2023 Vermont Energy Burden Report

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Efficiency Vermont

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Executive Summary

Energy burden, which examines energy usage in context of income, is an important lens for understanding the impacts of energy costs on Vermont households and communities. It can also help us understand if Vermont's energy transformation programs[1] are reaching the customers who can most benefit from them.

This new analysis of data through 2021 indicates that energy burdens have remained relatively constant over the last decade, with households on average spending 11% of their income on energy costs—including electricity, transportation fuels, and home heating (thermal) fuels. Spending on transportation energy makes up the largest portion of these costs (45%). This report is somewhat unique in that it includes transportation fuel costs in the determination of energy burden, which can make it challenging to understand where Vermont stands in a national context. However, a combined electric and thermal burden of greater than 6% is generally considered high;[2] when transportation costs are removed from our calculation, the average electric and thermal burden for Vermont is 5%, indicating that there are many households in our state with high energy burden. Consistent with the last iteration of this report, published in 2019 (and based on data from 2013-2017), we find that adoption of clean energy technologies, which can lower costs and decrease energy burden, is lagging in highly energy-burdened communities where they can provide the most benefits to residents.

Meeting Vermont's aggressive energy and equity goals will require widespread adoption of technologies that reduce energy costs and climate impact. This means designing and implementing energy programs that explicitly address energy burden and make significant resource investments to address the barriers faced by residents with limited means or historic disadvantages. Energy efficiency and electric distribution utility programs are just one part of the solution to these challenges, but they will likely need the flexibility to place a greater focus on addressing energy burden in the context of their overall performance requirements.

[1] Programs intended to help Vermont residents reduce their energy costs and/or fossil fuel consumption.

[2] Affordable levels of spending or burden vary by category. Generally, a combined electricity and thermal energy spending burden less than 6% of household income is considered affordable (see ACEEE: https://www.aceee.org/sites/default/files/energy-affordability.pdf; NYSERDA: https://www.nyserda.ny.gov//media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/LMI-Special-Topic-Rpt---Energy-Burden.pdf; Connecticut PUC: https://portal.ct.gov/-/media/PURA/electric/FAQs-Docket-No-17-12-03RE11.pdf). A combined transportation and housing burden of 45% of household income is used by the Housing and Transportation Affordability Index (see https://htaindex.cnt.org/about/#methodology). The combined 45% affordability threshold is inclusive of total shelter costs (rent/mortgage, insurance, utility costs, etc.) and all associated transportation costs (vehicle maintenance, fuel, insurance, public transit costs). For the purposes of this report, we only considered transportation energy (fuel) costs.

Introduction

This is the third iteration of the Vermont Energy Burden Report, which presents an analysis of geographic patterns and trends across the three major components of household energy costs: Electricity, Thermal[3], and Transportation.

For this study update, we leveraged electric usage data and other publicly-available data sets to estimate the average dollars spent annually on energy, as a percentage of annual income, at the town level, and at the census block group level[4] for towns with larger populations[5]. While this report discusses our town-level findings, we created a companion resource (available at efficiencyvermont.com/energyburden) that enables readers to examine census block group data. We also examined customer participation data for the subset of Efficiency Vermont's programs most likely to help reduce household energy burden.

Our primary goals in conducting this analysis were to:

1. Provide a data-driven assessment of the impact of energy costs on Vermonters, in order to support equitable program design and more effective engagement with residents who can most benefit from clean and affordable energy technologies.
2. Explore whether there have been any notable changes or shifts in the basic patterns we identified in the first two Vermont Energy Burden Reports, published in 2016 and 2019.
3. Assess the extent to which Efficiency Vermont's programs are reaching energy-burdened residents, within the limitations of available data on customer participation.

While there are some limitations in the data that are currently available – particularly in terms of customer demographics[6] – we hope that this report will help provide context for ongoing conversations around how best to advance progress on Vermont's energy, climate, and equity[7] goals.

[3] Thermal costs are primarily driven by home heating but may also include cooking and water heating.
[4] A census block group is the smallest geographic unit for which the U.S. Census Bureau provides basic demographic data: https://www.census.gov/newsroom/blogs/random-samplings/2011/07/what-are-census-blocks.html.
[5] Defined as 3,000 or more residents.
[6] Efficiency Vermont does not routinely capture demographic data for customers who participate in its programs; doing so can be particularly difficult for programs that are offered at point of sale.
[7] Leveraging the American Council for an Energy-Efficient Economy's (ACEEE) Energy Equity project as our guide, Efficiency Vermont defines "Equity" as working to address the embedding of Diversity, Equity and Inclusionary considerations into our programs, policies, and investments, such that we can improve and expand determination of, access to, and utilization of impactful clean energy services and technologies for underserved groups while creating more just processes, outcomes, and systems. More information is available at: https://www.aceee.org/topic/energy-equity.

Background

The pattern of total energy burden in Vermont remains largely unchanged since our 2016 analysis, with relatively low burden in Chittenden County and relative high burden in the Northeast Kingdom.[8] However, there have been some changes in our methodology for each iteration of this report.

In 2016, we explored energy burden through census block group and zip code. We opted to report energy burden by town in 2019, because that unit is more accessible and relatable. However, analyzing energy burden exclusively at the town level can obscure significant variations within Vermont's larger communities. While easy to understand, this approach risks giving an impression that only relatively small rural communities must contend with high energy burden. For example, there are 28 census block groups in Burlington, including one of the most energy-burdened block group in Vermont; however, our town-level analysis places Burlington in the "lowest" energy burden category. In order to provide a more accurate characterization of energy burden across Vermont, we have created an interactive online resource as a companion to this report that allows readers to explore census block group-level estimates of energy burden for all of Vermont's larger communities. Each census block group contains between 600 and 3,000 people. In rural areas of Vermont, many towns only have one block group, meaning a block-group level analysis provides no additional information.

Census Block Group Data

Analyzing energy burden exclusively at the town level can obscure significant variations within Vermont's larger communitiies.

In the previous two versions of the report, we used data from a variety of sources to estimate thermal energy spending. We relied heavily on the American Community Survey (ACS) which provides primary heating fuel source(s) for each census block group and town in Vermont. We combined these estimates with cost data from the Vermont Public Service Department to estimate household-level spending. In this year's report, we opted to use the US Department of Energy's Low Income Energy Affordability Data (LEAD) Tool.[9] The LEAD Tool is a rigorously tested and sophisticated model that provides estimates of spending on household heating by census tract.[10]

Image 1. Total Energy Burden, 2016–2023.

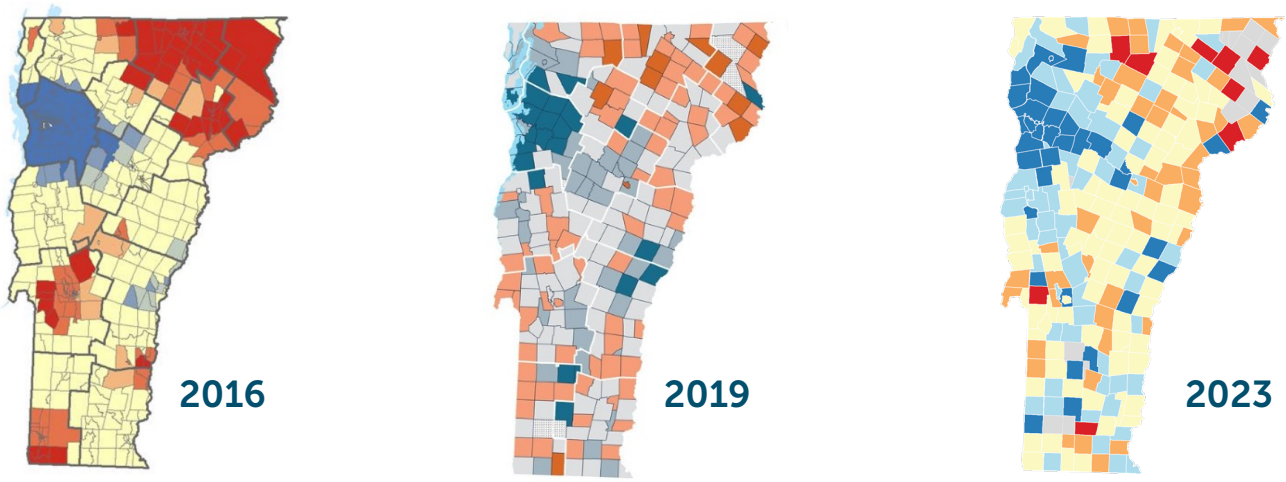

Image 1: Total Energy Burden maps from the 2016 (left), 2019 (center), and 2023 (right) Vermont Energy Burden Reports demonstrate the same basic pattern. Red areas indicate high burden and blue areas indicate low burden.

[8] Caledonia, Essex, and Orleans counties.
[9] https://www.energy.gov/scep/slsc/lead-tool
[10] Per the U.S Census Bureau, census tracts are "small relatively permanent statistical subdivisions of a County, averaging about 4,000 residents:" https://www2.census.gov/geo/pdfs/education/CensusTracts.pdf

Since the first report was published in 2016, Efficiency Vermont has increased its consideration of energy burden in the design of programs, but is still working to understand how to best track and measure the impact of this work. Among many changes and improvements, there are now bonus incentives and zero interest loans available for low- and moderate-income Vermonters to help them complete weatherization projects and install cold climate heat pumps. We have also leveraged new flexibility made possible by the passage of the Energy Efficiency Modernization Act (Act 151 of 2020) to introduce a pilot program, in partnership with Vermont's electric utilities, which pairs income-eligible Weatherization Assistance Program customers with Efficiency Excellence Network contractors to install cold climate heat pumps at no cost. This program and other programs supporting efficiency measures for low-income households are largely driven by policy preferences of legislators and regulators and made possible by Efficiency Vermont balancing the overall budget impact of these programs against other programs that generate much higher energy savings at a significantly lower cost.

Programs such as these will likely need to be scaled up dramatically over the next decade if Vermont is to meet its aggressive climate goals and ensure that a larger share of low- and moderate-income Vermonters can adopt and benefit from energy-saving technologies. However, there is a limit to how much additional investment can be made from Vermont's energy efficiency programs, which are generally focused on maximizing electricity and thermal savings at the lowest possible cost. While the current focus is important for reducing costs for all Vermont residents, it drives a different set of program priorities than would a focus on reducing energy burden, or reducing greenhouse gas emissions.

Improving Programs

Since the first report was published in 2016, Efficiency Vermont has increased its consideration of energy burden in the design of programs.

Methodology

We used a combination of residential electric usage data, U.S. Census data, and modeling from the LEAD Tool to estimate total energy spending and burden in Vermont communities. Energy burden is provided at the town level for all communities with more than 50 households.[11] For communities with more than 3,000 residents,[12] we have also estimated energy burden at the census block group level (representing 60 towns and 313 block groups).

Energy Spending ÷ **Household Income** = **Total Energy Burden**

Total energy spending is the sum of annual costs for three categories: Electricity, Thermal, and Transportation.[13] Energy burden is defined as annual energy spending expressed as a percentage of household income.

