Northwest
Regional Planning
Commission

Northwest Regional Planning Commission

Regional Energy Plan Update

Act 174 Overview

- Establishes a set of optional municipal and regional energy planning standards
- Standards originally developed by Department of Public Service in November 2016, updated in 2022 to match new Comprehensive Energy Plan
- Plans that meet the standards receive a determination of energy compliance (DOEC) and get “Substantial Deference” in Section 248 proceedings (electric generation and transmission facility siting)

Due Consideration

Statute calls for "due consideration." Does not define what "due consideration is" or assign whether the PUC or the Courts are the ultimate arbiter.

The SCOV indicated that the PUC only has to give "due consideration to the recommendations of the municipal and regional planning commissions in deciding [if] the project will not unduly interfere with the orderly development of the region."

Substantial Deference

Defined in Statute:

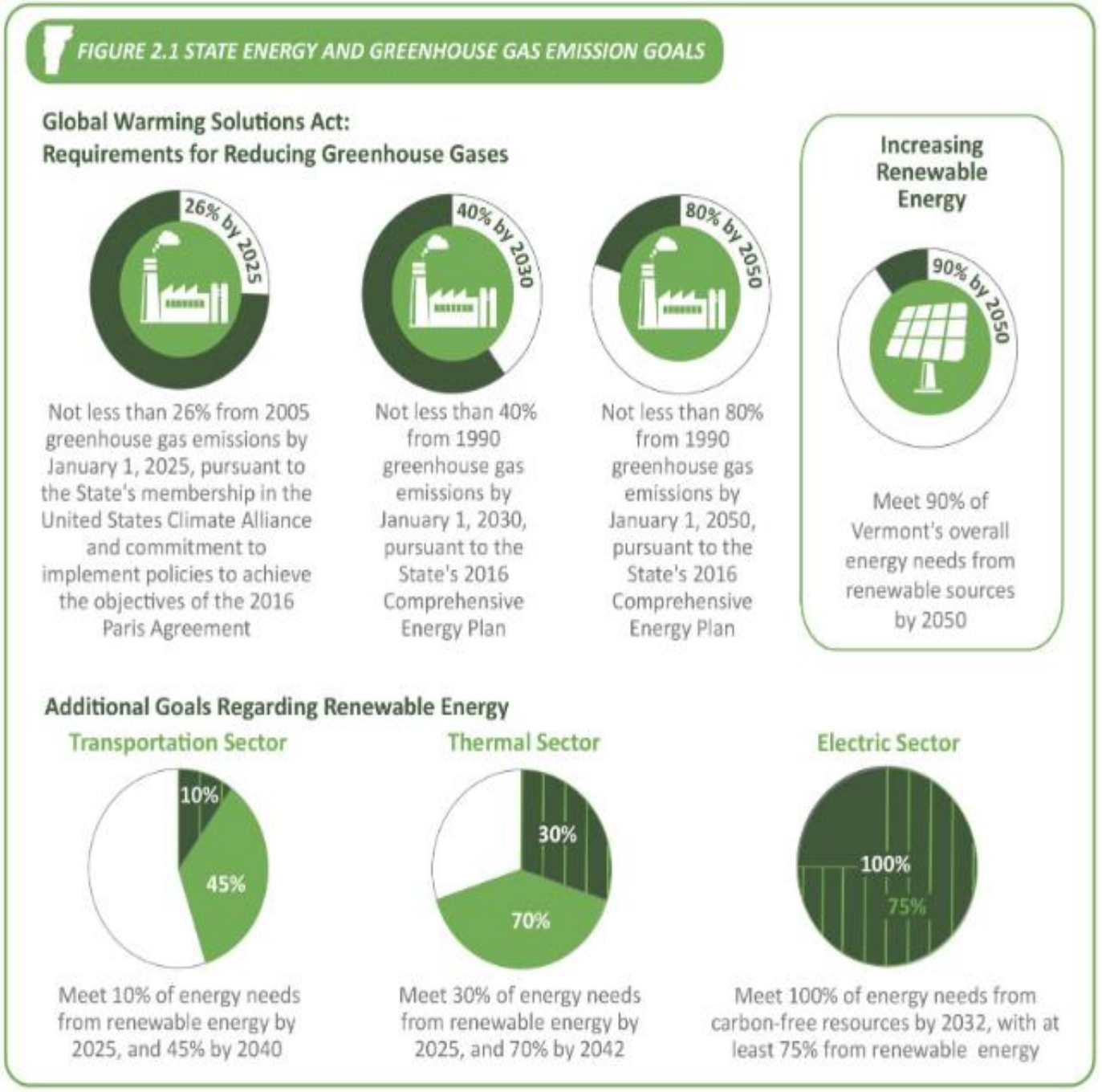
"that a land conservation measure or specific policy shall be applied in accordance with its terms unless there is a clear and convincing demonstration that other factors affecting the general good of the State outweigh the application of the measure or policy."

