STATUTORY REQUIREMENTS

Regional Enhanced Energy Plans must (in addition to being adopted):

- Include the energy element as described in 24 V.S.A. § 4348a(a)(3)
    - which may include an analysis of resources, needs, scarcities, costs, and problems within the region across all energy sectors, including electric, thermal, and transportation;
    - statement of policy on the conservation and efficient use of energy and the development and siting of renewable energy resources;
    - a statement of policy on patterns and densities of land use likely to result in conservation of energy;
    - identification of potential areas for the development and siting of renewable energy resources and areas that are unsuitable for siting those resources or particular categories or sizes of those resources.
- Be consistent with state energy policy (described below) in the manner described in 24 V.S.A. § 4302(f)(1): ***To make efficient use of energy, provide for the development of renewable energy resources, and reduce emissions of greenhouse gasses***. Including*: increasing the energy efficiency of new and existing buildings; identifying areas suitable for renewable energy generation; encouraging the use and development of renewable or lower emission energy sources for electricity, heat, and transportation; and reducing transportation energy demand and single occupancy vehicle use.*
    - Greenhouse gas reduction requirements under 10 V.S.A. § 578(a) (26% from 2005 levels by 2025; 40% from 1990 levels by 2030; 80% from 1990 levels by 2050)
    - The 25 x 25 goal for renewable energy under 10 V.S.A. § 580 (25% in-state renewables supply for all energy uses by 2025)
    - Building efficiency goals under 10 V.S.A. § 581 (e.g., reduce fossil fuel consumption across all buildings by 10% by 2025)
    - State energy policy under 30 V.S.A. § 202a and the recommendations for regional and municipal planning pertaining to the efficient use of energy and the siting and development of renewable energy resources contained in the State energy plans adopted pursuant to 30 V.S.A. §§ 202a and 202b
    - The distributed renewable generation and energy transformation categories of resources to meet the requirements of the Renewable Energy Standard under 30 V.S.A. §§ 8004 and 8005
- Meet all standards for issuing a determination of energy compliance detailed in the 2022 Comprehensive Energy Plan and detailed here: Final Update Regional Determination Standards_ Form Fillable.docx (live.com)

Methodology Supplements

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Methodology: Municipal Energy Use and Targets

Please refer to the Department of Public Service's Act 174 Landing Page which has guidance for regions and municipalities and a host of tools used in the analyses that support this plan. This supplement provides additional, not comprehensive, methodological information so as not to duplicate that which is already laid out by the State. Lastly, up-to-date supplement can be found on the CVRPC webpage along with municipal breakouts for targets which will be published throughout the Spring 2024 and update as municipalities adjust for their own enhanced energy planning needs.

Vermont's Regional Planning Commissions have been tasked with developing reasonable estimates for local consumption across the transportation, heating, and electric energy sectors. While these estimates use best available data, they should not be considered a unit-by-unit audit of energy use. Rather, they serve as a starting point for better understanding our region's current energy use patterns, the cost drivers, and what we need to do to achieve long-range energy goals. Note, estimates and targets are frequently given in British Thermal Units (BTUs) and millions of BTUs (MMBTUs) in order to allow for comparison between different energy types.

Current residential and commercial & industrial electricity usage data is provided by Efficiency Vermont (both municipal and regional totals- see supplement), transportation and thermal sector data is estimated via the Municipal Consumption Tool which pulls from a variety of sources including the Vermont Department of Public Service, American Community Survey, Vermont Department of Labor, the Vermont Department of Motor Vehicles, and DriveElectric (VEIC) (see supplement for specifics). Using the regionalized LEAP results provided by the Department of Public Service, targets are established to provide milestones for thermal efficiency; renewable energy use; and conversion of thermal and transportation energy from fossil fuel based to renewable resources. These milestones are intended to help the region measure progress towards the overall goals and are not identified as requirements. **Regional LEAP targets were disaggregated using each municipality's share of current regional energy use, municipal disaggregation factors were calculated for transportation (Light Duty Vehicles), residential thermal, commercial thermal, residential electric, and commercial electric.** Targets are established for the years 2025, 2035, and 2050 which coincide with the State Comprehensive Energy Plan (update 2022). Targets include both a "business as usual" baseline and the CAP (Climate Action Plan) mitigation scenario targets. While a summary of results is included below and referenced throughout this chapter, a walkthrough of the methods, data sources, and interim steps are included in the supplement and accompanying tools and supporting resources hosted by the Department of Public Service. Furthermore, full details of the LEAP Model methods, data sources and assumptions may be found as Appendix

D to the 2022 Comprehensive Energy Plan[1]. Municipal analyses and targets will be made available on the CVRPC website and in the supplement.

Residential Heating Energy Use and Cost Estimates

The following explains the series of steps that CVRPC has taken to calculate estimates of Residential Heating Energy use, square footage, and costs for the Central Vermont region. According to the Department of Public Service, residences in New England use somewhere about 45,000 to 80,000 BTUs of heat energy per square foot annually, averaging statewide at about 110 MMBTUs per residence per year for space and water heating. Space heating is by far the biggest use, and older building stock can require significantly more energy to heat.

Caveats:

- ACS data is based on random sampling over a multi-year period with large margins of error especially for rural communities like many in the Central Vermont Region. As the writing of this plan, it remains the most consistent and comprehensive data available on residential heating.
- ACS data identifies only one primary source of heating. In reality, many residents use two or more resources.

1. **Data (ACS 2022 5-Year Estimates used)**
    a. B25117 Tenure by House Heating Fuel,
    b. B25010: Average Household Size of Occupied Units by Tenure,
    c. DP04 Selected Housing Characteristics,
    d. Total Housing Units.
    e. These data can be downloaded into an excel spreadsheet, CSV, or other file type. CVRPC did this by town and aggregated them in excel (Tables).

House heating fuel is categorized on the ACS questionnaire as follows:

Utility Gas: This category includes gas piped underground from a central system to serve the neighborhood. The only utility in Vermont that delivers gas in this manner (i.e. natural gas) is Vermont Gas, and its service area is well outside of our region. A small number of ACS respondents indicated that they heated with “utility gas.” It is most likely that they confused this source with bottled, tank or LP gas. We therefore made adjustments to account for this error.
Bottled, Tank, or LP Gas: This category includes liquid propane gas stored in bottles or tanks that are refilled or exchanged when empty. This is the second most dominant heat source for owner- and renter-occupied homes.
Electricity: This category includes electricity that is generally supplied by means of above or underground electric power lines. Census data does not distinguish between types of electric heat (e.g. resistance vs. heat pumps). We assume that additional homes in this category since he last plan and in the future are new heat pumps and not new resistance heat.
Fuel Oil, Kerosene, etc.: This category includes fuel oil, kerosene, gasoline, alcohol, and other combustible liquids. This category (oil) is the leading source of heat in the region overall, and for both owner- and renter-occupied homes.
Coal or coke: This category includes coal or coke that is usually distributed by truck. Some households in our region use anthracite in stove, furnaces, and boilers. There are very few of these, if any, still in the region, as the margin of error suggests potential to be zero.

[1] https://publicservice.vermont.gov/content/2022-cep-analysis-greenhouse-gas-emission-reduction-pathways-vermont

Wood: This category includes purchased wood, wood cut by household members on their property or elsewhere, driftwood, sawmill or construction scraps, or the like. Wood is a close third largest source of heat in the region for owner-occupied homes, much of which is likely cordwood.
Solar Energy: This category includes heat provided by sunlight that is collected, stored, and actively distributed to most of the rooms. It is difficult to anticipate what residents mean when they select this option given new technology; thus we combine with other fuel.
Other Fuel: This category includes all other fuels not specified elsewhere. This category very likely consists of non-fossil fuel sources, but it is difficult to make further assumptions.

2. **Determine total square footage of housing by tenure:** For renter households, multiply the average household occupancy (e.g. 2.24 people) by **500 sq ft per person** (this number is a constant; it comes from the US Census Bureau's 2011 American Housing Survey and represents the national average size of a housing rental housing unit per occupant). For owner households, multiply the average occupancy by **800 sq ft per person** (from the same report). This provides an estimate—albeit, a very rough one—for the total square footage of occupied housing.
   Note: This is one of several areas where the methods could be improved in the future as these are only very broad estimates.

3. **Square Footage by Fuel Type:** In order to estimate the amount of space being heated by each fuel, the percentage of each fuel type was generated for owner- and renter-occupied households. Once the fuel use as percentages of total Renter and Owner households were calculated, the percentage for each fuel was multiplied by the total estimated square footage calculated in step 2.

4. **Energy Required for Heating:** This step is very simple. CVRPC used a basic estimate to take square footage and turn it into a calculation of the energy required for heating. The Department of Public Service cites a range of estimates for heat energy intensities per square foot from 45,000BTUs to 80,000BTUs for poorly insulated, leaky buildings for example pre-1940s housing units among others. Given the aging housing stock across the region, CVRPC used 60,000 BTUs as a generic estimate of the annual energy required to heat one square foot of housing annually in Vermont. In other words, all of the total square footages were multiplied by 60,000 BTUs/square feet.

   Note: In the future CVRPC might account for energy efficiency here, based on the number of buildings that have been weatherized or the percentage of buildings built in each decade (assuming that older buildings are less energy efficient in general when not weatherized). But for the purpose of consistency with initial calculations—the goal of which is to establish a general understanding of energy use in our regions—and without a good baseline of total homes weatherized, this method seems sufficient.

