



ENERGY ACTION NETWORK

# ANNUAL PROGRESS REPORT

for VERMONT  
2022

Emissions

Energy

Equity

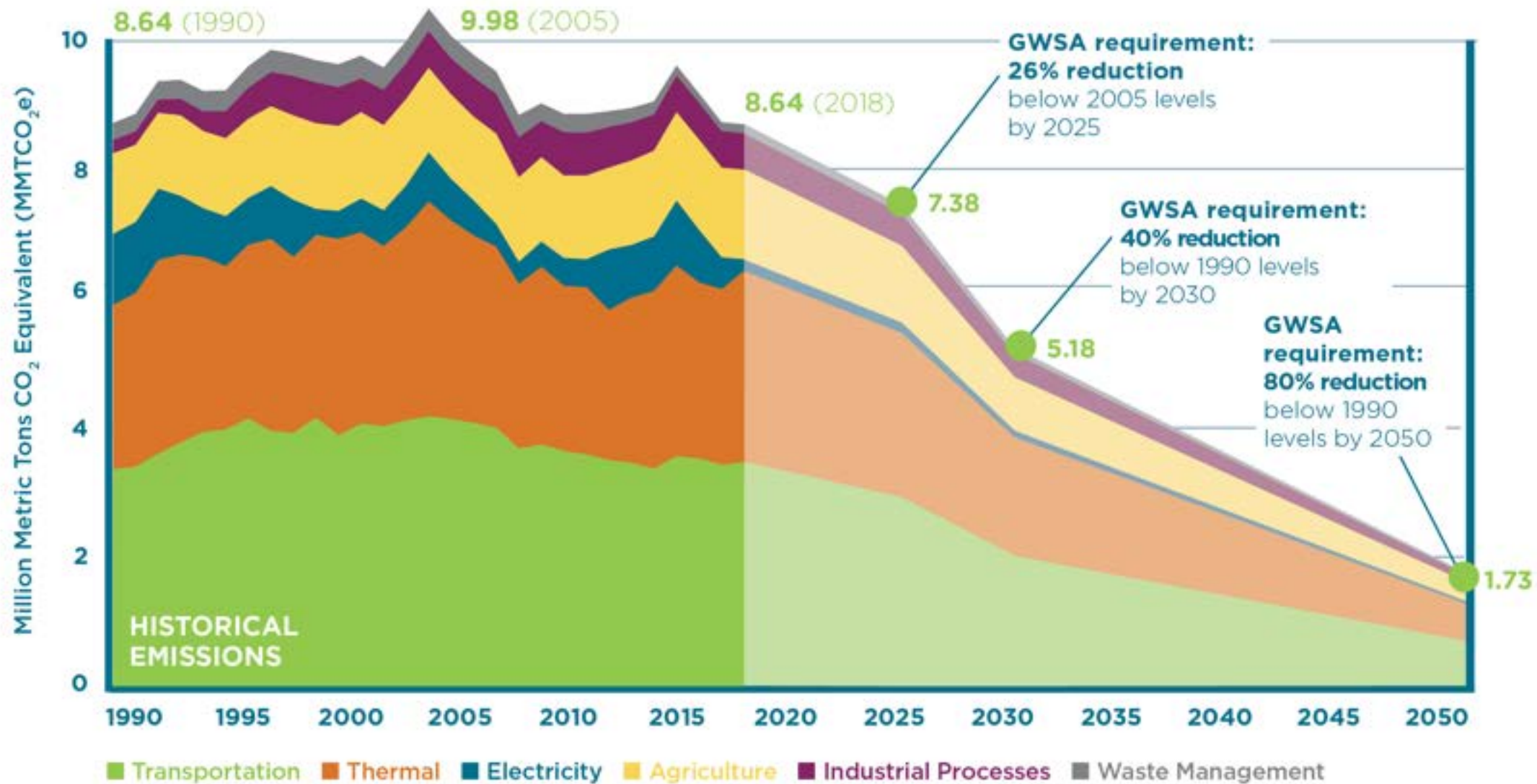
and the Economy



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

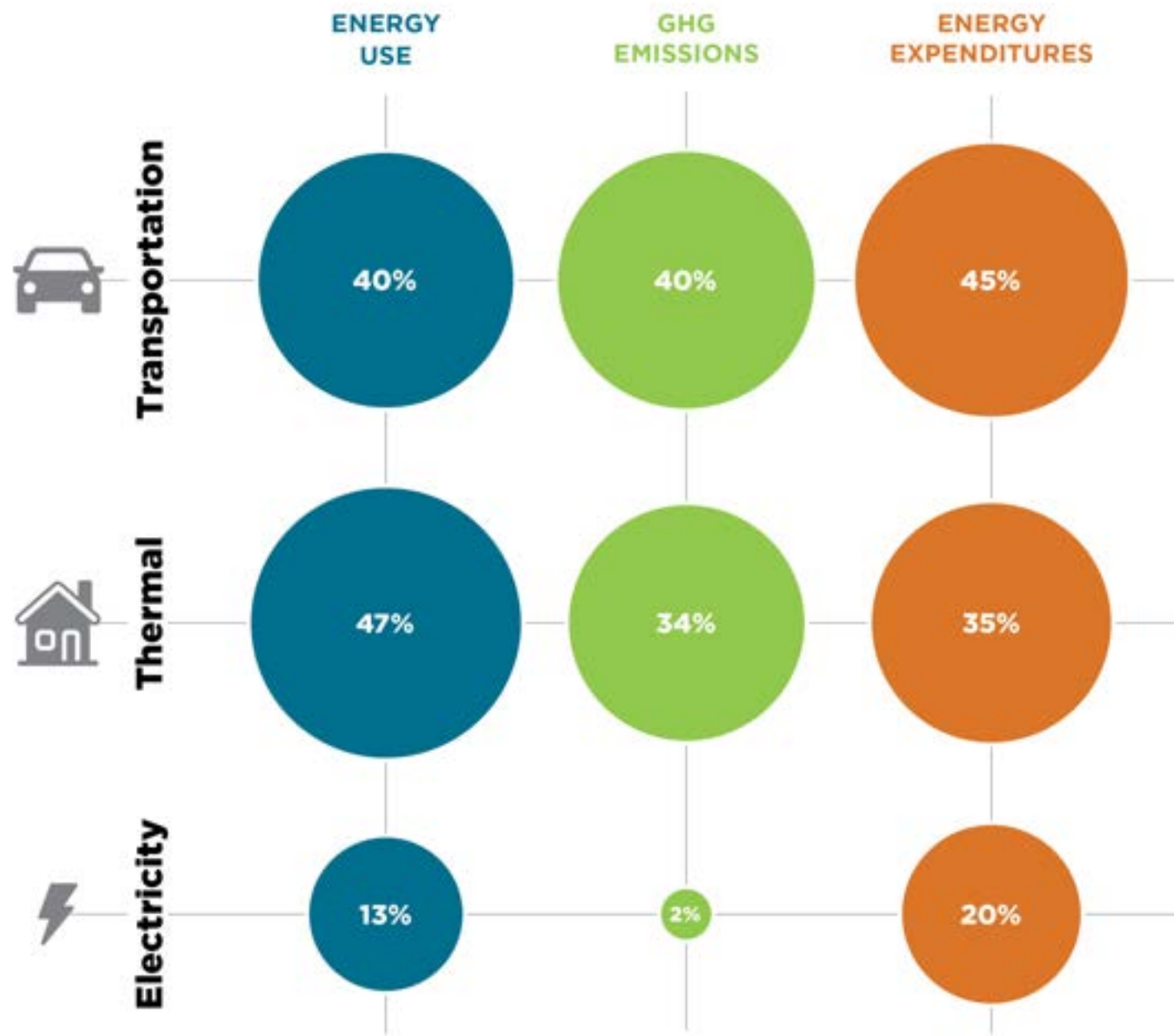
- VT now has legally binding **GHG reduction requirements** -- not goals.
- We are **not on track to meet the requirements for 2030.**
- **VT has not passed the policies** that could give us confidence that we could be on track, as **recommended in the Climate Action Plan.**
- Meeting our requirements 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.

# Vermont's historical GHG emissions and future requirements



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





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).





