TOWN OF MONKTON

ENHANCED ENERGY PLAN

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PLANNING COMMISSION HEARING: 6/18/2024
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SECTION I. INTRODUCTION

Importance of Enhanced Energy Planning

Energy is a major household and business cost to Monkton residents. It is relied on for heating, cooking, water pumping, sewage management, appliances and transportation. Reducing its cost and improving its efficient use is in everyone's best interest. However, our current energy sources of heating oil, propane, gasoline and diesel oil are not unlimited as well as being a major source of pollution and greenhouse gas emissions, which is now taking its toll on our climate conditions.

The State of Vermont has therefore addressed these issues with its "2016 Comprehensive Energy Plan" (CEP) and encourages each town to participate in the goals and objectives of the plan by supporting it through their own Regional and Town Plan. A major thrust of the CEP is to gradually wean us off fossil and non-renewable energy sources and move to renewable sources. The Vermont State goal is to have 90% of all energy used in Vermont to be sourced by renewable energy by 2050. The Town showed their support for the CEP by passing Article 9 at the 2018 Town Meeting. Also, Article 8 at the 2019 Town Meeting recommending the Select Board consider the viability of setting up a Town Energy Fund that will be used to support the CEP objectives. This of course brings its own set of challenges to which this plan lays out pathways towards achieving.

Through the work of the Monkton Energy Committee, various town surveys and the Energy Open House, Monkton residents have shown significant support towards moving towards renewable energy sources, which is borne out by the steady growth in the installation of residential solar, heat pumps, pellet stoves and electric and hybrid vehicles. Surveys of Monkton residents have also shown that they value the rural nature, natural beauty and history of the town. We therefore realize the importance of protecting our environment and to cherish and protect these resources for the future as we move towards renewable energy sources.

Monkton is and will continue to be very pro-active in the process of the State energy goals, as outlined in the 2016 Comprehensive Energy Plan, by continuing to enhance opportunities to create renewable energy sites, construction which encourages green development, promote transportation opportunities for carpooling and innovative vehicles, and availability to educate our residents in energy conservation. Though Vermont's energy transformation may take years to implement, it will enhance the vitality of the state and local economy by reducing money spent on fuels pumped, mined or generated elsewhere, improve our health through reduced emissions, alternative transportation and improve the quality of our local and global environment through reduced greenhouse gas emissions. This robust energy plan is used as a tool to advance the economic and environmental well-being of Monkton, thereby improving the quality of life for its residents. Furthermore, these energy goals will reduce Monkton's vulnerability to energy-related economic pressures and, in the long-term, climate change-related natural disasters, and promote long-term community resiliency in a variety of contexts.

The estimated energy cost in Monkton including residential and municipal (for heating, and transportation) is estimated to be in excess of $4.5 million per year and for electricity in excess of $1.3 million per year (see Energy Costs & Expenditures section below for a break-down of this figure). Because a large majority of this energy is imported from outside the town and Addison region, most of the money spent on energy does not directly benefit the local economy. Efforts to reduce the use of energy sources from outside the Town as well as shift reliance to locally produced energy can improve household financial security and strengthen the local economy.

From an environmental perspective, petroleum and other hydrocarbon-dependent energy is a significant cause of localized environmental damage where those fuels are produced and refined, and the emissions from their

use is responsible for human-induced climate change, related climate-change disasters, and ecological degradation. Any efforts to reduce the use of non-renewable energy and shift to more environmentally-sound energy sources will benefit the town's environment. The recommendations in this plan become increasingly important in light of the 2018 report by the *Intergovernmental Panel on Climate Change* (IPCC). This report, based on established scientific facts, spells out the dire consequences of global warming and highlights the importance of locally adopted solutions for limiting fossil fuel use and its infrastructure expansion.

While Monkton can do little to shift the broader state or federal policies, we can influence energy use and production on a local level. In this energy plan, we hope to address Monkton local actions for increasing our energy efficiency and promoting renewable energy generation, and overall pathways to become more resilient. A plan which meets the State's requirements (Act 174) has more standing in the new energy generation development permitting process which includes the siting of these developments.

This Enhanced Energy Plan combines energy and land use planning while looking to meet the State goal of 90% renewable energy by 2050.
Key sections of the plans are:

- Analysis on current energy use and projections and targets of future use
- Identifying pathways and policies to achieve the goals
- Supporting maps which analyze renewable resource availability

Local Consideration – MONKTON ENERGY FUND
To reach state and local renewable energy goals, the Monkton Energy Committee suggests creating a TOWN ENERGY FUND. This fund could provide funding to residents to incentivize energy conservation, efficiency and/or renewable energy efforts for municipal, residential, and local business properties.

MEETING VERMONT STATE ENERGY GOALS

This Enhanced Energy Plan includes the required analysis, target data, goals, policies, implementation actions, and associated mapping required to meet the municipal determination standards for enhanced energy planning enabled in 24 V.S.A. 4352. The purpose of enhanced energy planning is to further regional and state energy goals, including the goal of having 90 percent of the energy used in Vermont obtained through renewable sources by 2050 "90 x 50" and the following:

A. *Vermont's greenhouse gas reduction goals under 10 V.S.A. § 578(a);*
B. *Vermont's 25 by 25 goal for renewable energy under 10 V.S.A. § 580;*
C. *Vermont's building efficiency goals under 10 V.S.A. § 581;*
D. *State energy policy under 30 V.S.A. § 202a* and the recommendations for regional and municipal energy 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. §§ 202 and 202b (State energy plans); and
E. 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.

A positive determination of compliance with the requirements of enhanced energy planning, as provided by the Regional Planning Commission, will enable Monkton to achieve "substantial deference"[1] instead of "due consideration" in Section 248 applications for energy generation facilities (i.e. wind facilities, solar facilities, hydro facilities, etc.) under Criterion (b)(1)-Orderly Development.

To receive a positive determination of energy compliance, an enhanced energy plan must be duly adopted, regionally approved, and contain the following information:

A. An analysis of current energy resources, needs, scarcities, costs, and problems.
B. Targets for future energy use and generation.
C. "Pathways," or implementation actions, to help the municipality achieve the established targets.
D. Mapping to help guide the conversation about the siting of renewables.

ENERGY PLAN ASSUMPTIONS

- Energy may not be abundant or cheap in the future;
- The full social, environmental, and economic costs of energy are not reflected in present market prices;
- The public interest is served by conserving energy, reducing consumption of nonrenewable energy and shifting reliance to renewable energy; and,
- Each town must play a role in shaping and implementing policies and actions that promote wise energy use.

TOPICS COVERED

The following topics are covered in this energy plan:

- SECTION II: THERMAL USE
- SECTION III: TRANSPORTATION USE
- SECTION IV: ELECTRICAL USE
- SECTION V: LAND USE, GENERATION AND TRANSMISSION
- SECTION VI: COMMUNITY STANDARDS FOR SITING and DECOMMISSIONING

<u>Section II through V have the following three sub-sections</u>:

1. **USE ANALYSIS:** The first sub-section, entitled, "Use Analysis" will analyze current usage data in Monkton for each of the four energy sectors. It includes charts of usage and a discussion concerning the usage data.

2. **FUTURE TARGETS**: In 2016, Addison County Regional Planning Commission worked with the Vermont Energy Investment Corporation (VEIC) and the Vermont Department of Public Service ("PSD") to develop

[1] According to the Public Utility Commission, substantial deference means *to give significant and meaningful weight* to the land conservation measures in the plans of the affected municipalities and the recommendations of the municipal legislative bodies and the municipal and regional planning commissions regarding the municipal and regional plans, respectively.

regional targets for future energy use and generation. The intent of these targets is to meet the State of Vermont's 90 x 50 goal. The targets represent one scenario of what meeting this goal may look like. However, there are numerous different ways for Vermont to achieve the 90 x 50 goal.

The Target Scenarios represent approaches that appear reasonable given current technology and probable technological advance from present to mid-century. For more information about the regional targets, please see the Addison County Regional Energy Plan (www.acrpc.com).

3. **PATHWAYS TO IMPLEMENTATION**: The third sub-section, entitled "Pathways to Implementation" provides goals, policies and recommended actions to implement the plan.

Section VI, Community Standards for Siting and Decommissioning:
This section provides specifics on Monkton's energy generation siting, decommissioning and site restoration standards. It also provides project size definitions for residential and commercial energy generation developments. In association with the set of maps within this energy plan, 'preferred', 'poor', 'good' and 'prohibited' sites for energy generation are identified within this section.

Local Considerations
Throughout the plan there are tables and discussions labeled 'Local Considerations'. These provide additional data, analysis, information or discussion that are not necessarily highlighted or clarified within state and regional level analysis.

SECTION II. THERMAL USE

THERMAL USE ANALYSIS

Home heating makes up a significant amount of Monkton's residential energy demand due to Vermont's cold climate. An estimate of current residential thermal energy demand in Monkton, based on data from the American Community Survey (2011-2015), is shown in Table 1. The data shows that the majority of residences in Monkton heat their homes with oil, and to a lesser degree with wood and propane. Other renewable sources for heating homes, but for which data is currently unavailable, include wood pellets, wood chips and efficient heat pumps. Residents with heat pumps have some advantage as they can be reversed in their operation to provide cooling air conditioning.

Energy Unit Conversion		
FUEL	**BTU**	**Measure**
Propane	91600	1 gallon
Electricity	3,413	1 KWh
Fuel Oil	140,000	1 gallon
Wood	24,000,000	1 Cord

Estimates for commercial and industrial thermal energy use are more difficult to calculate. An estimate of total commercial energy use (thermal and electricity) is provided in Table 2. and based on data from the Vermont Department of Labor (VT DOL) and the Vermont Department of Public Service (VT DPS).

Table 1. Municipal Current Residential Thermal Energy Use

Fuel Source	Monkton Hseholds (ACS 2011-2015)	Monkton % of Hseholds	Municipal Sq. Ft Heated	Monkton BTU (in Billions)	Number of Gallons	Number of Cords	Cost $
Natural Gas	0	0.0%	0	0	0	-	-
Propane	196	24.8%	380,710	23	251,000		$891,000 [a]
Electricity	3	0.4%	6,432	0			
Fuel Oil	382	48.4%	774,340	46	329,000		$920,000 [b]
Coal	0	0.0%	0	0			
Wood	195	24.7%	406,054	24	0	1000	$277,000 [c]
***Solar**	3	0.4%	6,432	0			
Other	10	1.3%	21,440	1			
No Fuel	0	0.0%	0	0			
Total	789	100.0%	1,595,408	96			$2,038,000

a. Propane@ $3.55/gal average. Source US Energy Information & Vermont DPS.
b. Fuel oil @ $2.80/gal average. Source US Energy Information & Vermont DPS.
c. Wood @ $227/cord average.

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* Table 1 shows a low number of homes heating completely with solar electrical generation. This does not represent homes that include solar as an element of their heating system. The latter is listed below in Table 1a.