5. **Convert to units of fuel and determine cost:** The total Energy required for each fuel type was divided by the Energy generated from one unit of that fuel type. CVRPC used the following estimates of energy/unit and cost per unit estimates below (Units used divided by cost per Unit). Note, ACS does not account for wood pellet use, a conversion and cost estimate is included in the table below so that municipalities who wish to account for pellet use may do so.

Fuel Type	Standard	BTUs	Cost	Total Regional Cost	Source (cost/unit)

	Unit			(Current Use)	
Fuel Oil, kerosene, etc.	Gallon	140,000	$4.133	40,869,208.29	Vermont Average Residential-EIA (March 2024)
Bottled, tank, or LP gas (propane)	Gallon	91,000	$3.575	30,470,927.14	Vermont Average Residential-EIA (March 2024)
Coal or coke	Ton	19,590,000	$500	44,949.46	VT newspapers and quote VT&NH suppliers
Wood (seasoned)	Cord	20,000,000	$350	7,709,887.50	(275 green-450 kiln dried) VT newspapers and quoted VT suppliers
Wood Pellets	Ton	16,400,000	$405		Vermont wood/pick-up; Energy Co-op of VT
Electricity	Kilowatt hour	3,414	$0.2109	3,939,594.36	**VT State Energy Profile, US Energy Information Administration**
Other Fuel (includes solar)				4,142,353.99	
Regional Total Cost				$87,176,920.74	

6. **Determine energy use for seasonal units:** There is no corresponding ACS data on heating sources of vacation/second/seasonal homes, though for several of the towns in the Central Vermont region, these make up a significant portion of overall homes. The Department of Public Service guidelines suggest that on average, seasonal homes account for about 5% of the thermal energy used in a year-round home (for example a seasonal camp may not have a central heating system, but it still may use propane to heat the water, have a woodstove or fireplace for unseasonably cool nights, etc.). This guidance does not quite match the Central Vermont region as several communities with many seasonal residents use their properties throughout the winter specifically and/or for more than occasional use. Thus, for estimation purposes we assigned 10% to seasonal units in the towns on the eastern half of the region featuring many lakes with summer seasonal population influx, and 25% for those on the western half of the region proximate to the region's winter recreation areas. Here is the formula for calculating MMBTUs for seasonal units:

Number of seasonal units (ACS) x Average MMBTUs per Owner-Occupied Unit (110) x 0.1 (or 0.25) = Total MMBTUs Seasonal

Table 7 Current Regional Residential Thermal Energy Adder (MMBTU) for Seasonal/Vacation Homes

	Seasonal/Vacation Homes	MMBTUs	% Use
Orange	36	396	0.1
Washington	55	605	0.1
Williamstown	73	803	0.1
Barre City	0	0	0.1
Barre Town	27	297	0.1

Berlin	57	627	0.1
Cabot	116	1276	0.1
Calais	117	1287	0.1
Duxbury	56	1540	0.25
East Montpelier	30	330	0.1
Fayston	565	15537.5	0.25
Marshfield	45	495	0.1
Middlesex	48	1320	0.25
Montpelier	88	968	0.1
Morteown	77	2117.5	0.25
Northfield	58	1595	0.25
Plainfield	19	209	0.1
Roxbury	124	3410	0.25
Waitsfield	233	6407.5	0.25
Warren	1735	47712.5	0.25
Waterbury	171	4702.5	0.25
Woodbury	341	3751	0.1
Worcester	66	1815	0.25
Totals	**4,137**	**97,201.5**	

7. **Final Data Combination:** Results were combined and displayed.

Methodology for Commercial Estimates

This table uses a worksheet, Municipal Consumption, created by the Department of Public Service, which uses data from the Vermont Department of Labor's Economic and Labor Market Information web site: http://www.vtlmi.info. The worksheet determines the municipality's share of the regional commercial building stock and applies assumptions from the Energy Information Institute's Survey of Commercial Uses. The estimate does not include industrial uses, which are highly variable.

Transportation Estimates

This data was developed using the Department of Public Service's Municipal Consumption worksheet. The total number of vehicles comes from American Community Survey (ACS) 5-Year Estimates. Average annual VMTs, accounts for slightly longer-than-average commutes and more incidental trips in the rural and commuter parts of our region. Total vehicle miles travelled assumes an average fuel economy of 22 miles per gallon. Registered EVs was determined by the Vermont Energy Investment Corporation (Drive Electric) and uses a low midpoint between the Dept. of Public Service's average of 7,000 VMTs per EV annually and the average of 12,000 for ICE vehicles taking into account early trends in EV adoption including reducing trips in adverse weather and co-incidence of alternative transportation modes as well as the high % of our region who is retired and thus without a daily commute.

Electricity Estimates

Efficiency Vermont has compiled three years of data, based on that provided (variously) by utilities serving the region.

Thermal Efficiency & Fuel Switching Targets (Residential & Commercial)

Targets for thermal efficiency of residential and commercial structures are based on a methodology developed by the regional Long-range Energy Alternatives Planning (LEAP) analysis carried out by the Department of Public Service and then disaggregated using municipal share of regional energy use determined via the Municipal Consumption Tool and then converted where appropriate with accepted measure conversions provided in the Analysis and Targets Aid Bottom Up tool. Residential targets use the mean MMBTUs for occupied households in the municipality, which were calculated by CVRPC. Commercial targets use the data from the Vermont Department of Labor. Data in this table represent the percentages of municipal households and commercial establishments that will need to be weatherized in the target years. The targets are cumulative. Targets assume a 6% increase in number of housing units/commercial establishments over each period. Weatherization projects are assumed to achieve an average of 25% reduction in MMBTUs for residential units and 20% for commercial establishments, although some weatherization projects can actually achieve deeper savings. As with thermal efficiency targets, these targets assume a 6% increase in number of housing units/commercial establishments over each period.

Advanced Wood Heat Target Creation

The regional CAP LEAP targets provided by the Public Service Department (Table 20) are paired with the targets for heat pump and heat pump hot water heaters model the state's general electrification policy with all other fuel types, other than biodiesel, decreasing dramatically. As discussed, Central Vermont approach to the thermal sector, specifically for residential and commercial heat, incorporates the sustained use of wood (cord wood) (stand alone or in combination with heat pumps). The following describes an adjustment to the LEAP targets and the addition of a target for converting inefficient wood stoves to high efficiency wood stoves.

Residential Heating from Table 5 for region is 2,788,000 plus seasonal/vacation/secondary residences from table 7 97,201.5= 2,885,201.5 Thousand MMBTU

Wood Heat

Table 5 441,000 Thousand MMBTU region + seasonal/vacation/secondary residences (14% wood across region) of 92,201.5

Table 19 provides a new target developed by CVRPC in recognition of the role wood heating plays in the region and can continue to do so as part of our energy policy and goals, specifically cord wood. These targets focus on the conversion of aged and/or inefficient woodstoves (cord wood) to high efficiency replacements. These targets are based on the constants used in current use estimates (see above and supplement), Efficiency Vermont projections that advanced wood heat conversion reduces fuel use by approximately 1/3 which was further reduced to 2/3 fuel use per home based on weatherization and conversion of some wood heating use from primary to secondary heating source (thus reflecting an average per household of 5.69 cords per year to 1.9 cords). While data on wood heating is coarse, see detailed discussion above, this target uses current use as a starting point at 2025, and strives for 20% of households to convert per target year through to 80% in 2050 (these leaves room for the unknown number of existing high efficiency wood stoves, etc). These targets increase the demand from wood per the LEAP targets provided by the Department of Public Service for the target 2050 but reflects a significantly lower estimation of demand in all previous years. CVRPC is working with the Department of Public Service and other partners to refine these LEAP targets to better reflect current use (see supplement). Despite this, the pairing of these targets for residential heating remain in line with the region's approach: a transition from fossil fuels and inefficient heating types (e.g. electric resistance) towards residential heating demand dominated by high efficiency electric and cord wood technologies (whether combined or not at a household level).

In the future CVRPC will work towards incorporating further adjustments to the targets associated with incorporating district heating, thermal energy networks, and geothermal.

Electrical Efficiency Targets

Efficiency and conservation measures are integrated into the thermal sector targets. Electricity efficiencies were embedded into the 20year load forecast used in the updated LEAP model, thus are not an output of their own (and why the Public Service Department removed the Electric Sector tab of the updated Analysis & Targets Tool). Additional targets will be made available at the regional and municipal scales via CVRPC's website once the Public Service Department determines an appropriate path forward for treating those targets. CVRPC did not find it necessary to add additional targets pre-empting a statewide, RPC-supported, approach is developed, given especially the focus on weatherization and efficient residential heating systems above that fits well with the region's vision and current approach.

Fuel Switching Transportation Targets

This table displays a target for switching from fossil fuel-based vehicles to EVs. This target is calculated using the Regional LEAP data and disaggregated the regional target based on the municipal share of current vehicles (light duty only). The targets are cumulative.

