

The GWSA and the Vermont Climate Action Plan: Electricity Sector



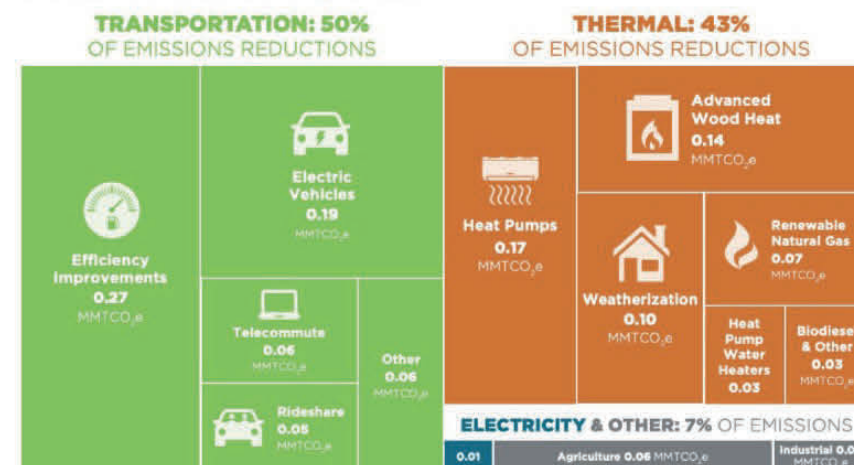
January 6, 2022 HET Committee
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Context for Electric Sector Mitigation

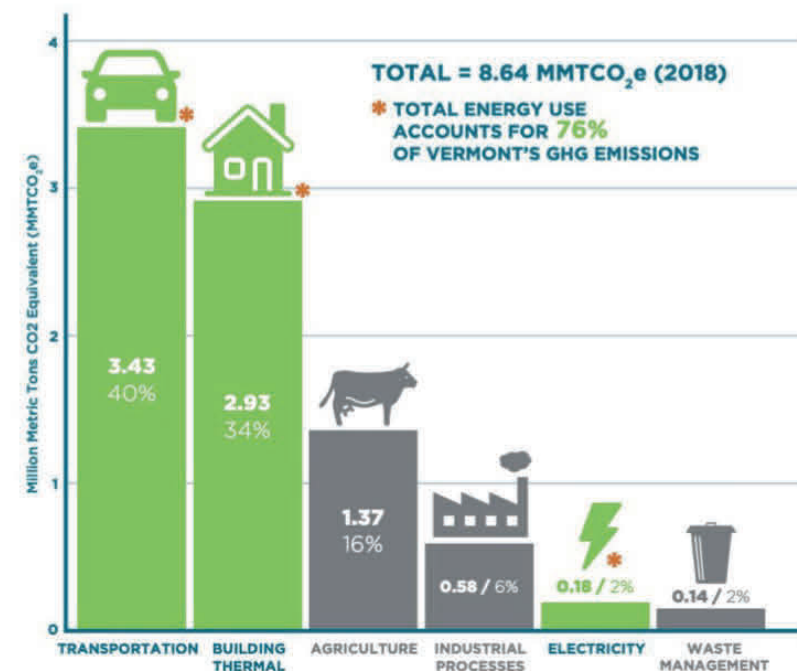
- The electric sector has made great strides in decarbonization and in efficiency programs to reduce overall electricity use and customer cost. A primary focus in upcoming years should be to use it as cost-effective backbone for the further fuel switching necessary to decarbonize the transportation and buildings/heating sector.
- DEC GHG inventory is consistent with region and “reflects the fact that Vermont is part of a regional electric grid where load and generation are balanced in real time; as more carbon-free energy is put onto the system, there is less overall generation from fossil-fuel-fired plants.” (pg 103)
- “Every kilowatt hour of a clean energy resources that counts in Vermont’s RES ... must actually be delivered and used in our New England region, as tracked annually through a registry and accounting system of RECs maintained by the NEPOOL GIS.” (pg 103)

