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Energy Action Network

Senate Natural Resources and
Energy Committee
January 18, 2023



ANNUAL PROGRESS REPORT

for VERMONT
2022

Emissions

Energy

Equity

and the Economy



Energy Action Network Members

Over 100 Network Members





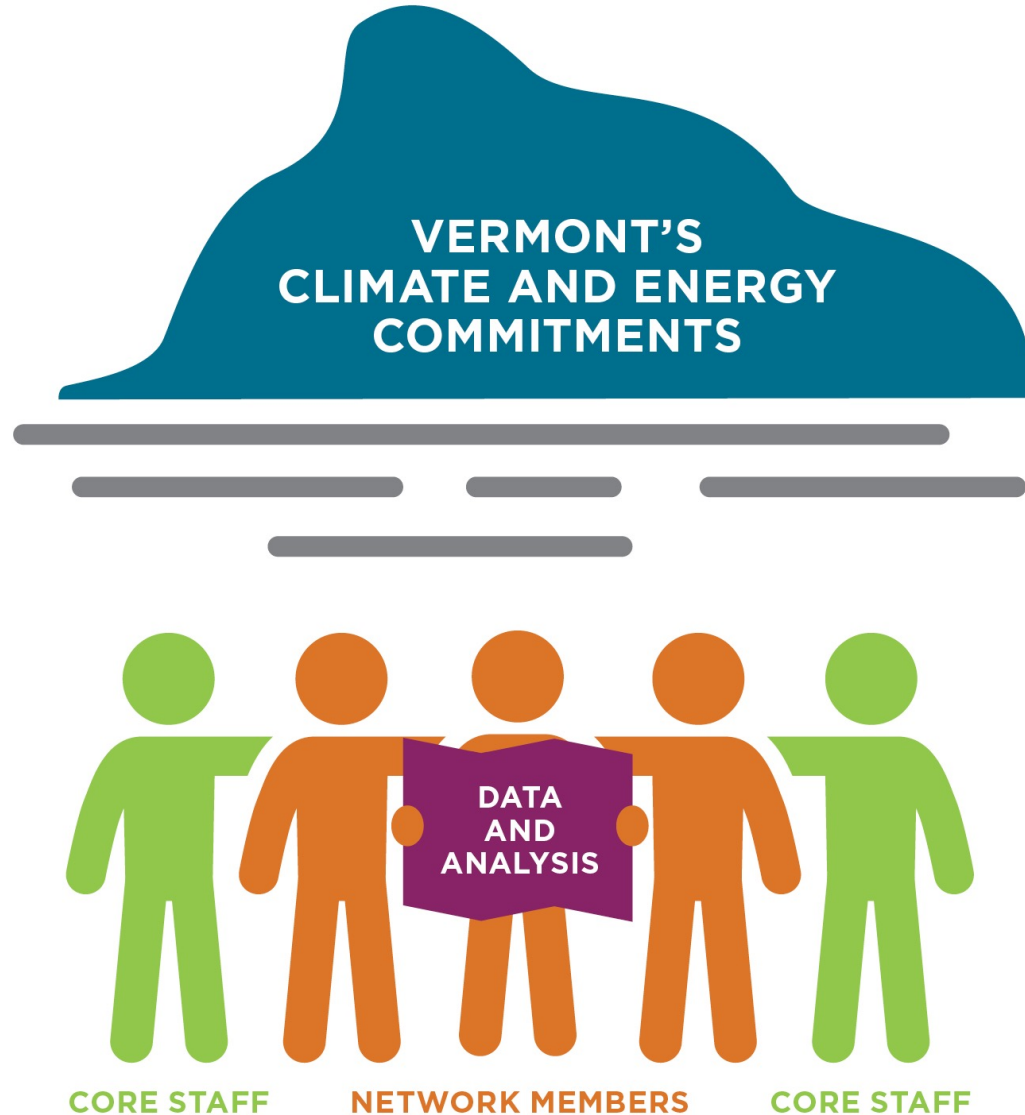
EAN Public Sector Partners

Over 100 Public Partners





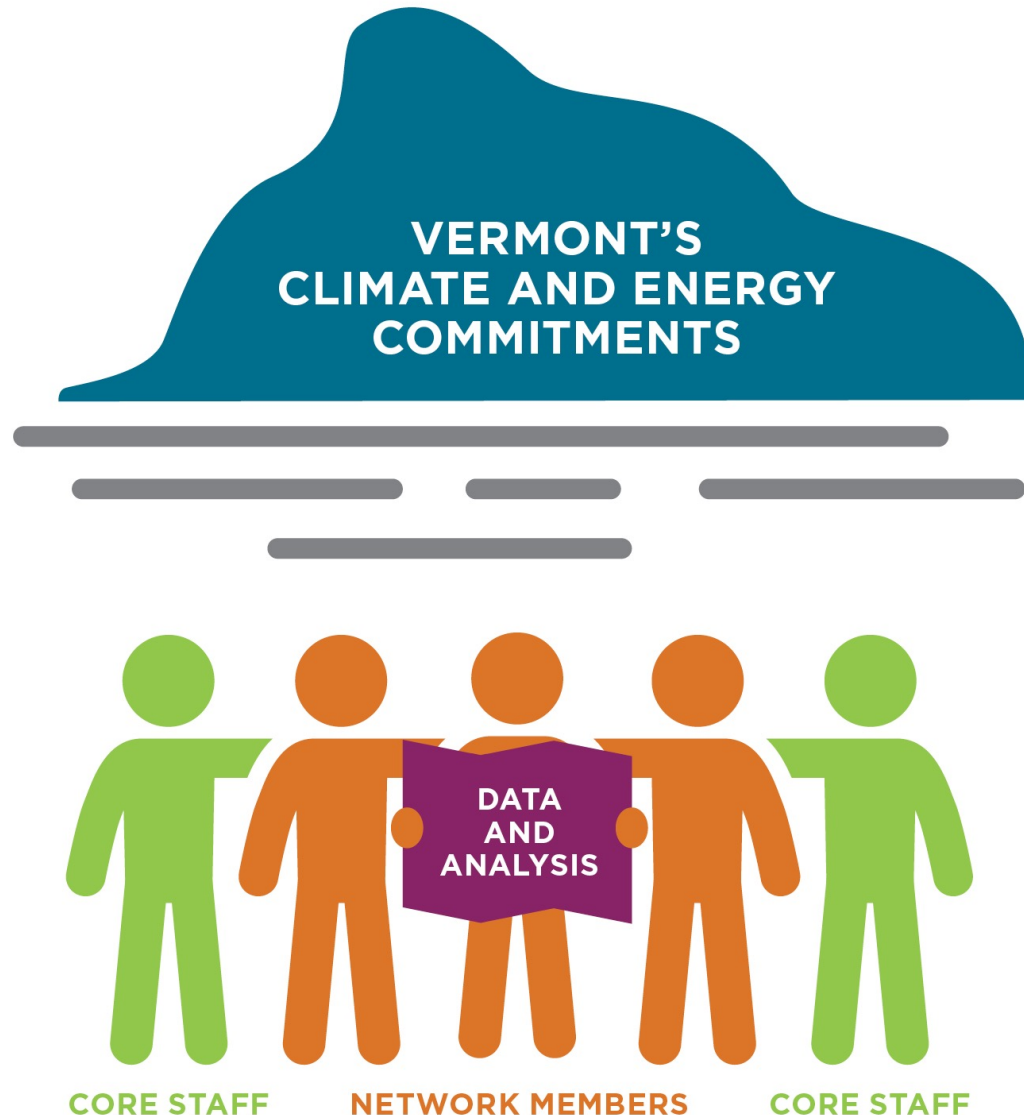
The Mission of EAN the Network



“To achieve Vermont’s climate and energy commitments in ways that create a more just, thriving, and sustainable future for Vermonters.”



The Role of EAN the Non-Profit Organization



- Serve as a **trusted, neutral convener** of **Network members** (ex. EAN Annual Summit; Network Action Teams)
- **Support communication across our broad and diverse Network of members and public sector partners** (ex. Total Energy News monthly newsletter).