Table 21. EV Registrations by Town

County	EV Registration Jan. 2023			EV Registration Jan. 2024			Increase 2023-2024	
Municipality	**AEV**	**PHEV**	**Total EVs**	**AEV**	**PHEV**	**Total EVs**	**Count**	**%**
Washington County Total	569	487	1056	**896**	**580**	**1476**	**420**	**40%**
Barre City	53	55	108	88	73	161	53	49%
Barre Town	5	9	14	9	16	25	11	79%
Berlin	23	15	38	32	22	54	16	42%
Cabot	4	7	11	4	8	12	1	9%
Calais	20	19	39	33	20	53	14	36%
Duxbury	4	2	6	9	3	12	6	100%
East Montpelier	21	12	33	28	18	46	13	39%
Fayston	2	5	7	3	4	7	0	0%
Marshfield	12	11	23	18	14	32	9	39%
Middlesex	28	20	48	41	20	61	13	27%

Montpelier	164	150	314	257	151	408	94	30%
Moretown	29	7	36	38	17	55	19	53%
Northfield	20	20	40	36	22	58	18	45%
Plainfield	20	26	46	35	37	72	26	57%
Roxbury	2	1	3	4	0	4	1	33%
Waitsfield	41	26	67	66	31	97	30	45%
Warren	34	22	56	51	33	84	28	50%
Waterbury	75	69	144	126	81	207	63	44%
Woodbury	0	2	2	0	2	2	0	0%
Worcester	12	9	21	18	8	26	5	24%
Orange	3	0	3	5	1	6	3	100%
Washington	5	2	7	5	3	8	1	14%
Williamstown	11	8	19	15	12	27	8	42%
REGIONAL TOTAL	**588**	**497**	**1085**	**921**	**596**	**1517**	**432**	**40%**

Methodology: Municipal Energy Generation, Existing and Potential

Existing Renewable Energy Generation

Significant effort was made to aggregate the most comprehensive list of existing renewable energy generation sites possible for the region. The Department of Public Service periodically provides an updated Distributed Generation Inventory which includes projects that have been submitted to the Public Utility Commission and are less than <5MW. CVRPC worked with both the Department of Public Service and Distribution Utilities (DUs) to conduct significant data cleaning of DU source data to address significant challenges in previous iterations including spelling errors, differences in notation and space, village and non-town names, incorrect zip codes, etc. while these may sound like minor inconveniences, it was impossible to attribute over 300 projects to either Barre City or Barre Town due to such issues which have now been resolved. The data however is still incomplete for smaller DUs.

CVRPC added a column for municipality and aggregated projects by town, removing inactive projects, and splitting existing and proposed plants. Projects were split two ways, first into town tabs then by generation and storage, resource type, size, and sorted by DU; secondly all CVRPC projects were split by Generation and Storage, Size, Resource Type, and sorted for Town and DU. Distribution Utility Integrated Resource Plans where then skimmed for missing assets of all types, and furthermore for hydroelectric facilities, Federal Energy Regulatory Commission records and Low Impact Hydropower Institute records were compared, as were town plans and the State Comprehensive Energy Plan to identify additional plants. Projects were then split into Category I-III by size (e.g. Table X), and totals could be calculated including regional and municipal totals of generation by tech type and size, number of generation projects by tech type and size, municipal shares of regional totals, storage capacity by town and size, etc. Estimated annual MWh output per installed MW nameplate capacity were calculated using constants provided in the table below which are consistent with those used by the Public Service Department and in the Generation Scenarios Tool, except for hydroelectric which was taken directly from DU IRPs, FERC, and LIHI records.

As the Department of Public Service embarks on a data initiative, CVRPC is dedicated to supporting their efforts to address outstanding data integrity issues and improve the reliability and availability of a single consistent data source. Unfortunately, though hope was long held out, the Energy Action Dashboard was officially updated leaving aside the difficulty task of updating and hosting the much-beloved and crowd -sourced Energy Atlas that is unfortunately 7+ years out of date.

Capacity Factor is the ratio of actual electrical energy output over a given period of time to the theoretical maximum over that same period (the theoretical maximum energy output of a given installation being continuous operation at full nameplate capacity over the relevant time period).

Renewable Energy Generation Outputs & Capacity Factors

Resource	Capacity Factor	Annual MWh output per installed MW
Ground Mount Solar	15%	1,314
Rooftop Solar	14.5%	1,270
Wind	22.5%	1,971
Utility Scale Wind	30%	2,628

Hydroelectric	50%	4,380
Natural Gas	75%	6,570
Biomass	70%	6,132

Source: Central Vermont Regional Planning Commission & Department of Public Service (Generations Scenarios Tool)

State Energy Planning Data: Known and Possible Constraints; Calculating Renewable Energy Potential

Prime and base layers taking into consideration the State's known and possible constraints as well as draft ground-mounted solar, rooftop solar, and wind potential layers can be downloaded from the recently updated Act 174 tab of the Vermont Planning Atlas maintained by the Agency Of Commerce and Community Development (2022 updates https://vcgi.vermont.gov/data-release/act-174-statewide-energy-planning-data-updated-known-and-possible-constraints). While CVRPC did use these as a starting point, these layers had to be divided by town boundaries, redundancies between rooftop solar (and building footprints broadly) and ground mount had to be removed, etc. before additional considerations including regional possible constraints could be added and analyses conducted. CVRPC is working to integrate possible local constraints in next 2025 comprehensive Regional Plan Update.

CVRPC is in the process of developing a tool for municipalities to use during their own Enhanced Energy Planning processes to determine the potential impact of adding additional constraints or better yet, preferred sites to the maps. CVRPC is furthermore, committed to integrating mapping tools into the project review process and the project development process to support quick evaluations for discussions including highlighting areas with different numbers of possible constraints, working to identify preferred sites, mapping existing preferred site types and project characteristics, etc.

Ground-Mounted Solar Energy Potential

The methodology for estimating ground-mounted solar electricity potential is to divide the number of acres available as prime and base resources by 8 acres per MW for prime solar; 60 acres per MW is used for base solar to account for the presence of possible constraints that reduce the land usable for solar panels. The annual electricity production is then estimated using the formula below. Solar MWh of energy = (number of MW) * (8760 hours per year) * (0.15 capacity factor).

Calculating Rooftop Solar Energy Potential

Rooftop solar potential data is sourced from the Vermont Center for Geographic Information (VCGI) dataset named Town Rooftop Solar Potential – Act 174 2022. As explained in the release notes, these estimates use a geographic information system (GIS) model of building footprints to determine the total surface area of rooftops suitable for solar photovoltaic panels (accounting for amount of solar radiation, slope, aspect, shading of nearby objects, and minimum size of rooftop viable for solar panels). Using published data for solar radiation, the VCGI data also estimates an annual solar energy production potential for each suitable rooftop, summarized by municipality, applying a capacity factor of 13.76% as published by the U.S. Environmental

Protection Agency. The total system capacity in megawatts is then estimated using the formula below. Rooftop MW of capacity = (number of annual MW) ÷ ((0.145 capacity factor) * (8760 hours per year)). This was further curtailed by CVRPC to provide a conservative estimate as roof and condition could not be integrated at this point in analyses.

Calculating Wind Energy Potential

The methodology for estimating wind electricity potential is to divide the number of acres available as prime and base resources by 25 acres per MW. There is no reduced land factor for base wind since possible constraints have a lesser impact on actual equipment siting due to the vertical nature of wind turbines. Then to estimate the amount of production using the formula below. Wind MWh of energy = (number of MW) * (8760 hours per year) * (0.225 capacity factor)

Calculating Renewable Energy Generation Targets- see CVRPC website and municipal breakouts

Generations Scenario Tool was set to meeting the Region's incremental regional energy target via 25% Ground Mount Solar, 50% Rooftop Solar, 20% Wind, and 5% Hydro. Natural Gas is set to 0% as there is no natural gas infrastructure in the region and Vermont's primary supplier, VGS (Vermont Gas Systems), is not only not looking to expand their territory for natural gas but is also exploring work conversion into geothermal and other technologies. Furthermore, Biomass (for electricity generation) was set to 0% as after the Moretown Landfill closed it seems there is little appetite for a project in the region. Note that landfills are included as preferred sites though, and this could change in future analyses if a project is developed. These inputs were set to maximize rooftop solar as a key preferred site. The table below identifies regional targets for new renewable electric energy generation; in addition to the target for 2050, the table includes intermediate years to help track progress towards that goal.

Municipalization: Land: 20%, Existing Generation: 10%, Demand: 50%, Population: 20%

	Existing Renewable Generation (MW)	Multiplier (distribution across technology type)	Incremental Regional Capacity Target (MW)		Resource Available (MW)	Prime Land Available (Acres)
			25% IN-STATE	50% IN STATE		
Ground Mount Solar	41.7	25%	31	84.7	1500.4	10,503
Rooftop Solar		50%	64.2	175.3	162.7	244

Wind	0.24	20%	16.6	45.2	867.6	34,795
Hydroelectric	26	5%	1.9	5.1	1.9	N/A
Biomass (Wood, methane, farm biogas)	0	0	0	0	0	0
Total Renewable Generation Potential	68	100%	113.7MW	310.4	2532.7	45,452

Source: Central Vermont Regional Planning Commission & Department of Public Service (via Generation Scenarios Tool, see methodology in supplement). Municipal tables will be available online May 2024. NOTE: while energy targets are provided in MWh, capacity targets are provided in MW- default outputs are provided here for consistency and comparison across regions. Values in orange exceed resources available although hydroelectric potentials are not yet well integrated into state planning tools and merit further consideration. Furthermore, our capacity target for the 50% in state scenario, in purple, would also exceed our Distribution Headroom.

NOTA BENE: Resource and Land Available simply form an extreme upper bound, they are many times over the land needed to met the targets

State Known and Possible Constraint Definitions and Descriptions

The following is a list of the known, possible, and regional constraints that were used and referenced in the mapping section of this document. A definition of the constraint including source of the data is provided. As discussed in the report, RPCs supported a coordinated effort by the Department of Public Service, VCGI, and ANR to aggregate these layers which are now available via the Act 174 tab of the DHCD Planning Atlas (https://vcgi.vermont.gov/data-release/act-174-statewide-energy-planning-data-updated-known-and-possible-constraints).

