

## Chapter 5 Renewable Energy

### *Helping to Sustainably Power the Town of Veteran into the Future*

**VISION:** *The Town of Veteran understands the potential to diversify their energy mix and is encouraging the deployment of renewable energy technologies in the Town. The Town's regulations should be reviewed to include provisions that effectively encourage and allow for easier adoption of these technologies.*

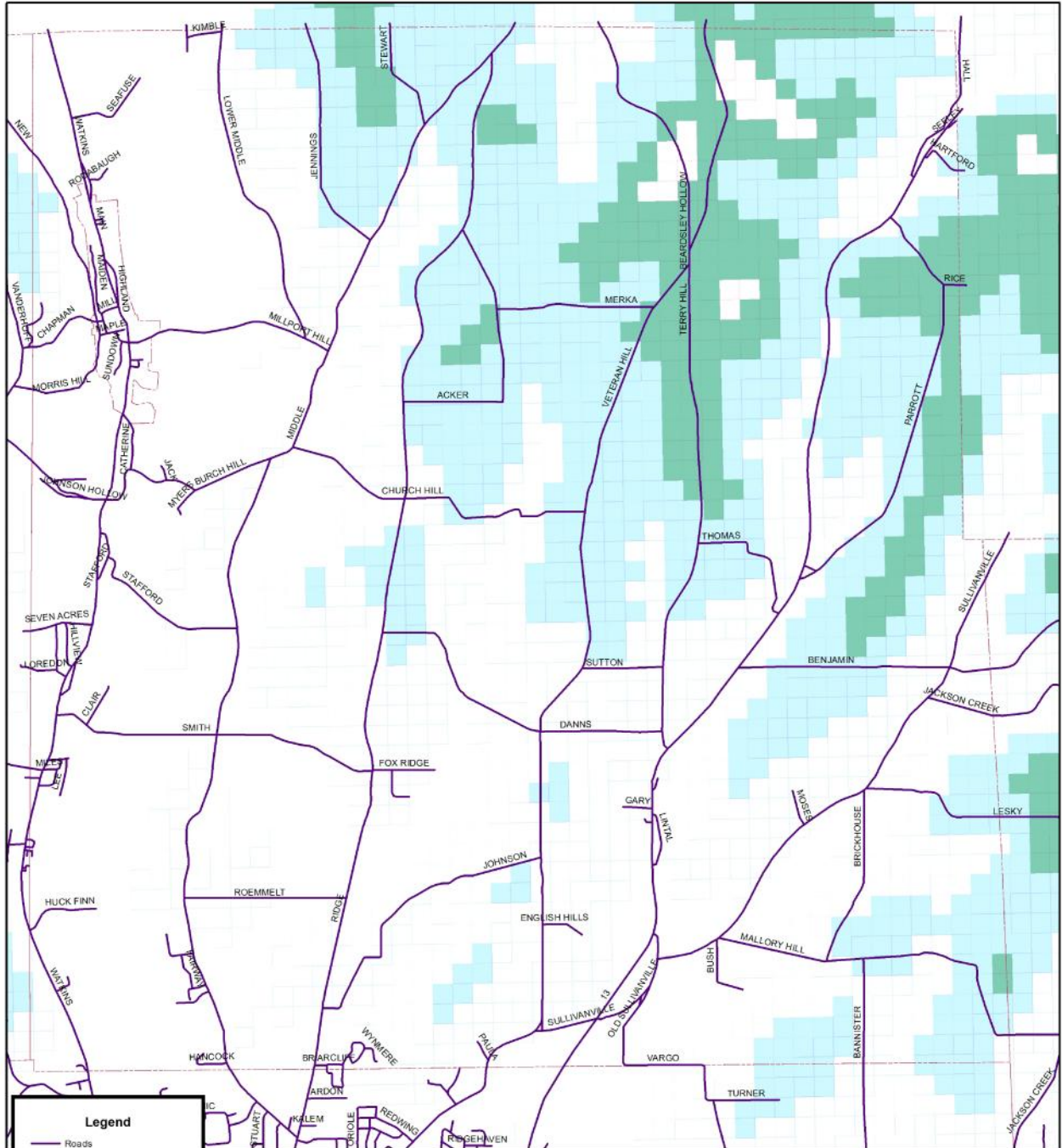
#### **Wind**

Wind power is the most prevalent of the renewable energy technologies being employed all over the world. New York State has set a Renewable Portfolio Standard (RPS) which is an agreement to have a certain percentage of the electricity generated by the State to come from a renewable energy source. New York's current RPS is set at 30% electricity from renewable energy sources by 2015, with the majority of that amount coming from wind. In fact, legislation is proposed that will require 20% of the electricity generated by 2020 to come from wind, which helps to explain why as of 2011 New York had a total installed capacity of 1,403 Megawatts (MW). The requirements for wind are straightforward; a strong reliable wind resource, access to transmission lines, and a wind turbine.