[11] Towns with fewer than 50 households were excluded from this analysis due to small sample sizes and high variability. These towns include: Avery's Gore, Averill, Brunswick, Ferdinand, Glastenbury, Granby, Lemington, Lewis, Somerset, Victory, Warner's Grant, Warren's Gore.

[12] Many communities with fewer than 3,000 households include only one census block group, and thus their energy burden data can be easily expressed at the town level.

[13] Estimates of spending do not account for fuel assistance that qualifying households may receive, since that data is not available at the community level.

To estimate energy spending and burden at the community level for each of the three energy categories we used the following data sources:

Electricity: Through Efficiency Vermont's ongoing partnership with Vermont's electric utilities, we obtained average electricity usage per residential account for the 246 (of 253) towns in Vermont for which it was available from 2019 to 2021. To the extent that the homes in a community are using electricity for heating, it would impact our estimate of electric burden; we anticipate revisiting this methodology in future iterations of this report to account for increasing usage of efficient electric heating systems.

Thermal: Estimates of spending on heating are available through the LEAD tool. The LEAD tool provides detailed estimates of spending on heating by a variety of demographic variables and building characteristics. The LEAD tool also reports spending by census tract. There are 180 census tracts in Vermont. Each census tract contains approximately 4,000 people. Most tracts contain more than one town and some cities contain more than one tract. We converted tract-based estimates of thermal energy spending to town-based estimates. The LEAD tool estimates are based largely on 2016 American Community Survey data.[14] We updated the tool's estimates with fuel-specific inflation factors available for Vermont through the Energy Information Administration to capture average prices over the 2017-2021 period.[15] As efficient electric heating systems become more widespread, we anticipate adjusting our methodology in future iterations of this report to more effectively account for their impact and costs. We converted tract-level estimates of spending from the LEAD Tool to town and block group level and calculated burden using town and block group-level median household income.

Transportation: To estimate spending on transportation energy we used estimates of vehicle miles traveled (VMT) available by census block group through the Housing and Transportation Affordability Index (H&T Index), from the Center for Neighborhood Technology. We averaged these estimates by town and used them to calculate town-level transportation energy spending. These estimates were merged at the town level to create town-level VMT estimates. They were then combined with statewide average fuel efficiency (23.4 miles per gallon)[17] and average gasoline prices ($2.91 in 2022)[18] to estimate fuel usage and spending. As the number of electric vehicles increases, we anticipate adjusting our methodology in future iterations of this report to more effectively account for their impact and costs. We included transportation energy costs in this analysis because transportation energy costs are consistently the largest portion of household energy spending and burden.

Median Household Income: Estimates of median household income are available through the American Community Survey in five-year blocks by both town[19] and census block group. For this analysis we used the most current five year estimates available: 2017-2021. Estimates of spending and income are expressed in constant dollars and not adjusted for inflation unless noted.

Towns with fewer than 50 households were excluded from all burden categories due to high margins of error.

The COVID-19 pandemic had wide ranging impacts, which are still being analyzed and are far beyond the scope of this report. However, where it is plausible to assume an impact on this analysis and/or the data sets we used, we have made specific reference to it.

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[14] A new version of the LEAD Tool was released in June of 2023, after analysis for this report had already been completed.
[15] https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_prices/res/pr_res_VT.html&sid=VT – this time period was chosen in order to mirror the most recently-available income and energy usage data leveraged in this analysis.
[16] See: https://htaindex.cnt.org/
[17] Vermont Transportation Energy Profile: https://vtrans.vermont.gov/sites/aot/files/planning/documents/planning/2021%20Vermont%20Transportation%20Energy%20Profile.pdf
[18] https://vtrans.vermont.gov/contract-admin/resources/construction-contracting/fuel-price-adjustment-historical. At the time this report was published (August 2023), the Vermont average gasoline price was more than $3.50/gallon.
[19] The American Community Survey did not provide median household income data for Mount Tabor or Landgrove – for that reason, we were unable to estimate energy burden for those communities in this report.

Results

We estimate that, on average, Vermont households are spending $7,071 annually on electricity, thermal, and transportation fuels. This represents approximately 11% of statewide household median income, which is generally consistent with our prior two reports. However, it represents an increase of $1,239 over average annual energy costs estimated in our 2019 report. Thermal energy and transportation fuel costs varied considerably across towns, with electricity costs being significantly less variable.

Table 1. Average spending by energy category +/- standard deviation for the current report and the previous version of the report released in 2019.

Energy Type	Average Expenditure (2019)	Range of expenditures (2019)	Proportion of total energy cost (2019)	Average Expenditure (2023)	Range of expenditures (2023)	Proportion of total energy cost (2023)
Electricity	$1,150 ±$199	$302 - $1,777	20%	$1,417 ±$209	$619 - $2,073	20%
Thermal	$2,050 ±$290	$1,041 - $2,916	35%	$2,447 ±$390	$1,050 - $4,340	35%
Transportation	$2,638 ± $126	$2,047 - $2,874	45%	$3,217 ±$417	$1,682 - $4,196	45%
Total	$5,837 ± $471	$3,859 - $6,949	-	$7,071 ±$741	$3,498 - $9,100	-

Chart 1. Graph of average spending by energy category +/- standard error.

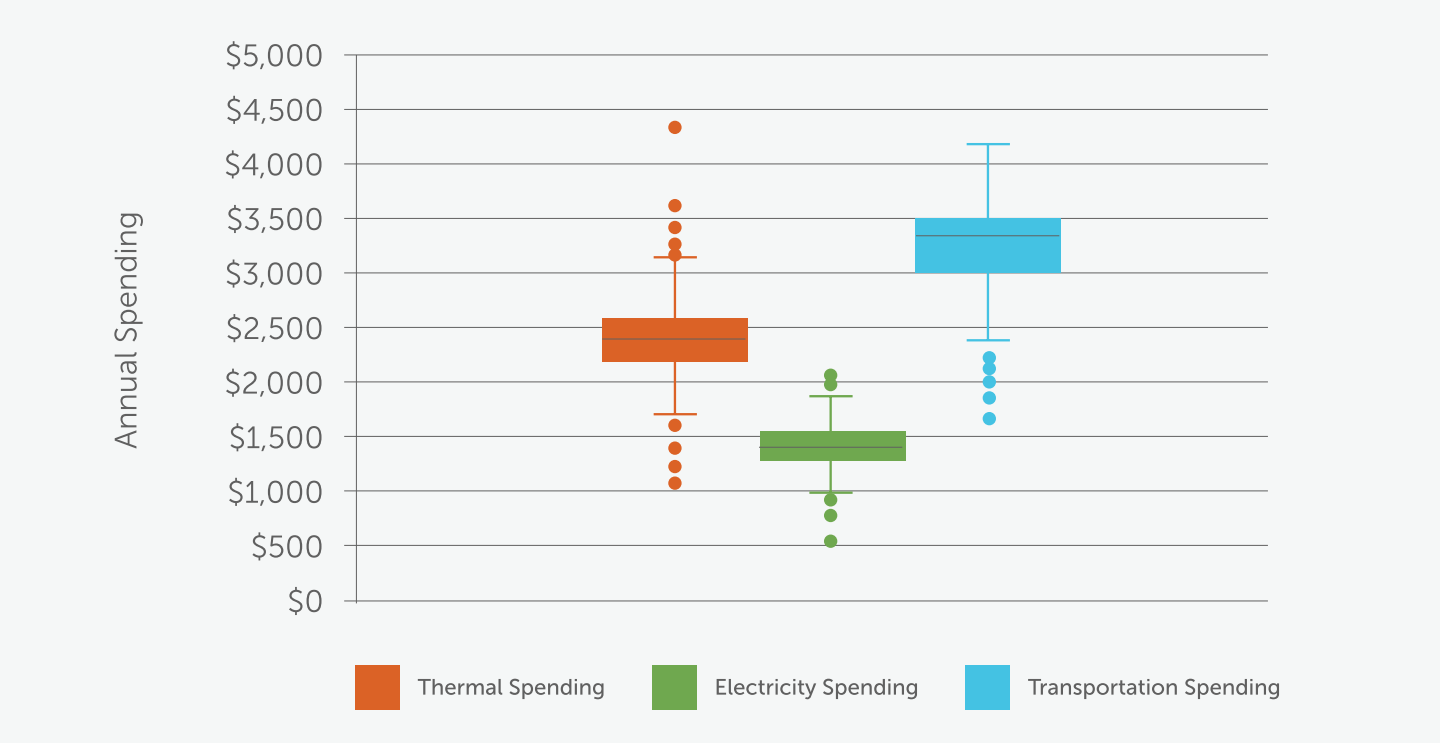
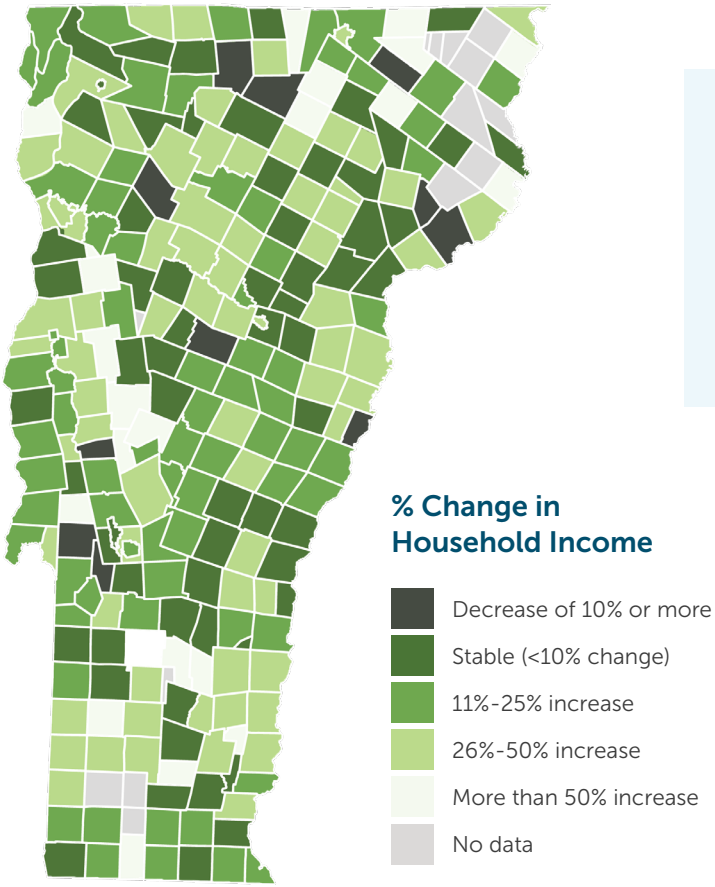


Chart 1: The full range of town-level burden estimates for each energy category is represented by dots. The box and lines represent the majority of all burden estimates, showing that thermal and transportation burdens are much more variable across communities than is electric burden.