Known Constraints

Vernal Pools (confirmed and unconfirmed layers) –

Source: Vermont Fish and Wildlife, 2009 - present

Vernal pools are temporary pools of water that provide habitat for distinctive plants and animals. Data was collected remotely using color infrared aerial photo interpretation. "Potential" vernal pools were mapped and available for the purpose of confirming whether vernal pool habitat was present through site visits. This layer represents both those sites which have not yet been field-visited or verified as vernal pools, and those that have.

Department of Environmental Conservation (DEC) River Corridors –

Source: DEC Watershed Management District Rivers Program, January 2015

River corridors are delineated to provide for the least erosive meandering and floodplain geometry toward which a river will evolve over time. River corridor maps guide State actions to protect, restore and maintain naturally stable meanders and riparian areas to minimize erosion hazards. Land within and immediately abutting a river corridor may be at higher risk to fluvial erosion during floods.

River corridors encompass an area around and adjacent to the present channel where fluvial erosion, channel evolution and down-valley meander migration are most likely to occur. River corridor widths are calculated to represent the narrowest band of valley bottom and riparian land necessary to accommodate the least erosive channel and floodplain geometry that would be created and maintained naturally within a given valley setting.

Federal Emergency Management Agency (FEMA) Floodways –

Source: FEMA Floodway included in Zones AE – FEMA Map Service Center

These are areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. A "Regulatory Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

State-significant Natural Communities and Rare, Threatened, and Endangered Species – *Source: Vermont Fish and Wildlife, National Heritage Inventory*

The Vermont Fish and Wildlife Department's Natural Heritage Inventory (NHI) maintains a database of rare, threatened and endangered species and natural (plant) communities in Vermont. The Element Occurrence (EO) records that form the core of the Natural Heritage Inventory database include information on the location, status, characteristics, numbers, condition, and distribution of elements of biological diversity using established Natural Heritage Methodology developed by NatureServe and The Nature Conservancy.

An Element Occurrence (EO) is an area of land and/or water in which a species or natural community is, or was, present. An EO should have practical conservation value for the Element as evidenced by potential (or historical) presence and/or regular recurrence at a given location. For species Elements, the EO often corresponds with the local population, but when appropriate may be a portion of a population or a group of nearby populations (e.g., metapopulation).

National Wilderness Areas –

Source: United States Department of Agriculture Forest Service
A parcel of Forest Service land congressionally designated as wilderness.

Class 1 and Class 2 Wetlands –

Source: Vermont Significant Wetland Inventory (VSWI) and advisory layers
The State of Vermont protects wetlands which provide significant functions and values and also protects a buffer zone directly adjacent to significant wetlands. Wetlands in Vermont are classified as Class I, II, or III based on the significance of the functions and values they provide. Class I and Class II wetlands provide significant functions and values and are protected by the Vermont Wetland Rules. Any activity within a Class I or II wetland or buffer zone which is not exempt or considered an "allowed use" under the Vermont Wetland Rules requires a permit.
Class I wetlands have been determined to be, based on their functions and values, exceptional or irreplaceable in its contribution to Vermont's natural heritage and, therefore, merits the highest level of protection. All wetlands contiguous to wetlands shown on the VSWI maps are presumed to be Class II wetlands, unless identified as Class I or III wetlands, or unless determined otherwise by the Secretary or Panel pursuant to Section 8 of the Vermont Wetland Rules.

Possible Constraints

Agricultural Soils –

Source: Natural Resources Conservation Service (NRCS)
"Primary agricultural soils" are defined as "soil map units with the best combination of physical and chemical characteristics that have a potential for growing food, feed, and forage crops, have sufficient moisture and drainage, plant nutrients or responsiveness to fertilizers, few limitations for cultivation or limitations which may be easily overcome, and an average slope that does not exceed 15 percent. Present uses may be cropland, pasture, regenerating forests, forestland, or other agricultural or silvicultural uses.
The soils must be of a size and location, relative to adjoining land uses, so that those soils will be capable, following removal of any identified limitations, of supporting or contributing to an economic or commercial agricultural operation. Unless contradicted by the qualifications stated above, primary agricultural soils include important farmland soils map units with a rating of prime, statewide, or local importance as defined by the Natural Resources Conservation Service of the United States Department of Agriculture.

FEMA Special Flood Hazard Areas -

The land area covered by the floodwaters of the base flood is the Special Flood Hazard Area (SFHA) on National Flood Insurance Program (NFIP) maps. The SFHA is the area where the NFIP's floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies.

Protected Lands –

State fee land and private conservation lands are considered protected lands. Other state level, non-profit and regional entities also contribute to this dataset. The Vermont Protected Lands Database is based on an updated version of the original Protected Lands Coding Scheme reflecting decisions made by the Protected Lands Database Work Group to plan for a sustainable update process for this important geospatial data layer.

Act 250 Ag Mitigation Parcels –

Source: Vermont Department of Agriculture

All projects reducing the potential of primary agricultural soils on a project tract are required to provide “suitable mitigation,” either “onsite or offsite,” which is dependent on the location of the project. This constraint layer includes all parcels in the Act 250 Ag Mitigation Program as of 2006.

Deer Wintering Areas (DWA) –

Source: Vermont Department of Fish and Wildlife

Deer winter habitat is critical to the long-term survival of white-tailed deer (Odocoileus virginianus) in Vermont. Being near the northern extreme of the white-tailed deer's range, functional winter habitats are essential to maintain stable populations of deer in many years when and where yarding conditions occur. Consequently, deer wintering areas are considered under Act 250 and other local, state, and federal regulations that require the protection of important wildlife habitats. DWAs are generally characterized by rather dense softwood (conifer) cover, such as hemlock, balsam fir, red spruce, or white pine. Occasionally DWAs are found in mixed forest with a strong softwood component or even on found west facing hardwood slopes in conjunction with softwood cover. The DWA were mapped on mylar overlays on topographic maps and based on small scale aerial photos.

Vermont Conservation Design include the following Highest Priority Forest Blocks: Connectivity, Interior, and Physical Landscape Diversity –

Source: Vermont Department of Fish and Wildlife

The lands and waters identified in this constraint are the areas of the state that are of highest priority for maintaining ecological integrity. Together, these lands comprise a connected landscape of large and intact forested habitat, healthy aquatic and riparian systems, and a full range of physical features (bedrock, soils, elevation, slope, and aspect) on which plant and animal natural communities depend.

Hydric Soils –

Source: Natural Resources Conservation Service

A hydric soil is a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part. This constraint layer includes soils that have hydric named components in the map unit.

CVRPC Energy Use, Targets, and Pathways (by Sector)

The data in this section is intended to provide an overview of current Central Vermont (CVRPC) energy use and a sense of the trajectories and scale of change needed to meet the region's shares of the State's goals. Current residential and commercial & industrial electricity usage data is provided by Efficiency Vermont (both municipal and regional totals- see supplement), transportation and thermal sector data is estimated via the Municipal Consumption Tool which pulls from a variety of sources including the Vermont Department of Public Service, American Community Survey, Vermont Department of Labor, the Vermont Department of Motor Vehicles, and DriveElectric (VEIC) (see supplement for specifics). Using the regionalized LEAP results provided by the Department of Public Service, targets are established to provide milestones for thermal efficiency; renewable energy use; and conversion of thermal and transportation energy from fossil fuel based to renewable resources. These milestones are intended to help the region measure progress towards the overall goals and are not identified as requirements. **Regional LEAP targets were disaggregated using each municipality's share of current regional energy use, municipal disaggregation factors were calculated for transportation (Light Duty Vehicles), residential thermal, commercial thermal, residential electric, and commercial electric.** Targets are established for the years 2025, 2035, and 2050 which coincide with the State Comprehensive Energy Plan (update 2022). Targets include both a "business as usual" baseline and the CAP (Climate Action Plan) mitigation scenario targets. While a summary of results is included below and referenced throughout this chapter, a walkthrough of the methods, data sources, and interim steps are included in the supplement and accompanying tools and supporting resources hosted by the Department of Public Service. Furthermore, full details of the LEAP Model methods, data sources and assumptions may be found as Appendix D to the 2022 Comprehensive Energy Plan[2]. Municipal analyses and targets will be made available on the CVRPC website and in the supplement.