Current Network Action Teams



Weatherization at Scale - 2020



Clean Heat Standard - 2020



Future of Rural Transit - 2020



Switch and Save - 2021



Climate Workforce - 2021



Tenant Weatherization Protection – 2022



Networked Geothermal Systems – 2022

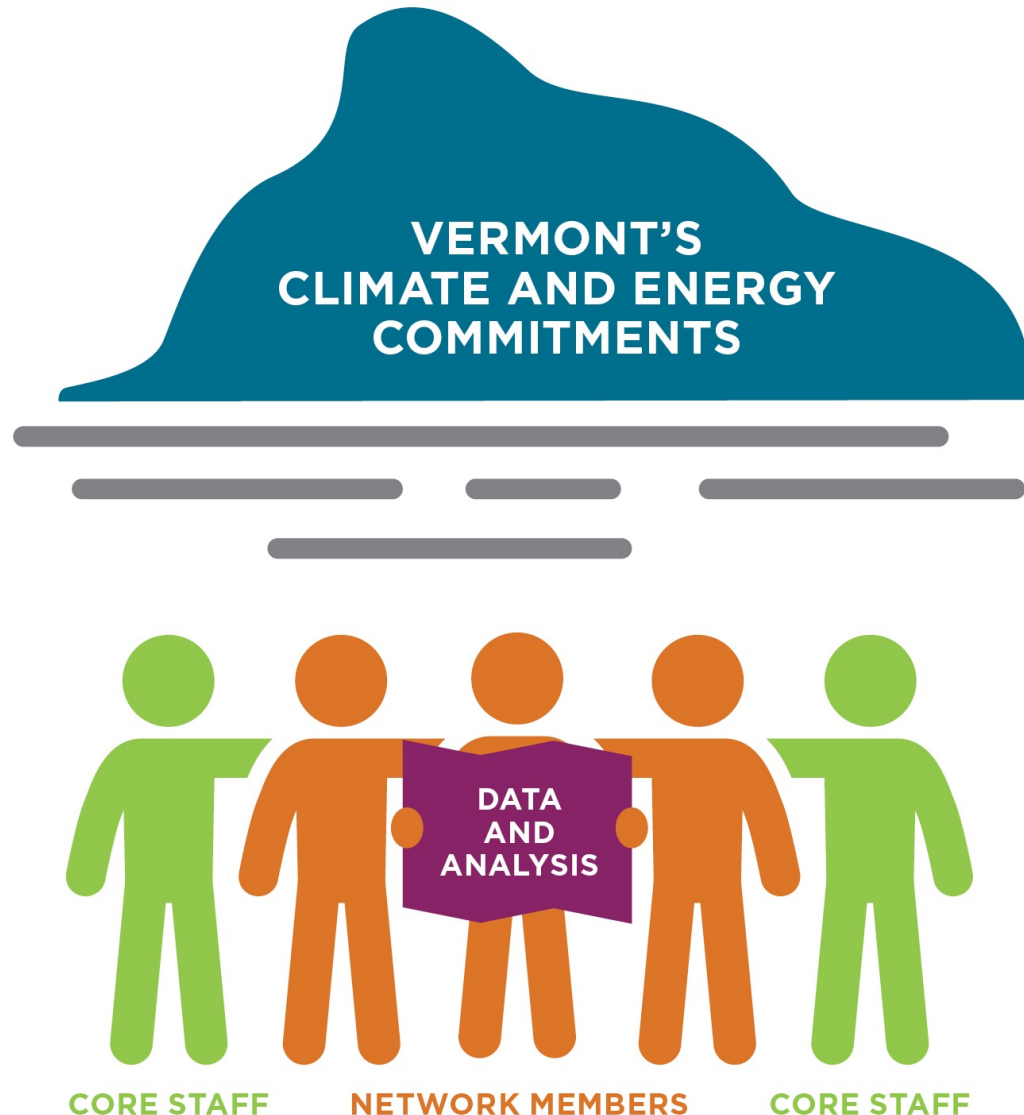


Transportation Cap & Invest – 2022





The Role of EAN the Non-Profit Organization

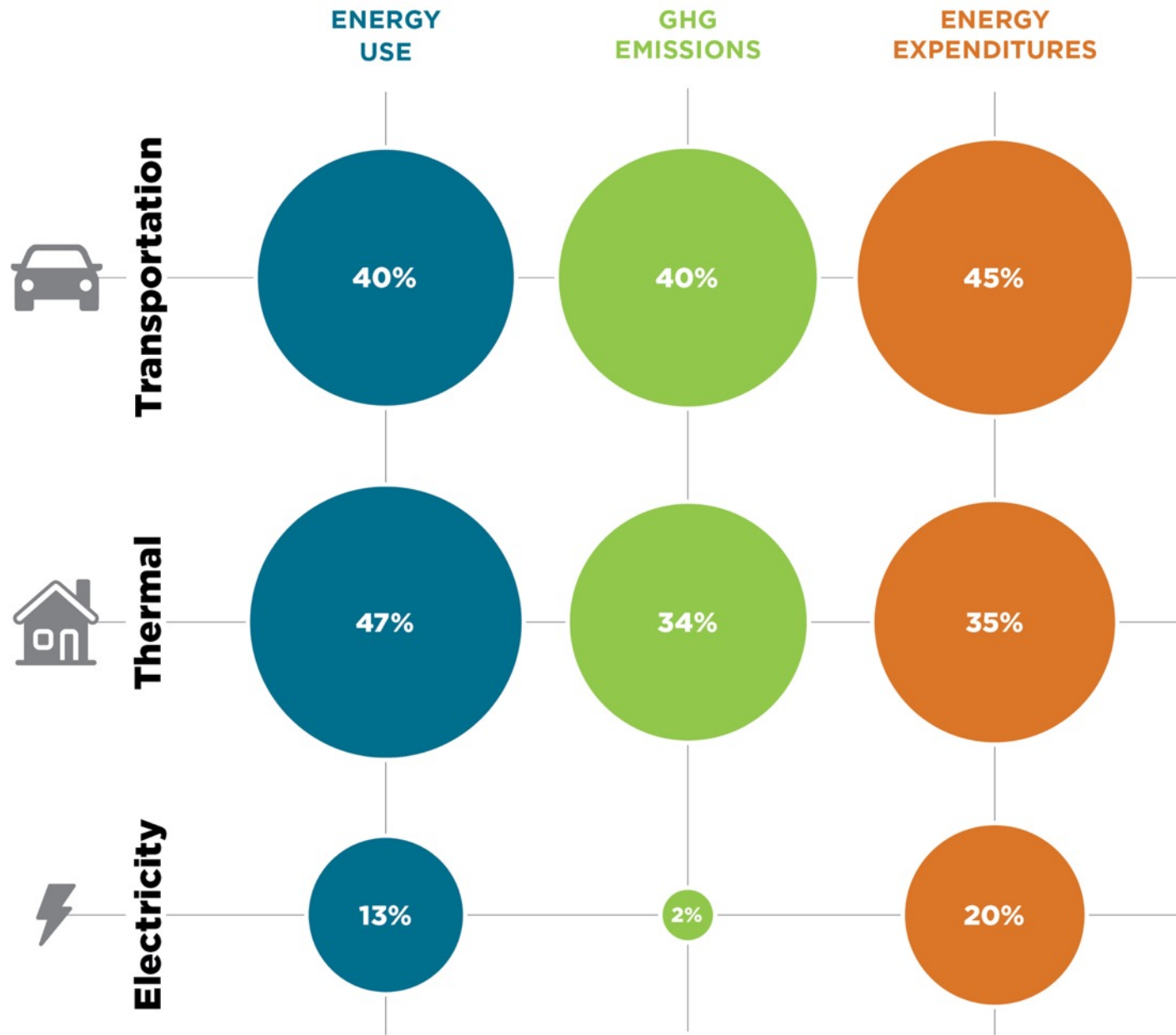


- **Collect, analyze, and report on emissions energy, equity, and economic data** (ex. EAN Annual Progress Report)
- Support **data-informed and evidence-based energy conversations** in Vermont



Some Key Takeaways from the 2022 EAN Annual Progress Report for Vermont

- VT now has legally binding **GHG reduction requirements** -- not goals.
- We are **not on track to meet the requirements for 2030.**
- **VT has not passed the policies** that could give us confidence that we could be on track, as **recommended in the Climate Action Plan.**
- Meeting our requirements can **save VTers money and strengthen the VT economy: \$6.4 billion in savings and avoided damages by 2050.**
- Nearly $\frac{3}{4}$ of our climate **pollution comes from transportation and thermal** – yet we have no sector wide policies to reduce those emissions, like we do with electricity.



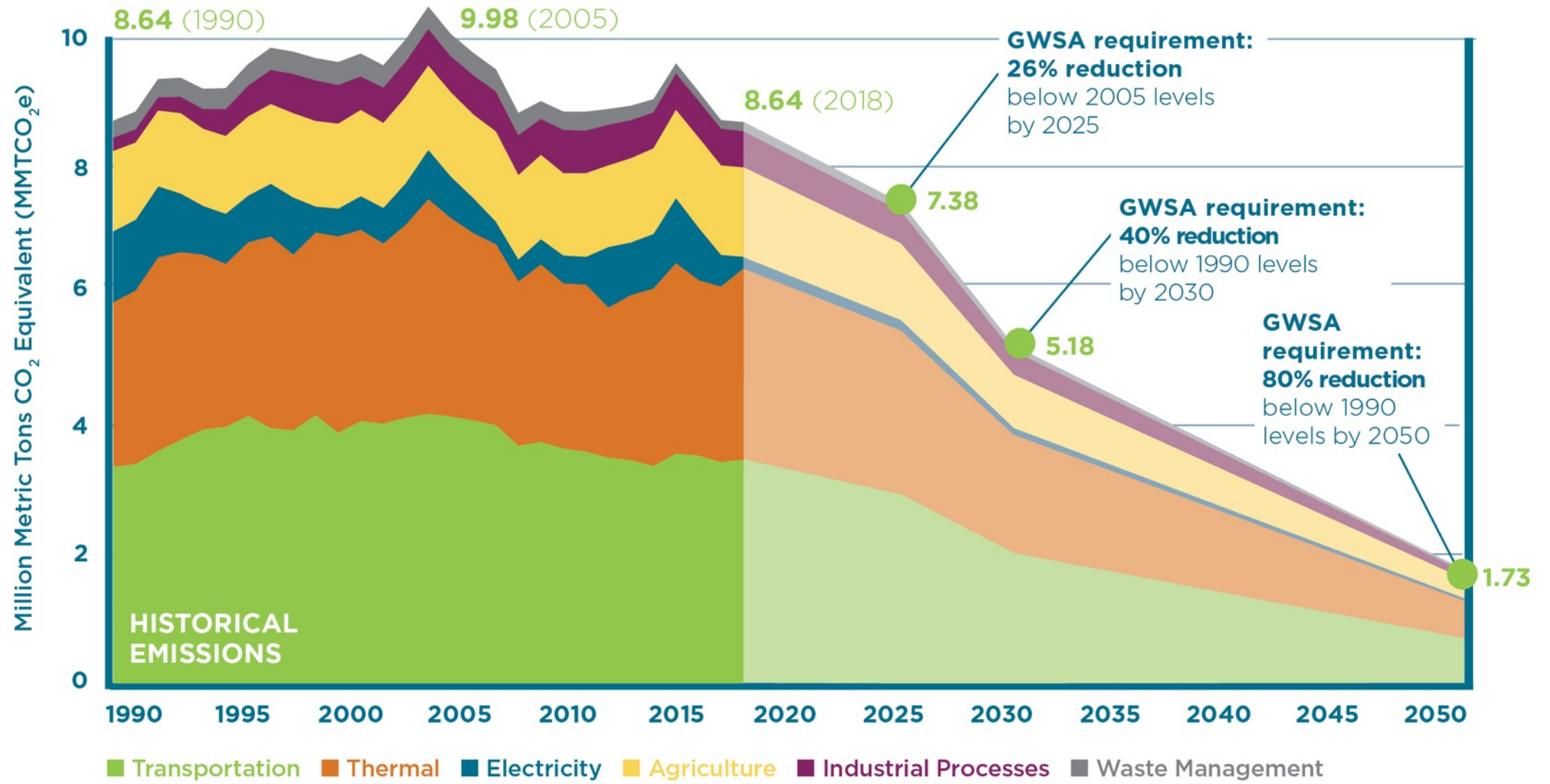
Source for Energy Use: Thermal and transportation based on EIA 2019 site energy; electricity from PSD site energy, after accounting for RECs.

