

**VECAN 2016**

**REGIONAL  
ENERGY  
PLANNING**

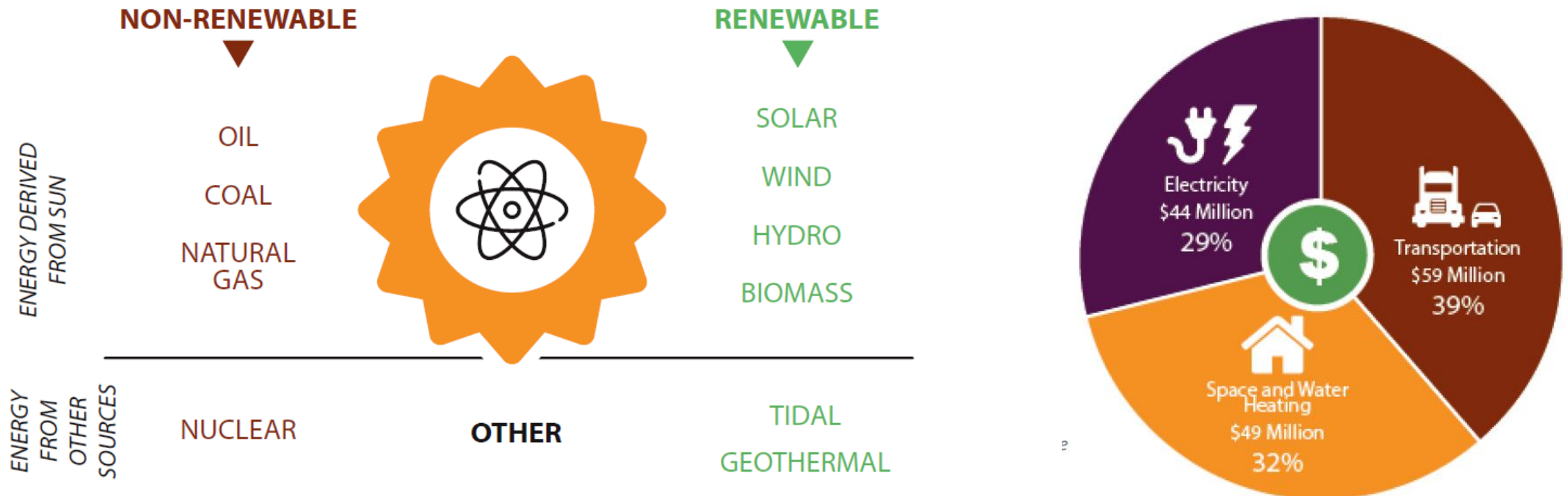


**Act 174**

**Municipal  
Energy  
Planning**

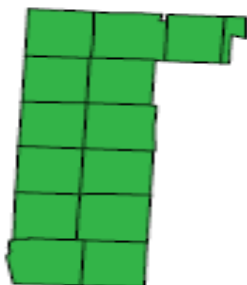
# Regional Plans

## Introduction: Energy - Environment - Economy



# Current Energy Use in the Region: Thermal, Transportation, Electricity

## BCRC REGION



### Population <sup>1</sup>

Total Population (2014): 35,211  
Population Density: 61 people per sq. mile

### Households <sup>1</sup>

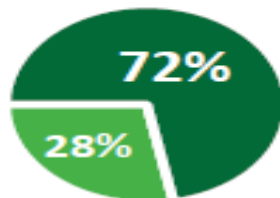
Total Households (2014): 14,722

#### OWNERS

Total HHs Owned: 10,219  
Avg. Owner HH Size: 2.4

#### RENTERS

Total HHs Rented: 4,503  
Avg. Renter HH Size: 2.1



### Businesses

Total businesses in BCRC Region (2014): 1435  
Total employees working in BCRC Region (2014): 16555  
Total employed residents in BCRC Region (2014): 17,094  
Average employment wage in BCRC Region (2014): \$40,208

### Residential Transportation Fuel Use <sup>3</sup>

Number of vehicles (2014): 25,271  
Mean vehicles per household: 1.7  
Estimated miles traveled: 394.0 Million Miles  
Estimated gallons of fuels used: 17.3 Million Gallons  
Estimated total cost: \$59.2 Million  
Percent of resident employees driving alone to work: 74%  
Average commute time: 17 Minutes