Supplemental Figures and Tables

[2] https://publicservice.vermont.gov/content/2022-cep-analysis-greenhouse-gas-emission-reduction-pathways-vermont

Town	Median Household Income	Electricity Spending	Thermal Spending	Transportation Spending	Total Spending	Total Energy Burden	Energy Burden Group
Barre City	$35,225	$1,110	$1,965	$2,227	**$5,302**	**15.1%**	Highest
Cabot	$43,864	$1,096	$2,081	$2,725	**$5,902**	**13.5%**	High
Plainfield	$48,529	$987	$2,222	$2,657	**$5,865**	**12.1%**	High
Worcester	$49,167	$1,085	$1,882	$2,757	**$5,724**	**11.6%**	High
Williamstown	$57,792	$1,221	$2,317	$2,584	**$6,122**	**10.6%**	Moderate
Washington	$56,696	$1,213	$2,062	$2,693	**$5,968**	**10.5%**	Moderate
Roxbury	$56,667	$1,059	$1,987	$2,703	**$5,749**	**10.1%**	Moderate
Berlin	$59,792	$1,161	$2,120	$2,585	**$5,866**	**9.8%**	Moderate
Marshfield	$60,833	$1,081	$2,050	$2,680	**$5,812**	**9.6%**	Moderate
Orange	$62,829	$1,094	$2,089	$2,692	**$5,874**	**9.3%**	Moderate
Waterbury	$65,750	$1,131	$2,426	$2,557	**$6,114**	**9.3%**	Moderate
Warren	$66,250	$1,101	$2,343	$2,608	**$6,052**	**9.1%**	Moderate
Barre Town	$70,521	$1,204	$2,396	$2,669	**$6,268**	**8.9%**	Low
East Montpelier	$67,844	$1,209	$2,131	$2,678	**$6,018**	**8.9%**	Low
Calais	$64,766	$964	$1,974	$2,747	**$5,685**	**8.8%**	Low
Moretown	$69,375	$1,135	$2,223	$2,707	**$6,065**	**8.7%**	Low
Woodbury	$63,438	$949	$1,839	$2,755	**$5,543**	**8.7%**	Low
Northfield	$67,750	$1,105	$2,099	$2,585	**$5,789**	**8.5%**	Low
Montpelier	$60,793	$957	$1,804	$2,288	**$5,049**	**8.3%**	Low
Middlesex	$74,188	$1,130	$2,191	$2,749	**$6,071**	**8.2%**	Low
Duxbury	$75,000	$1,074	$2,276	$2,752	**$6,103**	**8.1%**	Low
Fayston	$79,940	$1,080	$2,646	$2,681	**$6,407**	**8%**	Low
Waitsfield	$78,264	$1,189	$2,317	$2,660	**$6,166**	**7%**	Low

Table 3 Energy Burden (2019 Efficiency Vermont Report)

Table 6 Existing Renewable Generation and Storage By Town (update from Feb to April 2024)

TOTAL EXISTING GENERATION			PROPOSED		EXISTING SOLAR			EXISITNG HYDROELECTRIC			EXISTING WIND		
Town	Total MW	% Regional	Projects	MW	Projects	MW	% Regional	Projects	MW	% Regional	Projects	MW	% Regional
Barre City	1.03	1.50%			138	0.93	2.20%		0	0.00%	1	0.1	42.39%
Barre Town	7.92	11.70%			273	7.79	18.70%	1	0.014	0.10%	3	0.12	51.28%
Berlin	1.32	1.90%	2 solar projects	4.4	79	1.32	3.20%						
Cabot	5.84	8.60%			53	0.84	2.00%	1	5	19.20%			
Calais	0.43	0.60%			54	0.43	1.00%						
Duxbury	9.25	13.60%			51	0.45	1.10%	1	8.8	33.80%			
East Montpelier	3.45	5.10%			148	2.28	5.50%	3	1.16	4.50%			
Fayston	0.48	0.70%			65	0.48	1.20%						
Marshfield	0.61	0.90%			68	0.61	1.50%						
Middlesex	0.75	1.10%			104	0.75	1.80%						
Montpelier	4.71	6.90%			307	3.78	9.10%	2	0.93	3.60%			
Moretown	5.21	7.70%			112	0.81	1.90%	2	4.4	16.90%			
Northfield	0.39	0.60%	16 solar projects, 2 hydroelectric projects	1.26	52	0.39	0.90%				1	0.003	1.04%
Orange	1.19	1.80%			23	1.19	2.90%						
Plainfield	0.53	0.80%			81	0.53	1.30%						
Roxbury	0.26	0.40%			32	0.26	0.60%						
Waitsfield	2.6	3.80%			132	2.6	6.20%						
Warren	1.34	2.00%			140	1.34	3.20%				1	0.003	1.06%
Washington	0.24	0.40%			29	0.23	0.60%				1	0.01	4.24%
Waterbury	9.97	14.70%			338	4.45	10.70%	1	5.53	21.20%			
Williamstown	9.97	14.70%			100	9.97	23.90%						
Woodbury	0.02	0.02%			2	0.02	0.04%						
Worcester	0.42	0.60%			39	0.24	0.60%	1	0.18	0.70%			
TOTAL EXISTING	**67.95**		**5.66**		**2420**	**41.7**		**12**	**26.02**		**7**	**0.24**	

Town	STORAGE		
	Total MW	Number of Projects	% Regional

Barre City	0.1367	17	1.72%
Barre Town	5.209	26	65.52%
Berlin	0.09	10	1.13%
Cabot	0.029	3	0.36%
Calais	0.01	1	0.13%
Duxbury	0.039	5	0.49%
East Montpelier	0.069	7	0.87%
Fayston	0.105	12	1.32%
Marshfield	0.08	9	1.01%
Middlesex	0.079	8	0.99%
Montpelier	0.3595	41	4.52%
Moretown	0.097	11	1.22%
Northfield	0.035	5	0.44%
Orange	0	0	0.00%
Plainfield	0.02	2	0.25%
Roxbury	0.075	9	0.94%
Waitsfield	0.3695	41	4.65%
Warren	0.543	60	6.83%
Washington	0.025	3	0.31%
Waterbury	0.539	62	6.78%
Williamstown	0.01	1	0.13%
Woodbury	0	0	0.00%
Worcester	0.03	3	0.38%
TOTAL EXISTING	**7.9497**	**336**	**100.00%**

TABLE 8 Current Regional Residential Fuel Use by Type and Town

% of Fuel Use by Tenure	**ORANGE**	**WASHINGTON**

	Owner Occupied		Renter Occupied		Total Occupied		Owner Occupied		Renter Occupied		Total Occupied	
	#	%	#	%	#	%	#	%	#	%	#	%
Utility gas	0	0.0%	0	0.0%	**0**	**0.0%**	16	3.2%	0	0.0%	**16**	**3.1%**
Bottled, tank, or LP gas	75	19.5%	4	10.5%	**79**	**18.7%**	109	22.1%	13	46.4%	**122**	**23.4%**
Electricity	0	0.0%	3	7.9%	**3**	**0.7%**	0	0.0%	0	0.0%	**0**	**0.0%**
Fuel oil, kerosene, etc.	204	53.1%	31	81.6%	**235**	**55.7%**	191	38.7%	3	10.7%	**194**	**37.2%**
Coal or coke	3	0.8%	0	0.0%	**3**	**0.7%**	0	0.0%	0	0.0%	**0**	**0.0%**
Wood	86	22.4%	0	0.0%	**86**	**20.4%**	169	34.2%	12	42.9%	**181**	**34.7%**
Other Fuel	16	4.2%	0	0.0%	**16**	**3.8%**	9	1.8%	0	0.0%	**9**	**1.7%**
No fuel used	0	0.0%	0	0.0%	**0**	**0.0%**	0	0.0%	0	0.0%	**0**	**0.0%**
Total Occupied Housing Units	384		38		**422**		494		28		**522**	

% of Fuel Use by Tenure	**WILLIAMSTOWN**						**BARRE CITY**					
	Owner Occupied		Renter Occupied		Total Occupied		Owner Occupied		Renter Occupied		Total Occupied	
	#	%	#	%	#	%	#	%	#	%	#	%
Utility gas	0	0.0%	0	0.0%	**0**	**0.0%**	58	3.3%	144	7.1%	202	5.3%
Bottled, tank, or LP gas	326	26.7%	75	78.9%	**401**	**30.5%**	286	16.3%	562	27.6%	848	22.3%
Electricity	30	2.5%	0	0.0%	**30**	**2.3%**	45	2.6%	287	14.1%	332	8.7%
Fuel oil, kerosene, etc.	679	55.7%	20	21.1%	**699**	**53.2%**	1,187	67.6%	976	47.9%	2163	57.0%
Coal or coke	0	0.0%	0	0.0%	**0**	**0.0%**	0	0.0%	0	0.0%	0	0.0%
Wood	160	13.1%	0	0.0%	**160**	**12.2%**	98	5.6%	48	2.4%	146	3.8%
Other Fuel	25	2.0%	0	0.0%	**25**	**1.9%**	72	4.1%	22	1.1%	94	2.5%
No fuel used	0	0.0%	0	0.0%	**0**	**0.0%**	10	0.6%	0	0.0%	10	0.3%
Total Occupied Housing Units	1120		95		**1315**		1756		2039		3795	

% of Fuel Use by Tenure	**BARRE TOWN**						**BERLIN**					
	Owner Occupied		Renter Occupied		Total Occupied		Owner Occupied		Renter Occupied		Total Occupied	
	#	%	#	%	#	%	#	%	#	%	#	%
Utility gas	10	0.3%	0	0.0%	**10**	**0.3%**	10	1.0%	0	0.0%	**10**	**0.9%**
Bottled, tank, or LP gas	389	12.8%	76	14.4%	**465**	**13.0%**	219	22.9%	32	25.8%	**251**	**23.2%**
Electricity	82	2.7%	157	29.7%	**239**	**6.7%**	12	1.3%	4	3.2%	**16**	**1.5%**
Fuel oil, kerosene, etc.	2,146	70.4%	296	56.0%	**2442**	**68.3%**	614	64.1%	75	60.5%	**689**	**63.7%**

	#	%	#	%	#	%	#	%	#	%	#	%
Coal or coke	0	0.0%	0	0.0%	**0**	**0.0%**	0	0.0%	0	0.0%	**0**	**0.0%**
Wood	393	12.9%	0	0.0%	**393**	**11.0%**	88	9.2%	13	10.5%	**101**	**9.3%**
Other Fuel	27	0.9%	0	0.0%	**27**	**0.8%**	15	1.6%	0	0.0%	**15**	**1.4%**
No fuel used	0	0.0%	0	0.0%	**0**	**0.0%**	0	0.0%	0	0.0%	**0**	**0.0%**
Total Occupied Housing Units	3047		529		3576		958		124		1082	