Map 20 shows the average wind speeds of the Town of Veteran at 100 meters (m). The minimum wind speed required for a large or utility scale wind turbine to be considered economical is between 15-17 miles per hour (MPH). As one can see from the images, a large scale wind project may be possible, but is less likely in the Town of Veteran due to lower wind speeds than surrounding areas.

It may be in the best interest of the residents of Veteran to look more into small scale wind, or wind turbines less than 100 Kilowatt (KW). These smaller residential turbines only require wind speeds around 12 MPH.

# Map 20: Town of Veteran 100M Wind



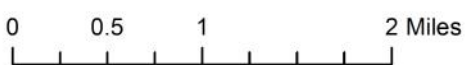
**Legend**

- Roads
- Town Boundaries

**Mean Wind Speed at 100 m**  
**<VALUE>**

|  |               |
|--|---------------|
|  | <12.3 MPH     |
|  | 12.3-13.4 MPH |
|  | 13.4-14.5 MPH |
|  | 14.5-15.7 MPH |
|  | 15.7-16.8 MPH |
|  | 16.8-17.9 MPH |
|  | 17.9-19.0 MPH |
|  | 19.0-20.1 MPH |
|  | 20.1-21.3 MPH |
|  | > 21.3 MPH    |

## Town of Veteran 100M Wind Map



Map Created 5/18/13

It is important to remember that these turbines can range in height from 50 -100 feet tall, and thus all zoning ordinances should be understood before installation commences. Also before installing turbines the owner must make sure that the turbine is not located in a recognized avian flyway as they normally prohibit wind turbines. The noise coming off of the large utility scale turbines is around 55 decibels (dBA) which is equivalent to a quiet suburb. The smaller scale turbines emit 40 dBA or less noise which is quieter than a library. Noise should not be an issue and limitations set at 50 dBA will not affect the deployment of wind turbines.

A community wind project where a group of people pool their resources to buy and install a turbine has shown to be an effective way to generate electricity for those involved in the project. This places less of an economic burden on the participants because the cost is being distributed over a group of people and not just one individual. This could be an excellent way for the residents of Veteran to get together and install their own turbine while instilling a sense of community as well.

Small scale turbines depending on their size can be utilized for pumping water, charging batteries, and for providing electricity for homes. Many incentives are available through New York State Energy Research and Development Authority (NYSERDA) and the United States Department of Agriculture's (USDA) Rural Energy in America Program (REAP) to provide residents with the funds to install their own turbines and even sell surplus electricity back to the grid.

**POLICY:** *To promote the development of small scale wind turbines in Veteran.*

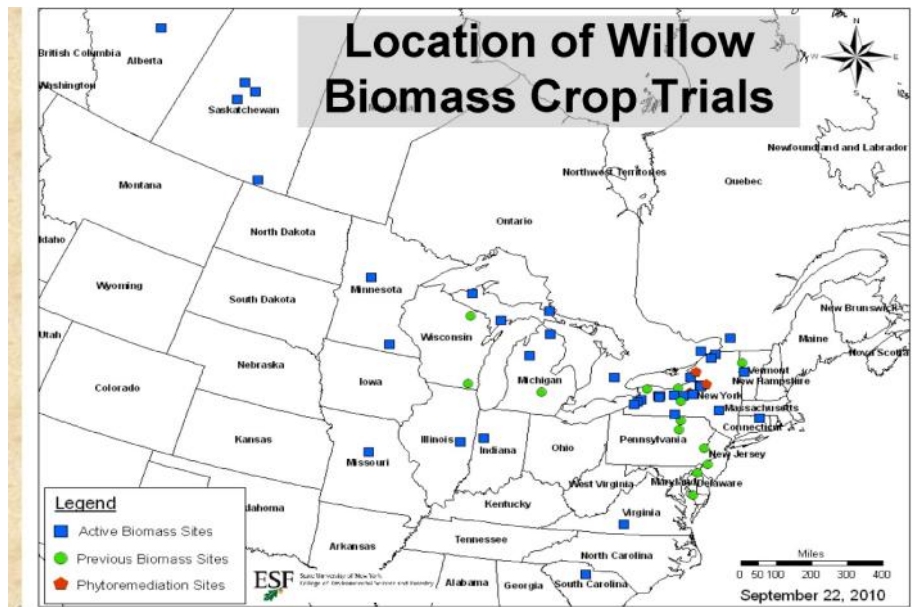
**RECOMMENDATION:**

- 5a. **Review Town ordinances so that they are compatible with small scale wind.**
  