# It Is (Past) Time to Act. Why?

- VT Has a Legal Requirement in Line w/ Science: 40% Reduction Below 1990 GHG Levels by 2030
- Moral Responsibility
- Opportunity to Reduce Energy Cost Burdens



# 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).

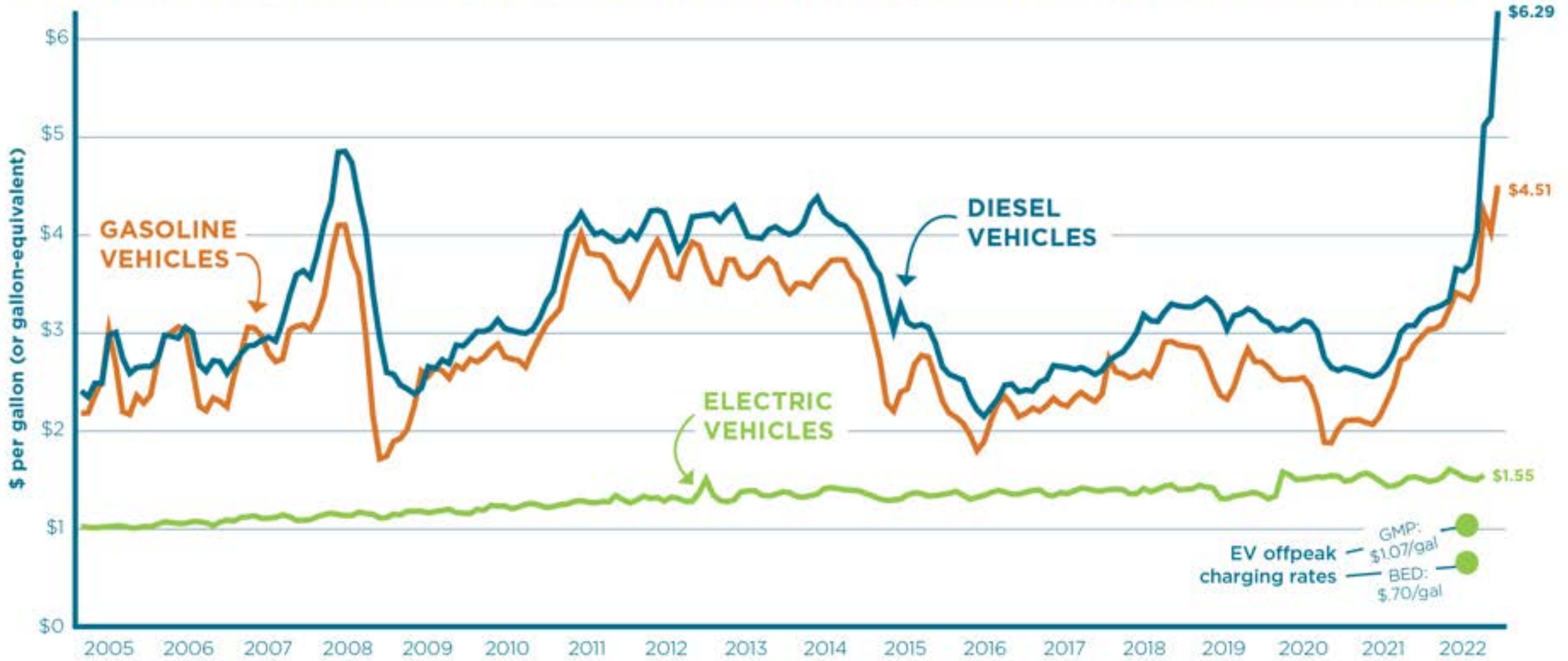
## 2. Advanced Clean Cars II and Advanced Clean Trucks rules

- 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)

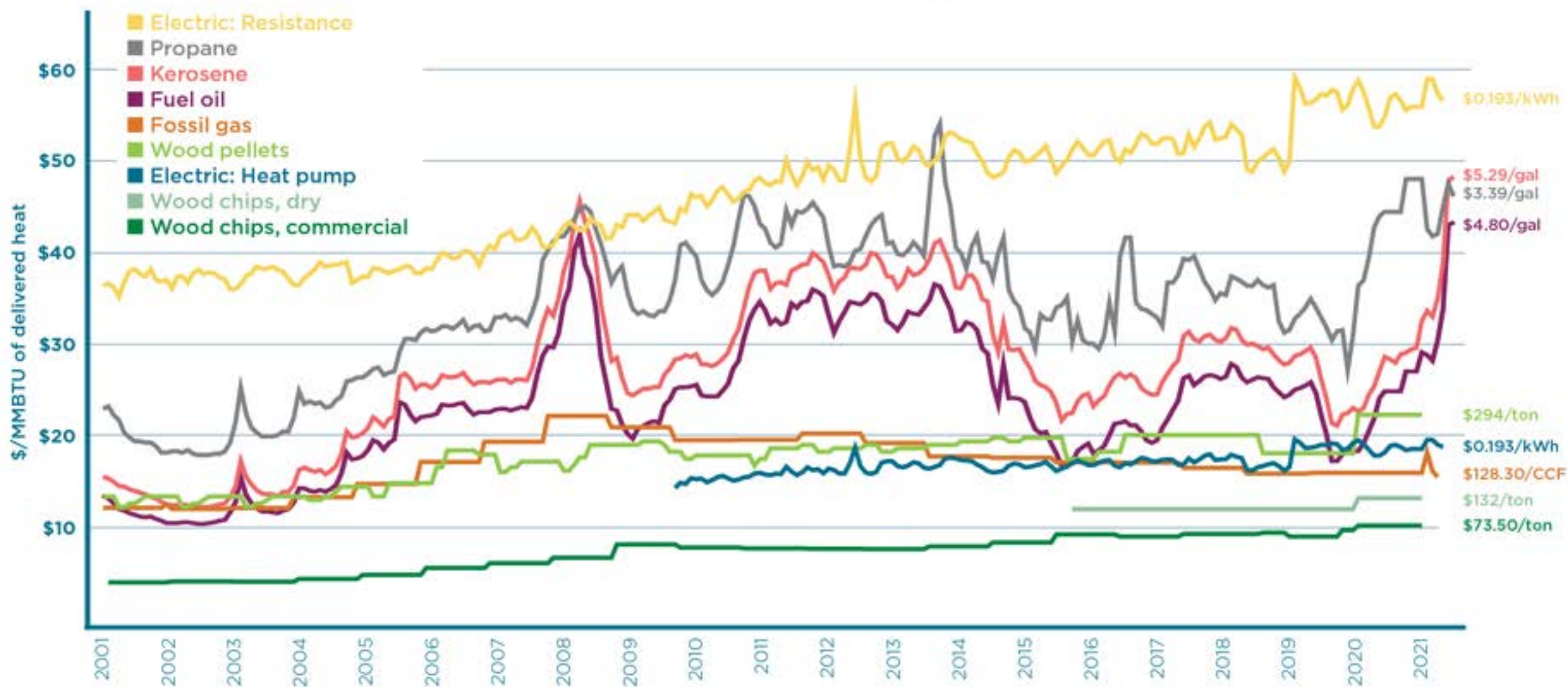
- Expected share of total emissions reduction requirement by 2030: Approx. **10%**
- Status: **Stalled** ("regional viability", or at least 3 participating states moving forward to implement the program, no longer exists since the decisions of CT, RI, and MA to withdraw from TCI-P in late 2021. Future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

# 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 (VTrans). Diesel and gas prices as of May 2022; electricity price as of March 2022.