Table 1a. Local Considerations – RESIDENTIAL SOLAR ELECTRICAL GENERATION			
Residential Solar	**Sites**	**% of households**	**Total Generation (MWh/year)**
Ground-mounted PV	33	3.7%	655.3 MWh
Ground-mounted PV Trackers	13	1.6%	167.3 MWh
Roof-mounted PV	63	6.7%	408.3 MWh
Hot water solar heater	14	1.9%	109.6 MWh
TOTALS	**123**	**14% approx.**	**TOTAL: 1,340.3 MWh/year**

Table 2. Current Municipal Commercial Energy Demand (Billion BTUs)			
	Commercial Establishments in Municipality (VT DOL)	Estimated Thermal Energy BTUs per Commercial Establishment (in Billions) (VT Dept. of Public Service)	Estimated Thermal Energy BTUs by Commercial Establishments in Municipality (in Billions)
Municipal Commercial Energy Use	13	0.725	9.43

COST OF HEATING

RESIDENTIAL

Cost of heating homes is expensive in Vermont and is incentive enough to look for alternative, more affordable methods. Though heating with oil is still dominant, there is some trend toward wood heating. Propane has held steady for numerous years at approximately 25 percent usage. The 2015 Monkton Energy survey showed a move toward the use of wood pellets, especially as a replacement system for old oil systems. According to *Efficiency Vermont*, five percent of Monkton households now use heat pumps for heating and cooling. Overall, the town and state home heating usage are very different from the national picture where natural gas (48 percent) and electric (37 percent) dominate.

MUNICIPAL

In 2015, the Monkton Energy Committee created the following energy use data table (Table 3.) for municipal buildings. This gives a good base point in which to measure future success of energy use and efficiency for municipal buildings.

TABLE 3. Monkton Municipal Building Energy Use								
Monkton Municipal Energy Usage	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Building								
Monkton Town Hall (1859)								
Electric Cost	$1300	$1401	$1587	$1550	$1366	$1409	$1270	$1354
Total kWh	6882	7131					5668	
Heat Cost (Propane and Oil)	$2600	$2704	$3639	$4151	$2452	$1736	$2182	$3452
Town Garage (1987)								
Electric Cost	$1586	$1514	$1575	$1621	$1595	$1581	$1643	$1816
Total kWh	9690	8851					9184	
Heat Cost	$8050	$4961	$4863	$5648	$2990		$2988	$4091
Monkton Fire Station (1974 + addition)								
Electric Cost	$2661	$2812	$2901	$2758	$2786	$2610	$2913	$2567
Total kWh	17428	15722						
Heat Cost	$5236	$4121	$4232	$5109	$6073	$4180	$5962	$1519
Russell Memorial Library (1971)								
Electric Cost	$1091	$1069	$1188	$1335	$1220	$1086	$1089	$1249
Total kWh	5896	5727					5705	
Rec Field Open Pavilion (1986)								
Electric Cost	$1300	$234	$260	$273	$230	$241	$541	$462
Total kWh	77	58					81	
Town Electric Total:	$7,938	$7,029	$7,509	$7,535	$7,194	$6921	$7462	$7448
Town kWh Total:	39,973	37,489						
Town Heat Total:	$15,886	$11,788	$12,733	$14,906	$11,513	$8296	$10,706	$9062
Town Total:	**$23,824**	**$18,818**	**$20,243**	**$22,441**	**$18,708**	**$15217**	**$18,168**	**$16,510**
Monkton Central School								
Electric Cost	$26490	$26,265	$25,719	$25,633	$21,778	$21,567	$22,641	$23,000
Total kWh	186,880	182,160						
Heat Cost (Propane & Oil)	$26,305	$32,996	$32,095	$39,356	$26,180	$36,651	$15,576	$25,200
School Total:	**$52,795**	**$59,261**	**$57,814**	**$64,989**	**$47,958**	**$58,218**	**$38,217**	**$48,200**
Electric Totals	**$34,428**	**$33,294**	**$33,228**	**$33,168**	**$28,972**	**$28488**	**$30,103**	**$30,448**
Total kWh	**226,853**	**219,649**						
Heat Totals	**$42,191**	**$44,784**	**$44,828**	**$54,262**	**$37,693**	**$44,947**	**$26,282**	**$34,262**
All Totals:	**$76,619**	**$78,079**	**$78,057**	**$87,430**	**$66,666**	**$73435**	**$56,385**	**$64,710**
Total Annual Change		1.91%	-0.03%	12.01%	-23.75%	+10.15%	-23.22	+14,76

NATURAL GAS

Vermont Gas Systems (VGS) installed a major natural gas transmission pipeline through Monkton as a feeder to towns south of Monkton. A Memorandum of Understanding signed by the town and VGS has the option to install a limited gas distribution network that would service the Village District, making gas available to approximately 10 percent of Monkton households should they choose. Currently there is no date as to when or if this distribution system will be installed. However, if it is installed, a specific plan to phase out the use of natural gas from fossil fuel sources and replace it with natural gas from renewable sources, should be negotiated in order to meet State energy goals by 2050.

The safety and risks of natural gas must be reviewed[2] and clearly explained to Monkton residents in order to decide if benefits out-weigh risks. Monkton must also consider how using natural gas fits into our state and local goals of switching to renewable energy sources.

THERMAL TARGETS

Monkton understands the need for greater energy efficiency in residential, commercial and municipal buildings. In the past several years Monkton has begun to monitor and analyze municipal energy usage, participate in state energy efficiency programs such as Button-Up Day, education events for residential renewable energy development, and conducted a town-wide energy survey. The Monkton Energy Committee has spearheaded these efforts with the support of the Select Board and Town staff. Moving forward, the Town of Monkton will support efforts to improve energy efficiency and the integration of renewable energy sources among residents, businesses, and municipal buildings. Thermal targets for Monkton include increasing weatherization of homes, new, efficient wood heat systems, and switching to efficient heat pump systems. See tables below for ideal target numbers to meet the 90 X 50 State goal.

Table 4. Thermal Efficiency Targets	Implementation Year		
	2025	**2035**	**2045**
Residential Thermal Efficiency Targets			
***Residential - Increased Efficiency and Conservation (% of municipal households to be weatherized)**	2%**	9%	47%
Commercial Thermal Efficiency Targets			
Commercial - Increased Efficiency and Conservation (% of commercial establishments to be weatherized)	17%	18%	51%
Thermal Fuel Switching Targets (Residential and Commercial) - Wood Systems			
New Efficient Wood Heat Systems (in units)	1**	2**	27**
Thermal Fuel Switching Targets (Residential and Commercial) - Heat Pumps			
New Heat Pumps (in units)	82	196	388

[2] The construction safety standards that were agreed to in the Certificate of Public Good (CPG) for the Addison Natural Gas Project is being investigated before the PUC to determine if stated standards were met.

Local Considerations – Thermal Targets
** The thermal fuel switching targets provided by state and regional data show very low targets of new efficient wood heat systems for Monkton. The numbers are also very low for overall efficiency and conservation, at 2 percent increase by 2025 of weatherized homes. The 2018 Monkton Energy Committee believes these are areas where Monkton could reach well beyond this given number in 2025, 2035 and by 2050.

THERMAL PATHWAYS TO IMPLEMENTATION

GOALS

1. Reduce reliance on nonrenewable energy sources such as oil and gas, and shift reliance to renewable energy sources such as solar, heat pumps and/or wood pellets or cord wood.
2. Reduce emissions of greenhouse gases and substances that cause acid rain.
3. Reduce annual fuel needs and fuel costs for heating structures,
4. Foster the transition from non-renewable fuel sources to renewable fuel sources
5. Maximize the weatherization of residential households and commercial establishments.
6. Encourage new building structures to maximize passive solar potential.

POLICIES

1. Promote building practices that use energy efficient materials and heating systems, solar orientation, and encourage net zero energy buildings.
2. Encourage energy usage analysis in all residential, commercial, and municipal buildings through partnerships with local contractors and Efficiency Vermont.
3. Support the conversion of oil and propane heating to efficient wood heating or electric heat pump systems and other technologies.
4. Lead by example. Encourage efficiency and the use of alternative means for energy production such as geothermal and solar in town buildings, the school and residences.
5. Conserve forest land as a renewable energy resource, tempered by the responsible use of wood for biomass energy production.

RECOMMENDED ACTIONS

1. Review updates to efficiency and energy usage at Monkton Central School and work with Monkton Central School to provide energy conservation and efficiency education for students
2. Create incentives that promote energy efficiency in new and existing buildings

and track energy usage in municipal buildings using the EPA portfolio manager.

3. The Monkton Energy Committee (MEC) will coordinate with ACRPC and *Efficiency Vermont* and any other state and low-income weatherization programs to encourage Monkton residents to participate in weatherization programs.
4. The Zoning Administrator will promote the use of the residential and commercial building energy standards by distributing code information to permit applicants and by acting as a clearinghouse for new information as it comes along.
5. The Selectboard and MEC, to the extent necessary, will conduct an energy audit of municipal buildings to identify weatherization retrofits and incorporate the recommendations into the municipal capital budget.
6. The Selectboard and MEC will promote and provide information about the *GoVermont* website which provides information to citizens regarding ride share, vanpool, and park-and-ride options.
7. The MEC and Selectboard will explore the funding opportunities and implementation possibilities to upgrade the efficiencies in (1) all town buildings including the school, town hall, library, town garage, fire station, and town offices, and (2) private residences and farms.
8. The Planning Commission will look for other ways to encourage the use of renewable energy sources for heating, hot water, and other electrical demands.
9. The Selectboard will exert leadership on municipal, commercial and residential energy efficiency and use of renewable energy sources
10. As of the writing of this energy plan, Monkton has no natural gas service to any part of town. MEC would like to encourage renewable energy systems rather than incorporating natural gas, a system reliant on fossil gas.
11. Seek funding for energy audits and other energy analysis and testing of residential, commercial and municipal buildings.

SECTION III. TRANSPORTATION USE

TRANSPORTATION USE ANALYSIS

See the Transportation and Land Use Chapters of this plan for associated discussion.

Table 5. Current Municipal Transportation Energy Use	
Transportation Data	**Municipal Data**
Total # of Vehicles (ACS 2011-2015)	1,795
Average Miles per Vehicle (VTrans)	11,356
Total Miles Traveled	20,384,020
Realized MPG (2013 - VTrans 2015 Energy Profile)	18.6
Total Gallons Use per Year	1,095,915
Transportation BTUs (Billion)	132
Average Cost per Gallon of Gasoline (RPC)	2.50
Gasoline Cost per Year	$2,531,564

Local Considerations – Municipal Fuel Use
In 2017, Monkton's Highway Department used 419 gallons of non-diesel fuel for a total of $1,472. 16,875 gallons of diesel fuel was used, for a total of $63,640.

The Vermont Comprehensive Energy Plan aims to reduce single-occupancy vehicle commutes by 20 percent in 20 years. At this time, Monkton residents rely primarily on single occupancy vehicles for transportation and there are limited alternatives to this transportation model in Monkton.

TRANSPORTATION TARGETS

The targets below are state and regionally generated data and suggest there should be at least 158 electrical vehicles in Monkton by 2025, 1037 by 2035 and 2092 by 2050. Monkton recognizes that the Town currently has little ability to switch private use of gas cars to electric cars. This change will depend on market demand, availability and affordability of electric vehicles in the future. In the short-term, transportation goals, policies and actions will focus on increasing access to alternative mobility such as public transportation, car-pooling, safe cycling and walking, and stressing the need for new growth to occur closest to existing services and amenities.

Table5b. Fuel Switching Targets by Year			
Target	**2025**	**2035**	**2050**
Transportation Fuel Switching Target - Electric Vehicles			
Electric Vehicles	158	1073	2092
Transportation Fuel Switching Target - Biodiesel Vehicles			
Biodiesel Vehicles	34	59	84
NOTE: While not noted on the data in Table 5b., hybrid vehicles are a stepping stone toward a renewable energy transportation system. Hybrid vehicles are used throughout Vermont and more EV charging stations are being incorporated into the State's transportation network.			

