

4. Energy

Objectives

By 2050:

1. Generate 20 percent of town's energy needs locally from renewable sources.
2. Weatherize 90 percent of homes in Putney.
3. Eliminate the use of fossil fuels for home heating in town.
4. Reduce Putney residents' use of fossil fuels for personal transportation by 90 percent.
5. Have at least 25 percent of working residents walk, bike, take transit or carpool to work.

Policies

1. Amend the town purchasing policy to include consideration of energy use.
2. Support the expansion and construction of the Putney sidewalk and bike path network.
3. Make maintenance of Putney sidewalks and bike paths a priority.
4. Promote the work of Efficiency Vermont and regional partners in advancing energy efficiency projects for residents and businesses in Putney.
5. Encourage more weatherization of Putney homes, including expansion of state programs to weatherize rental and ownership units occupied by low- and fixed-income households.
6. Support state or regional initiatives to replace older mobile homes with more efficient units.
7. Support the Moover transit system.
8. Promote walking, biking, and bus transport for Putney's schoolchildren.

Actions

1. Create a baseline energy profile for all town-owned buildings, infrastructure, and operations.
2. Establish a green energy reserve fund.
3. Partner with community renewable energy entities to offset fossil fuel powered town operations with renewable energy generation.
4. Partner with neighboring towns or the regional planning commission to establish a shared Energy Coordinator position.
5. Ensure that RBES standards are incorporated by reference into Putney's land use regulations in accordance with state statute.
6. Require certificates of compliance for zoning permits when the work is subject to RBES in accordance with state statute.
7. Establish a fund to support feasibility studies for extending the Putney sidewalk and bike path network.
8. Prioritize sidewalk and bike path maintenance in the capital budget and annual highway department work plan.
9. Replace town-owned fossil fueled tools (e.g., chainsaws) and vehicles with electric powered alternatives where they exist at the time of replacement.
10. Install level three EV chargers at Putney Town Hall.

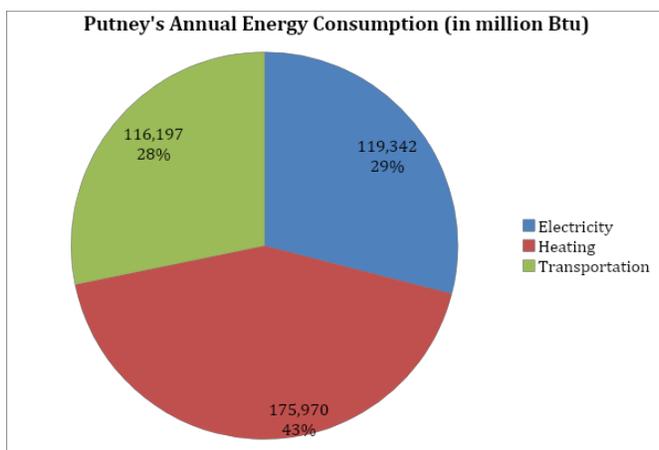
9. Encourage more active use of rideshares and public transit to reduce single occupancy commuting using rideshare boards and apps.
10. Work with the Moover to expand its MicroMoo microtransit scheme to Putney.
11. Foster local initiatives focusing on home weatherization for low- and fixed-income households.

Putney’s long-term goal is to become carbon free by phasing out the use of carbon-emitting energy while increasing the production and consumption of carbon neutral energy. By reducing carbon emissions, while also advancing the economic and environmental well-being of Putney’s residents, Putney will not only make a positive contribution in terms of reducing its emissions but will also increase its resiliency as a community. There are 5 pathways needed to reach this goal, which are: reduce energy consumption related to structures, reduce carbon emissions from transportation, promote local production of carbon-neutral energy, promote land uses that conserve energy and store carbon, and increase energy conservation and conversion through education.

Current Conditions

Putney has a similar pattern of energy consumption to other Vermont communities. Green Mountain Power (GMP) supplies electricity in Putney and electricity accounts for approximately 29% of the town’s annual energy consumption. The average annual spending on electricity for GMP residential customers is \$1,200.