There is generally greater variation in energy burden than energy spending. Spending on energy is relatively inelastic (meaning consumers do not have a lot of control immediate over the amount of energy they use on an ongoing basis), relative to non-essential household expenses, and there is substantial variation in median household income across towns. Median income can vary significantly from year to year – particularly in communities with a small number of households. While we updated our methodology this year by excluding towns with fewer than 50 households to help account for that variability, there are some trends that have impacted our estimates of town-level energy burden. Between 2017 and 2021, statewide median household income increased 26%, from about $57,500 to over $72,000.[20] These increases were not restricted to specific regions, occurred in communities throughout the state, and occurred relatively consistently each year (meaning the increase in median income over that five-year period cannot be attributed solely to the COVID-19 pandemic in 2020-2021).

Image 2. Change in town level median income 2017-2021.



Income & Burden

There were 37 towns that experienced significant declines in median income from 2017-2021. Where there was a decrease in median income, we generally observed a corresponding increase in energy burden.

Image 2: Percent change in median household income by town, 2017 ACS vs. 2021 ACS.

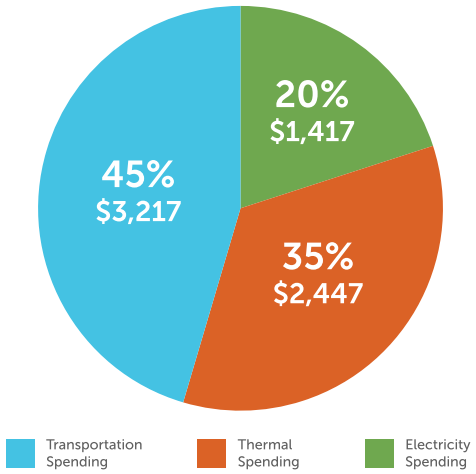
There were 31 towns where median household income increased by over 40% between 2017 and 2021, including Troy, Hancock, Hinesburg, St. George, Irasburg, and Ripton. There were 37 towns that experienced significant declines in median income; these were also dispersed throughout the state and included Underhill, Fairlee, Lowell, and Castleton. There do not appear to be any discernible trends or shared characteristics in terms of which towns experienced significant increases, or decreases, in annual median income. However, in towns where there was a decrease in median income, we generally observed a corresponding increase in energy burden.

[20] Nationally, median household income increased 15.5% between 2017 and 2021 (see American Community Survey Table S1901).

Total Energy Spending & Burden

Total energy spending across towns ranged from more than $8,000 to less than $4,000, meaning that households in the lowest-spending communities spent roughly half as much as those in the highest-spending communities. Consistent with the 2019 report, transportation is the highest cost category, representing nearly half (45%) of annual household spending on energy, followed by thermal (35%), with electricity representing the smallest share (20%).

Figure 2. Statewide household total energy spending by category.



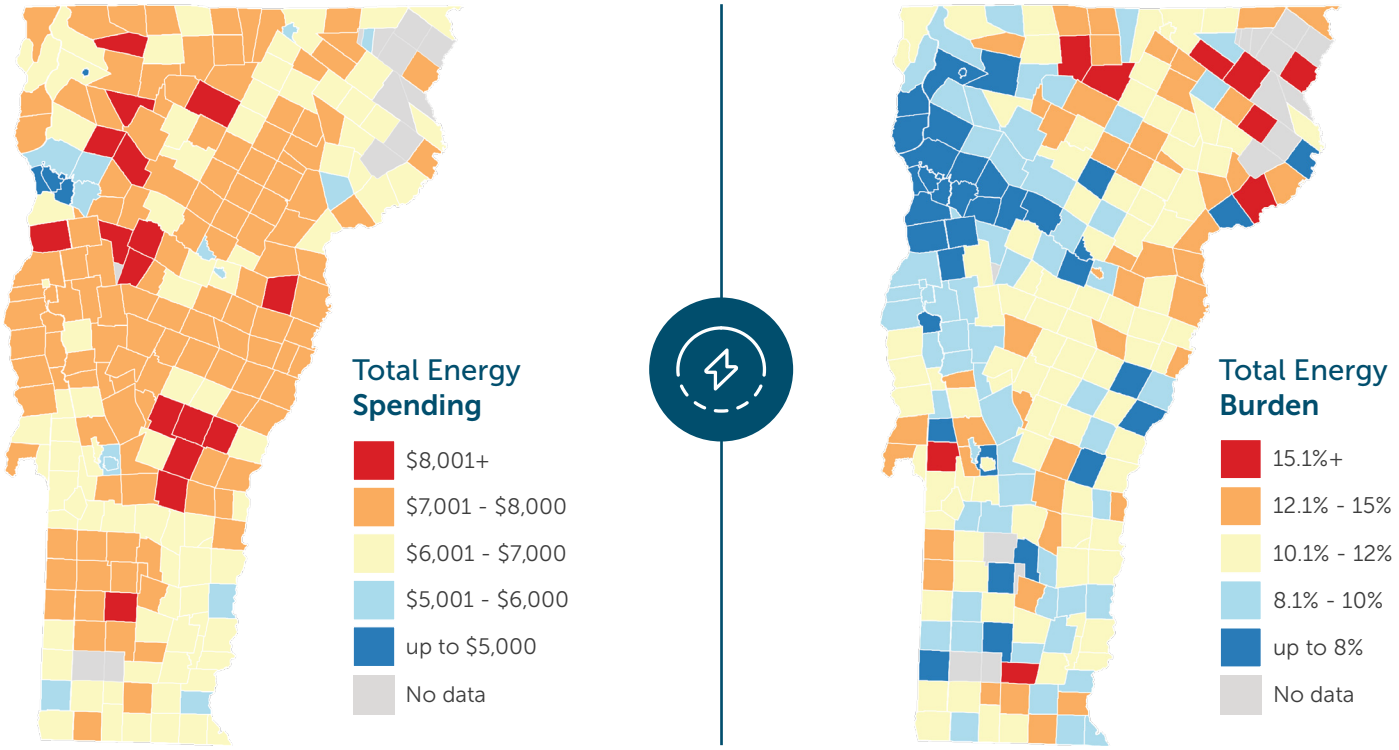
Similar to our previous reports, we observe town-level total energy burden to be highest in the Northeast Kingdom and pockets of southern Vermont, and the lowest in Chittenden County and the greater Champlain Valley region. We attribute this pattern to higher household incomes in the Champlain Valley region, along with access to natural gas (a relatively low-cost heating fuel), and the prevalence of more compact settlement patterns, which reduce vehicle miles traveled and enable access to lower-cost transportation options. The addition of census block group data in this analysis shows that despite energy burdens being lower in the Champlain Valley on a regional basis, there is still significant variation and pockets of high energy burden within Vermont's most populous communities. More than variation in spending, what an analysis by block group reveals is variation in household income, which can vary substantially within a given town. This variation is masked when burden is only examined at the town-level. For instance, Rutland City overall has a moderate total energy burden of 10%. By block group however, that total burden varies from 5.6% in the eastern part of the city to nearly 30% in the western part, and includes three of the most highly burdened block groups that we studied.

Table 2. Ten Highly Burdened Census Block Groups.

Block Group Location (U.S. Census ID#)	Town	Median Household Income	Electricity Burden	Thermal Burden	Transportation Burden	Total Energy Burden
Southeastern Barre City (500239552002)	Barre	$13,550	9.6	16.9	17.5	44.%
Northwestern Rutland City (500219632004)	Rutland	$16,366	6.8	12.9	9.0	29%
Southern St. Johnsbury (500059574002)	St. Johnsbury	$16,602	5.1	13.7	9.4	28%
Central/Southern Manchester (500039704011)	Manchester	$23,636	6.1	11.5	9.3	27%
UVM campus dorms (500070039004)	Burlington	$11,417	5.5	9.9	8.3	24%
Western Windsor (500279660003)	Windsor	$29,018	4.1	8.2	7.0	19%
Central Barre City (500239551004)	Barre	$22,381	3.8	9.3	6.0	19%
Central Springfield (500279666002)	Springfield	$28,750	4.0	7.7	6.3	18%
Western Rutland City (500219633004)	Rutland	$22,454	5.2	8.1	4.5	18%
Southwestern Rutland City (500219633005)	Rutland	$26,708	3.7	6.8	6.1	17%

Census block group analysis isn't necessary for Vermont's smaller communities, since many are comprised of a single block group. Town-level data gives us a good understanding of energy burden in such areas. Again, we find the most burdened communities tend to be in rural areas, like the Northeast Kingdom, and in areas with lower median incomes. Despite the fact that many Northeast Kingdom towns have a high energy burden, we estimate that annual energy usage and spending in these communities is often at or below the statewide average. Household incomes in this region of the state are relatively low, which is the single biggest driver of energy burden. In addition, this region of the state is largely rural, with little or no access to low-cost public transit. Many homes in this region are older[21] and likely cost more to keep warm in the winter, despite a higher prevalence of wood heat, which is typically a more affordable fuel source.

Image 2. Total energy spending and burden by town.



There are nine towns with an estimated total energy burden of greater than 15%, the majority of which are located in the Northeast Kingdom. Only three of these communities (Montgomery, Dover and Castleton) are located outside of the Northeast Kingdom. All of the towns have relatively low populations and are characterized by lower household median income and near average spending on energy.

Only two of these towns (Brighton and Montgomery) were highlighted in our 2019 report, which listed the ten communities with the highest total energy burden. In the case of Montgomery, estimated energy burden has increased significantly (from 15% to 23%), which can be attributed to a decrease in median household income from $41,513 to $30,500. We estimate that in Brighton, total energy burden has held steady at 15%, despite the fact that median household income has increased by approximately 22%. While Granby and Lemington both appeared on the list of highly burdened communities in our 2019 report, we did not estimate energy burden for those towns this year, due to an updated methodology which limited our analysis to communities with 50 or more households in order to control for the significant variability that is inherent in small sample sizes.