TRANSPORTATION PATHWAYS TO IMPLEMENTATION

GOALS

1. Reduce emissions of greenhouse gases and substances that cause pollution by reducing single occupancy car trips.
2. Increase access to fuel efficient and carbon neutral multi modal transportation options.
3. Increase ridesharing.
4. Adoption of a higher MPG and or electric municipal vehicle fleet
5. Increase walkability and bike-ability (and acceptance of) within Monkton village regions

POLICIES

1. Support the expansion of public transportation and make it a priority to establish a bus route with a stop in Monkton.
2. Encourage walking and cycling within town with appropriate sidewalk and paths linking amenities and services.
3. Support regional efforts to increase access to safe every day walking and cycling within and across municipal borders.
4. Support state and regional public transportation programs serving Monkton.
5. Prioritize development proposals with driveway siting and design scenarios which support energy efficiency and access to public transit, park and ride, and safe walking and cycling opportunities.

RECOMMENDED ACTIONS

1. Advertise the Monkton *Park and Ride*.
2. MEC and Selectboard will work with ACTR and other service providers to understand ways in which service to Monkton could be improved.
3. Selectboard and Monkton Energy Committee plan for and install electric vehicle charging infrastructure on municipal property, or in other appropriate locations, to the extent funding is available.
4. Prioritize fuel-switching for municipal equipment and support alternative fuels for farm equipment and schools.
5. Road Commissioner will review municipal road standards and/or work with the *Regional Walk-Bike* to ensure that they reflect all "complete streets" principles applicable to our rural roads, including adding 'Shared Road' signs to roads frequented by those walking, cycling, running and/or horse riding.
6. Selectboard will nominate a Monkton representative to sit on the *Walk-Bike Council of Addison County* to foster safe and accessible opportunities for walking and cycling as an alternative to SOV.
7. Review subdivision street and driveway design standards to insure they are energy efficient and incorporate multimodal amenities.
8. Encourage conversations between the Planning Commission, Selectboard, and Road Commissioner to ensure mutual understanding of energy goals as they relate to road and street maintenance.

SECTION IV. ELECTRICAL USE

ELECTRICAL USE ANALYSIS

Green Mountain Power Corporation (GMP) currently provides the distribution of electric power in Monkton. According to the GMP website, "We make a serious effort to maintain the cleanest fuel mix possible, and are focused on low cost, low carbon, and reliability." The distribution of three phase and single phase power lines together with their circuit ratings is shown in in the map section.

In addition to local distribution lines, a high voltage transmission line, owned and maintained by Vermont Electric Company (VELCO), currently runs north to south through the town: there is no distribution from this line to the town.

An estimate of current electricity use in Monkton is shown in Table 6. This data was made available from *Efficiency Vermont*. These numbers represent everyday electrical use by Monkton residents. Agricultural businesses account for most of the Commercial and Industrial category in the table below.

Table 6. Monkton Electric Utility Data
Usage by Year and Cost

Sector	**KWH 2015**	**KWH 2016**	**KWH 2017**	**Cost $ 2017**
Commercial & Industrial	641,958	624,932	579,643	$93,902
Residential	7,149,515	7,015,769	6,844,283	$1,225,127
Total	**7,791,473**	**7,640,700**	**7,423,926**	**$1,319,029**
Count of Residential Premises	869	881	893	
Average Residential Usage	8,227	7,963	7,664	$1,372

Data Source: Efficiency Vermont

ELECTRICAL POWER TRANSMISSION AND DISTRIBUTION

Electricity is difficult to store without specialized systems and is transmitted across long distances via high-voltage lines. These are vulnerable to system failures and localized outages, especially during winter storms. The distribution of three phase and single phase power lines is shown in the map section of this energy plan together with the circuit ratings.

ELECTRICAL TARGETS

The Town of Monkton believes that the existing distribution and transmission facilities serving Monkton are adequate to meet the current utility requirements. Over time, single phase lines may need to be upgraded.

Conservation and efficiency are important strategies in decreasing demand for electrical energy. The Monkton Energy Committee understands this work is done household by household, through weatherization programs, energy auditing, construction standards, education and outreach, and incentives. The long-term goal is to substitute electrical energy derived from renewable energy sources for up to 90 percent of the town's energy requirements in 2050.

As the region's electrical needs grow, Monkton prefers using small, localized power sources that encourage alternative fuel sources located to meet the need instead of wide scale transmission and distribution projects. Local, renewable energy generation combined with established and emerging battery storage technology can provide a clean, stable and resilient electricity supply for the Town of Monkton, even during times of localized or regional power grid failures.

Promising new battery technology offers individuals with both traditional electric grid access and domestic solar panels to store backup power on site. GMP is currently one the first utilities in the country to offer Tesla's 7 and 10kW domestic Powerwall batteries. A home battery such as the Powerwall can be paired with domestic solar panels to store energy, or it can be used without solar as a battery to store power from the grid. In the event of a grid outage, the battery can power essential parts of the home like lights, a refrigerator, and furnace. GMP grid customers can charge the batteries at inexpensive low- demand times and then use the stored battery power during peak energy times to reduce demand on the grid, lower household bills as well as transmission and capacity costs. Solar inverters are also available with an auxiliary 115 AC power outlet that can provide limited power during power outages.

Table 7. Electrical Targets Per Year

Electricity Efficiency Targets	**2025**	**2035**	**2050**
Increase Efficiency and Conservation	10.8%	37.2%	59.2%
Use of Renewables - Transportation			
Renewable Energy Use - Transportation	2.7%	18.2%	83.5%
Use of Renewables - Heating			
Renewable Energy Use - Heating	46.8%	60.3%	88.9%
Use of Renewables - Electricity			
Renewable Energy Use - Electricity (MWh)	10958.50	21917.00	33207.50

Local Considerations – Electrical Solar Generation
In 2017, Monkton generated 1,340.333 MWh of electrical power from solar generation. This is 17% of the electrical power consumed by the Town.

ELECTRICAL PATHWAYS TO IMPLEMENTATION

GOALS

1. Conserve renewable and nonrenewable energy resources.
2. Reduce reliance on nonrenewable energy sources such as oil and gas.
3. Reduce emissions of greenhouse gases and substances that cause acid rain.

POLICIES

1. Support energy conservation efforts and the efficient use of energy across all sectors.
2. Promote energy efficiency and increased use of renewable fuels in all buildings, especially new ones.
3. Plan for increased electric demand with the support of Green Mountain Power.
4. Encourage the shift from nonrenewable energy reliance to renewable energy sources, such as solar and residential wind, by encouraging conversion to electric heat pumps and electric cars.
5. Promote the use of the residential and commercial building energy standards by distributing code information to permit applicants and working closely with the Zoning Administrator.

RECOMMENDED ACTIONS

1. Clarify and Codify Tax Policy: Codify a town policy that eliminates tax assessments on the value of residential renewable energy installations when determining property taxes. Advertise this policy so it is a clear incentive for all Monkton residents.
2. The Energy Committee is exploring ways to participate in a group net metering arrangement in order to meet municipal energy needs through renewable sources. The Energy Committee will also explore energy procurement from other resources, including biomass and methane from biodigesters.
3. Community Solar Procurement. The Town, led by the energy committee, should pursue opportunities to develop community-owned solar projects to power municipal buildings, including the elementary school and homes that may not be able to site solar on their property.
4. Selectboard and MEC will investigate the installation of a municipal solar and/or wind net-metering facilities to off-set municipal electric use.
5. Selectboard and MEC will investigate installation of a community-based renewable energy project.
6. Selectboard will consider funding for firefighters to receive training in fighting fires on structures which have roof-mounted solar installations.
7. MEC and Selectboard will explore the funding opportunities and implementation possibilities to upgrade the efficiencies in (1) all town buildings including the school, town hall, library, town garage, fire station, and town offices, and (2) private residences and farms.

SECTION V. LAND USE, GENERATION AND TRANSMISSION

LAND USE

Please refer to the Land Use Chapter of the Monkton Town Plan for a full description of landscape characteristics, land use types, and land use planning areas and polices. Please refer to our Transportation Chapter for details on transportation policy and our Natural Resources Chapter for detailed natural, scenic, recreational and agricultural policies.

Clustered Settlement Patterns and Growth

Land use and energy are closely related. Land use patterns exert a strong influence on major end uses of energy, including transportation, heating and cooling of buildings, and the energy used in developing infrastructure. Development that is clustered provides for greater energy efficiency. Clustering means fewer miles of road are needed to connect the homes or commercial buildings, school buses and snow plows travel shorter distances, and utilities do not need to be extended. Carefully considered placement of a building on a lot adds to the efficiency of any new structure by increasing passive solar gain and decreasing wind pressures.

Concentrating development in the village district, encouraging job development in town, and supporting local businesses, including farms and our local food system, are some ways this plan supports reductions in energy use. Supporting alternatives to the car, such as partnering with ACTR to establish routes from and to Monkton, and providing walking and cycling provisions, are directly associated with decreasing energy consumption. This plan supports such efforts.

Building and Siting Practices

This plan encourages building practices that use energy efficient materials, heating systems, lighting and appliances. Where possible, buildings should be sited so as to take advantage of southeast, south, or southwest orientations for passive solar gain. This plan also encourages the siting of newly constructed buildings in a way that does not impede solar energy collection by adjacent buildings, except where topographically unreasonable. This plan also encourages renewable energy projects for new construction and retrofitting existing buildings.

Aesthetic and Scenic Considerations

Our land use plan goals and policies reflect our value of our bucolic rural landscape and viewsheds. Thoughtful siting of residential and commercial uses, services, utilities and facilities plays an important role in preserving unique landscape character, such as long reaching views, and minimizing negative impacts to property values. ***Please refer to the Section VI. Community Siting and Decommissioning Standards for policies associated with scenic impacts.***

EXISTING GENERATION

Although Monkton's energy supply is largely consistent with statewide patterns, Monkton does have a number of alternative energy installations that tap local energy resources. A growing number of homes have photovoltaic systems that supply at least a portion of their electrical energy. Thanks to Vermont's net-metering law, owners of these systems can sell excess power back to the grid during periods of high solar

production, and purchase grid power when needed. Thus, the grid serves as a kind of storage system for solar-produced electrical energy. Banking excess Kilowatt hours during solar generating periods and withdrawing it when needed when there is no solar generation periods (cloudy days and night time). A number of other homes have solar domestic hot water systems. No homeowners currently use wind energy to generate electricity. Table 8 depicts Monkton's existing generation resources as of May 29, 2018

Table 8. Existing Renewable Energy Generation Sites in Monkton

Source	**Sites 2015**	**Sites 2018**	**Generation (in MW) 2015**	**Generation (in MW) 2018**	**Generation (in MWh/year) 2015**	**Generation (in MWh/year) 2018**
Solar	45	123	0.621	1.156	761.6	1,340.333
Wind			0		0	
Hydro	0		0		0	
Biomass	0*		0		0	
Other	0		0			
Total	45	123	0.621	1.156	761.6	1,340.333

Source: Vermont Energy Dashboard https://www.vtenergydashboard.org/my-community/monkton/statistics

Local Considerations – BIOMASS

*****Table 1 indicates, in 2015, 25% of homes used wood as a primary source of heating. In 2018 it was estimated this number was closer to 30% when wood pellet use was also considered. Results from the Monkton Energy survey shows a number of households use these sources as a secondary or backup heat source. This would push the 30% number even higher.

FUTURE GENERATION

Hydropower
While regional hydropower is a significant source of Vermont's renewable electricity supply, very little potential for development exists in Monkton. While large-scale hydropower is not viable, "micro-hydro" for personal households or landowners may be a viable option to generate small-scale electricity.

Biomass
As mentioned above, wood or wood pellets are used by Monkton households as either a primary or backup heat source. Both wood and wood pellets offer a local, renewable heat source from potentially very local sources, increasing efficiencies while building our local forest industries. Local forests are being harvested to provide wood chips to heat Mt. Abraham High School and other buildings.