### Space Heating For Households <sup>1</sup>

Median Year Built for Housing Units: 1971  
Percent of Housing Built Since 2000: 9%  
Percent of Housing Built Before 1960: 37%  
Median Annual Household Income: \$48,388  
Total Energy Use: 1,437 Billion BTUs  
Total Cost: \$26,129,000 <sup>4</sup>  
Mean Cost per Household: \$1,700

Fuel Type: Space Heating	Number of Households	Avg. Use (Annual)	Percent of Use (All HHs)	Percent of Use: Owner	Percent of Use: Renter	Percent of Cost (All HHs)
Tank/LP/etc. Gas	2261 HHs	2.3 Mil Gal	15%	12%	22%	26%
Electricity	383 HHs	8.1 GWh	3%	1%	7%	5%
Fuel Oil		7.0 Mil Gal	67%	67%	65%	56%
Wood	1993 HHs	12.9K Tons	14%	17%	6%	13%
Other	269 HHs	-	2%	2%	0%	-

ALL HOUSEHOLDS

OWNERS

RENTERS



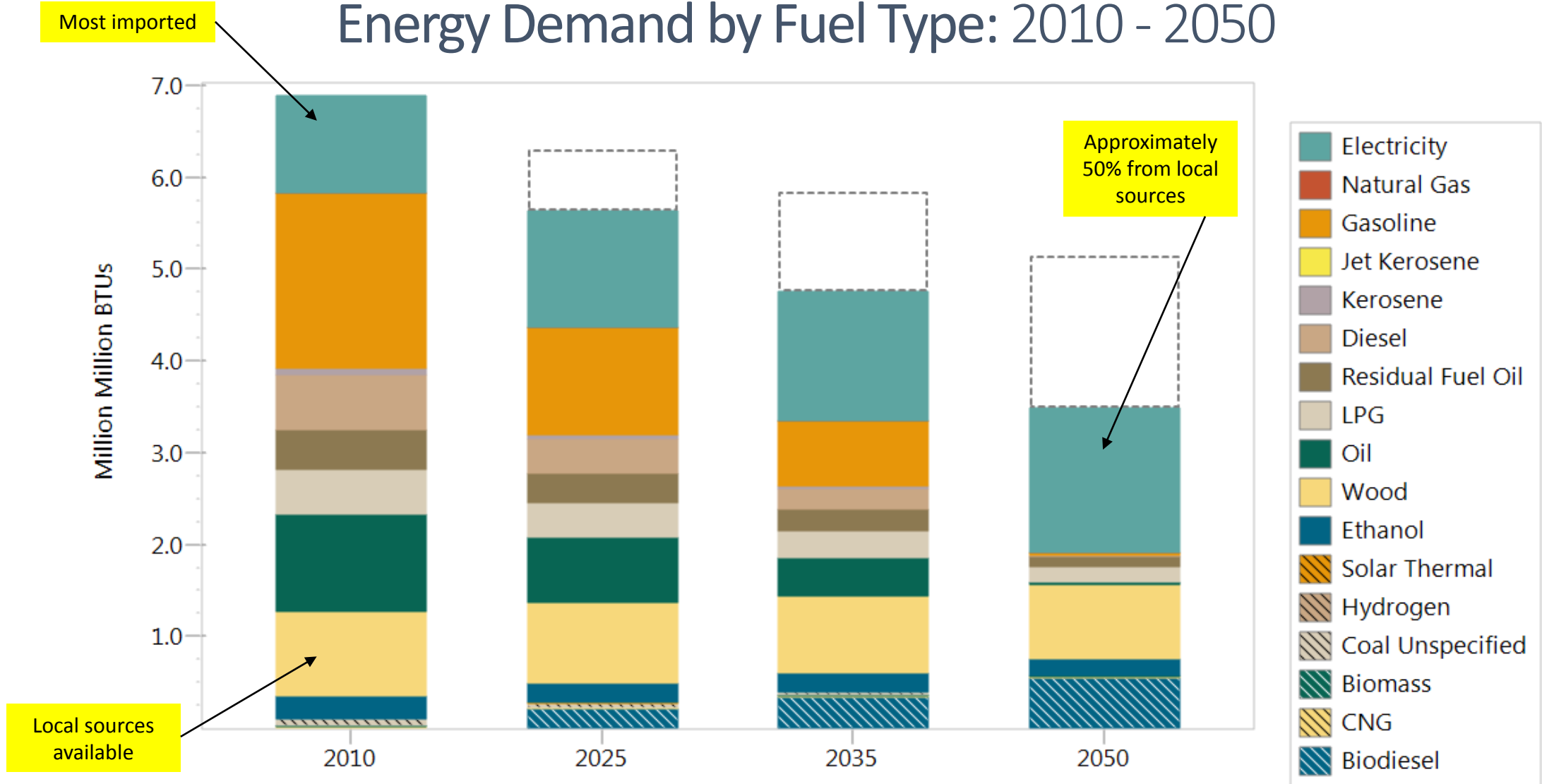
### Space Heating for Businesses <sup>2</sup>