% of Fuel Use by Tenure	**CABOT**						**CALAIS**					
	Owner Occupied		**Renter Occupied**		**Total Occupied**		**Owner Occupied**		**Renter Occupied**		**Total Occupied**	
	#	%	#	%	#	%	#	%	#	%	#	%
Utility gas	0	0.0%	0	0.0%	**0**	**0.0%**	26	4.1%	0	0.0%	**26**	**3.6%**
Bottled, tank, or LP gas	108	21.1%	24	24.7%	**132**	**21.7%**	86	13.6%	52	57.8%	**138**	**19.1%**
Electricity	11	2.2%	10	10.3%	**21**	**3.5%**	0	0.0%	0	0.0%	**0**	**0.0%**
Fuel oil, kerosene, etc.	144	28.2%	35	36.1%	**179**	**29.4%**	193	30.5%	24	26.7%	**217**	**30.0%**
Coal or coke	2	0.4%	0	0.0%	**2**	**0.3%**	8	1.3%	0	0.0%	**8**	**1.1%**
Wood	181	35.4%	28	28.9%	**209**	**34.4%**	295	46.6%	14	15.6%	**309**	**42.7%**
Other Fuel	65	12.7%	0	0.0%	**65**	**10.7%**	25	3.9%	0	0.0%	**25**	**3.5%**
No fuel used	0	0.0%	0	0.0%	**0**	**0.0%**	0	0.0%	0	0.0%	**0**	**0.0%**
Total Occupied Housing Units	511		97		**608**		633		90		**723**	

% of Fuel Use by Tenure	**DUXBURY**						**EAST MONTPELIER**					
	Owner Occupied		**Renter Occupied**		**Total Occupied**		**Owner Occupied**		**Renter Occupied**		**Total Occupied**	
	#	%	#	%	#	%	#	%	#	%	#	%
Utility gas	3	0.6%	0	0.0%	**3**	**0.5%**	0	0.0%	0	0.0%	**0**	**0.0%**
Bottled, tank, or LP gas	201	41.5%	42	50.0%	**243**	**42.8%**	319	32.5%	18	12.5%	**337**	**29.9%**
Electricity	0	0.0%	0	0.0%	**0**	**0.0%**	16	1.6%	14	9.7%	**30**	**2.7%**
Fuel oil, kerosene, etc.	150	31.0%	35	41.7%	**185**	**32.6%**	378	38.5%	107	74.3%	**485**	**43.0%**
Coal or coke	0	0.0%	0	0.0%	**0**	**0.0%**	0	0.0%	0	0.0%	**0**	**0.0%**
Wood	130	26.9%	3	3.6%	**133**	**23.4%**	239	24.3%	5	3.5%	**244**	**21.7%**
Other Fuel	0	0.0%	4	4.8%	**4**	**0.7%**	31	3.2%	0	0.0%	**31**	**2.8%**
No fuel used	0	0.0%	0	0.0%	**0**	**0.0%**	0	0.0%	0	0.0%	**0**	**0.0%**
Total Occupied Housing Units	484		84		**568**		983		144		**1127**	

% of Fuel Use by Tenure	FAYSTON						MARSHFIELD					
	Owner Occupied		Renter Occupied		Total Occupied		Owner Occupied		Renter Occupied		Total Occupied	
	#	%	#	%	#	%	#	%	#	%	#	%
Utility gas	4	1.0%	0	0.0%	**4**	**0.8%**	6	1.1%	0	0.0%	**6**	**1.0%**
Bottled, tank, or LP gas	254	60.5%	54	100.0%	**308**	**65.0%**	89	16.3%	5	7.6%	**94**	**15.4%**
Electricity	0	0.0%	0	0.0%	**0**	**0.0%**	15	2.8%	0	0.0%	**15**	**2.5%**
Fuel oil, kerosene, etc.	81	19.3%	0	0.0%	**81**	**17.1%**	207	38.0%	33	50.0%	**240**	**39.3%**
Coal or coke	0	0.0%	0	0.0%	**0**	**0.0%**	0	0.0%	0	0.0%	**0**	**0.0%**
Wood	78	18.6%	0	0.0%	**78**	**16.5%**	198	36.3%	28	42.4%	**226**	**37.0%**
Other Fuel	3	0.7%	0	0.0%	**3**	**0.6%**	30	5.5%	0	0.0%	**30**	**4.9%**
No fuel used	0	0.0%	0	0.0%	**0**	**0.0%**	0	0.0%	0	0.0%	**0**	**0.0%**
Total Occupied Housing Units	420		54		**474**		545		66		**611**	

% of Fuel Use by Tenure	MIDDLESEX						MONTPELIER					
	Owner Occupied		Renter Occupied		Total Occupied		Owner Occupied		Renter Occupied		Total Occupied	
	#	%	#	%	#	%	#	%	#	%	#	%
Utility gas	5	0.7%	0	0.0%	**5**	**0.7%**	47	2.2%	85	5.0%	**132**	**3.4%**
Bottled, tank, or LP gas	215	30.4%	8	25.0%	**223**	**30.1%**	363	16.9%	627	36.7%	**990**	**25.6%**
Electricity	5	0.7%	0	0.0%	**5**	**0.7%**	80	3.7%	173	10.1%	**253**	**6.6%**
Fuel oil, kerosene, etc.	291	41.1%	11	34.4%	**302**	**40.8%**	1,369	63.6%	723	42.4%	**2092**	**54.2%**
Coal or coke	0	0.0%	0	0.0%	**0**	**0.0%**	0	0.0%	0	0.0%	**0**	**0.0%**
Wood	177	25.0%	13	40.6%	**190**	**25.7%**	251	11.7%	14	0.8%	**265**	**6.9%**
Other Fuel	15	2.1%	0	0.0%	**15**	**2.0%**	39	1.8%	66	3.9%	**105**	**2.7%**
No fuel used	0	0.0%	0	0.0%	**0**	**0.0%**	5	0.2%	19	1.1%	**24**	**0.6%**
Total Occupied Housing Units	708		32		**740**		2154		1707		**3861**	

% of Fuel Use by Tenure	MORETOWN						NORTHFIELD					
	Owner Occupied		Renter Occupied		Total Occupied		Owner Occupied		Renter Occupied		Total Occupied	
	619	%	102	%	#	%	1,351	%	455	%	#	%
Utility gas	3	0.5%	0	0.0%	**3**	**0.4%**	0	0.0%	32	7.0%	**32**	**1.8%**
Bottled, tank, or LP gas	267	43.1%	42	41.2%	**309**	**42.9%**	156	11.5%	45	9.9%	**201**	**11.1%**
Electricity	26	4.2%	38	37.3%	**64**	**8.9%**	28	2.1%	73	16.0%	**101**	**5.6%**

Fuel oil, kerosene, etc.	178	28.8%	16	15.7%	**194**	**26.9%**	910	67.4%	278	61.1%	**1188**	**65.8%**
Coal or coke	0	0.0%	0	0.0%	**0**	**0.0%**	0	0.0%	0	0.0%	**0**	**0.0%**
Wood	119	19.2%	3	2.9%	**122**	**16.9%**	257	19.0%	0	0.0%	**257**	**14.2%**
Other Fuel	26	4.2%	3	2.9%	**29**	**4.0%**	0	0.0%	27	5.9%	**27**	**1.5%**
No fuel used	0	0.0%	0	0.0%	**0**	**0.0%**	0	0.0%	0	0.0%	**0**	**0.0%**
Total Occupied Housing Units	619		102		**721**		1351		455		**1806**	

% of Fuel Use by Tenure	**PLAINFIELD**					
	Owner Occupied		**Renter Occupied**		**Total Occupied**	
	#	%	#	%	#	%
Utility gas	0	0.0%	0	0.0%	**0**	**0.0%**
Bottled, tank, or LP gas	85	22.8%	28	16.5%	**113**	**20.8%**
Electricity	2	0.5%	22	12.9%	**24**	**4.4%**
Fuel oil, kerosene, etc.	148	39.8%	103	60.6%	**251**	**46.3%**
Coal or coke	0	0.0%	0	0.0%	**0**	**0.0%**
Wood	114	30.6%	17	10.0%	**131**	**24.2%**
Other Fuel	23	6.2%	0	0.0%	**23**	**4.2%**
No fuel used	0	0.0%	0	0.0%	**0**	**0.0%**
Total Occupied Housing Units	372		170		**542**	

% of Fuel Use by Tenure	**ROXBURY**					
	Owner Occupied		**Renter Occupied**		**Total Occupied**	
	#	%	#	%	#	%
Utility gas	3	0.8%	0	0.0%	**3**	**0.7%**
Bottled, tank, or LP gas	100	27.4%	8	12.5%	**108**	**25.2%**
Electricity	0	0.0%	1	1.6%	**1**	**0.2%**
Fuel oil, kerosene, etc.	161	44.1%	35	54.7%	**196**	**45.7%**
Coal or coke	2	0.5%	0	0.0%	**2**	**0.5%**
Wood	94	25.8%	14	21.9%	**108**	**25.2%**
Other Fuel	5	1.4%	6	9.4%	**11**	**2.6%**
No fuel used	0	0.0%	0	0.0%	**0**	**0.0%**
Total Occupied Housing Units	365		64		**429**	

