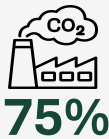


ENERGY

OVERVIEW

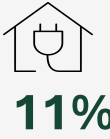
The relationship between climate change and the energy sector is dynamic and interdependent. Energy sources produce greenhouse gas (GHG) emissions, contributing to climate change. Meanwhile, climate change is impacting the energy sector’s infrastructure, supply, demand, and long-term sustainability. Vermont’s climate is getting warmer and wetter, with extreme weather events becoming more frequent and intense. Stress from extreme events have historically resulted in power outages and lasting damage to energy infrastructure; trends that are likely to intensify. Utility companies, policy makers, researchers, industry, and the public all have a shared role in effectively responding to these multifaceted energy-related challenges.



Share of GHG emissions from the energy sector



Major power outages are weather related (2000-2025)



Share of gross annual income spent on energy costs



U.S. per capita electric vehicle adoption (2023)

CLIMATE CHANGE STRAINS ENERGY INFRASTRUCTURE

Power lines, towers, facilities, and poles are all vulnerable to extreme weather events (Table 1). Heavy precipitation and storm events, which are intensifying in Vermont, can cause trees to fall and damage infrastructure creating more frequent and severe power outages. In 2023, about a third of all Vermont power outages occurred in November and December due to winter storms. Drought can reduce hydropower generation; in 2024, drought conditions led to a 30% decline in hydroelectricity generation, which had to be offset by fossil fuel sources. More resilient energy infrastructure requires physical grid hardening (e.g., undergrounding power lines, installing steel cables to help stabilize poles).

Extreme weather	Infrastructure/energy type impact/risks	Demand impact/risks	Possible mitigation/adaptation
Severe storms	Falling trees on power lines leading to localized outages	Outages are more likely, transportation is more difficult	Underground powerlines
Drought	Lower hydropower, cooling requirement risks	Increased demand for irrigation, water pumping, etc.	Demand management
Ice storms and blizzards	Ice accretion, line overloading, icing flashover	Outages are more likely, transportation is more difficult	Grid hardening
Floods	Flash floods, road closures, landslides	Outages are more likely, transportation is more difficult	Grid hardening
Heat waves	Temperature strain on transmission lines and transformers	Cooling related demand increases	Demand management, flexible mix of energy sources

Table 1 A summary of infrastructural risks due to specific weather events
Source: Chapter 8: Energy (Poudel et al. 2026)

MOST GHG EMISSIONS ARE FROM TRANSPORTATION AND HEATING

Emissions from the energy sector (i.e., transportation, thermal, and electricity) contribute to 75% of Vermont’s total GHG emissions: transportation and thermal are the most dependent on fossil fuels, while almost all electrical energy produced in Vermont comes from renewable sources (Figure 1).

Vermont's GHG emissions have decreased since their peak in the mid-2000s, yet the state is not currently on track to meet emission reduction requirements mandated by the 2020 Global Warming Solutions Act (GWSA)—80% below 1990 levels by 2050.

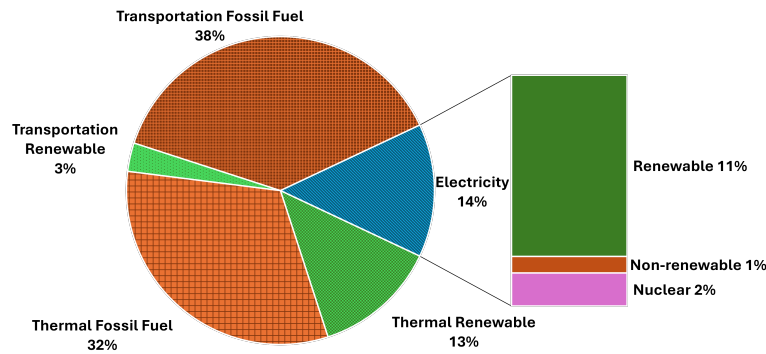


Figure 1 Proportion of annual energy usage by sector (electricity, thermal, and transportation), and source (fossil fuel, renewable, and nuclear) in Vermont, 2023.

