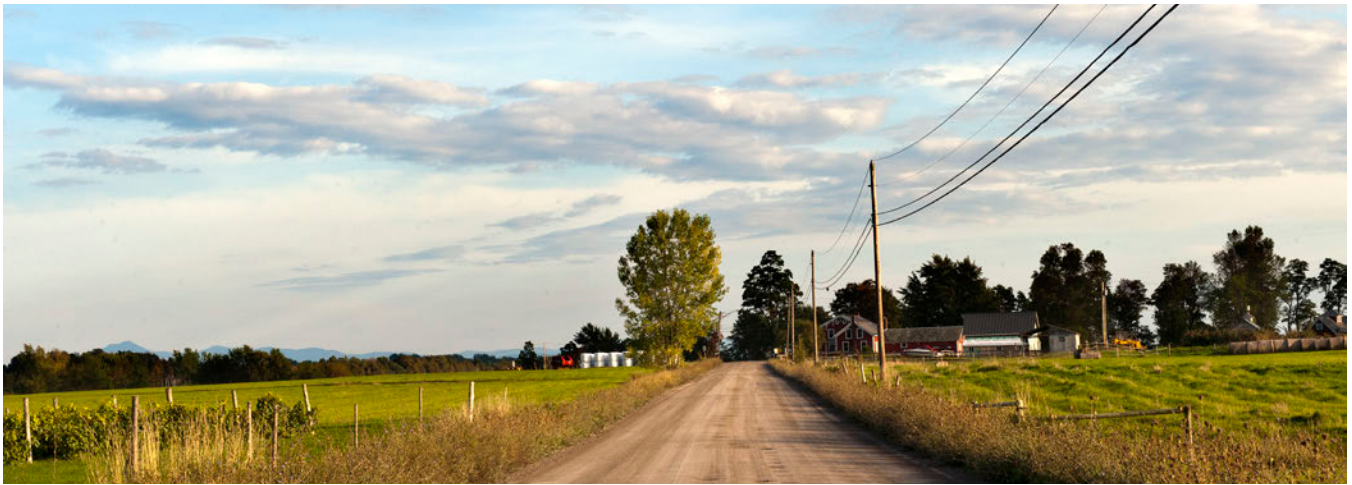




18. Electricity Sector Pathways for Mitigation

Beneficial Electrification Is Key to Reducing Climate Pollution

In the preceding sections on Transportation and Buildings we set out high-level recommendations to lower emissions from the two most climate-polluting sectors of the Vermont economy. The most significant of those recommendations would accelerate the use of electric vehicles and electric heat pumps in place of existing fossil-fueled vehicles and furnaces. These new electric technologies are more efficient, less polluting, and over time are less expensive than their fossil counterparts. Providing clean electricity to power those devices is foundational for a low-emissions economy. Using electricity in this way is called “beneficial electrification.”⁽¹⁴³⁾

Vermont is in an especially strong position to advance beneficial electrification because our existing electric power mix is substantially lower emitting than the power mix in other states. In 2024, Vermont’s electricity supply was 75% renewable, about 16% nuclear, and only 9% fossil-based, and electricity accounted for just 3% of the state’s total emissions.⁽¹⁴⁴⁾ Replacing fossil fuel-powered vehicles and heating appliances with electric technologies can significantly lower the emissions from those uses. Adding these new loads to the grid can be “beneficial” in climate terms but the right policies also need to be in place to minimize power system costs, meet reliability standards and promote climate resilience.

143 Farnsworth, D., Shipley J., Lazar J., Seidman N. “[Beneficial Electrification: Ensuring Electrification in the Public Interest.](#)” Regulatory Assistance Project. June 2018.

144 Energy Action Network. [Annual Progress Report on Emissions, Energy, Equity, and the Economy](#) (page 11). 2024.

Expanding Renewable Electricity Supplies

Since the release of the *Initial Vermont Climate Action Plan*, steps have been taken to further decarbonize Vermont's already very clean electricity supply and to enhance grid resilience. Notably, the passage of bill H.289 in 2024, which amended Vermont's Renewable Energy Standard (RES), addressed a recommendation in the Initial Plan to move toward 100% carbon-free or renewable electricity supply by mandating a 100% renewable electricity supply for all regulated utilities by 2035, with some larger utilities mandated to reach that by 2030. The updated RES also includes provisions to increase the supply of in-state renewable generation along with new regional renewable energy, enhance load growth planning, and incorporate equity considerations.⁽¹⁴⁵⁾

Recognizing this recent legislative action, the updated priority recommendations for the electricity sector in this CAP focus on the following interrelated and complementary areas:

- Ensure a strong, affordable, and resilient electric grid to support deep emissions reductions in the transportation and thermal sectors.
- Enable all Vermonters to electrify their homes, businesses, and transportation affordably and equitably.
- Expand access to and participation in local renewable energy programs, especially for disadvantaged communities.