Regional Energy Plan

Appendix II in Regional Plan

- Equity
- Regional Energy Supply and Consumption
  - Current energy generation and supply
  - Current thermal, transportation, and electric consumption breakdowns
- Targets for Energy Conservation, Energy Use, and Electricity Generation
  - Created using LEAP modeling
  - Targets for 2025, 2035, 2050
  - Covers consumption and generation
  - Consumption split into thermal, transportation, and electric sectors
- Strategies to Achieve Regional Targets
- Feasibility and Challenges
- Appendices
  - Siting maps and mapping explanation
  - Municipal data (update to be completed by end of 2024)

Consistency with State Goals



Current Regional Energy Use

Regional Energy Use – Space Heating

FIGURE 4.3 REGIONAL RESIDENTIAL THERMAL ENERGY USE - 2021

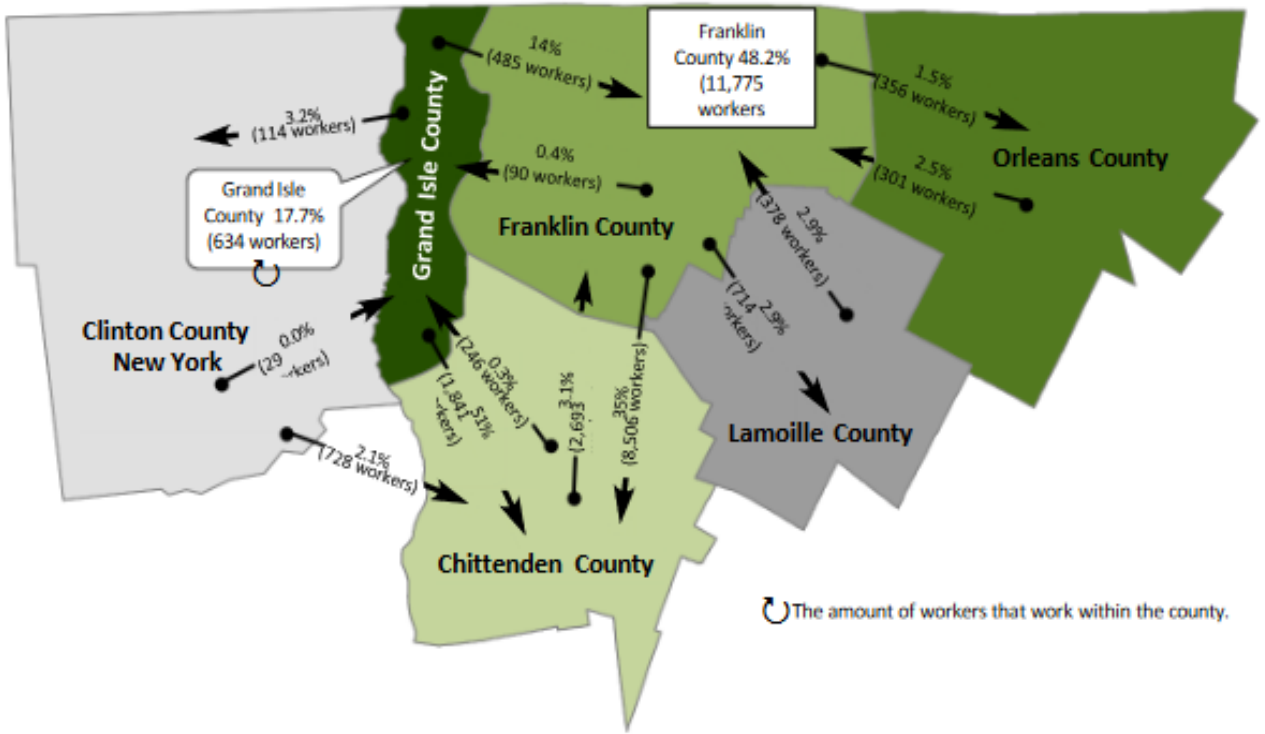
Fuel Source	Regional Households (ACS 2016-2021)	% of Households	BTU (in billions)	Change Since 2013	% of the Total Costs
Natural Gas	5,082	23%	561.22	29%	13%
Propane	3,774	17%	440.72	21%	26%
Electricity	1,123	5%	108.69	168%	4%
Fuel Oil	8,216	37%	946.72	-14%	44%
Coal	14	0%	1.78	6%	n/a
Wood	3,273	15%	404.13	-16%	13%
Solar	62	0%	7.87	-	n/a
Other	427	2%	46.53	-2%	n/a
No Fuel	40	0%	3.63	-24%	n/a
Total	**22,011**	**100%**	**2,521.28**	**2%**	**100%**