Mean Estimated Building Space for Businesses: 12,105 sq. ft  
Total Energy Use: 1,042 Billion BTUs  
Estimated Total Annual Cost: \$23,276,000  
Average Annual Cost per Business: \$16,220

# Projecting Future Energy Use by Sector and Fuel Type

## Bennington Region

### Energy Demand by Fuel Type: 2010 - 2050



# Implementation Plan



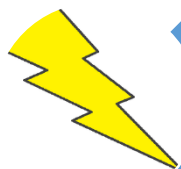
Policies and specific action recommendations to promote conservation, efficiency, switch to renewable fuels, and imported and locally generated electricity derived from renewable sources.



Thermal: improving building stock, changing and improving heating systems and fuels.



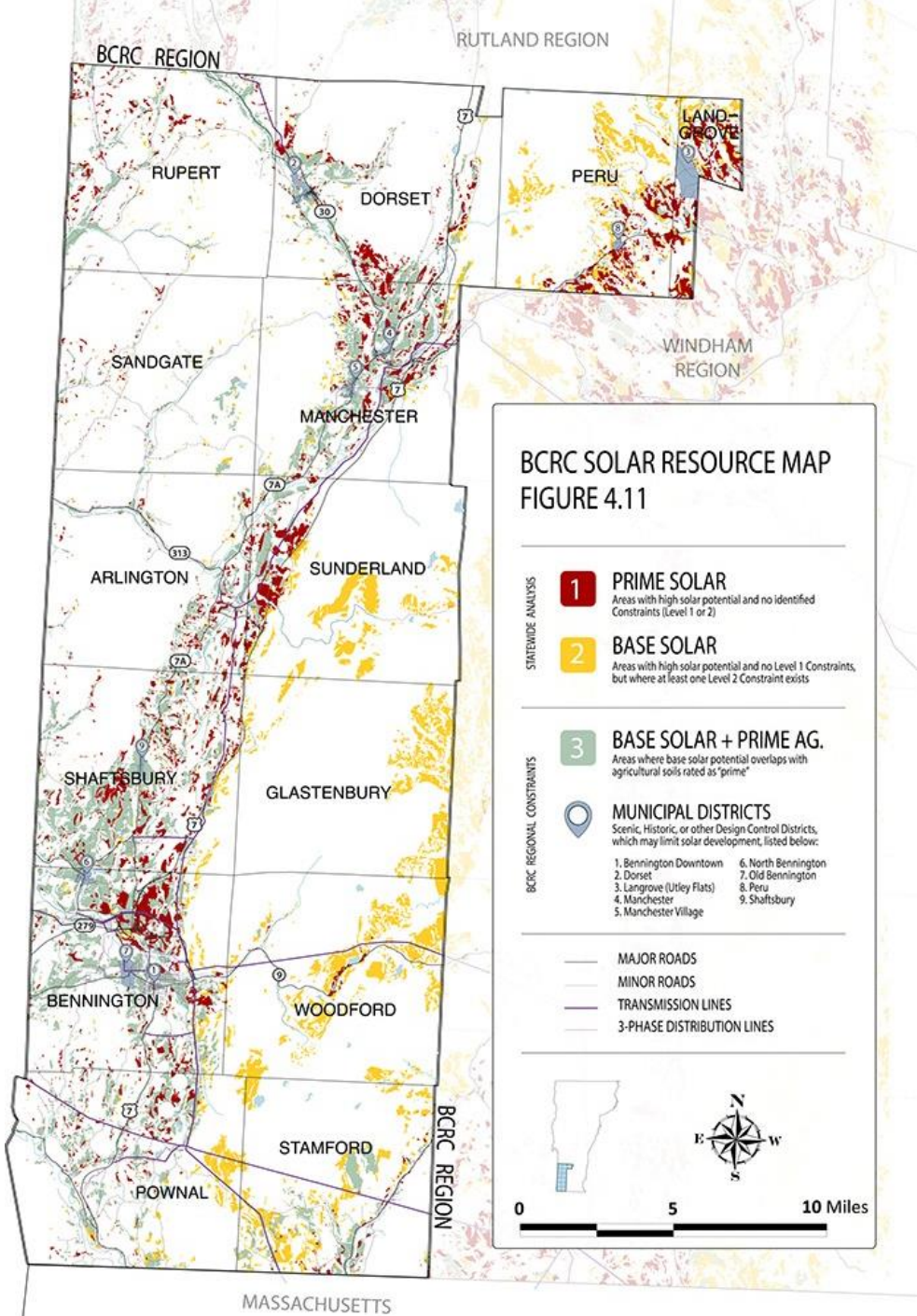
Transportation: reducing the amount of driving and transforming the vehicle fleet.



