POWERING COLCHESTER

VISION: The Town shall take the initiative to interact and collaborate regionally and locally to ensure that adequate, safe, sustainable, and affordable energy systems are available to all residents and businesses and encourage the efficient use of energy.

GOAL: The Town of Colchester will provide a framework for the community, individuals, businesses, and organizations to implement the goals of the State of Vermont as enumerated in their 2016 Comprehensive Energy Plan (CEP):

- To obtain 90% of all energy across all sectors (transportation, heating, and electricity) from renewable sources by 2050, with the interim goals of 25% renewable by 2025 and 40% renewable by 2035 in which renewable means solar energy, wind energy, solid biomass, liquid biofuels, biogas (methane), and hydropower;
- To reduce total energy consumption per capita by 15% by 2025, and by more than one-third (1/3) by 2050.
- To weatherize 25% of homes by 2020;
- To reduce greenhouse gas emissions by 50% from 1990 levels by 2028 and 75% by 2050.

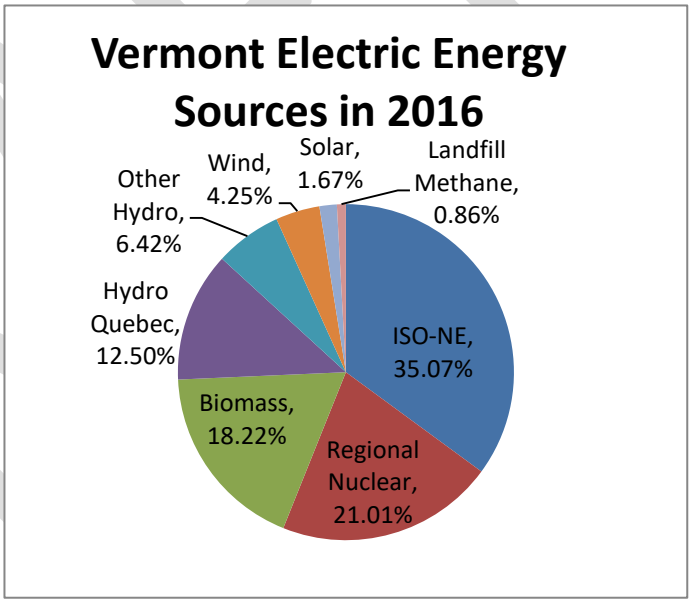
OBJECTIVE: Colchester has chosen to institute local actions to make progress on and achieve the State's goals by 2050. It is recognized that progress will only be achieved by the buy-in and actions of private individuals and entities. While the Town can educate and inform, it has limited power to effectuate these changes by itself and will be reliant upon innovation in the private sector and other governmental entities to achieve these goals. By attaining substantial deference under Act 174, Colchester will be able to balance both state and local priorities regarding energy use and production with more localized needs and priorities.

BACKGROUND: The Town of Colchester's geography has historically limited its ability to produce power. The low lands of Colchester at the mouths of the Lamoille and Winooski Rivers have not allowed for local power production beyond that of one hydro dam in the gorge of the Winooski River shared with South Burlington and individual, small, residential-scale wind turbines. Within this plan, small scale energy generation facilities shall be considered as producing 150 kW or less with large facilities producing more than 150 kW.

Note: Kilowatts (kW) is the maximum instantaneous power that an energy-generating project can produce. This is also known as capacity. Kilowatt hours (kWh) are the total amount of electricity they actually generate over a period of time. For example, a solar project rated at a power level of 10,000 kW capacity can potentially generate 10,000 kWh of energy over an hour of optimal conditions. Even though a solar or wind project may have the same capacity, the different technologies and environmental conditions can generate a different amount of electricity.

Energy Sources: The Town of Colchester's energy history and outlook is very much tied to that of the State of Vermont. In 2016, the State of Vermont received 35.07% of electricity from regional non-renewable energy imports (ISO-NE), 21.01% from regional nuclear, 18.22% from biomass, 12.5% from Hydro-Quebec, 6.42% from other hydropower, 4.25% from wind, 1.67% from solar, and 0.86% from landfill methane. These sources are displayed in Figure 1. These sources dictate pricing throughout the state with little variation.