Source: Vermont Comprehensive Energy Plan

Regional Energy Use - Transportation

FIGURE 4.7 REGIONAL COMMUTING PATTERNS

- Roughly 35% of workers who reside in Franklin County commute to Chittenden County for work. About 50% of workers commute within Franklin County.
- Approximately 75% of Grand Isle County workers commute to jobs outside the county, including a total of 51% of all workers who commute to Chittenden County.



Source: US Census – Longitudinal Employer-Household Dynamics On The Map tool (2019)

FIGURE 4.5 ELECTRIC VEHICLE TOTAL REGISTRATIONS

	2013	2021	% Change
Battery Electric Vehicle	5	316	6,220%
Plug-In Hybrid Vehicle	6	536	8,833%
Total	11	852	7,645%

Source: Efficiency Vermont, Electric Vehicle Registrations from Vermont DMV

FIGURE 4.4 GAS VEHICLE ENERGY USE

	2013	2021
Est. # of Gas Vehicles	42,471	39,564
Average Miles Traveled (Vermont)	11,356	12,274
Transportation BTUs (Thousand MMBTU)	3,121	3,029
Gasoline Cost	$59,883,119	$95,863,654

Source: US Census 2016-2021 ACS, 2021 VTrans Vermont Transportation Energy Profile

Regional Energy Use – Electricity Use and Generation

FIGURE 4.9 ELECTRICAL ENERGY USE (in Billions BTUs)

	2013	2021	% Change
Residential	664.0681448	730.384048	10.0%
Commercial & Industrial	983.145859	991.27734	0.8%

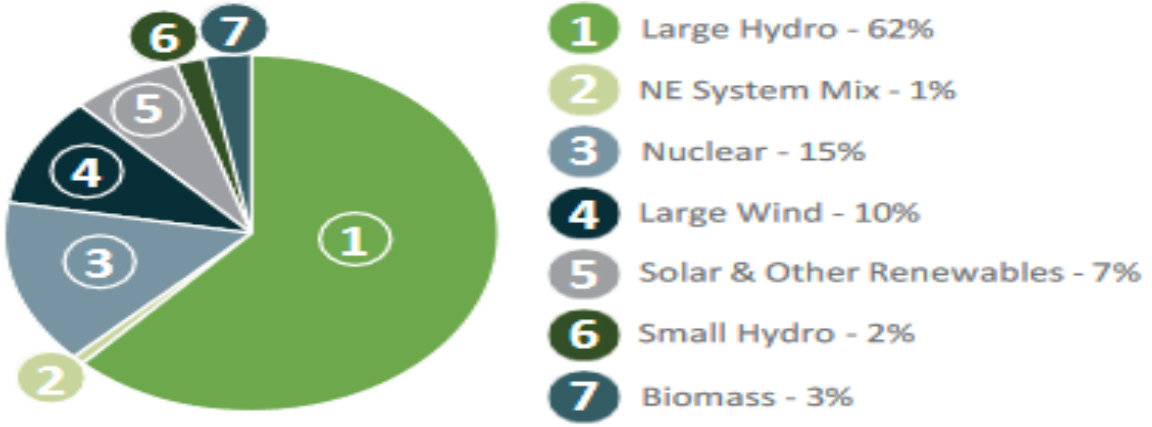
Source: Efficiency Vermont

FIGURE 4.10 RENEWABLE GENERATION

	MW Capacity
Solar	39.1
Wind	5.2
Hydro	43.5
Biofuels	3.1
Solar & Wind Combined	0.1
Total	91.0