Source for Emissions: VT Agency of Natural Resources, 2021. GHG Emissions Inventory, 1990-2018.

Source for Energy Expenditures: Vermont Energy Burden Report, VEIC (October 2019).



Vermont's historical GHG emissions and future requirements



Source: Vermont Agency of Natural Resources, Vermont GHG Emissions Inventory and Forecast (1990-2017), 2021.



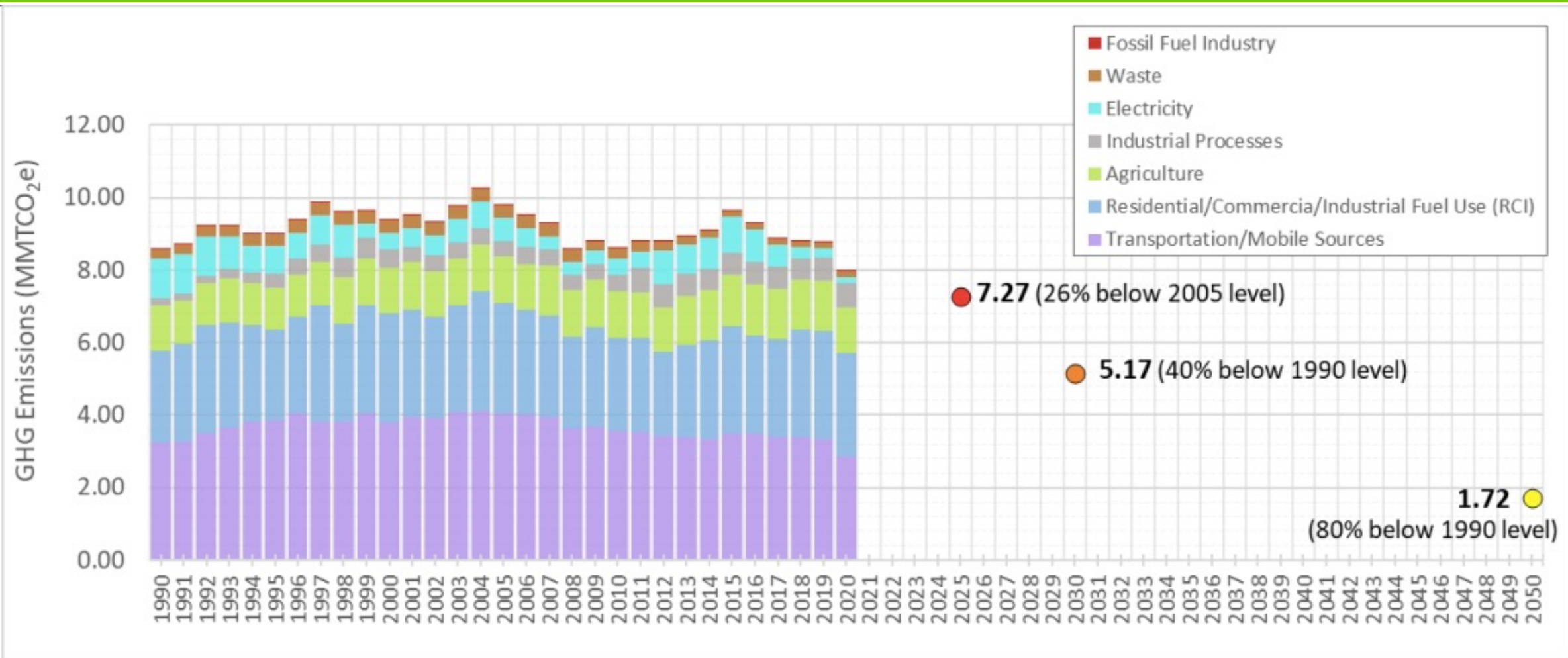


Note of Caution: Be Careful with 2020 Data

- The onset of the **pandemic** in March of 2020 created significant changes in VT energy use and emissions.
- Example: In 2020, **gasoline sales in VT dropped by 17%** (over 52 million gallons) and **diesel sales dropped by 7%** (4.5 million gallons). The combined effect was a **15% decline in VT transportation emissions in 2020**, compared to 2019.
- To what degree is 2020 data an **outlier**, subject to a **snap-back effect**?
- To what degree might some of the trends that emerged in 2020 prove more durable (i.e., an increase in remote/virtual work leading to less commuter miles?).
- To disentangle this carefully, we need to wait for 2021 and 2022 data.
- In the meantime, **be wary of drawing future year conclusions based on 2020 data.**



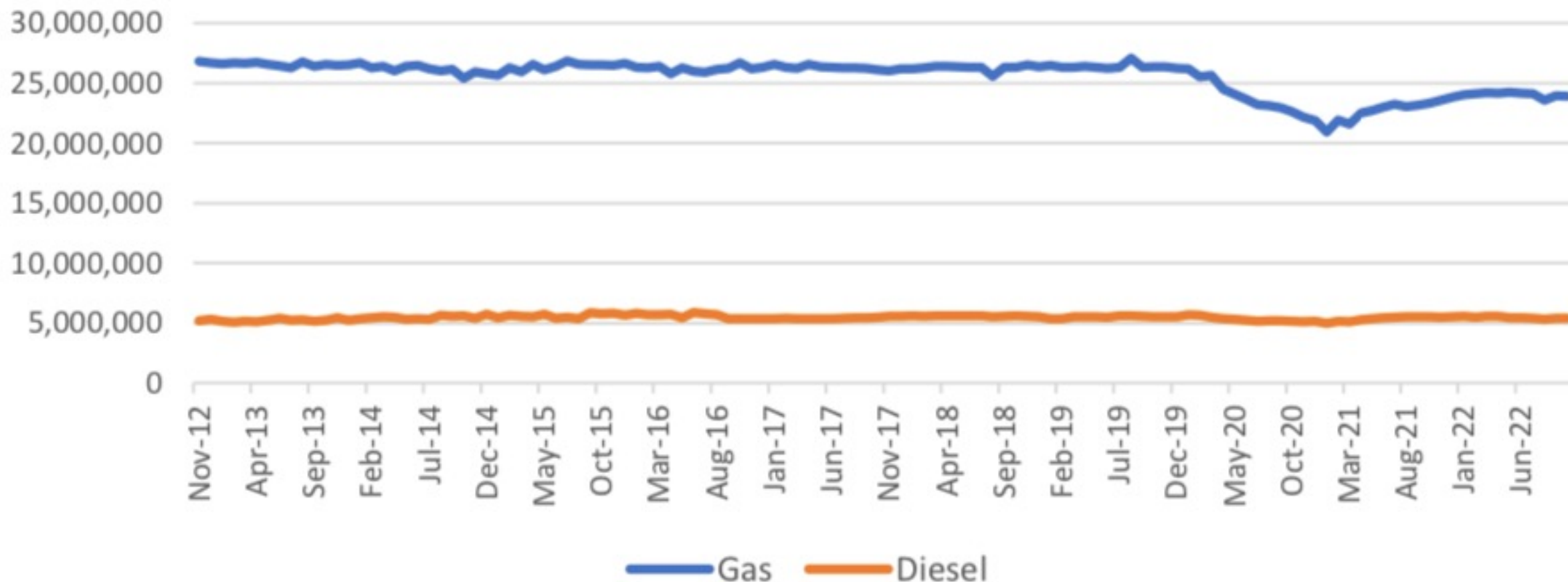
DRAFT 2020 VT GHG Inventory Figures from ANR



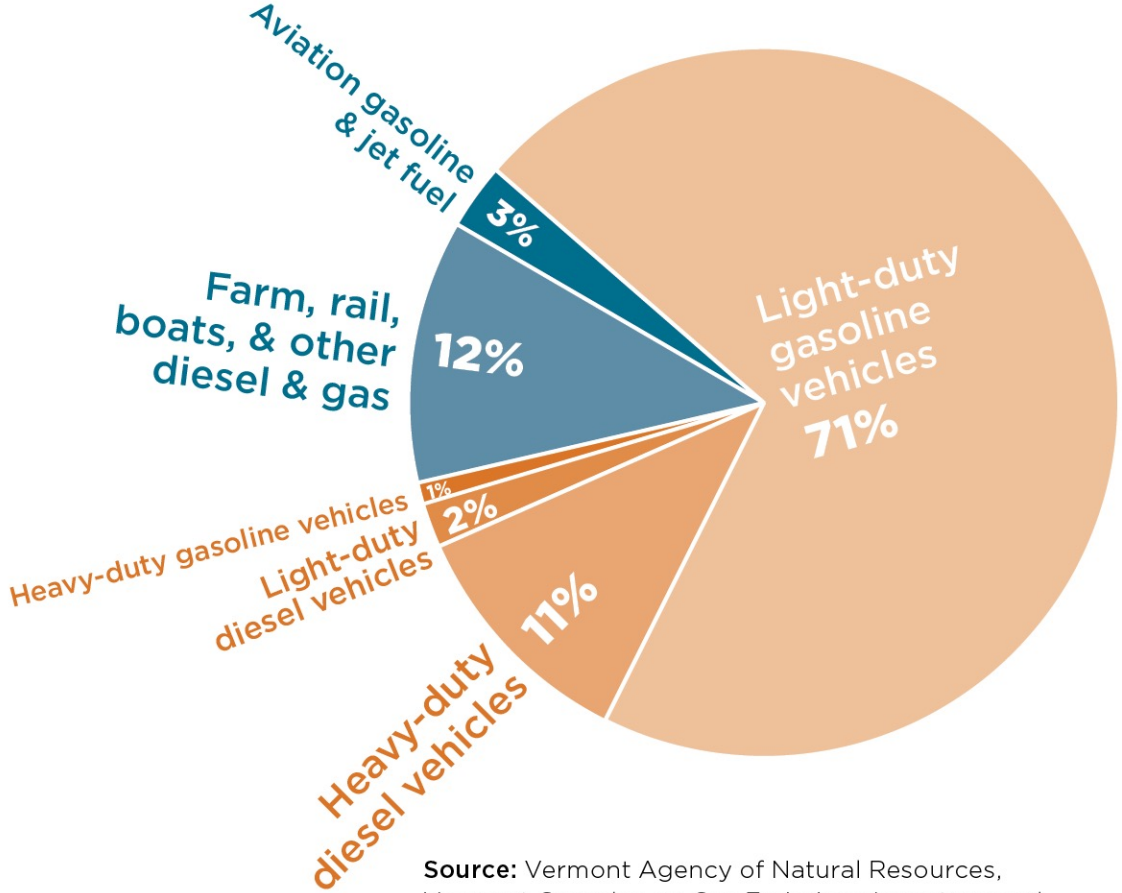


An Early Look from PSD's Annual Energy Report – Transportation Emissions Rebounding

Gas and Diesel Monthly Sales (12-Month Rolling Avg.)