As of 2016, Colchester was estimated to have a population of 17,319 people, using a total of 130,883,974 kWh (kilowatt hours) for electricity and 785,470 MMBtus (million British Thermal Units) of natural gas for thermal energy. Figure 1 outlines the sources of this energy as of 2016. This is the 4th highest consumption of energy in Chittenden County. In a state with a seven month heating season, the cost of energy has a high impact on the overall cost of living and doing business. While Vermont historically has had high energy prices in the last two decades, since 2011 the rate of consumer price increases has been 3.1% within Vermont, compared to 12.3% on average in New England. As of 2017, Colchester is served entirely by Green Mountain Power (GMP) with 9,696 customers. For residential customers, rates have increased slightly from $0.15 per kWh in 2014 to $0.15668 per kWh in 2018. For commercial and industrial customers, prices have increased more substantially from the range of $0.069 - $0.09 per kWh in 2014 to $0.13981 - $0.17164 per kWh in 2018. It must be noted that GMP is planning on consolidating legacy contracts under this commercial and industrial rate to one value of $0.16020 per kWh by April 1st, 2020. . Regarding Vermont Gas's 2018 prices, residential and commercial rates have each increased 1.5% to $0.4188 per ccf for residential, and $0.4864 per ccf for commercial.



(FIGURE 1, Source: Vermont Energy Action Network, 2016)

A variety of other energy sources are also utilized in the community from gasoline to liquid propane to wood pellets. While an increasing number of residences are heated with biomass (18% of homes in Vermont), the major home heating sources in Colchester are natural gas and liquid propane. Many of Colchester's most affordable homes and mobile homes have limited heating options due to their construction and are often reliant upon some of the most expensive and volatile petroleum fuel sources (see Our Homes Chapter). Small scale residential wind turbines within Colchester continue to be viable; however, at this time Colchester's low level elevations combined with state and local constraints (MAP REFERENCE) diminish the viability of commercial scale wind operations. Solar currently produces 4 MW (Mega-watts) of power and 3,905 MWh (Mega-watt hours) of energy annually across the community with significant expansion potential. Saint Michael's College employs geothermal in their Dion Family Student Center and this thermal source continues to be incorporated into residential builds. Additionally, Colchester has several wood harvesting operations that serve residences. An opportunity for an energy generating methane facility near Exit 16 has been explored in the past, but was inevitably found not viable due to the design of the landfill cap. Alternative and renewable energy sources will continue to grow in importance as traditional energy sources become more limited and expensive. The Colchester Development Regulations should continue to encourage the use of solar modules and residential wind turbines as well as other alternative energy sources such as geothermal.

Of Colchester's various dams, only one produces power: Green Mountain Power's Winooski Gorge 18 Hydroelectric Facility. This facility is located in the Lime Kiln Gorge and straddles the border with South Burlington. No changes are anticipated to the dam during the term of this plan. As the facility has the capability of producing 1.8 MW of power and generates 9,000 MWh annually from a renewable resource, the Town is supportive of its continued operation and improvements that may be made to it.

Energy Distribution: There are currently fifteen gasoline service stations and two fuel distributors within the community. Vermont Gas Systems serves the majority of the Bay, Severance Corners, the Village, Exit 16, the Fort, Severance Road, and Malletts Bay Avenue by the Winooski Town Line. The main gas transmission line for Chittenden County runs through Colchester north to south originating at the Canadian Border from the TransCanadian System which brings natural gas from Alberta. This is one of three gas transmission lines in the community:

1) The first gas line originates in Burlington and crosses the Winooski River and terminating at Exit 16,
2) The second gas line originates in Winooski in the Exit 16 area and runs north along the Routes 2 & 7 corridor then forking off to the Town of Essex along the Severance Road area with the trunk line continuing on to the Milton Town Line at Exit 17, and

3) The third gas line runs from Winooski along Route 15 into Essex.

A peak shaving facility at Exit 16 serves to boost supply using storage tanks during hours of peak natural gas use. As of 2018, Vermont Gas has no plans to increase transmission lines in Colchester, but the Town should be mindful of this possibility going forward and work to ensure that such expansions occur within existing transportation or utility corridors to minimize community impacts.

