A just climate transition for housing: What will it take?

Speakers

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Kathy Beyer

Sr. Vice President – Real Estate Development, Evernorth

Vermont Statewide Housing Conference
November 14, 2024

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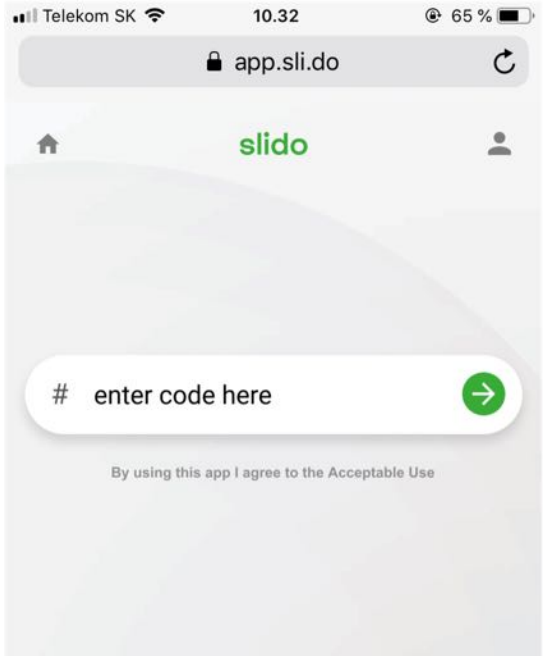

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Enter your thoughts into the live poll as we share presentations. At the end of the session, we'll discuss the responses.

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What resources do you need to reduce fossil fuel use in our affordable housing stock?

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Thermal Sector Context

For energy and emissions tracking, thermal sector = *residential, commercial, and industrial (RCI) fuel use*

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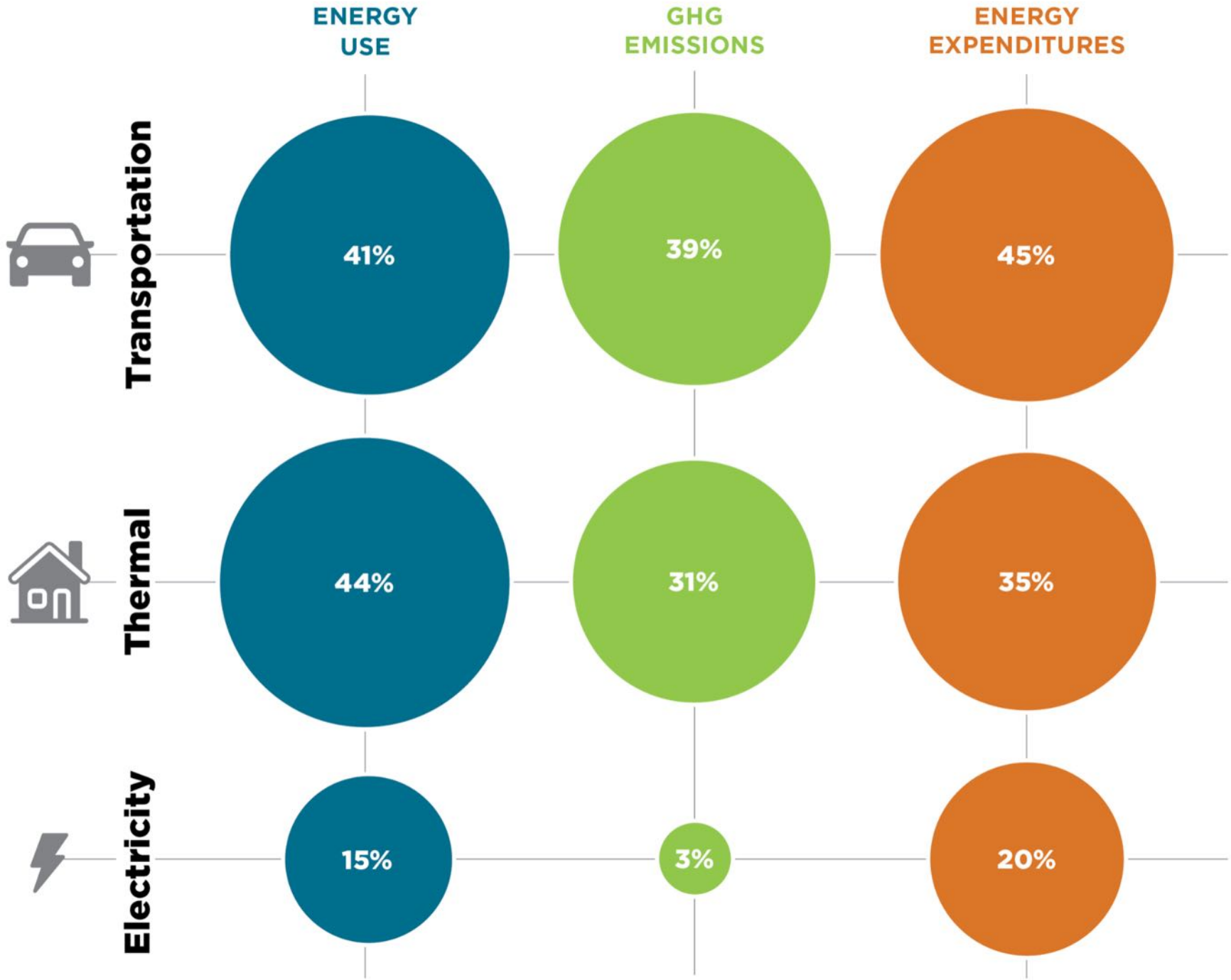
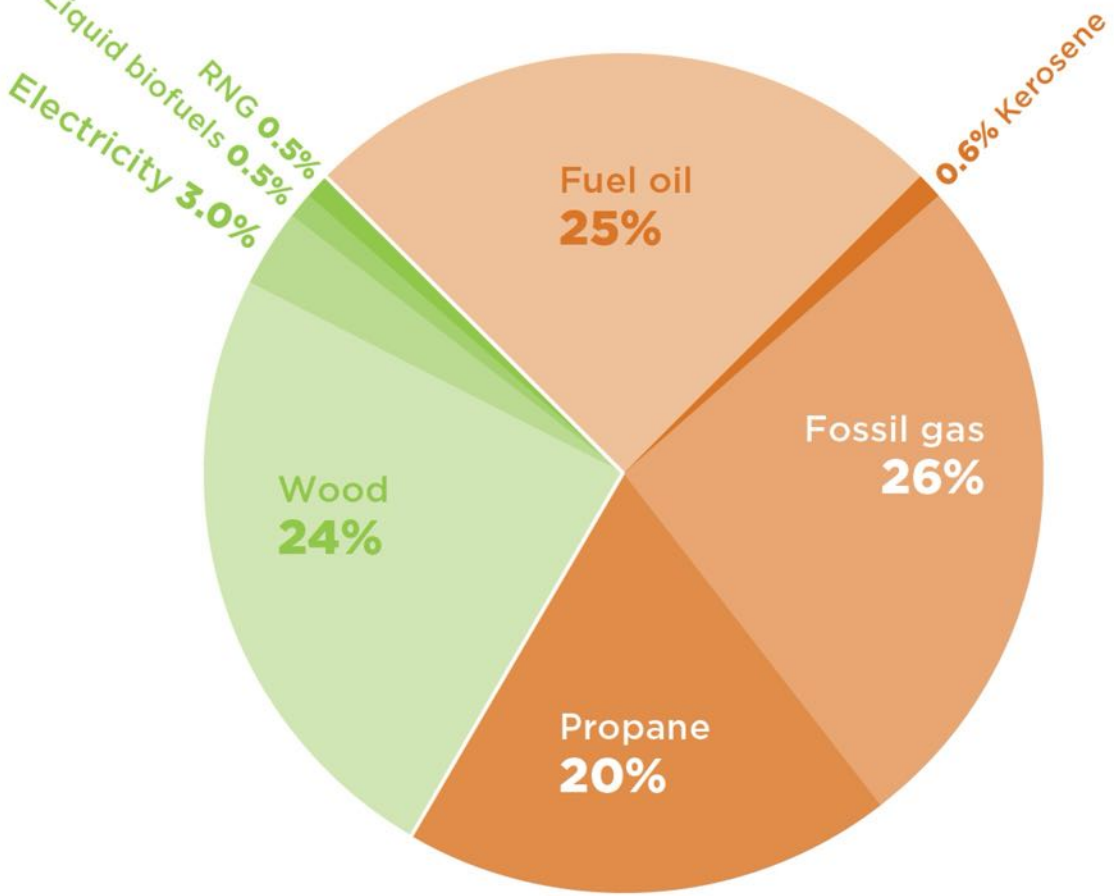

ENERGY USE
GHG EMISSIONS
ENERGY EXPENDITURES
Transportation
41%
39%
45%
Thermal
44%
31%
35%
Electricity
15%
3%
20%

VT thermal energy sources, 2022

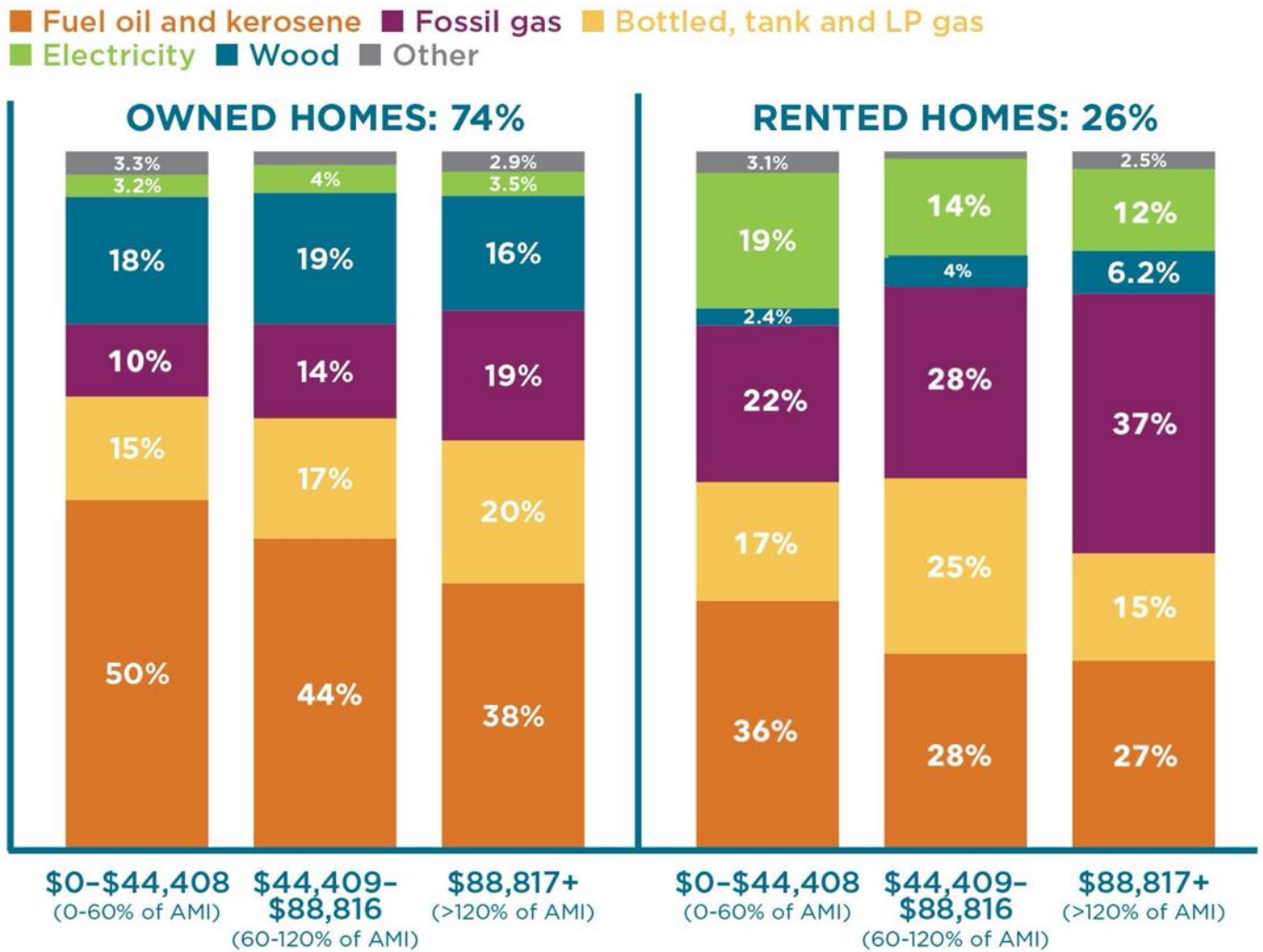


Sources: VT Department of Taxes, 2024; Energy Information Administration (EIA) State Energy Data System, 2024; Efficiency Vermont, 2024; VGS, 2024.