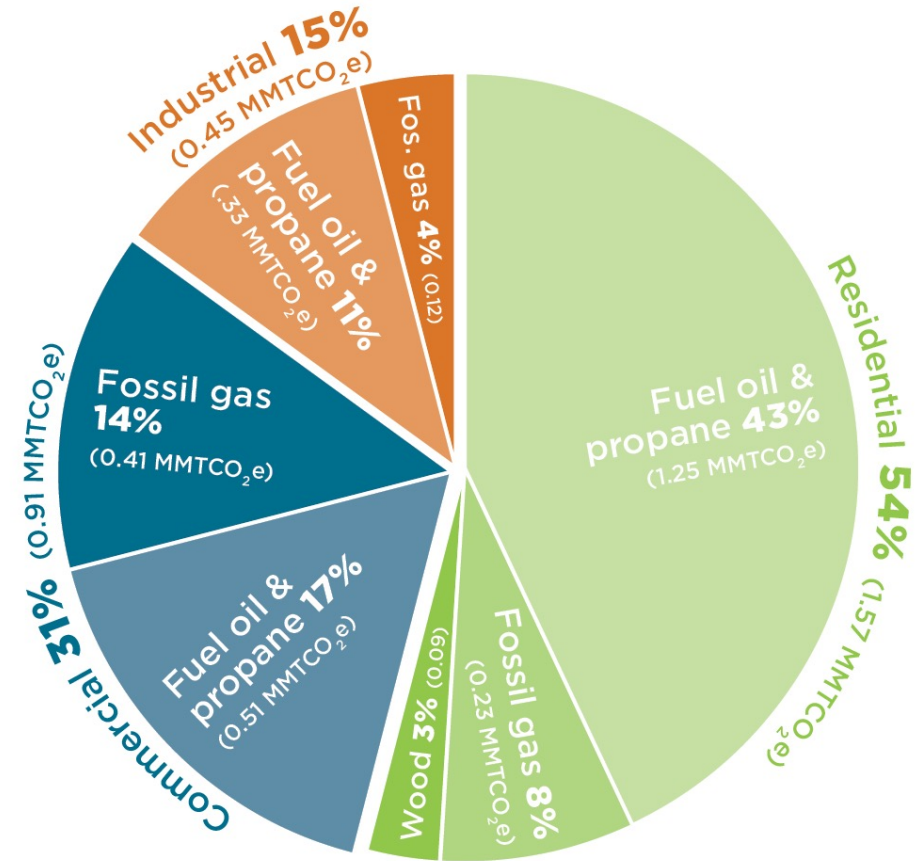
VT GHG emissions from transportation by type and fuel, 2017



Source: Vermont Agency of Natural Resources, Vermont Greenhouse Gas Emissions Inventory and Forecast (1990-2017), 2021.



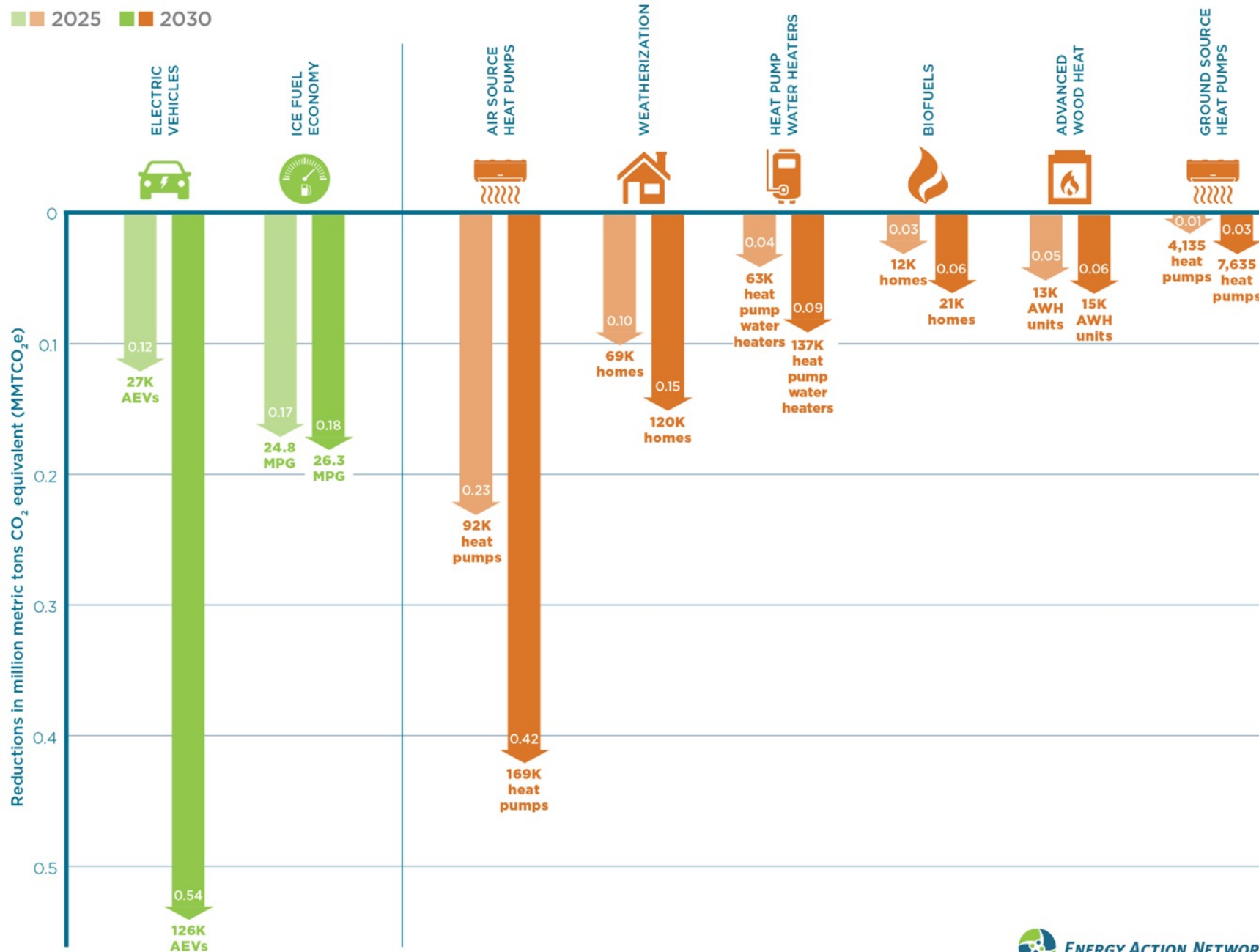
Vermont thermal GHG emissions by sector and fuel type



Source: Vermont Agency of Natural Resources, Vermont Greenhouse Gas Emissions Inventory and Forecast (1990-2017), 2021. There is a small amount of emissions from wood heating in the commercial sector, but it is too small to show up on this pie chart

Pathways emissions reductions, 2025 and 2030

2025 2030

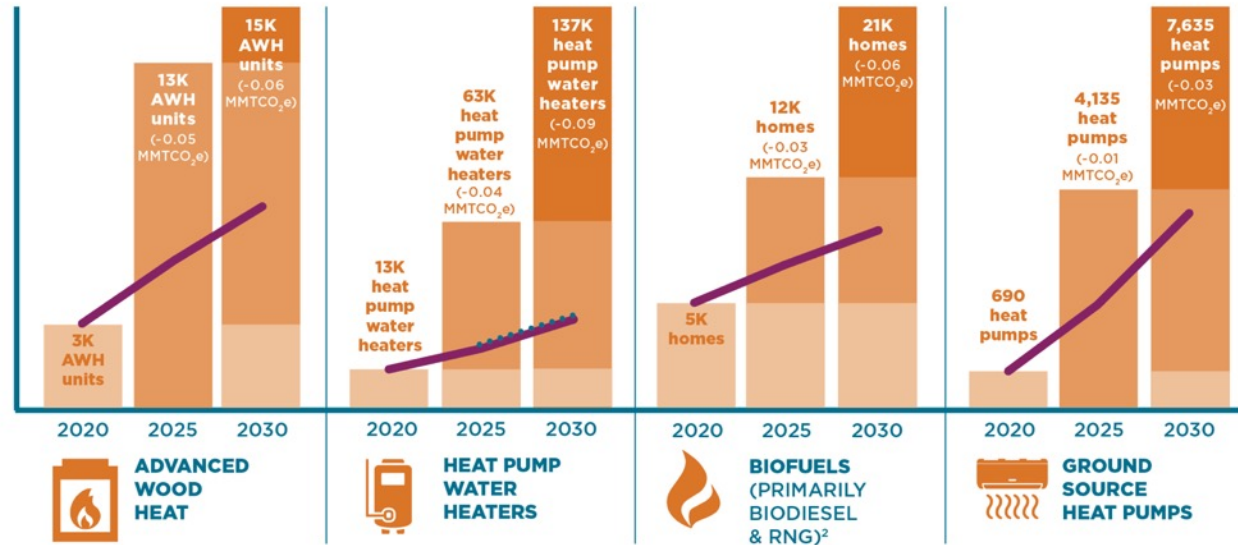
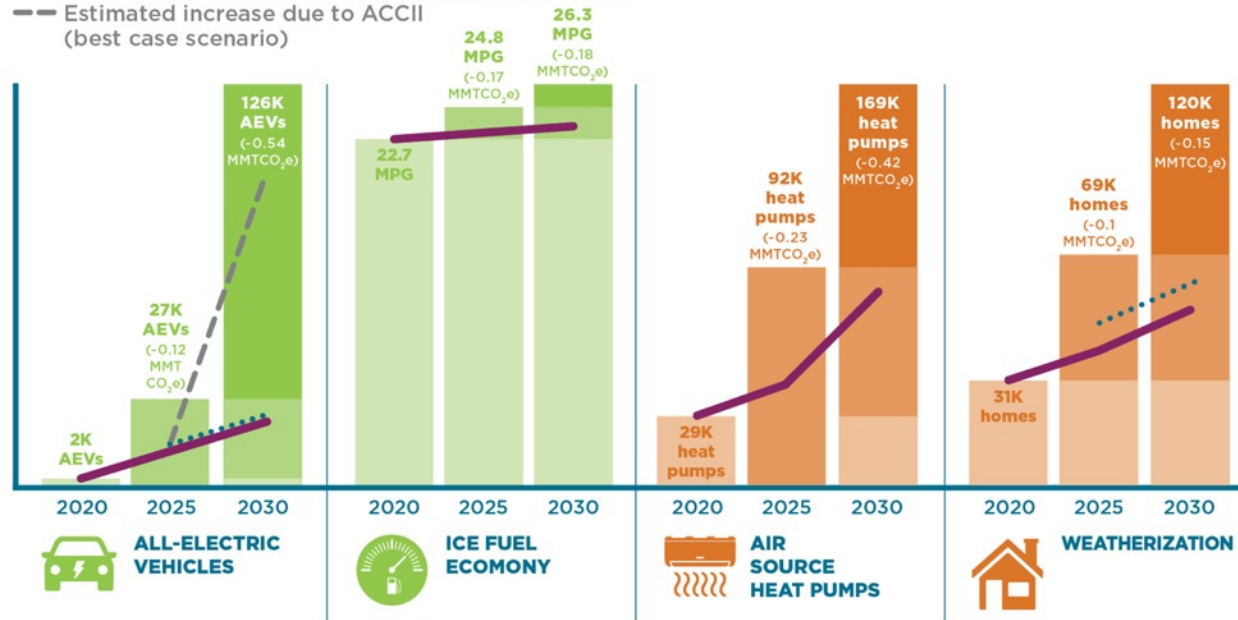


