wholesale commodity cost. Only 26% of the money we spend on fossil fuels recirculates in the Vermont economy, going to Vermont gas stations, fuel dealers, and in-state transportation, storage, and delivery.

In contrast, **58% of the money we pay for electricity stays and recirculates in the Vermont economy,** supporting the jobs and spending of Vermonters, including line workers, tree trimmers, local power producers, and other utility employees.

In- and out-of-state dollar flows by energy source, 2021–2025

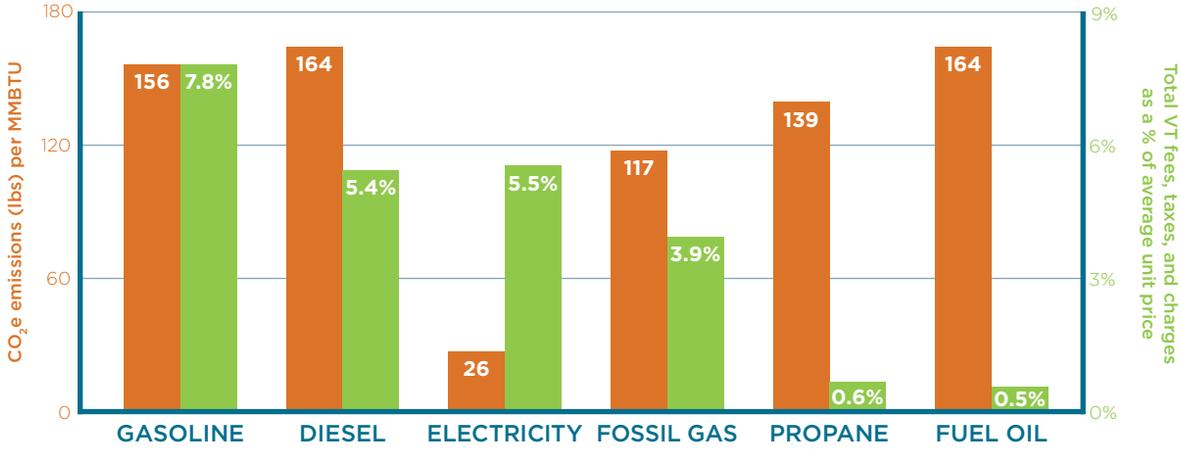


Sources: Fossil fuel spending: VT Department of Taxes, 2026; VGS, 2026; EIA, 2026; Dollar recirculation share: EAN, "Dollar Flow Analysis of Energy Expenditures in Vermont," 2026.
Notes: Data shown are an average of 2021-2025. This graph includes spending on thermal and transportation fuels only.

Sources: Electricity spending: Vermont Department of Public Service and VT electric utilities. Dollar recirculation share: EAN, "Dollar Flow Analysis of Energy Expenditures in Vermont," 2026. **Notes**: Data shown are an average of 2021-2025. The methodology for the dollar recirculation share was updated in January 2025 to account for out-of-state transmission costs.

In addition to direct costs, energy sources are assessed widely varying levels of taxes, fees, and charges. Gasoline and diesel contribute the highest taxes, fees, and charges, mostly to pay for road building and maintenance. On the other hand, propane and fuel oil used for heating are assessed very low taxes, fees, and charges, even though they are some of the most polluting fuels. Fuel oil and diesel are particularly interesting; they are essentially the same fuel, have the highest GHG emissions of any commonly used fuel in Vermont, and yet when used for transportation they pay 5.4% for fees, taxes, and charges, while fuel oil contributes only 0.5%.

Some of Vermont's most polluting energy sources pay the lowest fees, taxes, and charges



Sources: Thermal fuels fees and taxes: Vermont Department of Taxes, 2026; thermal fuels prices: Vermont Department of Public Service, 2026, VGS, 2026; gasoline and diesel fees and taxes: Vermont Department of Motor Vehicles, 2026; gasoline and diesel prices: EIA, 2026; 2026 Energy Efficiency Charge for electricity and fossil gas: PUC Determination of 2026 Energy Efficiency Charge Rates; electricity prices: Vermont utility filings with the Vermont Public Utility Commission, 2026; emissions factors for fossil fuels: EPA; emissions factor (0.09 lbs CO_2e/kWh) for Vermont electricity calculated based on VT Agency of Natural Resources "Vermont Greenhouse Gas Emissions Inventory and Forecast " (2025).
Note: Unit price of fuels is based on residential rates and prices as of May 1, 2026.

Despite electricity contributing a greater share of dollars spent back to the Vermont economy — and despite electricity being our least polluting energy source — Vermont policy asks fossil heating fuels to contribute far less to societal needs through taxes, fees, and charges than electricity and transportation fuels.

5. What are the most significant impacts on human health and the environment of our current reliance on fossil fuels?

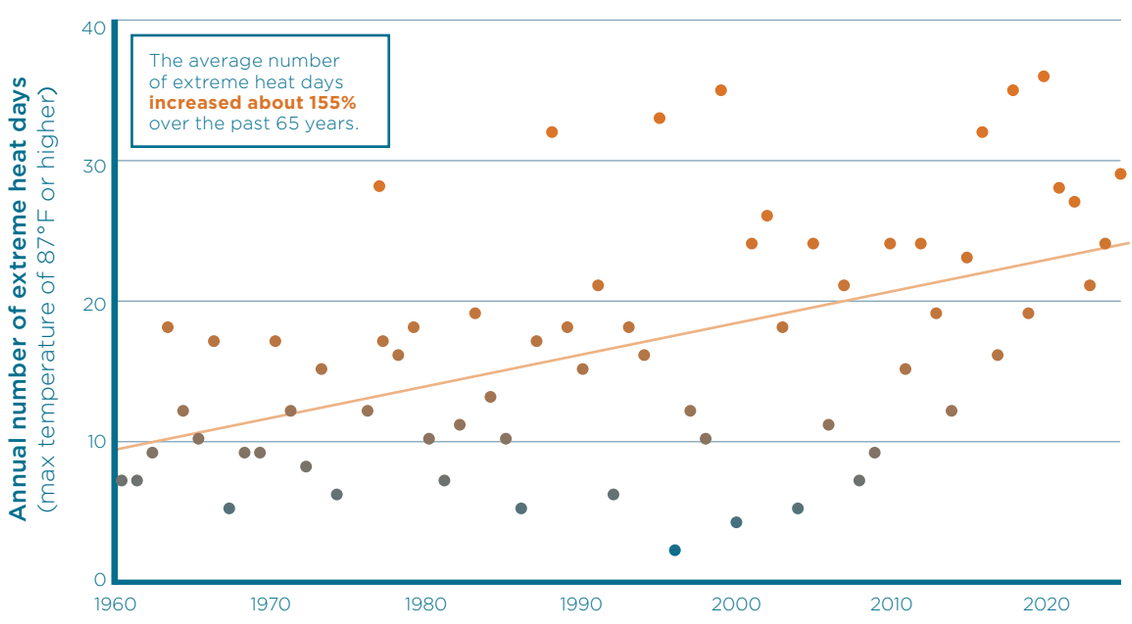
Harms to human health and the environment from fossil fuels and climate disruption

The use of fossil fuels harms human health and the environment across its full life cycle — from production, to refining, transportation, and combustion. At all stages of the supply chain, fossil fuels result in toxic emissions and spills, which pollute the air, water, and land. Fossil fuel combustion also results in airborne particulate pollution that worsens respiratory health, exacerbating asthma and impacting lung health.

Fossil fuels are the primary cause of climate destabilization, with their burning responsible for 81%–91% of human-caused CO_2 emissions in the last decade.[1] The results of climate destabilization include more frequent and intense precipitation, leading to more destructive flooding events, as we have experienced in Vermont.

Global warming–driven changes to precipitation patterns, storms, temperature extremes, flooding, and drought present major challenges for Vermont. This is especially true for many whose work is vital to our economy and communities, including farmers and those who work in outdoor recreation. The elderly, the very young, those who are unhoused, and others who have medical concerns are also particularly vulnerable to these climate impacts.

Extreme heat days in Burlington, VT, 1960–2025



Source: NOAA, Burlington International Airport Weather Station, 2026.
Note: In Vermont, extreme heat is considered 87° F (31° C) or higher (Vermont Department of Health).

Global warming is also leading to greater incidences of tick- and mosquito-borne disease, wildfires and wildfire smoke, and rising sea levels, each of which create significant harm to human wellbeing. **Here in Vermont, we have experienced increases in heat-related illness, stroke, and death due to rising temperatures.[2] Burlington experienced a 155% increase in extreme heat days since 1960.**

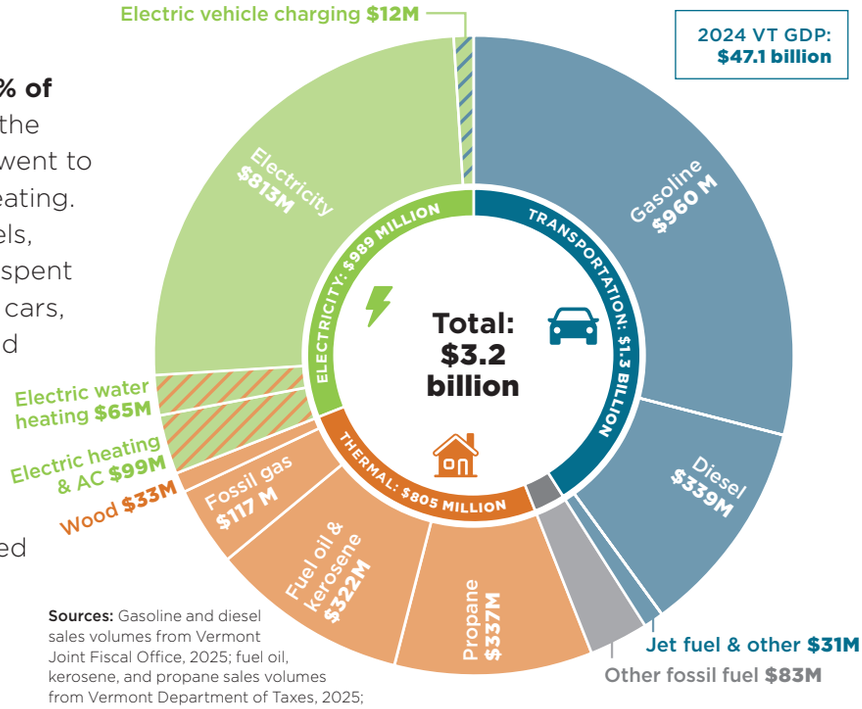
1. Intergovernmental Panel on Climate Change (IPCC), "Synthesis Report of the IPCC Sixth Assessment Report (AR6)," 2023.
2. Vermont Department of Health, 2025.

Energy economics in Vermont

Energy expenditures accounted for almost 7% of all economic activity in Vermont in 2024. Of the $3.2 billion spent on energy, about two-thirds went to paying for fossil fuels for transportation and heating. Within the nearly $2.2 billion spent on fossil fuels, the largest single cost was the nearly $1 billion spent on gasoline. The purchase and maintenance of cars, heating and cooling systems, water heaters, and other equipment are significant additional expenses beyond the $3.2 billion spent directly on energy.

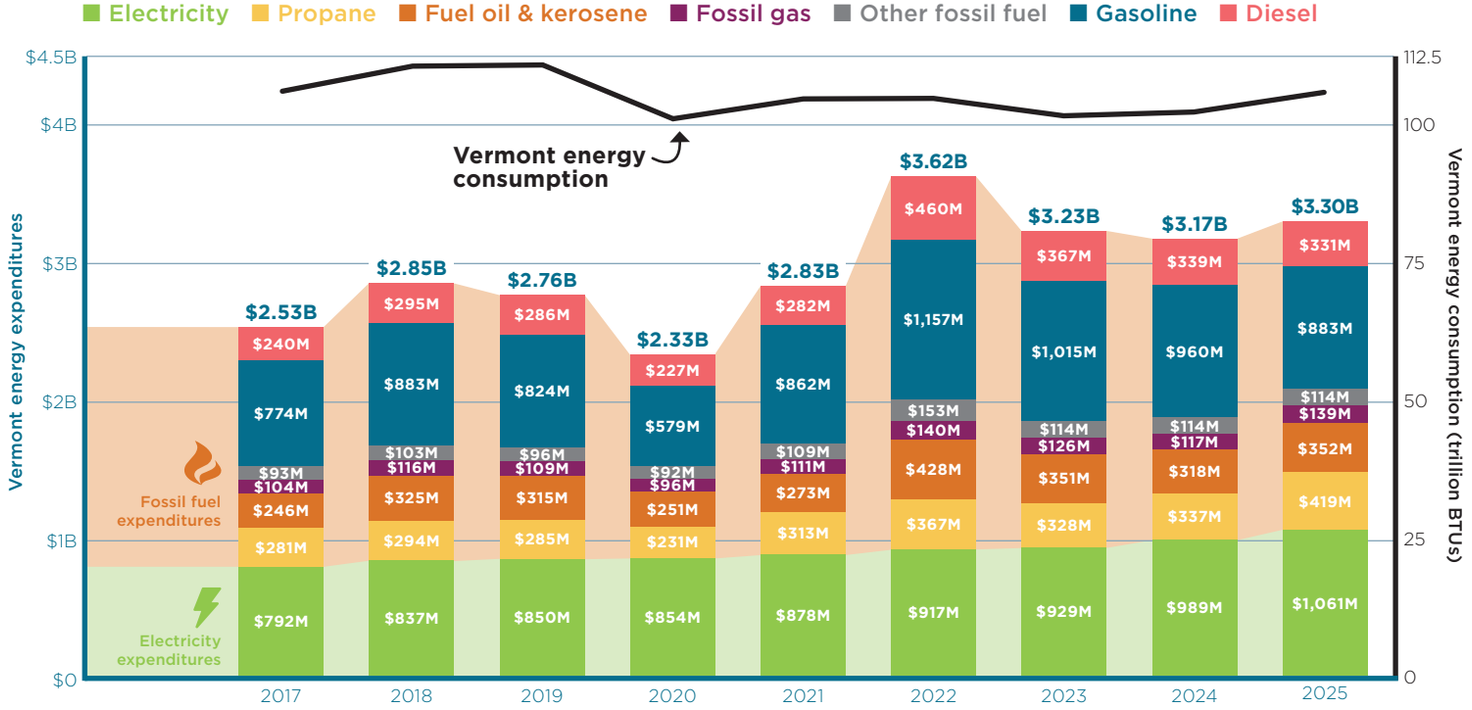
Over the last several years, the total amount of energy *consumption* in Vermont has remained fairly consistent, between 100 to 105 trillion BTUs per year. However, fossil fuel prices have been highly volatile, resulting in large cost swings. For instance, **for the same amount of fossil fuels, Vermont consumers paid $700 million more in 2022 as compared to 2021.** Meanwhile, electricity costs have increased more gradually, roughly in line with inflation.

Total Vermont fuel expenditures by sector, 2024



Sources: Gasoline and diesel sales volumes from Vermont Joint Fiscal Office, 2025; fuel oil, kerosene, and propane sales volumes from Vermont Department of Taxes, 2025; fossil gas sales volumes and prices from VGS, 2025; all other fossil fuel prices from Vermont Department of Public Service and EIA; electricity expenditures from Vermont Department of Public Service; wood and "other fossil fuels" expenditures from EIA. "Other fossil fuels" includes asphalt and road oils, lubricants, special naphthas, and hydrocarbon gas liquids. VT GDP: FRED, Federal Reserve Bank of St. Louis, 2026.
Note: Energy spending represents 6.8% of Vermont's total economic activity, calculated using Vermont's 2024 Gross Domestic Product (GDP). Fossil fuel spending takes up 4.6% of Vermont's GDP. Electric space and water heating is an EAN estimate based on data from the Vermont Department of Public Service, the U.S. Census Bureau American Community Survey, Efficiency Vermont, and EIA. Electricity used for transportation is estimated by EAN based on the number of electric vehicles registered in VT.

Vermont energy expenditures and consumption



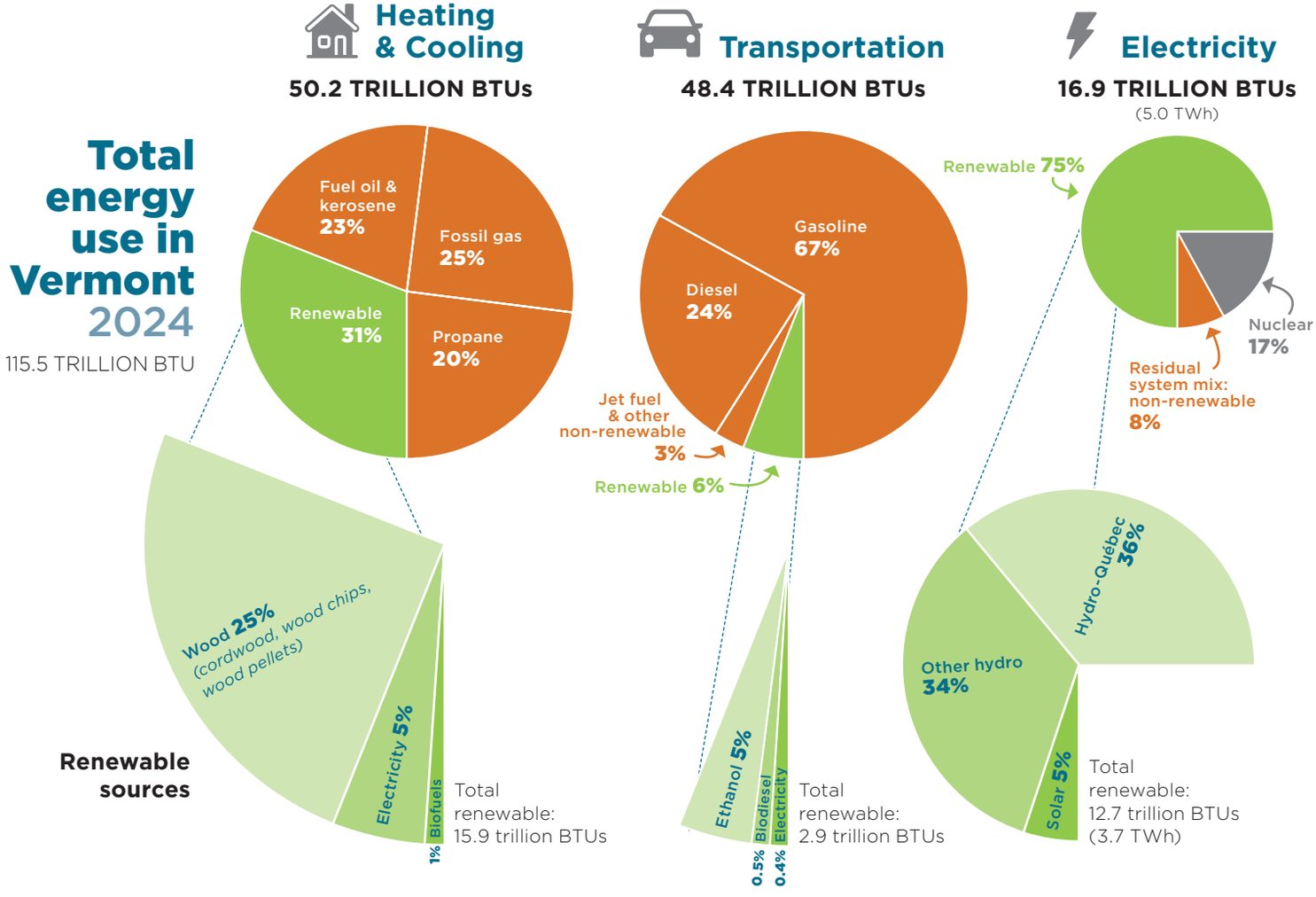
Sources: Gasoline and diesel sales volumes from Vermont Department of Taxes via the Joint Fiscal Office; fuel oil, kerosene, and propane sales volumes from Vermont Department of Taxes; fossil gas sales volumes and prices from VGS; electricity expenditures and other fuel prices from Vermont Department of Public Service and EIA.
Notes: Wood expenditure and consumption data is not shown on this graph due to data limitations. For context, in the last year in which reliable data exists (2022), VEIC estimated wood consumption to be 12.66 TBTU. The estimate of fossil fuel expenditures includes sales of gasoline, diesel, propane, fuel oil and kerosene, fossil gas, and "other fossil fuels" in Vermont. "Other fossil fuels" include aviation gasoline, jet fuel, hydrocarbon gas liquids, lubricants, asphalt and road oil, and special naphthas. Fossil gas is also referred to as "natural gas," "utility gas," "pipeline gas," "fracked gas," or "methane." Prices shown are nominal and not adjusted for inflation.

Vermont's energy use by sector

The largest share of energy use in Vermont is for space and water heating, followed closely by transportation. However, transportation is our most fossil fuel dependent energy sector at 94%, compared to 69% fossil fuel use in the heating sector. Vermont's electricity sector, by contrast, is only 8% dependent on fossil fuels; it is 75% renewable and 92% carbon-free. However, electricity is currently Vermont's smallest energy sector.

Although EAN generally represents energy use across three sectors — heating and cooling, transportation, and electricity — electricity is also one of the fuels used in the transportation and heating and cooling sectors. In this visualization of statewide energy use by sector, EAN estimates the amount of electric energy used for transportation in the transportation pie chart and the amount of electricity used for heating and cooling within the heating and cooling pie chart. This means that as Vermont electrifies these sectors, we will see increasing amounts of electric energy usage within the heating and transportation pie charts. The electricity pie chart primarily represents electricity used for appliances (or "plug loads"), lighting, and industrial processes.