- 5b. **Educate residents on the benefits and tax incentives of adding wind power into their home and agricultural operations. Evaluate the residents' interest in working together to install wind energy in neighborhoods. Information can be made available at the Town hall and NYSERDA can be invited to give a program for residents at the Town hall.**

**Biomass**

Biomass is the most widely used resource in the world for providing energy. The most common forms of biomass are wood and agricultural residues, but also include biofuels. Biomass is considered a renewable energy because, if done sustainably, biomass will take carbon out of the atmosphere while it is growing and return the carbon in the same quantities when it is burned. For example, when a tree grows it sequesters carbon

**Map 21: Biomass Crop Trails**



dioxide (CO<sub>2</sub>) during photosynthesis. After the tree is felled and is combusted the entire CO<sub>2</sub> inside of the tree is then released back into the atmosphere where it originally came from.

Many of these fuel plants are suitable for growth in Veteran including switchgrass, hemp, miscanthus, and tree species such as poplar and willow. The SUNY College of Environmental Science and Forestry (SUNY ESF) in Syracuse has developed a hybrid strain of Willow aptly named Ecowillow that is being deployed for use as a biomass fuel source. This Ecowillow has demonstrated yields of 4-6 dry tons per acre for the first year's harvest with subsequent yields 10-15% larger. The Ecowillow is harvested every 3 years, and only needs to be replanted every 30 years. It generally costs about \$1,000 per acre for the initial planting for large applications.

According to a SUNY ESF study (<http://www.esf.edu/willow/projects.htm>), the average yields for Ecowillow in Veteran will be in the 50,000-80,000 dry tons/ year range. In Map 21 you will see that central and western New York have a higher density of Willow Biomass crops.

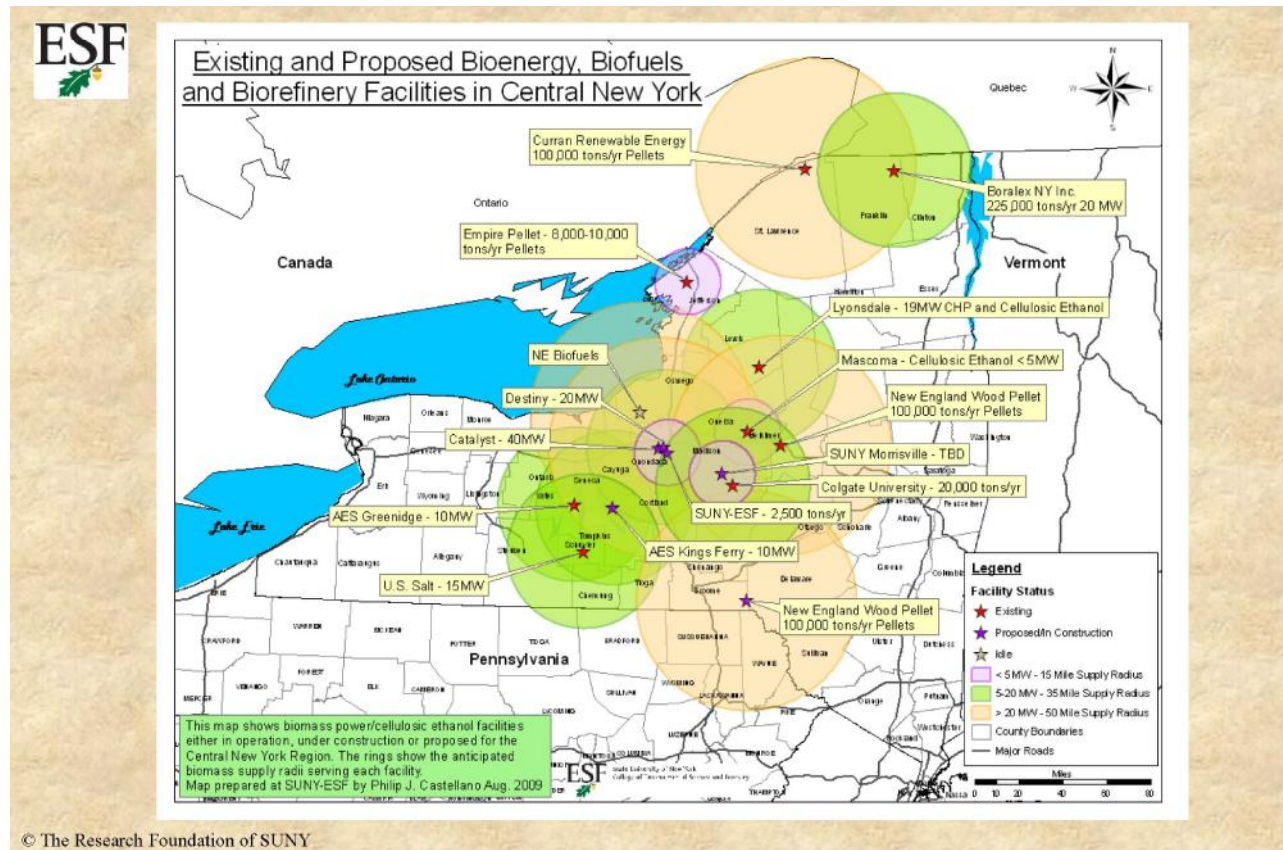
***POLICY: Encourage the adoption and plantation of biomass crops to use as an energy source.***