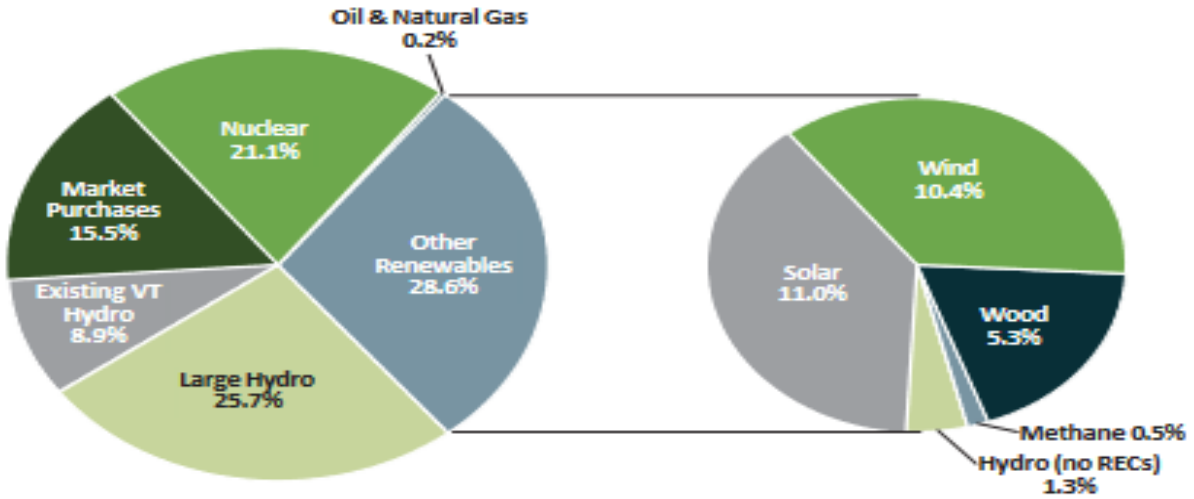
Source: Department of Public Service

FIGURE 4.12 VEC ENERGY PURCHASES BY FUEL - 2021



Source: Vermont Electric Cooperative

FIGURE 4.11 GMP ENERGY PURCHASES BY FUEL - 2021



Source: Green Mountain Power

Regional Energy Targets

Regional Energy Targets – Use and Generation

FIGURE 5.14 TOTAL ELECTRICAL ENERGY USE: CHANGE FROM 2020 TO 2050

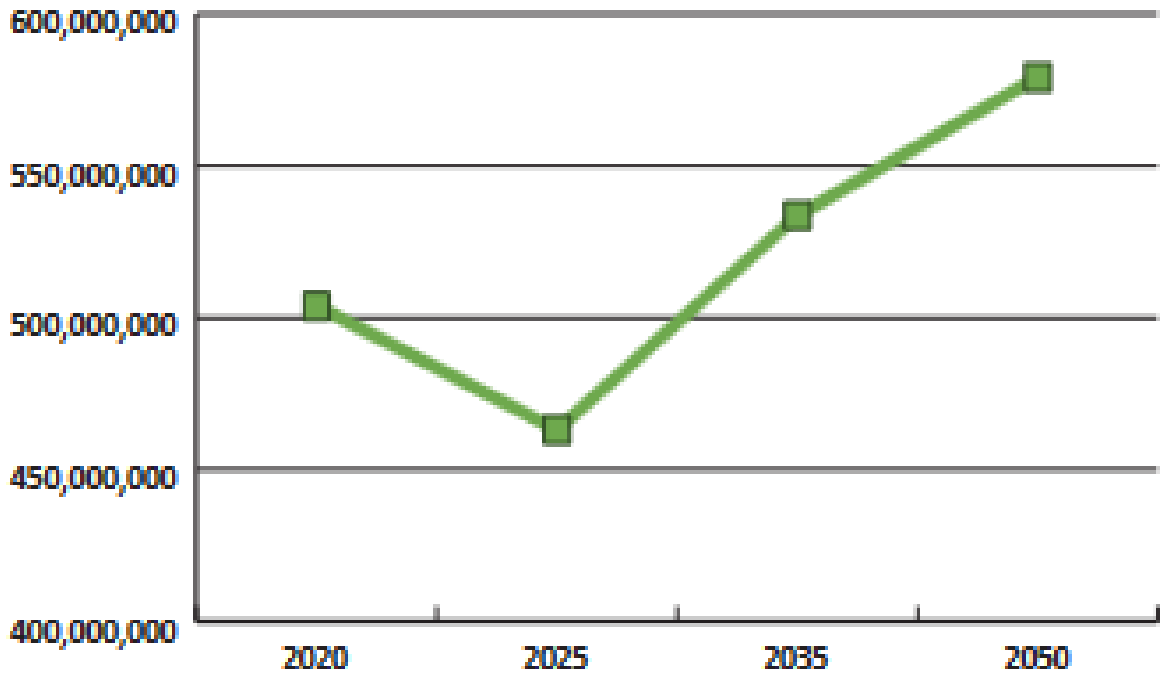


FIGURE 5.15 RENEWABLE GENERATION TARGETS

	2025	2035	2050
Solar	15.0	65.0	140.1