Top GHG reduction measures in Climate Council Pathways

— Business-as-usual projection implied by existing policies as of fall 2021

•••• Estimated increase from FY23 budget investments¹

— Estimated increase due to ACCII (best case scenario)





Status of the 3 Most Significant Climate Action Plan (CAP) Recommendations for GHG Reduction

1. Clean Heat Standard

- Expected share of total emissions reduction requirement by 2030: **34%**
- Status: **Not yet adopted**. (Vetoed by Governor, 1 House vote short of override in 2021).

2. Advanced Clean Cars II and Advanced Clean Trucks rules

- Expected share of total emissions reduction requirement by 2030: **14%**
- Status: **Adopted**. (Proposed by Agency of Natural Resources; approved by Legislative Committee on Administrative Rules; adopted as of Dec.16th, 2022).

3. Transportation and Climate Initiative Program (TCI-P)

- Expected share of total emissions reduction requirement by 2030: Approx. **10%**
- Status: **Stalled** ("regional viability", or at least 3 participating states moving forward to implement the program, no longer exists since the decisions of CT, RI, and MA to withdraw from TCI-P in late 2021. Future uncertain).

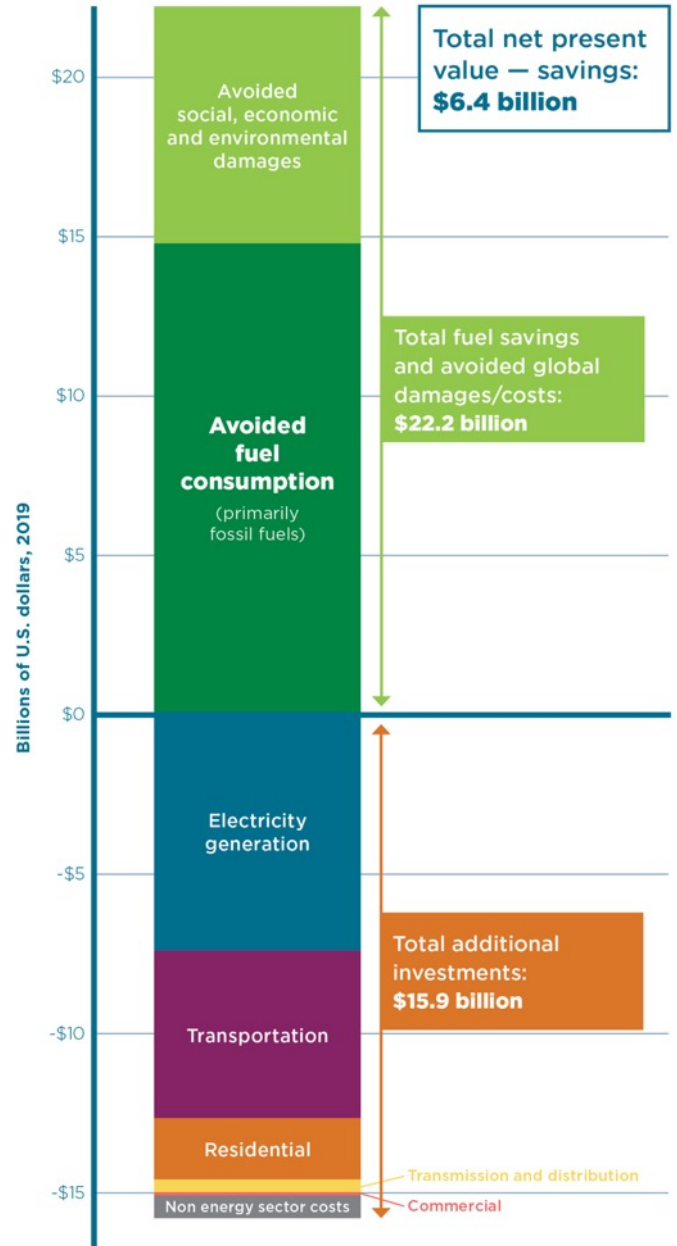


Addendum to the CAP re: Transportation Policy

“The only currently known policy options for which there is strong evidence from other states, provinces, and countries of the ability to confidently deliver the scale and pace of emissions reductions that are required of the transportation sector by the GWSA are one or a combination of:

- a) a cap and invest/cap and reduce policy covering transportation fuels
and/or
- b) a performance standard/performance-based regulatory approach covering transportation fuels.”

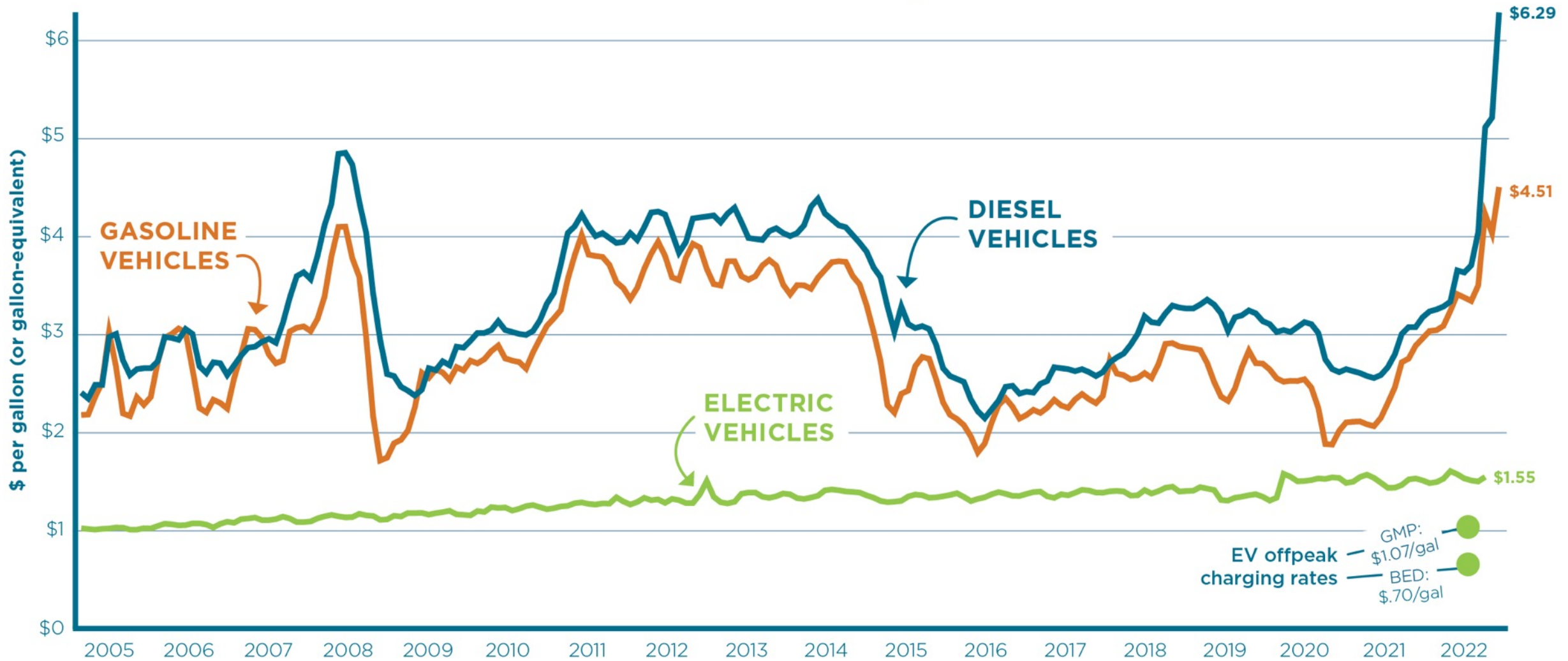
Climate Action Plan: \$ savings from pathways, net present value, 2015-2050



Source: Cadmus/EFG, Vermont Pathways Analysis Report 2.0, 2022.