ENERGY ACTION NETWORK

Notes: Percentages do not add up to 100% due to independent rounding. Electricity used for heating is estimated based on the number of heat pumps installed in Vermont and the number of homes estimated to be heated with electric resistance systems.

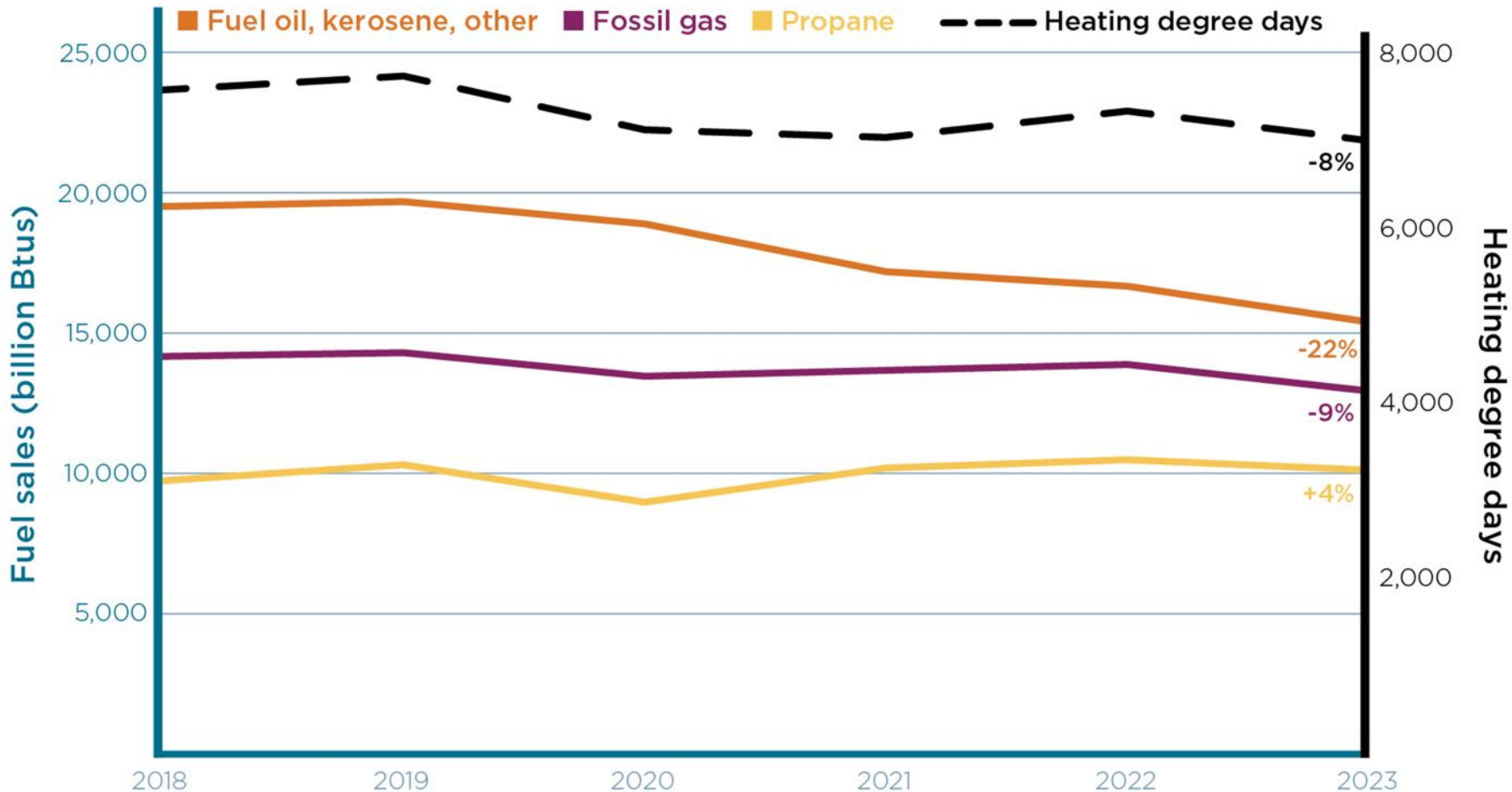
Vermont primary household fuel use by income and housing type



Source: U.S. Census Bureau, 2018-2022 American Community Survey 5-year Public Use Microdata Samples. **Note:** Income categories are based on 2018-2022 median household income in Vermont of $72,014. Data is self-reported.

ENERGY ACTION NETWORK

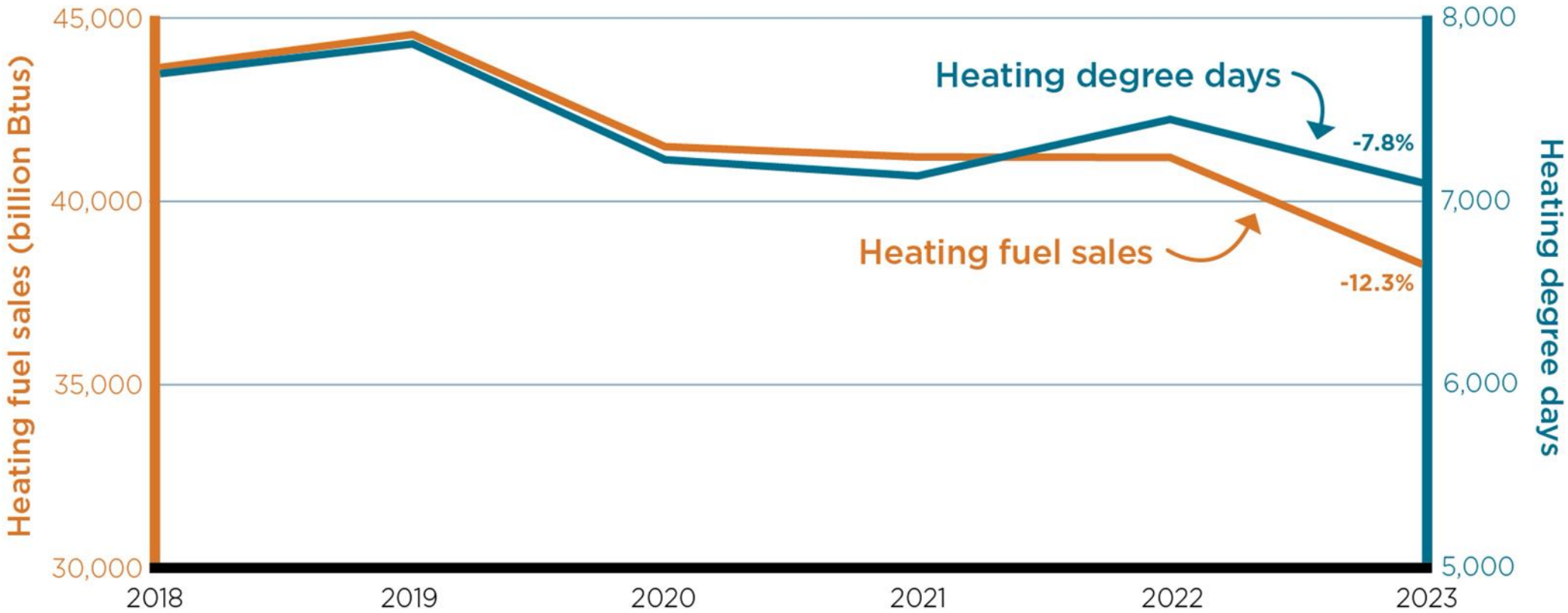
VT fossil heating fuel sales and heating degree days, 2018–2023



Sources: Heating fuel sales data: Vermont Department of Taxes, 2024; VGS, 2024. Fuel heat content conversion factors: U.S. Energy Information Administration, 2023. Heating degree days: NOAA Climate Prediction Center, 2023.

ENERGY ACTION NETWORK

Total fossil heating fuel sales and heating degree days in Vermont, 2018–2023



Sources: Heating fuel sales data: Vermont Department of Taxes, 2023; VGS, 2023. Fuel heat content conversion factors: U.S. Energy Information Administration, 2023. Heating degree days: NOAA Center for Weather and Climate Prediction, 2023. **Note:** Heating degree days are a measure that compares the mean outdoor temperature on a given day to a standard temperature of 65 degrees Fahrenheit.

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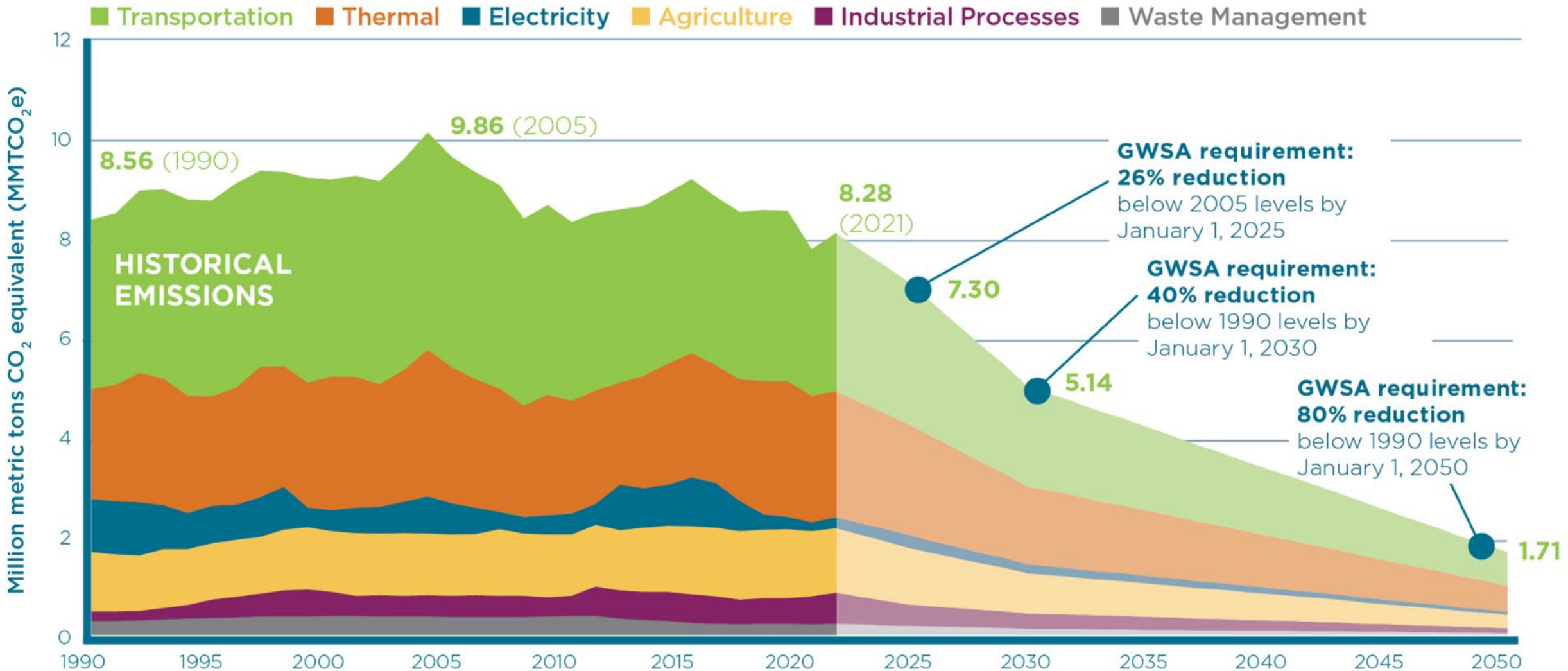
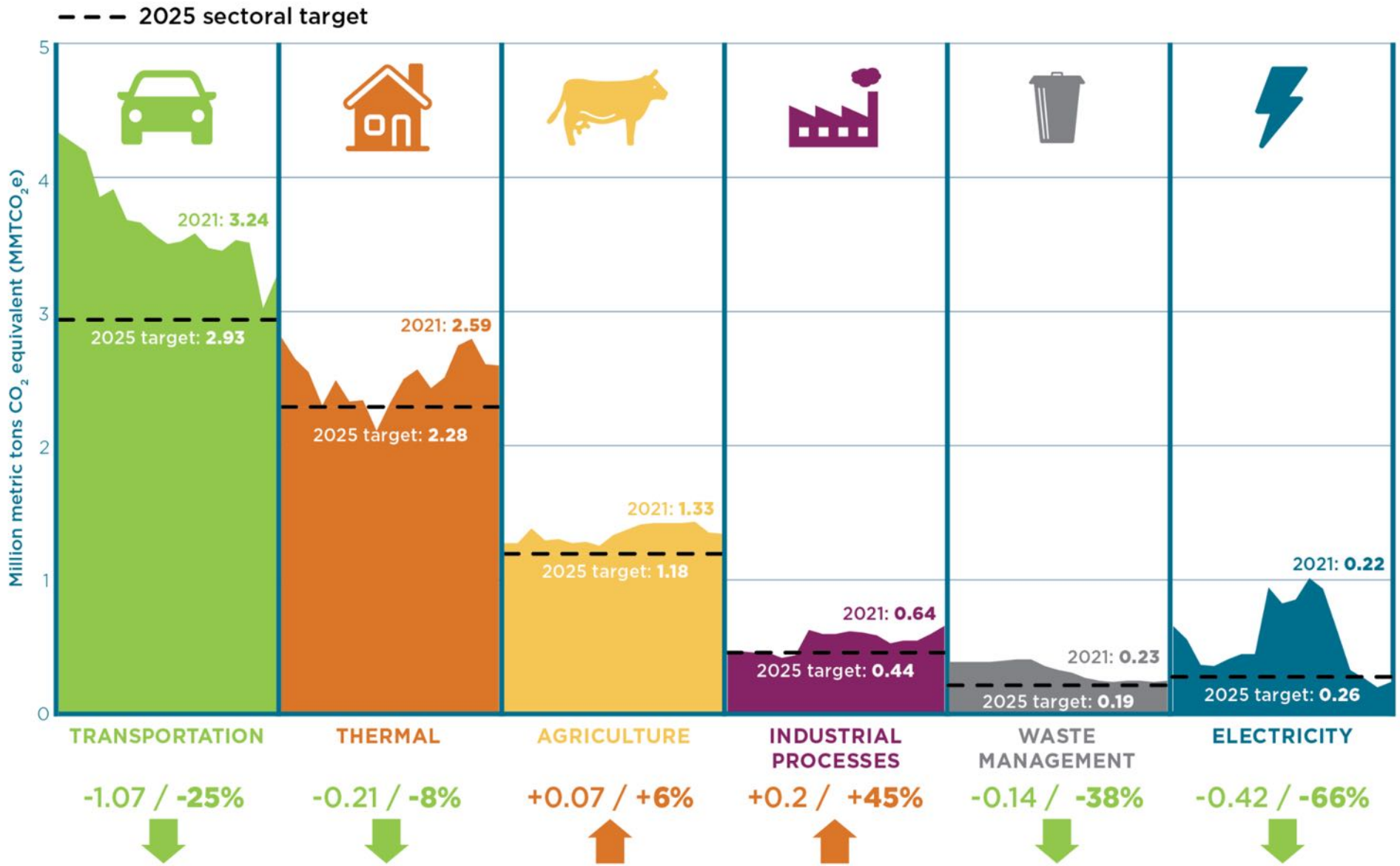
Vermont's historical GHG emissions and future requirements