[21] https://vtdigger.org/2023/04/09/vermonts-aging-homes-put-extra-strain-on-states-housing-crisis/

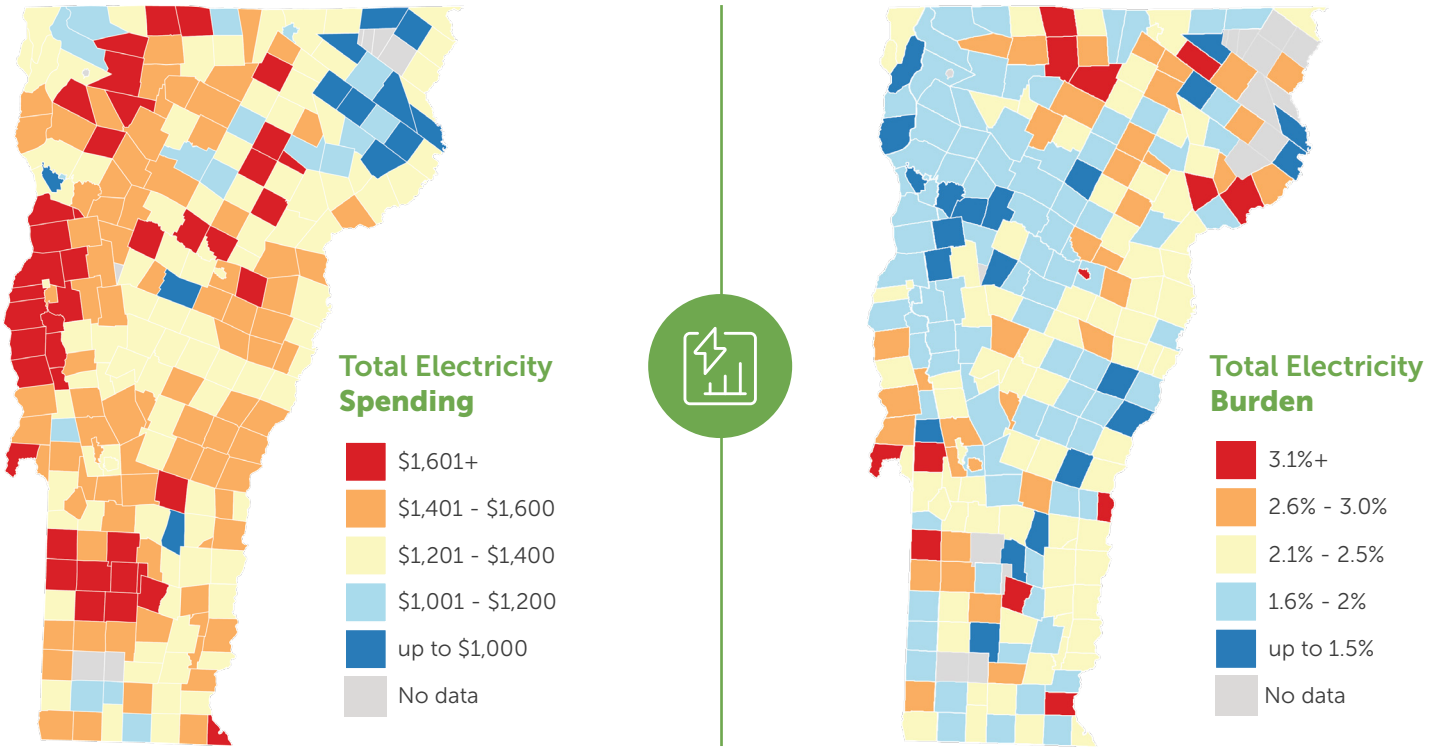
Table 3. Towns with total energy burdens greater than 15%

Town	Total Households	Median Income (2017-21)	Thermal Burden	Electricity Burden	Transportation Burden	Total Energy Burden
Montgomery	522	$30,500	7%	4%	12%	23%
Charleston	441	$37,798	6%	3%	10%	19%
East Haven	132	$36,250	6%	3%	10%	19%
Lowell	326	$42,000	5%	3%	9%	17%
Concord	478	$41,667	5%	3%	8%	16%
Brighton	558	$42,431	5%	3%	8%	16%
Castleton	1,685	$43,257	5%	3%	7%	15%
Dover	570	$45,625	6%	2%	6%	15%
Bloomfield	115	$46,563	5%	3%	8%	15%
Statewide	256,514	$67,674	4%	2%	5%	11%

Electricity: Spending, Burden, & Trends

Consistent with our 2019 report, there is a pattern of relatively high electricity spending along the western side of the state, particularly in Addison County and northern Bennington County.

Image 3. Electricity spending and burden by town.



There is not a stark pattern for the distribution of town-level electricity burden, but generally there is a lower burden in Chittenden County, consistent with our other energy usage categories. There is a pocket of high electricity burden in eastern Franklin and western Orleans Counties, though there are other highly burdened communities distributed throughout the state.

Table 4. Towns with electricity burdens of 3% or greater

Town	Total Households	Median Income (2017-21)	Electricity Spending	Electricity Burden
Montgomery	522	$30,500	$1,342	4%
Pawlet	537	$50,096	$1,715	3%
Lowell	326	$42,000	$1,416	3%
Castleton	1,685	$43,257	$1,405	3%
Charleston	441	$37,798	$1,216	3%
Windsor	1,621	$44,761	$1,374	3%
Richford	958	$52,946	$1,606	3%
St. Johnsbury	3,188	$43,190	$1,309	3%
Brattleboro	5,533	$41,001	$1,240	3%
Barre city	3,880	$44,298	$1,322	3%
Londonderry	792	$55,465	$1,646	3%
Statewide	256,514	$67,674	$1,417	2%

Table 5. Three-year growth in residential electric consumption by county.

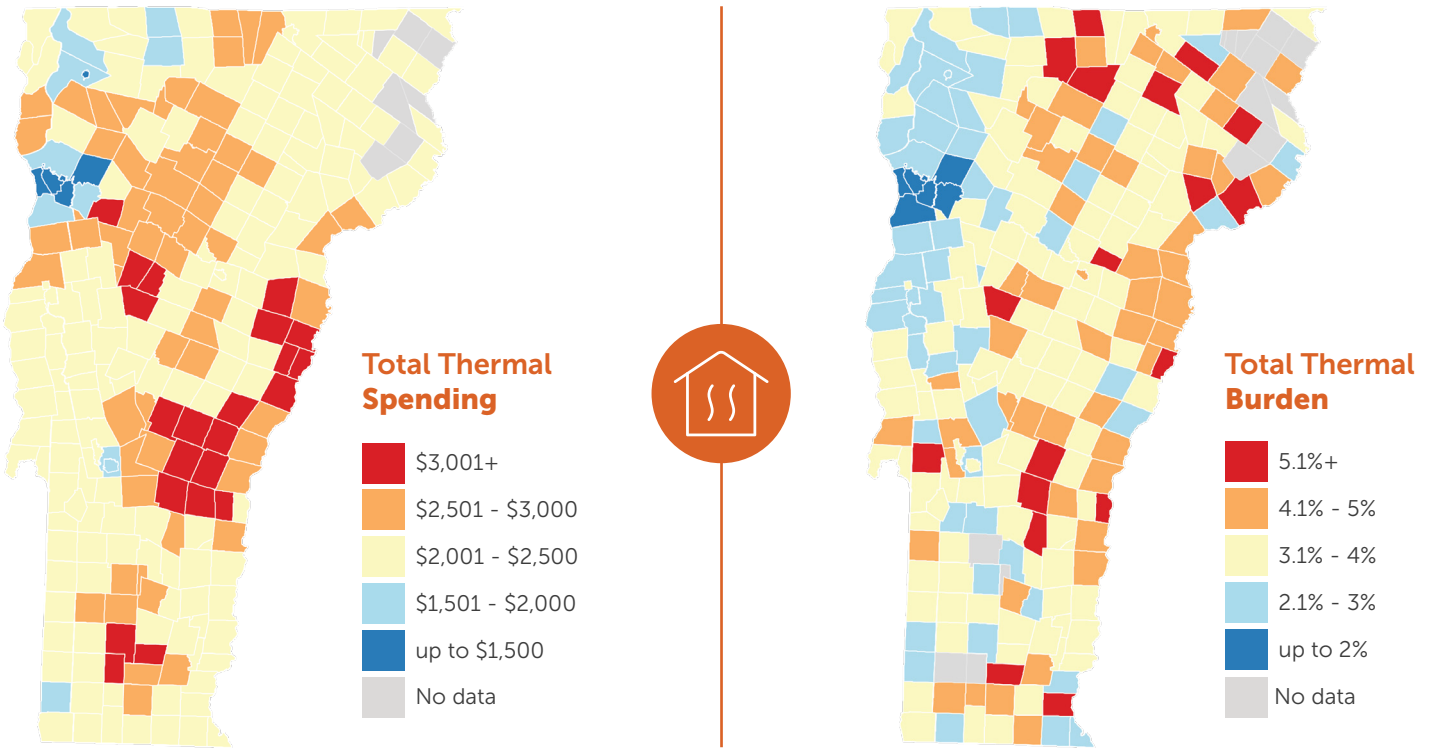
County	Change in annual residential electric usage (2019-21)
Addison	12%
Bennington	8%
Caledonia	10%
Chittenden	11%
Essex	8%
Franklin	7%
Grand Isle	6%
Lamoille	2%
Orange	8%
Orleans	4%
Rutland	7%
Washington	8%
Windham	9%
Windsor	8%

In contrast with our 2019 report, which showed a downward trend in residential electric usage, we observed an increase in every county from 2019-2021. This is generally consistent with national trends that began to emerge during the COVID-19 pandemic, and which may continue as more consumers begin to electrify their heating and transportation, and with a continued higher prevalence of "work from home" jobs.

Thermal: Spending, Burden, & Trends

We estimate that on average Vermont households spend $2,447 on thermal energy annually, which equates to a thermal energy burden of 3.6%. Our analysis indicates that there is a concentration of communities in the Upper Valley region where households are spending more than $3,000 annually on thermal costs. However, as many of these towns are at or above statewide average median income, this does not translate to a high thermal energy burden. Towns with a high thermal burden are generally located in the Northeast Kingdom and along the Green Mountains. There is a notable pattern of low thermal energy burden in the Champlain Valley region in Franklin, Chittenden, and Addison Counties, which we attribute to higher median household incomes, and lower spending on thermal energy, likely due to the accessibility of natural gas, which is a relatively affordable heating fuel.

Image 4. Thermal spending and burden by town.



The towns that were identified as having thermal energy burdens of greater than 5% (our highest thermal energy burden category) are located throughout the state, excluding the Champlain Valley, and all have median incomes below the statewide average. Only three (Fairlee, Bridgewater, and Warren) of 17 have annual thermal spending exceeding $3,000; we do not have sufficient information to speculate on why this is the case.