Source: Adapted from Energy Action Network (2025)

ENERGY BURDENS ARE UNEQUAL

Vermonters pay 28% more for electricity compared to the national average. Energy burdens (i.e., the percentage of household income spent on energy) in Vermont are unequally distributed, causing some to experience energy poverty. While the average Vermonter spends 11% of their gross annual income on energy costs, low-income or rural residents spend between 15–20% (Figure 2). High energy burdens can

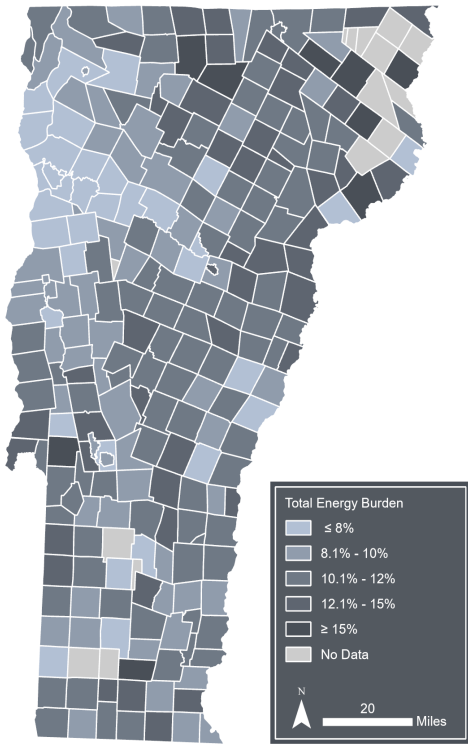


Figure 2 Energy burden, or the percentage of annual household income spent on energy (%), by township in Vermont

Source: Efficiency Vermont (2023)

lead to trade-offs between heating and cooling homes and food or other necessities creating or exacerbating health concerns. Vermont's Weatherization Assistance Program (WAP) and Efficiency Vermont Home Energy Loan seek to help low- and moderately low-income residents access resources for weatherization of homes and purchase and install heat pumps, lowering energy costs while reducing GHG emissions and improving energy system resilience.

MOVING TOWARDS ENERGY RESILIENCE

The Comprehensive Energy Plan (CEP) and the Climate Action Plan (CAP) are two policy avenues to achieve climate goals mandated by the 2020 Global Warming Solutions Act. The state pledges to meet 90% of energy demand with renewable sources by 2050 (CEP) and reduce GHG emissions by 80% below 1990 levels by 2050 (CAP). Electrification of the transportation (e.g., through EV adoption) and thermal sectors (e.g., through heat pump installation) can help lower fossil fuel dependence. While EV adoption has grown rapidly in the state, both EV adoption and EV charging infrastructure are skewed towards wealthier areas (Figure 3). The divergence in EV adoption rates between urban and rural Vermonters highlights the challenges of electrifying equitably across the state. Investment in public, fast, and conveniently located EV chargers could increase adoption, but most regions of Vermont cannot accommodate EV fast-charging because of old, lower-capacity pole top transformers. Residential solar panels, battery backup storage, and heat pumps require substantial up-front costs, out of reach for many Vermonters. Incentive programs can help the state meet its energy and climate targets, but more investment is needed to modernize Vermont's grid to accommodate increased demand and mitigate climate risk.

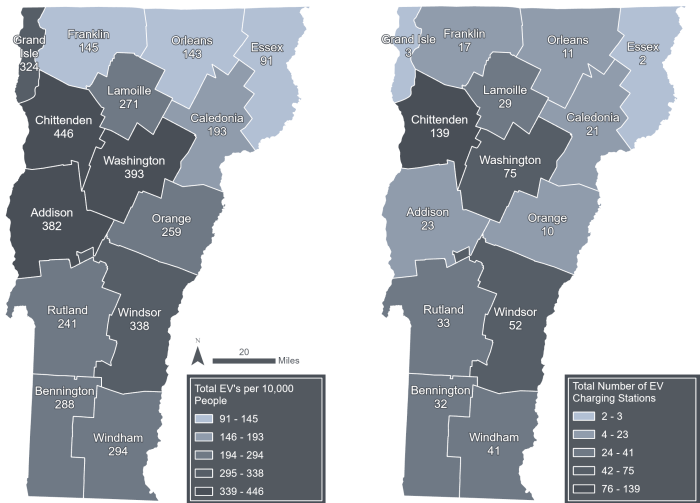


Figure 3 Electric vehicles per 10,000 people as of April 2026 (left panel) and total number of electric vehicle charging stations as of January 2022 (right panel) in Vermont

Source: Drive Electric Vermont (2026); VT Agency of Commerce and Community Development (2022)