Wind	0.2	0.9	1.9
Hydro	0.4	1.9	4.0
Biodigesters	0.2	1.0	2.1
MWH Total (in MWH)	23,396	101,384	218,365

Source: NRPC Targets based on Department of Public Service Renewable Generation Scenarios Tool

Regional Energy Targets – Thermal

FIGURE 5.5 TOTAL RESIDENTIAL HEAT PUMPS

2020 (Est.)	1,162	
2025	7,000	6x more than 2020
2035	18,821	16x more than 2020
2050	27,736	23x more than 2020

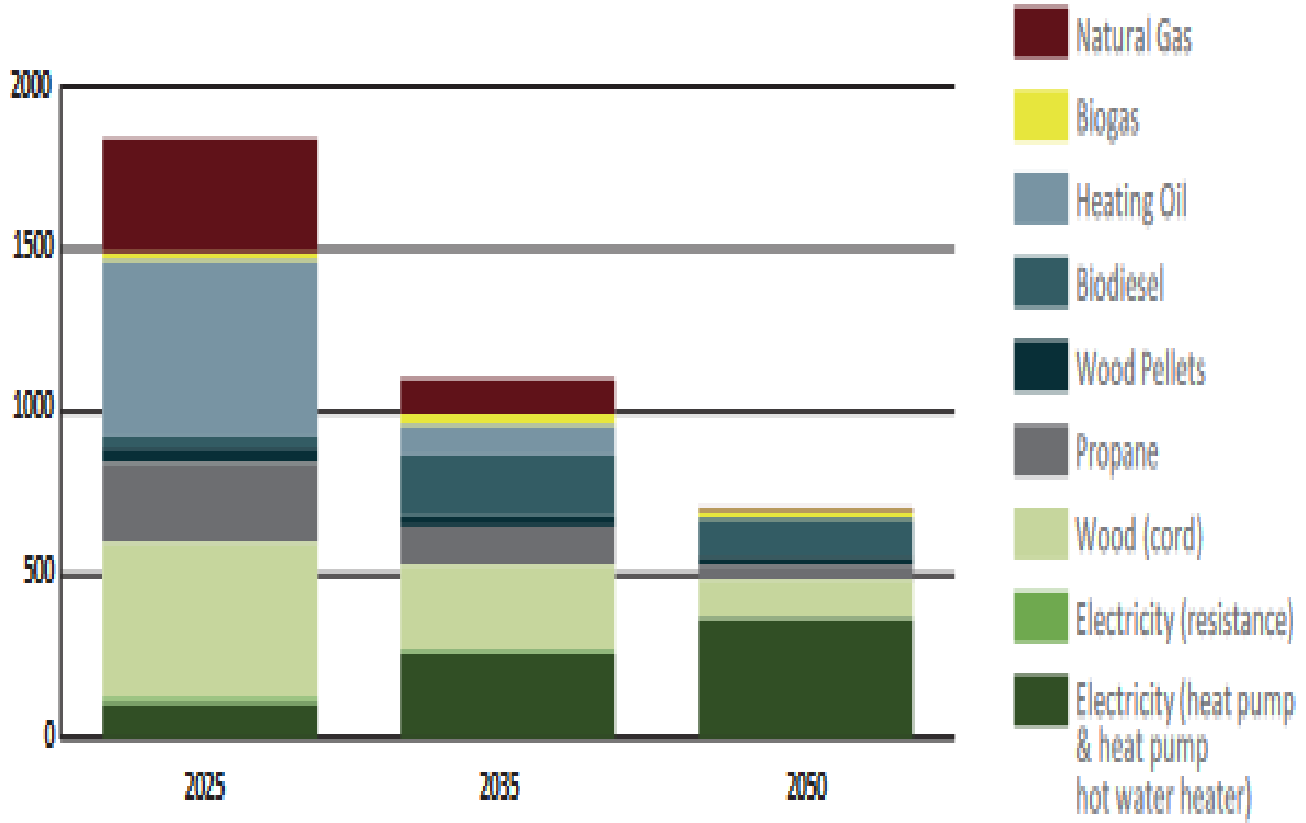
Source: Efficiency Vermont, LEAP Modeling, CAP Mitigation Scenario