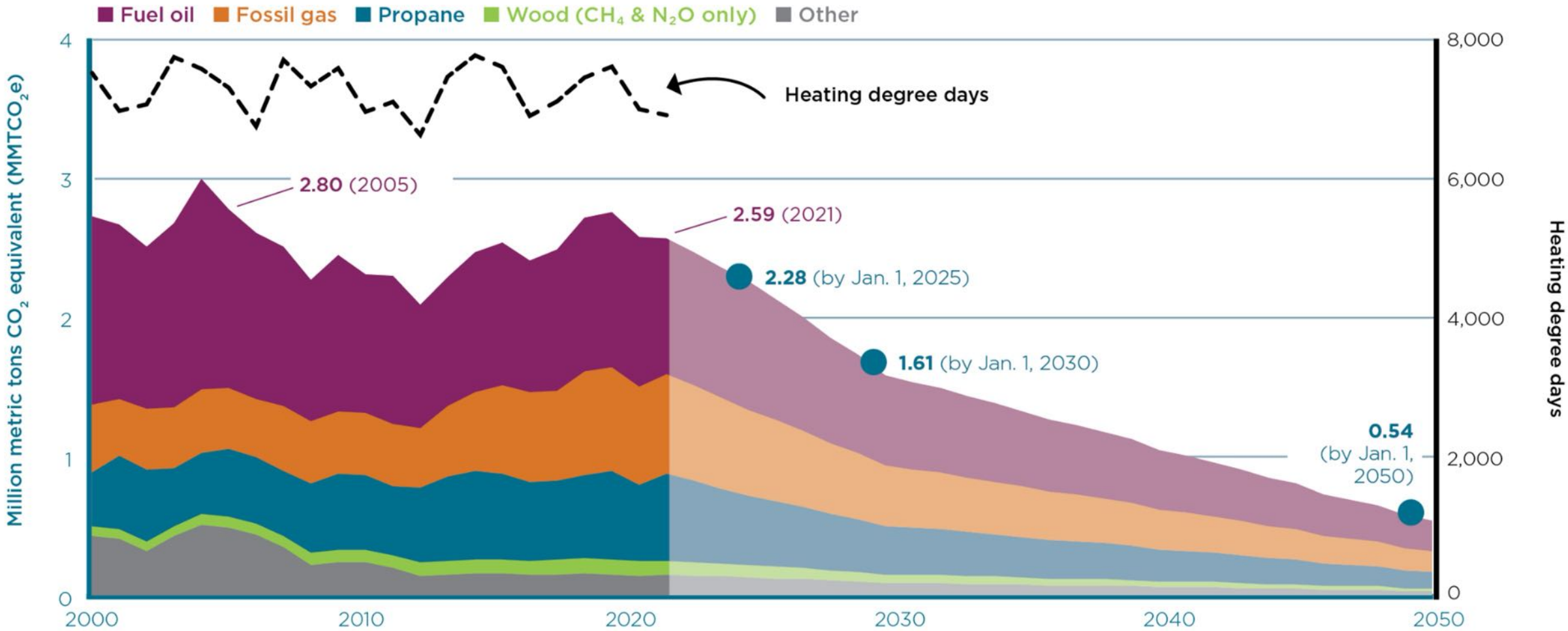


Emissions data from VT ANR

Vermont GHG emissions by sector, 2005–2021



Historical VT thermal GHG emissions and future sector targets



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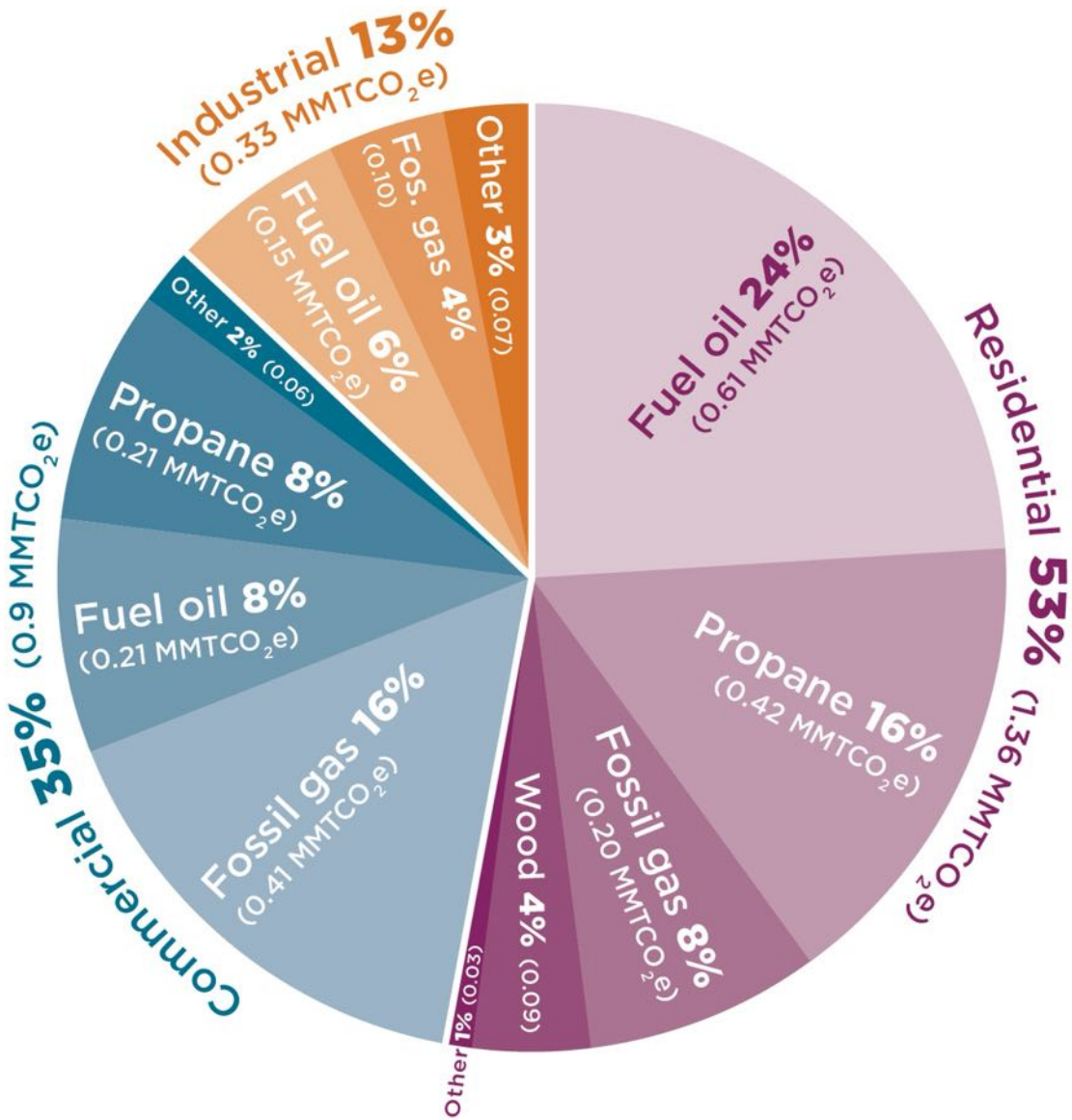
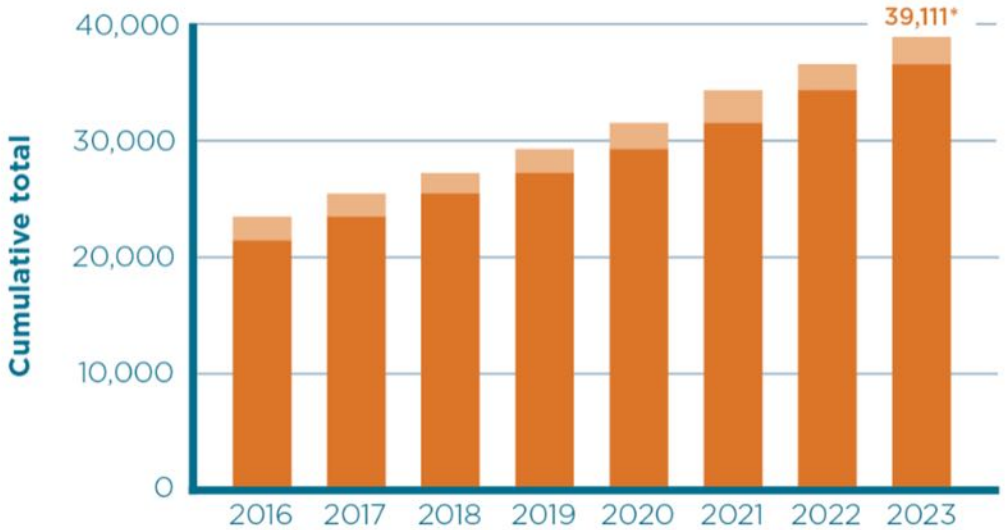
Sources: GHG emissions: Vermont Agency of Natural Resources, "Vermont Greenhouse Gas Emissions Inventory and Forecast: 1990-2021," 2024. Heating degree days: NOAA Climate Prediction Center, 2024. **Notes:** Heating degree days are a measure of how cold the temperature was on a given day, and compares 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.