% of Fuel Use by Tenure	**WAITSFIELD**					
	Owner Occupied		**Renter Occupied**		**Total Occupied**	
	#	%	#	%	#	%
Utility gas	0	0.0%	22	10.5%	**22**	**2.6%**
Bottled, tank, or LP gas	342	52.7%	90	43.1%	**432**	**50.3%**
Electricity	76	11.7%	18	8.6%	**94**	**11.0%**
Fuel oil, kerosene, etc.	167	25.7%	40	19.1%	**207**	**24.1%**
Coal or coke	0	0.0%	0	0.0%	**0**	**0.0%**
Wood	54	8.3%	11	5.3%	**65**	**7.6%**
Other Fuel	10	1.5%	28	13.4%	**38**	**4.4%**
No fuel used	0	0.0%	0	0.0%	**0**	**0.0%**
Total Occupied Housing Units	649		209		**858**	

% of Fuel Use by Tenure	**WARREN**					
	Owner Occupied		**Renter Occupied**		**Total Occupied**	
	#	%	#	%	#	%
Utility gas	17	2.7%	37	28.5%	**54**	**7.1%**
Bottled, tank, or LP gas	366	58.5%	73	56.2%	**439**	**58.1%**
Electricity	44	7.0%	0	0.0%	**44**	**5.8%**
Fuel oil, kerosene, etc.	76	12.1%	11	8.5%	**87**	**11.5%**
Coal or coke	0	0.0%	0	0.0%	**0**	**0.0%**
Wood	116	18.5%	0	0.0%	**116**	**15.3%**
Other Fuel	7	1.1%	9	6.9%	**16**	**2.1%**
No fuel used	0	0.0%	0	0.0%	**0**	**0.0%**
Total Occupied Housing Units	626		130		**756**	

% of Fuel Use by Tenure	WATERBURY						WOODBURY					
	Owner Occupied		**Renter Occupied**		**Total Occupied**		**Owner Occupied**		**Renter Occupied**		**Total Occupied**	
	#	**%**	#	**5**	#	**%**	#	**%**	#	**%**	#	**%**
Utility gas	30	2.0%	17	2.5%	**47**	**2.2%**	0	0.0%	0	0.0%	**0**	**0.0%**
Bottled, tank, or LP gas	620	41.1%	345	51.0%	**965**	**44.2%**	46	17.4%	6	20.7%	**52**	**17.7%**
Electricity	64	4.2%	186	27.5%	**250**	**11.4%**	8	3.0%	0	0.0%	**8**	**2.7%**
Fuel oil, kerosene, etc.	667	44.2%	128	18.9%	**795**	**36.4%**	114	43.2%	6	20.7%	**120**	**41.0%**
Coal or coke	0	0.0%	0	0.0%	**0**	**0.0%**	0	0.0%	0	0.0%	**0**	**0.0%**
Wood	96	6.4%	0	0.0%	**96**	**4.4%**	94	35.6%	17	58.6%	**111**	**37.9%**
Other Fuel	32	2.1%	0	0.0%	**32**	**1.5%**	2	0.8%	0	0.0%	**2**	**0.7%**
No fuel used	0	0.0%	0	0.0%	**0**	**0.0%**	0	0.0%	0	0.0%	**0**	**0.0%**
Total Occupied Housing Units	1509		676		**2185**		264		29		**293**	

% of Fuel Use by Tenure	Worcester						REGION TOTAL					
	Owner Occupied		**Renter Occupied**		**Total Occupied**		Owner Occupied		Renter Occupied		**Regional Total**	
	#	**%**	#	**%**	#	**%**	Totals	%	Totals	%	**Totals**	**%**
Utility gas	0	0.0%	0	0.0%	**0**	**0.0%**	238	1%	337	5%	**575**	**2%**
Bottled, tank, or LP gas	87	26.3%	23	28.8%	**110**	**26.8%**	5,108	25%	2,252	32%	**7,360**	**27%**
Electricity	4	1.2%	0	0.0%	**4**	**1.0%**	548	3%	986	14%	**1,534**	**6%**
Fuel oil, kerosene, etc.	100	30.2%	35	43.8%	**135**	**32.8%**	10,355	51%	3,021	43%	**13,376**	**49%**
Coal or coke	0	0.0%	0	0.0%	**0**	**0.0%**	15	0%	0	0%	**15**	**0%**
Wood	126	38.1%	22	27.5%	**148**	**36.0%**	3,613	18%	262	4%	**3,875**	**14%**
Other Fuel	14	4.2%	0	0.0%	**14**	**3.4%**	491	2%	165	2%	**656**	**2%**
No fuel used	0	0.0%	0	0.0%	**0**	**0.0%**	15	0%	19	0%	**34**	**0%**
Total Occupied Housing Units	331		80		**411**		20,383		7,042		**27,425**	

Table 12 Summary of 2020-2023 Residential Weatherization (Efficiency Vermont projects include Home Performance with Energy Star, other weatherization projects, and residential new construction projects; their total savings include all measures)

	2020		2021		2022		2023	
Total Homes Weatherized (Capstone only)	**78**		**143**		**112**		**173**	
Performance with ENERGY STAR Projects (Efficiency VT)	**136**		**123**		**70**		**329**	
Weatherization Projects (Efficiency VT)	**40**		**46**		**57**		**143**	
Residential New Construction Projects	**8**		**21**		**25**		**54**	
Total kWh Saved (Capstone)	**526.28**		**49,639.31**		**38,114.35**		**106,643.73**	
Total MMBTUs Saved (Capstone)	**2,680.07**		**2,843.15**		**5,220.97**		**6,915.32**	
Total kWh Saved (Efficiency VT))*	**3,476,376**		**471,560**					
Thermal MMBTUs Saved (Efficiency VT)*	**13,800**		**32,206**		**31,520**			
Town Totals	**Capstone (Homes)**	**Efficiency Vermont (Projects)**	**Capstone (Homes)**	**Efficiency Vermont (Projects)**	**Capstone (Homes)**	**Efficiency Vermont (Projects)**	**Capstone (Homes)**	**Efficiency Vermont (Projects)**
Barre City	20	31	25	38	19	28	38	
Barre Town	10	7	14	1	11	4	11	
Berlin	3	4	3	2	12	3	8	
Cabot	1	4	2	3	6	2	8	
Calais	2	8	2	7	3	2	9	
Duxbury	0	0	0	4	1	5	1	
East Montpelier	5	6	2	3	3	5	6	
Fayston	1	3	0	3	2	5	0	
Marshfield	1	4	2	3	2	2	2	
Middlesex	2	5	0	5	1	5	5	
Montpelier	10	41	16	46	17	27	28	
Moretown	2	5	2	10	3	3	1	
Northfield	5	10	29	12	14	6	10	

Orange	2	0	3	0	2	0	6	
Plainfield	1	8	3	4	2	1	3	
Roxbury	2	3	0	2	1	1	1	
Waitsfield	1	6	2	2	0	9	0	
Warren	0	9	2	12	1	11	0	
Washington	1	0	3	3	0	4	4	
Waterbury	4	20	1	25	3	21	7	
Williamstown	4	7	28	3	4	2	14	
Woodbury	0	0	1	2	3	2	3	
Worcester	1	3	3	0	2	4	8	
Regional Total	**78**	**184**	**143**	**190**	**112**	**152**	**173**	

Capstone Weatherization Central Vermont 2020-2023

	2020	2020						2021	2021						2022	2022						2023	2023					
Town Totals	Total Homes	Multi Family Buildings	Multi Family Units	Single Family Homes	Occupants	kWh Savings	MMBTU Savings	Total Homes	Multi Family Buildings	Multi Family Units	Single Family Homes	Occupants	kWh Savings	MMBTU Savings	Total Homes	Multi Family Buildings	Multi Family Units	Single Family Homes	Occupants	kWh Savings	MMBTU Savings	Total Homes	Multi Family Buildings	Multi Family Units	Single Family Homes	Occupants	kWh Savings	MMBTU Savings
Barre City	20			20	44		530.75	25	9	4	21	37	3902.88	710.39	19	8	8	11	39	1865	586.17	38	7	11	27	69	8435.38	1519.96
Barre Town	10	8	3	7	18	145.5	837.31	14			14	34		433.98	11	5	8	3	17	8467	1040.36	11			11	23		361.96
Berlin	3			3	4		91.32	3			3	4		40.02	12	15	10	2	17	27650.35	366.88	8			8	22		307.24
Cabot	1			1	5		53.17	2			2	3		64.97	6			6	15		299.88	8			8	10		252.04
Calais	2			2	3		99.83	2			2	6		67.31	3			3	4		104.11	9	8	3	6	19	93766.02	781.62
Duxbury	0			0	0		0.00	0			0	0		0.00	1			1	1		42.51	1			1	1		13.07
East Montpelier	5			5	6		153.83	2			2	3		31.36	3			3	5		448.32	6			6	10		247.79
Fayston	1			1	1		8.15	0			0	0		0.00	2			2	2		106.66	0			0	0		0.00
Marshfield	1			1	5		90.71	2			2	4		24.43	2			2	4		53.14	2			2	2		57.67
Middlesex	2			2	2		110.84	0			0	0		0.00	1			1	1		9.47	5			5	7		241.58
Montpelier	10	4	5	5	13	380.78	82.12	16	15	6	10	27	1408	428.42	17	9	6	11	32	132	752.30	28	19	20	8	36	4090.33	1106.17
Moretown	2			2	2		42.55	2			2	3		44.51	3			3	4		261.37	1			1	3		17.10
Northfield	5			5	8		108.69	29	9	20	9	50	1330	196.57	14			14	39		486.82	10			10	24		461.47

Orange	2			2	5		37.92	3			3	9		42.40	2			2	5		71.84	6			6	12		275.08
Plainfield	1			1	2		18.87	3			3	6		104.90	2			2	5		83.93	3			3	4		127.20
Roxbury	2			2	4		77.70	0			0	0		0.00	1			1	5		32.18	1			1	1		69.65
Waitsfield	1			1	2		35.67	2			2	2		47.14	0			0	0		0.00	0			0	0		0.00
Warren	0			0	0		0.00	2			2	5		42.96	1			1	1		12.61	0			0	0		0.00
Washington	1			1	3		10.20	3			3	5		90.32	0			0	0		0.00	4			4	8		219.25
Waterbury	4			4	5		102.28	1			1	1		30.94	3			3	4		60.57	7			7	10		192.24
Williamstown	4			4	11		135.88	28	4	22	6	51	42998.43	165.70	4			4	11		215.52	14	3	3	11	36		430.90
Woodbury	0			0	0		0.00	1			1	4		38.70	3			3	5		153.77	3			3	8		51.26
Worcester	1			1	3		52.27	3			3	3		238.14	2			2	4		32.54	8	4	4	4	21	352	182.06
Regional Total	**78**	12	8	70	**146**	**526.28**	**2680.07**	**143**	37	52	91	**257**	**49639.31**	**2843.15**	**112**	37	32	80	**220**	**38114.35**	**5220.97**	**173**	41	41	132	**326**	**106643.73**	**6915.32**

ADDITIONAL GOALS, POLICIES AND STRATEGIES (include if already do them, or if in other chapters?)