The priority recommendations are briefly summarized below as pathways.

Pathway 1: Keep the electric system strong and affordable to support beneficial electrification of buildings and transportation

In coming decades, Vermont utilities will likely need to reliably serve hundreds of thousands of new heat pumps and electric vehicles, while also interconnecting new utility-scale and distributed renewable generators and storage batteries. Ensuring that essential electric services remain both reliable and affordable is an important priority and a substantial challenge.

Vermont utilities and regulators will need to employ leading-edge regulatory policies, investments and technologies in this rapidly emerging field. At least three types of actions are needed:

- Utilities support grid modernization and the optimal use of transmission and distribution assets by leveraging their system and customer data to determine where grid-enhancing technologies may be deployed to secure the greatest value.

¹⁴⁵ Importantly, the updated RES also includes a legislatively mandated check-in regarding progress, or barriers that may develop, in 2029. This review, in addition to provision for waivers from the Public Utility Commission when needed, will help ensure affordability and practicality as these requirements come into effect while regional renewable energy projects evolve.

- Utilize tools such as advanced metering, storage, and distributed energy resource management systems to improve the efficiency and design of necessary grid infrastructure investments.
- Avoid or defer grid infrastructure expansions where feasible and cost effective.

The Public Utility Commission (PUC) should continue to ensure that utilities employ efficiency, demand response, and flexible load management programs and rate structures to manage peak loads and overall demand as well as to promote affordability and equity. Utilities and stakeholders should utilize energy storage, including both short-duration and proven long-duration technologies, where appropriate, to enhance grid flexibility, affordability, and support reliability during peak periods.

Utilities should target grid-hardening investments that improve resilience against extreme weather events. They should coordinate these resilience investments with state and local efforts, invest in cost-effective solutions, and leverage funding where available. Expanded investments in storm resilience and preparation will be required as the effects of climate change intensify, and all sectors must glean lessons from the severe weather events Vermont has already experienced.

Pathway 2: Enable all Vermonters to choose electrification

In this pathway we recommend actions to support the transition to electrified transportation, heating, and industrial energy across Vermont. The focus in this pathway is on customer-facing policies that facilitate customer decisions to switch from fossil to electric end uses.

In support of this objective, utilities should:

- Deploy cost-effective infrastructure upgrades (e.g., service panel upgrades, service drops, transformers, grid hardening) to support statewide resilience and electrification goals, through both customer-requested projects and utility projects.
- Provide electrification incentives through Tier III of the RES and other programs to encourage customer decarbonization, including for low-income customers and those in multi-family housing, all the while keeping an eye on moderating electricity rate impacts to help customers choose beneficial electrification options.
- Continue to deploy innovative programs to help cost-effectively manage electric vehicles, storage, and other distributed energy resources. Offer rates (e.g., time-of-use pricing), where cost-effective, to encourage efficient energy consumption.

Pathway 3: Increase access and participation in renewable energy programs

In this pathway we seek to ensure that all Vermonters, especially rural and frontline communities and low-income earners, benefit equitably from renewable electricity programs. As a foundation, policies should continue to support appropriate development of in-state renewables, in line with the updated RES Tier II requirements, which mandate a 20% share of new in-state renewable generation for most of the state's consumption, consistent with the overarching goal of energy affordability.

In addition, the PUC and utilities should implement appropriate recommendations from the [Act 179 study](#)⁽¹⁴⁶⁾ regarding evolution of community-level renewable energy programs, especially for low-income customers. Utilities, with PUC support and stakeholder input, should enable customer enrollment programs that expand participation in local renewable energy projects, including for disadvantaged communities and low-income customers. Wherever possible, utilities and developers should seek state and federal funding for community-scale renewable energy projects. Such funding will lower costs for participating customers and help to keep electricity rates lower, in support of electrification objectives generally.

Finally, regulators and utilities should adopt and implement policies to support deployment of geothermal heating systems, including thermal energy networks like community-scale geothermal and waste heat recovery, as an additional option to provide efficient, renewable heating and cooling services.

Vermont's electric sector has long been low emitting, and we have made significant strides toward fully decarbonizing this sector over the past decade. By continuing to advance these electricity sector priorities while working to maintain affordability for customers, Vermont can continue to be a leader in a clean, affordable, resilient, and community-driven energy transformation.

¹⁴⁶ [Act 179 of 2024 Report](#). This report was prepared by the Department of Public Service as required in Act 179, An Act Relating to the Renewable Energy Standard