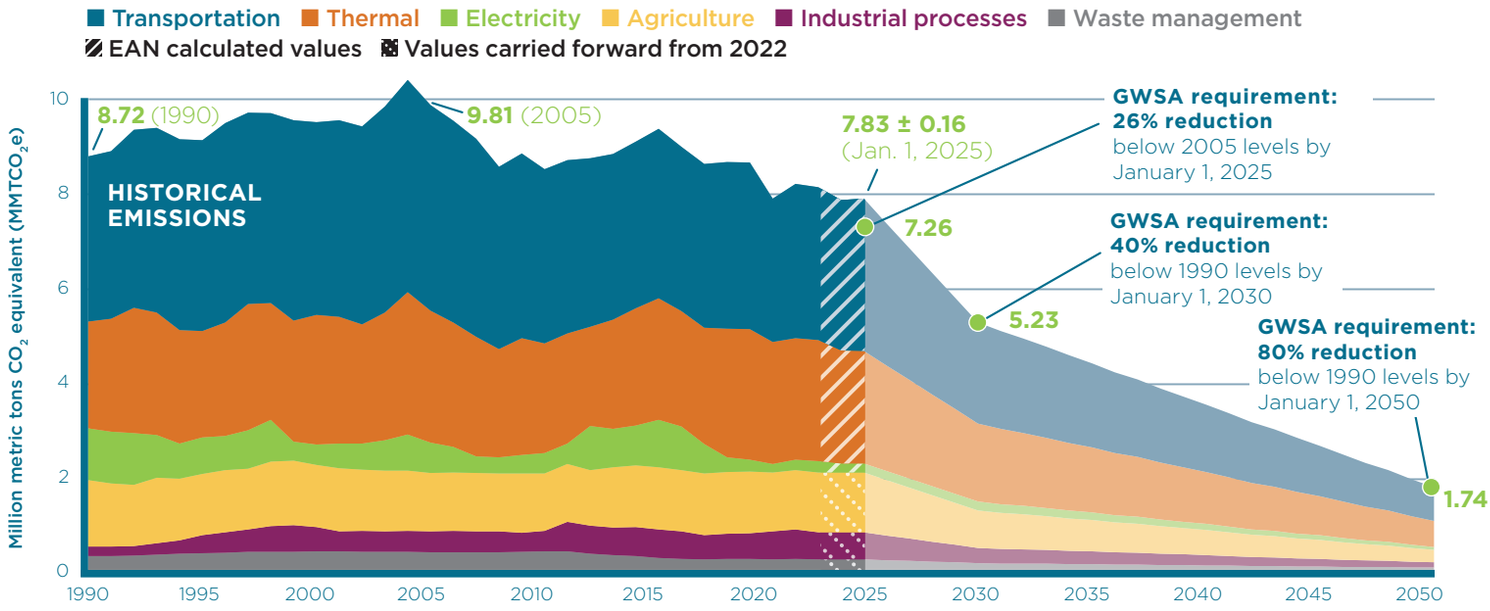
As we continue to electrify the transportation and heating sectors, total energy use across all three sectors is expected to decline, likely significantly. This is because modern electric heat pumps and electric vehicles are far more efficient than the fossil fuel equipment they are replacing. As more energy use is shifted to electricity, less energy input will be needed to achieve the same results.



Sources: EIA State Energy Data System, 2026; Efficiency Vermont, 2026; Vermont Department of Public Service, 2026; Vermont Department of Taxes, 2025.
Notes: Percentages may not sum exactly to 100% due to independent rounding. The electricity pie chart does not include electricity used for for heating and cooling and transportation purposes, as that electricity usage is shown in the respective heating and cooling and transportation pie charts. Electric space and water heating is an EAN estimate based on data from the Vermont Department of Public Service, the U.S. Census Bureau American Community Survey, Efficiency Vermont, and EIA. Electricity used for transportation is an EAN estimate based on multiple VT EV data points. The electricity pie chart shows Vermont's electricity portfolio after accounting for Renewable Energy Credits (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 0.7% of total thermal energy use.

Vermont's climate pollution by sector

VT's historical GHG emissions, estimates, and future requirements



Source: 1990–2022 emissions: Vermont Agency of Natural Resources, "Vermont Greenhouse Gas Emissions Inventory and Forecast: 1990-2022," 2025. EAN calculated emissions estimates for 2023 and 2024 in the transportation and thermal sectors use sales data from the Vermont Department of Taxes, the Vermont Joint Fiscal Office, Vermont Gas Services, and GHG emissions factors from the EPA. EAN calculated electric emissions estimates for 2023 and 2024 use electricity delivery data from the Vermont Department of Public Service and GHG emissions factors from NEPOOL GIS (as described in the Vermont Agency of Natural Resources' (ANR) Greenhouse Gas Emissions Inventory methodologies document) plus a carry-forward estimate of emissions from wood-fired electricity generation from the 2022 ANR Greenhouse Gas Emissions Inventory and Forecast.
Note: 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 2022, is not visible on this graph.

Vermont's Global Warming Solutions Act (GWSA) established legal commitments to statewide GHG emissions reductions by January 1st of 2025, 2030, and 2050. The first commitment was a 26% reduction below 2005 emissions by January 1, 2025. Based on EAN's analysis of state data, **it is virtually certain that Vermont failed to meet this pollution reduction requirement.**

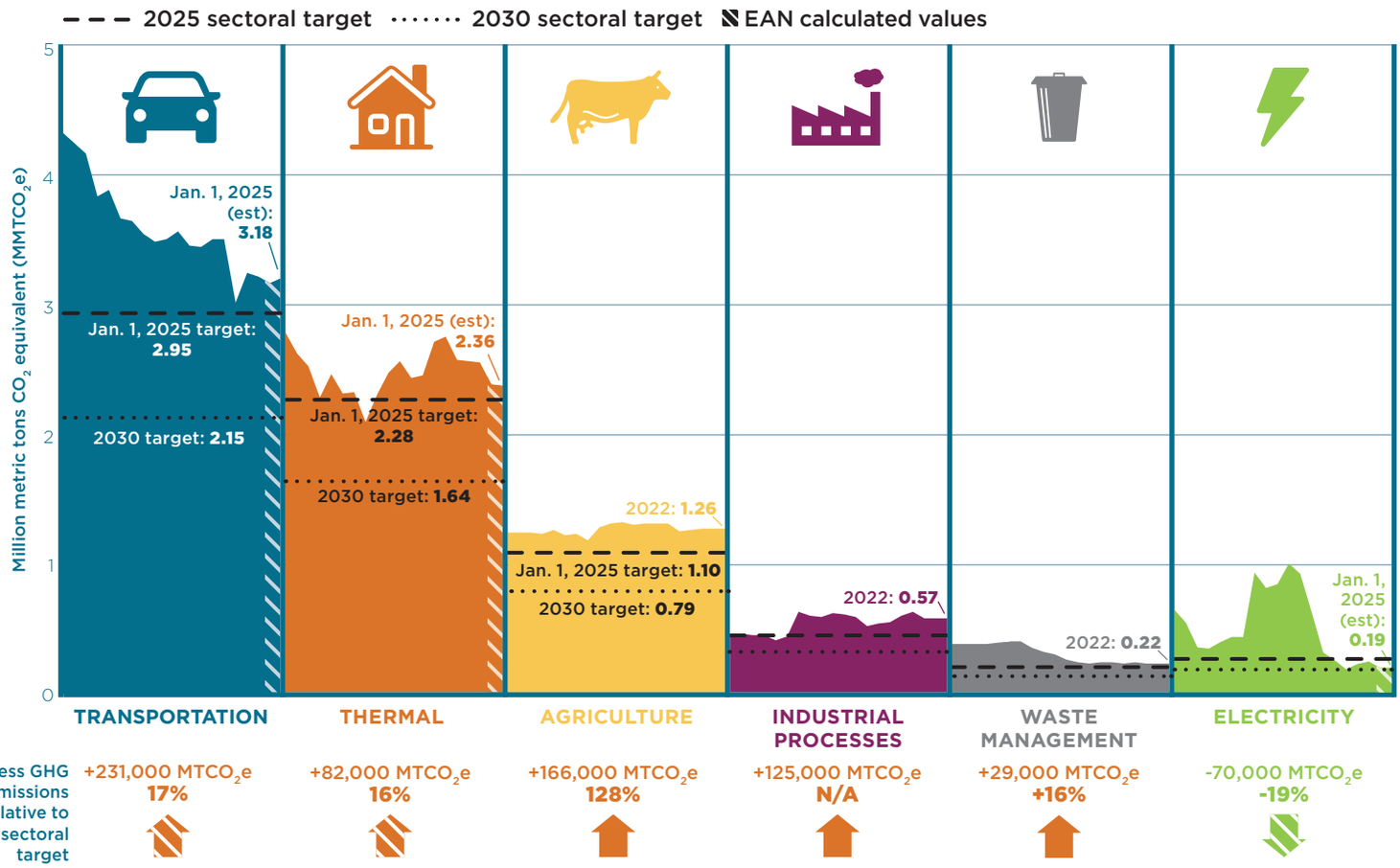
Vermont's official emissions inventory is the Vermont Agency of Natural Resources' "Greenhouse Gas Inventory and Forecast."[1] Due to federal data limitations, the official emissions inventory for 2024 will likely not be completed until 2027. In the meantime, EAN has used official Vermont fuel sales data to calculate preliminary statewide emissions estimates for 2023 and 2024. State-level fuel and electricity sales data enable an accurate and timely analysis of the energy-related emissions from the transportation, thermal/heating, and electricity sectors, which account for 75% of statewide climate pollution. To account for the remaining emissions from agriculture, industrial processes, and waste management, EAN allowed for a range of possibilities, spanning the high and low emissions values observed for these sectors over the last five years of Inventory data (2018-2022). Historically, emissions from non-energy sectors have not changed much, with most of the observed change in emissions occurring within the energy sectors. **EAN's methodology results in an estimate of statewide annual emissions by January 1, 2025[2] of 7.83 (± 0.16) million metric tons of CO_2 equivalent ($MMTCO_2e$). This is between 16%–29% short of Vermont's first statewide emissions reduction commitment under the GWSA.**

To meet the 2030 GWSA commitment, annual GHG emissions will need to be nearly 2.8 million metric tons lower in 2029 than they were estimated to be in 2024, which is equivalent to reducing gasoline consumption by over 300 million gallons per year.

1. The Vermont Agency of Natural Resources' Greenhouse Gas Inventory and Forecast determines Vermont's progress toward the goals set by the Global Warming Solutions Act. This official state emissions inventory historically relied on federal tools that were updated on an annual basis before being discontinued in 2026. As a result, the 2023 Inventory was delayed and will be published after the release of this EAN report.

2. The GWSA's first compliance date is January 1, 2025, which means calendar year 2024 emissions.

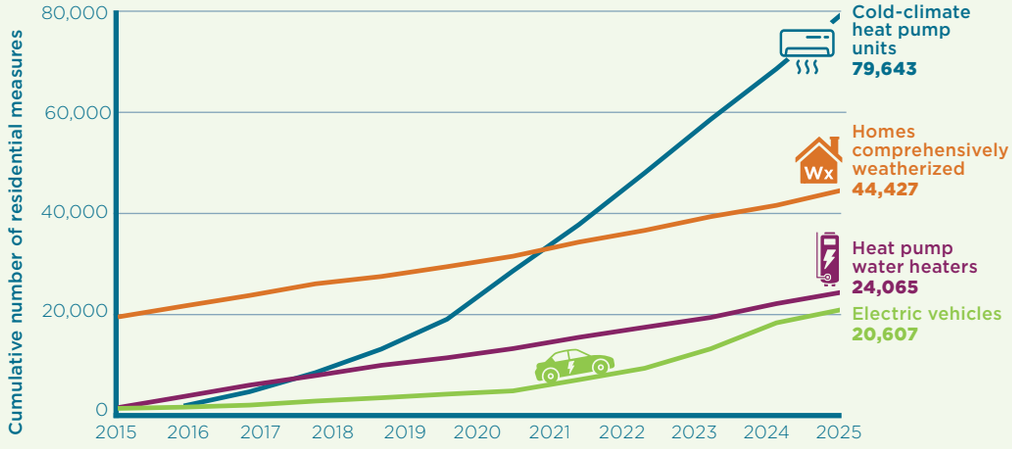
Vermont GHG emissions by sector since 2005



	TRANSPORTATION	THERMAL	AGRICULTURE	INDUSTRIAL PROCESSES	WASTE MANAGEMENT	ELECTRICITY
Excess GHG emissions relative to 2025 sectoral target	+231,000 $MTCO_2e$ **17%**	+82,000 $MTCO_2e$ **16%**	+166,000 $MTCO_2e$ **128%**	+125,000 $MTCO_2e$ **N/A**	+29,000 $MTCO_2e$ **+16%**	-70,000 $MTCO_2e$ **-19%**

Source: 2005-2022 emissions: Vermont Agency of Natural Resources, "Vermont Greenhouse Gas Emissions Inventory and Forecast: 1990-2022," 2025. EAN calculated emissions estimates for 2023 and 2024 in the transportation and thermal sectors using sales data from the Vermont Department of Taxes, the Vermont Joint Fiscal Office, Vermont Gas Services, and GHG emissions factors from the EPA. EAN calculated electric emissions estimates for 2023 and 2024 using electricity delivery data from the Vermont Department of Public Service and GHG emissions factors from NEPOOL GIS (as described in the Vermont Agency of Natural Resources' (ANR) Greenhouse Gas Emissions Inventory methodologies document) plus a carry-forward estimate of emissions from wood-fired electricity generation from the 2022 ANR Greenhouse Gas Emissions Inventory and Forecast.
Notes: The VT Climate Council set sectoral emissions targets for GWSA compliance based on each sector's share of emissions in 2018. EAN calculated estimates of GHG emissions in the transportation, thermal, and electric sectors for 2023 and 2024. The agriculture, industrial processes, and waste management sector emissions data is only available through 2022. 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 2022, is not visible on this graph. Sectoral values may not sum to statewide values due to independent rounding. The 2025 sectoral target for industrial process emissions was that they remain at 2005 levels, so a percentage of targeted reduction in this sector cannot be calculated.

Recent adoption trendlines for key clean energy solutions in Vermont



Sources: Cold-climate heat pumps and heat pump water heaters: Efficiency Vermont, Burlington Electric Department, and VGS; Electric vehicles: Vermont Department of Motor Vehicles via Drive Electric Vermont; Weatherization: Efficiency Vermont, Burlington Electric Department, VGS, 3E Thermal, and Vermont OEO. **Notes:** Adoption measured by incentives provided in Vermont. Weatherization data include residential measures only. The heat pump totals represent the number of outdoor units installed, not the number of individual indoor heads. Individual homes may have multiple outdoor units.

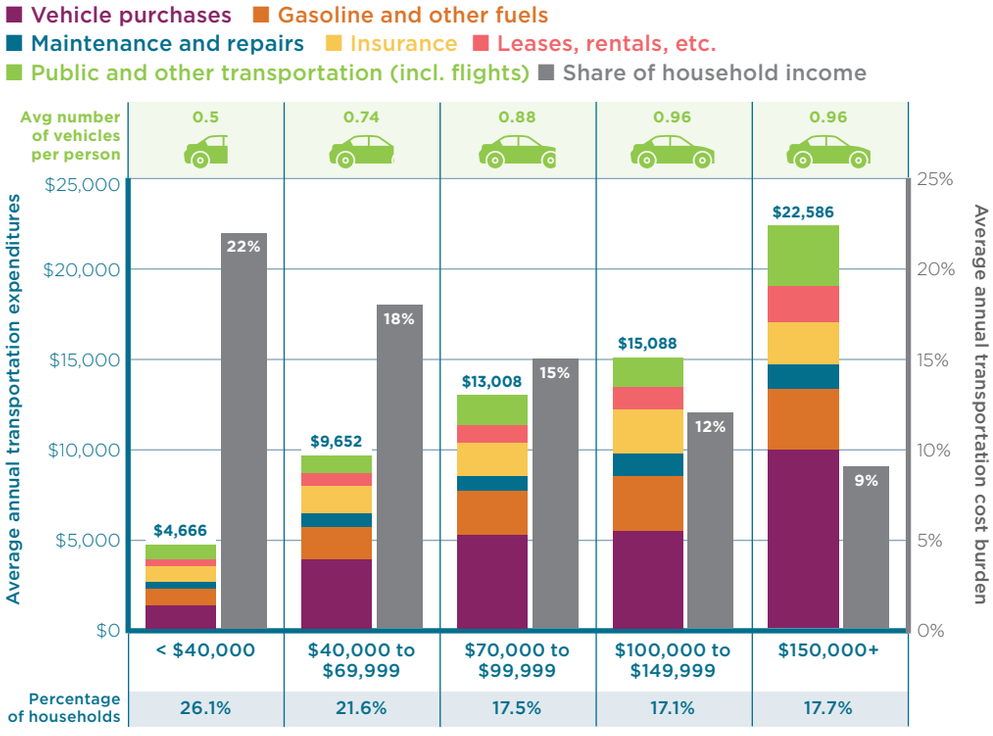
Vermonters are adopting efficient technologies that can cut energy use, costs, and pollution

Although Vermont almost certainly did not meet its first GHG reduction requirement, Vermonters have been adopting clean energy solutions that are often helping them to save money while reducing climate pollution. Tens of thousands of Vermonters have received incentives to weatherize their homes, install cold climate heat pumps and heat pump water heaters, and switch to electric vehicles. Although the up-front purchase costs for these solutions can be higher than other equipment, they can deliver durable savings, often bringing down both monthly and lifetime energy costs, while cutting emissions.

Transportation and affordability

Transportation costs are the second largest expense for households in the Northeast on average, surpassed only by the cost of housing.[1] In this region, households with the lowest incomes spend about ⅕ as much on transportation as the highest income households, but they have a significantly higher transportation cost burden. Households with higher incomes spend a larger portion of their transportation expenditures on vehicle purchases, while gasoline, maintenance, and repairs make up a larger share of transportation expenditures for households with lower incomes.

Transportation expenditures and burden by household income, Northeast, 2023-2024

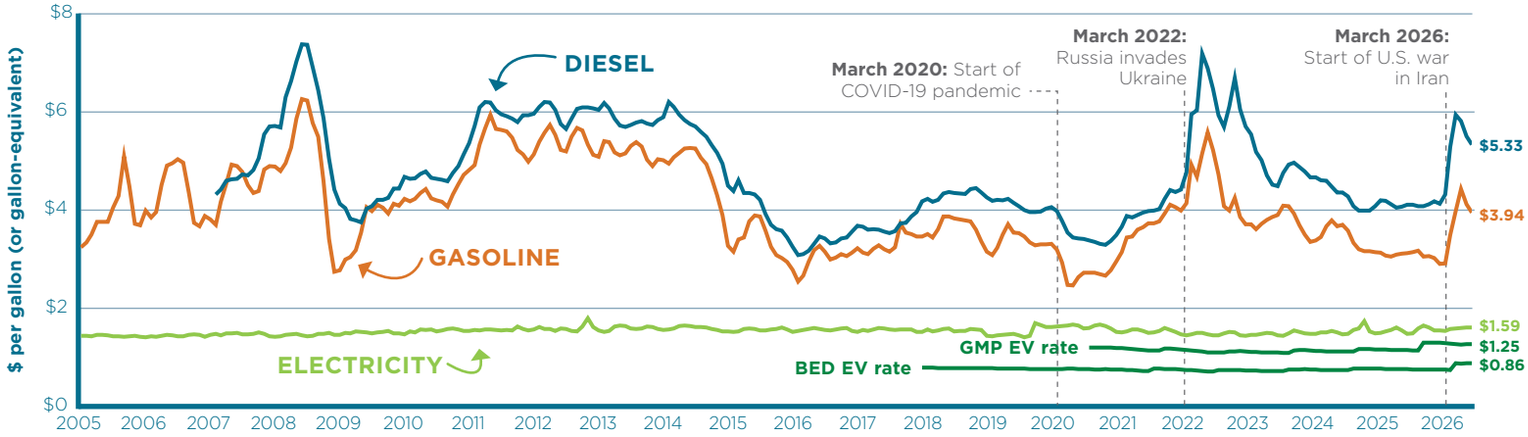


Source: U.S. Bureau of Labor Statistics, Consumer Expenditure Surveys, average expenditures for the Northeastern U.S., 2023-2024. **Note:** Transportation cost burden is the share of household income spent on transportation-related costs.

Households with lower incomes also tend to have fewer vehicles available per person. This can impact the ability of people with lower incomes to get to jobs, medical care, affordable food stores, and social events, if they do not have access to adequate public transportation options or safe walking and biking routes.

Although fuel for vehicles is only a portion of transportation costs, gasoline prices are a highly visible and important part of transportation affordability. **Fossil fuels like gasoline and diesel are subject to large price spikes, stressing budgets of households and businesses dependent on those fuels for their transportation needs.**

Prices of different transportation fuels over time in Vermont, adjusted for inflation

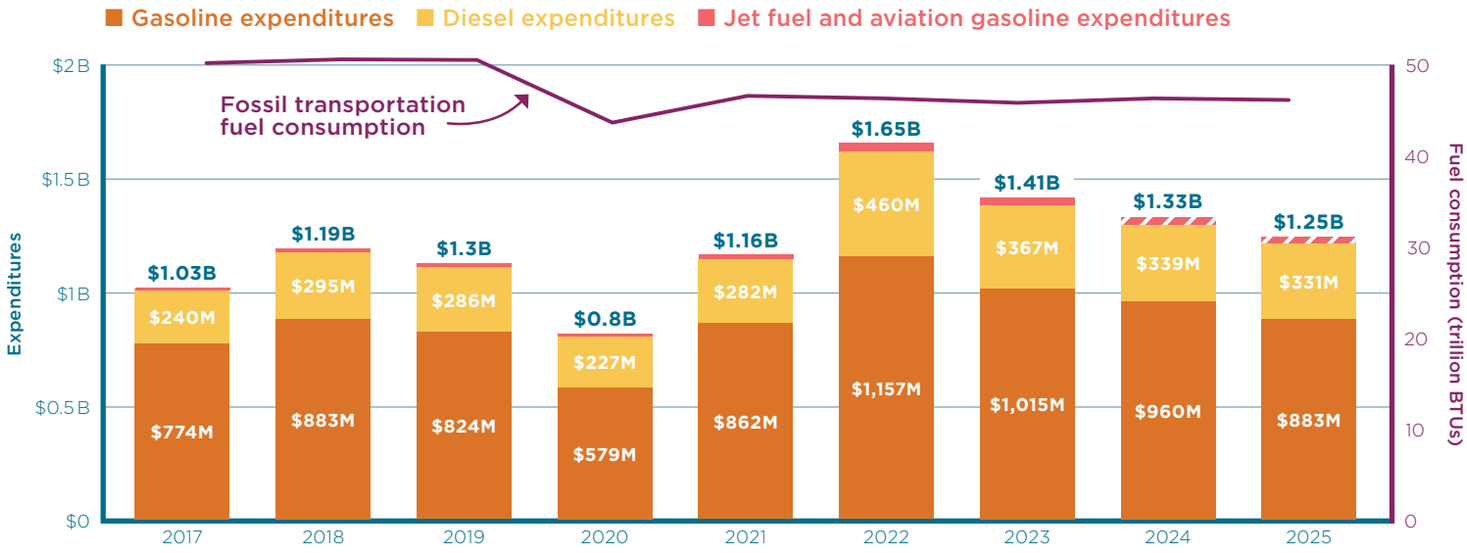


Sources: Vermont electricity, gasoline, and diesel prices: Energy Information Administration, 2026, and Vermont electric utility PUC filings; Off-peak EV rates: Green Mountain Power and Burlington Electric Department, 2026.
Notes: Electricity prices shown in light green are statewide average residential prices. Prices are adjusted for inflation and shown in July 2026 dollars, using the U.S. Bureau of Labor Statistics Consumer Price Index.