Vermont thermal GHG emissions by sector and fuel type, 2021

TOTAL THERMAL EMISSIONS 2.59 $MMTCO_2e$

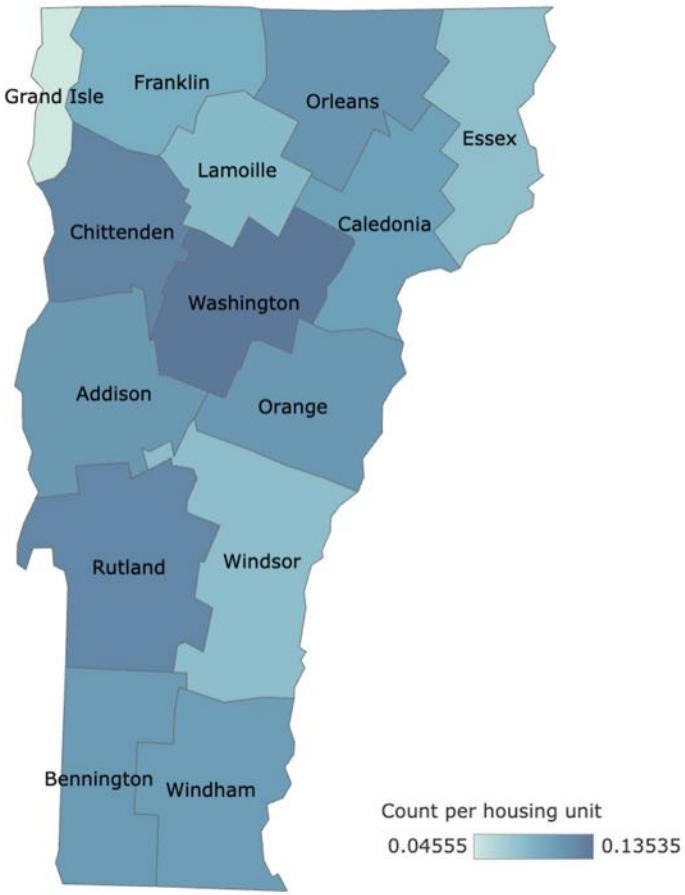


Housing units comprehensively weatherized

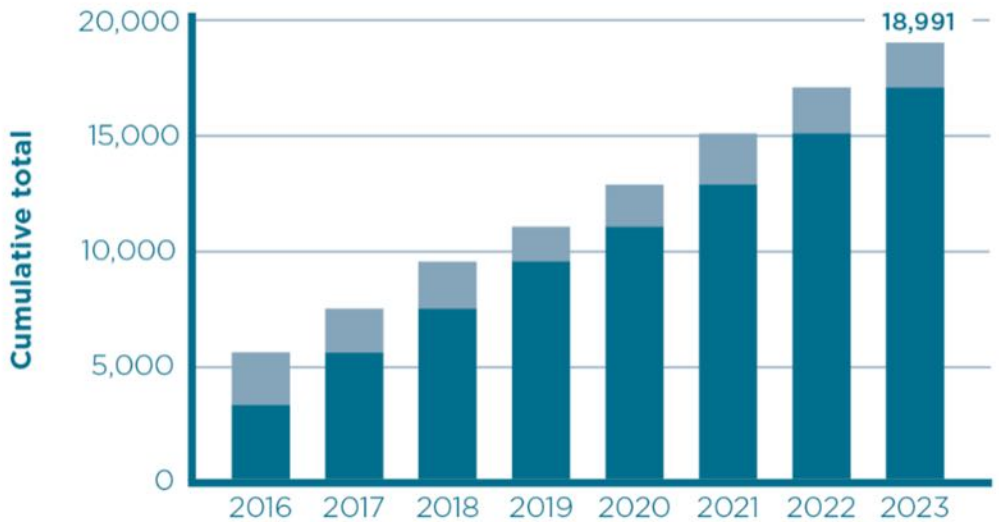


Weatherization by county as of 2022

Click on a county to filter



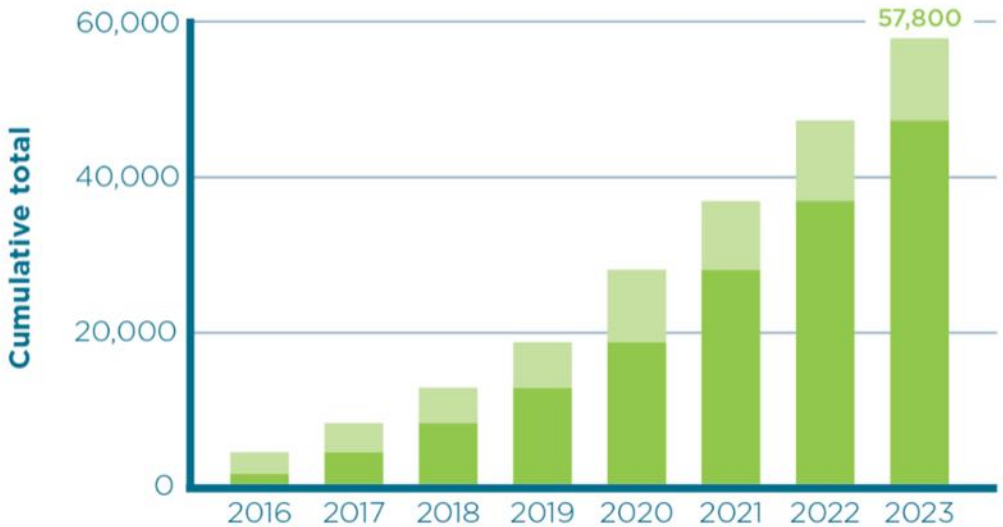
Residential heat pump water heaters



Heat pump water heaters by county as of 2022

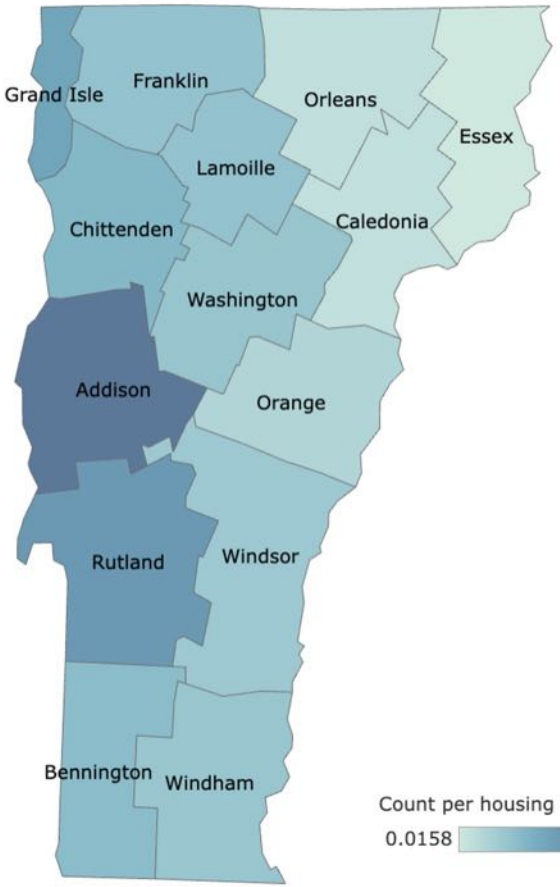
Click on a county to filter

Residential cold-climate heat pumps

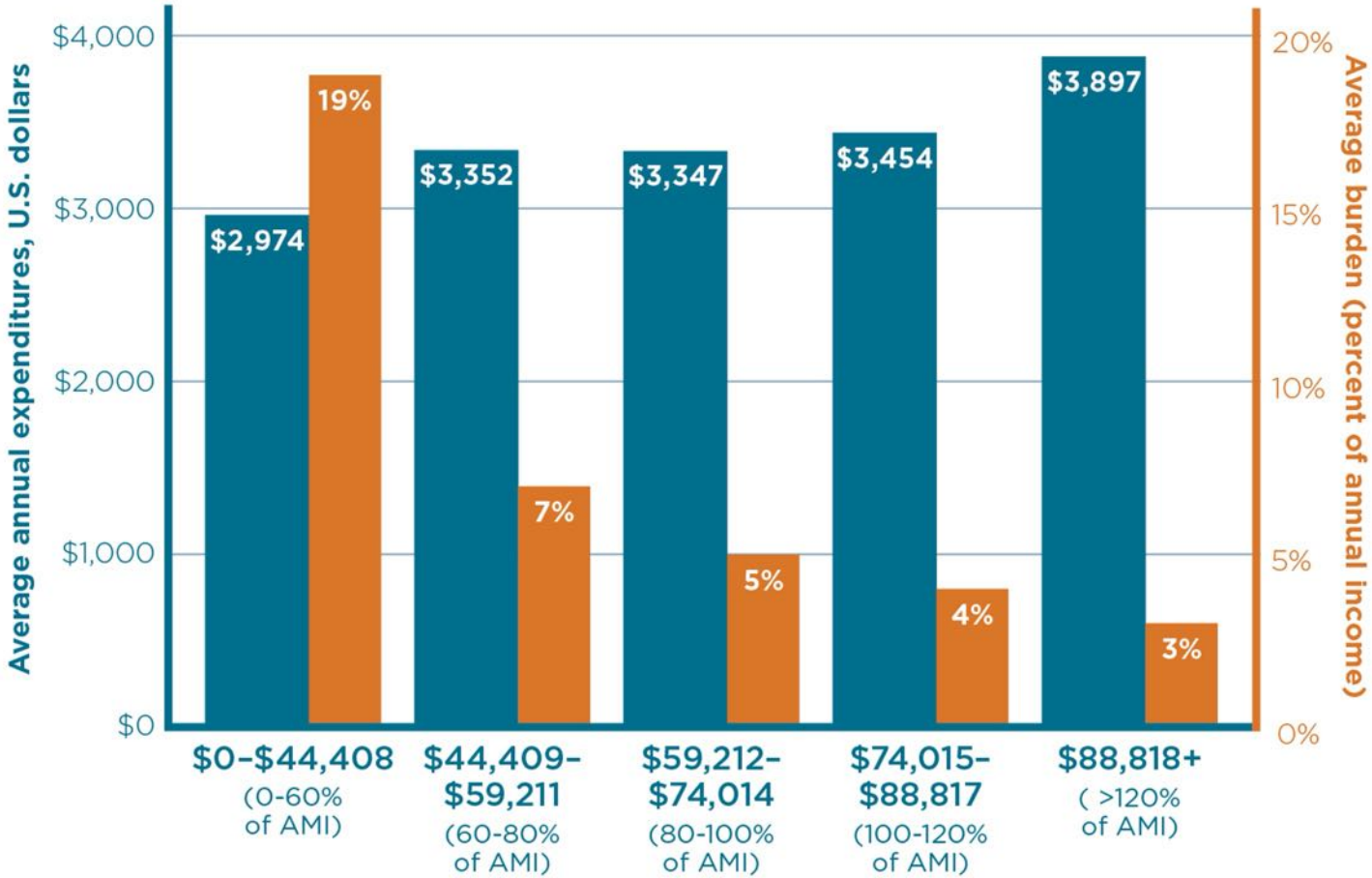


Cold-climate heat pumps by county as of 2022

Click on a county to filter



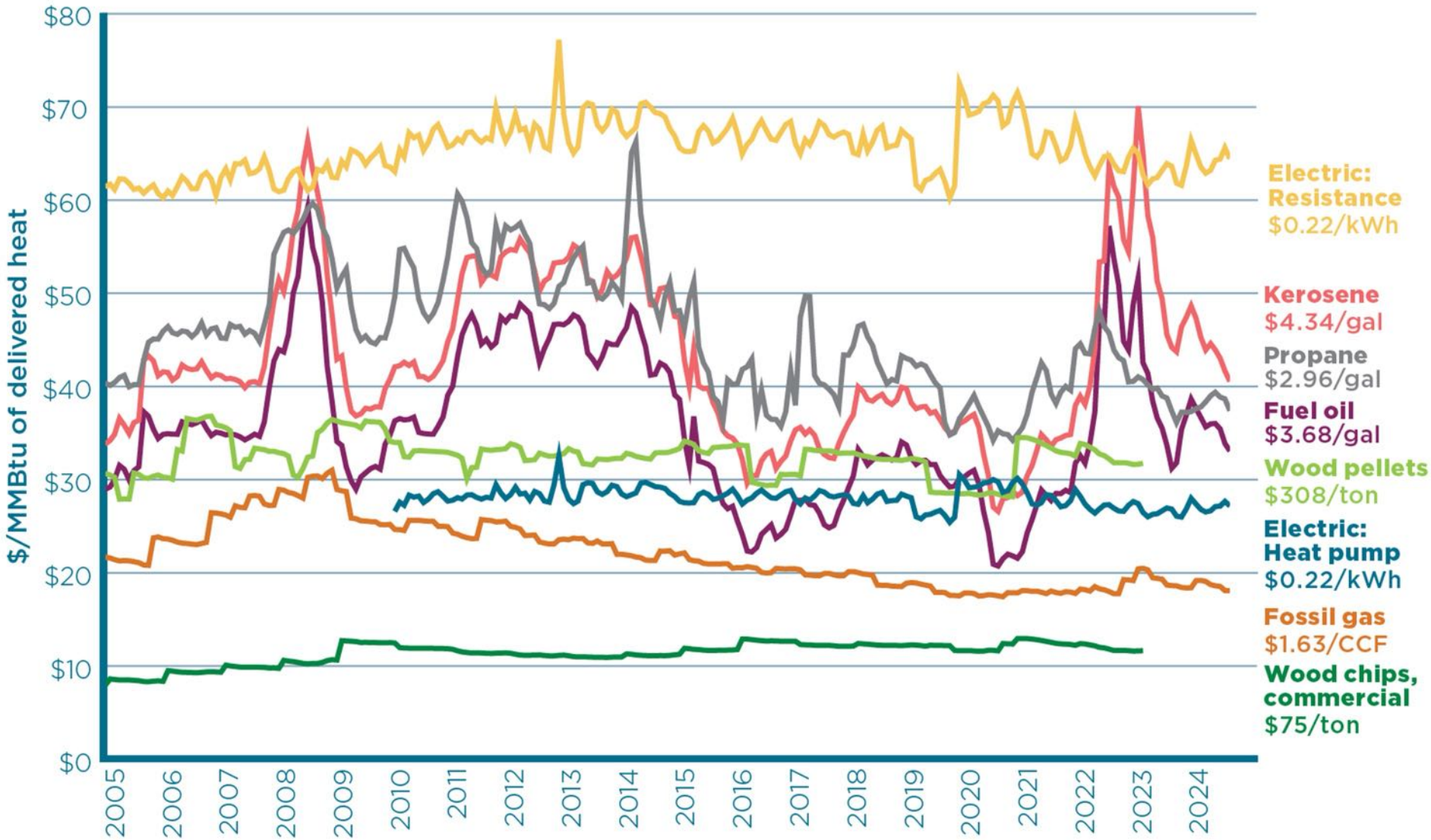
Vermont combined average household heating and electricity fuel costs and burden by income level, 2018–2022