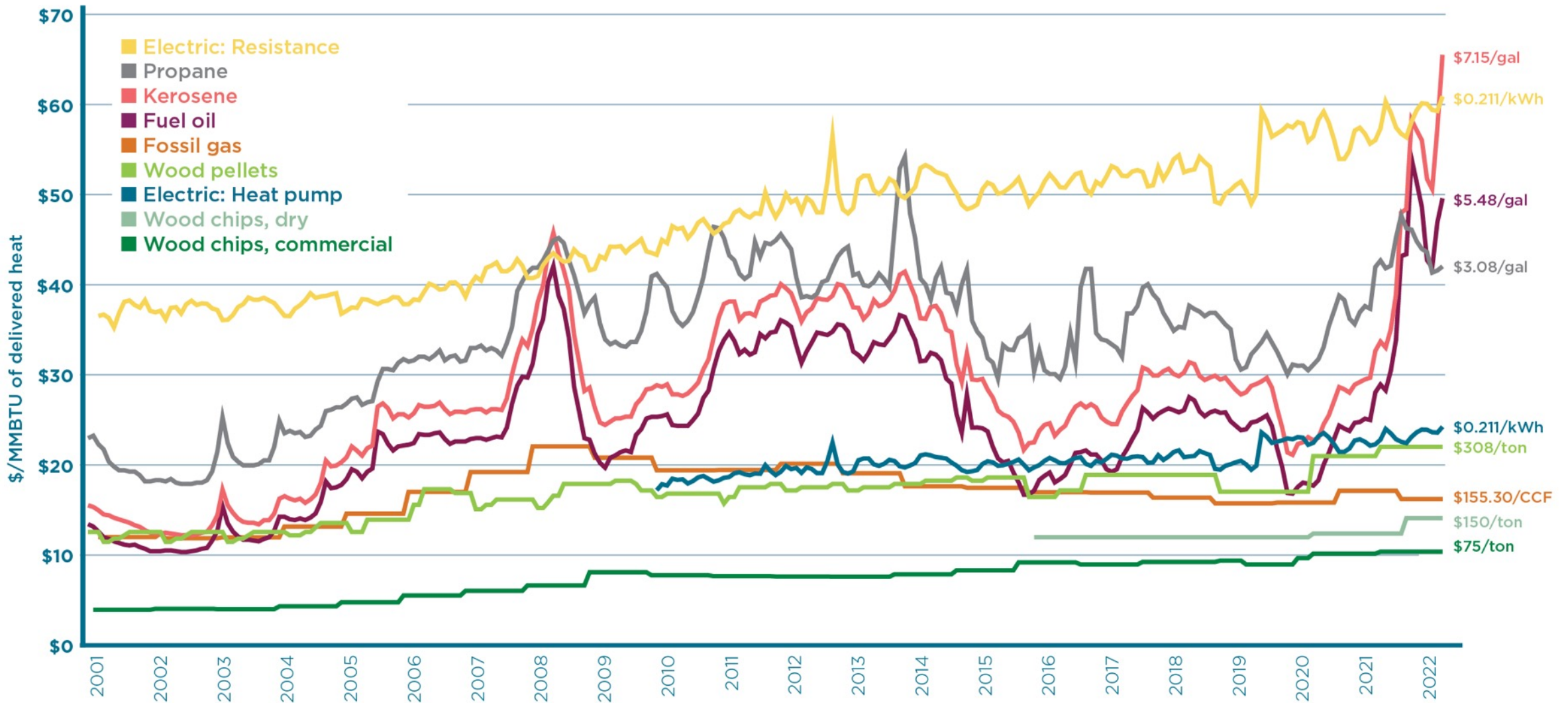


Gasoline and diesel vehicles are more expensive to drive than EVs



Sources: Gas and Electric — Drive Electric VT (via EIA); Diesel — Vermont Agency of Transportation (VTTrans). Diesel and gas prices as of May 2022; electricity price as of March 2022.

Cost comparison of different heating fuel options over time

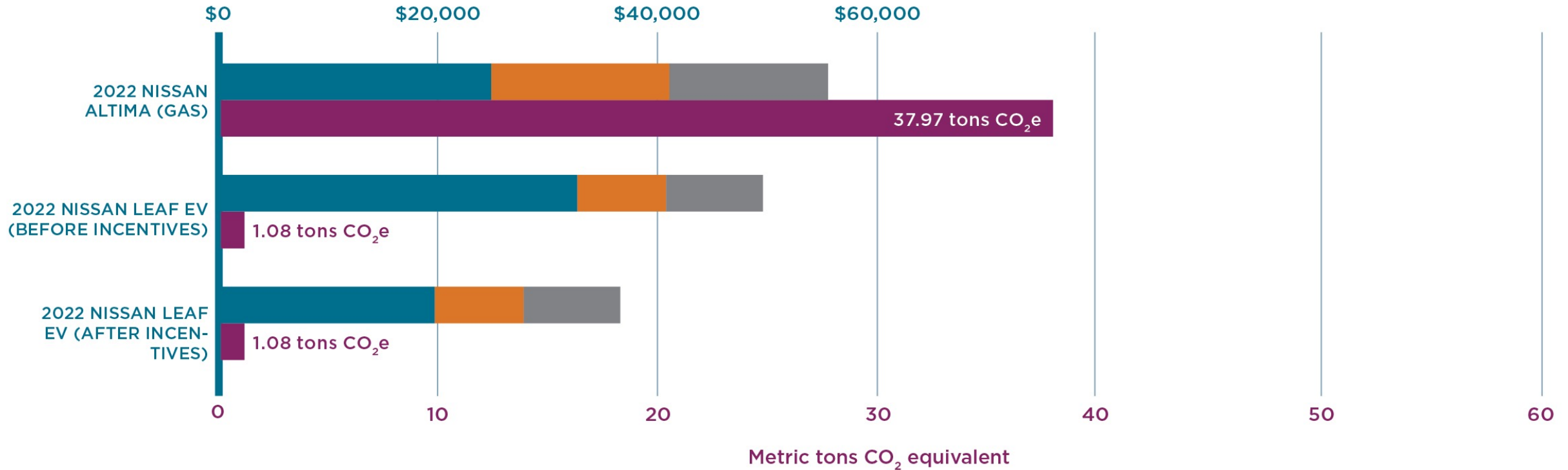


Sources: Fuel Oil, Propane, Kerosene, Wood Pellets: VT Department of Public Service, Fuel Price Report, 2021. Fossil Gas, Electricity: EIA, 2021. Wood Chips: Biomass Energy Research Center, 2021. Note 1: Electricity prices presented here are a statewide average. Electricity prices vary by utility territory. Note 2: The reason propane can be 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. Propane's energy content is only 66% that of fuel oil, by gallon (EIA).



Costs and emissions of comparable gas vs EV passenger cars

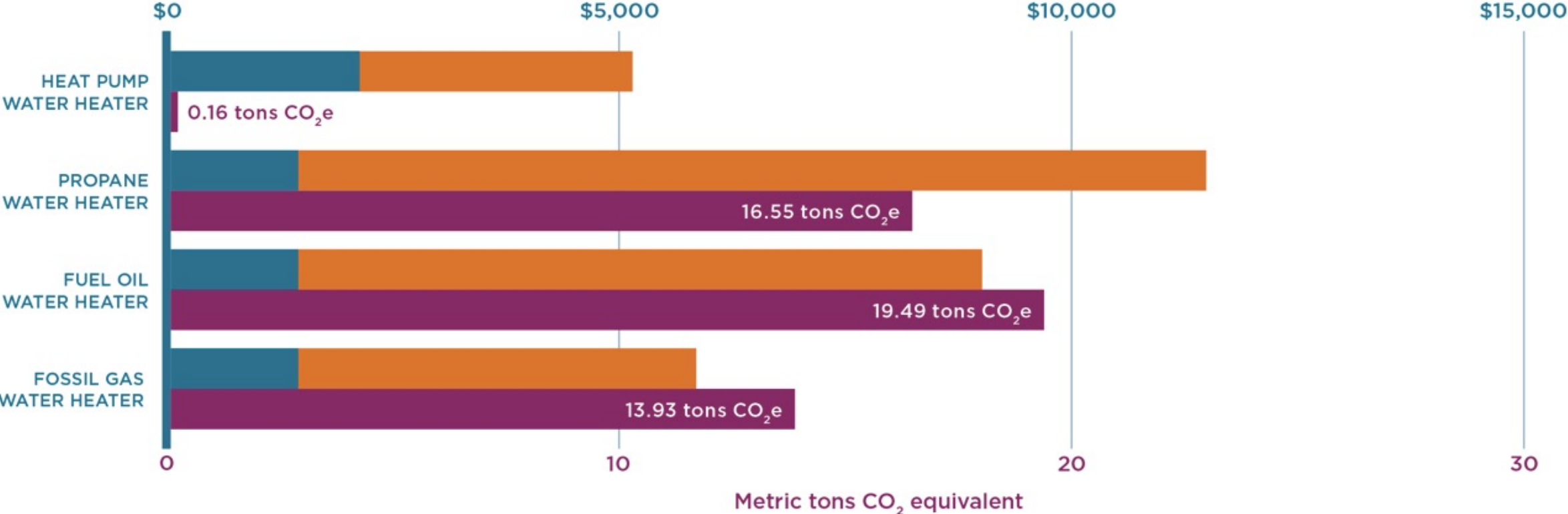
■ Cost of vehicle ■ Fuel for 12 years ■ Maintenance for 12 years ■ GHG emissions for 12 years



Sources and notes: Fuel costs are based on the average from December 2021 to May 2022 of \$3.75/gallon of gasoline, and the May 2022, Green Mountain Power rate of \$0.177/ kWh of electricity. CO₂e value for VT electricity is 52 lbs/MWh. CO₂e value for gasoline is 19.4 lbs/gallon. For EV vs ICE costs: EPA, Alternative Fuels Data Center Cost Calculator, 2022. For EV vs ICE Maintenance costs: U.S. Department of Energy, "FOTW #1190, Battery-Electric Vehicles Have Lower Scheduled Maintenance Costs than Other Light-Duty Vehicles", 2021. For vehicle costs: Drive Electric Vermont, 2022. For CO₂e values of VT electricity: Vermont Agency of Natural Resources, 2021. For fossil fuel CO₂e values: EIA, 2022. For fuel costs: PSD, 2022. For electricity rates GMP 2022.