1. U.S. Bureau of Labor Statistics, Consumer Expenditure Surveys, average expenditures for the Northeastern U.S., 2023-2024.

In contrast, electric vehicle (EV) charging costs are much more stable and are consistently lower on a gallon-equivalent basis. For those who are able to charge their vehicle at home, charging at average residential electric prices in Vermont is equivalent to paying $1.59/gallon, but can be even lower through utility programs for off-peak charging. As of 2026, Burlington Electric Department (BED) has an EV charging rate equivalent to about $0.86/gallon, and Green Mountain Power's (GMP) EV rate is equivalent to about $1.25/gallon. This allows EV drivers to save hundreds of dollars each year on fuel costs. Combined with savings on maintenance, transitioning to EVs can be especially beneficial for households with high transportation cost burdens.[1]

Vermont statewide transportation fossil fuel expenditures and consumption, 2017–2025

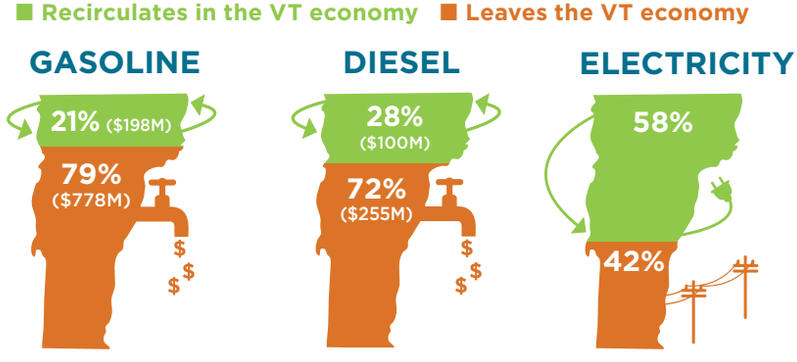


Sources: Gasoline and diesel sales volumes from Vermont Department of Taxes via the Joint Fiscal Office; annual expenditures estimated based on monthly average fuel prices for New England from EIA. Gasoline prices represent a combined value of regular reformulated gasoline and premium reformulated gasoline, weighted by EIA's most recent consumption estimates as a share of total statewide gasoline consumption. Jet fuel and aviation gasoline: EIA State Energy Data System, 2026.
Notes: Data for jet fuel and aviation gasoline for 2024 and 2025 was not available at the time of publication. 2024 and 2025 values for jet fuel and aviation gasoline are carried forward from 2023. Prices shown are nominal and not adjusted for inflation.

For transportation alone, Vermonters spend more than $1 billion annually on fossil fuels. Between 2021 and 2025 the amount of gasoline and diesel purchased in Vermont was quite consistent, at around 46 trillion BTUs annually (or 370–380 million combined gallons of gasoline and diesel). Despite using essentially the same amount of transportation fuel, the cost to Vermonters varied widely during that period, including 30% higher costs in 2022 than 2021. Price spikes since the start of the war in Iran make it likely that we will see another large increase in annual expenditures by the end of 2026.

The dollars spent on fossil fuels drain out of Vermont at a much higher rate than money spent on electricity. When we buy gasoline and diesel, which are global commodity fuels not produced in Vermont, only 21%–28% of the dollars spent recirculate in-state. On average, over the last four years, more than $1 billion of the $1.3 billion spent each year on gasoline and diesel drained out of the state economy. On the other hand, because much more local labor and infrastructure is involved in providing electricity, 58% of the money spent on electricity, including to fuel EVs, stays and recirculates in Vermont.

In- and out-of-state dollar flows by transportation fuel, 2021–2025



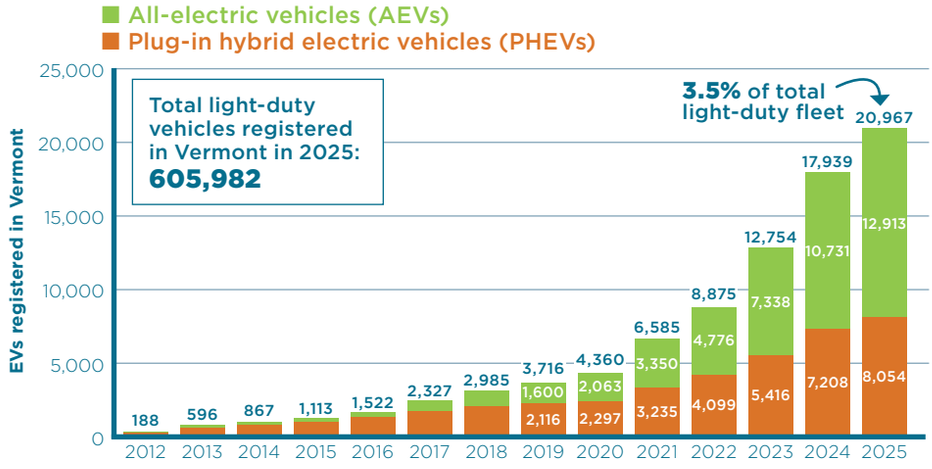
Sources: Dollar recirculation share: EAN, "Dollar Flow Analysis of Energy Expenditures in Vermont," 2026. Fossil fuel spending: VT Department of Taxes, 2026; EIA, 2026; Electricity spending: VT Department of Public Service and VT electric utilities, 2026.

1. Operations and maintenance costs: AAA "Your Driving Costs,"2025.

Electric vehicles are cheaper to drive than gas vehicles in most situations

Increasing EV adoption is a major opportunity to save more drivers money and help reduce climate and other pollution from Vermont's highest emitting sector. By the end of 2025, there were 20,967 EVs registered in Vermont. This included 12,913 all-electric vehicles (AEVs) and 8,054 plug-in hybrid electric vehicles (PHEVs), which can operate fully on electricity, but also have a gasoline engine as backup. While there were nearly 5 times as many EVs registered in Vermont at the end of 2025 than at the end of 2020, EVs still made up only 3.5% of Vermont's total light-duty fleet.

Vermont EV registrations

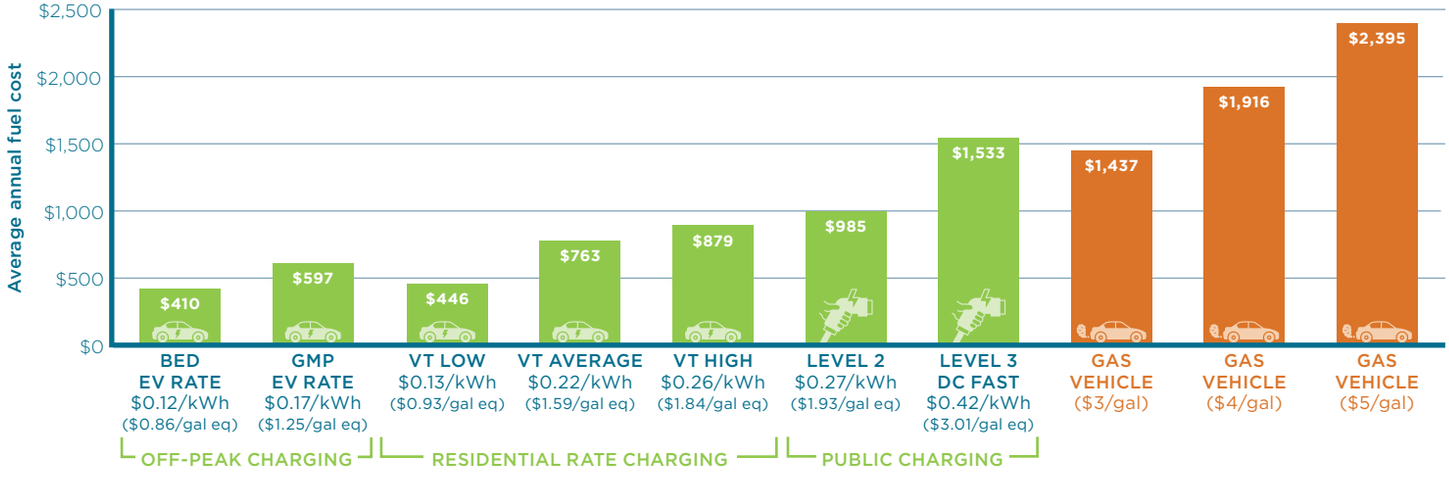


Sources: Drive Electric Vermont, 2026; Atlas Public Policy, EValuateVT Dashboard, 2026.

In almost all circumstances, Vermonters spend less money driving an EV than a gas vehicle. This has long been true, but as gasoline prices climbed above $4.50/gallon in 2026, the long-term value of EVs became even more pronounced. The amount a specific household can save with an EV depends on the price of gasoline, the electric rates offered by their utility, and whether they have regular access to at-home and/or at-work charging. 75% of Vermonters live in the territory of a utility that offers lower rates for charging EVs during off-peak periods through BED and GMP, and other Vermont utilities are developing EV rates or bill credits.

At the most affordable end, an average driver who is able to charge exclusively on BED's off-peak charging rate pays only $410 per year to fuel their car, less than a fifth as much as a driver paying for gasoline at summer 2026 prices. A driver charging an EV at average Vermont residential electric rates spends less than half as much as a driver using gasoline to fuel their car for the same number of miles driven at $4.00/gallon. Even a driver relying exclusively on public Level 3 DC Fast Charging at the statewide average of 42¢/kWh is saving money relative to recent gas prices.

Annual vehicle fueling costs in VT, electricity vs. gasoline, 2026

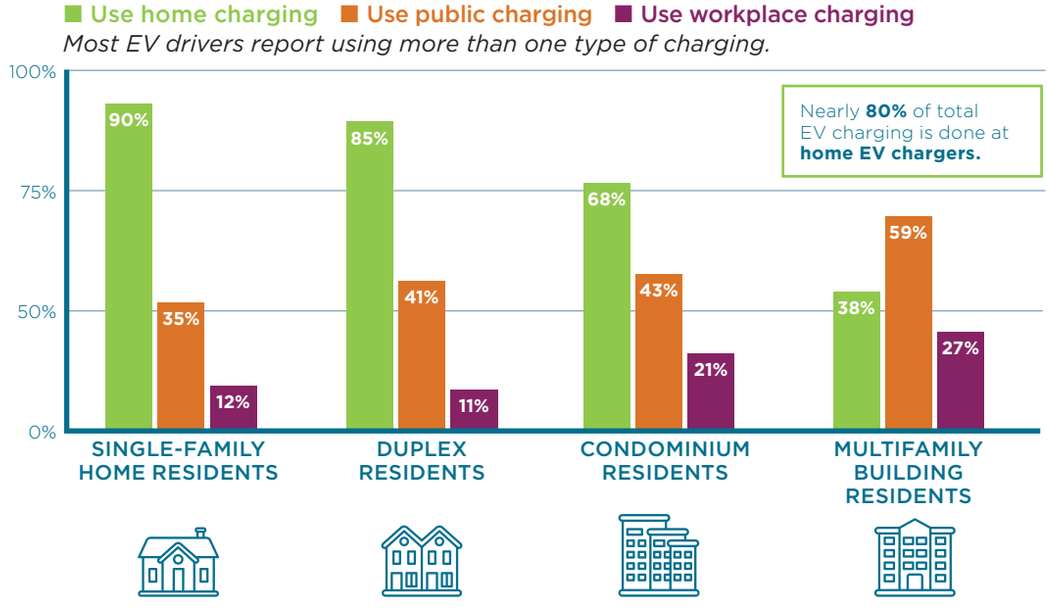


Sources: Electricity rates from Vermont electric utility rate filings; Average public charger rates from Vermont Weights & Measures EVSE 2025 Summary (2026). Public charging rates include sales tax (Tax Foundation, 2026), but do not include session fees, which are sometimes added. Annual costs based on Vermont average VMT of 11,209 miles from the Federal Highway Administration Highway Statistics 2024, Table PS-1, and average vehicle efficiency rates from the UVM Transportation Research Center and Vermont Agency of Transportation, "Vermont Transportation Energy Profile 2021." **Notes:** As of 2026, Burlington Electric Department (BED) and Green Mountain Power (GMP) are the only two VT utilities that offer specific EV charging rates, though other utilities are also developing and piloting EV rates or offering bill credits. $/gallon equivalent ($/gal eq) denotes how the price per kWh would compare to the price per gallon of gasoline at average electric vehicle efficiency of 3.27 miles per kWh (UVM Transportation Research Center and Vermont Agency of Transportation, "Vermont Transportation Energy Profile 2021"). In addition to electricity rates, utility bills also include fees and charges, which are not shown on this graph. It is not uncommon for charges and fees to make up 10% of total electricity bills.

EV charging is available in most parts of the state

Nearly 80% of EV charging is done at home, but EV drivers also use public and workplace charging. Most Vermonters are served by an electric utility offering free home charging equipment and/or other financial support to make home charging more accessible. While residents of single family homes and duplexes are generally able to install chargers at home, **renters and condominium residents have less ability to install home chargers, and are thus more reliant on higher cost and less reliable public charging.** However, under new "Right-to-Charge" legislation, condominium associations can no longer (as of summer 2026) prohibit or unreasonably restrict EV charger installation.[1] While this legislation does not apply to rental apartments, utilities are piloting innovative solutions to support people living in multifamily housing, such as utility pole drop-down chargers in Burlington.

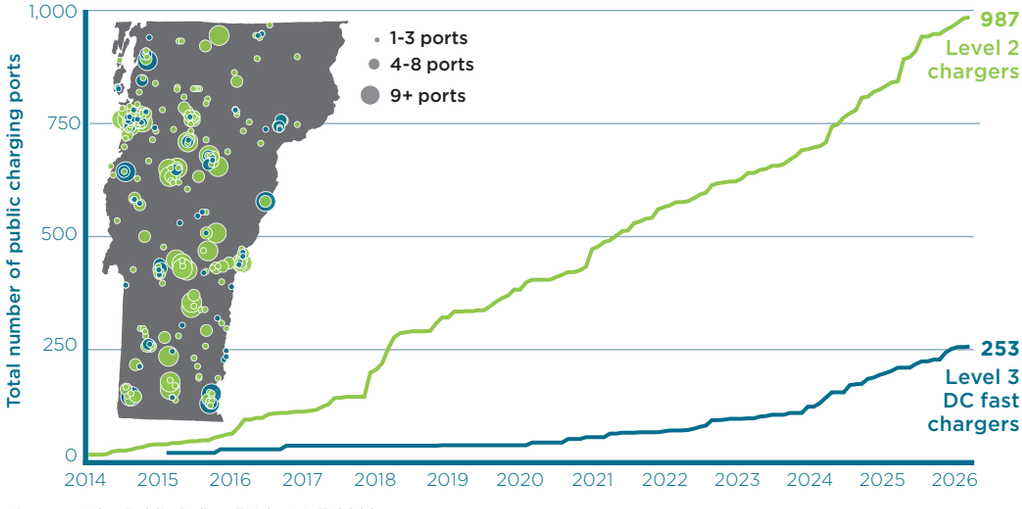
Where Vermonters live impacts how they charge their EVs



Source: VT Department of Public Service, "Vermont State and Distribution Utility Electric Vehicle Programs Evaluation," 2024. Total home charging percentage: VT Department of Public Service, "2026 Annual Energy Report."
Note: Bars add up to percentages greater than 100% because survey respondents could choose more than one option.

Even drivers who do most of their charging at home need public charging stations for longer trips. Vermont has made a commitment to building out a robust public charging network. As of 2026, the state had almost 1,000 public level 2 chargers, which are efficient chargers that can add about 20-30 miles of range per hour of charge.[2] Vermont also had more than 250 Level 3 DC Fast Chargers, which can charge most all-electric vehicles to 80% in 20–40 minutes.[3] For years, only Tesla vehicles were able to charge at Tesla chargers. However, advances in technology and new policy have made it possible for drivers of other EVs to use Tesla's fast charging network. Though public chargers are more concentrated in higher population areas, **public chargers are now present in all regions of the state, especially along highway corridors and in population centers.**

Public charging ports for electric vehicles in VT



Source: Atlas Public Policy, EValuateVT, 2026.

1. Vermont Act 168 of 2026, sec. 31-32.
2. Driveelectricvt.com, 2026
3. Ibid.

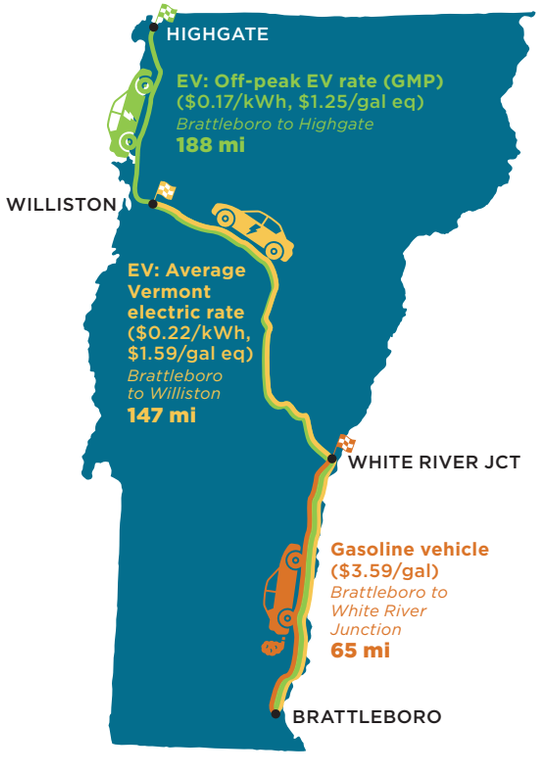
Vehicles and efficiency

Because EV charging is so much less expensive than fueling with gasoline, $10 spent on fuel for an average gasoline car would only get you from Brattleboro to White River Junction (65 miles) at $3.59/gallon. In contrast, $10 spent on electricity for an EV at the statewide average residential rate would get you all the way from Brattleboro to Williston (147 miles)— and at Green Mountain Power's EV rate, $10 would take you all the way to Highgate (188 miles).

Electric vehicles usually deliver lower lifetime costs of ownership versus comparable gasoline and diesel vehicles. This is true even when an EV costs more to purchase up-front, because fueling and maintenance costs are much lower for EVs. For instance, the total lifetime cost of a 2026 all-electric Subaru Trailseeker is estimated to be about $5,000 lower than the cost of a comparable gasoline-fueled Outback. These savings do not factor in any of the federal or state incentives that were available in recent years, or utility incentives that continue to be available. The majority of Vermonters can access utility incentives of at least $500 towards the purchase of a new or used EV. Lifetime savings of EV ownership are even greater for drivers who utilize purchase incentives and who charge using an EV rate or any rate below the statewide residential average. Additionally, gas vehicles emit far more climate pollution than EVs.

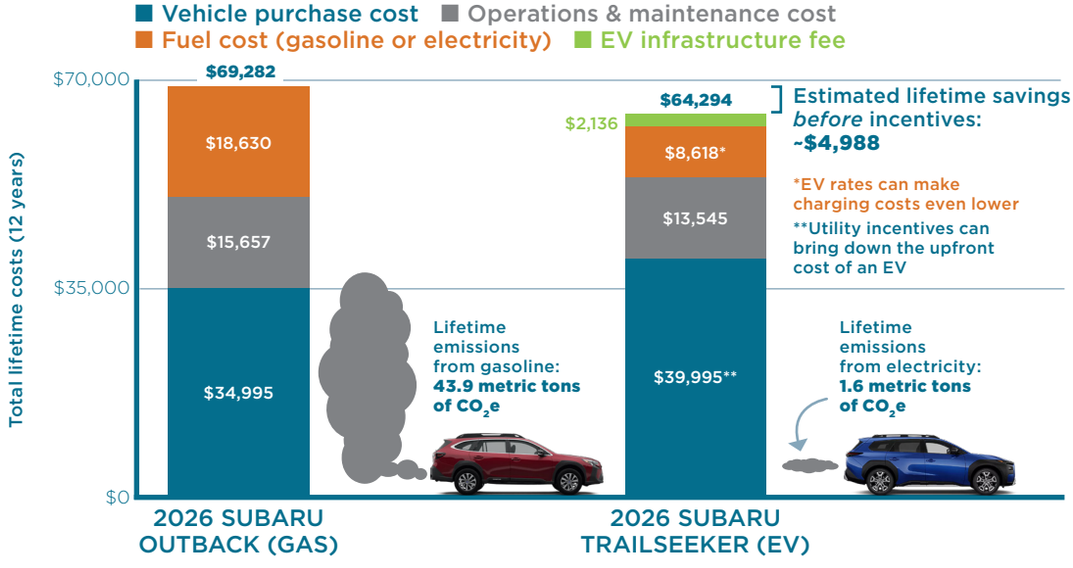
About two-thirds of vehicle purchases in Vermont are of used vehicles. Thankfully, there are increasing numbers of used EVs on the market as more EVs come to the end of a lease or are sold by their original owner. Used EVs are also still eligible for utility incentives. For up-to-date information about incentives, visit driveelectricvt.com.