# Cost comparison of different heating fuel options over time

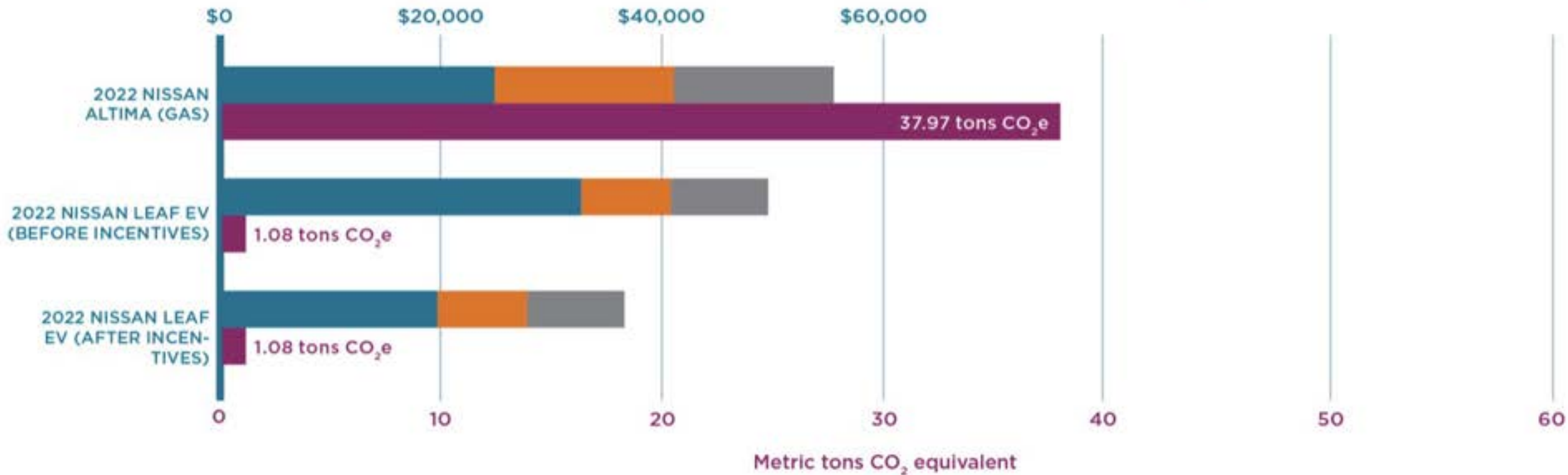


**Sources:** Fuel Oil, Propane, Kerosene, Gasoline, Diesel, Wood Pellets: VT Department of Public Service, Fuel Price Report, 2021. Fossil Gas, Electricity: EIA, 2021. Wood Chips: Biomass Energy Research Center, 2021. Note 1: Electricity prices presented here are a statewide average. Electricity prices vary by utility territory. Note 2: The reason propane is 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 emission of comparable gas vs EV passenger cars

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

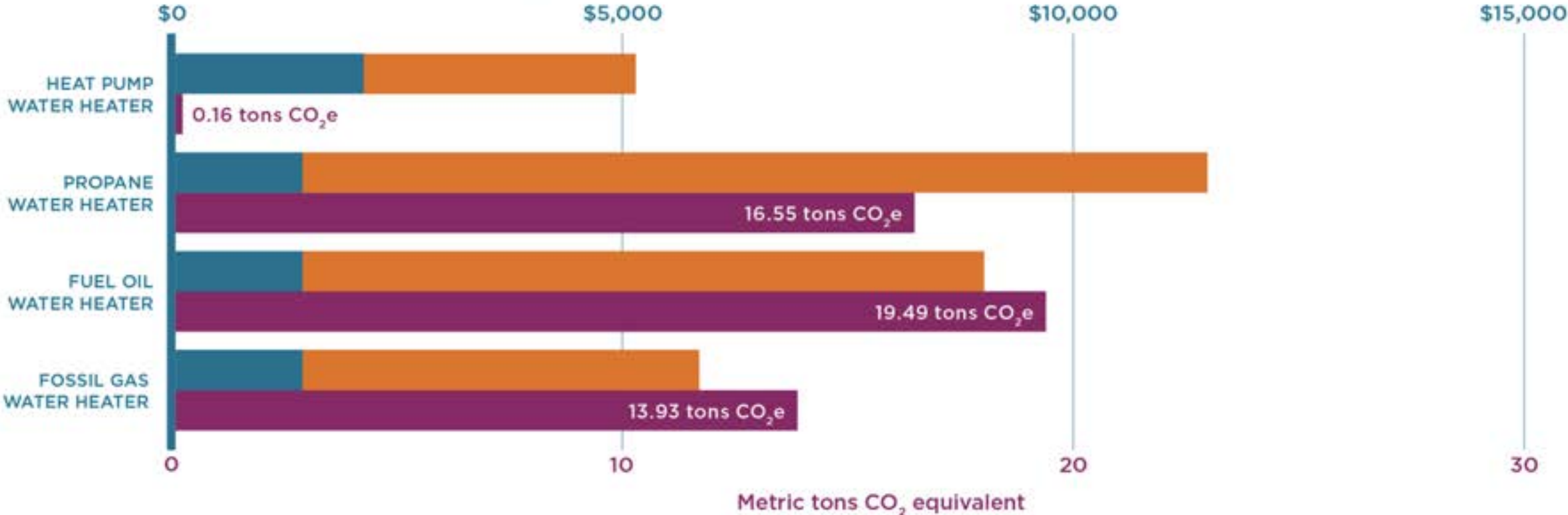


**Sources and notes:** Fuel costs are based on the average from December 2021 to May 2022 of \$3.75/gallon of gasoline, and the May 2022, Green Mountain Power rate of \$0.177/ kWh of electricity. CO<sub>2</sub>e value for VT electricity is 52 lbs/MWh. CO<sub>2</sub>e value for gasoline is 19.4 lbs/gallon. 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 CO<sub>2</sub>e values of VT electricity: Vermont Agency of Natural Resources, 2021. For fossil fuel CO<sub>2</sub>e values: EIA, 2022. For fuel costs: PSD, 2022. For electricity rates GMP 2022.



# Costs and emissions from home water heating

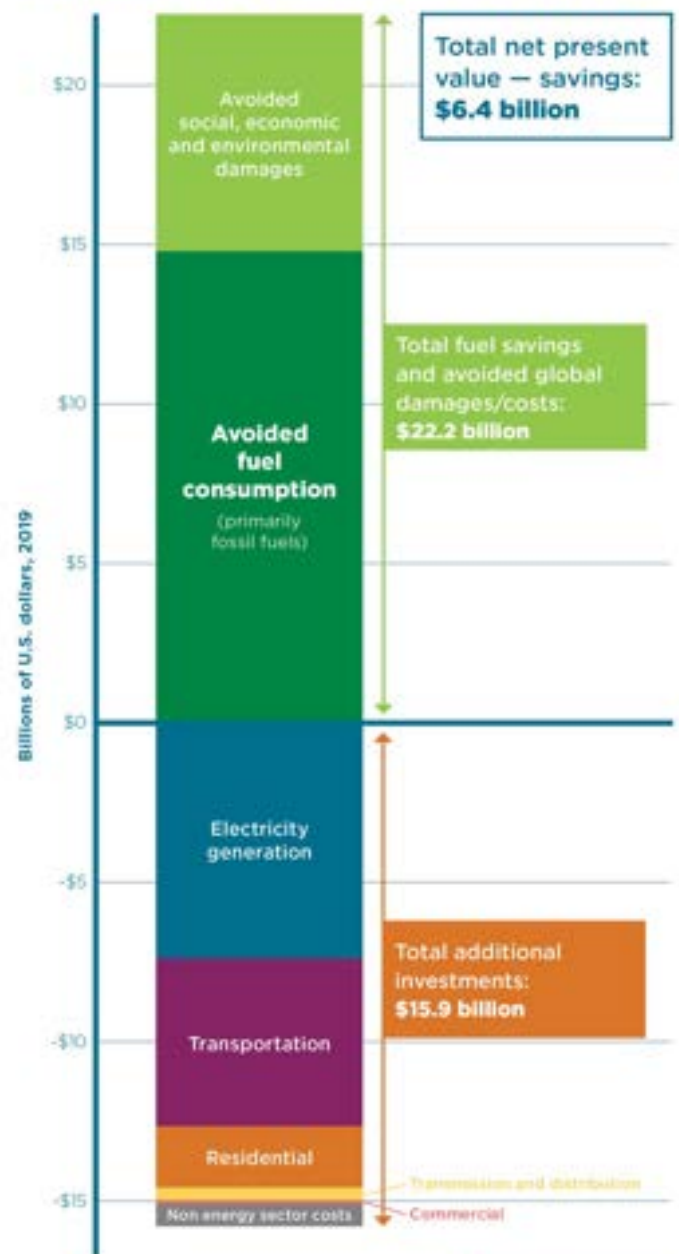
■ Equipment cost ■ Lifetime fuel cost (12 years) ■ GHG emissions in tons CO<sub>2</sub>e for 12 years



**Notes:** Fuel costs used were the May 2022 Green Mountain Power rate of \$0.177/k@h, 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 CO<sub>2</sub>e values of VT electricity and wood pellets: Vermont Agency of Natural Resources, 2021. For fossil fuel CO<sub>2</sub>e 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.