Re-adopted Pathways for evaluation in subsequent 2025 Regional Enhanced Energy Plan Update

Policy: Evaluate generation from existing renewable energy generation by municipality including the identification of constraints, resource areas, and existing infrastructure by energy type. Identifying and mapping existing renewable energy generation facilities throughout the region will provide a baseline to determine the generation that currently exists. This information can provide a better understanding for where developments are currently being established and can help prioritize assistance that may be needed at the municipal level. Additionally, mapping existing constraints will provide municipalities with a better understanding of resources that are available within their community.

	IMPLEMENTATION ACTION	RESPONSIBILITY	PRIORITY/ TIMELINE	MEASURE OF SUCCESS
1	Provide regular updates to municipalities regarding existing generation facilities to maintain an up-to-date inventory of locations.	CVRPC, Department of Public Service, Distribution Utilities	On-going	Updated maps provided as requested
2	Provide regular mapping updates to municipalities regarding known and possible constraints to ensure consistency with state guidelines on renewable energy siting.	CVRPC, State Agencies	On-going	Updated maps provided as necessary
3	Update regional maps to reflect changes at the municipal level regarding preferred or unsuitable locations for renewable energy generation.	CVRPC, Municipalities	On-going	Maps and information updated as necessary
4	Work with state agencies to map locations of woody biomass to evaluate cord wood acquisition for residential heating and ensure it is in line with conservation and forest corridor priorities	CVRPC, State Agencies	On-going	Specific locations are identified and mapped

Policy: Evaluate generation from potential renewable energy generation by municipality including the identification of constraints, resource areas, and existing infrastructure by energy type. Identifying and mapping potential renewable energy generation throughout the region will provide municipalities with information regarding available land area where renewable energy generation could be located. This information can be used to help municipalities prioritize and evaluate where future renewable generation could or should occur based on municipal land use policies and constraints to meet their own, regional, and state needs and goals.

	IMPLEMENTATION ACTION	RESPONSIBILITY	PRIORITY/ TIMELINE	MEASURE OF SUCCESS
1	Evaluate known, possible, and regionally identified constraints to ensure up-to-date information is available for future planning purposes.	CVRPC, State Agencies	On-going	Constraints will be evaluated and mapped as necessary
2	Update information on utility infrastructure including existing and proposed transmission facilities to ensure accurate data exists.	CVRPC, Utility Providers	On-going	Utility information s updated and mapped as necessary
3	Evaluate and update preferred and unsuitable locations for future renewable energy generation siting as needed based on state, regional, and municipal policies and plans.	CVRPC, Municipalities, State Agencies	On-going	Preferred and prohibited locations are evaluated and mapped as necessary
4	Update generation potential based on future land developments, changes to land uses, or updates to priority areas as identified by state, regional, or municipal actions.	CVRPC, Municipalities, State Agencies	On-going	Generation potential is updated as necessary

5	Work with municipalities, as requested, to evaluate and prioritize future renewable energy generation technologies and locations to best suit municipal needs and policies.	CVRPC, Municipalities	On-going	Locations and technologies will be evaluated and prioritized

Patterns and Densities of Land Use Likely to Result in Conservation of Energy

IMPLEMENTATION ACTION		RESPONSIBILITY	PRIORITY	MEASURE
1	Evaluate municipal regulations to ensure higher density development patterns are located in regional and town centers to maintain existing settlement patterns and do not inadvertently promote sprawling development.	CVRPC, Municipalities	Medium On-going	Regulations are evaluated as needed and recommendations are included
2	Assist municipalities to identify future growth areas that can accommodate development needs while meeting smart growth principles and respecting historic settlement patterns of compact villages, neighborhoods, and urban centers as appropriate.	CVRPC, Municipalities	Medium On-going	Assistance provided and areas identified
3	Assist municipalities in preparing information necessary to acquire or maintain state designations including statutory requirements.	CVRPC, Municipalities, ACCD	Low On-going	State designations are maintained or acquired
4	Work with municipalities and regional partners to inventory and map existing infrastructure such as water and wastewater to evaluate capacity and development potential, integrating wasteheat recovery considerations into siting and design.	CVRPC, Municipalities	Medium 3 to 5 years	Infrastructure mapped and updated as needed

5	Work with communities to evaluate their land development regulations to ensure these regulations (including scale, massing, building height, and minimum lot size) are suitable to support density in appropriate locations and in proximity to needed infrastructure that is consistent with community character.	CVRPC	Low 5 to 10 years	Regulations evaluated and updated as appropriate
6	Develop or make available model ordinances related to Planned Unit Developments, for review and consideration by municipalities as a way to establish compact development patterns outside of existing growth areas.	CVRPC	Low 5 to 10 years	Model regulations developed

IMPLEMENTATION ACTION		RESPONSIBILITY	PRIORITY/ TIMELINE	MEASURE OF SUCCESS
7	Provide information related to available funding opportunities (including sources and programs) for municipal infrastructure projects or improvements that will promote or support development density or compact development patterns.	CVRPC, State Agencies	High 1 to 3 years	Information on funding collected and available
8	Work with interested municipalities to create policies that incentivize development in designated growth areas with opportunities that could expedite land development reviews, permitting, or other regulatory processes as appropriate.	CVRPC, Municipalities, State Agencies	High 1 to 3 years	Regulations & processes updated as appropriate

9	Assist interested municipalities to review regulations and develop updates as appropriate that would support the development of community scale infrastructure for renewable energy generation and conservation.	CVRPC, Municipalities	Medium 3 to 5 years	Regulations updated as appropriate
10	Work with interested municipalities to ensure adequate land exists for agricultural uses as a way to encourage local food production.	CVRPC, Municipalities	Medium 3 to 5 years	Regulations updated as appropriate
11	Work with municipalities and the Agency of Agriculture, Food & Markets to ensure prime farmland inventories are up-to-date and mapped.	CVRPC, Agency of Agriculture, Food, & Markets, municipalities	On-going	Prime agricultural land inventories are updated and mapped
12	Support amendments to local regulations that encourage local food production through regulatory and non-regulatory approaches that focus development and preserve agricultural opportunities.	CVRPC, Municipalities, Agency of Agriculture, Food, & Markets	Medium 3 to 5 years	Regulations are updated as appropriate

Policy: Strongly prioritize development in compact, mixed-use centers when feasible and appropriate; and identify ways to make compact development more feasible throughout Central Vermont. Compact development patterns create opportunities whereby land uses that support where people live, work, and recreate, are all within close proximity. This not only creates a greater sense of place but it provides opportunities to walk, bike, or utilize public transit as the primary mode of transportation. Additionally, compact development patterns can promote conservation of energy through the redevelopment of underutilized spaces therefore including more energy efficient building designs.

IMPLEMENTATION ACTION	RESPONSIBILITY	PRIORITY/ TIMELINE	MEASURE OF SUCCESS

1	Provide information to municipalities regarding alternative land use regulations such as form-based codes and identify communities where similar regulations have been successfully implemented including rural or non-urban scale regulations.	CVRPC	Low 5 to 10 years	Workshops or other informational sessions conducted
2	Evaluate municipal regulations and recommend amendments that will support and encourage infill development, redevelopment, adaptive reuse of existing buildings such as historic structures, and reuse of "brownfield" sites	CVRPC, Municipalities, Regional Partners	High 1 to 3 years	Regulations evaluated and recommendations made as appropriate
3	Provide information to municipalities on capital planning, public investment strategies, or state and federal programs that support infill development within core community areas.	CVRPC, State Partners	High 1 to 3 years	Workshops or other informational sessions conducted
4	Evaluate roadways in existing villages, downtowns, or municipal activity centers to identify conflict points between motorized and non-motorized modes of travel and recommend options to promote walkable and bike friendly centers that encourage alternative transportation choices	CVRPC, VTrans, Municipalities	Medium 3 to 5 years	Evaluations completed as needed and ecommendations provided

5	Work with municipalities to identify priority development zones, growth areas, or locations where high demand for electric loads exist or are planned (such as industrial parks) to ensure current planning acknowledges future needs.	CVRPC, Municipalities, State Partners	High 1 to 3 years	Locations are identified and incentives established as appropriate