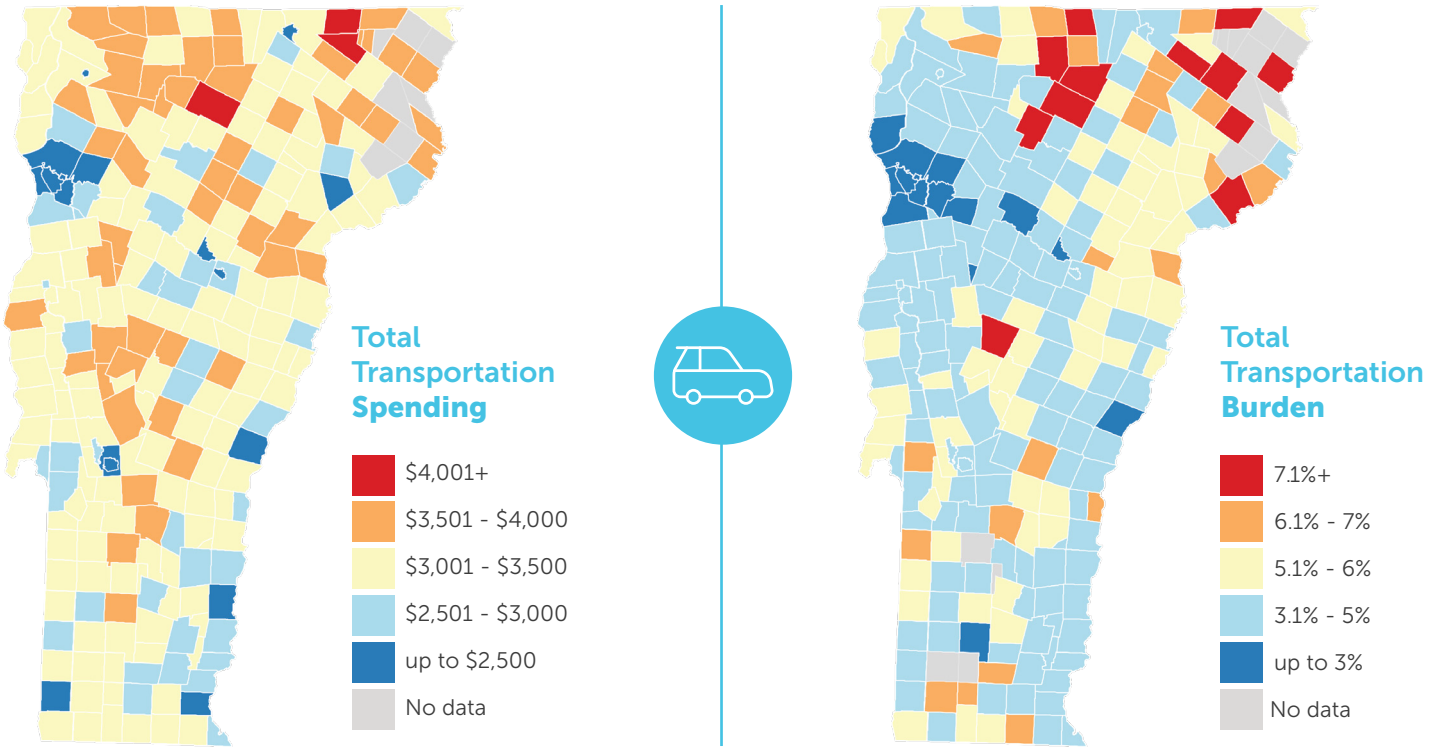
Table 6. Towns with thermal burdens greater than 5%.

Town	Total Households	Median Income (2017-21)	Thermal Spending (est.)	Thermal Burden
Montgomery	522	$30,500	$2,024	7%
Dover	570	$45,625	$2,833	6%
East Haven	132	$36,250	$2,209	6%
Ludlow	822	$46,928	$2,837	6%
Fairlee	516	$53,767	$3,129	6%
Charleston	441	$37,798	$2,170	6%
Brattleboro	5,533	$41,001	$2,265	6%
St. Johnsbury	3,188	$43,190	$2,373	6%
Bridgewater	481	$60,218	$3,210	5%
Concord	478	$41,667	$2,209	5%
Jay	244	$48,750	$2,580	5%
Windsor	1,621	$44,761	$2,367	5%
Plymouth	180	$60,714	$3,210	5%
Castleton	1,685	$43,257	$2,275	5%
Plainfield	534	$47,500	$2,483	5%
Warren	702	$66,136	$3,422	5%
Lowell	326	$42,000	$2,133	5%
Statewide	256,514	$67,674	$2,447	3.6%

Transportation: Spending, Burden, & Trends

Transportation energy burden has remained relatively constant, at 4% statewide, but spending on transportation energy shows more variability than in our 2019 report. This variability appears to have come from declines in vehicle miles traveled (VMT) in denser areas of the state including in South Burlington, Burlington, Winooski, Barre, Rutland, and Newport. We attribute this to changes in travel patterns due to the COVID-19 pandemic.

Image 5. Transportation spending and burden by town.

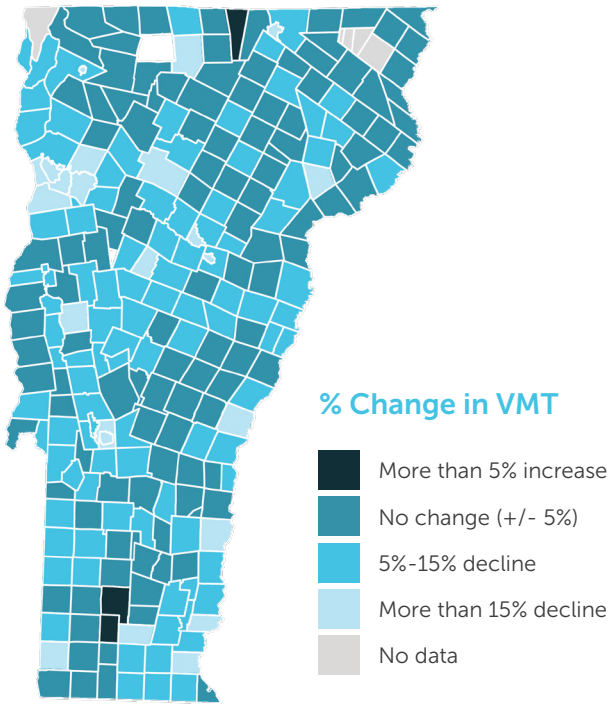


While there are communities throughout the state with relatively high spending on transportation energy, the towns with the highest transportation energy burden are concentrated in the Northeast Kingdom, and adjacent communities in northern Lamoille and eastern Franklin Counties. Granville is the only town in the highest transportation burden category that is not located in these regions. Unsurprisingly, the greater Burlington region is characterized by both low transportation energy spending and burden, being the only area of the state with relatively easy access to public transit and the widespread opportunity for shorter commuting distances as well as easier access to health care and education facilities.

Table 7. Towns with transportation burdens greater than 7%.

Town	Total Households	Median Income (2017-21)	Transportation Spending (est.)	Transportation Burden
Montgomery	522	$30,500	$3,666	12%
Charleston	441	$37,798	$3,822	10%
East Haven	132	$36,250	$3,623	10%
Lowell	326	$42,000	$3,640	9%
Brighton	558	$42,431	$3,640	8%
Bloomfield	115	$46,563	$3,699	8%
Norton	56	$48,000	$3,699	8%
Concord	478	$41,667	$,194	8%
Eden	571	$54,861	$4,196	8%
Granville	156	$51,250	$3,705	7%
Jay	244	$48,750	$3,502	7%
Johnson	1.284	$47,717	$3,347	7%
Statewide	256,514	$67,674	$3,217	4%

Image 6. Changes in Vehicle Miles Traveled (VMT) by town, 2017-2021.



For the majority of Vermont towns, we have seen VMT hold steady or decline over the last five years. However, there were some areas of the state that experienced significant shifts in recent years. Unfortunately, these changes did not help address existing inequities, since we saw the largest declines in VMT in the greater Burlington region, where transportation energy burdens were already the lowest in the state.

Changes in Travel

We saw the largest declines in vehicles miles traveled (VMT) in the greater Burlington region, where transportation energy burdens were already the lowest in the state.

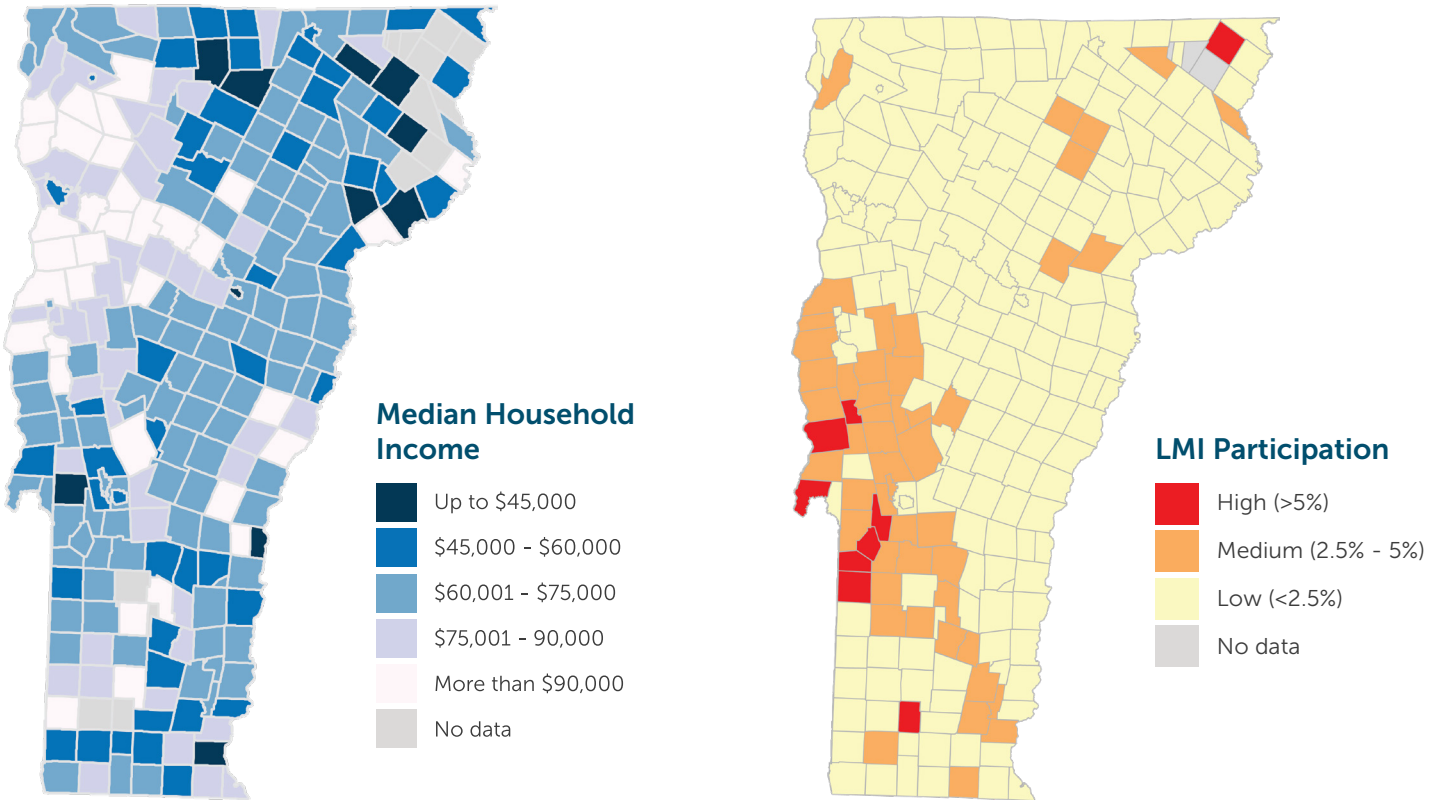
Ultimately energy burden is still a relatively narrow lens for understanding equity in the transportation sector. While residents of Burlington, Winooski, and other communities served by Vermont's public transit system may spend less of their income paying to get from one place to another, they may still invest a significant amount of time in doing so – and their options for employment and recreation may be limited by proximity to transit. In addition, the higher cost of housing in these areas may outstrip their transportation savings.