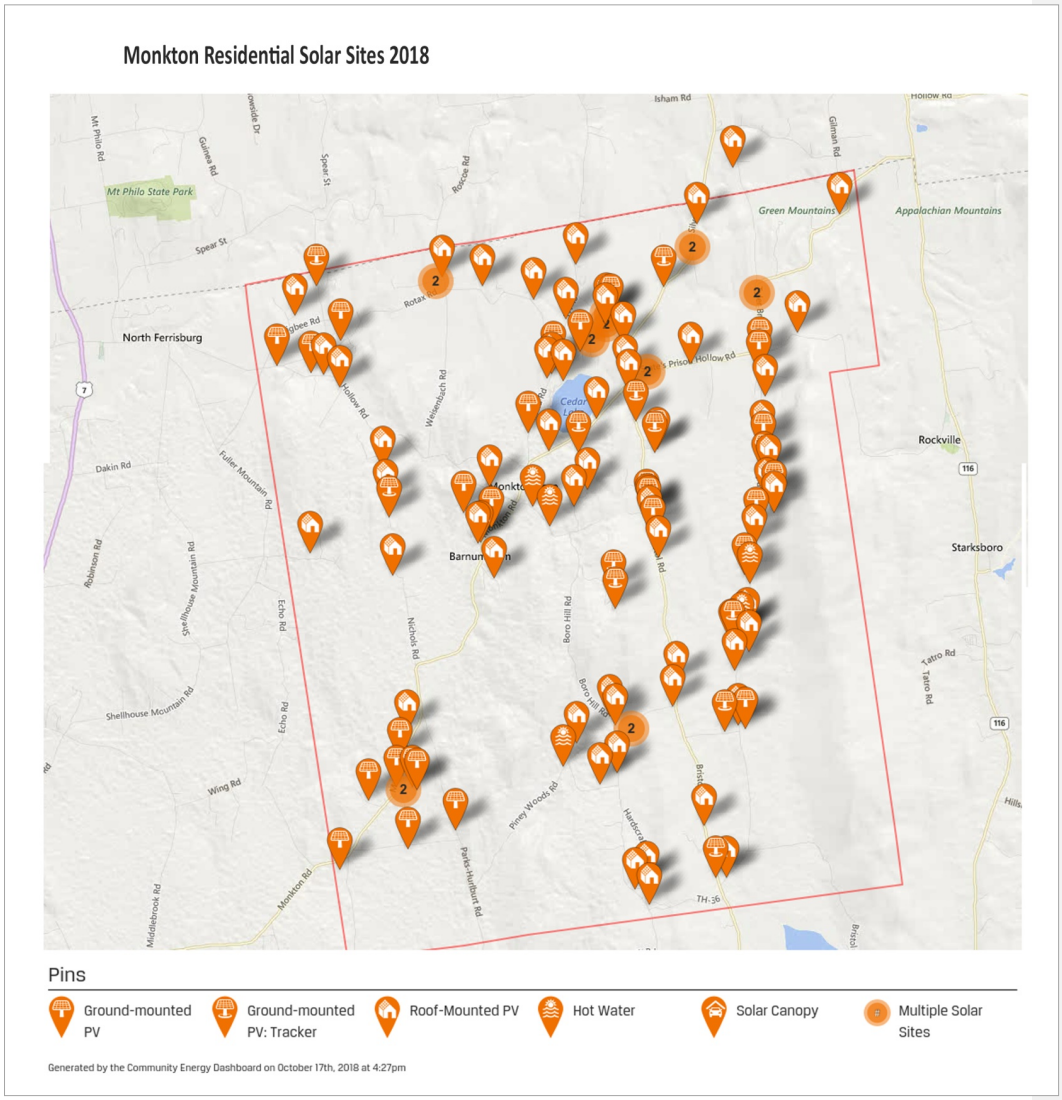
Some farms in Vermont are producing biomass crops, such as corn for corn pellet stoves, and seed-oil crops for the production of bio-diesel for both on-site production operations and off-site sales.

Methane Digester

Methane digesters could be located as part of Monkton farming operations with the first emphasis to supplement the farm's own energy needs, as demonstrated on other Addison County farms. Excess energy could be diverted to generating electricity distributed easily through the existing power grid. As technology evolves, there is the possibility to create a "filling station" for town vehicles which could be converted to burn methane. The emergence of farm-based methane and subsequent production of energy from the same, should be locally sourced and distributed separately from non-renewable natural gas sources.

Residential Wood

Within Monkton and nearby communities, local forests are being harvested to provide cordwood for local residents. There is a wood bank to provide wood and other home heating supplies to local families in need via HOPE. Utilizing volunteer labor and donated timber, the wood bank provides winter home heating security to residents.



Source: Vermont Energy dashboard https://www.vtenergydashboard.org/

Residential Solar Generation

Residential solar electric generation is widely popular in Monkton. Ninety percent of 227 survey participates were in favor of single-family solar generation in Monkton. For commercial solar farms, 59 percent of participants supported allowing them in town (14 percent strong yes, 45 percent yes if the town approves the siting).

The majority of the solar electricity generation in the town of Monkton is a mix of "grid-tied" systems along with a small number of "off-grid" systems coupled with battery bank storage. Grid-tied systems typically use "net metering" to allow customers to generate electricity during solar availability to meet their domestic needs and feed excess power capacity back to GMP. Credits are then awarded which significantly reduce or eliminate monthly electricity costs. At night and during periods when the sun is not available, the system draws power from the main grid. Solar inverters are also available that can provide a separate 115V AC output during grid outages and during periods of sun. Off-grid systems store electricity from panels in domestic battery banks that provide power during times without sun access. Back-up generators powered by

	STRONGLY AGREE	AGREE	NEITHER AGREE OR DISAGREE	DISAGREE	STRONGLY DISAGREE	TOTAL
I would support commercial solar projects that are no greater than 150 kW (approximately 1.5 acres)	20.27% 15	43.24% 32	18.92% 14	6.76% 5	10.81% 8	74
I would support commercial solar projects greater than 150 kW, less than 500 kW (more than 1.5 acres, less than 4 acres)	10.81% 8	27.03% 20	18.92% 14	20.27% 15	22.97% 17	74
I would support commercial solar projects greater than 500 kW (exceeding 4 acres)	4.05% 3	10.81% 8	18.92% 14	28.38% 21	37.84% 28	74
How a solar project is sited within the surrounding landscape (screened by trees and/or topography, or proximity to abutting uses) impacts my support of the project.	39.47% 30	40.79% 31	7.89% 6	11.84% 9	0.00% 0	76
I would generally support commercial solar projects even if I can't see them.	24.00% 18	33.33% 25	22.67% 17	9.33% 7	10.67% 8	75
I do not support commercial solar projects even if I can't see them.	16.22% 12	6.76% 5	13.51% 10	28.38% 21	35.14% 26	74
Monkton should limit the number of solar array projects in town.	22.54% 16	30.99% 22	25.35% 18	14.08% 10	7.04% 5	71
It is important to identify places in Monkton where we do and do not want to see future energy generation projects.	40.00% 30	42.67% 32	8.00% 6	5.33% 4	4.00% 3	75
Monkton should directly benefit from commercial solar projects in town.	35.53% 27	38.16% 29	17.11% 13	5.26% 4	3.95% 3	76
I support commercial wind projects in town.	8.00% 6	21.33% 16	29.33% 22	12.00% 9	29.33% 22	75

gasoline or propane often supplement these systems.

Below are results from a solar siting and project-scale question at the 2018 Planning Open House of which there were just under 90 participants showing support for solar projects that are 1.5 acres and smaller.

Community and Commercial Solar Generation

Monkton has access to only one three-phase power line route that originates in Ferrisburgh and runs west to east through the northern section of town. This greatly limits commercial solar installation in our community. A high percentage of single-phase power lines are rated as 'poor' by Green Mountain Power. Fifty-nine

percent of 2015 survey participants support allowing commercial solar farms in town (14 percent strong yes, 45 percent yes if the town approves the siting).

Residential Wind Generation

Wind power systems are becoming more economically viable at the residential and commercial level. Wind turbines propelled by the wind generate electricity and come in a range of sizes for appropriate scale applications from small residential systems all the way to large commercial wind farms. The challenge for wind power in Vermont, and specifically Monkton, is the lack of reliable wind at lower elevations. Small-scale, on-site residential wind generation can harness wind at lower elevations by taking advantage of microclimates and local wind patterns. Good wind sites for larger applications are usually in high elevations with exposure to prevailing winds, mostly on mountaintops and ridgelines. Siting projects in these areas is controversial as they affect the viewsheds, prominent natural features that define Vermont, and disturb fragile ecosystems and impact groundwater recharge areas.

According to the 2015 MEC Survey, Monkton residents widely support residential wind generation and are generally opposed to commercial wind farms. In the survey, 77 percent supported single-family residential wind power generation with only 22 percent opposed. On the commercial side the data is more ambiguous. About 44 percent of survey participants supported wind farms with 32 percent only supporting the idea if the town approves of the siting. A majority 56 percent of participants did not support commercial wind generation. Twenty percent said there could be some exceptions to their opposition.

Residential Geothermal Heating

A properly designed and installed geothermal heat pump system is more efficient than electric, oil, or gas heating systems, providing a renewable alternative to heating with fossil fuels. This process begins as water is pumped through tubes underground or from a well. Throughout the winter the heat pump "extracts" heat from the water to distribute throughout the building, and the now-cooled water is returned to the earth. The system is reversed in the summer, with the heat pump drawing hot air out of the building and sending warmed water into the earth.

With an appropriately sited water well, the same efficiencies and energy savings apply and are very promising when balanced against the high heating costs incurred by our long, cold winters. The additional upfront costs are usually returned within 5-10 years of installation, with a system life of 25 years for internal components and 50 or more years for the well or ground loop.

Most broadly, geothermal is any use of heat from the earth. Geothermal heat pumps in Vermont rely on the constant (55 degrees Fahrenheit) temperature of the earth, or on groundwater in a well. Though there are only a handful of geothermal installations currently in Monkton (>1 percent household home heating) there is great potential to include geothermal heat pumps in combination with domestic water wells in new-build projects.

GENERATION POTENTIAL AND TARGETS

Table 9 and 9a. below, were provided to Monkton by ACRPC using Vermont State data and methodology. The data comes from the Public Utility Commission, Vermont Energy Investment Corp and Green Mountain Power. The numbers were generated in conjunction with GIS data used in mapping 'Potential Solar Siting Areas' and 'Potential Wind Siting Areas', included in this energy plan. The data used does not consider *all* locally-known

constraints, typically calculating development potential based on a larger acreage than may actually be available. This methodology results in the large 'potential generations' numbers listed in Table 9. below. While Monkton is including these numbers in the plan, local energy-use patterns, land-use patterns, policies and survey results should be considered in understanding how to best nuance this information for Monkton. The target numbers are relative to target numbers in the Addison County Regional Energy plan.

The PUC requires Vermont towns to reach specified energy targets in ways that make sense for each individual town. One town may have capacity for hydropower while another has greater capacity for switching to electric vehicles. While Table 9. notes that there is 3917.25MW wind generation potential in Monkton, local data shows that Monkton residents have invested and generally support solar generation over wind generation. This is reflected in the significant increase in residential homes integrating solar into energy systems over the past five years (Table 8.). In the same time period, there has been no wind development in Monkton. Recent community surveys indicate there is support for some commercial solar development, but not as much support for commercial wind development. Energy generation via biomass may be more viable than what Table 9. shows, due to the agricultural nature of Monkton businesses and an agricultural land base.