Modeled emission reductions for 2025

Total reductions of 1.26 MMTCO₂e to meet Vermont's statutory emissions reduction requirements



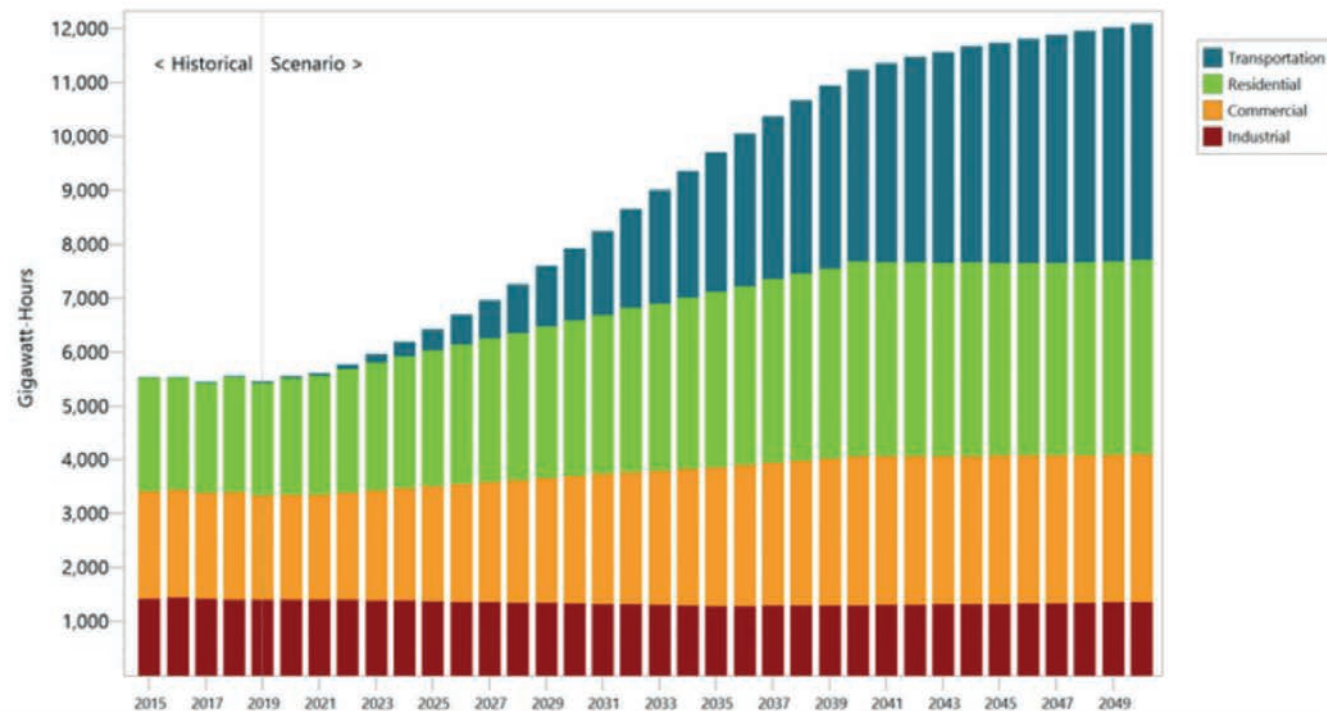
Vermont's GHG emissions by sector, 2018



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

Further carbon reductions will require many strategies, such as efficiency and fuel switching, including significant electrification in transportation and heating