FIGURE 5.3 CHANGE IN FUEL SOURCE - RESIDENTIAL THERMAL

	2021	2050	Difference
Natural Gas	561	10	56x less
Propane	441	44	10x less
Electricity (*Heat Pump & Resistance*)	109	368	3.4x greater
Fuel Oil	947	92	10 x less
Wood (*Pellet & Cord*)	404	20	20x less
Biogas	0	115	-
Other	60	-	-

Source: U.S. Census American Community Survey and 2023 Regional LEAP Modeling

FIGURE 5.4 CAP MITIGATION SCENARIO: RESIDENTIAL THERMAL ENERGY USE



Regional Energy Targets - Transportation

FIGURE 5.12 CAP SCENARIO: ENERGY USE FOR PASSENGER CAR & LIGHT DUTY TRUCKS

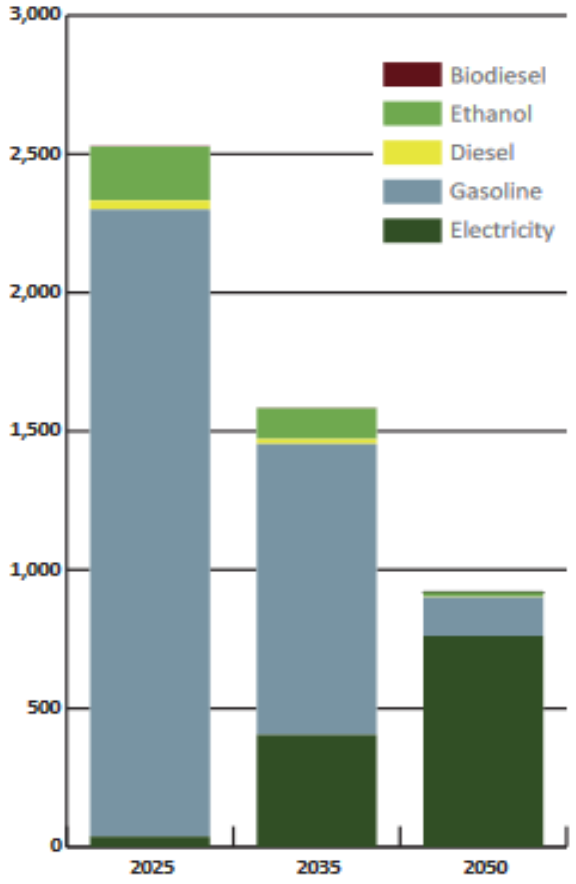


FIGURE 5.13 CAP SCENARIO: ENERGY USE FOR MEDIUM & HEAVY-DUTY TRUCKS

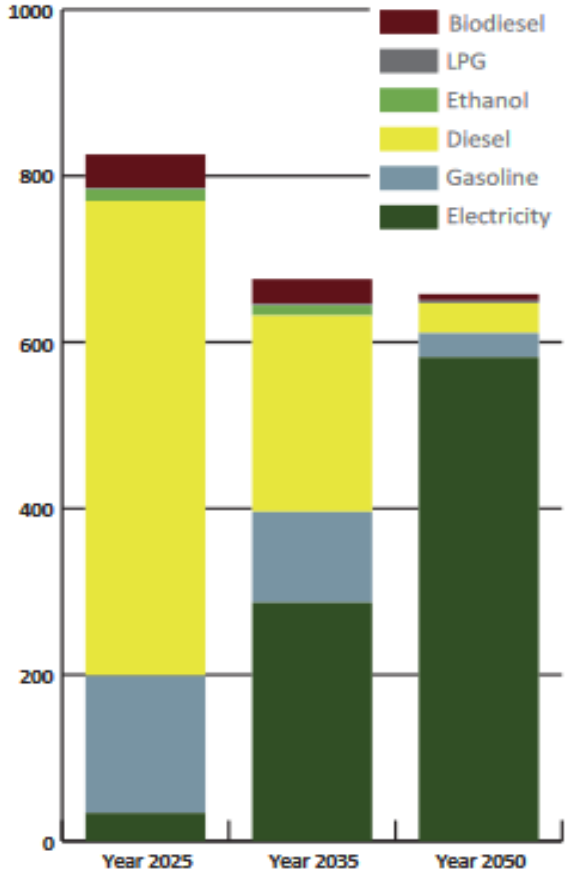


FIGURE 5.10 TARGET: GASOLINE ENERGY USE

	Gasoline in Thousand MMBTU	% Change from Present Est.
2025	2,372	-25%
2035	1,883	-65%
2050	1,298	-95%

Source: 2023 Regional LEAP Modeling, CAP Mitigation Scenario

Data Note: Current est. include only household vehicles, this estimate may also include commercial or fleet vehicles

FIGURE 5.11 TARGET: ELECTRIC VEHICLE - TOTAL REGISTRATIONS

	Plug-In Hybrid (PHEV)	Battery Electric Vehicle (BEV)	% Change from Present Est. (Total PHEV & BEV)
2025	290	1,939	162%
2035	276	23,427	2,382%
2050	66	51,071	5,902%

Source: 2023 Regional LEAP Modeling, CAP Mitigation Scenario

Goals, Policies, and Implementation

Goals

1) Use demand-side management to handle the expected doubling of electric energy demand in the Northwest region by 2050

2) To reduce annual regional fuel needs and fuel bills for heating structures, to foster the transition from non-renewable fuel sources to renewable fuel sources, and meet regional targets for the weatherization of residential households and commercial establishments

3) Hold VMT per capita to 2011 levels through reducing the share of single occupancy vehicle (SOV) commute trips increasing the share of pedestrian and bicycle commute trips, increasing public transit ridership, and focusing regional development in or near existing growth centers and villages