Discussion

While this analysis can help provide critical context for the work of Vermont's Energy Efficiency Utilities (EEUs),[22] it is important to note that it does not provide household level estimates of energy burden, since the data necessary for that approach is not readily available. Instead, we have generated estimates of energy burden aggregated at the community level. While this is a common practice, the limitation of this approach is that it can falsely lower the average energy burden calculated in communities with more significant income variation, since energy spending does not increase proportionally with income. For this reason, Efficiency Vermont uses energy burden to help guide the focus of our community-level programs and engagement – but when implementing programs specifically designed to alleviate energy burden, we will (where practicable) carry out an additional process to calculate household-level burden and tailor our proposed project recommendations.

Since this analysis does not consider household level energy burden, we have sought to leverage community level data on program uptake in order to understand the extent to which highly energy burdened Vermont residents are accessing programs that might help lower their ongoing costs. Efficiency Vermont does not collect demographic information from customers for most programs – though we do have participation data by income level for low- and moderate-income bonus incentives for cold climate heat pumps and weatherization, which is based on self-verification via a signed attestation.[23]

Image 7. Town-level median income and per-household participation in Efficiency Vermont low- and moderate-income (LMI) bonuses (2017-2021).



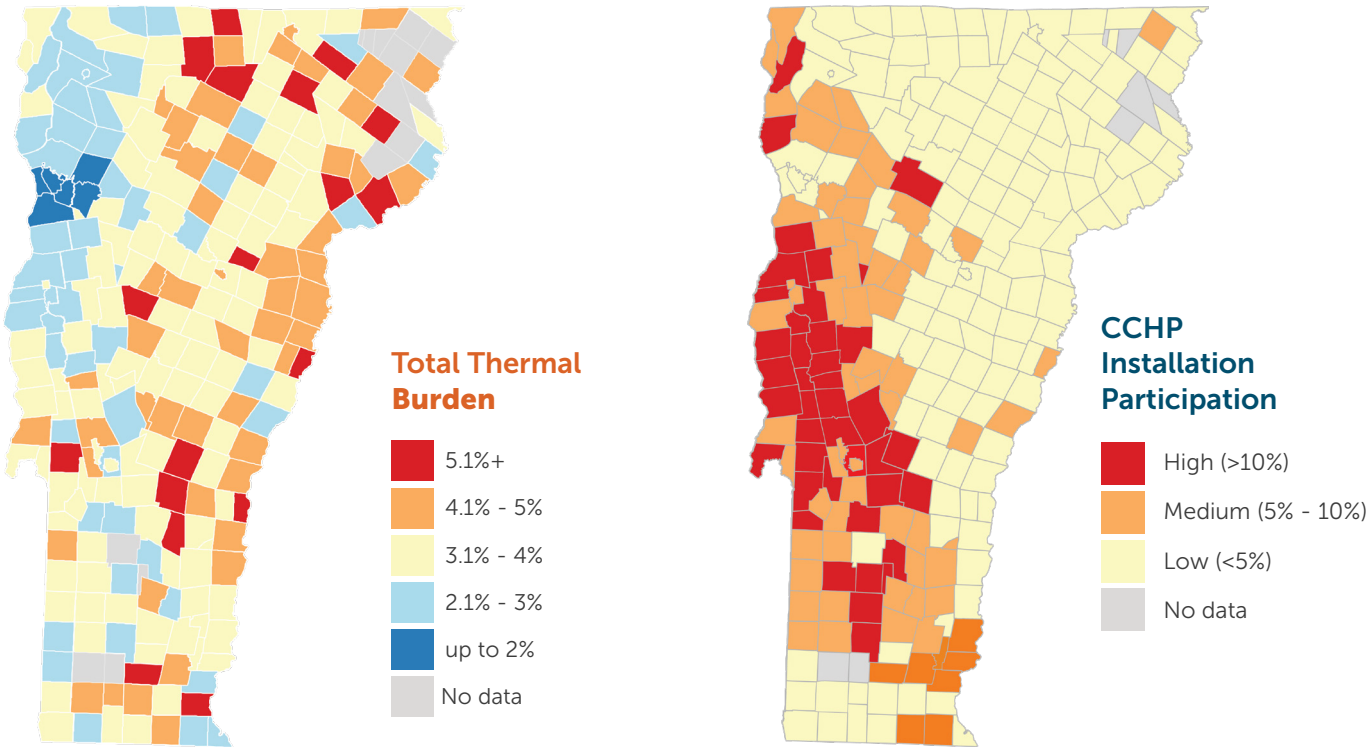
[22] Efficiency Vermont, Burlington Electric Department, and Vermont Gas Systems serve as Energy Efficiency Utilities, under Orders of Appointment from the Vermont Public Utility Commission.

[23] As of 2022, Efficiency Vermont contracts with a financial institution to conduct document-based income verification for the Home Performance with ENERGY STAR® program, in accordance with requirements for administration of American Rescue Plan Act funding.

A comparison of per capita town-level participation data for these bonus incentive programs with town level median income indicates that they may not yet be reaching the customers who could most benefit from energy and cost savings. Where incomes are notably lower in the Northeast Kingdom, participation in low- and moderate-income bonuses is also relatively low. Participation is highest in Rutland and Addison counties.[24]

We were particularly interested to understand whether Vermonters with a high thermal energy burden have been able to access heating technologies that could help alleviate it, such as cold climate heat pumps. A comparison of thermal energy burden against the per capita uptake[25] of this technology at the town level indicates that there is a much higher prevalence of heat pumps in communities with a relatively low energy burden – with more than 20% of homes in some Champlain Valley towns having installed this technology.[26] Installations of heat pumps appear to be much lower in the Northeast Kingdom and high-burden communities.

Image 8. Thermal energy burden by town and per capita installations of cold climate heat pumps by town (2017-2021).



As we did in our 2019 report, we looked at which towns in Vermont had the highest per capita adoption of several clean energy technologies, and found an even starker pattern, with only two communities in our high and highest energy burden categories appearing on the lists. This provides another indication that the Vermonters who could most benefit from the energy and cost savings of these technologies are not currently accessing them, presumably as a result of the high upfront investment they require.

[24] We estimate overall rates of participation in our LMI programs to be over 3% of the general population and even 5% in many communities. A 2017 review by ACEEE noted that the median rate of participation among eligible customers (not the general population) in electric utility EE programs nationally was 1% (see 'Making a Difference: Strategies for Successful Low-Income Energy Efficiency Programs' https://www.aceee.org/research-report/u1713)

[25] Efficiency Vermont has comprehensive sales and installation data for heat pump technologies through management of a statewide point-of-sale rebate program, in partnership with Vermont's electric utilities.

[26] Installation data does not indicate how customers are using cold climate heat pumps – whether as a primary or secondary heating source, or primarily as an air conditioner. Efficiency Vermont generally recommends that customers maintain a supplemental heat source even after installing a cold climate heat pump.

Table 8. Top ten towns by per capita adoption of clean energy technology (2021).[27]

Rank	Cold Climate Heat Pumps & Thermal Burden	Electric Vehicles & Transportation Burden	Weatherized Homes & Thermal Burden
1	Stratton	Charlotte	Winhall
2	Winhall	Norwich	Dover
3	Mendon	Strafford	Landgrove*
4	Ripton	Montpelier	Shrewsbury
5	Killington	Cornwall	Stratton
6	Peru	Plainfield	Mount Holly
7	Cornwall	Shelburne	Jamaica
8	St. George	Waitsfield	Peru
9	Sudbury	Huntington	Averill*
10	Orwell	Thetford	Dorset

*Energy burden was not calculated for communities with fewer than 50 households, or where median income data was not available.

Burden category:

Highest	High	Moderate	Low	Lowest

We anticipate that the next iteration of this analysis will need to be significantly adapted to account for the increasing electrification of thermal and transportation energy. This trend is aligned with Vermont's climate goals because our state's electric sector produces very little greenhouse gas emissions. It is also the sector for which household level usage data is most readily available – however, it is not possible, as of yet, to disaggregate this data and understand what end uses are being electrified in a given home. We cannot, therefore, have a complete understanding of the extent to which an individual household is reducing its energy burden. This is significant because electrification will not always lead to reductions in energy burden; for example, if a customer installs a heat pump but uses it primarily for air conditioning in summer (increasingly a necessity as our climate continues to warm) and does not leverage it to offset higher cost fossil fuels in the winter, they will see an increase in their annual energy costs. And, importantly, any heating or air conditioning system installed in a home that is not weatherized will lead to higher costs.

Conclusion

How might we help alleviate energy burden for Vermont's most vulnerable residents? There are a range of programs from utilities and state agencies that lower the upfront cost of technologies with the potential to reduce energy burden, from cold climate heat pumps, to weatherization, to electric vehicles. Vermont's EEUs lead and partner on a number of these programs and have historically maintained minimum spending requirements for programs that serve income-eligible residents as their primary approach to addressing energy burden. It is easy to measure progress against such spending goals, but there is an ongoing national conversation about whether they are the most effective way to advance equity in the energy sector.[28]

[27] Sources: Energy Action Network Vermont Energy Dashboard: www.vtenergydashboard.org, and Drive Electric Vermont EV registration data.

[28] https://energyequityproject.com/wp-content/uploads/2022/08/220174_EEP_Report_8302022.pdf

Low-income spending requirements have increased over time, and are generally a major component of EEU services, though the majority of savings achieved from EEU programs continues to be generated by lower-cost savings through market-generated projects. As an example, within Efficiency Vermont's current programs, a project to install pipe insulation for a large business customer might cost $10 per unit of energy saved, while helping a moderate-income customer complete a home weatherization project can cost in excess of $300 per unit of energy saved. It is quite common to see cost disparities between residential and business projects, since homes generally use much less energy than businesses, so the impact of any single efficiency project is much smaller. These same disparities often also exist between small and large business customers, with much greater savings opportunities present in large energy-intensive facilities.

Equity & Cost

Within Efficiency Vermont's current programs, a project to install pipe insulation for a large business customer might cost $10 per unit of energy saved, while helping a moderate-income customer complete a home weatherization project can cost more than $300 per unit of energy saved.

However, the relative impact of energy savings – and their attendant cost reduction – may be more significant in relieving energy burden for the customer whose home has been weatherized, or for the corner store that upgrades its refrigeration, than for a large business. In addition to energy cost savings, the residential customer likely will experience the benefits of a home that is more resilient to a changing climate, holding heat for longer in the winter and maintaining cooler temperatures in the summer. Many customers who weatherize their homes also experience other health and safety benefits including a reduction in pests, improved indoor air quality, noise reduction, and greater comfort throughout the year. A corner store with new refrigerators may be better able to meet the needs of its community, see savings from reduced food spoilage, and create a better working environment for employees in addition to the electric bill savings its owners experience.

Low- and moderate-income customers, renters (both residential and commercial), rural, Black, Indigenous, and people of color (BIPOC) and many others face higher barriers in completing clean energy projects.[29] Beyond a lack of access to upfront capital, which is often the case for low- and moderate-income residents, they may lack the authority to make decisions about the features and quality of their home or business (in the case of renters); they may have been forced to live far from their place of work due to a lack of access to affordable housing (residents of rural communities); or they may have been historically denied access to homeownership and capital, which severely limits the ability to build generational wealth (BIPOC Vermonters). Finding solutions to these challenges takes sustained commitment, significant resources, and time – and is critical to do, because the Vermonters who will most feel the effects of our changing climate in the coming years will often be those who cannot access clean energy technologies.