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



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



# Average annual fossil fuel spending in VT, 2010-2019



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





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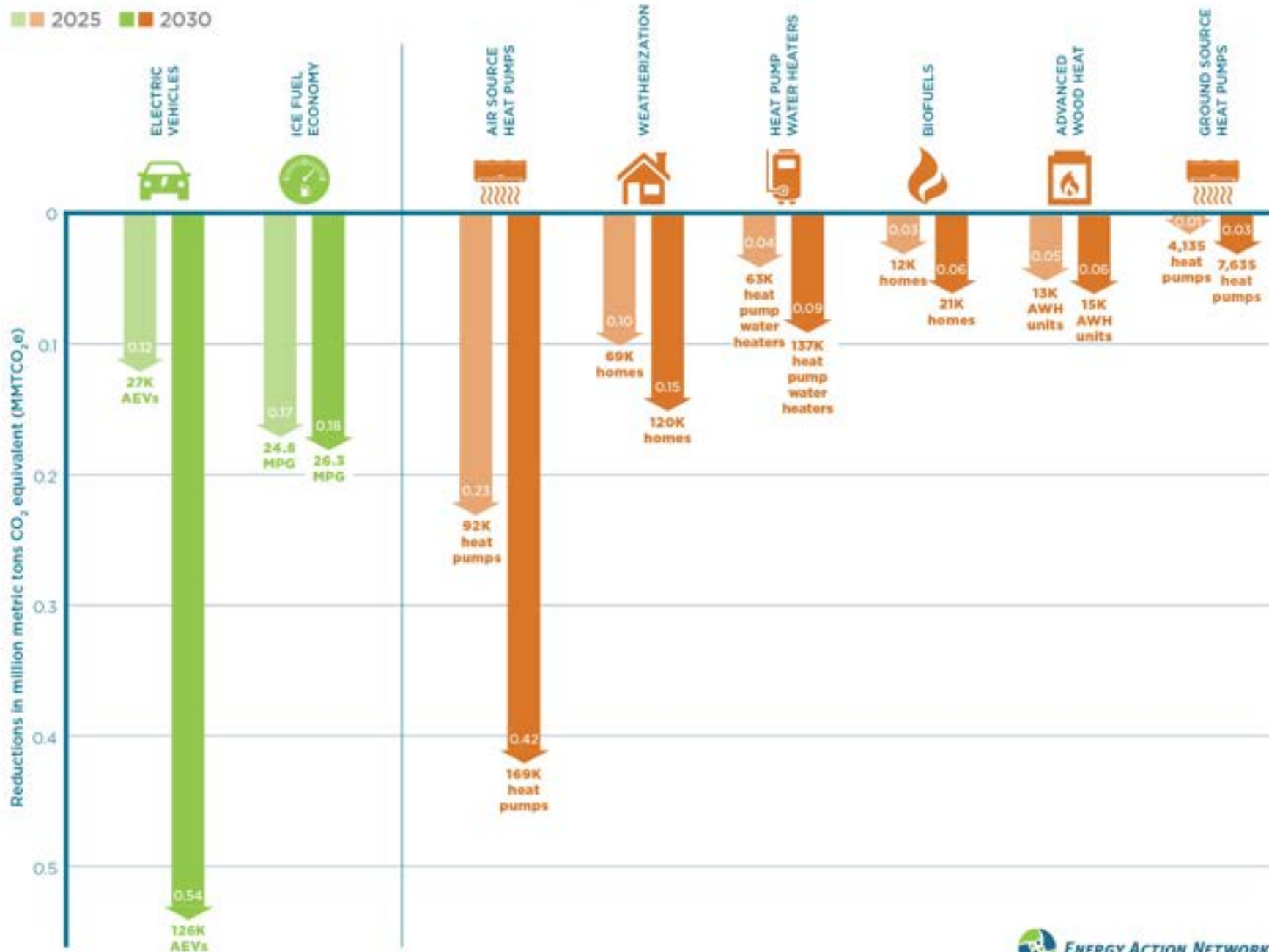
Download a copy: [eanvt.org](https://eanvt.org)

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# Pathways emissions reductions, 2025 and 2030

2025 2030

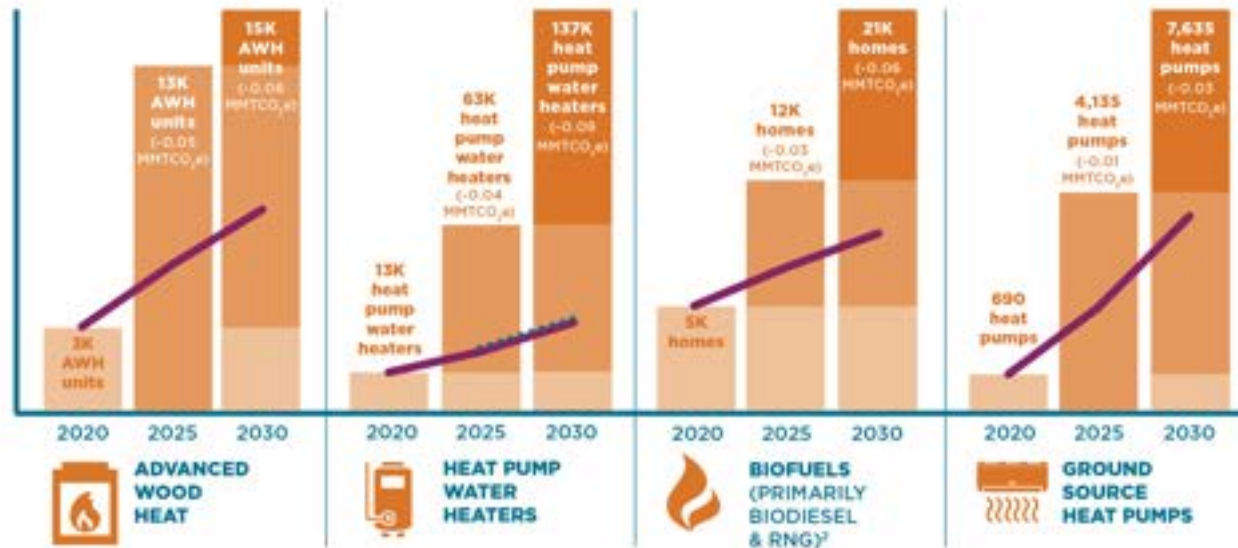
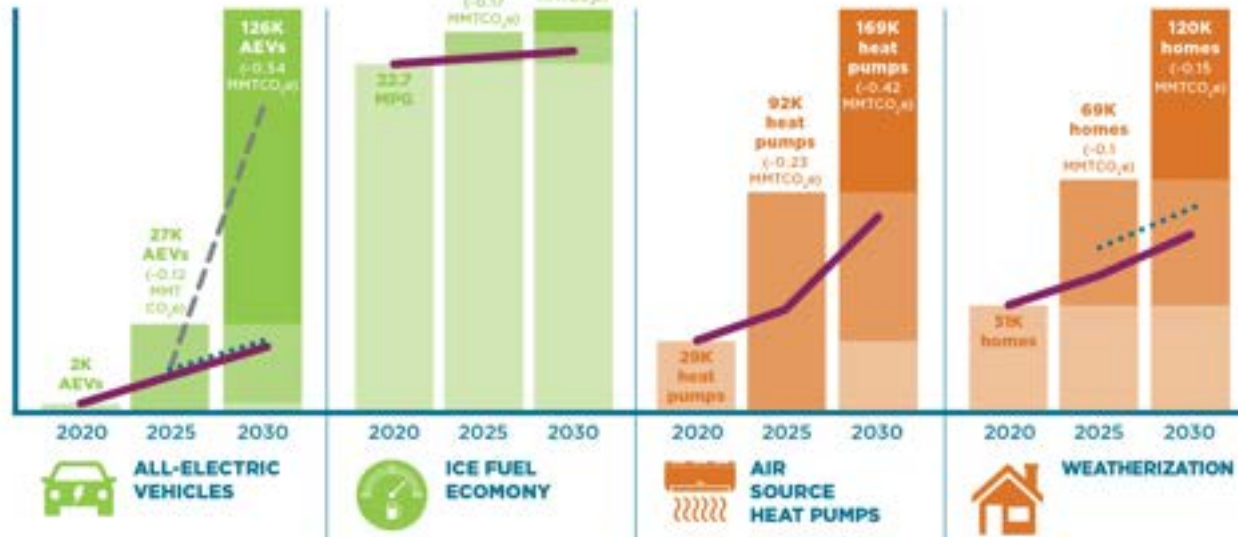