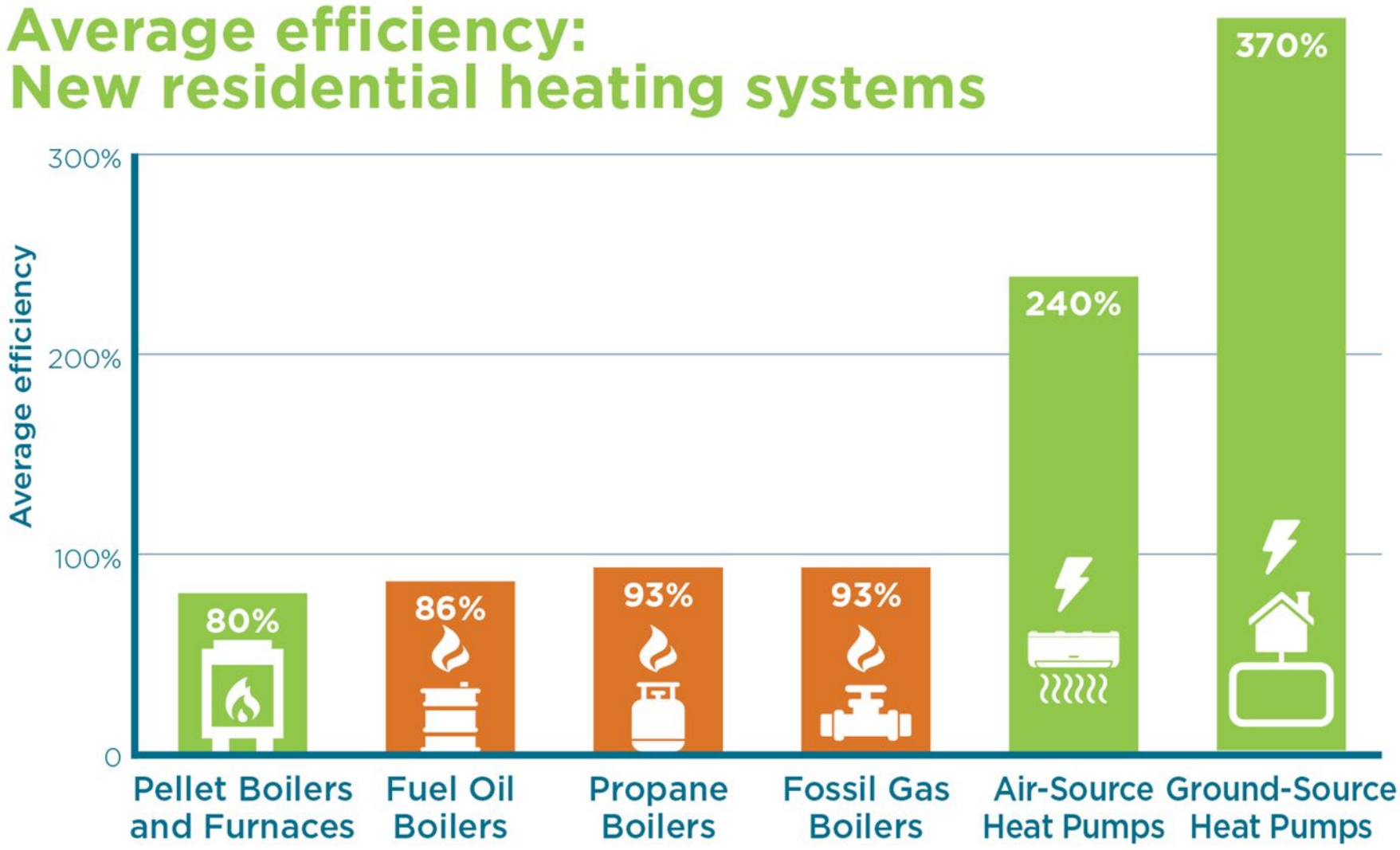
Source: U.S. Census Bureau, 2018-2022 American Community Survey 5-year Public Use Microdata Samples. **Notes:** Income categories are based on 2018-2022 median household income in Vermont of $74,014. Energy burden refers to the share of annual household income spent on energy. Costs include fuel only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

ENERGY ACTION NETWORK

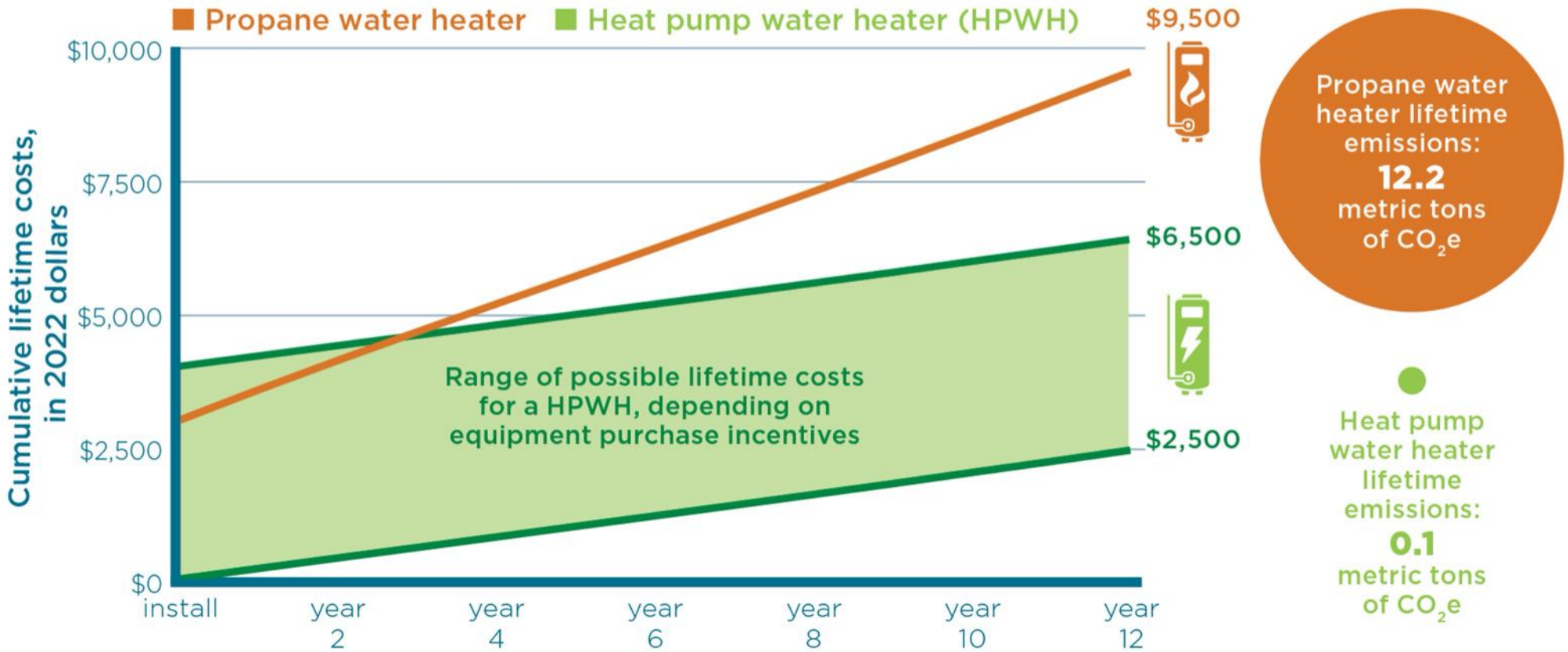
Cost comparison of different heating fuel options over time (adjusted for inflation, June 2024 dollars)



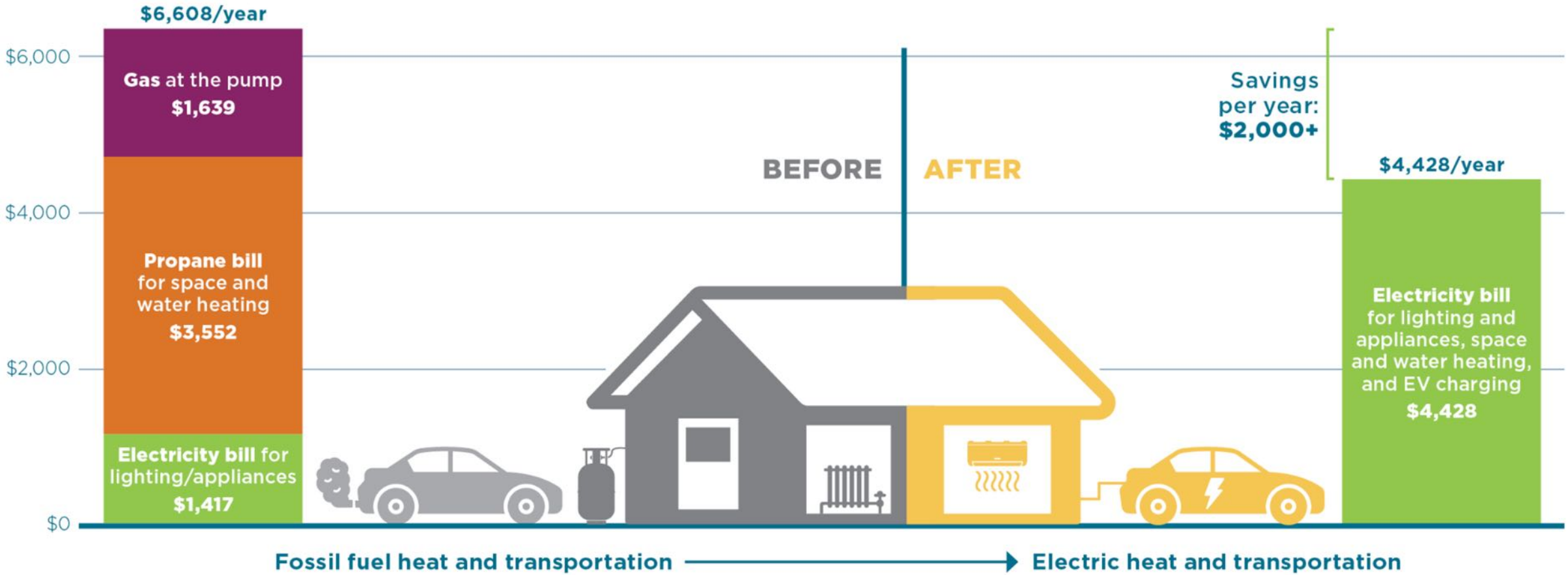
Modern electric equipment is more energy efficient



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



Estimated annual energy bill costs for a sample Vermont single-family household, before and after electrification



Thank you!

Questions?

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

To request free copies of the report or to schedule a presentation, email cara@eanvt.org

November 14, 2024 – VHFA Annual Housing Conference

Energy Justice

Challenges and Opportunities in Vermont's energy policy and practice

Kelly Lucci

Director, Strategy & Partnerships, Efficiency Vermont

Efficiency Vermont

Who we are

- Statewide energy efficiency utility
- Reduce the cost of energy for all Vermonters
- Help families, businesses, and institutions understand and make better use of energy and reduce greenhouse gases

What we do

- Direct support through incentives, training, and technical advice
- Market transformation through supply chain engagement
- Partnership with energy service providers

Efficiency Vermont

The impacts of efficiency

Over $3 billion

Lifetime savings from 2000-2021

Over 13 million metric tons of CO_2e

Lifetime avoided from 2000-2021

2.8 million cars

Equivalent impact of GHG emissions avoided

38% lower

Vermont's average energy bills, below the national average

9,832 jobs

Vermont's energy efficiency jobs – 58% of the clean energy workforce

482 businesses

Efficiency Excellence Network members

The economic value of efficiency

Efficiency comprises over 15% of VT's electric portfolio, delivered at 75% of the cost of purchasing new power.