Ultimately, these considerations of equity, cost to generate energy savings, and the metrics we use to measure the success of energy-saving programs have an impact on who these programs serve – and how we serve them – every day. We hope this report will serve as a resource for Vermont policymakers as they continue seeking the appropriate balance between greenhouse gas reductions, cost savings, and accessibility in our rapidly-evolving energy system.

[29] https://www.aceee.org/energy-burden

Appendix A

Reducing Energy Burden

The table below provides an estimate of how various measures and projects would impact energy burden for a household of median income, living in a baseline Vermont home.[30]

Category	Action	Annual $ Savings	Lifetime $ Savings	Reduction in Total Annual Energy Burden
Low-Cost Measures	Replace a standard programmable thermostat with a smart thermostat	$158	$1,577	2.2%
	Replace a standard showerhead with a low flow showerhead	$72	$646	1.0%
	Replace a standard high flow faucet aerator with a low flow faucet aerator	$18	$158	0.2%
	Replace an incandescent light bulb with an LED	$11	$166	0.2%
Appliances	Replace an oil water heater with a heat pump water heater	$449	$5,832	4.3%
	Replace a standard electric water heater with a heat pump water heater	$299	$3,884	4.2%
	Replace a pre-1993 refrigerator with a high efficiency refrigerator[31]	$138	$2,343	1.9%
	Replace a 1993-2001 refrigerator with a high efficiency refrigerator	$49	$840	0.7%
	Replace a standard dehumidifier with an ENERGY STAR dehumidifier	$46	$550	0.6%
	Replace an inefficient fossil fuel furnace/boiler with a high efficiency fossil fuel furnace/boiler	$190	$4,268	2.7%
Comprehensive Weatherization	Comprehensive weatherization (including air sealing, whole building insulation, window improvements, and attic/ceiling/wall insulation).	$467	$11,680	6.6%
Ductless Heat Pumps	Install a single zone heat pump in a home heated by fossil fuels	$215	$3,223	3.0%
	Install a multi zone heat pump in a home heated by fossil fuels	$560	$8,402	7.9%
Electric and Plug-in Hybrid Vehicles	Change from a fossil fuel powered vehicle to a new all electric vehicle	$835	$6,683	11.8%
	Change from a fossil fuel powered vehicle to a used all electric vehicle	$835	$3,341	11.8%
	Change from a fossil fuel powered vehicle to a new plug-in hybrid electric vehicle	$695	$5,559	9.8%
	Change from a fossil fuel powered vehicle to a used plug-in hybrid electric vehicle	$695	$2,780	9.8%

[30] Assumptions are derived from the Efficiency Vermont and Renewable Energy Standard Technical Reference Manuals. MMBtu cost savings are calculated using fuel oil as the existing fuel. It is assumed that each measure is installed on its own, and rather than in combination with other measures, which is the most common practice for customers, particularly with higher cost projects.
[31] Consortium for Energy Efficiency (CEE) Tier 2

Appendix B

Energy Burden by Town[32]

Town	Total # of Households	Median Household Income	Thermal	Electricity	Transportation	Total Energy	Total Energy Burden Bin
Addison	546	$93,438	3%	2%	4%	8.4%	Low
Albany	400	$60,938	3%	2%	5%	11.0%	Moderate
Alburgh	764	$63,462	4%	2%	5%	11.4%	Moderate
Andover	193	$75,139	3%	2%	4%	9.3%	Low
Arlington	1,045	$75,750	3%	2%	3%	8.3%	Low
Athens	181	$67,656	3%	2%	5%	10.1%	Moderate
Bakersfield	605	$80,223	3%	2%	5%	9.6%	Low
Baltimore	128	$69,545	3%	2%	5%	10.0%	Low
Barnard	472	$73,621	4%	2%	5%	11.0%	Moderate
Barnet	574	$55,000	5%	2%	6%	12.4%	High
Barre	3,492	$74,977	3%	2%	4%	9.0%	Low
Barre city	3,880	$44,298	5%	3%	4%	12.2%	High
Barton	1,215	$47,841	5%	3%	7%	14.2%	High
Belvidere	179	$80,547	3%	2%	4%	9.3%	Low
Bennington	5,931	$51,851	4%	3%	4%	10.8%	Moderate
Benson	337	$54,766	4%	3%	6%	12.6%	High
Berkshire	499	$71,806	3%	2%	5%	10.5%	Moderate
Berlin	1,100	$80,789	3%	2%	3%	7.9%	Lowest
Bethel	817	$65,768	4%	2%	4%	10.3%	Moderate
Bloomfield	115	$46,563	4%	3%	8%	15.1%	Highest
Bolton	440	$100,208	3%	1%	3%	7.6%	Lowest
Bradford	1,194	$66,100	5%	2%	4%	11.1%	Moderate
Braintree	435	$66,319	4%	2%	6%	11.4%	Moderate
Brandon	1,721	$61,653	3%	2%	5%	10.7%	Moderate
Brattleboro	5,533	$41,001	6%	3%	5%	13.5%	High
Bridgewater	481	$60,218	5%	2%	6%	13.9%	High
Bridport	499	$65,156	4%	3%	5%	11.5%	Moderate
Brighton	558	$42,431	5%	3%	8%	15.5%	Highest
Bristol	1,624	$77,500	3%	2%	4%	9.1%	Low
Brookfield	615	$67,212	4%	2%	5%	10.7%	Moderate
Brookline	197	$65,139	3%	2%	5%	10.4%	Moderate
Brownington	388	$53,690	4%	3%	6%	13.4%	High
Buels Gore	60	$125,833	2%	-	3%	-	
Burke	546	$62,857	4%	2%	5%	10.4%	Moderate
Burlington	17,174	$59,331	2%	1%	3%	5.9%	Lowest

[32] As noted in the Methodology section of this report towns with less than 50 households, and those for which median income data was not available have not been included in his analysis. Towns with less than 50 households are Avery's Gore, Averill, Brunswick, Ferdinand, Glastenbury, Granby, Lemington, Lewis, Somerset, Victory, Warner's grant, Warren's gore. Towns for which income data is not available are Mount Tabor and Landgrove.

Town	Total # of Households	Median Household Income	Thermal	Electricity	Transportation	Total Energy	Total Energy Burden Bin
Cabot	630	$62,671	4%	3%	5%	11.7%	Moderate
Calais	707	$76,875	3%	2%	4%	9.5%	Low
Cambridge	1,376	$78,816	3%	2%	4%	9.3%	Low
Canaan	367	$52,560	4%	2%	6%	12.1%	High
Castleton	1,685	$43,257	5%	3%	7%	15.2%	Highest
Cavendish	469	$59,485	4%	2%	6%	11.6%	Moderate
Charleston	441	$37,798	6%	3%	10%	19.1%	Highest
Charlotte	1,717	$111,535	3%	2%	3%	7.3%	Lowest
Chelsea	509	$59,821	4%	3%	6%	12.3%	High
Chester	1,268	$61,397	4%	2%	5%	10.8%	Moderate
Chittenden	527	$90,313	3%	2%	4%	8.3%	Low
Clarendon	944	$61,974	4%	2%	5%	11.4%	Moderate
Colchester	6,868	$83,869	2%	2%	3%	6.6%	Lowest
Concord	478	$41,667	5%	3%	8%	15.9%	Highest
Corinth	683	$67,434	4%	2%	5%	11.7%	Moderate
Cornwall	436	$90,417	3%	2%	4%	8.2%	Low
Coventry	428	$51,827	4%	3%	6%	13.0%	High
Craftsbury	419	$72,670	3%	2%	4%	8.9%	Low
Danby	447	$60,739	4%	3%	6%	11.8%	Moderate
Danville	981	$62,617	4%	2%	5%	11.3%	Moderate
Derby	2,036	$64,096	4%	2%	5%	10.4%	Moderate
Dorset	848	$68,333	4%	3%	5%	11.0%	Moderate
Dover	570	$45,625	6%	3%	6%	15.2%	Highest
Dummerston	890	$85,357	3%	2%	3%	8.1%	Low
Duxbury	583	$79,276	4%	2%	4%	10.1%	Moderate
East Haven	132	$36,250	6%	3%	10%	18.9%	Highest
East Montpelier	1,098	$70,119	4%	3%	4%	10.6%	Moderate
Eden	571	$54,861	5%	3%	8%	14.8%	High
Elmore	464	$96,364	3%	1%	4%	7.6%	Lowest
Enosburgh	999	$59,856	3%	3%	5%	11.3%	Moderate
Essex	9,315	$88,136	2%	2%	3%	5.9%	Lowest
Fair Haven	989	$64,618	4%	2%	4%	10.4%	Moderate
Fairfax	1,967	$92,536	3%	2%	4%	8.3%	Low
Fairfield	697	$98,942	2%	2%	4%	7.9%	Lowest
Fairlee	516	$53,767	6%	2%	6%	14.1%	High
Fayston	383	$109,432	4%	1%	3%	8.3%	Low
Ferrisburgh	1,117	$95,625	3%	2%	4%	8.3%	Low
Fletcher	481	$80,625	3%	2%	5%	10.2%	Moderate
Franklin	519	$83,229	3%	2%	5%	9.1%	Low
Georgia	1,728	$91,456	3%	2%	4%	8.6%	Low
Glover	393	$61,806	4%	2%	6%	11.8%	Moderate
Goshen	79	$75,750	3%	2%	5%	9.5%	Low
Grafton	249	$68,125	3%	2%	5%	10.0%	Low