Fuel oil and propane are the major forms of winter heating fuel and thermal energy accounts for approximately 43 percent of the town’s annual energy consumption. The American Community Survey (ACS) shows 44% of Putney homes were heated by fuel oil or kerosene, 30% were heated by wood, 16% were heated by propane and 4% by electricity in 2021. Comparison to the 2010 ACS shows a decrease in use of fuel oil or kerosene and an increase in both wood and propane.



The average Vermont household spends \$4,000 to \$5,000 on energy annually with most households ranging between \$3,000 and \$6,000 according to the VTDPs 2021 Annual Energy Report (Appendix C). Efficiency Vermont classified Putney as a town with a high energy burden in

its 2019 Energy Burden Report. That report estimated that the average household was spending about \$5,600 per year or more than 11% of their income to meet their energy needs. If, as expected fossil fuels and utility electricity prices continue to increase the energy burden will be more deeply felt by Putney households on fixed and low incomes. Importantly, renter households confront more challenges accessing weatherization benefits because they do not own the structure.

Putney energy budgets

Energy Category	Average Household Expenditures 2019/\$
Transportation	2,500
Electricity	1,120
Thermal (heating)	1,960

Efficiency Vermont, Energy Burden, 2019

Weatherizing a home can reduce energy consumption and costs can be reduced by up to 23% for an average home according to the VT DPS 2021 Annual Energy Report. The 2021 American Community Survey estimates the median age of a home in Putney is 46 years (1975) with 24% of homes built before 1940. This suggests that a lot more progress is possible on improving residential energy efficiency. Currently there are 224 dwelling units that have been ‘comprehensively weatherized’ in Putney according to data from the Energy Action Network. Since 2015 the annual average rate of weatherizing dwelling units has been 15. This slow rate may reflect a lack of qualified contractors among other factors.

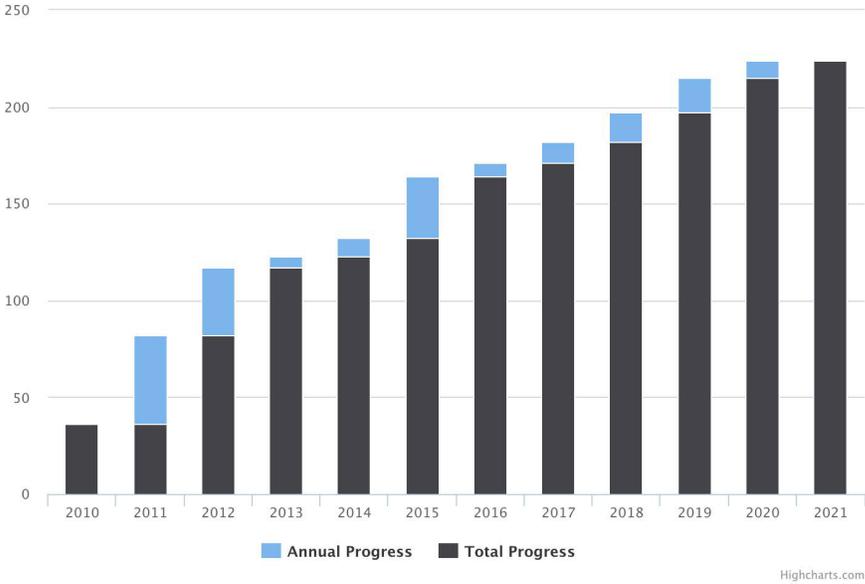
Electric Utility Data

KWH Usage by Year

Sector	2019	2020	2021
Commercial & Industrial	25,862,729	26,447,219	26,328,039
Residential	6,975,187	7,850,227	8,645,656
Total	32,837,917	34,297,446	34,973,695
Count of Residential Premises	1,124	1,223	1,220
Average Residential Usage	6,206	6,419	7,087

Efficiency Vermont, Windham Regional Report, June 2022

Number of Housing Units Comprehensively Weatherized in Putney for Bldg. Efficiency



Residential Energy Efficiency Projects in Putney

	2019	2020	2021	Total
Total Residential Projects (includes projects below)	125	104	116	345
Home Performance with ENERGY STAR® Projects	3	4	11	18
Other Weatherization Projects	2	0	3	5
Residential New Construction Projects	0	0	0	0
Other Selected Measure and Engagement Counts				
Home Energy Visits	3	0	2	5
Heat Pump Water Heater Installations	16	14	24	54
Cold Climate Heat Pump Installations	43	60	58	161
Wood Heating Installations	1	5	7	13

Efficiency Vermont, Windham Regional Report, June 2022

Transportation

Transportation accounts for about 28% of the town’s annual energy consumption. There are 2,198 people over the age of 18 years living in Putney. According to the Bureau of Transportation Statistics there are 1.1 registered vehicles for every licensed driver in Vermont, which suggests that Putney has approximately 2, 420 registered vehicles. According to Efficiency Vermont only 60 (2%) of these vehicles were either all-electric or plug-in hybrids in 2021.