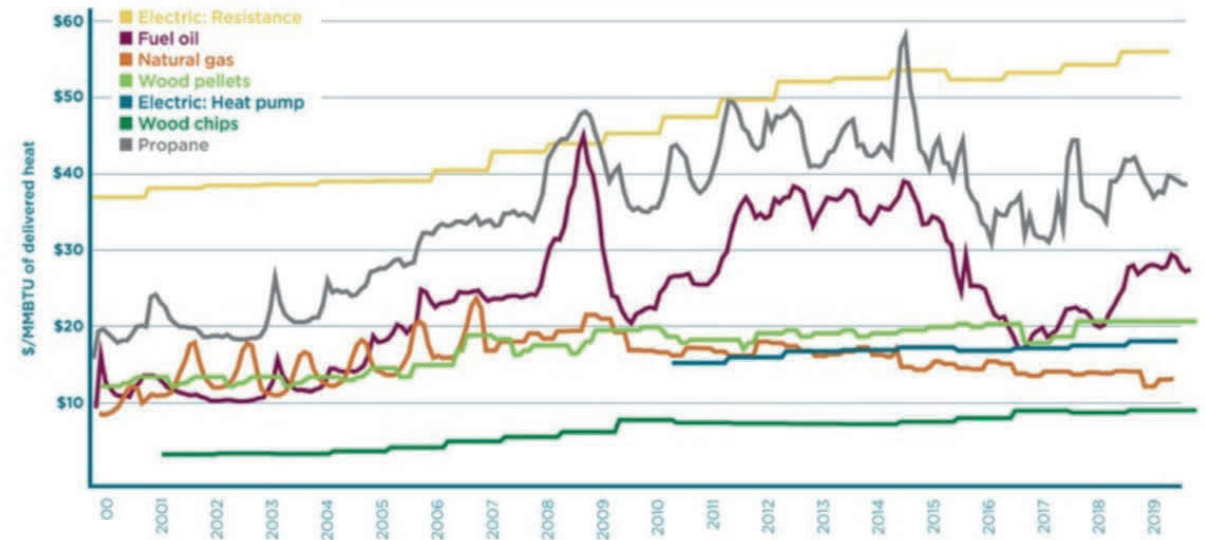
Modeled Electricity Demand in Vermont, thru 2050



There are opportunities for not just carbon savings but also cost savings through electrification and other fuel switching

Figure 3. Cost Comparison of Different Heating Fuel Options Over Time

Cost comparison of different heating options over time

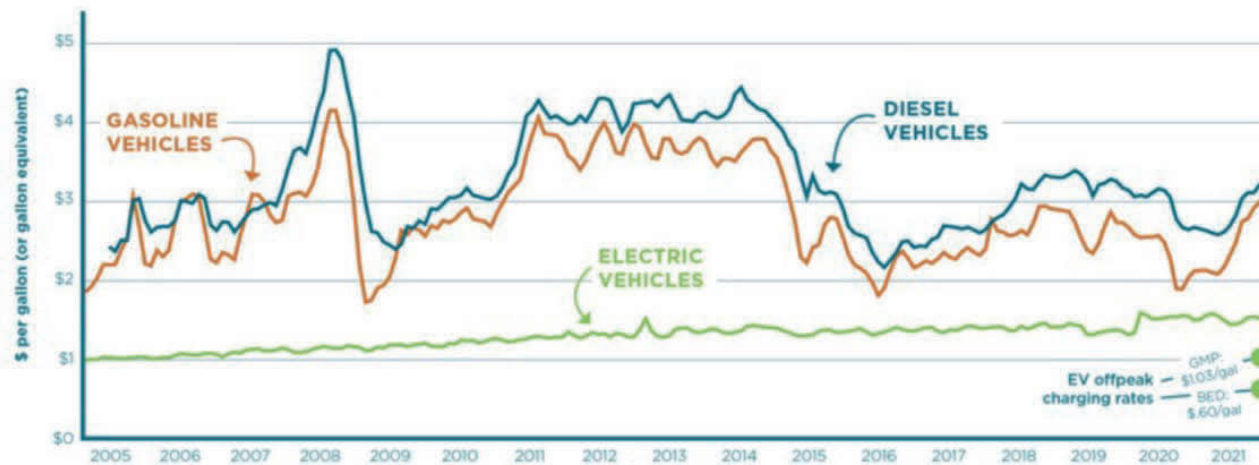


s Energy Resource Center, 2019. Note: electricity prices presented here are a statewide average.
s vary by utility territory.