15.1%

Percentage of Vermont's 2021 electric needs met by efficiency

5.32¢/kWh

Cost of saving electricity with efficiency

VS

7.4¢/kWh

Cost of supplying electricity

$13.00/MMBtu

Cost of saving fossil fuel with efficiency

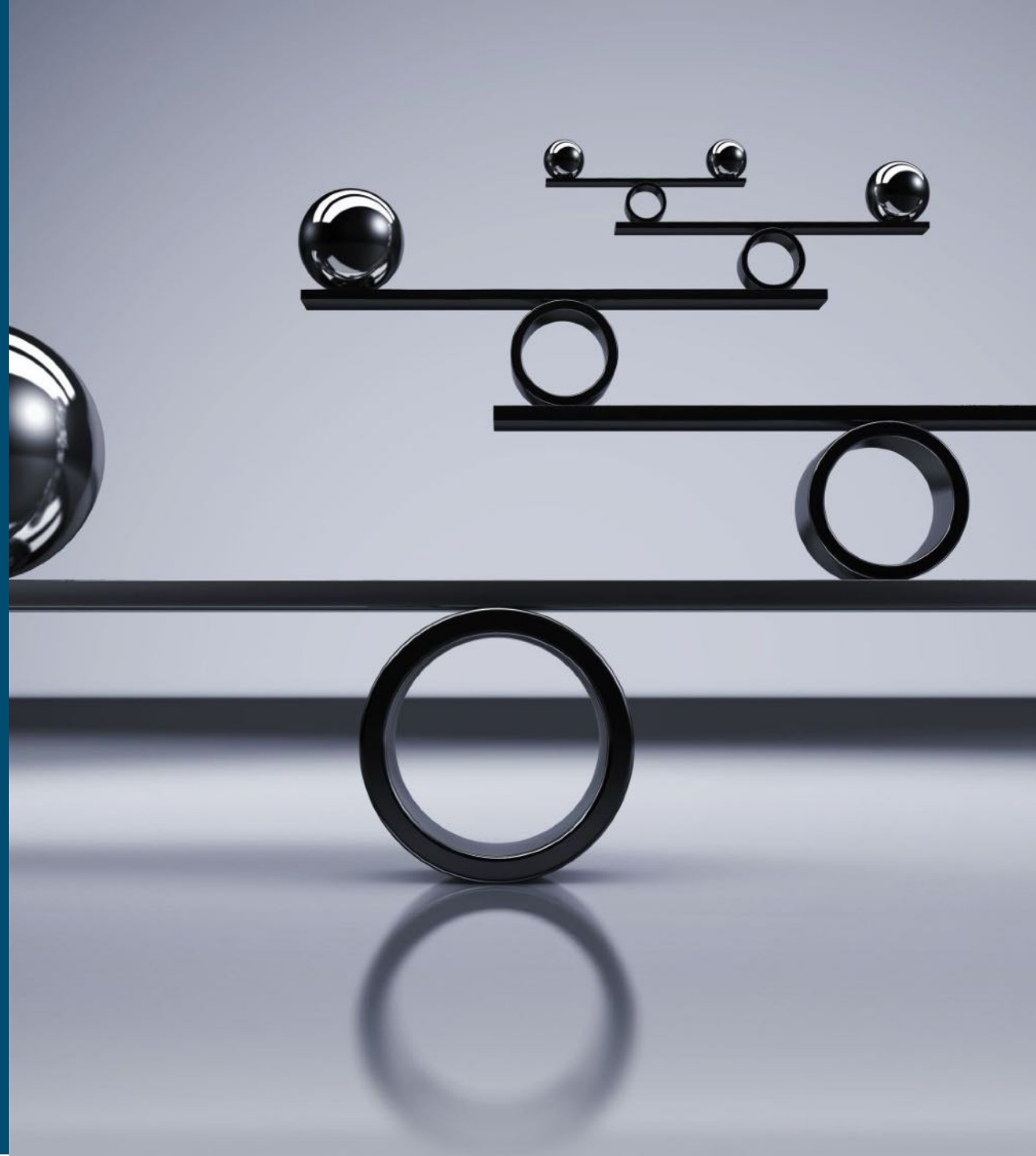
VS

$23.55/MMBtu

Cost of supplying fossil fuel

But the benefit has been felt inequitably

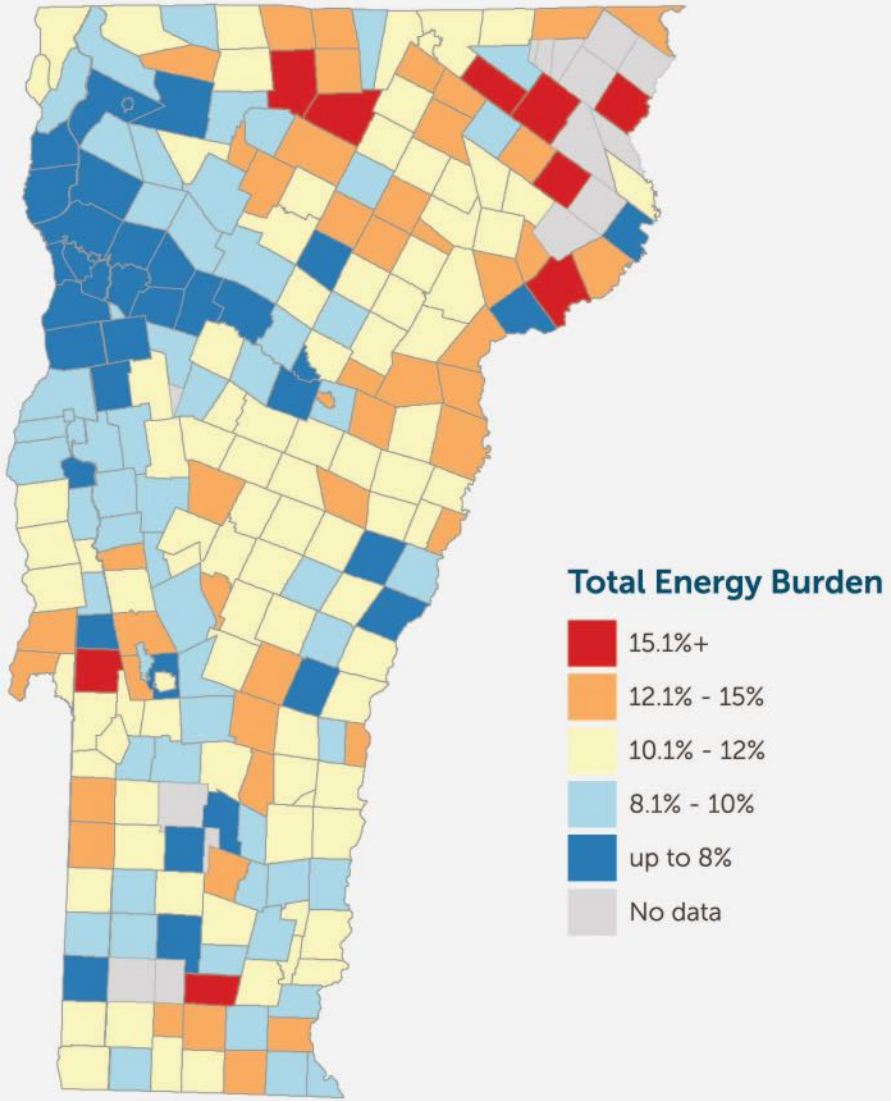
Energy Justice asks us to think about our work differently



Efficiency Vermont

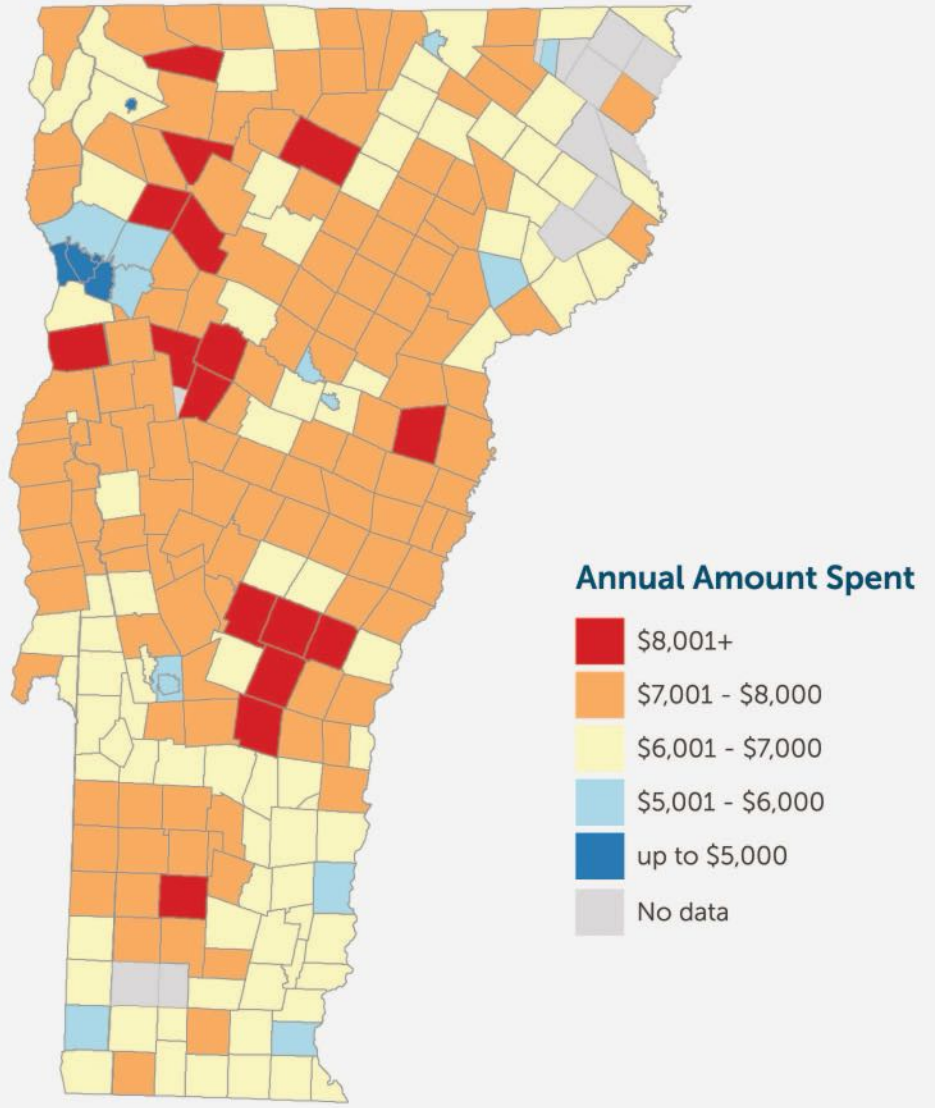
Efficiency Vermont

2023 Vermont Energy Burden Report: Total Energy Burden & Spending by Town



Total Energy Burden

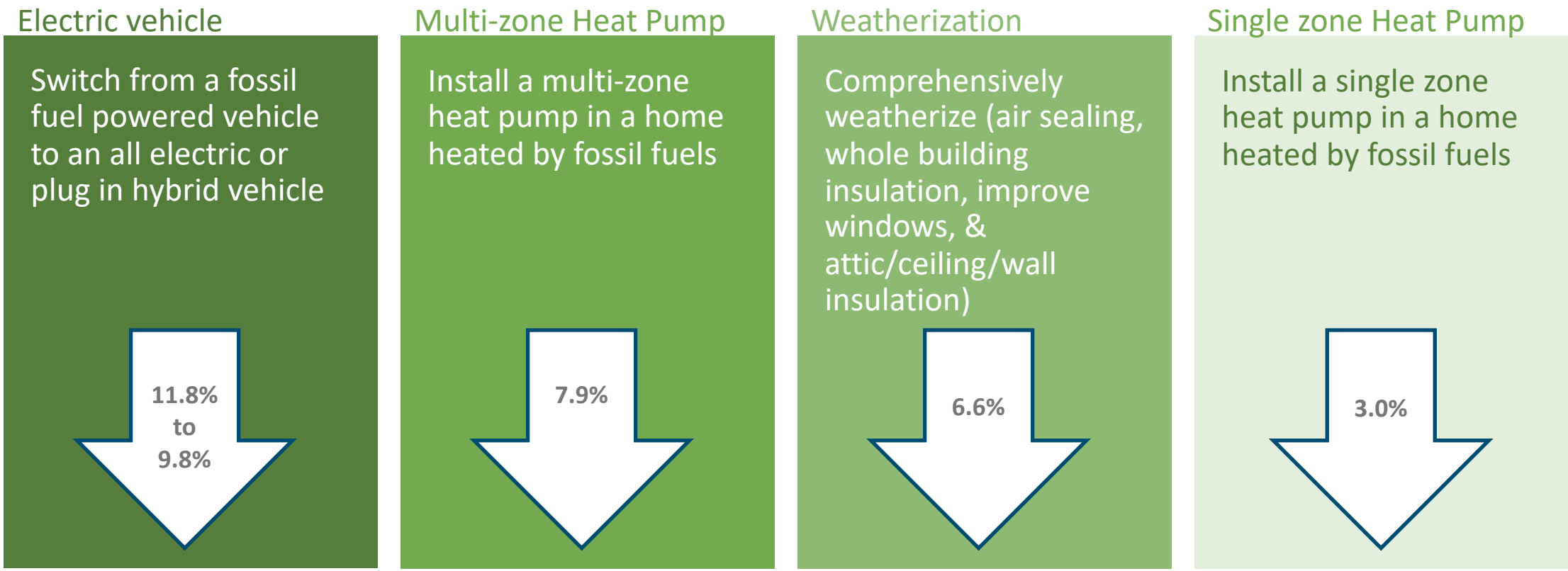
- 15.1%+
- 12.1% - 15%
- 10.1% - 12%
- 8.1% - 10%
- up to 8%
- No data