# Top GHG reduction measures in Climate Council Pathways

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

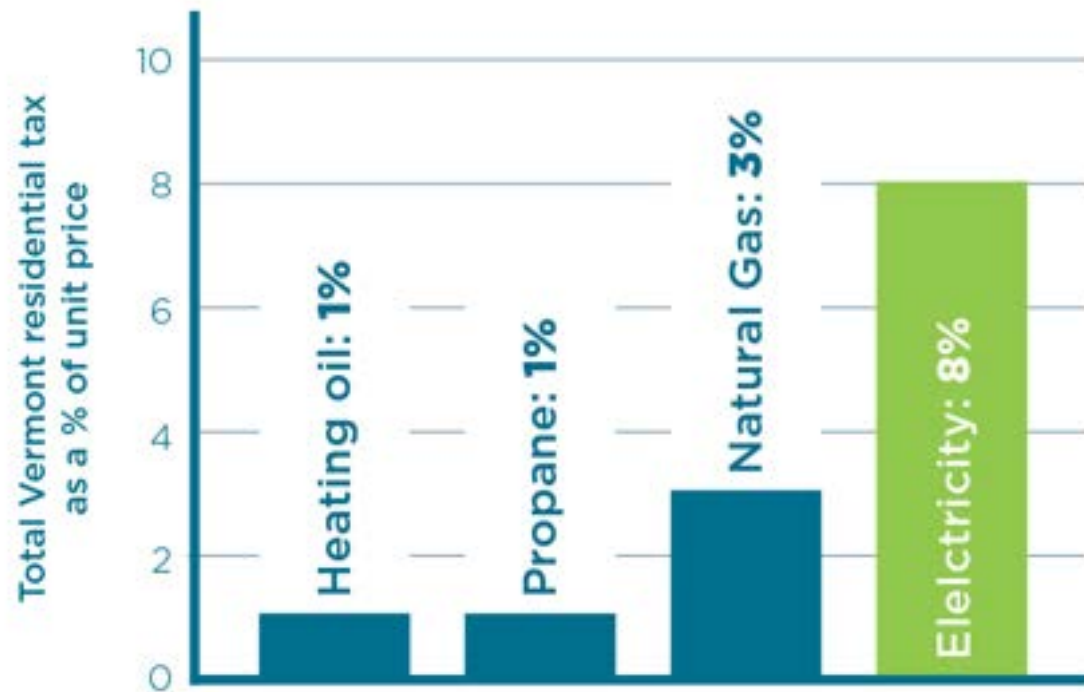
•••• Estimated increase from FY23 budget investments<sup>1</sup>

--- Estimated increase due to ACCII (best case scenario)



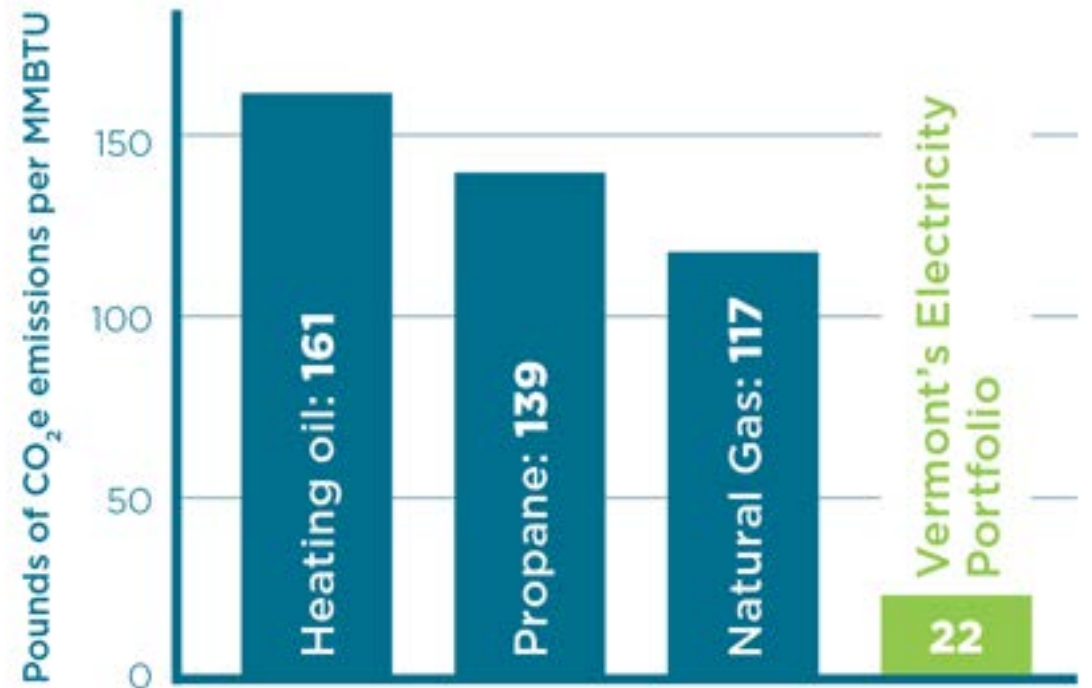
# VT Taxes and Fees for the Most Polluting Energy Sources are Far Lower than on our Cleanest Energy Sources

## Vermont taxes and fees as percent of unit cost



Source: Vermont Department of Public Service, 2019; Vermont Fuel Dealers Association, 2021.

## Pounds of CO<sub>2</sub>e emissions per MMBTU



Source: EIA, Emissions Factors for Greenhouse Gas Inventories, March 2020.

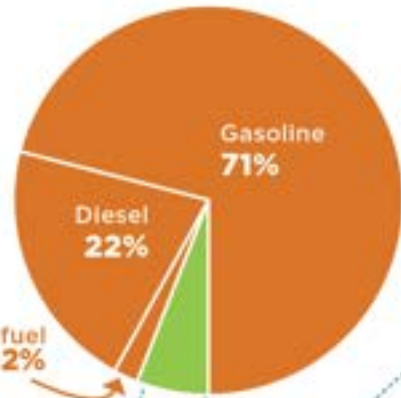




## Transportation

49.3 TRILLION BTU

**TOTAL ENERGY 2019**  
125 TRILLION BTU



TOTAL ENERGY  
**Renewable sources**



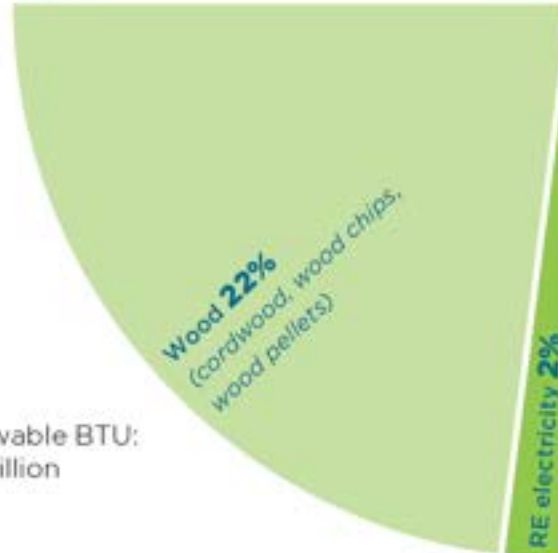
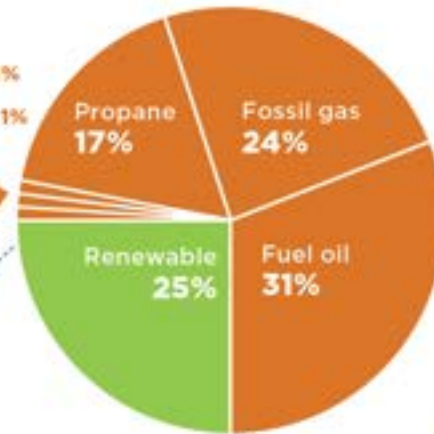
Total renewable BTU:  
2.8 trillion