4) Increase region-based passenger rail trips and rail freight tonnage in the region.

5) Increase the share of renewable energy in transportation by increasing the use of renewable and less carbon-intensive fuels such as electricity, biofuels, and compressed natural gas

6) Increase the number of municipal energy committees in the Northwest region.

7) Increase local food production and consumption

8) Increase the renewable energy generation capacity in the Northwest region through a mix of generation types including solar, wind, hydro, and biodigesters

Implementation Challenges

- High Upfront Costs
- Complex and Intertwined Systems
- Landlord/Renter Mismatched Priorities
- Baseload vs. Intermittent Electricity
- Grid Limitations
- Inclement Weather
- Difficulty in Developing New Hydro
- Issues with Biofuels, Renewable Natural Gas, and Heat Pumps
- Proximity to Chittenden County
- Reliance on Cord Wood and Biomass

Solar

Northwest Region, VT
Act 174
Energy Development Improvement Act

The map and the corresponding data is intended to be used to inform energy planning efforts by municipalities and regions. This may also be used for conceptual planning or initial site identification by those interested in developing renewable energy infrastructure. The maps do **NOT** take the place of site specific investigation for a proposed facility and cannot be used as zoning maps.

Legend

- Substation
- 3 Phase Power Line
- Transmission Line
- 1/2 Mile Buffer* (3 Phase Power Line & Transmission Line)
- Prime Solar/No Known Constraints
- Base Solar/Possible Constraints

*The half mile buffer shows where generation facilities can be located without significant loss of power in transit to transmission lines.

Sources: VCGI

Disclaimer: The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Northwest RPC is not responsible for these. Questions of on the ground location can be resolved by site inspections and/or surveys by a registered surveyor. This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.