How far does $10 take you? Electric vs. gasoline vehicles



Sources: Average gas (23.4 MPG) and electric vehicle (3.27 mi/kW) efficiencies from UVM Transportation Research Center and Vermont Agency of Transportation, "Vermont Transportation Energy Profile 2021"; electric rates from Vermont utility regulatory filings; gasoline price from EIA.
Notes: Electricity prices are current Vermont utility rates as of June 1, 2026. Gasoline price is a year-to-date average price as of June 1, 2026.

Lifetime costs and GHG emissions of comparable gas vs. electric vehicles in Vermont

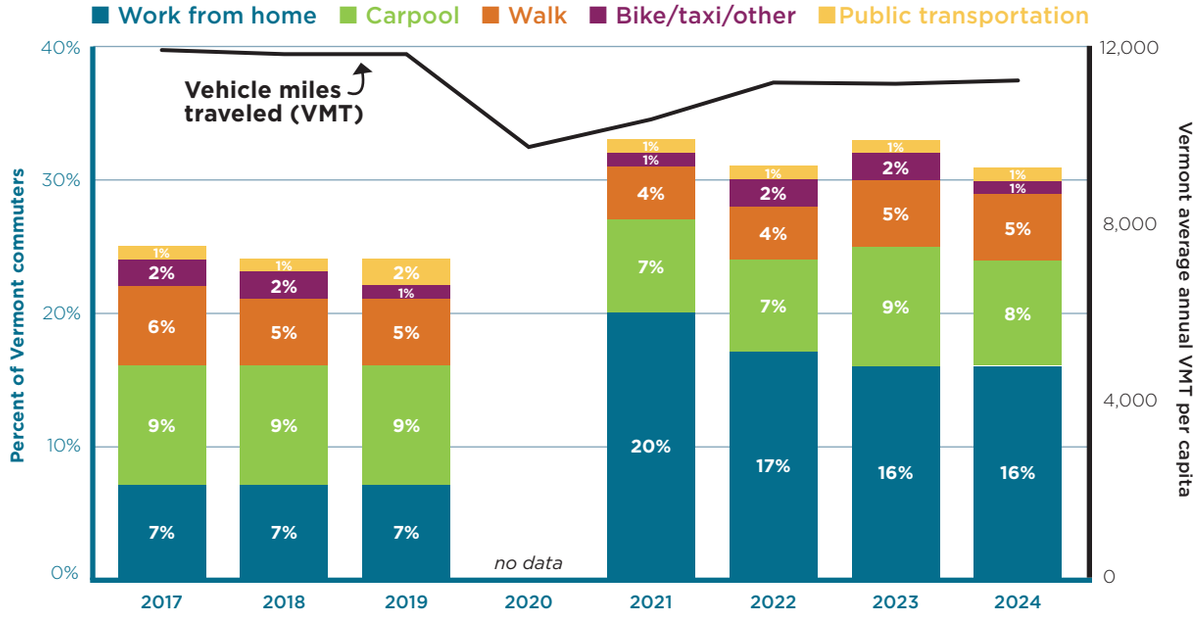


Sources: Vehicle costs represent the base MSRP for 2026 models. Gasoline emissions factor from EIA; electricity emissions factor (0.09 lbs CO_2e/kWh) calculated based on VT Agency of Natural Resources "Vermont Greenhouse Gas Emissions Inventory and Forecast" (2025). Fuel costs calculated based on 2026 year-to-date (as of June 3) average gasoline prices for New England ($3.59/gal) and average VT electricity prices ($0.22/kWh) from VT utility regulatory filings. Operations and maintenance costs: AAA "Your Driving Costs" study, 2025. Operating costs and fuel costs are calculated based on 2024 VT average annual mileage of 11,209 miles from the Federal Highway Administration. EV infrastructure fee ($178/year): Act 168 of 2026.
Notes: Charging costs for EVs can be even lower than presented with the use of EV charging rates offered by some VT utilities. Vehicle efficiency rates are from manufacturer reporting; however, actual efficiency rates are often lower in colder temperatures. Average vehicle lifetime used is 12 years. For vehicle lifetimes beyond 12 years, average total EV savings relative to gas vehicles would be higher than presented here, with additional accumulated annual fuel and maintenance savings. Vehicle purchase costs for EVs can be lower after incentives. For the latest information about EV incentives, visit driveelectricvt.com.

Transportation options

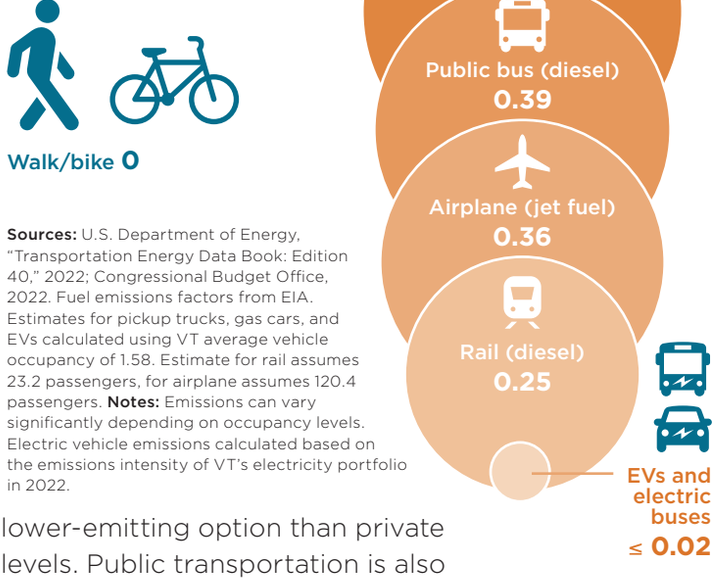
Due to our state's rural nature and low population density, Vermonters are especially dependent on personal vehicles to get around. As a result, **Vermonters drive more miles per capita — 11,209 in 2024 — than residents of any other state in the Northeast.**[1] However, for some drivers, as well as residents of Vermont's denser towns and cities, other transportation options are available. While not representing all vehicle miles traveled, commuting patterns, in particular, changed after the pandemic, with a large increase in the share of people working from home and a slight decrease in carpooling. While there was a rebound in single-occupancy vehicle commutes post-pandemic, the share of telecommuters has remained more than twice what it was pre-pandemic. Looking beyond just commuting, Federal Highway Administration data show a slight but persistent decrease in the average annual vehicle miles traveled per person in Vermont since the pandemic.

Vermont commute modes (besides single occupancy vehicles) and vehicle miles traveled



Source: Commute modes: U.S. Census Bureau, American Community Survey 1-year estimates, 2017-2024; VMT: Federal Highway Administration, Highway Statistics 2024, Table PS-1.
Notes: 2020 data not available due to the pandemic. Remaining commute mode share is by single-occupancy vehicles.

Pounds of CO_2e per passenger-mile by vehicle type (fuel emissions only)



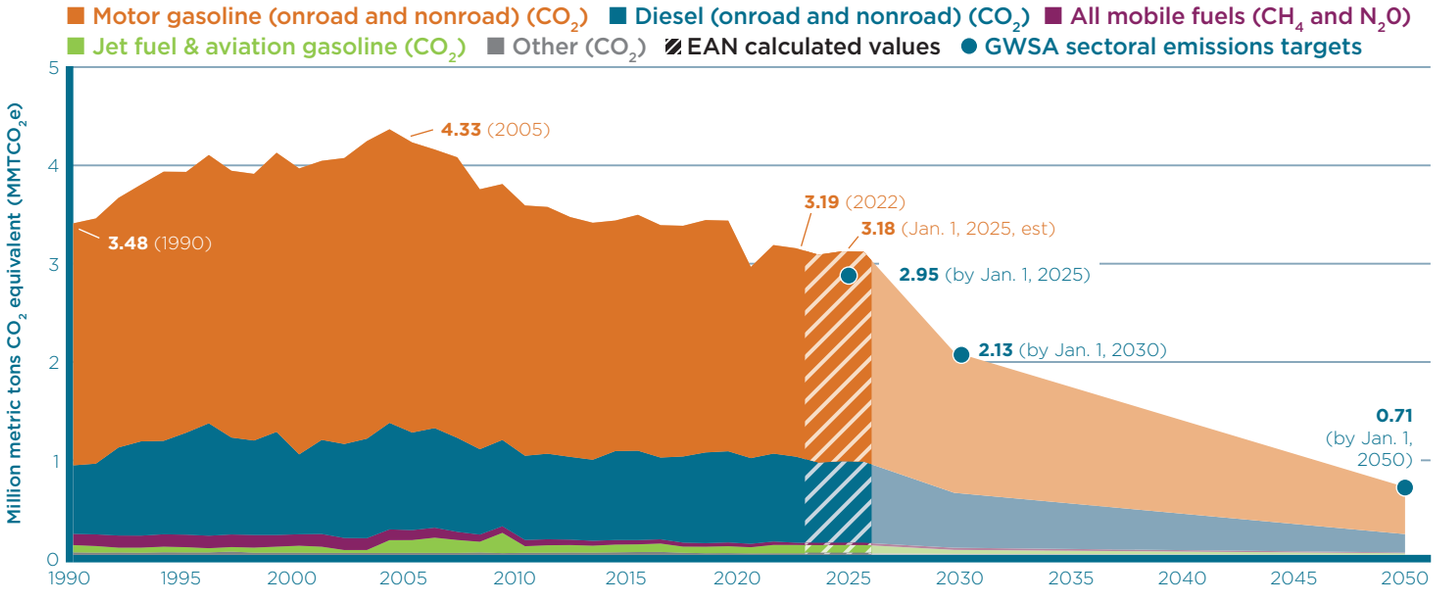
Sources: U.S. Department of Energy, "Transportation Energy Data Book: Edition 40," 2022; Congressional Budget Office, 2022. Fuel emissions factors from EIA. Estimates for pickup trucks, gas cars, and EVs calculated using VT average vehicle occupancy of 1.58. Estimate for rail assumes 23.2 passengers, for airplane assumes 120.4 passengers. **Notes:** Emissions can vary significantly depending on occupancy levels. Electric vehicle emissions calculated based on the emissions intensity of VT's electricity portfolio in 2022.

Different transportation options result in widely varying amounts of climate pollution. **When practical, working from home, walking, or biking are the least polluting forms of transportation, and thus developing safe routes for walking and biking offers pollution reductions as well as health benefits.** When these options aren't practical, EVs and electric buses are significantly less polluting than other vehicles. Non-electric public transportation can also be a lower-emitting option than private gas and diesel cars and trucks, depending on occupancy levels. Public transportation is also important for accessibility and equity for people who don't have other options.

1. EAN, "Assessing Vermont's Climate Responsibility," 2025

Transportation sector greenhouse gas emissions

Historical VT transportation GHG emissions and future sector targets

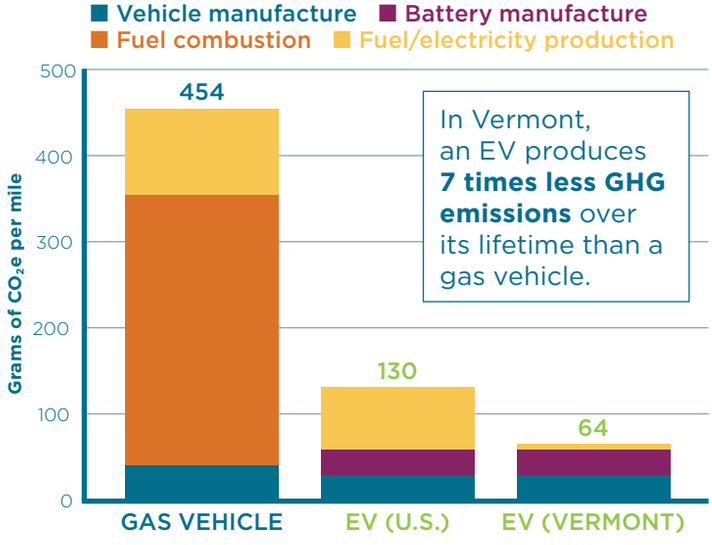


Source: 2005-2022 emissions: Vermont Agency of Natural Resources, "Vermont Greenhouse Gas Emissions Inventory and Forecast: 1990-2022," 2025. 2023-2025 emissions: EAN.
Notes: EAN calculated emissions estimates for 2023-2025 in the transportation sector using sales data from the Vermont Department of Taxes, the Vermont Joint Fiscal Office, and GHG emissions factors from the EPA. The VT Climate Council set sectoral emissions targets for GWSA compliance, which are represented by the blue dots on the graph.

Transportation GHG emissions made up 40% (3.22 $MMTCO_2e$) of Vermont's statewide climate pollution in 2022, the largest share of any sector. While the complete Vermont GHG Inventory and Forecast has a three-year lag due to reliance on federal data, transportation sector GHG emissions for 2024 can be calculated using Vermont gasoline and diesel sales data. **EAN estimates that Vermont's transportation emissions in 2024 were 3.18 $MMTCO_2e$, over 231,000 metric tons higher than was needed to achieve the sector's proportional target for the first (2025) emissions reduction commitment of the GWSA.**

Replacing gas and diesel vehicles with electric vehicles is one of the most significant actions Vermonters can take to reduce climate pollution. EVs have substantial climate benefits over gasoline cars, both in terms of emissions from fuel usage and on a more comprehensive lifecycle basis.

Lifecycle GHG emissions of gas vs. electric vehicles



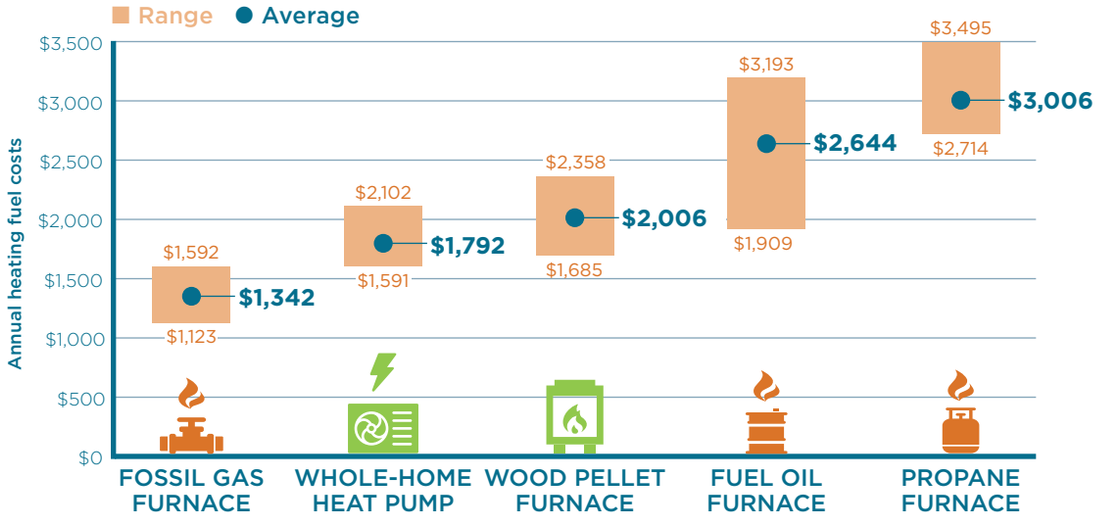
Sources: ICCT, "Life-cycle greenhouse gas emissions of U.S. sedans and SUVs with different powertrains and fuel sources," 2024. Vermont electricity emissions based on 2020 life cycle emissions from Vermont Agency of Natural Resources/ERG, "Vermont Energy Sector Life Cycle Assessment," 2024. **Notes:** Values represent emissions over the lifetime of a vehicle purchased in 2024. Emissions from EVs are presented separately for the U.S. and Vermont because Vermont's electricity portfolio is much lower-emitting than the national average.

While EVs are responsible for more GHG emissions during the manufacturing phase due to emissions from battery production, gasoline cars create much higher emissions over the full life of the vehicle due to fossil fuel combustion. **EVs in Vermont are 7 times less climate polluting on a lifecycle basis than comparable gasoline vehicles, due to our relatively clean electricity portfolio.** Although the electric grid in the rest of the U.S. isn't as clean as Vermont's, EVs are still 3.5 times less climate polluting, on average, than gas vehicles nationally. If Vermont and the U.S. continue to decarbonize our electricity portfolios, the lifecycle GHG emissions of EVs will decline even further.

Heating and cooling and affordability

Home heating costs are a major strain on Vermonters' budgets. This is particularly true during very cold winters, such as 2024–25 and 2025–26, or when prices rise rapidly, as they did for heating oil in the 2026 heating season after the start of the Iran war.

Annual heating costs by fuel type in VT, range and average, forced hot air systems, 2021-2025

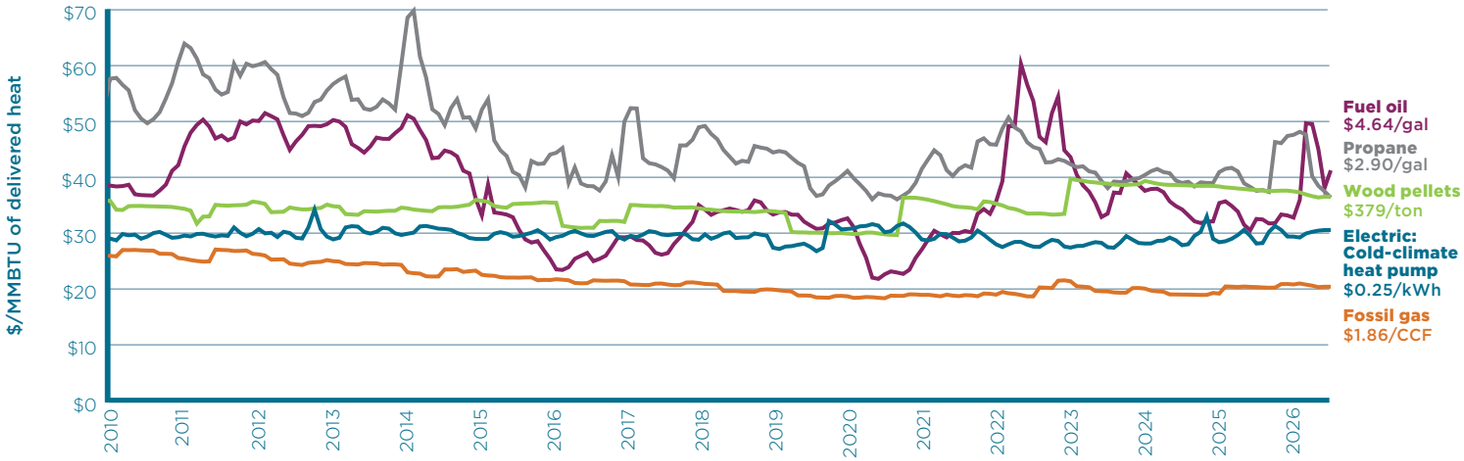


Sources: Average monthly fuel prices: EIA; Vermont Department of Public Service, Retail Prices of Heating Fuels; VGS. Average efficiency rates of heating equipment: Efficiency Vermont "Technical Reference Manual (TRM), Program Year 2024." Annual fuel costs assume average household heating load of 83 MMBtu, adjusted to account for annual population-weighted heating degree days from NOAA Climate Prediction Center.
Note: This graph compares heating fuel costs for ducted (forced air) heating systems. Costs are inclusive of any applicable charges, not merely rates. Equipment purchase costs vary widely and are not represented. To learn about applicable equipment incentives, visit efficiencyvermont.com. Prices shown are nominal and not adjusted for inflation.

Over the last five years, **fuel costs to heat a home with a whole-home (ducted) heat pump averaged $850 less per year than heating with fuel oil and $1,200 less than with propane.** During that time period, households that used fuel oil or propane for heating also experienced a much wider range of annual fuel costs, due to the price volatility of those fossil fuels. Although Vermont does not yet offer reduced rates to save heat pump users money, some other states, including Massachusetts, do offer these rates.

Looking back over the past 20 years at fuel prices adjusted for inflation, some fuels have been much more price stable than others. **Electricity (when used for heat pumps) and fossil gas have been among the cheapest and least price-volatile ways to heat a home. In contrast, propane, fuel oil, and kerosene have been both more expensive and much more price volatile.** Although not reflected on the graph due to data limitations, cord wood can also be an inexpensive way to heat a home, especially when Vermonters harvest wood from their own property.