Costs and emissions from home water heating

■ Equipment cost ■ Lifetime fuel cost (12 years) ■ GHG emissions in tons CO₂e for 12 years

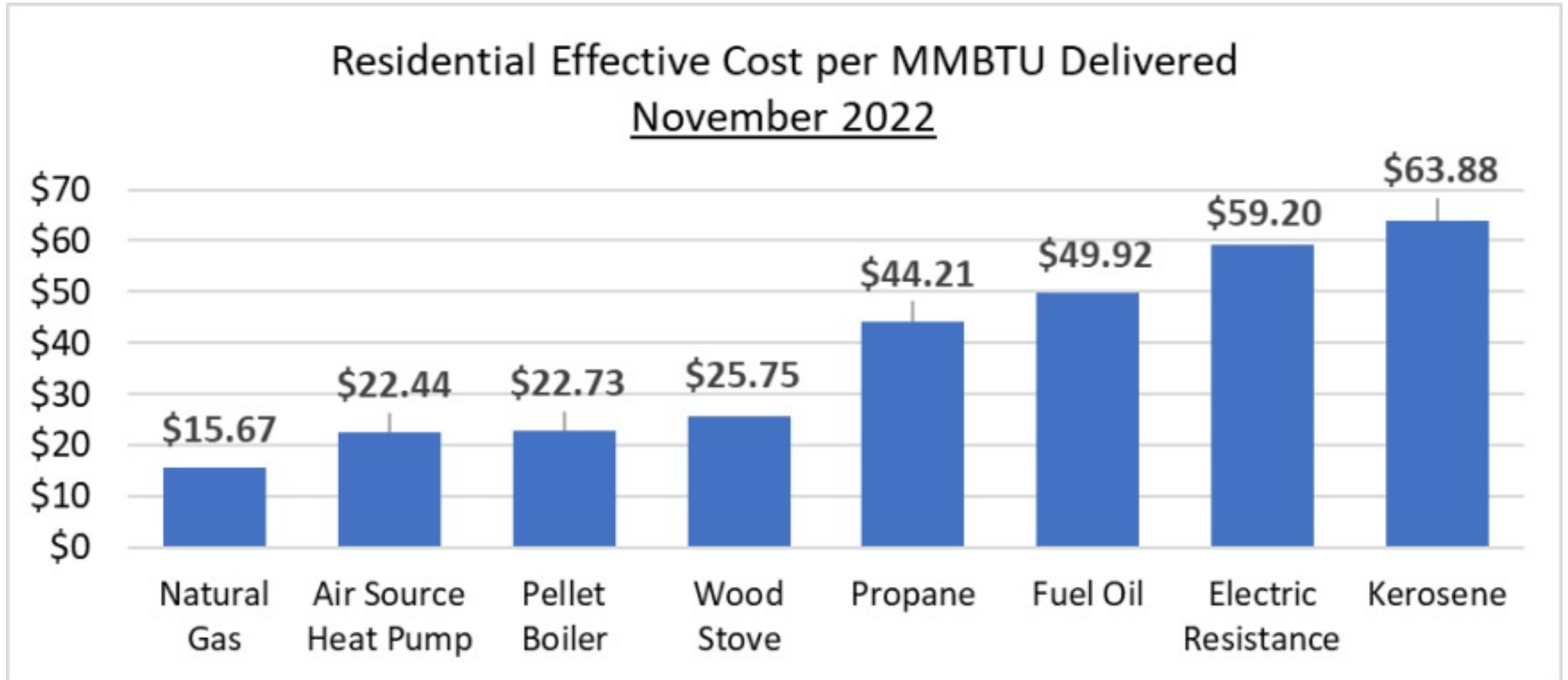


Notes: Fuel costs used were the May 2022 Green Mountain Power rate of \$0.177/kWh, the average of the 2021/22 heating season for propane at \$3.16/gallon, fuel oil at \$3.61/gallon, and wood pellets at \$300/ton, and the listed rates for fossil gas from VGS for Aug 2022. **Sources:** For CO₂e values of VT electricity and wood pellets: Vermont Agency of Natural Resources, 2021. For fossil fuel CO₂e values: EIA, 2022. For fuel costs: PSD, 2022. For electricity rates GMP 2022. Equipment pricing from the TAG TRM where available. Additional pricing sources can be shared on request.

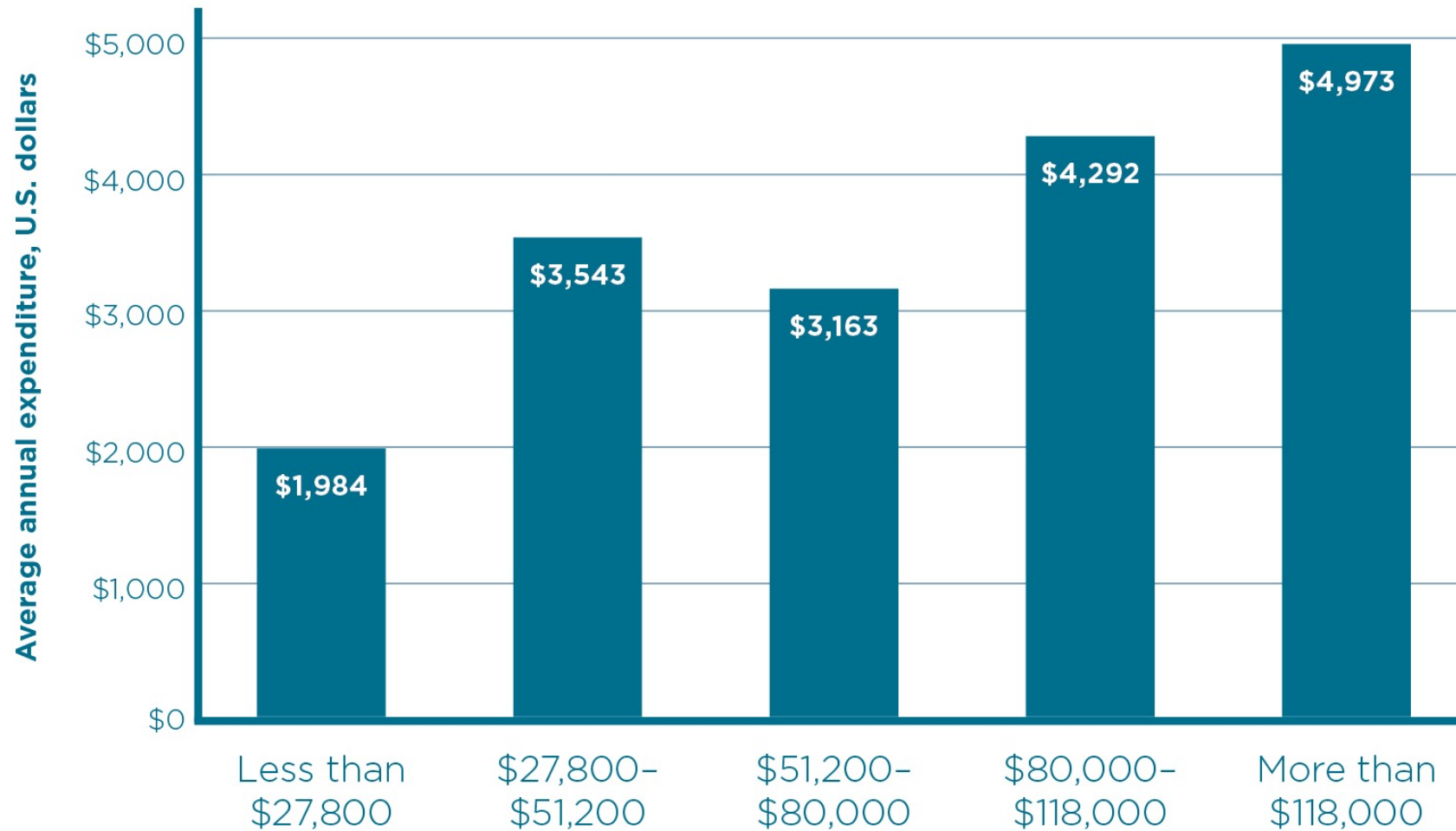




Another View on Heating Costs Comparison (PSD Annual Energy Report)