0 1 2 3 4 Miles

Wind

Northwest Region, VT
Act 174
Energy Development Improvement Act

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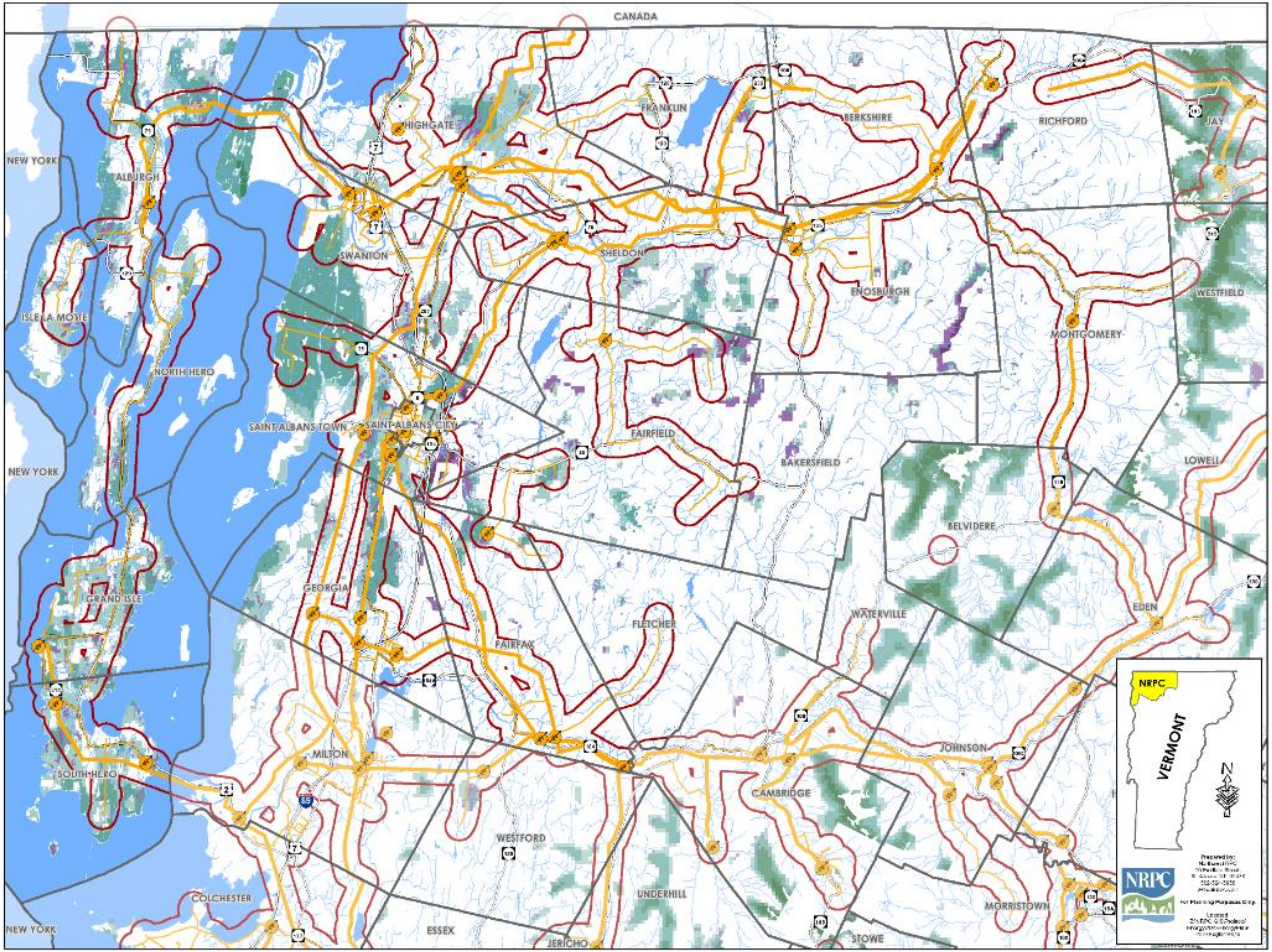

Legend

- Substation
- 3 Phase Power Line
- Transmission Line
- 1/2 Mile Buffer* (3 Phase Power Line & Transmission Line)
- **Prime Wind**
  Areas of high wind potential and no known constraints.
  Darker areas have higher wind speeds.
- **Base Wind**
  Areas of high wind potential and a presence of possible constraints.
  Darker areas have higher wind speeds.

*The half mile buffer shows where generation facilities can be located without significant loss of power in transit to transmission lines.

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0 1 2 3 4 Miles

Questions? Comments?

We would love your feedback! mvalenta@nrpcvt.com

Please submit any comments on the determination request to PSD.planning.standards@vermont.gov by November 8.