Table 8. shows Monkton energy generation at **1,340.33 MWh** in 2018. Table 9a., below, shows a target future annual generation, in 2025, of **2,638 MWh**. Given the exponential rate at which residents are incorporating solar into residential energy systems (see Table 8), this seems like an attainable target, by residential solar alone. While the data shows generation by wind as having a large potential in Monkton, the Town will likely focus on solar generation and, to a lesser degree, biomass and methane systems.

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Table 9. New Renewable Generation Potential in Municipality		
Source	**Generation Potential (MW)**	**Generation Potential (MWh)**
Rooftop Solar	1.46	1,794
Ground-mounted Solar	644.38	790,262
Wind	3917.25	12,010,289
Hydro	0.00	0
Biomass and Methane	0.00	0
Other	0.00	0
Total	4563.09	12,802,344

9a. Municipal Renewable Generation Targets (in MWh)			
Renewable Generation Targets (in MW)	2025	2035	2050
Total Renewable Generation Target (in MWh)	**2,638**	**5,276**	**7,994**

Source: ACRPC in conjunction with PUC, VEIC, GMP

Longer Term Goals

To meet the long term goals, it is predicted that if the current rate of solar installations is maintained, then the 2035 target should be attained.

To meet the longer term goals of 2050 it would be necessary to generate an additional 6.5 MW via new solar arrays. This translates into approximately 50 plus acres that need to be identified for commercial solar. These general areas have been identified on the map called: "Renewable Energy: Potential Solar Resource Siting Areas -Monkton ". This map produced by the Department of Public Service (State Energy Planning Guidelines) is part of a larger regional map that in turn is a part of the Addison County Regional Plan. This map identifies Primary Solar Resources Siting Areas and Secondary areas. These areas are where renewable energy generation would be the most feasible according to the natural conditions of the area. Overlaid on these, are areas identified as "Preferred Net Metering Solar Locations". These are areas identified for meeting the towns longer term goals.

Siting such projects has to take into consideration known and possible constraints (see Table 10) as well as meeting the siting standards (detailed in Section VI: Community Standards for Siting and Decommissioning). The landowners in these areas are however under no obligation and would have to be agreeable to any such projects.

While the map identifies recommended areas, it does not eliminate other sites or projects as long as they meet the siting standards and, landowners participation.

Should other forms of renewable energy sources or increased efficiency solar systems become available in the next 30 years it could change, and probably reduce the MW to acreage ratio.

LAND AND USE PATHWAYS TO IMPLEMENTATION

GOALS

1. Future growth will be concentrated in areas closest to amenities and services to reduce travel requirements for work, services, shopping and recreation.
2. Future growth will allow the continued conservation of our natural, recreational and scenic resources.
3. Future growth will prioritize close proximity to existing infrastructure and utilities.

POLICIES

1. Support public transit connections to and from our most compact neighborhood districts to other parts of the region and consider access to public transit when reviewing Act 250 applications.
2. Discourage fragmentation of forests and wildlife habitat.
3. Promote general stores and other businesses in village areas.

4. Promote infilling of existing large-lot development if higher density development is desirable and appropriate.
5. Support local farms and local food system which decrease energy demands of trucking and shipping and give value and purpose to our open agricultural lands.

RECOMMENDED ACTIONS

1. Review and update our Zoning Regulations to reflect significant advances in renewable energy and efficiencies going forward.
2. The Monkton Energy Committee will continue to work closely with the Monkton Planning Commission, Development Review Board (DRB) and Zoning Administrator on any proposed energy development projects within Monkton.

RENEWABLE GENERATION AND TRANSMISSION PATHWAYS TO IMPLEMENTATION

GOALS

1. Generation and transmission of renewable energy in conformance with the goals, strategies, mapping and community standards outlined in this energy plan and the town plan.
2. Improve access, understanding, and implementation of affordable, residential, small-scale[3] wind, solar, geothermal heat pumps and other renewable energy sources for daily use.

POLICY

1. Development of renewable generation shall be favored in identified preferred locations over the development of other sites.
2. Support production of energy from methane as a desirable agricultural practice.
3. Encourage the use of residential wind energy with due regard to aesthetic and environmental considerations, especially in high and medium density residential areas.
4. Support responsibly sited and responsibly developed renewable energy projects, which includes such structures as solar panels, wind turbines and all supporting infrastructure.
5. Incentivize residential solar systems

RECOMMENDED ACTIONS

1. The Monkton Energy Committee will work closely with the Monkton Planning Commission and Selectboard to evaluate any proposed energy generation or transmission projects pursuant to the policies and siting standards contained within this Energy Plan.
2. Investigate the installation of, or subscription to, municipal solar and/or wind net-metering facilities to off-set municipal electric use.

[3] Small-scale commercial solar is defined in this plan as a project 500 kW or smaller.

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Support responsibly sited and responsibly developed renewable energy projects, which includes such structures as solar panels, wind turbines and all supporting infrastructure.¶

Deleted: <#>Investigate installation of community-owned renewable energy project(s) to allow Monkton citizens to participate in the economic benefits of local energy production.¶ Adopt regulatory siting policy for community solar systems.¶ Incentivize residential solar systems. ¶
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3. Investigate installation of community- owned renewable energy project(s) to allow Monkton citizens to participate in the economic benefits of local energy production.

MAPPING GENERATION POTENTIAL

Monkton has incorporated maps provided by ACRPC. These maps show data as required by the Public Utility Commission's *Determination Standards* for enhanced energy planning. The maps are a planning tool only and may not precisely indicate locations where siting a facility is acceptable. These maps show areas with potential access and constraints to energy resources such as: solar, wind, hydro, and biomass. Constraints considered on these maps are only those ones outlined on Table 10.

"Known" and "possible" constraints were subsequently identified on the maps. Known constraints are conservation resources that shall be protected from all future development of renewable generation facilities. Possible constraints are conservation resources that shall be protected, to some extent, from the development of renewable generation facilities. The presence of possible constraints on land does not necessarily impede the siting of renewable generation facilities on a site. Siting in these locations could occur if impacts to the affected possible constraints are mitigated, preferably on-site.

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Table 10, describes the constraints, as identified on the maps, and the source of the specified data.

Table 10 – Mapping Constraints		
Solar, Wind and Biomass Maps - Known Constraints		
Constraint	**Description**	**Source**
Confirmed and unconfirmed vernal pools	There are a 600-foot buffer around confirmed or unconfirmed vernal pools.	ANR[4]
State Significant Natural Communities and Rare, Threatened, and Endangered Species	Rankings S1 through S3 were used as constraints. These include all of the rare and uncommon rankings within the file. For more information on the specific rankings, explore the methodology for the shapefile.	VCGI[5]
DEC River corridors	Mapped River Corridors were depicted.	ANR
Class 1 and Class 2 Wetlands	**Vermont State Wetlands Inventory (VSWI) and advisory layers from site specific work collected by the municipality**	VCGI
Solar, Wind and Biomass Maps - Possible Constraints		
Constraint	**Description**	**Source**
Protected lands	This constraint includes public lands held by agencies with conservation or natural resource oriented missions, municipal natural resource holdings (ex. Town forests), public boating and fishing access areas, public and private educational institution holdings with natural resource uses and protections, publicly owned rights on private lands, parcels owned in fee by non-profit organizations dedicated to conserving land or resources, and private parcels with conservation easements held by non-profit organizations.	VCGI
Deer wintering areas	Deer wintering habitat as identified by the Vermont Agency of Natural Resources.	ANR
Hydric soils	Hydric soils as identified by the USDA/NRCS.	VCGI
Agricultural soils	Statewide, and prime agricultural soils are considered.	VCGI
Act 250 Agricultural Soil Mitigation Areas	Sites conserved as a condition of an Act 250 permit.	ANR
FEMA Flood Insurance Rate Map (FIRM) special flood hazard areas	Special flood hazard areas as digitized by the ACRPC were used (just the 100-year flood plain -500-year floodplain not mapped). The inclusion of this resource as a regional constraint is consistent with goals and policies of the Addison Co Region Plan.	ACRPC[6]
Vermont Conservation Design Highest Priority Forest Blocks	The lands and waters identified here 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. The inclusion of this resource as a regional constraint is consistent with goals and policies of the Addison County Regional Plan. (Source: ANR)	ANR

[4] Agency of Natural Resource: http://anr.vermont.gov/
[5] Vermont Center for Geographic Information: http://vcgi.vermont.gov/
[6] Addison County Regional Planning Commission: www.acrpc.org

SECTION VI: COMMUNITY STANDARDS FOR SITING AND DECOMMISSIONING

A. INSTALLATION SCALE DEFINITIONS

A1. Solar Installations

Residential-scale Solar: projects 15kW or less (typically consist of a roof or ground mounted)
Small-scale Commercial Solar: any project 150 kW-500kW (about 1.5-4 acres)
Large-scale Commercial/Industrial Solar: any project over 500kW (typically exceeding 4 acres)

A2. Wind Installations

Residential Scale Wind consists of a single tower less than 120 feet high generating less than 15kW of energy.
Community Scale Wind consists of 1 or more towers all less than 200 feet high (so as not to require night lighting) and producing less than 1 MW of electricity.
Industrial Scale Wind consists of wind projects with a total capacity of greater than 1MW or with a tower or towers taller than 200 feet or requiring night lighting for any reason.

B. SITING – GENERAL

Project siting requires the careful balance between the necessity to move to renewables while not upsetting the balance of what the community considers as the desirable attributes and features of the town. These have been detailed in previous sections of this plan based on town surveys and open house's as well as guidance from ACRPC. Accordingly all renewable energy projects must evaluate and address the proposed site's aesthetic impact on the surrounding landscape and significant view sheds, prime agriculture land, ecological sensitive and natural areas. Monkton's Ridgelines are protected by the "Ridgeline District" in which any building is prohibited. Poor siting cannot be mitigated. The Public Utility Commission Map shows where solar and wind energy generation is most feasible according to natural conditions. However, there are a number of constraints that might preclude these areas for solar and wind projects, such as conserved land, wildlife areas, watershed or floodplains, prime agricultural land, access to electrical power lines or where use would conflict with policies within the Town Plan. For example, where clearing trees would conflict with policies supporting the preservation of upland forests and wildlife corridors.

B1. Siting for Solar Installations

Good Solar Sites have one or more of the following characteristics:

- Roof-mounted systems;
- Systems located in close proximity to existing larger scale, commercial, industrial or agricultural buildings;
- Proximity to existing hedgerows or other topographical features that naturally screen the proposed array from view from at least two sides
- Systems fit the scale and context of their location.
- Reuse of former brownfields or otherwise impacted property.
- Glare and noise are minimized to the extent possible.

Poor Solar Sites have one or more of the following characteristics:

- No natural screening;

- Topography that causes the arrays to dominate the skyline from common vantage points like roads or neighborhoods;
- Installations that require large amounts of clearing of existing forested areas.
- Any site that requires extensive clearing of meadow or woodland for access.
- Locations in floodways or mapped river corridors;
- A location in proximity to and interfering with a significant viewshed. Significant viewsheds within the municipality of Monkton include open farm fields with unobstructed views from roads or other points in Monkton. Specifically, these include, but are not limited to, those sites valued and identified in the "Monkton Viewshed Study 2016" and include:
    - Views towards the west from Covered Bridge Road at Higbee Road
    - Views visible from Raven Ridge, looking west and southwest
    - Views down the valleys from both sides of Rotax Road, west of the Rosco Road intersection, looking north and south
    - The valleys north and south below Monkton Ridge, looking east and south
    - Looking south from Prison Hollow Road, heading west, prior to Tracy Road
    - Looking south from Boro Hill Road as it descends towards the Hardscrabble Road intersection.
    - Views to Camels Hump Mountain from Monkton Ridge, Silver Street, Turkey Lane and Tyler Bridge Road.