Electricity: continuing efforts at conservation (Efficiency Vermont), and opportunities for new generation in the region.

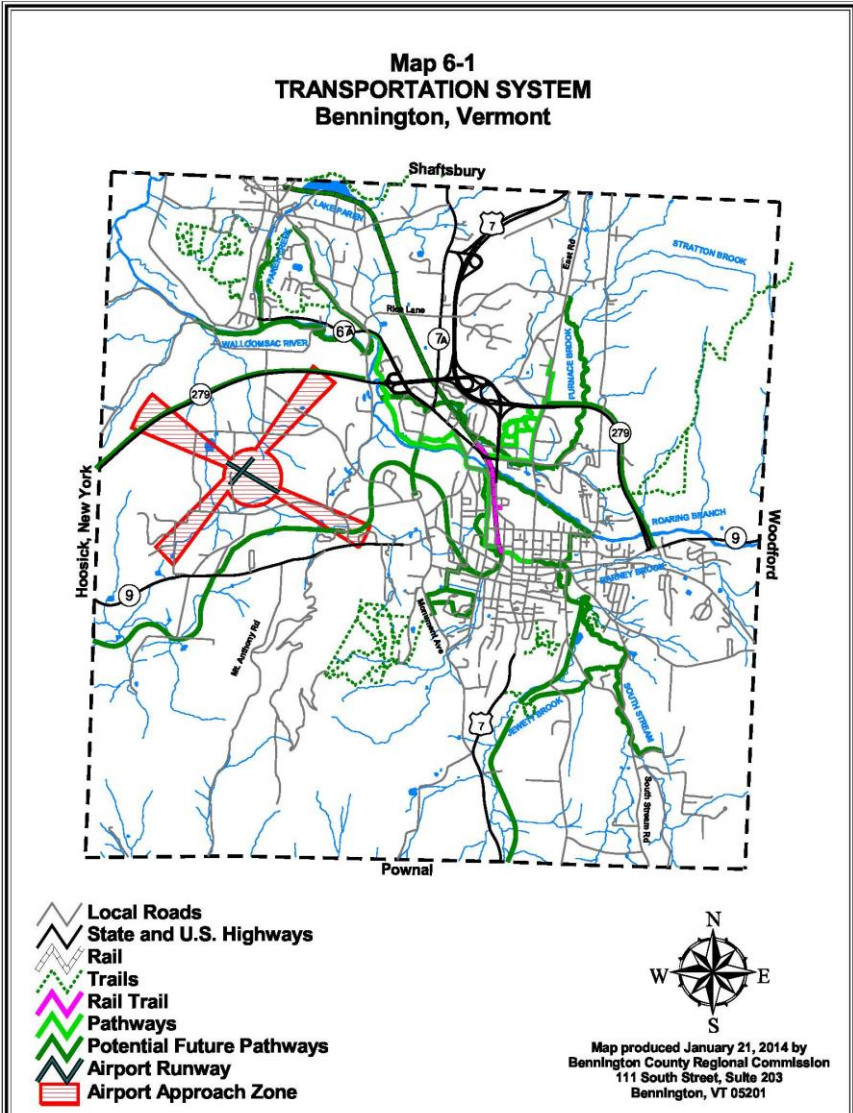
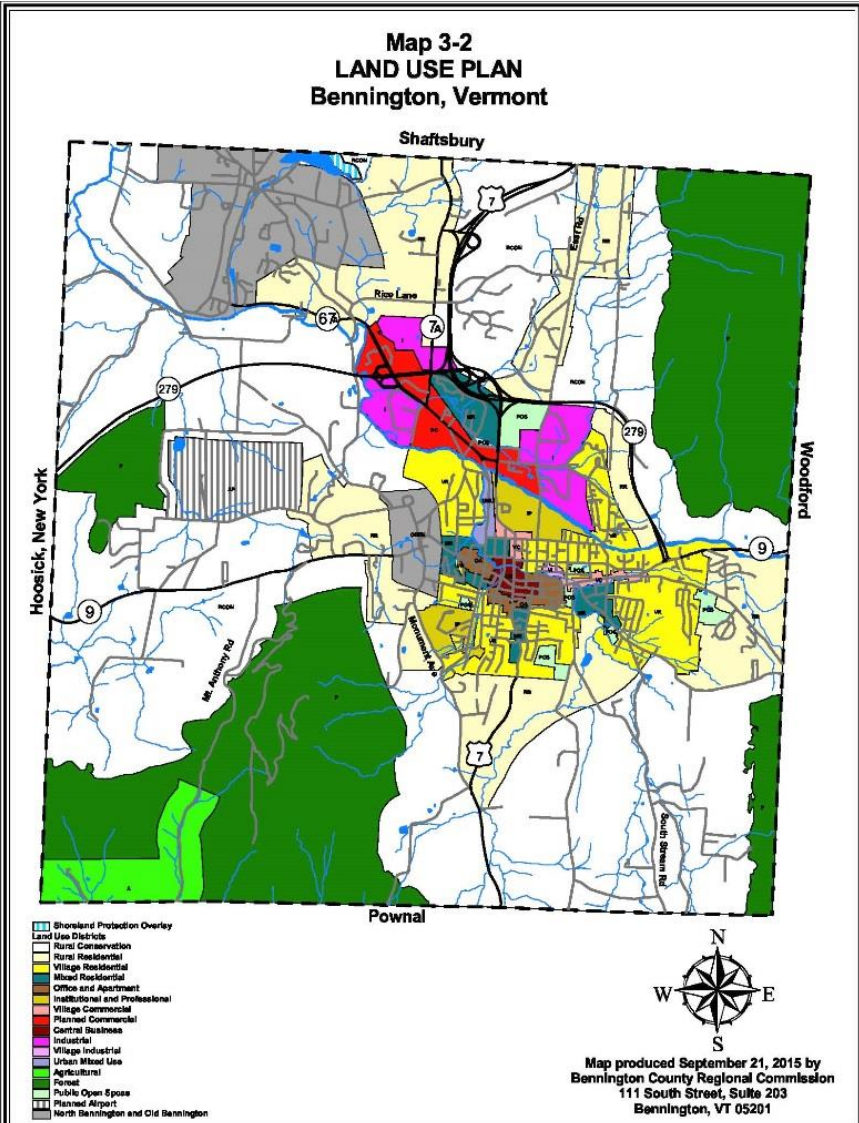
# Maps of Solar, Wind, Hydroelectric, and Biomass Energy Resources

- Identification of areas with greatest energy resource availability
- Overlay critical and potential environmental constraints
- Add local and regional opportunities and constraints