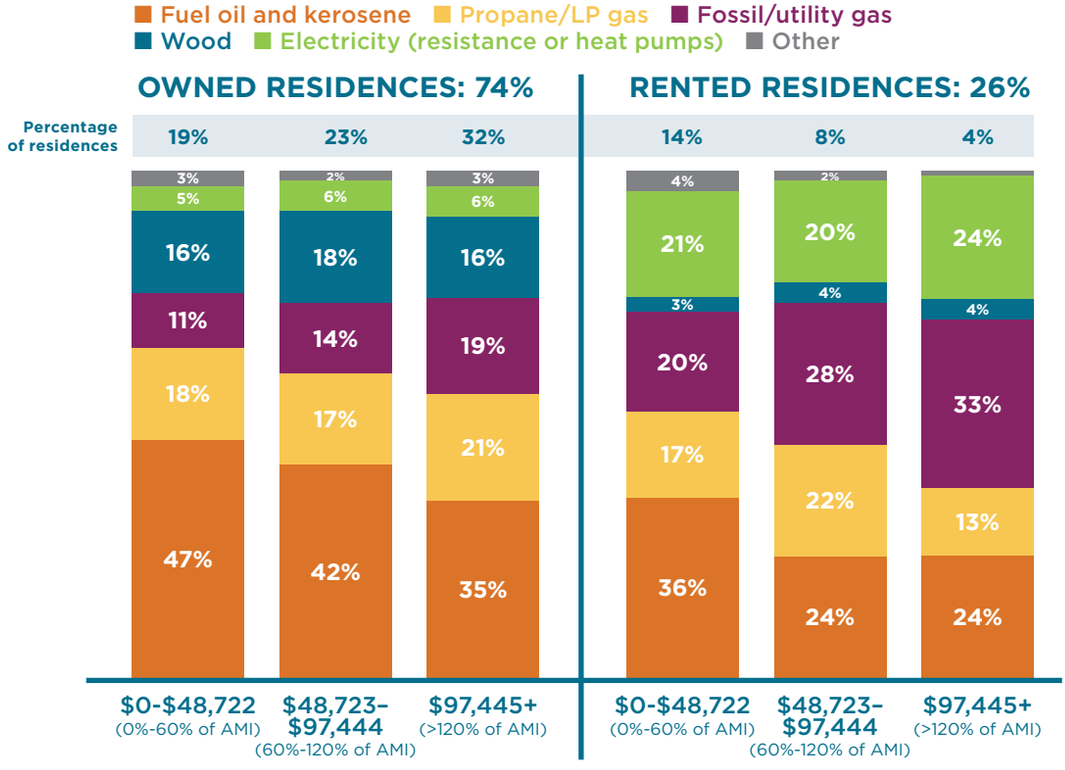
Cost comparison of different heating fuel options over time, adjusted for inflation



Sources: Fuel oil and propane prices: VT Department of Public Service, "Retail Prices of Heating Fuels," and EIA. Fossil gas: VGS. Electricity: EIA. Wood pellets: Biomass Energy Research Center (2026 prices estimated based on a small sample of Vermont suppliers and average prices collected by Maine and New Hampshire).
Notes: Electricity prices presented here are a statewide average but vary by utility territory. The reason propane is usually more expensive per MMBTU than fuel oil but less expensive on a per gallon basis is because propane has a lower energy content per gallon (66% of the energy of fuel oil per gallon). Prices shown are adjusted for inflation and shown in July 2026 dollars, using the U.S. BLS Consumer Price Index.

Households with lower incomes don't have the same ability to invest in higher quality heating equipment as their higher-income neighbors, placing already cost-burdened Vermonters at the mercy of some of the least efficient equipment and most expensive fuels for heating their homes. In particular, **households with lower incomes are disproportionately dependent on three of the highest-cost heating sources: fuel oil, kerosene, and inefficient electric resistance systems.**

Vermont primary household fuel use by income and housing type, 2020–2024

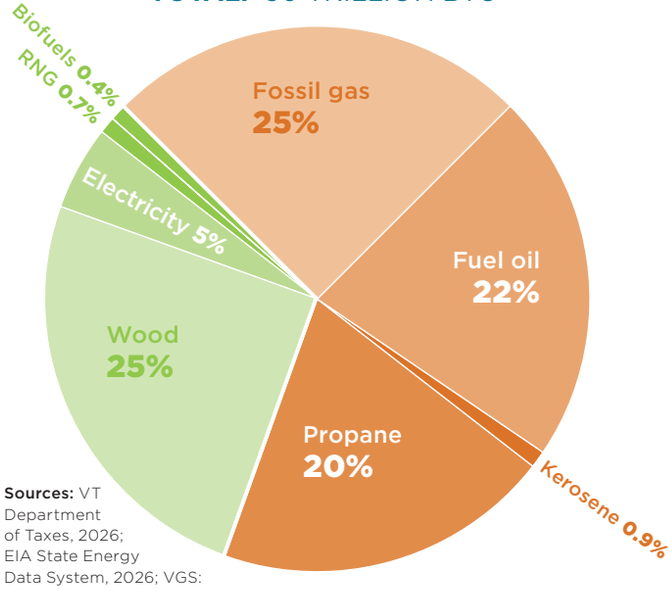


Source: U.S. Census Bureau, 2020-2024 American Community Survey 5-year Public Use Microdata Samples.
Notes: Income categories are based on 2020-2024 area median income (AMI) for Vermont of $81,203. Data is self-reported. Percentages may not sum to 100% due to independent rounding. Kerosene makes up only 3%–4% of total "fuel oil and kerosene" gallons sold. ACS data does not disaggregate between electricity used for resistance heating vs. heat pump heating. However, EAN analysis of historical ACS data suggest that resistance electric is likely the primary heating source of about 5% of VT households, with heat pumps about 7%. It is assumed that the majority of heat coming from electricity in rented residences is electric resistance.

In rental units, which make up 26% of Vermont housing units, there is often a split incentive where the tenant pays the utility bill but the property owner has control over installation of heating equipment and weatherization. Therefore, when a property owner pays to install advanced heating technologies that save money over the life of the equipment, the property owner does not experience cost savings: instead, the tenant (who pays the monthly bills) gets an ongoing financial benefit. This dynamic disincentivizes property owners from making improvements that could lead to financial savings and a healthier home for many renters.

Vermont heating and cooling energy sources, 2024

TOTAL: 50 TRILLION BTU



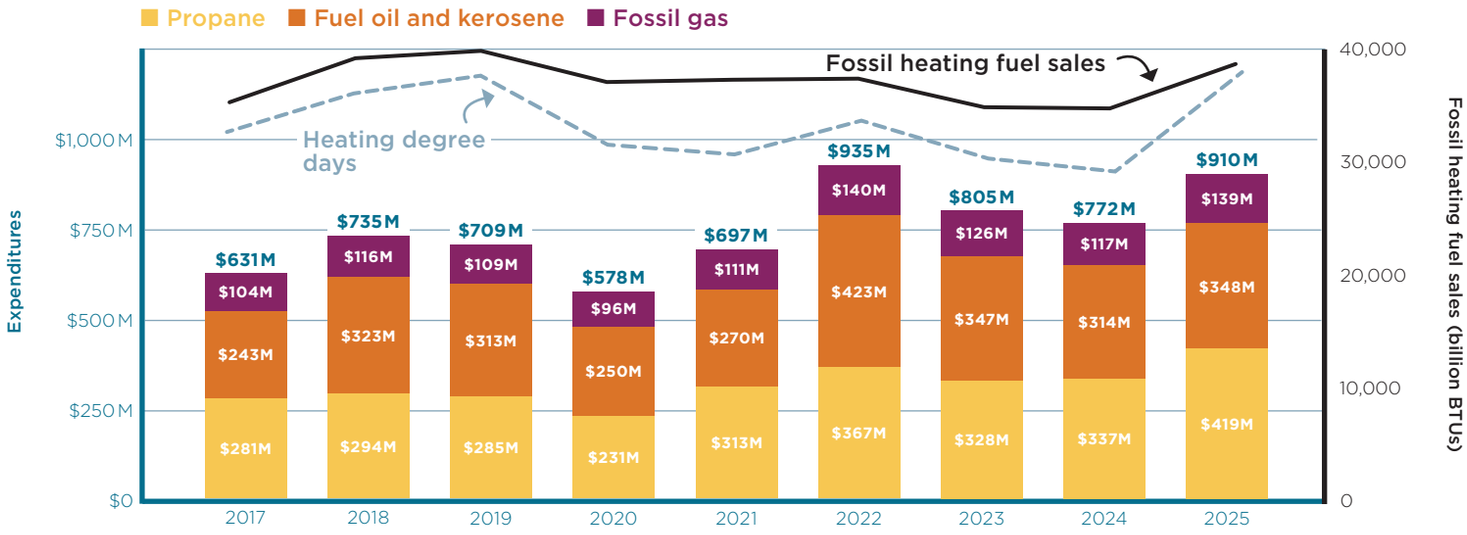
Sources: VT Department of Taxes, 2026; EIA State Energy Data System, 2026; VGS: 2026; VEIC, 2022.
Notes: Percentages may not add up to 100% due to independent rounding. Electricity used for thermal purposes is estimated based on the number of heat pumps and heat pump water heaters installed in Vermont, as well as the number of homes estimated to have air conditioning and electric resistance heat or hot water.

The use of electricity for heating provides a good example of the split incentive challenge. ***Electric heat pumps*** can be one of the most efficient, clean, and cost-effective ways to heat a home over time — but they have relatively high upfront purchase and installation costs. On the other hand, ***electric resistance heating*** (such as electric baseboard heating) is one of the most expensive ways to heat a home over time for whoever is paying the electricity bill, yet it has very low upfront purchase and installation costs for the property owner. This is a big reason why so many renters are still stuck with high-cost electric resistance systems, which is especially challenging for those on the lower end of the income distribution.

A large majority (69%) of Vermont's energy use for heating and cooling across the residential, commercial, and industrial sectors comes from fossil fuels, primarily fossil gas (25%), fuel oil (22%), and propane (20%).

While adoption of cold-climate heat pumps and heat pump water heaters has increased in recent years, electricity remains a very small share (only 5%) of total heating and cooling. Wood heat (25%) makes up most of the rest of Vermont's heating energy, primarily from cord wood, but also wood chips and wood pellets.

Vermont annual fossil heating fuel expenditures and consumption, 2017-2025

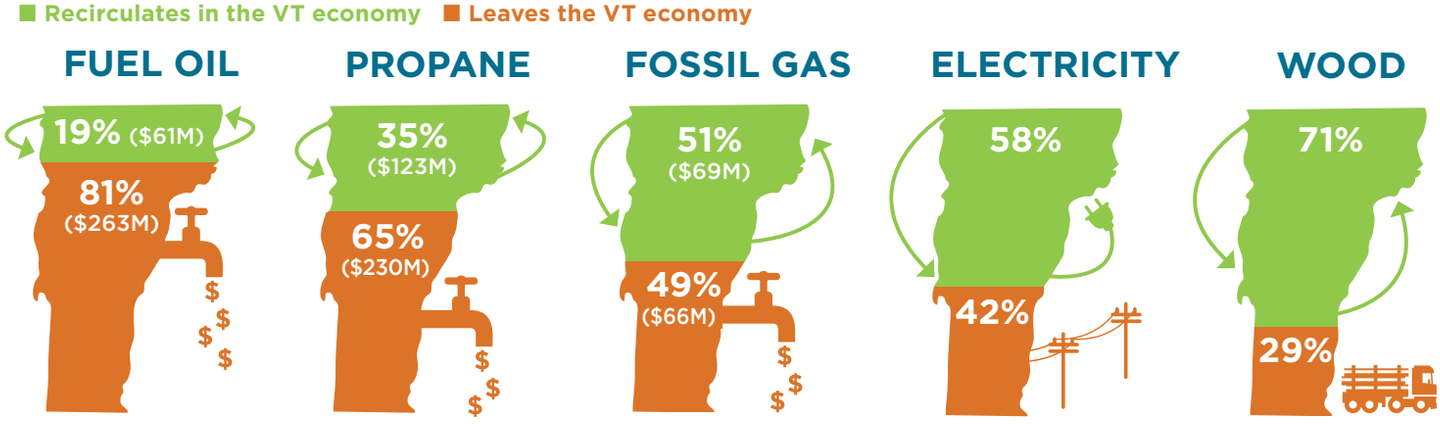


Sources: Fuel sales volumes from the Vermont Department of Taxes, VGS, and EIA; annual expenditures estimated based on monthly average fuel prices for Vermont from the Vermont Department of Public Service, VGS, and EIA; Vermont population-weighted heating degree days from NOAA Climate Prediction Center.
Notes: Heating degree days are a measure that compares the mean outdoor temperature on a given day to a standard temperature of 65 degrees Fahrenheit meant to quantify heating needs. The range in this time period went from a low of 6,985 (2024) to a high of 7,898 (2025). A higher number of heating degree days indicates a colder year. Total fossil heating fuel expenditures includes "residual fuel oil," however, the amount is too small to be visible on the graph. Kerosene makes up only 3%–4% of total "fuel oil and kerosene" gallons sold. Prices shown are nominal and not adjusted for inflation.

Between 2017 and 2025, an average of about $752 million was spent annually on fossil heating fuels in Vermont. Annual costs varied considerably, with total statewide fossil heating fuel expenditures increasing by almost $240 million in just one year (from 2021 to 2022). Given the fossil fuel price spikes that began in March 2026, we expect another large increase in fossil fuel expenditures from 2025 to 2026. How warm or cold a winter is creates some variation in how much fuel is used each year, but **most of the difference in total annual heating costs has been related to the volatility of fossil fuel prices,** over which Vermont has no control.

The vast majority of the money Vermonters spend on fuel oil and propane each year leaves the state economy: on average, between 2021 and 2025, more than $550 million of the over $800 million spent per year on the three most used fossil heating fuels drained out of Vermont's economy. On the other hand, **when we purchase electricity or wood to heat our homes and businesses, a significantly larger share of our dollars stay and recirculate in Vermont.**

In- and out-of-state dollar flows by heating fuel, 2021–2025



Sources: Fossil fuel spending: VT Department of Taxes, 2026; VGS, 2026; EIA, 2026; Electricity spending: VT Department of Public Service and VT electric utilities, 2026; Wood spending: VEIC, "Wood Heat Use in Vermont," 2024; Dollar recirculation share: EAN, "Dollar Flow Analysis of Energy Expenditures in Vermont," 2026.
Note: Total dollars spent on electricity and wood for thermal purposes not available.

Heating and cooling and efficiency

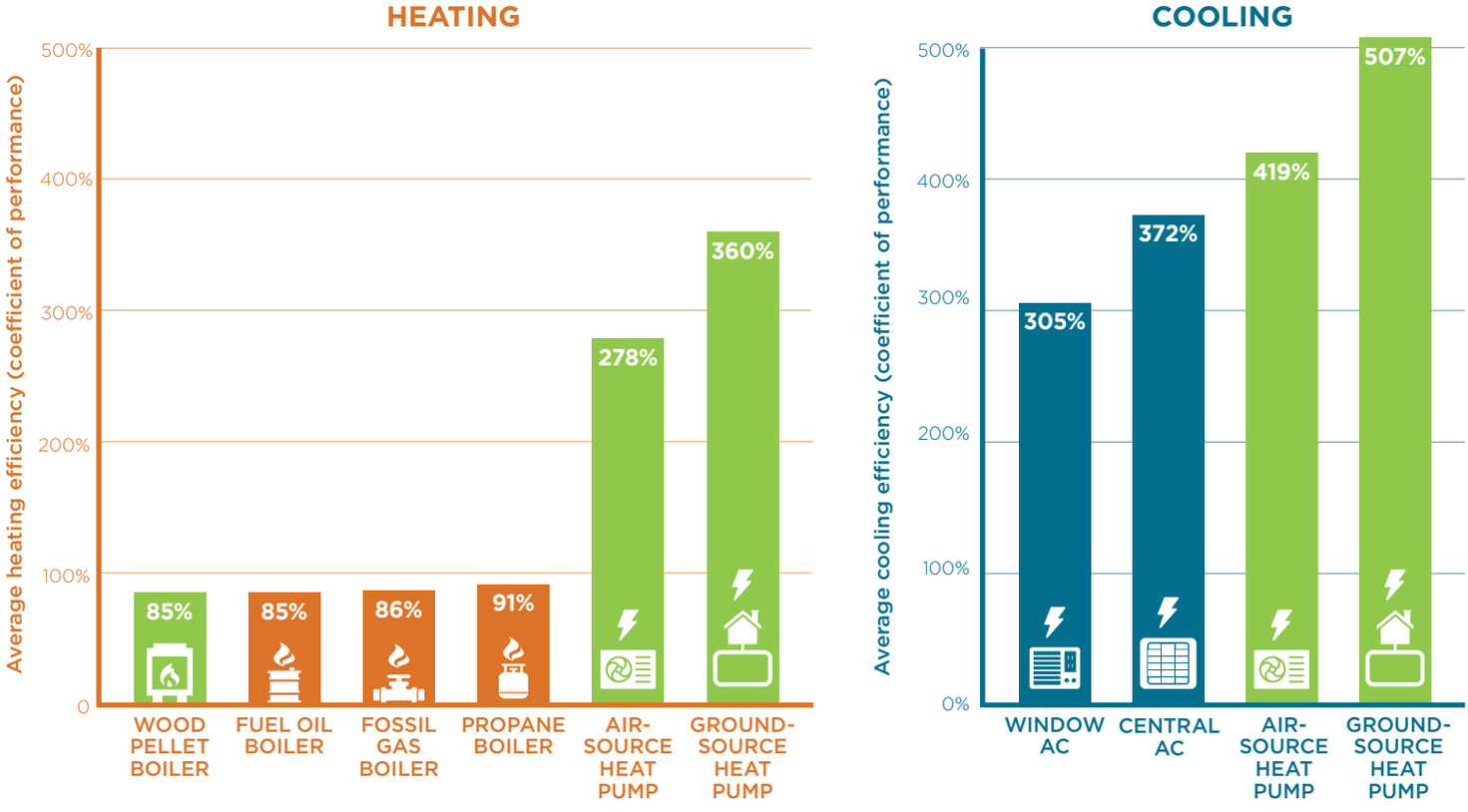
Modern electric heating technology is significantly more energy efficient than traditional combustion-based heating equipment or old-fashioned electric resistance heaters.

Heat pumps use energy to transfer rather than generate heat, allowing them to achieve efficiency rates well above 100%. This is represented by the coefficient of performance (COP) of a heat pump, which compares the amount of heat energy emitted by a heat pump relative to its electricity usage.

Heat pumps are often two to four times more energy efficient than fossil fuel-based heating systems. The most efficient heat pumps are ground source (or geothermal) heat pumps, which have very long functional life times and low operating costs, but also very high upfront installation costs. Air source heat pumps are also very efficient, and less expensive to install. Air source heat pumps include mini-splits, which are the most common type of heat pump installed in Vermont, and whole-home air-to-air units that replace a furnace. Air-to-water (hydronic) systems that can be used with radiators to replace a boiler are newer to the market.

As our climate heats up, heat pumps can also provide cooling that is much more efficient than a window or central air conditioning unit. Having one piece of equipment that can both heat and cool a home efficiently is attractive to building owners and residents.

Average efficiency: New residential heating and cooling systems



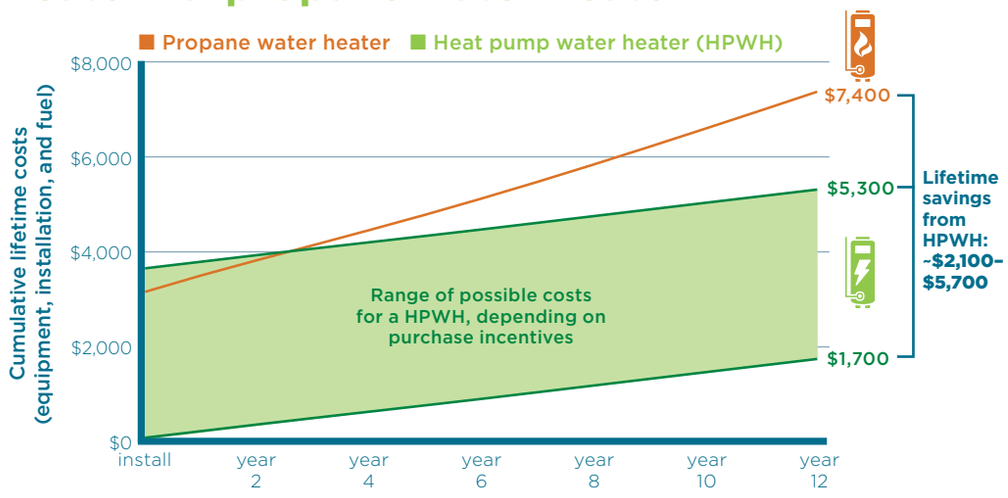
Sources: Pellet boilers, air-source heat pumps, fuel oil and propane boiler, central air conditioner, and window air conditioner efficiencies: Efficiency Vermont "Technical Reference Manual (TRM), Program Year 2024." Fossil gas boiler efficiency: Vermont Department of Public Service, "2020 Vermont Single-Family Existing Homes Baseline Study," 2023. Ground-source heat pumps: U.S. EIA, "Updated Buildings Sector Appliance and Equipment Costs and Efficiencies," 2023.
Notes: Air-source heat pumps refer to air-to-air heat pump systems. Heating and cooling efficiencies refer to the average rate at which an appliance converts energy from fuel to thermal output, measured in BTUs and expressed as a percentage. Heat pumps are capable of achieving heating efficiency rates greater than 100% because the energy input is used to transfer (rather than generate) heat. Efficiency rates for air-source heat pumps vary depending on outdoor air temperature — the efficiencies presented here are averages.

Heat pump technology is also used in water heaters. Heat pump water heaters can provide both lower fuel and lower lifetime costs, even when the upfront purchase price of a fossil fuel water heater is lower. Compared to propane water heaters, **heat pump water heaters can start saving households money either right away or within 3 years,** depending on the amount of equipment incentives.

The cost savings from modern heat pump water heaters are due to their much higher efficiency compared to both fossil fuel water heating equipment and traditional electric resistance water heaters. **A heat pump water heater requires about one-third of the energy of an electric resistance water heater — and less than one-fifth of the energy used by a propane water heater.** This allows heat pump water heaters to provide the same amount of hot water with far less energy use and at lower costs over the life of the equipment.