Town	Total # of Households	Median Household Income	Thermal	Electricity	Transportation	Total Energy	Total Energy Burden Bin
Grand Isle	867	$97,361	3%	2%	3%	7.7%	Lowest
Granville	156	$51,250	5%	3%	7%	14.3%	High
Greensboro	323	$57,917	4%	3%	5%	12.2%	High
Groton	435	$61,458	4%	2%	6%	12.3%	High
Guildhall	144	$103,333	2%	1%	4%	7.0%	Lowest
Guilford	959	$77,431	3%	2%	4%	8.9%	Low
Halifax	290	$50,357	5%	2%	6%	13.7%	High
Hancock	234	$64,449	4%	2%	6%	11.5%	Moderate
Hardwick	1,224	$61,116	4%	3%	5%	12.0%	Moderate
Hartford	4,765	$61,678	5%	2%	4%	10.8%	Moderate
Hartland	1,501	$66,356	4%	2%	5%	11.1%	Moderate
Highgate	1,313	$64,974	4%	2%	5%	11.1%	Moderate
Hinesburg	2,024	$103,750	3%	1%	3%	7.4%	Lowest
Holland	256	$65,536	3%	2%	6%	11.4%	Moderate
Hubbardton	288	$89,167	3%	1%	4%	7.4%	Lowest
Huntington	728	$82,118	3%	2%	4%	9.8%	Low
Hyde Park	1,241	$69,323	4%	2%	5%	10.8%	Moderate
Ira	143	$62,679	3%	2%	6%	11.1%	Moderate
Irasburg	469	$65,781	3%	2%	5%	10.5%	Moderate
Isle La Motte	213	$60,417	4%	2%	6%	11.6%	Moderate
Jamaica	418	$57,800	4%	2%	5%	11.8%	Moderate
Jay	244	$48,750	5%	2%	7%	14.7%	High
Jericho	2,084	$96,442	2%	2%	3%	7.4%	Lowest
Johnson	1,284	$47,717	5%	3%	7%	14.3%	High
Killington	364	$68,333	4%	2%	4%	10.2%	Moderate
Kirby	283	$51,250	4%	3%	7%	13.5%	High
Leicester	452	$55,357	4%	2%	6%	12.8%	High
Lincoln	553	$66,985	4%	2%	5%	10.8%	Moderate
Londonderry	792	$55,465	5%	3%	5%	13.3%	High
Lowell	326	$42,000	5%	3%	9%	17.1%	Highest
Ludlow	822	$46,928	6%	1%	6%	13.2%	High
Lunenburg	573	$45,792	5%	3%	6%	13.5%	High
Lyndon	2,227	$53,536	4%	2%	5%	11.5%	Moderate
Maidstone	108	$65,500	3%	1%	6%	10.3%	Moderate
Manchester	1,956	$81,885	3%	2%	4%	9.0%	Low
Marlboro	365	$80,250	3%	2%	4%	8.6%	Low
Marshfield	653	$62,131	4%	2%	6%	11.9%	Moderate
Mendon	399	$82,417	3%	2%	4%	9.1%	Low
Middle Springs	283	$63,558	3%	2%	5%	10.6%	Moderate
Middlebury	2,875	$68,239	4%	2%	4%	9.3%	Low
Middlesex	714	$96,250	3%	2%	4%	8.2%	Low
Milton	3,997	$97,813	2%	2%	3%	6.8%	Lowest
Monkton	752	$112,500	2%	1%	3%	6.7%	Lowest
Montgomery	522	$30,500	7%	4%	12%	23.1%	Highest

Town	Total # of Households	Median Household Income	Thermal	Electricity	Transportation	Total Energy	Total Energy Burden Bin
Montpelier city	3,939	$71,163	3%	2%	3%	7.9%	Lowest
More	696	$87,109	3%	2%	4%	8.7%	Low
Morgan	352	$78,611	3%	1%	5%	9.1%	Low
Morris	2,429	$58,621	5%	2%	5%	11.4%	Moderate
Mount Holly	565	$59,395	4%	2%	6%	11.8%	Moderate
New Haven	746	$84,375	3%	2%	4%	9.0%	Low
Newark	240	$51,667	5%	2%	7%	13.1%	High
Newbury	880	$60,867	5%	2%	6%	12.5%	High
Newfane	826	$59,792	4%	2%	5%	11.5%	Moderate
Newport	681	$68,616	4%	2%	5%	10.4%	Moderate
Newport City	1,910	$52,283	4%	2%	4%	10.3%	Moderate
North Hero	528	$84,375	3%	1%	4%	8.1%	Low
Northfield	1,873	$60,819	4%	2%	5%	10.3%	Moderate
Norton	56	$48,000	4%	2%	8%	14.0%	High
Norwich	1,273	$121,509	2%	1%	2%	5.9%	Lowest
Orange	392	$63,021	4%	3%	5%	12.0%	Moderate
Orwell	416	$63,333	4%	3%	5%	11.6%	Moderate
Panton	266	$83,594	3%	2%	4%	9.5%	Low
Pawlet	537	$50,096	5%	3%	6%	14.7%	High
Peacham	358	$68,571	4%	2%	6%	11.0%	Moderate
Peru	172	$108,182	3%	2%	3%	7.2%	Lowest
Pittsfield	236	$58,382	4%	3%	6%	12.4%	High
Pittsford	1,205	$58,118	4%	3%	6%	12.2%	High
Plainfield	534	$47,500	5%	3%	7%	14.3%	High
Plymouth	180	$60,714	5%	3%	5%	13.3%	High
Pomfret	383	$86,250	4%	2%	4%	9.5%	Low
Poultney	1,039	$60,750	4%	2%	5%	10.8%	Moderate
Pownal	1,224	$63,654	3%	2%	5%	10.8%	Moderate
Proctor	671	$66,635	3%	2%	4%	9.8%	Low
Putney	856	$57,500	4%	2%	5%	11.0%	Moderate
Randolph	1,946	$70,000	4%	2%	4%	10.0%	Low
Reading	230	$66,500	5%	2%	5%	11.7%	Moderate
Readsboro	300	$60,833	4%	2%	5%	11.3%	Moderate
Richford	958	$52,946	4%	3%	6%	13.2%	High
Richmond	1,833	$105,625	3%	1%	3%	7.5%	Lowest
Ripton	243	$88,393	3%	2%	4%	8.3%	Low
Rochester	684	$62,941	4%	2%	6%	11.5%	Moderate
Rockingham	2,161	$61,514	4%	2%	4%	9.7%	Low
Roxbury	429	$66,250	4%	2%	5%	10.8%	Moderate
Royalton	1,054	$67,000	4%	2%	4%	9.9%	Low
Rupert	282	$61,471	4%	3%	6%	12.1%	High
Rutland	1,646	$74,107	3%	2%	3%	7.8%	Lowest
Rutland City	7,536	$51,868	4%	3%	4%	10.0%	Low

Town	Total # of Households	Median Household Income	Thermal	Electricity	Transportation	Total Energy	Total Energy Burden Bin
Ryegate	464	$60,833	4%	2%	6%	12.4%	High
Salisbury	462	$87,083	3%	2%	4%	8.7%	Low
Sandgate	212	$63,032	4%	2%	6%	11.3%	Moderate
Searsburg	52	$52,500	4%	2%	7%	13.3%	High
Shaftsbury	1,248	$91,198	2%	2%	4%	7.6%	Lowest
Sharon	580	$76,293	4%	2%	4%	10.2%	Moderate
Sheffield	270	$70,000	3%	2%	5%	10.4%	Moderate
Shelburne	3,180	$104,796	2%	2%	3%	5.9%	Lowest
Sheldon	851	$64,602	4%	3%	6%	12.5%	High
Shoreham	499	$73,393	3%	2%	5%	10.2%	Moderate
Shrewsbury	474	$81,136	3%	2%	4%	9.3%	Low
South Burlington	8,727	$83,750	1%	2%	2%	5.1%	Lowest
South Hero	553	$107,750	3%	1%	3%	7.0%	Lowest
Springfield	3,955	$57,160	4%	2%	5%	11.1%	Moderate
St. Albans	2,647	$82,913	2%	2%	4%	7.5%	Lowest
St. Albans City	2,747	$49,063	3%	0%	5%	7.4%	Lowest
St. George	254	$88,750	3%	2%	3%	8.6%	Low
St. Johnsbury	3,188	$43,190	5%	3%	5%	13.7%	High
Stamford	365	$78,250	3%	2%	4%	9.1%	Low
Stannard	91	$60,795	4%	3%	6%	12.3%	High
Starksboro	701	$77,188	3%	2%	5%	10.0%	Low
Stockbridge	332	$71,250	4%	2%	5%	11.4%	Moderate
Stowe	2,401	$74,065	4%	2%	4%	9.7%	Low
Strafford	554	$98,083	3%	1%	3%	7.3%	Lowest
Stratton	118	$107,500	3%	1%	3%	7.0%	Lowest
Sudbury	219	$72,375	3%	2%	5%	9.7%	Low
Sunderland	379	$75,673	3%	2%	5%	9.7%	Low
Sutton	385	$61,406	4%	2%	6%	11.7%	Moderate
Swanton	2,540	$68,294	3%	2%	5%	9.3%	Low
Thetford	1,198	$81,750	4%	2%	4%	9.7%	Low
Tinmouth	320	$68,750	3%	2%	5%	9.7%	Low
Townshend	641	$73,068	3%	2%	4%	8.7%	Low
Topsham	415	$67,557	4%	2%	5%	12.0%	Moderate
Troy	637	$78,490	3%	2%	4%	9.2%	Low
Tunbridge	538	$68,929	4%	2%	5%	10.6%	Moderate
Underhill	1,285	$87,227	3%	2%	4%	9.3%	Low
Vergennes	1,101	$65,750	4%	2%	4%	9.7%	Low
Vernon	876	$78,393	3%	2%	4%	8.8%	Low
Vershire	350	$62,333	4%	2%	6%	11.9%	Moderate
Waitsfield	878	$72,692	5%	2%	4%	10.9%	Moderate
Walden	437	$67,768	3%	2%	5%	10.7%	Moderate
Wallingford	779	$72,689	3%	2%	4%	9.2%	Low
Waltham	191	$85,208	3%	2%	4%	8.8%	Low

Town	Total # of Households	Median Household Income	Thermal	Electricity	Transportation	Total Energy	Total Energy Burden Bin
Wardsboro	336	$78,500	4%	2%	4%	9.6%	Low
Warren	702	$66,136	5%	2%	5%	11.9%	Moderate
Washington	489	$63,417	4%	2%	5%	11.5%	Moderate
Waterbury	2,104	$92,231	3%	2%	3%	7.5%	Lowest
Waterford	518	$96,136	3%	2%	4%	7.7%	Lowest
Waterville	183	$61,250	4%	2%	6%	12.3%	High
Weathersfield	1,101	$67,236	4%	2%	5%	11.0%	Moderate
Wells	386	$66,364	3%	2%	5%	10.0%	Low
West Fairlee	320	$69,821	4%	2%	5%	11.1%	Moderate
West Haven	115	$61,607	4%	3%	5%	12.1%	High
West Rutland	1,016	$50,909	4%	3%	6%	12.9%	High
West Windsor	470	$94,300	3%	2%	3%	8.3%	Low
Westfield	252	$54,375	5%	3%	6%	13.7%	High
Westford	842	$99,464	3%	2%	4%	8.2%	Low
Westminster	1,210	$64,297	4%	2%	4%	10.4%	Moderate
Westmore	168	$70,333	3%	1%	5%	9.3%	Low
Weston	288	$110,000	2%	1%	3%	6.4%	Lowest
Weybridge	310	$100,185	2%	2%	3%	7.4%	Lowest
Wheelock	304	$62,308	4%	2%	6%	11.2%	Moderate
Whiting	210	$68,125	3%	3%	5%	11.2%	Moderate
Whitingham	560	$62,167	4%	2%	5%	10.8%	Moderate
Williams	1,349	$70,813	4%	2%	5%	10.7%	Moderate
Williston	4,114	$99,071	2%	1%	3%	5.6%	Lowest
Wilmington	873	$59,821	5%	2%	5%	12.1%	High
Windham	184	$78,750	3%	2%	4%	8.5%	Low
Windsor	1,621	$44,761	5%	3%	6%	14.4%	High
Winhall	272	$69,375	4%	3%	5%	11.8%	Moderate
Winooski city	3,504	$61,033	2%	2%	3%	6.5%	Lowest
Wolcott	702	$62,931	4%	2%	6%	12.0%	Moderate