## Thermal

59.5 TRILLION BTU

Kerosene 1%  
Non-RE electricity 1%  
Coal 1%



Total renewable BTU:  
14.8 trillion

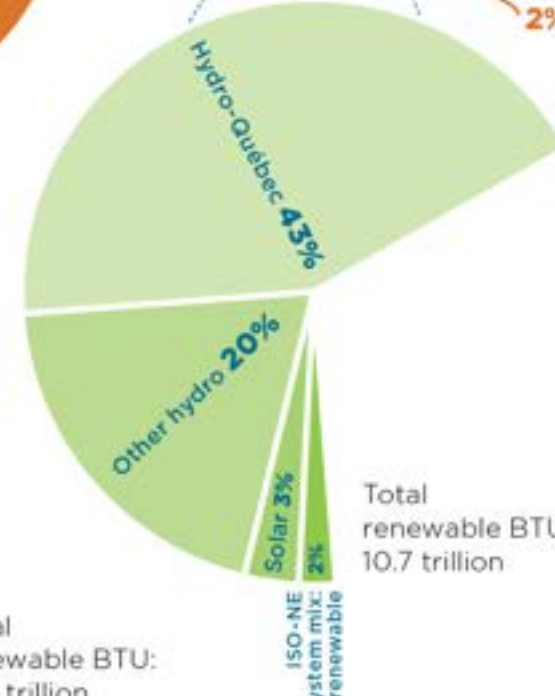
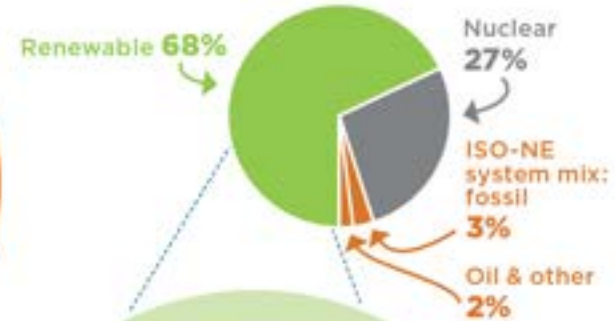


## Electricity

16.2 TRILLION BTU

(after accounting for RECs)

Renewable 68%

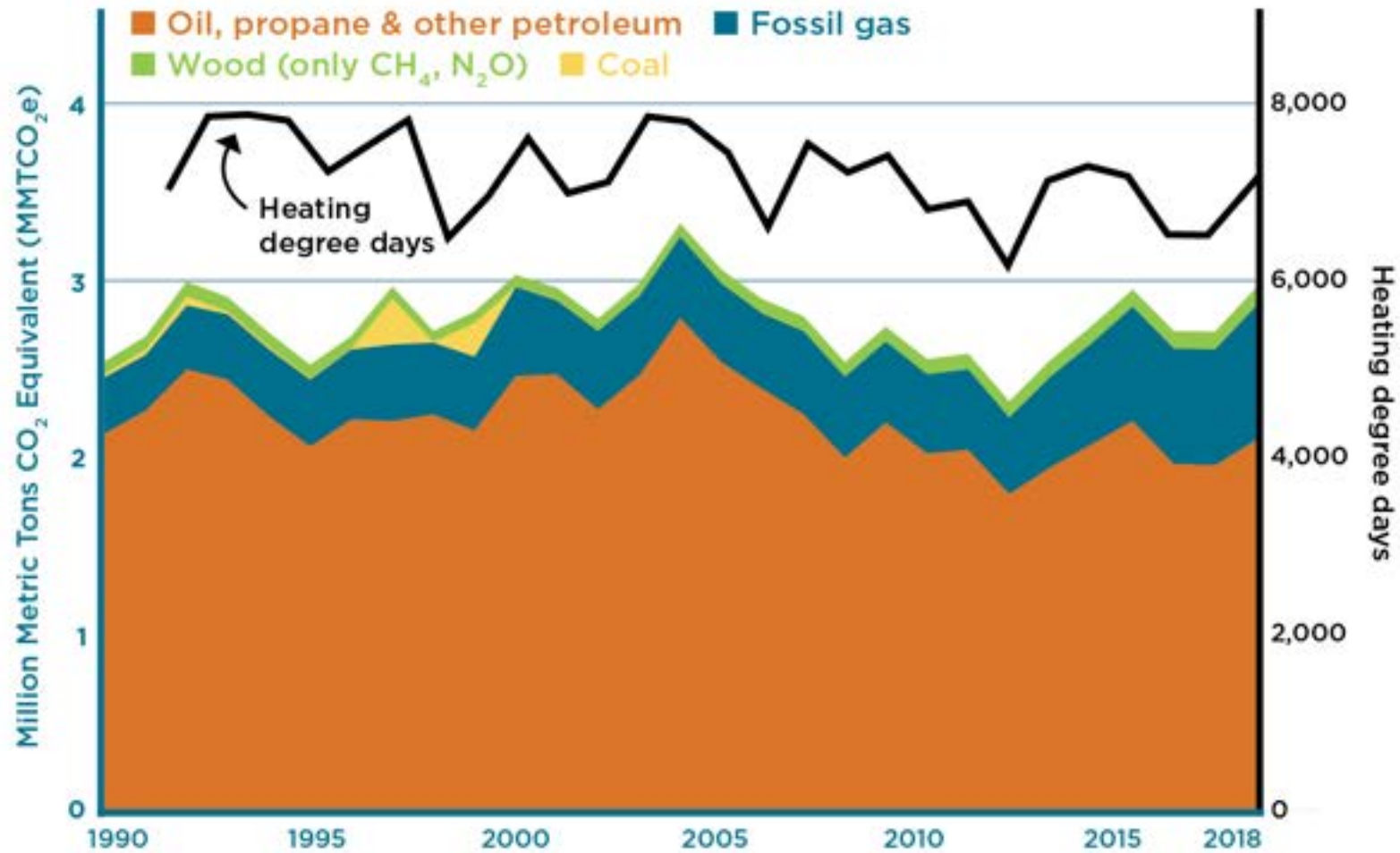


Total renewable BTU:  
10.7 trillion

Sources: Energy Information Administration, Efficiency Vermont, Vermont Department of Public Service, Vermont Agency of Natural Resources, and Energy Action Network.



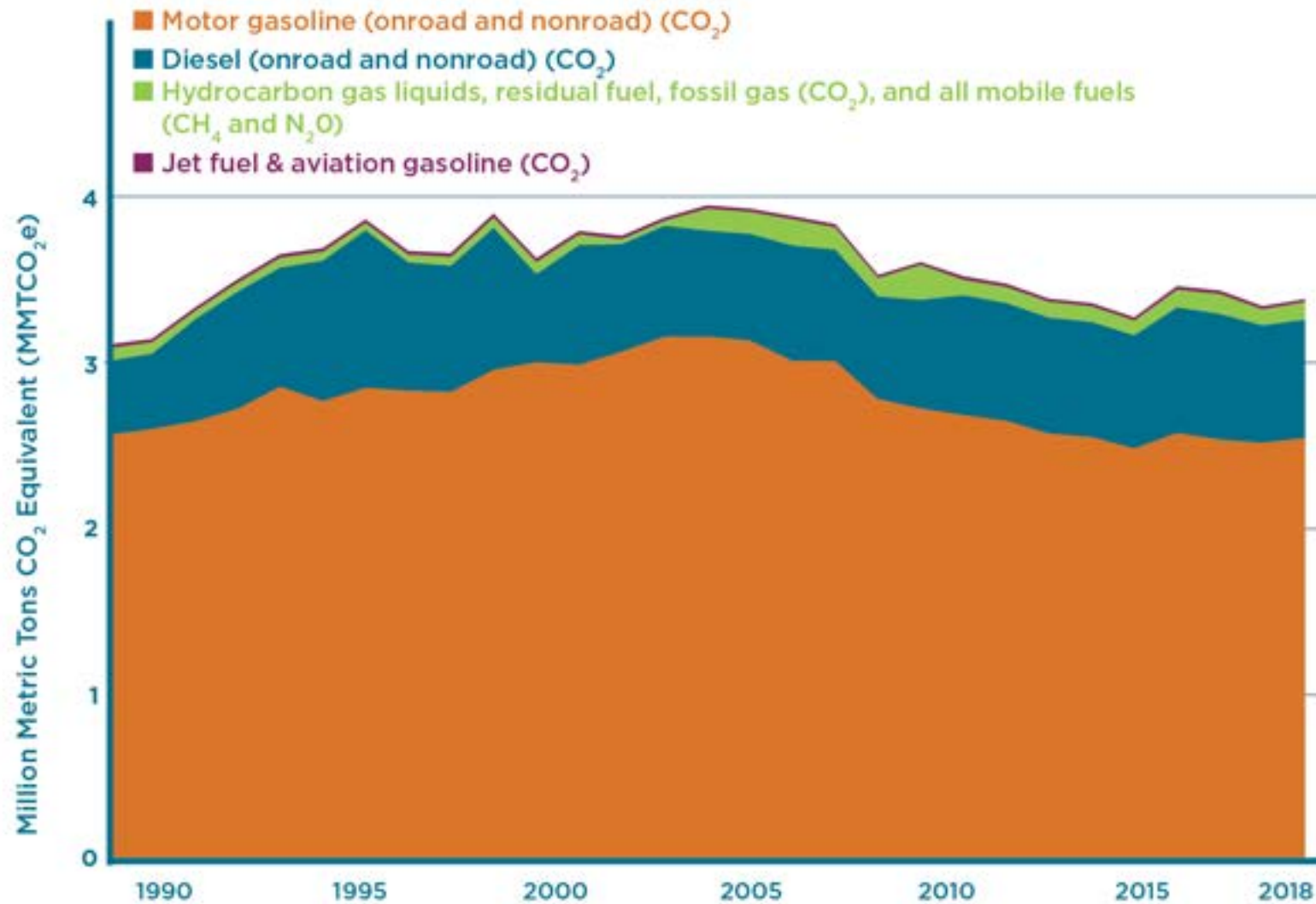
# Historical VT thermal GHG emissions by source