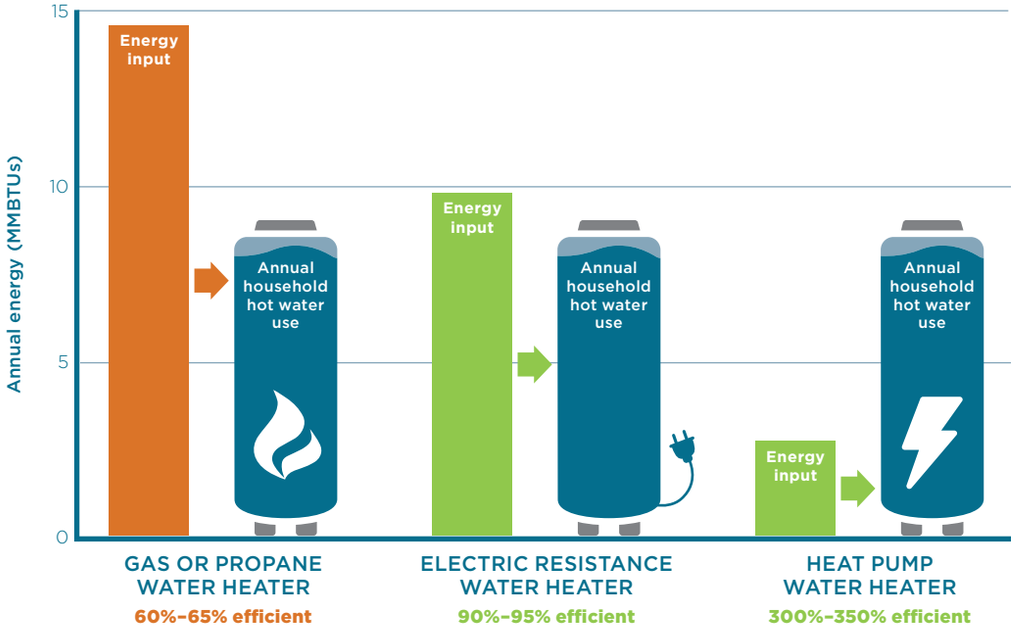
Each year, an estimated 10,000 to 12,500 Vermont households replace their space heating systems, and roughly 20,000 to 25,000 replace their water heaters. While some of these replacements are planned, many have to occur at the spur of the moment, after equipment dies. When possible, this time of change-out is a key moment to replace old fossil fuel systems with more efficient and cleaner upgrades to avoid locking in decades of high costs and additional pollution.

Lifetime cost comparison: heat pump water heater vs. propane water heater



Sources: Annual energy load, efficiency, and equipment lifespan assumptions from the Efficiency Vermont "Technical Reference Manual (TRM), Program Year 2024." Upfront cost data from VT Office of Economic Opportunity, 2026. Prices shown are in 2026 dollars and reflect projections from EIA's "Annual Energy Outlook 2026," covering 2026–2037.
Notes: While installed costs of propane water heaters can vary, there is greater variation in heat pump water heater installed costs due to the availability of incentives. Installed costs for heat pump water heaters reflect different incentives for various income levels, including from Efficiency Vermont and the Weatherization Assistance Program, which have historically brought the upfront cost as low as $0 for income-eligible customers. Heat pump water heaters cool and dehumidify the space where they operate. This graph does not include the "heating penalty" whereby a heat pump water heater increases the heating load in the winter, nor does it include cooling and dehumidification benefits in the summer. The net energy impact of a water heating technology varies widely based on the efficiency of one's space heating equipment, and whether one would be using equipment to cool or dehumidify.

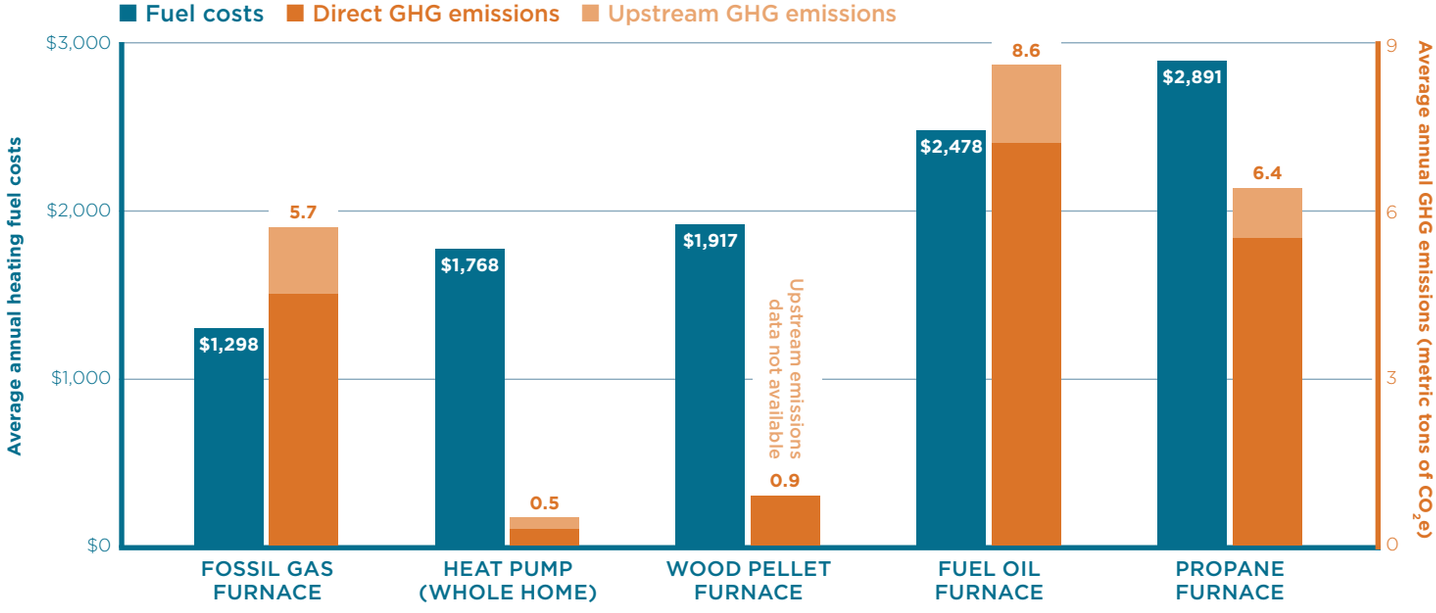
Energy needed for annual household water heating: Fossil fuel vs. electric



Sources: Efficiency Vermont, "Technical Reference Manual (TRM), Program Year 2024," EIA, Updated Buildings Sector Appliances and Equipment Costs and Efficiencies, 2023.
Notes: Average annual household water heating load assumed to be 9.04 MMBtus. Efficiency rates are for storage/tank water heaters.

Heating costs and emissions

Average annual Vermont household heating fuel costs and GHG emissions, forced hot air systems, 2020–2025

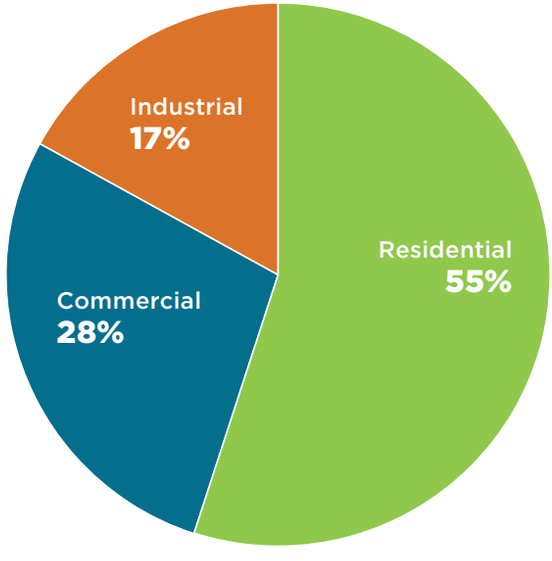


Sources: Average monthly fuel prices: EIA; Vermont Department of Public Service, Retail Prices of Heating Fuels; VGS. Average efficiency rates of heating equipment: Efficiency Vermont, "Technical Reference Manual (TRM), Program Year 2024." Direct/site emissions factors: VT Agency of Natural Resources, "Vermont Greenhouse Gas Emissions Inventory and Forecast, 1990-2022," 2025. Upstream emissions factors: ERG, prepared for VT ANR, "Vermont Energy Sector Life Cycle Assessment," 2024. Annual fuel costs assume average household heating load of 83 MMBtu, adjusted to account for annual population-weighted heating degree days from NOAA Climate Prediction Center.
Notes: Prices are nominal and not adjusted for inflation. Consistent with the Agency of Natural Resources greenhouse gas inventory, biogenic CO_2e emissions are not included in the direct/site emissions for wood.

Propane and fuel oil are among the most expensive and most climate polluting heating fuels. By comparison, heat pumps are the lowest GHG emitting option, and also tend to cost less to run than many combustion-based heating technologies. Heat pumps are particularly cost competitive in spring, fall, and on warmer winter days, when they can even cost less to operate than fossil gas or wood-fired heating systems.

Greenhouse gas emissions are usually accounted for at the direct/site level, but they can also be assessed on a lifecycle basis that incorporates upstream emissions (from raw material extraction, processing, transportation, etc.), in addition to site emissions. **Fuel oil, propane, and fossil gas all produce more than 10 times as much climate pollution as heat pumps on both a direct and an upstream basis.**

Vermont thermal energy use by sub-sector, 2023



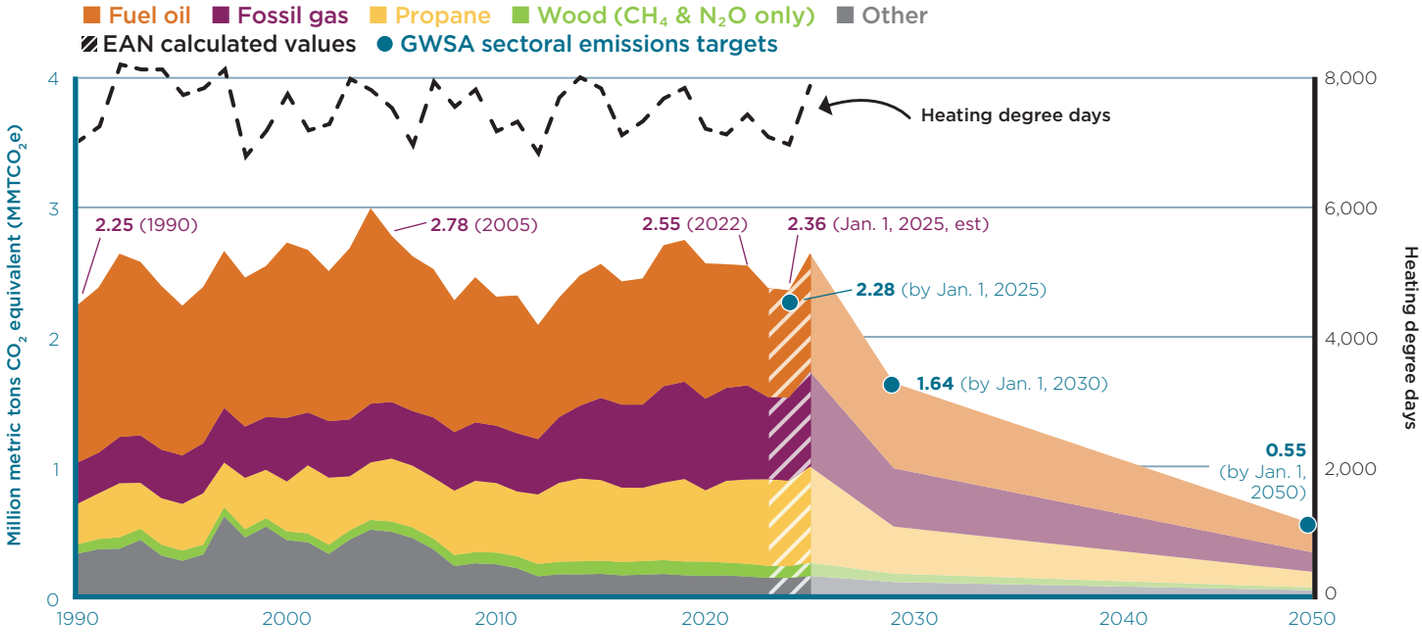
Source: VT Department of Public Service, "2026 Annual Energy Report," 2026.

Residential, Commercial, and Industrial (RCI) emissions make up what is commonly referred to as the thermal sector. **Residential heating fuel choices have an outsized influence on overall thermal costs and emissions because 55% of thermal energy use in Vermont goes to heating our homes.** Another 28% of our thermal energy use is for heating businesses in the commercial sector, while industry uses 17% of thermal energy for a combination of space heating and manufacturing/material processing.[1]

1. Vermont Department of Public Service, "Annual Energy Report," 2026.

Thermal sector/RCI emissions

Historical VT thermal GHG emissions and future sector targets



Sources: 2005-2022 emissions: Vermont Agency of Natural Resources, "Vermont Greenhouse Gas Emissions Inventory and Forecast: 1990-2022," 2025. 2023-2025 emissions: EAN. Heating degree days: NOAA Climate Prediction Center, 2025.
Notes: EAN calculated emissions estimates for 2023–2025 in the thermal sector using sales data from the Vermont Department of Taxes, the Vermont Joint Fiscal Office, Vermont Gas Services, and GHG emissions factors from the EPA. "Thermal sector" refers to the Residential/Commercial/Industrial (RCI) Fuel Use sector in the ANR GHG Inventory. "Other" includes kerosene, coal, and less common commercial and industrial fuels. Heating degree days are a measure of how cold the temperature was on a given day, and compares the mean outdoor temperature to a standard temperature of 65F. It is measured by subtracting the mean temperature from the standard temperature and aggregated over the entire year. The VT Climate Council set sectoral emissions targets for GWSA compliance, which are represented by the blue dots on the graph.

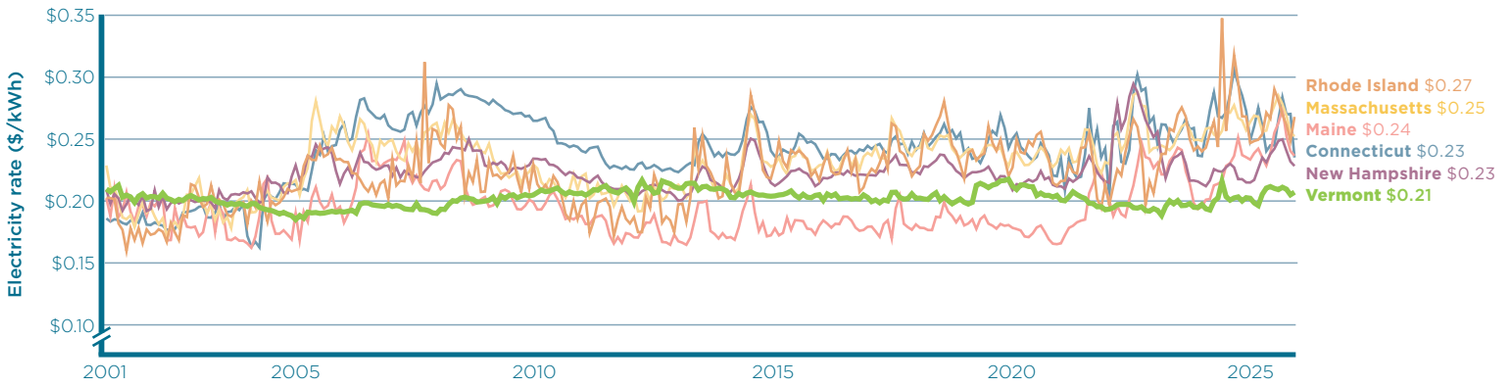
Residential, commercial, and industrial (RCI) emissions primarily come from the use of heating fuels. Commonly referred to as the thermal sector, RCI emissions made up 31.5% (2.55 $MMTCO_2e$) of Vermont's statewide climate pollution in 2022, the second largest share of Vermont's statewide climate pollution. Although the official Vermont GHG Inventory and Forecast has a three-year lag due to reliance on federal data, thermal sector GHG emissions for 2024 can be calculated using available state-level heating oil, propane, fossil gas, and kerosene sales data. Using this data, **RCI emissions in Vermont are estimated to have been 2.36 $MMTCO_2e$ in 2024, missing the Global Warming Solutions Act sectoral target for January 1, 2025 by approximately 16%.** This puts us even further behind when it comes to meeting the January 1, 2030 target of 1.64 $MMTCO_2e$.

The consumption of RCI fuels has historically moved in line with how relatively warm or cold each year is, which can be measured using heating degree days. The winter of 2025 was particularly cold, resulting in a spike in both heating degree days and the GHG emissions from the additional heating fuels burned in Vermont that year. However, **if Vermont shifts more of our heating away from fossil fuels and towards less polluting and more efficient electric technologies, emissions should begin to decouple from trends in heating degree days,** allowing us to durably cut emissions regardless of how cold future winters are.

Because of a lack of adequate policy progress in recent years, the path to meet the thermal sector's climate pollution reduction targets for 2030 has become increasingly steep. Workforce challenges in Vermont have also limited the scale and pace of heating sector transformation.

Economics of Vermont's electricity sector

Average monthly retail electricity rates by New England state, adjusted for inflation



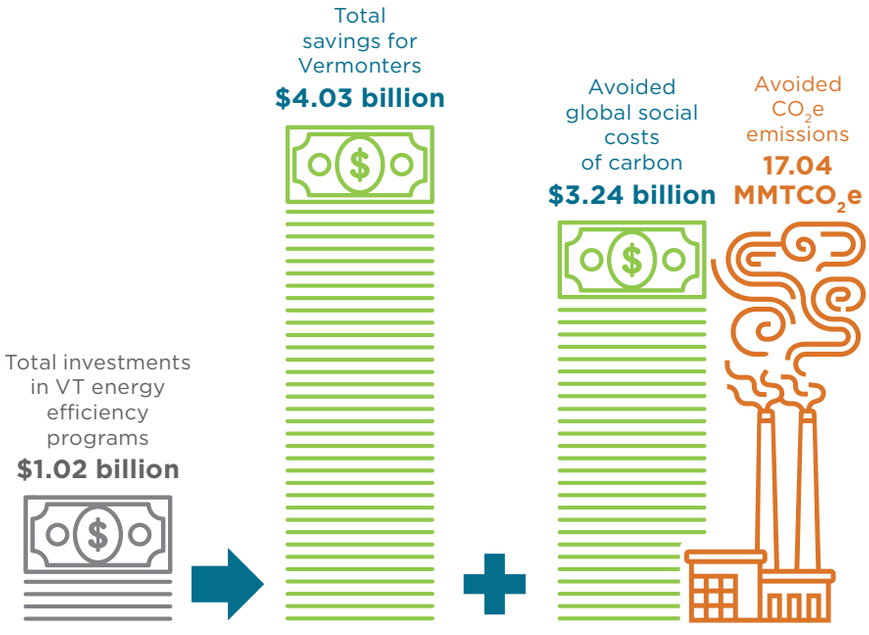
Sources: U.S. Energy Information Administration, Average retail price of electricity, all sectors, 2026; U.S. Bureau of Labor Statistics, CPI for all urban consumers, 2026.
Note: All prices are adjusted for inflation and presented in May 2026 dollars.

Vermont households spend about $1,400 per year on average for electricity, representing one-fifth of average household energy expenditures. As Vermonters continue to electrify more of their transportation and heating equipment, more household energy expenditures will shift from fossil fuel bills to electricity bills, highlighting the importance of maintaining reasonable electricity rates. While electrification increases statewide electric load, a higher load can lower costs for all customers by spreading the fixed cost of delivery across more kilowatt-hours.

Historically, average electricity rates for Vermont homes and businesses have been lower and more price-stable than other states in New England. This is largely due to Vermont's regulated electric utility structure that allows utilities to enter into long-term contracts to meet supply needs. As a result, electricity rates in Vermont have been relatively insulated from the volatility of global and regional energy markets. Additionally, Vermont's dedicated investments in electric energy efficiency via energy efficiency utilities have helped avoid new transmission and distribution costs that would have otherwise driven up rates.

Investments by Vermont's energy efficiency utilities (Efficiency Vermont, Burlington Electric Department, and Vermont Gas Services) have helped Vermonters both save money and reduce emissions. **Altogether, $1.02 billion in efficiency investments by Efficiency Vermont, Burlington Electric Department, and Vermont Gas Services since 2000 have resulted in total savings of $4.03 billion.** This is almost $4 in savings for every $1 invested, before even accounting for the approximately $3.24 billion value of avoided societal costs from preventing 17.04 $MMTCO_2e$ of emissions.

Lifetime return on investment from Vermont energy efficiency programs

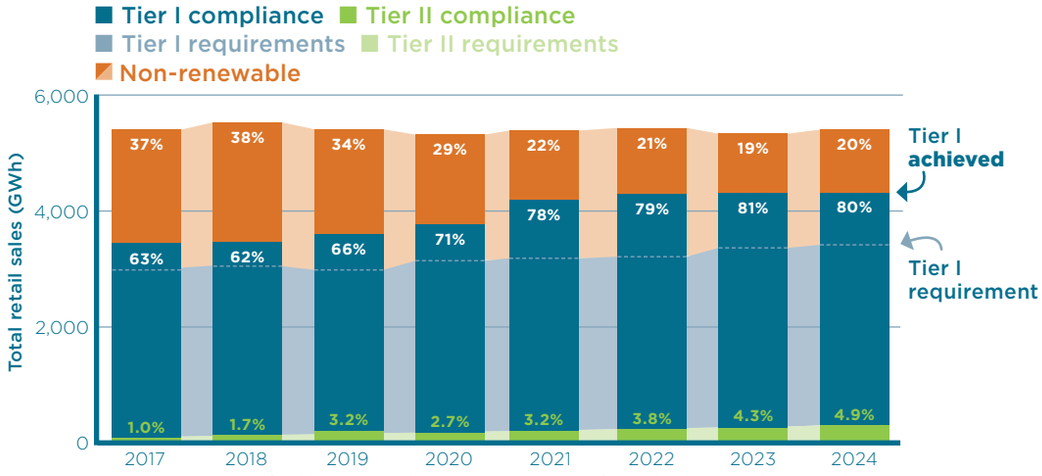


Source: Efficiency Vermont, 2026; Burlington Electric Department, 2023; VGS, 2026.
Notes: BED values from 2000-2021; EVT and VGS values from 2000-2024. Social cost of carbon based on estimate of $190 per metric ton (EPA, "Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances," 2023). Savings, avoided costs, and avoided emissions incorporate the modeled lifetime of the measures. Avoided CO_2e emissions are calculated by energy efficiency utilities using marginal emissions of the ISO-NE mix, rather than of VT's electricity portfolio.