Figure 2: Cost Comparison of Different Transportation Fuels Over Time

Comparison of Vermont transportation fuel costs, 2005-2021



Electric Sector Priorities, Strategies & Actions from the Climate Action Plan

Pathway 1: Further decrease GHG emissions from Electric Sector Purchases

- **Strategy: 100% Carbon-free or Renewable Energy Standard (RES) by 2050**
 - **Action:** Move from 75% RES to 100% Carbon-free or RES.

Pathway 2: Enable all Vermonters to Choose Electrification

- **Strategy: Provide financial and technical assistance to Upgrade service and purchase and install equipment**
 - **Action:** Develop coordinated programs for implementation of 200-amp service upgrades and related services.

Pathway 3: Load Management and Grid Optimization

- **Strategy: Expand on existing programs and policies for load management and grid optimization**
 - **Action:** Support direct utility load control programs.
 - **Action:** Encourage utilities to offer dynamic rates for customers.

Key CAP Recommendations on Vermont's Renewable Energy Standard

- “Vermont should develop 100% carbon free or renewable electric portfolio standard into the 2030s and beyond while being mindful of the economic impact on cost-burdened Vermonters...” (page 103)
 - “Vermont’s current RES aims to achieve 75% renewable resources annually by 2032; the accompanying analysis by Cadmus indicates that the current RES is adequate to meet the GWSA goals for 2025 and 2030.” (page 103)
 - “Regardless of eventual design, a legislative requirement that Vermont’s utilities have power supplies that are 100% carbon free by 2030 will reduce electric sector emissions and enable deeper carbon reductions [in other sectors].” (page 104)
 - “The strategy recommends that new requirements are designed to fit already-procured resources, including long-term committed contracts for carbon-free resources that run through the mid-2030s.” (page 104)
- The Legislature should “adopt a carbon reduction policy that directs the Public Utility Commission, utilizing expertise as appropriate, to identify, review, and research as needed design parameters for a 100% carbon-free or renewable electric portfolio standard that equitably promotes electrification.” (page 104)

Suggested RES questions to be addressed in any redesign

Questions that warrant further research in such a study include:

- Using existing renewables and new resources – the right mix for equity and additionality
 - Date of qualification for ‘new’ resources – considering both regional and instate generation
- In-state and out-of-state generation – the right mix for economic development, equity, affordability, land use, and other considerations
- Supporting generation of all sizes and types (small/large/hydro/wind/solar/storage etc.)
- Pace of increased requirements by type of resource/RES Tier
- Incentivizing resources to deliver when needed (e.g. during peak hours, noting that these are likely to shift over time; seasonal needs such as winter loads; how storage may fit in), taking into account the time scale on which renewability is measured now (annually) and in the future (e.g., quarterly, monthly, hourly)
- Siting, including environmental, community, and transmission system considerations
- Carbon impact of resources; what source/criteria are utilized; whether the framework changes to a carbon standard rather than a renewable standard
 - Informed by any additional GHG inventory recommendations

Climate Action Plan pages 104-105

And a “Plug” for Considering the Other Electricity Pathways in the Climate Action Plan...

- **Enabling Vermonters to Participate in Fuel Switching through Electrification**
- **Further Facilitating Load Management & Grid Optimization**

While VELCO reports that our current transmission system is capable of handling high levels of electrification through 2030, significantly expanding the amount of transportation and thermal energy needs met by electricity will eventually necessitate new investments in our transmission and distribution system. The extent to which Vermont households and businesses save money via beneficial electrification of transportation and thermal energy use will depend in part on Vermont’s ability to secure low-cost carbon-free electricity resources, as well as efficient and effective demand response and load management strategies.