**Source:** Vermont Agency of Natural Resources, Vermont Greenhouse Gas Inventory: 1990–2017, 2021. Note: 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. Heating degree day measurements are aggregated over the entire heating season.



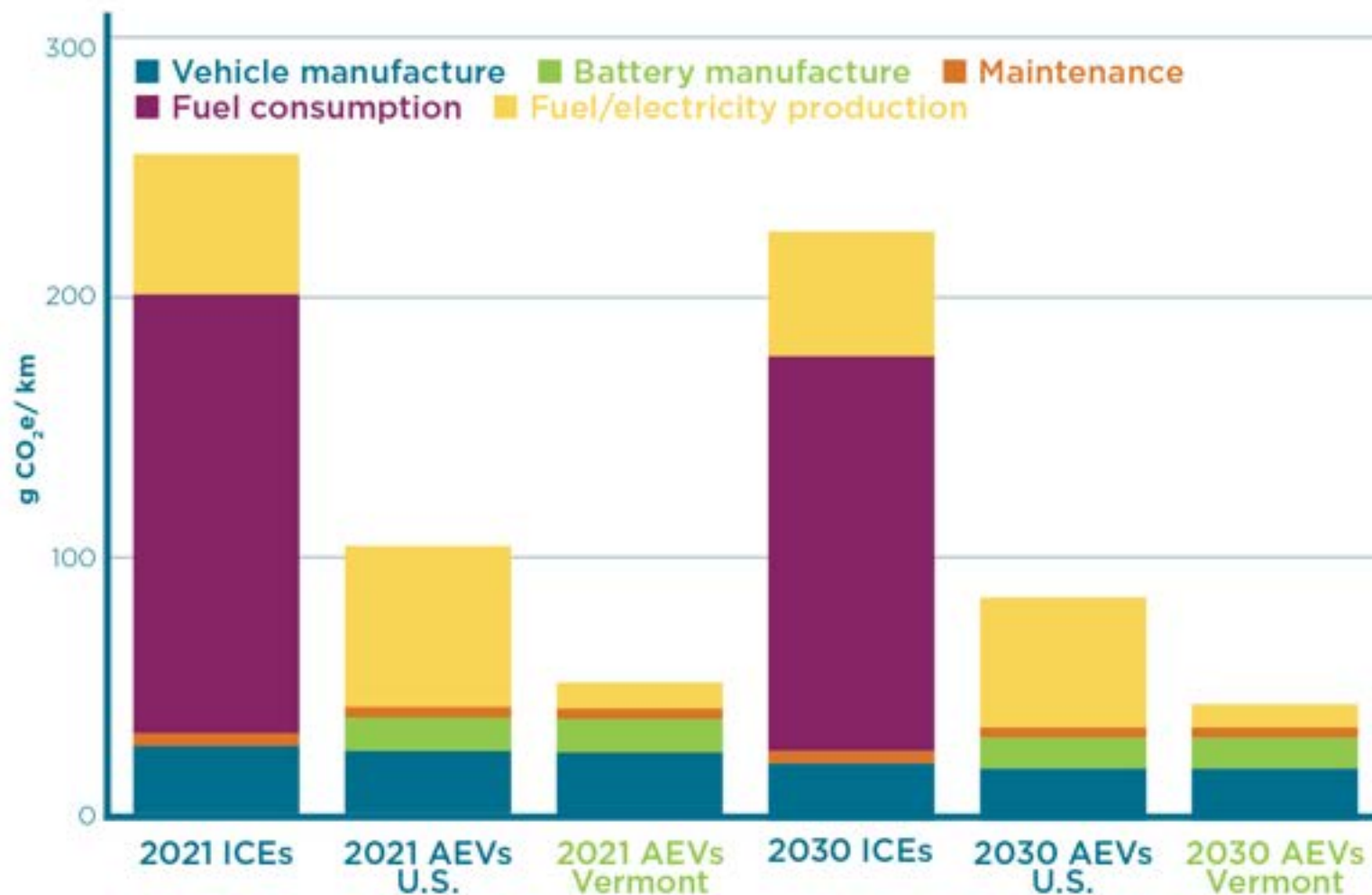
# Historical VT transportation GHG emissions by source



Source: Vermont Agency of Natural Resources, Vermont Greenhouse Gas Inventory: 1990 - 2017, 2021.