- These viewsheds are admittedly described broadly, and when looked at in the context of a particular location the town might be able to accommodate carefully sited installations. By identifying these viewsheds, the town is making it clear how important retaining the integrity of these areas is to the character of the town;
- The removal of large parcels of productive agricultural land from agriculture use; and
- Sites that require public investment in electrical transmission and distribution infrastructure in order to function properly.

B2. Siting for Wind Installations

Good Wind Sites have one or more of the following characteristics:

- Reuse of former brownfields or otherwise previously impacted properties (instead of sites with no-previous development).
- Within agricultural, commercial or industrial contexts and where practical, near other structures.
- Proximity to existing electrical transmission system to minimize the new infrastructure required to serve the project.

Poor Wind Sites have one or more of the following characteristics:

- In landscapes valued for natural or scenic features, particularly the Hogback Mountains, vistas allowing views of Camels Hump Mountain, and views identified below:
    - Ridge lines
    - Views towards the west from Covered Bridge Road,
    - Views visible from Raven Ridge,

- Views down the valleys from both sides of Rotax Road, west of the Roscoe Road intersection.
- The valleys north and south below Monkton Ridge from Prison Hollow Road.
- Boro Hill Road as it descends towards the Hardscrabble Road intersection.
- Views to Camels Hump Mountain from Monkton Ridge, Silver Street, Turkey Lane and Tyler Bridge Road.
- Impacts the flight and migration patterns of birds

Prohibited Wind Sites:

- Industrial scale wind installations are prohibited in Monkton (total capacity of greater than 1MW or with a tower or towers taller than 200 feet or requiring night lighting for any reason.)
- Community scale (consists of 1 or more towers all less than 200 feet high, so as not to require night lighting and producing less than 1 MW of electricity) wind is prohibited in Monkton's Ridgeline Overlay District, as outlined in Monkton's Unified Planning Document (UPD).

B3. Siting for Electrical Transmission Power lines and Substations

Good sites have one or more of the following characteristics:

- Systems located in close proximity to existing larger scale, commercial, industrial or agricultural buildings;
- Proximity to existing hedgerows or other topographical features that naturally screen the proposed corridor from view from at least two sides;
- Shared or neighboring ROW with other transmission or transportation infrastructure

Poor Sites have one or more of the following characteristics:

- No natural screening;
- Topography that causes the lines to be visible against the skyline from common vantage points like roads or neighborhoods;
- A location in proximity to and interfering with a significant viewshed;
- The removal of productive agricultural land from agricultural use
- Where the land use, as identified in the Land Use Plan and Unified Zoning document, would become restricted

C. MASS and SCALE

C1. Solar Mass and Scale

Rural structures like barns and silos fit into the landscape because their scale and mass generally do not impact large tracts of otherwise open land. When houses are added to Monkton's landscape, sensitive siting and appropriate screening are required by the Monkton Town Plan, Zoning and Subdivision Bylaws Renewable energy systems shall also be limited in mass and scale, or have their mass and scale broken by screening, to fit in with the landscape.

Solar systems of 150 kW and less (which comprise 1.5 acres or less) should fairly easily conform to these standards given the smaller size. All commercial scale solar arrays (i.e. above 150kW) shall also be limited in mass and scale, and/or have their mass and scale broken by screening to fit in with the

landscape. Large commercial solar projects larger than 500 kW, are typically in excess of four acres and larger than any other structure within the municipality of Monkton. This size solar project is difficult to screen or otherwise mitigate from visual and ecological perspectives. In the event such inability to adequately screen or otherwise mitigate from visual and ecological perspectives is the case, large-commercial solar projects, above 500kW, are prohibited.

C2. Wind Mass and Scale

- Use white or other colored materials (tower, hub blades) and earth tones for ground infrastructure or fences that blend into the landscape instead of metallic or other brighter colors).
- **Residential Wind projects:** shall follow the Public Service Department guidelines and scoring system in their Wind Siting Handbook[7] for small turbines and be reasonably construed to score below the "significant" zone.
- **Community Scale Wind projects**: Shall not exceed 200 feet in height, excepting movable blades.
- **Noise** from commercial wind projects will also meet Vermont State Guidelines[8]

C3. Electrical Transmission Power Lines and Substations Mass and Scale

- Industrial and commercial scale transmission lines and associated sub-stations or other buildings may need to be limited in height and scale, and/or have their height and scale broken by screening to fit in with the landscape in any given municipality.

- Projects which on balance are found to have poor siting characteristics pursuant to the community standards contained above or in other parts of the Monkton Town Plan are considered to be in violation of orderly development as outlined in this Town Plan.

- Any subsequent upgrades to the current VELCO electrical power transmission system shall first consider the use of existing poles, shall not expand further deforestation or expansion of the ROW, and shall not exceed the current power pole height. Any additional power lines and poles in parallel with the current transmission lines is highly discouraged, as is seizing land by eminent domain.

- In the event that the PUC grants VELCO the right to upgrade the power transmission system then the following criteria shall be considered prior to expanding poles and lines:

    a. Preference for the use of existing power poles (or substituted with poles of the same height)
    b. The use of higher carrying capacity conductors or the doubling of conductors on existing poles
    c. Consideration of using DC voltage transmission on existing conductors to meet new power requirements.

In the event of upgrades or changes to the power transmission system, then the following must be performed:

[7] http://publicservice.vermont.gov/sites/dps/files/documents/Renewable_Energy/Resources/Wind/psb_wind_siting_handbook.pdf

[8] In 2017, the PUC held the daytime sound level limit to be 42 decibels, and changed the allowable nighttime level to be 39 decibels. These numbers may change in the future.

1. Provide documentary evidence that such changes do not present a safety or health hazard to residences in close proximity to the power lines.
2. Perform an analysis and provide documentary evidence that no safety hazard exists with proximity to the gas transmission pipeline that parallels the electrical transmission line. The systems installed to mitigate electrical induced currents and provide corrosion protection of the gas transmission pipeline should be analyzed and tests performed to ensure that they fully function and comply with all Federal and State of Vermont specifications in the presence of the new power line installation.
3. All corrective actions taken to comply with these system requirements shall be installed and tested prior to commissioning any powerline upgrade or modification.

D. MITIGATION METHODS.

D1. Solar Mitigation Methods

In addition to properly siting a project according to the criteria set forth above, solar developers must take the following action to mitigate all project sites:

- Locate the structures on the site to keep them from dominating the skyline above the horizon from public vantage points;
- Shorter panels may be more appropriate in certain spaces than taller panels to keep the project lower on the landscape.
- Use the existing topography, development or vegetation on the site to screen and/or break the mass of the array;
- In the absence of existing natural vegetation, the commercial development must be screened by native plantings beneficial to wildlife and pollinators that will grow to a sufficient height and depth to provide effective screening within a period of 5 years. Partial screening to break the mass of the site and to protect public and private views may be appropriate.
- Practice a "good neighbor policy". The siting of the array should be done in such a manner that the array creates no greater burden on neighboring property owners or public infrastructure than it does on the property on which it is sited. As an example, a landowner may not site an array on his or her property in a location calculated to diminish the visual impact of the array from his or her residence, but places the array immediately within their neighbor's or the public's viewshed.
- Use black or earth tone materials (panels, supports, fences) that blend into the landscape instead of metallic or other brighter colors, and take all possible steps to eliminate or reduce reflection on affected properties or views from the public roads.

D2. Wind Mitigation Methods

The actual footprint of a wind turbine tends to be small but its resource impact is more substantial within the footprint area, and wind turbines (particularly wind farms) are likely to have scenic or esthetic impacts, sometimes quite dramatic. Scale and landscape context are important considerations in siting wind installations. Because the siting of wind will be more challenging given potential heights and visibilities due to Monkton's often open and rolling landscapes, proposals need to be considered on a one-by-one, specific basis. Using the criteria in A-E of this *Community Standards* section will be used to evaluate whether on balance potential wind installations meet or violate the Monkton Town Plan:

D.3 Transmissions and Substations Mitigation Methods

In addition to properly siting a project, transmission and substation developers must take the following action to mitigate all project sites:

- Consider burying the transmission infrastructure as a potential way to lessen visual/aesthetic impacts;
- Locate the structures on the site to keep them from dominating the skyline above the horizon from public vantage points;
- Shorter structures may be more appropriate in certain spaces than taller structures to keep the project lower on the landscape.
- At a minimum, all sub-stations must observe the setback restrictions listed in the Municipal Zoning Regulations within the Zoning District in which it lies;
- Use the existing topography, development or vegetation on the site to screen and/or break the mass of the array;
- In the absence of existing natural vegetation, the commercial development must be screened by berms and/or native plantings beneficial to wildlife and pollinators that will grow to a sufficient height and depth to provide effective screening within a period of 5 years. Partial screening to break the mass of the site and to protect public and private views of the project may be appropriate;
- Practice a "good neighbor policy". The siting of the towers should be done in such a manner that the substation creates no greater burden on neighboring property owners or public infrastructure than it does on the property on which it is sited. Locating a sub-station in a manner designed to reduce impacts on neighbors or public viewsheds constitutes reasonable mitigation.
- Use black or earth tone materials (towers, supports fences) that blend into the landscape instead of metallic or other brighter colors).

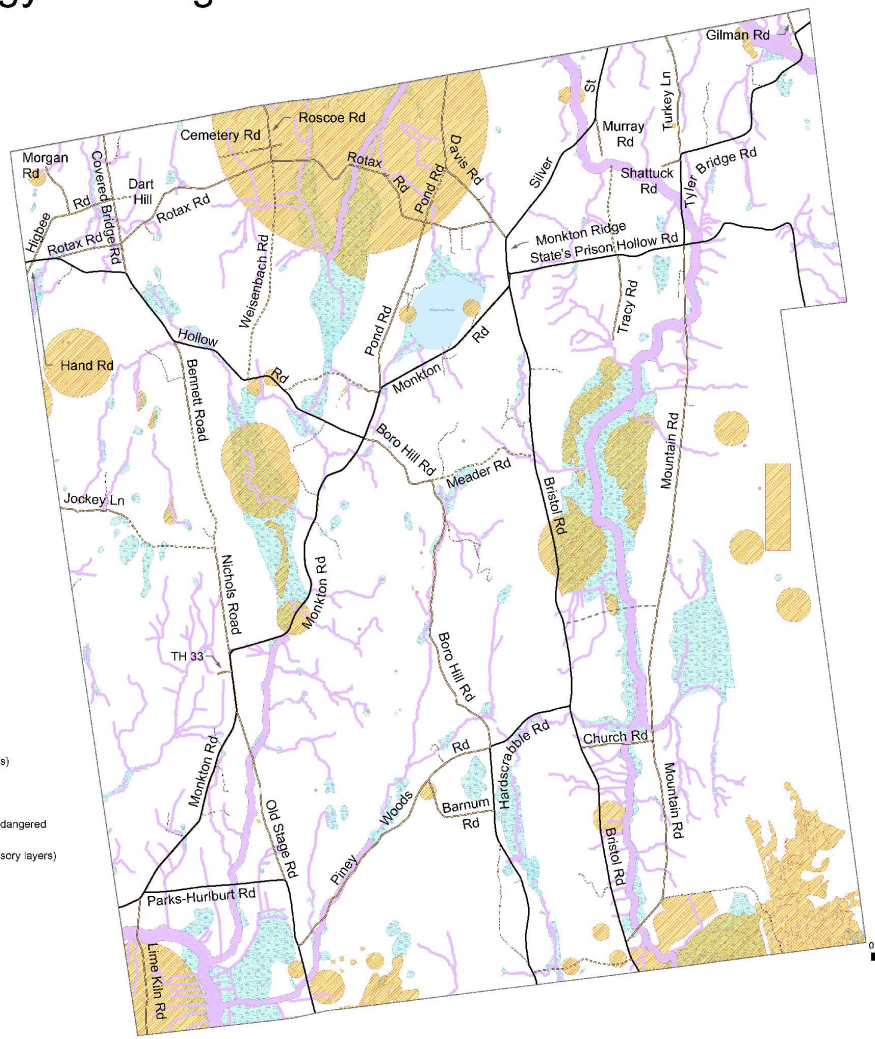
E. DECOMMISSIONING AND RESTORATION. All commercial energy projects shall be decommissioned at the end of their useful life. No more than a year shall pass from end of life to the decommissioning and restoration of site. Pursuant to the requirements contained in Rule 5.900 of the Vermont Public Utility Commission rules. This means equipment shall be removed, landscaping kept and disturbed areas restored. Developers of all projects 150 kW and greater shall provide the municipality with appropriate assurances to guarantee funding exists to decommission the project and restore the site in keeping with Monkton's desire to retain its agricultural land base, a solar array's useful life shall be deemed to be at the end of its useful life when the tower(s) are taken off line.