Vehicle Type	2019	2020	2021
All Electric	16	20	27
Plug In Hybrid	19	25	33
Total	35	45	60

As Putney ages fewer people are engaged in the paid workforce, consequently commuter trips are also declining. The Census Bureau reported that 1,027 Putney residents commuted to jobs in 2020, 23 percent of commuters worked in downtown Brattleboro and 7 percent worked in Putney. The Moover transit service operates bus service between Putney and Brattleboro twice per weekday. The bus stops in two locations in the Village, the Putney Meadows stop is walking distance from the park-and-ride lot located adjacent to the Fire House on Route 5. Recently the Moover has been experimenting with a van-based on-demand ride system enabled by an app in Windsor, Vermont. If this service proves viable and is offered in other communities, it could allow more households to own a single vehicle.

Commute to Work by Distance

Commute Distance/miles	% of commute trips
Less than 10	52
10 to 24	23
25 to 50	9
More than 50	16
	100

US Census Bureau, "On the Map"

Renewable Energy Resources

Vermont generates almost 100 percent of its electricity from renewable sources, a larger share than any other US state. Data provided by the US Energy Information Administration shows conventional hydroelectricity accounts for almost 46 percent of total state generation. The state's five utility-scale wind farms accounted for 14 percent of total state generation. Putney does not host any large scale hydroelectric, wind farm or large-scale solar generators. As of 2020, 1,566kW of solar electricity generation has been installed in a few small-scale commercial and community systems with the remainder being from individual or residential systems. A limiting factor in large-scale (greater than 500kW, no more than 2MW) generation is the limited network of three-phase power supply needed to connect large solar generation facilities to the grid.

[map to be added]

Siting standards

This plan calls for increased renewable energy generation in Putney. This objective needs to be balanced against:

- Protecting natural resources.
- Maintaining viable agricultural and silvicultural operations and the working lands needed to sustain them.

These commitments mean that large scale renewable solar energy projects are not appropriate for areas mapped as forest blocks, orchards, and farms in Putney. The ecological value of these lands includes some measure of carbon sequestration, in addition to providing critical habitat and local food production. There should be no limitation on the siting of individual or residential scale renewable energy projects provided that the owner meets the setback and screening requirements as laid out in the Putney zoning regulations. Where the project is a commercial venture the landscaping and screening standards as found in section XX.XX will apply.

The Solar Energy Potential Map shows larger areas of land suitable for solar electricity generation lie in the eastern part of town roughly between I-91 and the Connecticut River. These river plains are also comprised of prime agricultural soils and therefore should be retained for agricultural production. The lands that have already been disturbed because of I-91 or the railroad or use as a waste dump (i.e., no longer suitable for agriculture) may be suitable for further solar electricity generation (although they are some distance from phase 3 power supply). Roof top solar and solar canopies in parking lots, and use of land with other development limitations (such as former gravel pits) should be encouraged.

Putney has extremely limited potential for large-scale wind development due to topography and land use constraints. Currently large-scale installations are typically sited on ridgelines at elevations of 2,000 to 5,000 feet. Putney's highest peak is 1,500 feet. If technology changes allow for large turbines to be located at lower elevations Putney will need to balance considerations for additional renewable energy generation against protection of natural resources.

Future Energy Use

Future targets for energy use and conservation are linked to longer-term demographic shifts and national and New England wide changes in energy technology and supply. Putney's population will continue to age and increase very little based on current projections. As the cost of petroleum-based energy for transportation and heating increase consumers will continue to shift to electricity. As transportation shifts from fossil fuels to electricity grid stability and total electricity demand will become more important policy concerns. Putney can make contributions to resiliency by continuing to increase solar electricity generation while continuing to encourage energy conservation strategies.