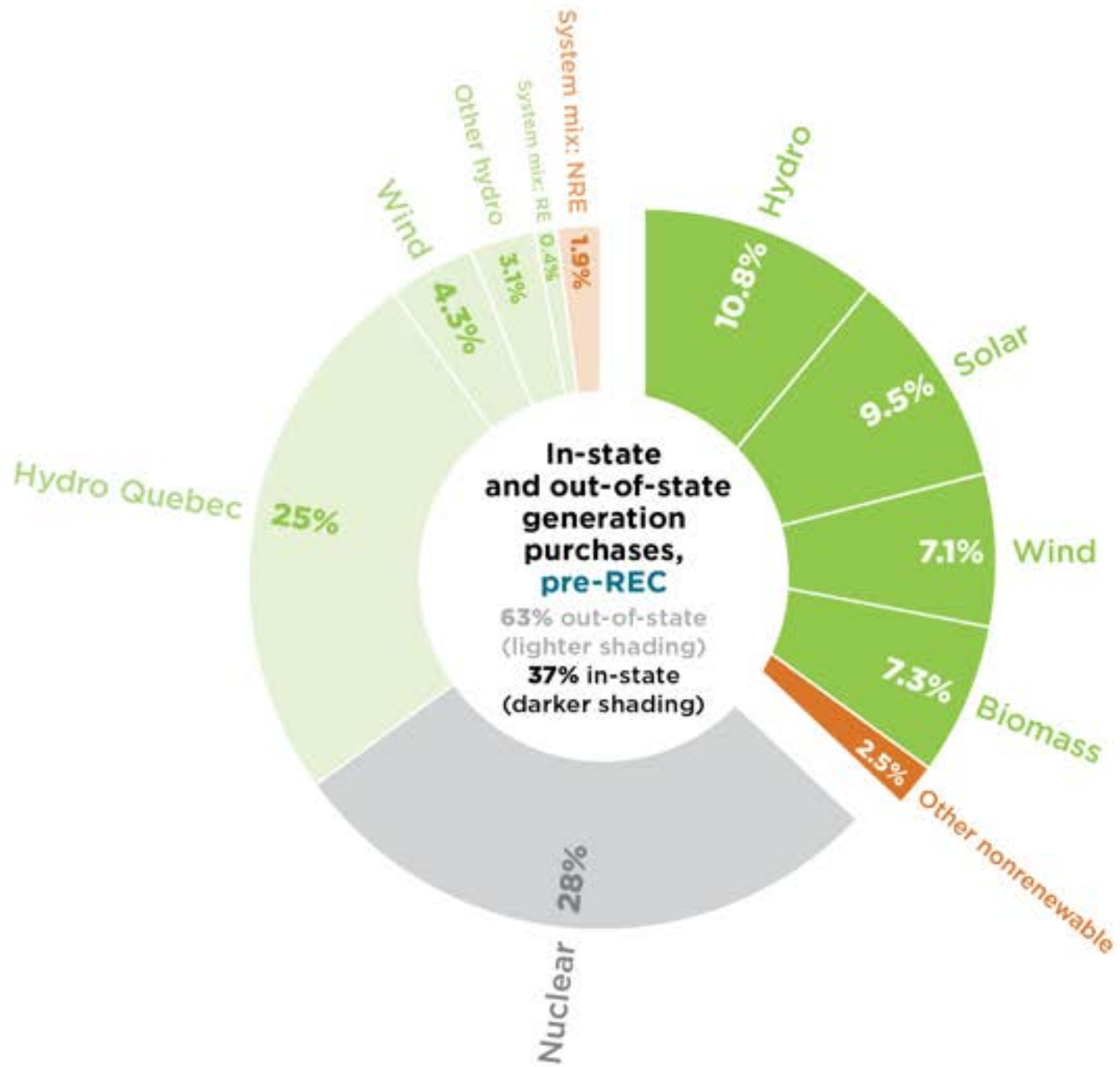


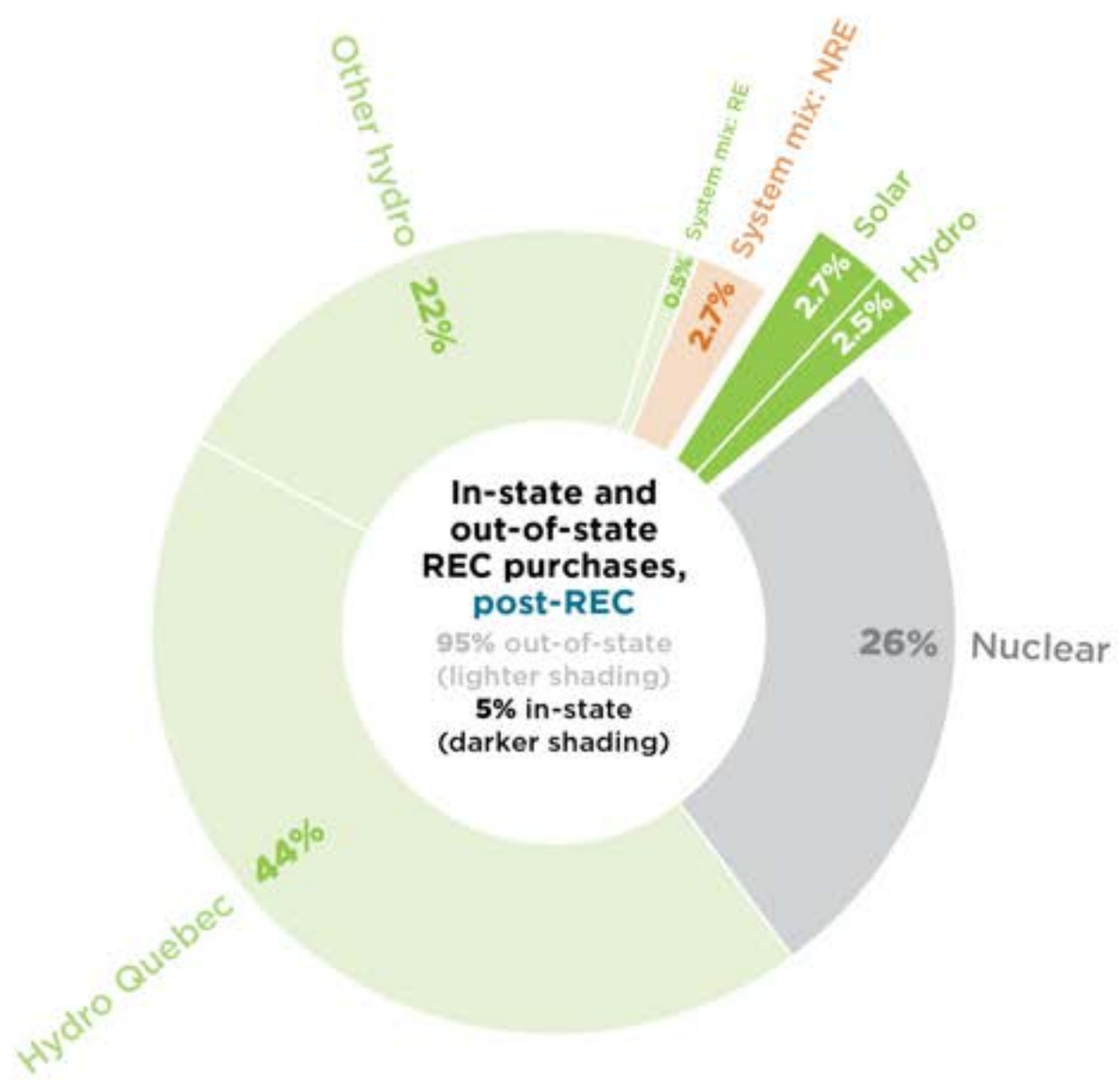
## Lifecycle GHG emissions of ICE vs EVs in the United States and Vermont



Source: ICCT, A Global Comparison of the Life-Cycle Greenhouse Gas Emissions of Combustion Engine and Electric Passenger Cars, 2021. Updated for VT electricity GHG emissions, EAN, 2022.



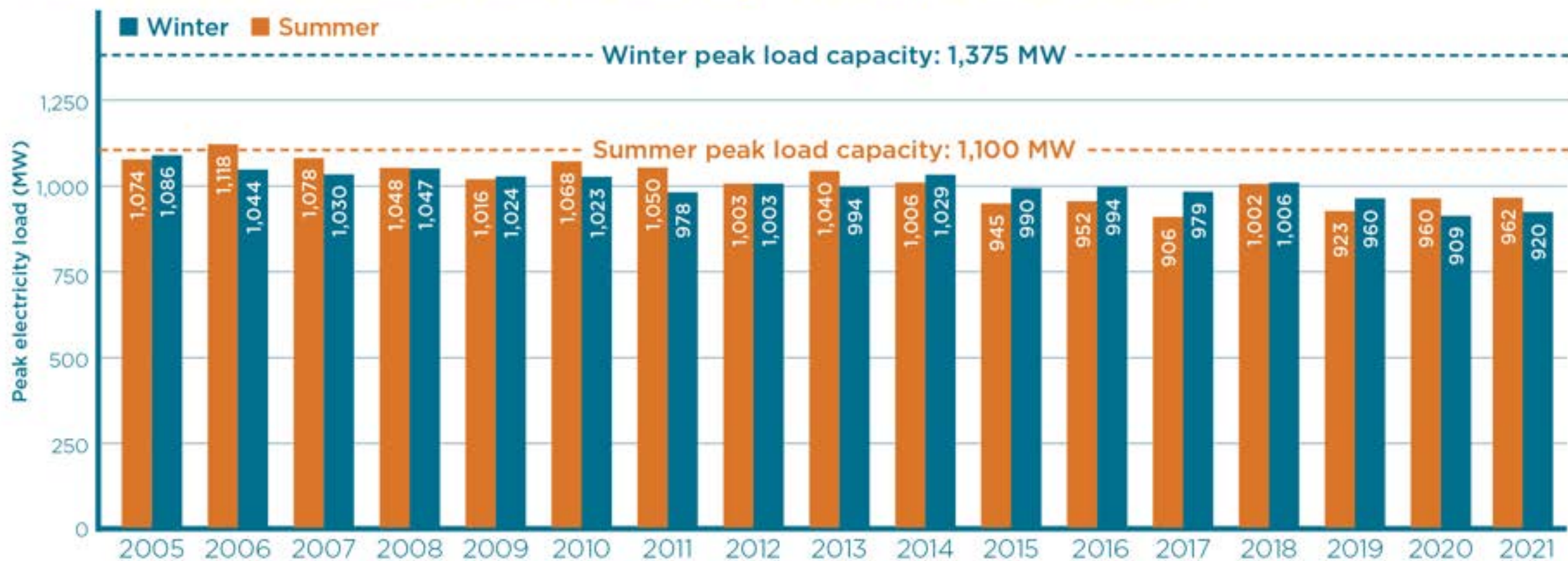




Source: Vermont Department of Public Service, 2020 Electric Utility Resource Survey, 2021.



## 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.