Annual Amount Spent

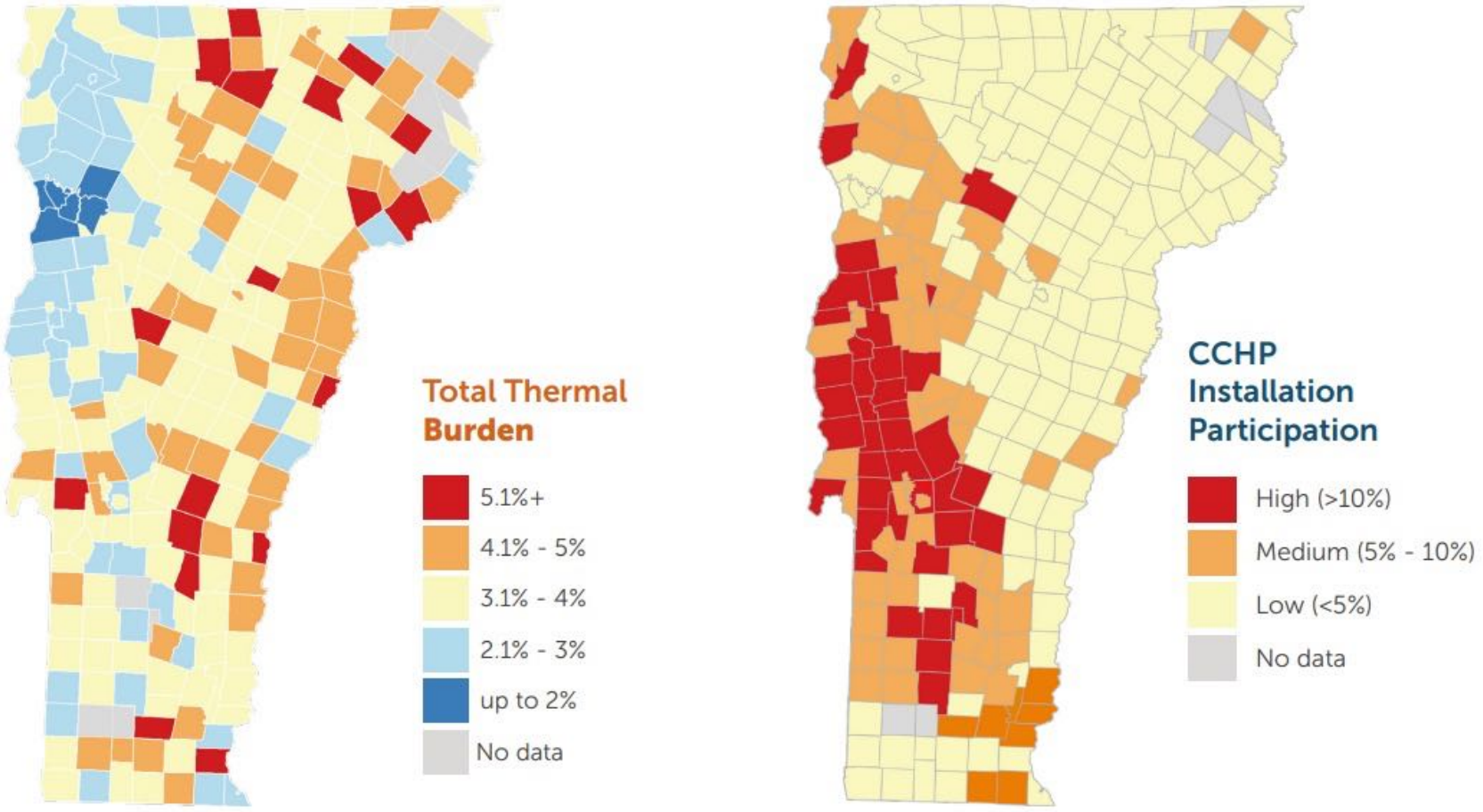
- $8,001+
- $7,001 - $8,000
- $6,001 - $7,000
- $5,001 - $6,000
- up to $5,000
- No data

Projects that reduce energy burden* the most are also the most expensive



*for a “typical” VT home, with average energy usage and income (2023 VT Energy Burden Report)

Which customers are able to take action?



Thermal burden and per capita installations of cold climate heat pumps by town (2017-21)

Which customers are able to take action?

Town*	Median household Income	Est. CCHP Adoption rate	Est. WX Adoption rate
Montgomery	$30,500	6.9%	4.2%
Dover	$45,625	6.7%	9.8%
East Haven	$36,250	1.0%	8.9%
Ludlow	$46,928	12.2%	6.5%
Fairlee	$53,767	15.1%	5.0%
Charleston	$37,798	2.7%	9.4%
Brattleboro	$41,001	12.4%	18.5%
St. Johnsbury	$43,190	3.9%	12.9%
Statewide	*$74,014*	*22.5%*	*13.7%*

* VT towns with a high thermal energy burden (>5%)

Sources: Efficiency Vermont and Energy Action Network VT Energy Dashboard

What's holding us back?

Efficiency Vermont

Putting current policy into practice…

Energy Efficiency Utilities (EEUs) must “realize all reasonably available, cost-effective energy efficiency savings”

When paired with aggressive overall energy savings goals, this directive keeps system-wide costs down – and **helps reduce rates and bills for everyone**

But it also creates a strong incentive for EEUs to seek out and support:

- Large energy users
- Customers who can cover a bigger share of upfront costs
- Projects that can be completed quickly

Putting current policy into practice…

Vermont energy code moving towards net zero

Assuming widescale compliance by builders:

- Reduces carbon emissions
- Decreases energy costs over the long term, in many cases

EEUs must assume compliance with energy code when analyzing potential savings for new construction projects. Therefore,

- With every code update cycle, EEUs can claim fewer savings towards their goals
- On a $/kwh basis, new construction savings continue to get more expensive

Avg. ZEM/high performance manufactured home = **$4,000/MWH**

Avg. multifamily new construction project = **$1,500/MWH**

Avg. (target) for large business projects = **$100-$150/MWH**

Putting current policy into practice…

EEU, utility, and federally-funded programs (deployed by a wide range of organizations) provide funding to support energy projects

Lots of options available to customers to reduce the upfront cost of energy projects

Can help provide additional support for projects that have relatively low energy savings and relatively high costs

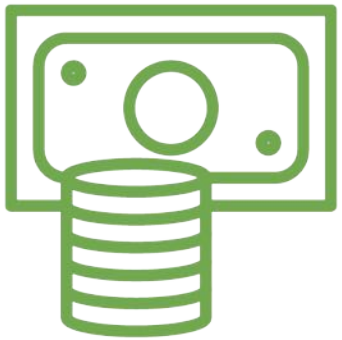
Can be very challenging – and costly – for customers to navigate all the programs and ensure a project meets qualification requirements

Reliance on one time funding:

- Inconsistent & uncertain
- Difficult to design with equity

Complex process to track/attribute savings can mean there is increased administrative cost – with no increased total customer incentive

Recent progress – and much more to do

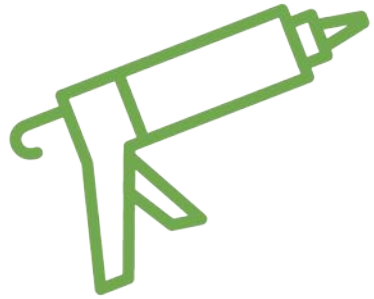


Income-sensitive and innovative rebate approaches for high-cost projects:

- Weatherization, heat pumps
- On-bill
- Direct payment to contractors

More programs to support and benefit renters:

- Window heat pump pilot
- Energy savings kits for renters
- Outreach to property owners



Directing new funding to support high-cost, low-savings projects:

- Weatherization
- Home repair (to enable weatherization)
- Multifamily new construction (coming soon)

Thank you!

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Efficiency Vermont

Affordable Housing is at the Intersection of the Climate Crisis and Housing Crisis

evernorth

Investing in communities. Building possibilities.

Energy Equity: How can we create a clean energy transition that places our most vulnerable population at the front of the line?

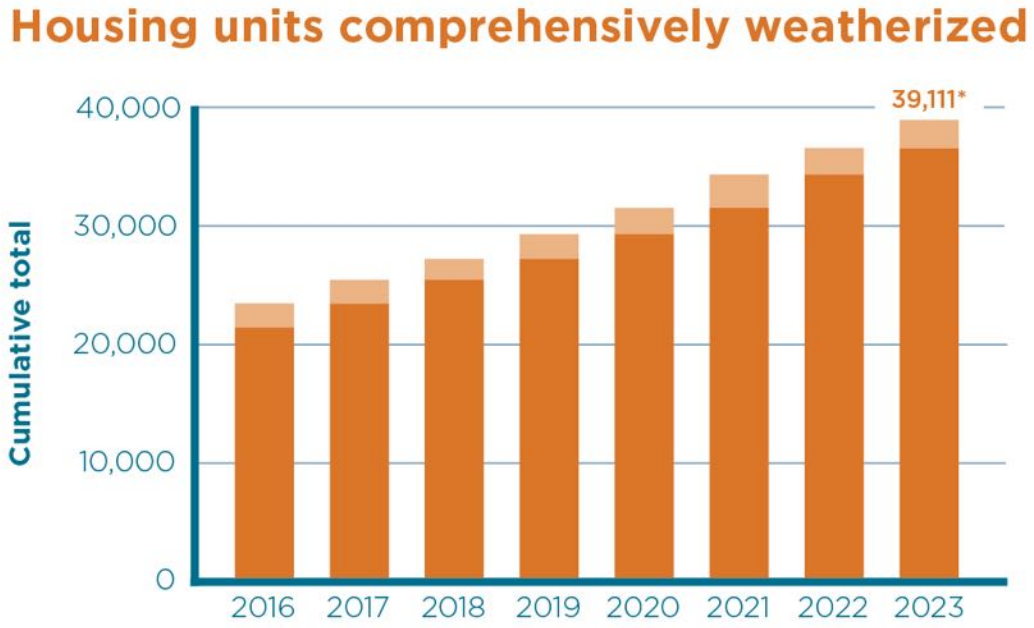
- Weatherization at Scale
- Advance Decarbonization Efforts with a Strong Equity Lens
- Land Use Policy is Climate Policy

Weatherization at Scale

This is the hardest and likely most expensive work we can do, but to not address weatherization would leave behind our vulnerable homeowners and renters.

42%

Of VT's housing stock was built before the 1970's



Energy Action Network 2024 Progress Report

30,000 New homes by 2030

Advance Decarbonization Efforts in Housing with a Strong Equity Lens

Here are some examples of how we do this…

Target State Level Energy Incentives

in a way that delivers higher incentives for housing for the lowest income Vermonters.