For commercial scale solar, the requirements of section 5.904(A) (of the VPUC rules) shall apply to installations greater than 100Kw.

Transmission and distribution utility lines associated with non-renewable energy sources, such as natural gas, shall be transitioned to carry renewable natural gas or other fuels as they become available in Monkton in order to meet our 2025, 2035 and 2050 targets. New distribution infrastructure must be transitioned to renewable energy sources or must be decommissioned pursuant to a plan agreed upon by the utility and the Town of Monkton prior to its installation.

SECTION VII MAPS

Renewable Energy Planning: Known Constraints - Monkton



Legend

- Vernal Pools (confirmed and unconfirmed layers)
- State River Corridors (inc 50ft buffers on sm streams)
- FEMA Floodways
- Natural Communities and Rare, Threatened and Endangered
- Vermont Significant Wetlands (Class 1 & 2 and advisory layers)
- National Wilderness Areas

Known Constraints (State Energy Planning Guidelines)

Vernal Pools (confirmed and unconfirmed)
DEC River Corridors (inc stream 50ft buffer)
FEMA Floodways
State Significant natural Communities and
Rare, Threatened and Endangered Species
National Wilderness Areas
Class 1 and Class 2 Wetlands (VSWI and advisory layers)
Regionally or Locally Identified Critical Resources (none currently)

0 0.5 1 2 Miles

Addison County
REGIONAL PLANNING COMMISSION

This map was created as part of a Regional Energy Planning Initiative with funding from the Vermont Public Service Department.

Renewable Energy Planning: Possible Constraints - Monkton

Legend

- Agricultural Soils
- FEMA Special Flood Hazard Areas
- Protected Lands
- Agricultural Soil Mitigation (Act 250)
- Deer Wintering Areas
- Highest Priority Forest Blocks
- Hydric Soils

Possible Constraints (State Energy Planning Guidelines)

Agricultural Soils (Prime, Statewide and Local USDA)
FEMA Special Flood Hazard Areas
Protected Lands (State fee lands and pvt cons lands)
Act 250 Agricultural Soil Mitigation areas
Deer Wintering Areas
ANR's Vermont Conservation Design Highest Priority Forest Blocks
Hydric Soils
Regionally or Locally Identified Critical Resources (none currently)

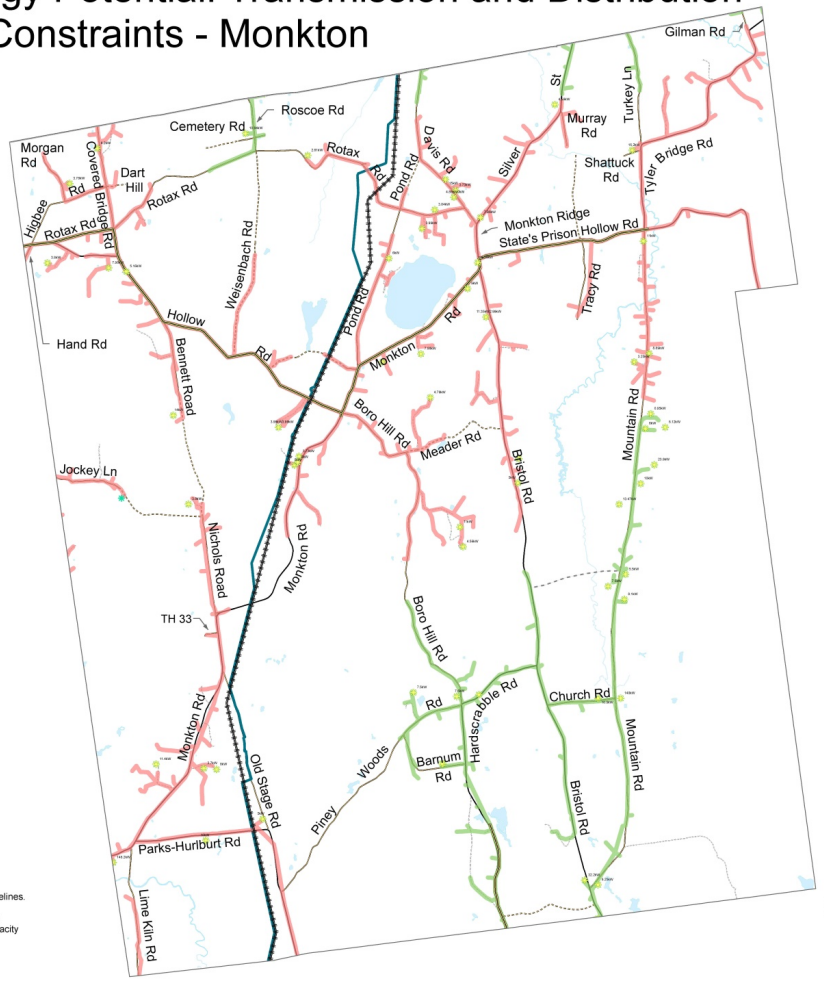
0 0.5 1 2 Miles

N

Addison County
REGIONAL PLANNING COMMISSION

This map was created as part of a Regional Energy Planning Initiative with funding from the Vermont Public Service Department.

Renewable Energy Potential: Transmission and Distribution Resources and Constraints - Monkton



Legend

- Substations
- Transmission Lines
- 3 Phase Power Lines

Circuit Ratings

- Good
- Fair
- Poor

Distributed Generation

- Solar
- Wind
- Bio
- Other
- Hydroelectric Dams
- Vermont Gas Line

Transmission and Distribution under the State Energy Planning Guidelines.

Substations, Transmission lines and 3-Phase power distribution lines from Green Mountain Power/ACRPC; Circuit Ratings identifying capacity loads and Distributed Generation also from Green Mountain Power , 4/28/2017.
Hydroelectric facilities from agency of Natural Resources.

Vermont Gas Line provided from Vermont Gas and Town of Monkton.

ACRPC 4/2017

0 0.5 1 2 Miles

N

Addison County
REGIONAL PLANNING COMMISSION

This map was created as part of a Regional Energy Planning Initiative with funding from the Vermont Public Service Department.

Renewable Energy: Potential Woody Biomass Resource Siting Areas - Monkton

Dept of Public Service Methodology

This map shows areas of resource potential for renewable energy generation from woody biomass, i.e. locations where renewable energy generation would likely be most feasible according to the natural conditions of an area. This map also considers various other conditions, such as natural resource areas, that may impact the feasibility of renewable energy development. These conditions are referred to as constraints. Areas of prime woody biomass potential exist where the natural conditions make development feasible and no constraints exist.

Known Constraints

Known Constraints signal likely, though not absolute, unsuitability for development based on statewide or local regulations or designated critical resources.

Known Constraints include: Vernal pools, FEMA floodways, river corridors, Federal wilderness areas, Natural Communities and Rare, Threatened and Endangered Species, and wetlands (class 1 and 2) and wetland advisory layers.

These areas have been removed and are not shown on this map.

Possible Constraints

Possible Constraints signal conditions that would likely require mitigation, and which may prove a site unsuitable after site-specific study, based on statewide or regional/local policies that are currently adopted or in effect.

Possible Constraints include: Agricultural soils, FEMA flood areas, Protected Lands, ACT 250 soil mitigation areas, Deer wintering areas, Highest Priority Forest Blocks, and Hydric soils.

These areas are shown on the map where they coincide with areas of renewable woody biomass potential.

Legend

- Primary Biomass Siting Areas
- Secondary Biomass Siting Areas

Woody Biomass Potential Analysis under the State Energy Planning Guidelines.

Statewide forest cover types from the 2006 National Land Cover Dataset (NLCD, 2006) were merged into a single file and used to calculate low-grade green tons per acre by VCGI. The forest cover areal extent was used in this analysis.

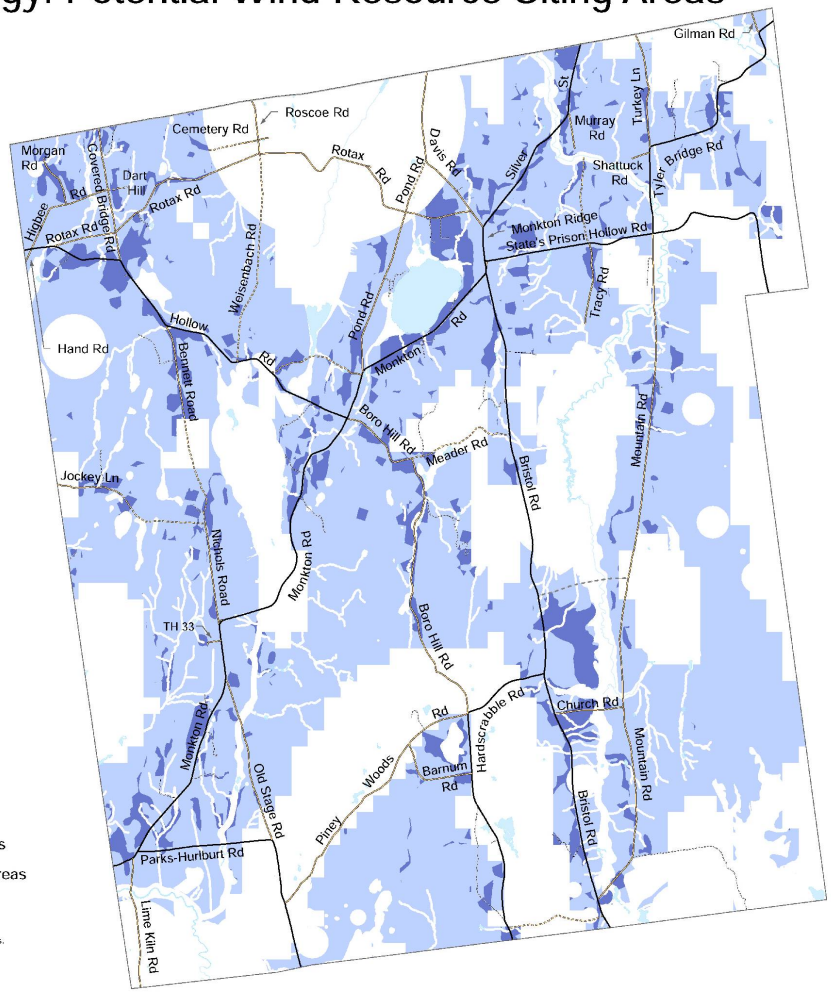
0 0.5 1 2 Miles

N

Addison County
REGIONAL PLANNING COMMISSION

This map was created as part of a Regional Energy Planning Initiative with funding from the Vermont Public Service Department.