Vermont's Renewable Energy Standard

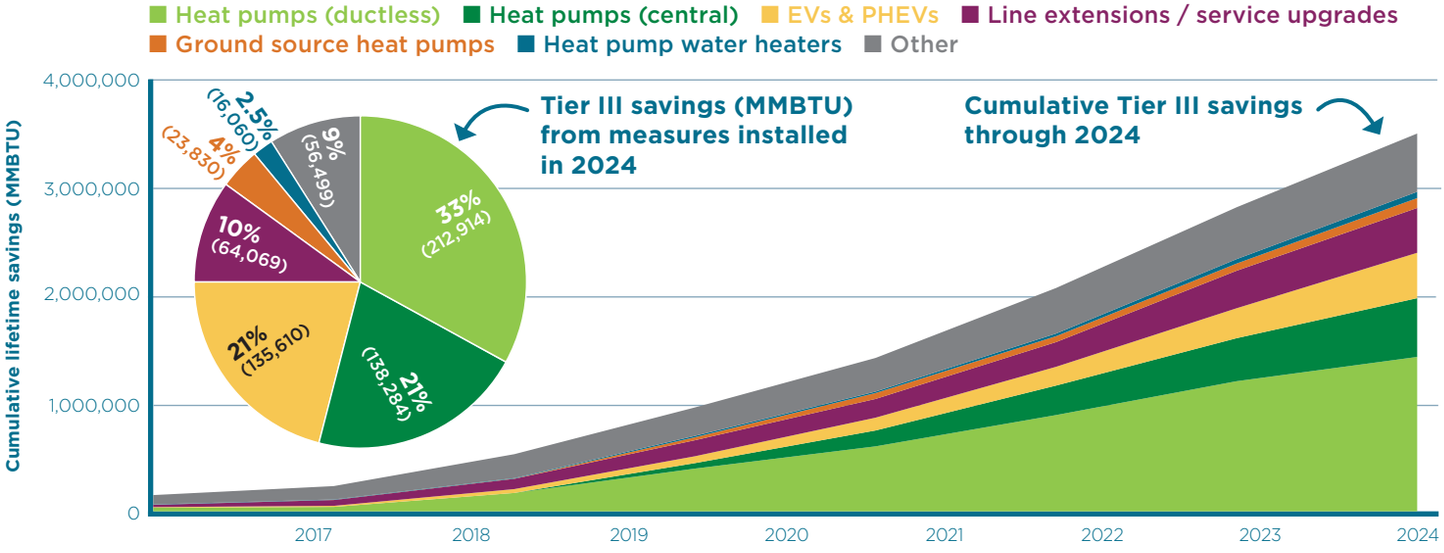
Unlike other energy sectors, Vermont's electricity primarily comes from renewable sources. This is largely because of Vermont's Renewable Energy Standard (RES), which consists of five tiers of requirements. **Tier I** requires utilities to increase the share of electricity they purchase from renewable sources over time, reaching 100% renewable statewide by 2035.[1] **Tier II** requires utilities to purchase an increasing share of electricity from small-scale, in-state renewables. **Tier III** requires Vermont utilities to invest in energy transformation projects that reduce fossil fuel use for their customers.[2] **Tier IV** requires utilities to purchase increasing amounts of electricity from new renewable resources located anywhere in the region. **Tier V** requires that an increasing percentage of new load growth is met using renewable resources starting in 2025.

Vermont Renewable Energy Standard requirements and compliance, 2017–2024



Sources: Vermont Department of Public Service, 2026. RES requirements from 30 V.S.A. § 8005 (a) (1) (C).
Notes: Distributed renewable generation that qualifies for Tier II also qualifies for and is included in Tier I. The percentages shown on the blue bars represent total Tier I generation, including Tier II (shown in green). For purposes of RES compliance, non-renewable electricity includes nuclear.

Renewable Energy Standard Tier III lifetime savings



Source: VT Department of Public Service, 2026. **Notes:** "Other" includes the following measures, listed in order from greatest to least savings in 2024: battery storage, custom projects, EV charging equipment, prescriptive projects, advanced wood heat, and weatherization. The Vermont Public Service Department accounts for Tier III savings in a given year by calculating the lifetime savings from all measures installed during that calendar year. Percentages may not add to 100% due to independent rounding.

Among the tiers of the Renewable Energy Standard, Tier III has driven some of the most noticeable benefits for Vermont consumers. Tier III, which requires Vermont utilities to invest in projects that reduce fossil fuel use for their customers, has incentivized significant uptake of electrification technologies and upgrades, including heat pumps, electric vehicles and chargers, electrical line extensions and service upgrades, and heat pump water heaters. **Measures installed as part of Tier III programs have saved more than 3.3 trillion BTU and have allowed tens of thousands of Vermonters to access electrification upgrades at a lower upfront cost.**

1. Tier I is an encompassing tier, i.e., compliance for Tiers II, IV, and V also counts toward Tier I compliance.
2. Examples include incentivizing the purchase of cleaner transportation and heating equipment, such as heat pumps and electric vehicles.

Load management strategies can support beneficial electrification

Vermont has 17 electric utilities, which range from large investor-owned utilities to smaller co-ops and municipal electric departments. Regardless of the ownership structure of a utility, the rates they are allowed to charge must be approved by the Vermont Public Utility Commission. The average residential rate in Vermont is 22¢ per kWh, but residential rates vary between 13¢ and 26¢ per kWh across utilities (with some lower rates available in special circumstances, such as the EV charging rates offered by GMP and BED).

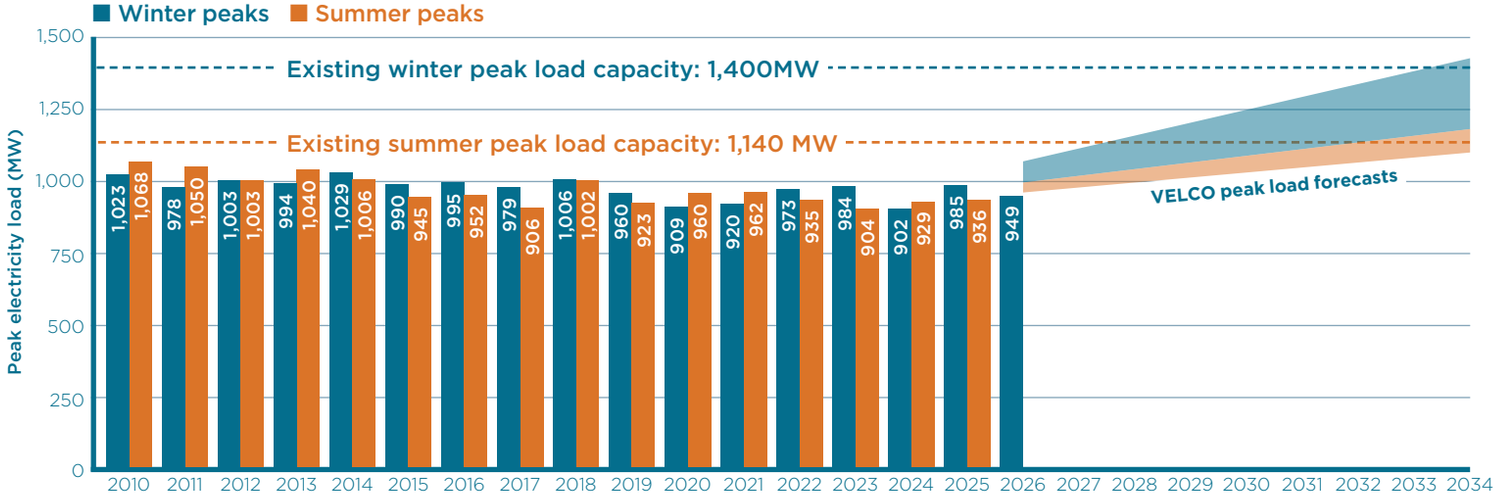
ISO-New England electricity peak load costs and emissions, summer 2025

ISO-NE load (MW)	Average price ($/MWh)	Emissions ($MTCO_2e$/minute)	# of days peaking in this range
12,000–14,999	$50	69	21
15,000–17,999	$74	85	33
18,000–20,999	$100	93	19
21,000–23,999	$153	111	15
24,000+	$458	135	6

Source: ISO New England, "Daily Summary of Hourly Data (2025)," 2026. Green Energy Consumers Alliance, "Shave the Peak End-of-Summer Trends," 2025.

However, the price that *utilities* pay for energy varies widely on the open market in response to supply and demand. **The most expensive and polluting power is generated at the time of peak demand when "peaker plants" are used.** These generators, which only operate at times when the grid is severely constrained, are typically significantly more expensive and emit much more climate pollution. Although we do not have specific data for Vermont on price and emissions impacts from peaking, when the New England grid is at its lowest combined load (below 15,000 MW), the average price of electricity is $50/MWh, with 69 metric tons (MT) of CO_2e pollution per minute. At the other end of the scale, when peak load is above 24,000 MW, the average price is more than 9 times higher, and the emissions are more than twice as high. **Reducing peak load brings down costs for utilities and their ratepayers while decreasing pollution.**

Vermont historical and forecasted peak loads



Sources: Existing peak load capacities, historical peak loads, and peak load forecasts: VELCO, 2026; historical peak loads: VELCO, "Vermont Long-Range Transmission Plan," 2024.
Notes: The peak load forecasts represent a low and a high scenario. The low "continued growth" forecast represents a business-as-usual scenario, and the high "VT Roadmap" forecast represents electrification consistent with Vermont climate goals. Peak load capacity is greater in winter than in summer because colder temperatures reduce the electrical resistance of power lines and improve the efficiency of heat dissipation, allowing more power to be transmitted without the risk of overheating or cable sag. For years prior to 2018, the winter peak load values represent the peak during the heating season ending in the year noted on the x-axis.

Vermont Electric Power Company (VELCO) has modeled a significant increase in statewide electricity use over the next 10 years, including a Vermont Roadmap (higher) load growth scenario consistent with achieving Vermont's climate commitments. The forecast also estimates a continued (lower) load growth scenario that, absent load control strategies, would see Vermont's summer peak load increase more than 17% by 2034, while the winter peak would increase around 24%.

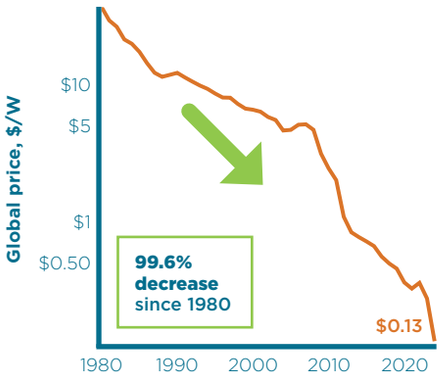
However, distribution utilities are implementing load management strategies to avoid such outcomes by reducing electricity demand during periods of peak usage. Load management strategies include energy efficiency, microgrids, battery energy storage, vehicle to grid (V2G) technologies, rate design, and direct load control by utilities. **Load management can improve grid resilience, save money, and reduce GHG emissions and air pollution, while also better aligning electricity demand with renewable generation.** Electrification paired with distributed energy resources, such as solar panels and battery storage, can alleviate some of the peak demand impacts that come from a larger quantity of electric vehicles and heat pumps in the state.

Solar cell efficiency has increased significantly since the technology was first developed, and more power can now be produced on the same amount of rooftop or land area. At the same time, solar cell prices have decreased drastically, with the global price of solar PV modules decreasing 99.6% since 1980. As of the end of 2025, Vermont had more than 730 MW of distributed renewable generation resources, including significant solar and wind generating capacity.[1]

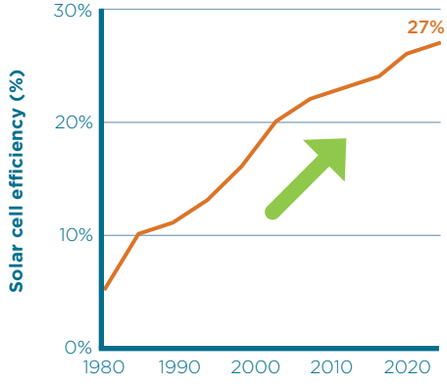
Battery technology and pricing have also been rapidly improving. Battery cells are now much more dense, and it takes a much smaller battery unit to provide the same amount of energy than would have been possible 10 or 20 years ago. Battery cell pricing has seen a huge decline as well. Since 1991, the global price per kW of energy storage has gone down by 99%.

For key electrification technologies, prices have gone down and efficiency has gone up

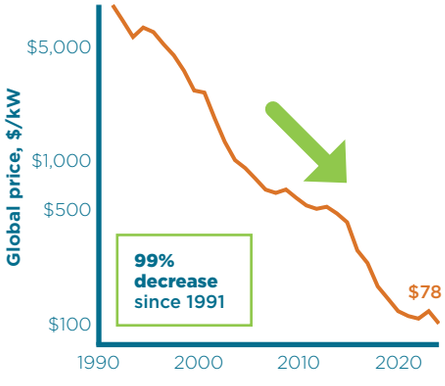
Solar PV module price



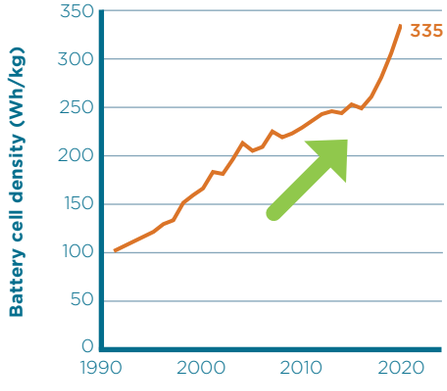
Solar cell efficiency



Battery price



Battery cell density



Source: Ember, "The Electrotech Revolution," 2025. **Note:** Price graphs use a logarithmic scale.

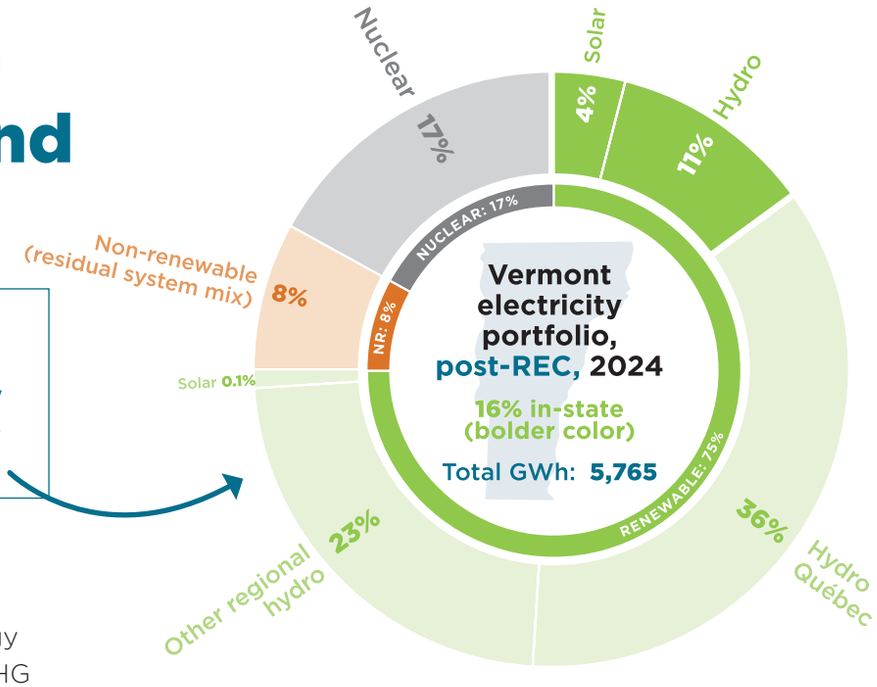
Energy storage is helpful for managing power demand and avoiding costly peaks. Vermont is a leader in installing battery storage to offset energy demands at high-usage times. For example, Green Mountain Power's Home Energy Storage program draws electricity from a large number of home battery storage devices when needed. During Vermont's 2026 summer peak, Green Mountain Power's (GMP) virtual power plant (VPP) of stored energy drove down peak energy costs by approximately $6 million for all GMP customers by deploying 90 MW of stored energy from residential and utility-scale batteries, equivalent of taking 50,000 homes off the grid during this time.[2] Other Vermont distribution utilities are also increasingly deploying utility-scale batteries.

In the near term, Vermont's electricity system has sufficient capacity to accommodate greater electrification of transportation and heating. **However, to maintain grid reliability, limit rate impacts, and reduce the need for additional transmission assets, it is necessary to continue deploying load control and storage measures, as well as time-of-use rates that shift demand away from the peaks.** These innovations help avoid increases to peak demand, while also reducing costs for all ratepayers.

1. Vermont Public Service Department, 2026 Annual Energy Report.
2. Green Mountain Power, 2026.

Electricity sector GHG emissions and energy usage

Vermont's post-REC electricity mix is what legally determines Renewable Energy Standard compliance and is what is officially used to measure electricity sector emissions in Vermont's GHG Inventory.

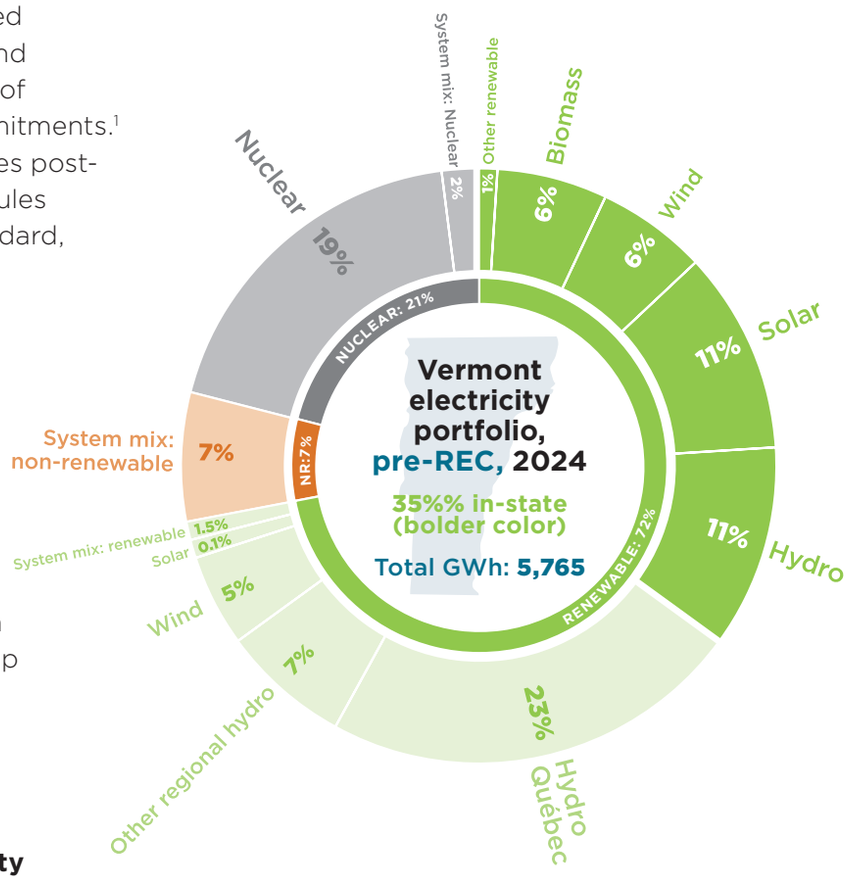


Sources: Vermont Department of Public Service, 2024 RES Compliance; NEPOOL GIS Residual Mix, 2024.
Notes: The residual system mix consists of the unclaimed certificates in the ISO-NE region from NEPOOL GIS after REC trading and is 99% non-renewable (NR). Non-renewable is primarily energy from fossil fuels. Totals may not add up to 100% due to independent rounding.

Emissions from Vermont's electricity sector can be counted in multiple ways. The state of Vermont officially calculates Renewable Energy Standard compliance and electricity sector GHG emissions via our purchased electricity portfolio, after accounting for REC purchases and retirements (post-REC). RECs, or Renewable Energy Credits, are the marketable property rights to the renewable attributes of power generation. RECs can be bundled and sold with renewable electricity, or unbundled and sold separately from the electricity for the purpose of complying with renewable electricity goals or commitments.[1] Vermont's official purchased electricity portfolio uses post-REC accounting in order to be consistent with the rules and practices of Vermont's Renewable Energy Standard, emissions accounting in most other New England states, and the regional electricity market in which we operate. **The majority of Vermont's post-REC electricity portfolio comes from hydroelectric generation (70%), with the rest coming from nuclear, solar, and a smaller non-renewable/fossil fuel mix.**

Vermont's electricity mix before taking RECs into account (pre-REC) represents the electricity produced in Vermont plus electricity delivered from outside the state. Hydroelectric generation makes up 44% of the pre-REC mix, and there is more nuclear, solar, wind, and biomass, and less additional non-renewable/fossil fuel than in the post-REC mix.