Ethan-Allen Duplex, Essex, VT (photo credit to CHT)

Red Clover Commons, West Brattleboro, VT

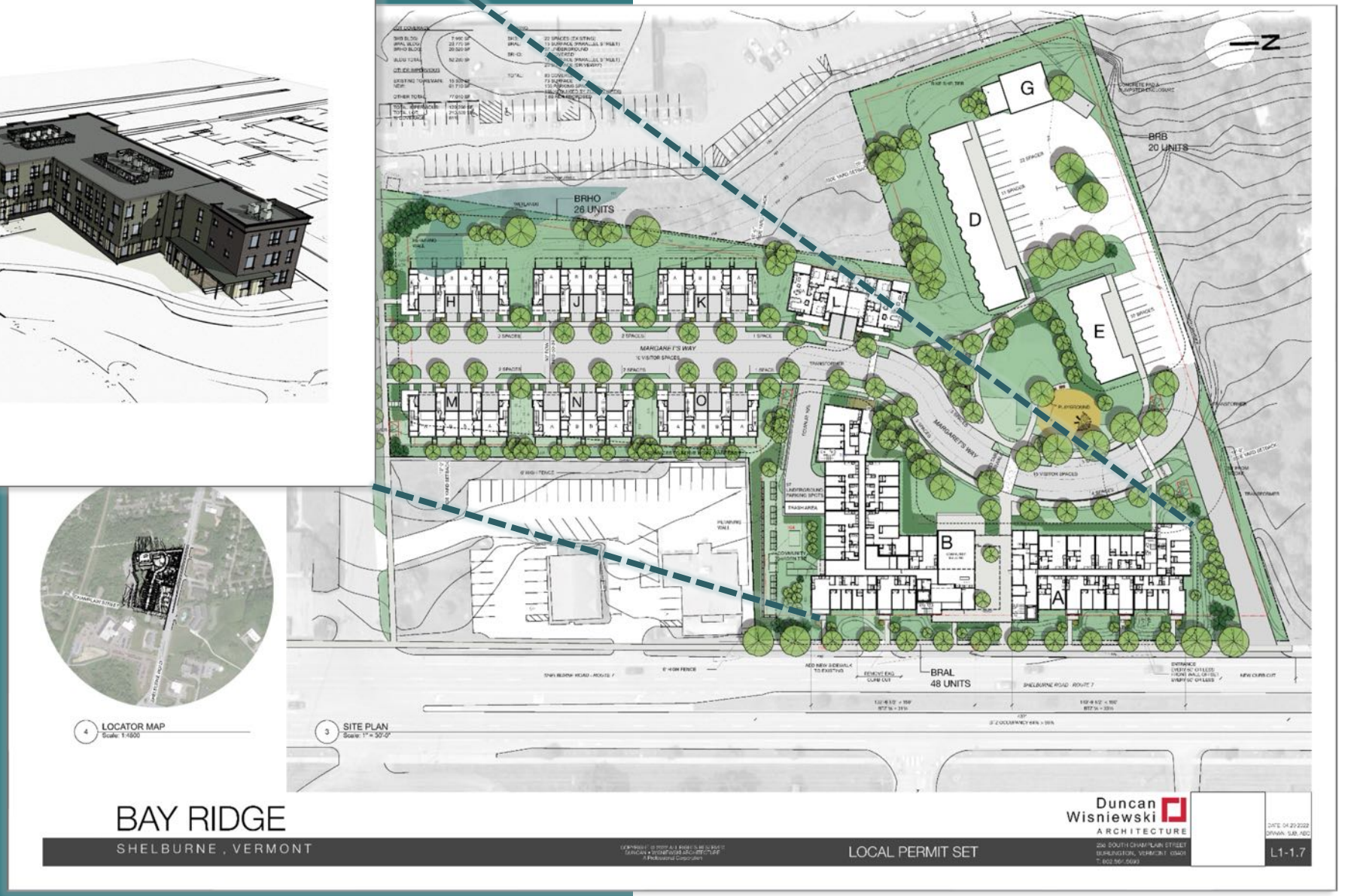
Question for Consideration: Can we create an incentive structure that is weighted towards lower income households?

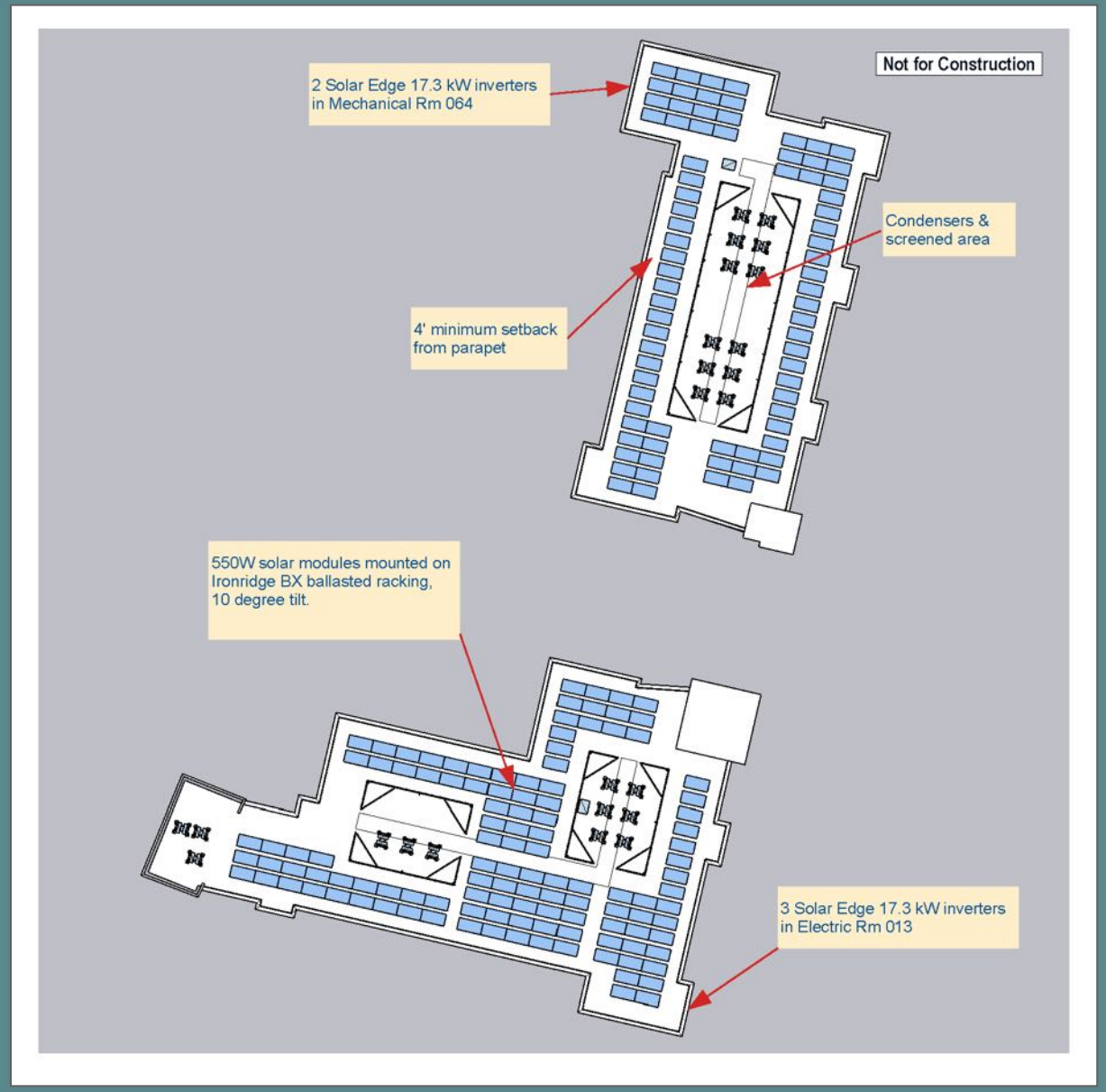
Solar to Scale for Affordable Multifamily Housing

Solar Array in Ferrisburgh, VT

Rooftop Solar at Wentworth Apartments, Hartford, VT

Bay Ridge Site Plan



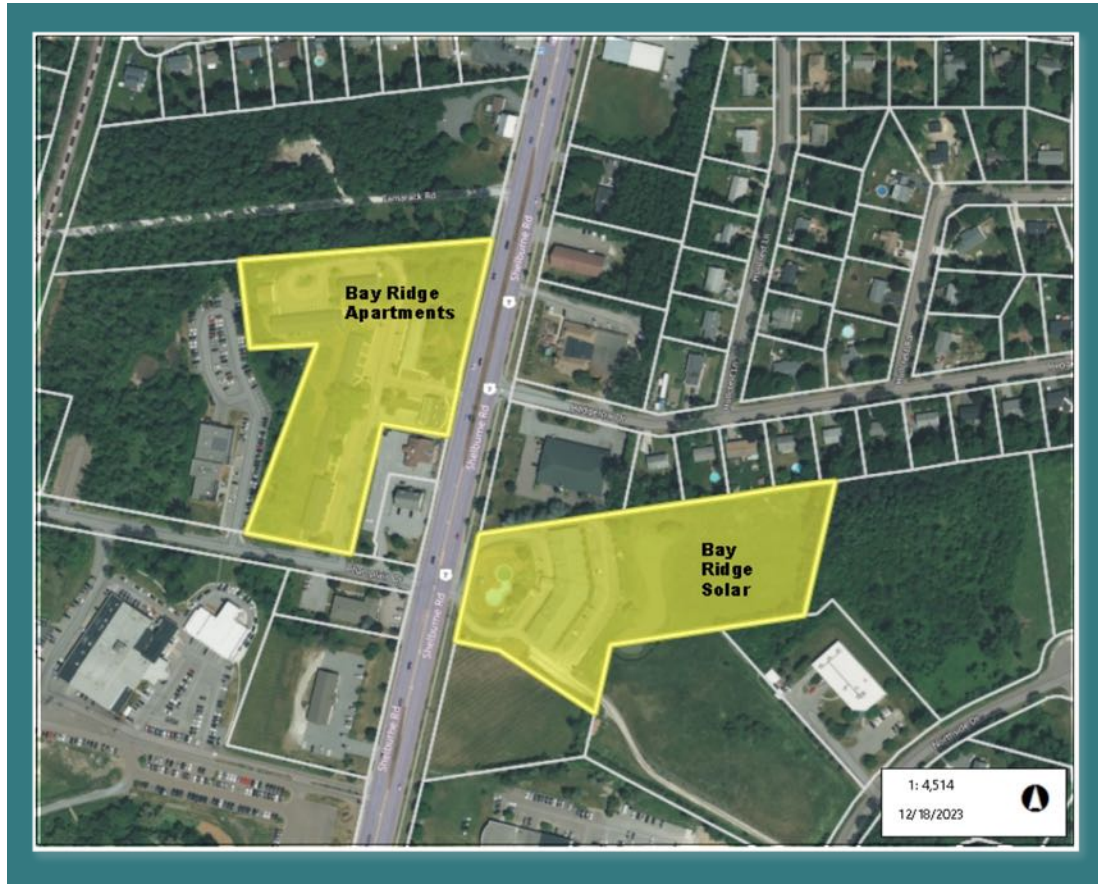


Bay Ridge Rooftop Solar

- Allows for ~87 kw of PV solar
- Offsets 15% of the electric load of 68 apartments

Bay Ridge Aerial View

- Allows for 150kw of solar
- Offsets 36% of the electric load for the 68 apartments

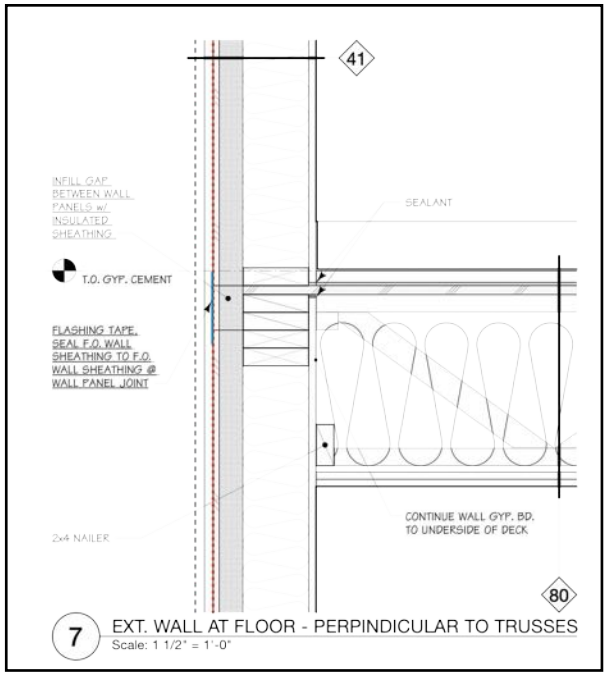


Bay Ridge
Solar Rooftop & Off-Site

	Rooftop	Offsite	Combined
kwh production	113,500	270,800	384,300
net-metered credits generated	$17,971	$32,875	$50,846
% total usage offset	15%	36%	51%

Question for Consideration: Can we advance solar at scale that largely benefits low-income households? And can we get that benefit to low or moderate income renters?

Enforce the Vermont Residential Energy Code and Match With Incentives



Laurentide Apartments, Burlington, VT

Question for Consideration: If the energy code updates are based on the state's energy plan goal of all new construction to be net zero by 2030, is that regulation enforceable, and is it matched with adequate incentives to help all developers and builders to get there?

Land Use Policy is Climate Policy

The location of our housing can also be a solution for reduction of greenhouse gas.

“A functioning society rests on a web of mutuality, a willingness among all involved to share enough with one another to accomplish what no one person can do alone.”

Heather McGee, The Sum of Us

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What resources do you need to reduce fossil fuel use in our affordable housing stock?

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