# Support for Municipal Planning Efforts

## Review of Existing Plans

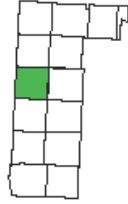


# Data and Projections

## ARLINGTON

### POPULATION <sup>1</sup>

Total Population (2014): 2,354  
Population Density: 56 people per sq. mile



### HOUSEHOLDS <sup>1</sup>

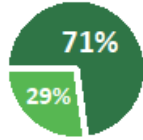
Total Households (2014): 1,070

#### OWNERS

Total HHs Owned: 757  
Avg. Owner HH Size: 2.2

#### RENTERS

Total HHs Rented: 313  
Avg. Renter HH Size: 2.2



### BUSINESSES

Total businesses in Arlington (2014): 102  
Total employees working in Arlington (2014): 924  
Total employed residents in Arlington (2014): 1,340  
Average employment wage in Arlington (2014): \$45,482

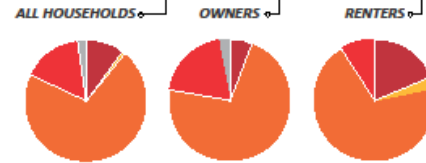
### RESIDENTIAL TRANSPORTATION FUEL USE <sup>5</sup>

Number of vehicles (2014): 1,821  
Mean vehicles per household: 1.7  
Estimated miles traveled: 28.4 Million Miles  
Estimated gallons of fuels used: 1.2 Million Gallons  
Estimated total cost: \$4.3 Million  
Percent of resident employees driving alone to work: 73%  
Average commute time: 18 Minutes

### SPACE HEATING FOR HOUSEHOLDS <sup>1</sup>

Median Year Built for Housing Units: 1963  
Percent of Housing Built Since 2000: 15%  
Percent of Housing Built Before 1960: 47%  
Median Annual Household Income: \$54,861  
Total Energy Use: 101 Billion BTUs  
Total Cost: \$1,698,000 <sup>4</sup>  
Mean Cost per Household: \$1,500

Fuel Type: Space Heating	Number of Households	Avg. Use (Annual)	Percent of Use (All HHs)	Percent of Use: Owner	Percent of Use: Renter	Percent of Cost (All HHs)
Tank/LP/etc. Gas	106 HHs	97K Gal	10%	6%	19%	18%
Electricity	9 HHs	174 MWh	1%	0%	3%	2%
Fuel Oil	757 HHs	514K Gal	71%	71%	70%	64%
Wood	175 HHs	1.1K Tons	16%	19%	9%	16%
Other	19 HHs	-	2%	3%	0%	-



### SPACE HEATING FOR BUSINESSES <sup>2</sup>

Mean Estimated Building Space for Businesses: 10,759 sq. ft  
Total Energy Use: 66 Billion BTUs  
Estimated Total Annual Cost: \$1,471,000  
Average Annual Cost per Business: \$14,417