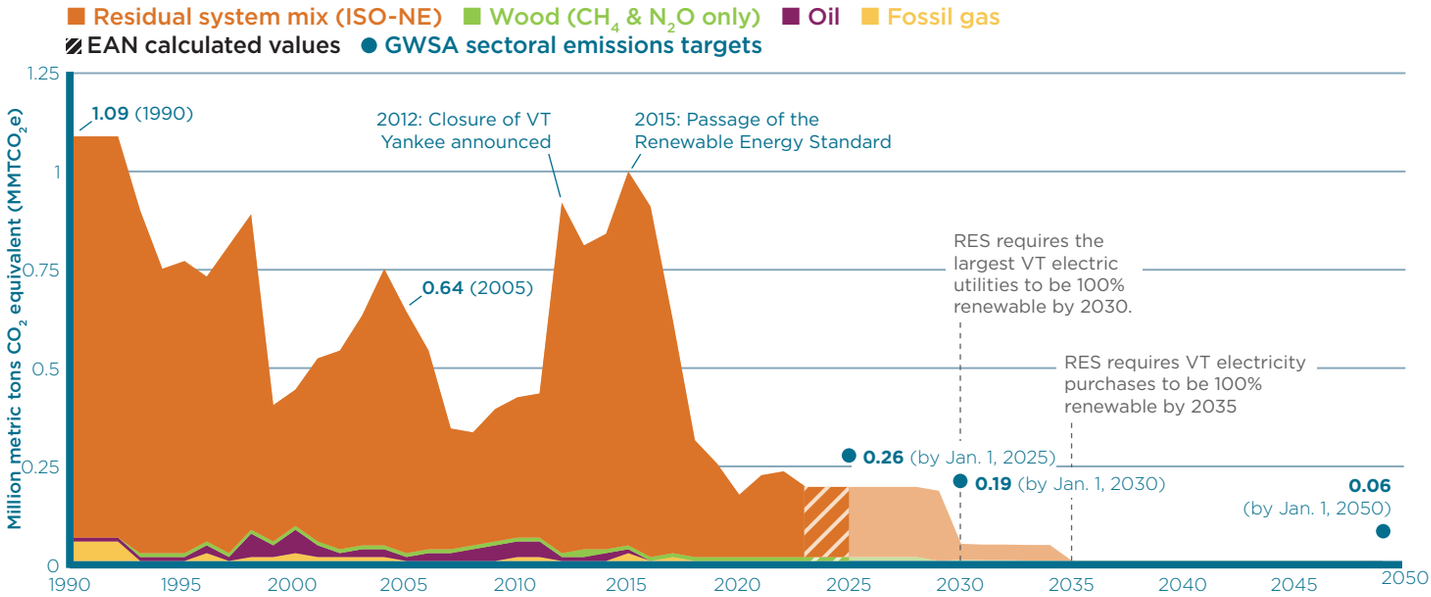
In either accounting scenario (pre- or post-REC), a very small portion of Vermont's annual electricity purchases come from fossil fuel sources (8% or less).



Sources: Vermont Department of Public Service, 2024 RES Compliance; ISO-NE, "Net Energy and Peak Load by Source Report," 2024.
Notes: System mix refers to the ISO New England regional electricity mix. Non-renewable is primarily energy from fossil fuels. Totals may not add up to 100% due to independent rounding.

1. Public Service Department 2025 Note: Some of the renewable electricity that is produced in Vermont is unbundled and its RECs are sold out of state, while Vermont purchases RECs from other sources, such as Hydro Québec. RECs can only be counted once, as tracked by the NEPOOL GIS system, and the renewable attributes can only be claimed by the owner of the RECs.

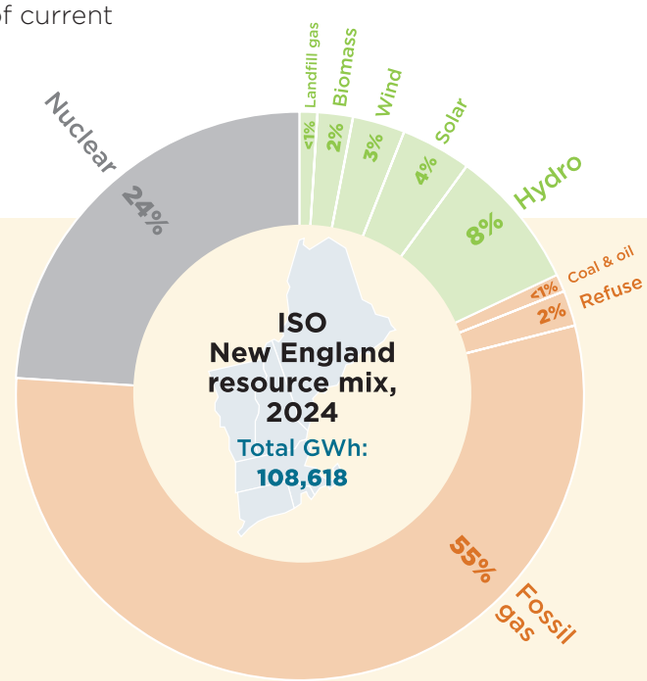
Historical VT electricity GHG emissions and projections based on Renewable Energy Standard



Source: 2005-2022 emissions: Vermont Agency of Natural Resources, "Vermont Greenhouse Gas Emissions Inventory and Forecast: 1990-2022," 2025. 2023-2024 emissions: EAN.
Notes: EAN calculated electricity sector emissions estimates for 2023 and 2024 using electricity delivery data from the Vermont Department of Public Service and GHG emissions factors from NEPOOL GIS (as described in the Vermont Agency of Natural Resources' (ANR) Greenhouse Gas Emissions Inventory methodologies document) plus a carry-forward estimate of emissions from wood-fired electricity generation from the 2022 ANR Greenhouse Gas Emissions Inventory and Forecast. The Renewable Energy Standard (RES) requires that 100% of electricity purchases by VT's largest electric utilities must be renewable by 2030, and 100% of all electricity purchases must be renewable by 2035. The emissions projections from 2025 to 2035 are conservative estimates of utility compliance with the RES.

Vermont's electric power sector is responsible for far fewer GHG emissions than our other energy sectors, representing just 3% of statewide climate pollution in 2022. Additionally, per EAN calculations, Vermont's electric sector emissions decreased further in 2023 and 2024, down to approximately 194,000 metric tons of CO_2e. Vermont's emissions from electricity declined by 70% between 2005 and 2024, more than meeting the sector's proportional share for emissions reduction toward the statewide 2025 GWSA requirement.

Vermont has long had the least carbon intensive electricity portfolio (CO_2e/MWh) of any state in the country. As we move to 100% renewable electricity by 2035 to meet the requirements of the Renewable Energy Standard, Vermont will only strengthen this position. Because of current and future renewability requirements, **electrifying Vermont's highest-polluting energy uses — transportation and heating — delivers both immediate and accruing GHG emissions reductions.**



Vermont is part of a regional electricity grid operated by an independent system operator, ISO New England (ISO-NE). While the New England grid is cleaner than the national average, ISO-NE has a significantly higher GHG emitting power supply than Vermont's portfolio. One reason for the reduction in emissions from Vermont's electricity sector is that the share of our portfolio that comes from the ISO-NE "residual system mix" of generation sources has been declining over time, from a recent high of 52% in 2015 to only 8% in 2024. It is also worth noting that while fossil fuel resources represent the majority of the total ISO-NE generation mix, this mix has become more renewable and carbon-free over time, increasing from 4% renewable in 2010 to 18% in 2024.

Source: ISO-NE, "Net Energy and Peak Load by Source Report," 2025.
Notes: ISO New England is New England's regional grid operator. Totals may not add up to 100% due to independent rounding.

Who We Are

Energy Action Network (EAN) consists of hundreds of public sector, non-profit, utility, business, and higher education partners working collaboratively toward a mission of achieving Vermont's climate and energy commitments in ways that create a more just, thriving, and sustainable future.

Non-Profits

American Institute of Architects Vermont (AIA VT)
Sarah O'Donnell, Catherine Lange

Building Performance Professionals Association of Vermont (BPPA)
Jonathan Dancing, Russ Flanigan, Malcolm Gray, Tom Perry, Chuck Reiss

Capstone Community Action
Scott Hall, Liz Scharf

CarShare Vermont
Annie Bourdon

Center for Sustainable Energy (CSE)
Gabrielle Stebbins

Champlain Valley Office of Economic Opportunity (CVOEO)
Paul Dragon, Virginie Diambou, Jeremy Francis, Pacifique Nsengiyumva

Climate Economy Action Center of Addison County (CEAC)
Shannon Bryant, Richard Hopkins, Steve Maier, Spencer Putnam, Mike Roy, Jean Terwilliger

Community Rides Vermont / Gopher
Amanda Carlson, Laura Brooke

Conservation Law Foundation (CLF)
Elena Mihaly, Adam Aguirre, Jennifer Rushlow

Cornerstone Housing Partners
Melanie Paskevich, Ann Lawless

Drive Electric Vermont
David Roberts

Evernorth
Kathy Beyer, Jess Neubelt, Charlie Willner

Lake Champlain Chamber
Catherine Davis, Austin Davis, Alex Bunten

Local Motion
Christina Erickson

New England Grassroots Environmental Fund
Bart Westdijk

Northern Forest Center
Rob Riley, Maura Adams, Joe Short

Preservation Trust of Vermont
Ben Doyle

Public Assets Institute
Stephanie Yu, Katrina Menard

Regulatory Assistance Project (RAP)
Richard Cowart, Nancy Seidman

Renewable Energy Vermont (REV)
Peter Sterling, Jonathan Dowds, Jess Turner

ReSOURCE
Thomas Longstreth

Rights and Democracy (RAD)
Alison Nihart, Katy Allen

Shelburne Farms
Megan Camp, Rob Hunter

Sierra Club Vermont Chapter
Robb Kidd, Bob Galvin

Sustainable Heating Education Outreach
Jeff Rubin

Sustainable Woodstock
Jenevra Wetmore

The Nature Conservancy
Lauren Oates, Drew Watson

Third Act
Beth Sachs

Vermont Adult Learning
David Justice

Vermont Businesses for Social Responsibility (VBSR)
Chelsea Bardot Lewis

Vermont Center for Independent Living (VCIL)
Peter Johnke

Vermont Clean Communities Coalition
Peggy O'Neill-Vivanco

Vermont Climate and Health Alliance
Dan Quinlan

Vermont Community Thermal Networks
Debbie New, Susan Smiley, Sally Burrell

Vermont Conservation Voters
Dan Fingas, Justin Marsh

Vermont Council on Rural Development (VCRD)
Denise Smith, Laura Cavin Bailey, Margaret McCoy, Nick Parker, Jessica Savage

Vermont Energy and Climate Action Network (VECAN)
Johanna Miller, Ford Young

Vermont Energy Education Program (VEEP)
Sophia Donforth, Mariah Keagy

Vermont Futures Project
Kevin Chu

Vermont Green Building Network
Jenna Antonino DiMare

Vermont Housing and Conservation Board (VHCB)
Gus Seelig, Sarah Phillips

Vermont Housing Finance Agency (VHFA)
Maura Collins, Mia Watson

VEIC
Rebecca Foster, Alison Donovan, Adam Sherman

VT Independent Power Producers Association
Mathew Rubin

Vermont Interfaith Power and Light
Ron McGarvey, Richard Hibbert, Sam Swanson

Vermont Land Trust (VLT)
Abby White

Vermont League of Cities and Towns (VLCT)
Ted Brady, Abby Friedman

Vermont Natural Resources Council (VNRC)
Lauren Hierl, Johanna Miller, Kati Gallagher, Evelyn Seidner, Ford Young

Vermont Outdoor Business Alliance
Kelly Ault

Vermont Passive House
Chris Clarke Miksic, Paul Sipple, Enrique Bueno

Vermont Public Interest Research Group (VPIRG)
Paul Burns, Ben Edgerly Walsh, Tom Hughes, Jordan Heiden

Vermont Sustainable Jobs Fund (VSJF)
Ellen Kahler, Jake Claro, Kurt Ericksen, Christine McGowan, Janice St. Onge

Vermont Works for Women
Rhoni Basden

Vital Communities
Erica Hiller

Businesses

3E Thermal
Tim Smith, Fritz Fay

AllEarth Renewables
David Blittersdorf, David Mullett

Bob the Green Guy
Bob Farnham

Bourne's Energy
Levi Bourne, Jim Kurrle

Black Bear Biodiesel
Jim Malloy

Building Energy
Russ Flanigan

Butternut Mountain Farm
David Marvin, Emma Marvin, Ira Marvin, Ed Fox

Catalyst Financial
Bob Barton, Marianne Barton

Catamount Solar
Kevin McCollister, Jarred Cobb

C.T. Donovan Associates, Inc.
Christine Donovan

Downs Rachlin Martin PLLC
Will Dodge

EastRise Credit Union
Rob Miller, Laurie Fielder

Eco-Equipment Supply
Steven Wisbaum

Encore Renewable Energy
Chad Farrell, Phillip Foy, Kate Desrochers

Energy Balance, Inc.
Andy Shapiro

Energy Co-op of Vermont
Shelley Navari, Rose Friedlander

Energy Futures Group (EFG)
Richard Faesy, David Hill, Dan Mellinger, Chris Neme, Zack Tyler

Fit Werx
Ian Buchanan

Forward Thinking
Jeff Forward

Grassroots Solar
Bill Laberge

Green Lantern Solar
Luke Shullenberger, Bill Miller, David Carpenter

Hunger Mountain Co-op
Mary Mullally

Maclay Architects
Bill Maclay

MMR
Justin Johnson

Montpelier Construction
Malcolm Gray

New Leaf Design
Tom Perry

Northam Forest Carbon
Tim Stout

Norwich Solar Technologies
Jim Merriam, Martha Staskus, Geoff Martin

Pellergy
Andy Boutin

Pomerleau Real Estate
Ernie Pomerleau

Quantified Ventures
Mike Crowley

Reiss Building and Renovation
Chuck Reiss

Saunders | Raubvogel | Hand
Geoff Hand, Victoria Westgate

Seventh Generation
Ashley Orgain

Stone Environmental, Inc.
Barbara Patterson, Nick Floersch, John Hanzas, Carleigh Cricchi

SunCommon
Mike McCarthy, Becca White

Sunrun
Chris Rauscher

Sunwood Biomass
David Frank

Tied Branch Clean Energy Consulting
Ryan Lamberg

Vermont Economic Development Authority (VEDA)
Sam Buckley

Vermont Energy Contracting & Supply Corp.
Nick Papaseraphim, Mark Stephenson

Vermont Wood Pellet Co.
Chris Brooks

Utilities

Burlington Electric Department (BED)
Darren Springer, James Gibbons, Jennifer Green, Mike Kanarick, Tom Lyle, Ita Meno, Amber Widmayer

Efficiency Vermont (EVT)
Peter Walke, Kelly Lucci, Phil Bickel, Laura Capps, Bekah Kuster, Brad Long, Jake Marin, Michelle McCutcheon-Schour, Will Schwartz, Steve Spatz

Green Mountain Power (GMP)
Mari McClure, Kristin Carlson, Josh Castonguay, Candace Morgan, Tiana Smith

Vermont Electric Power Company (VELCO)
Tom Dunn, Betsy Bloomer, Luke Looman, Shana Louiselle, Mark Sciarotta

Vermont Electric Cooperative (VEC)
Rebecca Towne, Andrea Cohen, Jake Brown

Vermont Gas Services (VGS)
Lindsay Kurrle, Neale Lunderville, Grace Amao, Richard Donnelly, Jonathan Drouin, Dylan Giambatista, Morgan Hood, Karen Horne, Andrea McNeil, Greg Morse, Tom Murray, Tim Perrin, Jill Pfenning, Alex Reese

Vermont Public Power Supply Authority (VPPSA)
Ken Nolan

Washington Electric Co-op (WEC)
Louis Porter, Stephen Knowlton

Higher Education

Dartmouth College, Tuck School of Business
Melody Brown Burkins

Middlebury College
Mez Baker-Medard, Jon Isham, Dan Suarez, Claire Tebbs

Norwich University
Tara Kulkarni, Michael Cross

University of Vermont (UVM)
Jon Erickson, Maureen Hebert, Kathryn Hinkelman, Taylor Ricketts, Amy Seidl, Richard Watts, Caylin McCamp, Liz Amler

UVM Leahy Institute for Rural Partnerships
Patricia Coates, Summer Colley

UVM Transportation Research Center (TRC)
Gregory Rowangould, Dana Rowangould, Clare Nelson

Vermont Law and Graduate School
Rod Smolla, Dave Celone

EAN's Core Funders

Maverick Lloyd Foundation

Sunflower Fund

VLITE

Vermont Community Foundation

Lintilhac Foundation

Ruth H. Brown Foundation

Bonwood Social Investments

Public Sector Partners

Local

Legislators: *Vermont's State Representatives and Senators*

Town Energy Committees: *Town Energy Committees from across Vermont*

Cities: *Burlington (Alex Bacheller), South Burlington (Bettina Miguez), Hartford (Dana Clawson)*

Regional

Addison County Regional Planning Commission (ACRPC): *Adam Lougee, Jolyon Larson*

Bennington County Regional Commission (BCRC): *Callie Fishburn, Mark Anders*

Central Vermont Regional Planning Commission (CVRPC): *Sam Lash*

Chittenden County Regional Planning Commission (CCRPC): *Ann Janda, Melanie Needle, Charlie Baker, Marshall Distel*

Lamoille County Planning Commission (LCPC): *Victoria Hellwig*

Mount Ascutney Regional Commission (MARC): *Martha Harrison*

Northeastern Vermont Development Association (NVDA): *David Snedeker, Allie Webster, Alison Low*

Northwest Regional Planning Commission (NRPC): *Catherine Dimitruck, Marlena Valenta*

Rutland Regional Planning Commission (RRPC): *Maggie O'Brien, Jeremy Gildrien*

Two Rivers-Ottauquechee Regional Commission (TRORC): *Harry Falconer*

Windham Regional Commission (WRC): *Chris Campany, Margo Ghia, Colin Bratton*

Brattleboro Development Credit Corporation: *Adam Grinold*

Green Mountain Transit Regional Transit Authority: *Chris Damiani, Jamie Smith*

Tri-Valley Transit: *Mike Riderer*

State

Agency of Agriculture, Food and Markets: *Anson Tebbetts, Alex DePillis*

Agency of Commerce and Community Development: *Laura Trieschmann, Bronwyn Cooke*

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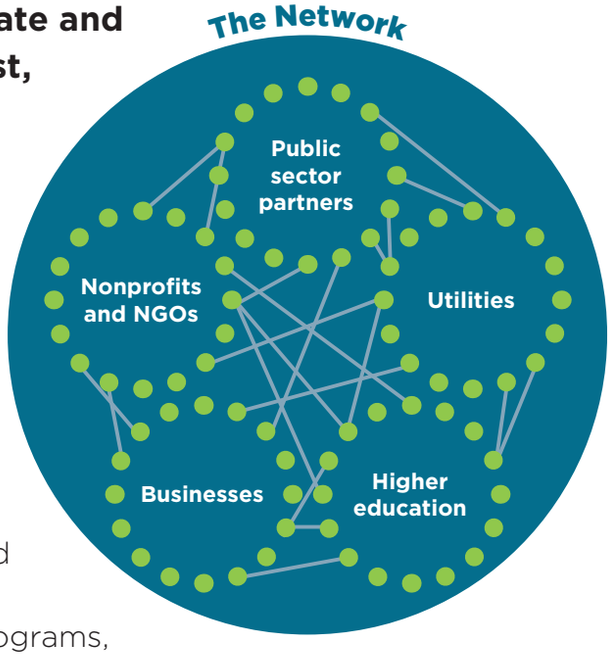
About EAN

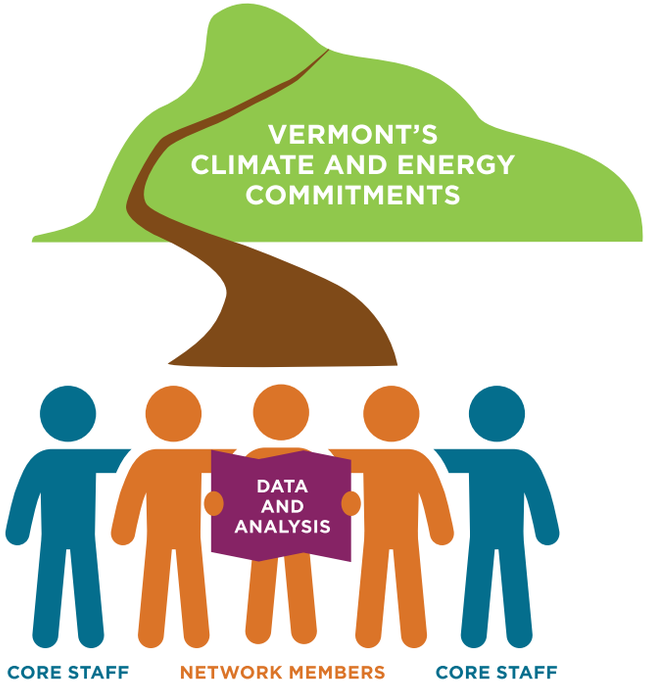
Energy Action Network consists of a ***network*** and an ***organization.***

The *Network's* mission is to achieve Vermont's climate and energy commitments in ways that create a more just, thriving, and sustainable future.



The Network consists of hundreds of public sector, non-profit, utility, business, and higher education partners working collaboratively to achieve this mission. Since 2020, EAN has structured much of our collaborative work through Network Action Teams, coalitions, and working groups selected by EAN members and partners for their potential to help Vermont rapidly, cost-effectively, and equitably reduce fossil fuel use and greenhouse gas pollution. Active teams in 2026 are working on Weatherization at Scale, Climate Workforce, Cold Climate Heat Pump Utilization, Clean and Affordable Vehicle Accessibility, Municipal Energy Codes, Energy Navigation Programs, and Networked Thermal Systems.

The *organization's* mission is to support Vermont in making evidence-based energy and climate decisions that are grounded in high-quality data and analysis, and collaboratively developed for effective and durable progress.



The organization plays two key roles.

1. Conducting **energy and climate data tracking, research, and analysis** on behalf of all Vermonters
2. Facilitating **effective collaboration** in service of the Network's mission by:
   - Stewarding a common agenda for Network members and partners,
   - Coordinating mutually reinforcing activities to develop, share, and advance high-impact ideas, and
   - Ensuring regular communication to and across the Network.

ENERGY ACTION NETWORK

9 Bailey Avenue #2, Montpelier, VT 05602

EANVT.ORG

Thank you!

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The primary co-authors of the report are EAN's staff — Jared Duval, Luke Miller, and Cara Robechek. Design and layout is by Dana Dwinell-Yardley (ddydesign.com).

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