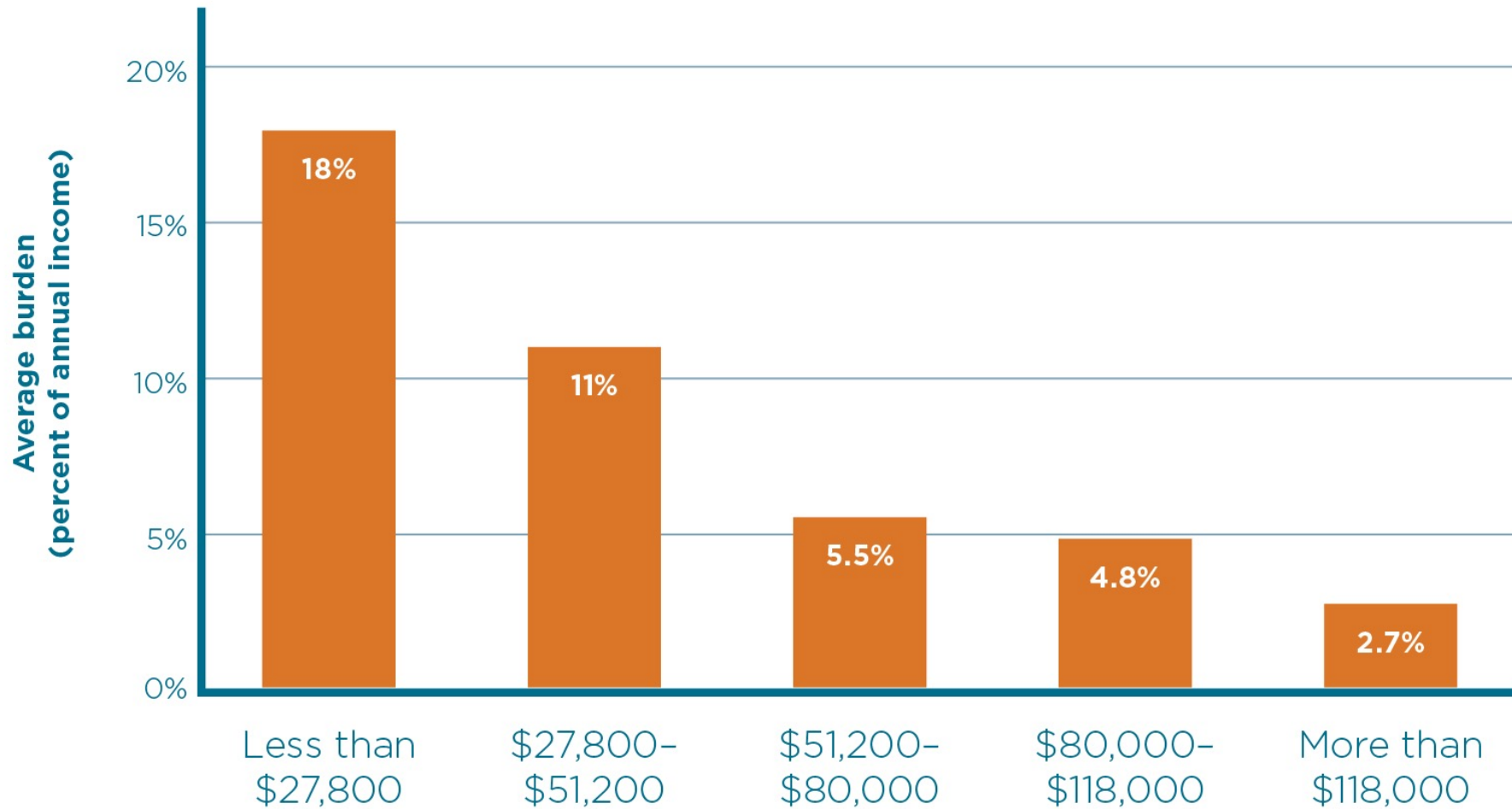


Combined heating and electricity expenditures in Vermont, by income quintile



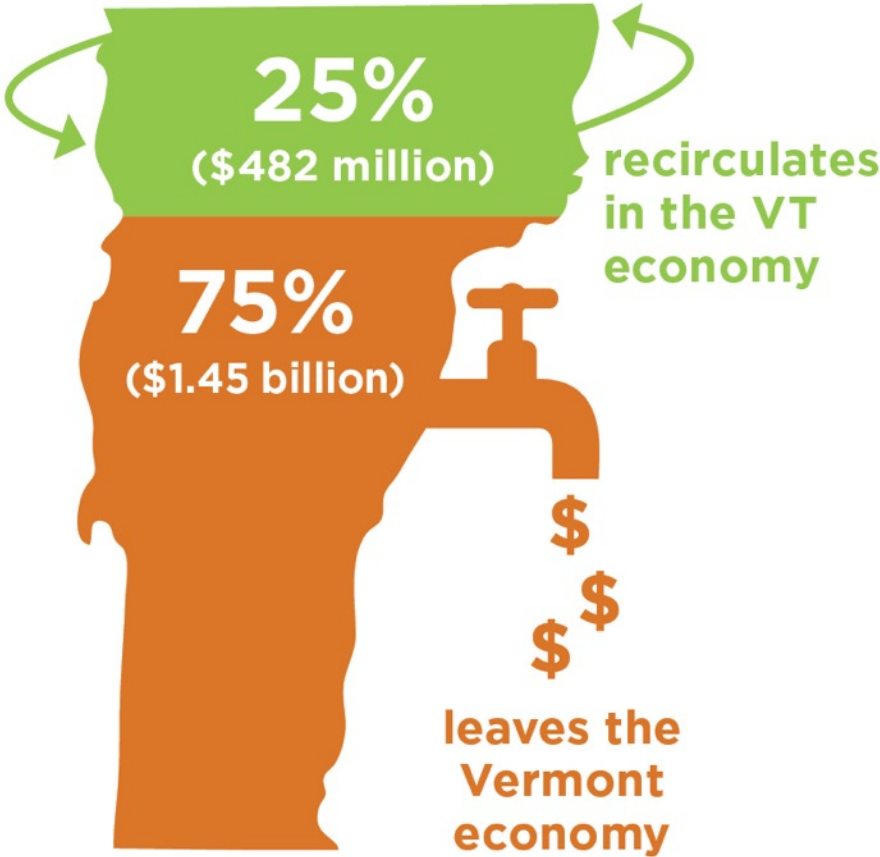
Source: U.S. Census Bureau, American Community Survey, 2018.

Combined heating and electricity energy burden in Vermont, by income quintile



Source: U.S. Census Bureau, American Community Survey, 2018.

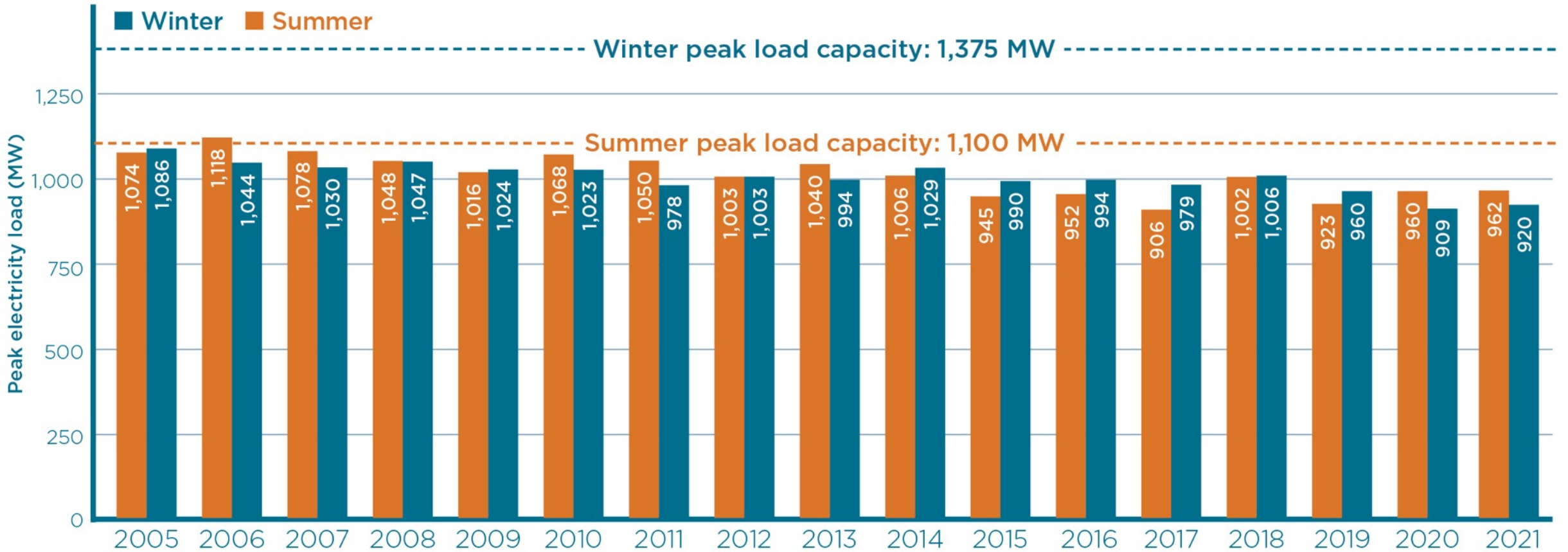
Average annual fossil fuel spending in VT, 2010-2019



Source: Vermont Agency of Commerce and Community Development, 2022.

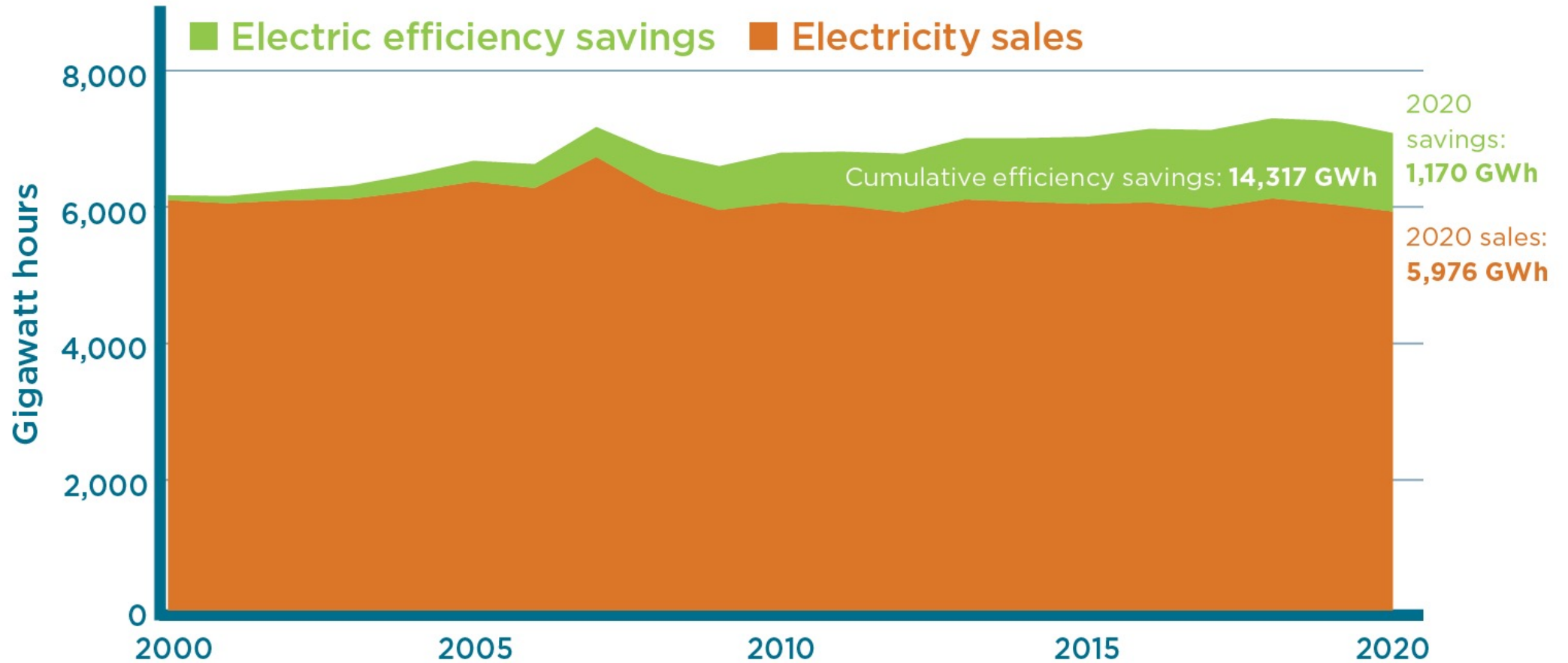


Vermont seasonal peak electricity loads, 2005-2021



Source: VELCO, 2022. This data shows VELCO's VT Load actuals. In the 2020/21 EAN Report we instead showed the VT Billing Load from ISO-NE, which is different.

Electricity savings from electric efficiency utilities



Source: Vermont Department of Public Service, 2021 Annual Energy Report, 2021. Data includes Efficiency VT and Burlington Electric Department.





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Questions about the Report?
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