### Town Example: Shaftsbury Home Heating (# Households)

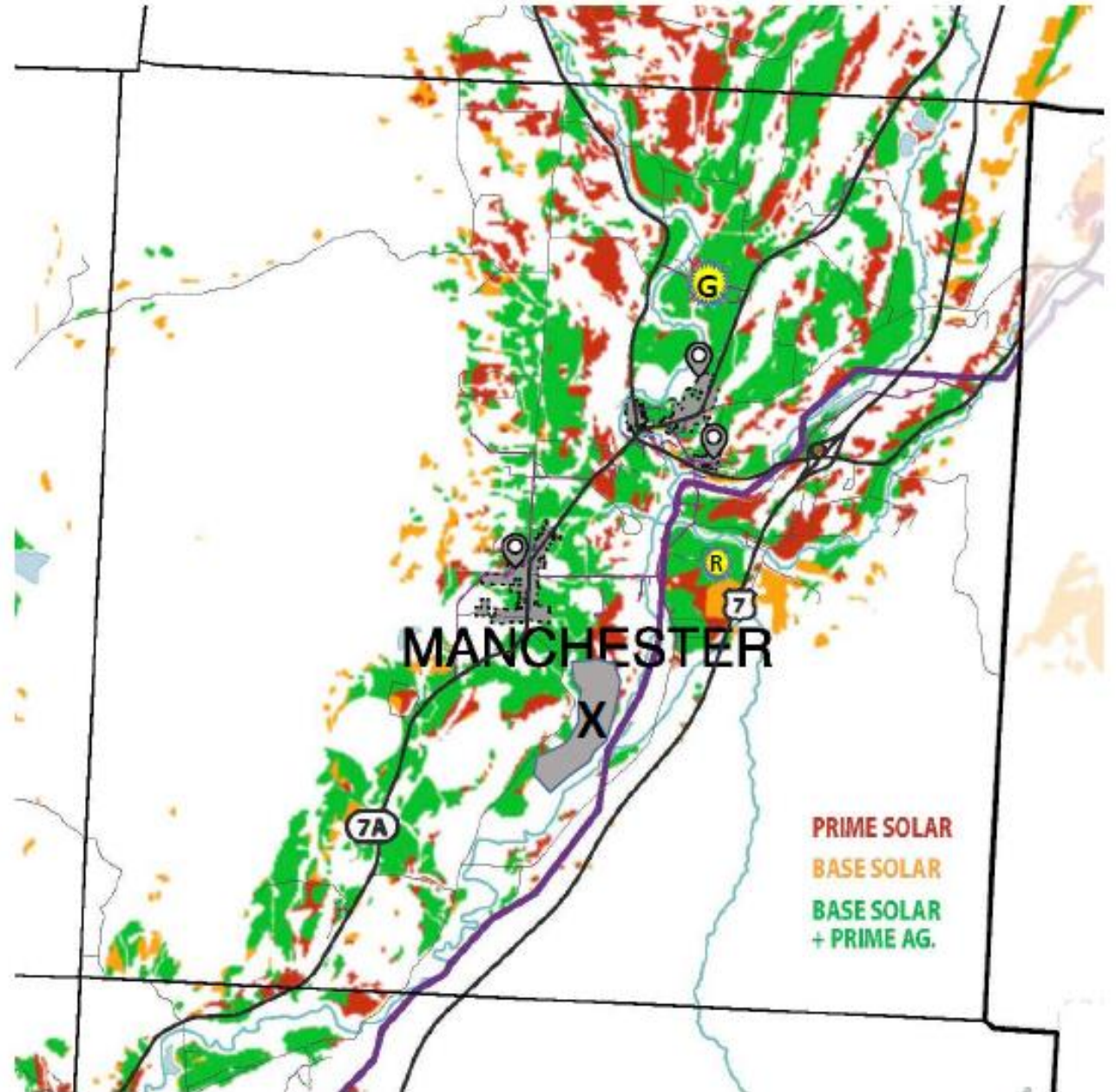
10.5% of Region Total

Fuel	2015	2025	2035	2050
Biodistillates	10	54	120	386
Cord Wood	352	341	342	452
Electric Resistance	64	67	49	25
Heat Pump	10	56	139	343
LPG	279	266	220	132
Natural Gas	-	-	-	-
Oil	719	590	417	-
Wood pellets	53	81	109	213



## Customizing Maps

Individual towns can use the regional map to refine maps at the local level by adding areas preferred for solar development and important local resources that should be avoided.



# Specific Locally Oriented Strategies for Implementation

(excerpted from the Bennington Town Energy Plan)

## Municipal Government Energy Conservation

18. Pursue energy audits at municipal buildings focusing on weatherization work at older buildings such as the town office building and old blacksmith shop and heating and electrical upgrades at the police station.
19. Consider alternative energy systems such as a small biomass district heat project to heat public buildings in the downtown, solar hot water production at the recreation center, and a demonstration project with liquid biofuels for some town equipment.
20. Consider purchase of more fuel efficient vehicles for all departments; hybrid sedans and SUVs might be particularly effective for the police department, as would new anti-idling technologies.
21. Publicize the successful LED streetlight conversion and encourage business owners to make similar changes on their external lights.

## Conservation Strategies for Schools and Institutions

22. The public schools should regularly participate in the School Energy Management Program reviews and continue to work with Efficiency Vermont to obtain incentives for weatherization and efficiency improvements.
23. The Southwestern Vermont Medical Center should continue to work with Efficiency Vermont to improve energy conservation at its campus and should seriously consider the financial, environmental, and economic benefits of converting its primary heating fuel to biomass.

## Regional Planning Commission Support

- RPCs will provide map and analysis data to municipalities by the end of April, 2017.
- RPC direct technical assistance for at least three municipalities this year.
- Contact your RPC directly: [www.vapda.org](http://www.vapda.org)