**RECOMMENDATION:**

- 5c. Support the planting of biomass resources including Ecowillow in abandoned and underutilized agricultural fields.**
- 5d. Provide the residents of Veteran with a carbon neutral source for heating and a cash crop to supplement their incomes.**
- 5e. Work with the Chemung County Cornell Cooperative Extension to explore the opportunities for local farmers to grow these resources. Set up public information sessions to better inform local land owners.**
- 5f. Consider the use of zoning districts to protect agricultural resources.**



## Map 22: Bioenergy, Biofuels and Biorefinery Facilities (Existing and Proposed)



Map 22 shows Chemung County and the Town of Veteran are located in an area in which they could begin using the supply of operating biomass facilities. Though Veteran does not have the most significant biomass resources available, they do contain sufficient amounts to utilize for residential purposes. The amount of biomass available is less than 50,000 tons per year.

It is important for the Town of Veteran to understand that these biomass resources, especially the timber resources present, should only be used in a sustainable manner. Practicing sustainable forestry and use will help to prevent erosion, continue to protect the air quality of the area, and keep the contiguity of the landscape intact. If the extraction of timber for biomass is to be undertaken, the town should make sure that provisions are set in place to set quotas, and attempt to prevent any unnecessary destruction of land or the roads.

**POLICY:** *Encourage residents to practice sustainable forestry methods when logging.*

### RECOMMENDATION:

- 5g. Ensure that logging for use as biomass is conducted in a sustainable manner.
- 5h. Work with the State DEC, the USDA, and the Chemung County Cornell Cooperative Extension for information, permitting, and advice on how to manage the forests sustainably for use as a biomass resource.
- 5i. Adopt a Town Timber Law to ensure sustainable timber practices are being followed.

## **Solar**

Solar Energy is the most powerful resource present on the planet. It is estimated that the amount of solar radiation that strikes the earth in 40 minutes could supply the energy needs of the entire world for a year. This shows how powerful of a resource the sun is. Unfortunately we are not able to fully capture this resource.

Most solar applications are Solar Photovoltaic (PV) which takes the solar energy and turns it into electricity. Solar water heating (solar thermal) can also be employed from solar panels, and active solar for residential and greenhouse uses are all viable options for Veteran.

The average solar radiation striking Veteran and much of New York State averages around 4-4.5 kwh/ m<sup>2</sup>/ day. Although this doesn't have the greatest incidence it can still be used effectively. The Healing Spirits farm in Avoca, NY uses 4 large solar panels that provide about 70 percent of the farms electricity needs including powering the irrigation system and charging electric batteries. This shows that since Avoca has the same average solar resources as Veteran, solar PV is viable for residential and agricultural use in the Town of Veteran.

There are many state and federal incentives including production tax credits that are available for homeowners looking to install their own panels. The NY-Sun Initiative aims to double the amount of residential solar systems in NY, and thus have many funds available for the next 4 years. Net metering, a system where surplus electricity produced can be sold back to the grid provides Veteran residents the ability to produce their own renewable energy and also the ability to sell back to the grid and make money.

***POLICY: Encourage the deployment of solar energy for use in residential, commercial, and agricultural operations in the Town.***

### **RECOMMENDATION:**

- 5j. Inform residents and businesses on the effects that solar energy, specifically solar PV, can have on their operations and finances.**
- 5k. Make information on tax credits and grants available to lower the capital cost of installing their own panels to Town residents.**
- 5l. Contact NYSERDA and local installers to hold a public information session on what opportunities are available and specific cost figures for the Town residents.**