Renewable Energy: Potential Wind Resource Siting Areas - Monkton



Dept of Public Service Methodology

This map shows areas of resource potential for renewable energy generation from wind. I.e. locations where renewable energy generation would likely be most feasible according to the natural conditions of an area. This map also considers various other conditions, such as natural resource areas, that may impact the feasibility of renewable energy development. These conditions are referred to as constraints. Areas of prime wind potential exist where the natural conditions make development feasible and no constraints exist.

Known Constraints

Known Constraints signal likely, though not absolute, unsuitability for development based on statewide or local regulations or designated critical resources.

Known Constraints include: Vernal pools, FEMA floodways, river corridors,Federal wilderness areas,Natural Communities and Rare, Threatened and Endangered Species, and wetlands (class 1 and 2) and wetland advisory layers.

These areas have been removed and are not shown on this map.

Possible Constraints

Possible Constraints signal conditions that would likely require mitigation, and which may prove a site unsuitable after site-specific study, based on statewide or regional/local policies that are currently adopted or in effect.

Possible Constraints include: Agricultural soils, FEMA flood areas, Protected Lands, ACT 250 soil mitigation areas, Deer wintering areas, Highest Priority Forest Blocks, and Hydric soils.

These areas are shown on the map where they coincide with areas of renewable wind potential identified in the wind analysis.

Legend

- Primary Wind Resource Siting Areas
- Secondary Wind Resource Siting Areas

Wind Potential Analysis under the State Energy Planning Guidelines.

Statewide 30m, 50m, and 70m wind speed layers from Mass.Tech Collaborative where filtered for minimum wind speed, then merged into a single file by VCGI.

0 0.5 1 2 Miles

Addison County REGIONAL PLANNING COMMISSION

This map was created as part of a Regional Energy Planning Initiative with funding from the Vermont Public Service Department.

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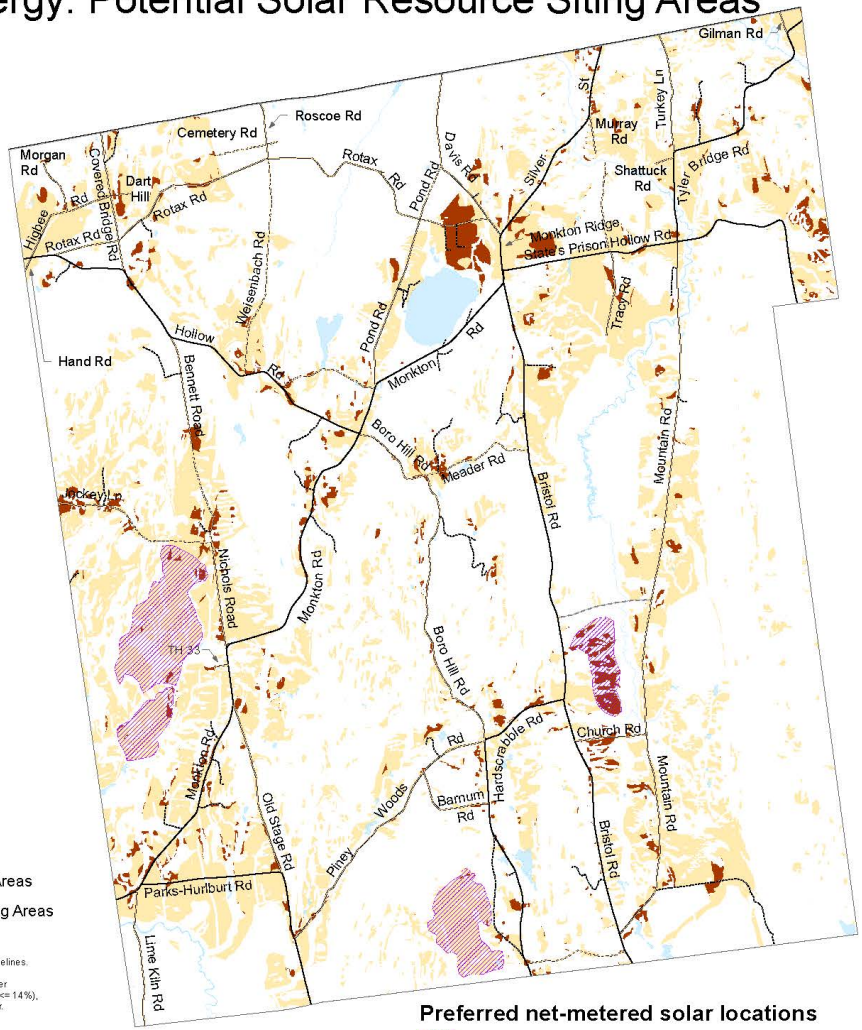
Renewable Energy: Potential Solar Resource Siting Areas - Monkton



Legend

- Primary Solar Resource Siting Areas
- Secondary Solar Resource Siting Areas

Solar Potential Analysis under the State Energy Planning Guidelines.

Statewide ground based (30m USGS DEM) solar potential layer created with ESRI solar analyst by VCGI. Filtered by SLOPE (<= 14%), ASPECT (90-270 degrees) and values >= 1,000 kWh/sq meter.

Preferred net-metered solar locations

- Preferred area with conditions

Dept of Public Service Methodology

This map shows areas of resource potential for renewable energy generation from solar, i.e. locations where renewable energy generation would likely be most feasible according to the natural conditions of an area. This map also considers various other conditions, such as natural resource areas, that may impact the feasibility of renewable energy development. These conditions are referred to as constraints. Areas of prime solar potential exist where the natural conditions make development feasible and no constraints exist.

Known Constraints

Known Constraints signal likely, though not absolute, unsuitability for development based on statewide or local regulations or designated critical resources.

Known Constraints include: Vernal pools, FEMA floodways, river corridors,Federal wilderness areas,Natural Communities and Rare, Threatened and Endangered Species, and wetlands (class 1 and 2) and wetland advisory layers.

These areas have been removed and are not shown on this map.

Possible Constraints

Possible Constraints signal conditions that would likely require mitigation, and which may prove a site unsuitable after site-specific study, based on statewide or regional/local policies that are currently adopted or in effect.

Possible Constraints include: Agricultural soils, FEMA flood areas, Protected Lands, ACT 250 soil mitigation areas, Deer wintering areas, Highest Priority Forest Blocks, and Hydric soils.

These areas are shown on the map where they coincide with areas of renewable solar potential identified in the solar analysis.

Locally preferred net-metered solar locations with conditions are identified in 3 areas. Specific sites must also meet the siting standards in the town plan. Sites in other locations in Monkton may also meet the siting standards.

0 0.5 1 2 Miles

Addison County REGIONAL PLANNING COMMISSION

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This map was created as part of a Regional Energy Planning Initiative with funding from the Vermont Public Service Department.

SECTION VIII REFERENCES

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SECTION IX ENERGY BULLETIN – 2018 PIZZA AND PLANNING OPEN HOUSE

This one-page bulletin and questionnaire was provided to residents who participated in the 2018 Community Planning Open House. There were five stations corresponding to the five topics – transportation, natural resources, village center, housing and energy.

Act No. 174 – Enhanced Energy Planning

Background
Vermont has a long history of both land use and energy planning. As Vermont has experienced the growth in renewable energy generation as one of the state's largest new land uses, the need for integration of energy planning with land use planning has grown Both the Governor's Energy Generation Siting Policy Commission (2013) and the Solar Siting Task Force (2015) recommended establishing a paradigm of enhanced energy planning integrated with land use planning. Informed by those recommendations, Act 174 of 2016 establishes a new set of municipal and regional energy planning standards, which if met allow those plans to carry greater weight - substantial deference - in the siting process for energy generation. Meeting the standards is entirely voluntary; if regions and municipalities do not wish to update their plans, they will continue to receive due consideration in the Section 248 process.

Process
Though there are many details to work through, at its core, the process of enhanced energy planning consists of three major tasks:
1) Understanding your municipality's current energy use and setting targets for the future that are in alignment with state energy goals;
2) Deciding how to reach the targets through "pathways," or implementation actions; and
3) Preparing maps to help guide renewable energy development in the municipality or region.
Towns in Addison County currently working on enhanced energy planning include: Ripton, Salisbury, Panton, Monkton, Leicester, and Weybridge. Addison County Regional Planning Commission has recently drafted their regional Enhanced Energy Plan. Their public hearing is scheduled for June 2018.

Definitions
Substantial deference: 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.

For more information on enhanced energy planning, please visit the Department of Public Service's site:
http://publicservice.vermont.gov/content/act-174-recommendations-and-determination-standards

Questions and Concerns

The Vermont Energy Plan states a target of 90 percent renewable by 2050. Vermont towns are considering what this means at the local level and how to incorporate energy planning into town planning and policy. It is helpful to get a sense of what Monkton residents think about energy conservation, efficiency and generation in order to understand Monkton's priorities in the context of Vermont's energy goals. Please answer the following questions to the best of your ability:

- Residential-scale Solar: projects 15kW or less (typically consist of a roof or ground mounted tracker)
- Small-scale Commercial Solar: any project 150 kW-500kW (about 1.5-4 acres)
- Large-scale Commercial/Industrial Solar: any project over 500kW (typically exceeding 4 acres)

A. Commercial Solar Projects

Do you agree or disagree with the following statements?

1. I would support commercial solar project that are no greater than 150 kW (approximately 1.5 acres).

   Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree

2. I would support commercial solar projects greater than 150 kW (1.5 – 4 acres).

   Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree

3. I would support commercial solar projects greater than 500 kW (exceeding 4 acres)

   Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree

4. How a solar project is sited within the surrounding landscape (screened by trees and/or topography, or proximity to abutting uses) impacts my support of the project.

   Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree

5. I would generally support commercial solar projects that are hidden from the right-of-way (road).

   Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree

6. I do not support commercial solar projects even if I can't see them.

   Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree

7. Monkton should limit the number of solar array projects in town.

   Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree

8. It is important to identify places in Monkton where we do and do not want to see future energy generation projects.

   Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree

9. Monkton should directly benefit from commercial solar projects in town.

   Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree

B. Energy Conservation and Efficiency

The State strives to limit carbon emissions to less than 80-95% below 1990 levels by 2050. How we use, conserve and generate energy at the local level will have an impact on reaching this goal. Do you agree or disagree with the following statements?

10. Monkton should require all new buildings be sited to maximize passive solar exposure.

Strongly Agree **Agree** **Neither agree or disagree** **Disagree** **Strongly disagree**

11. Monkton should require all new buildings to include rooftop solar arrays where siting allows for efficient generation.

    Strongly Agree **Agree** **Neither agree or disagree** **Disagree** **Strongly disagree**

12. Monkton should require all new construction to include a cold climate heat pump.

    Strongly Agree **Agree** **Neither agree or disagree** **Disagree** **Strongly disagree**

13. Property tax breaks should be given for new construction which includes a minimum percent of energy use derived from renewable energy.

    Strongly Agree **Agree** **Neither agree or disagree** **Disagree** **Strongly disagree**

14. It would be great to have a volunteer energy committee to help residents reduce energy use and emissions and save money.

    Strongly Agree **Agree** **Neither agree or disagree** **Disagree** **Strongly disagree**

15. I would like to receive more information from the Town on how to weatherize my home and other ways to conserve energy.

    Strongly Agree **Agree** **Neither agree or disagree** **Disagree** **Strongly disagree**