With plans to incorporate net-metering and the predicted increase in electricity usage by 2050, it is important to understand how GMP distributes electricity in Colchester. GMP and VELCO use transmission lines to bring electricity from power-generating facilities into Colchester, and eventually electricity is distributed to residents through a combination of 3 Phase Power Lines (along main roads such as Route 7), 2 Phase Power lines, and Single Phase Power lines. Electricity is brought into Colchester by the following three transmission lines:

1) GMP's phase three line from Burlington, through Winooski, terminating at the substation on Bay Road,
2) Vermont Electric Power Company (VELCO)'s first 115kV line from the Essex Station to Sandbar,
3) VELCO's second 115kV line from the Essex Station to Georgia.

Individually owned wind turbines and solar panels may use inverters to feed unused energy back into the grid on 3, 2, or single phase power lines. This contribution is a step in the right direction, but more will need to be done in order to achieve the State's goals.

Energy Conservation: According to the 2017 Housing Needs Assessment conducted by the Town of Colchester, an estimated 6,000 homes were built before 1998 (over 80% of current stock) and, based on their age, should be weatherized. The Town exempts most weatherization projects, such as, door and window replacement from permits. While this measure helps to lower barriers to weatherization projects, the lack of permit data makes it difficult to track improvement in this area. Given the high number of properties that could benefit from weatherization, it is recommended that the Town promote retrofits and other efficiency programs. In the CCRPC's 2018 ECOS Plan, it was noted that homes participating in government sponsored energy efficiency projects rose from 74 in 2014 to 197 in 2016.

From 2015-2017 the Town spent considerable effort working with Champlain Housing Trust to upgrade the 166 housing units that comprise Winchester Place in Fort Ethan Allen. $5 million in non-local funding was spent in rehabilitation activities which included replacing windows and exterior doors, replacing hot water systems, and replacing heating systems. Additionally the Town provided Champlain Housing Trust with $43,000 in Federal Funds to upgrade the streetlights to low energy use models which both reduced energy uses and helped make the property more affordable.

In 2014, the Town borrowed $400,000 and replaced most of its street lights with high efficiency bulbs. The loan will be paid off by 2022 through savings in electric bills. Over the twenty year lifespan of the lights, after capital payback, the Town will save $1.3 million dollars, a 38% savings over using older lighting technology

In 2015, the Town conducted a Level 2 Energy Audit of municipal facilities. This audit provides a performance baseline and relative energy usage for 16 buildings, totaling in 46,464 square feet. It is estimated that 97,865 kWh of electricity, 3,043 CCF (hundreds of cubic feet) of natural gas and 62.77 kGal (kilogallon) of water could be saved through efficiency projects. These improvements would cost an estimated $750,000. The payback period on average is of 33 years--longer than the life of most equipment and fixtures. So an adaptive approach of replacing equipment and fixtures with more efficient equipment at end of life is more cost effective for the Town. However, the more cost effective elements of the list may be targeted for within-lifespan replacement. When similar and adjacent systems are under replacement and when opportunities exist to combined system improvements with energy improvements, they will be considered. For example, when the Burnham Library had two HVAC systems in need of replacement and another was marginal, a decision was made to replace all three for reliability and energy efficiency. The Town will continue implementing these improvements over the term of the plan.

In all construction, the Town's localized building codes and inspection process creates higher standards for energy efficiency. Residential construction must meet the Residential Building Energy Standards (RBES) and the International Residential Code. All other construction must meet the Commercial Building Energy Standards (CBES) and Vermont Fire and Building Safety Code at a minimum with many projects also required to meet Act 250 Stretch Codes. These codes will lead to greater energy efficiency and energy conservation in the long-run.

ENERGY FOR OUR FUTURE: CCRPC developed a Long-Range Energy Alternatives Planning (LEAP) model for Chittenden County in 2018. This model serves to create a framework for public and private sectors to make progress toward2025, 2035, 2050 milestones. At the time of the development of this plan, suitable metrics for many of these milestone are not yet identified. An example is that it is unknown how many electric vehicles are owned in Colchester and how many homes are being weatherized. During the term of this plan, the Town should work with CCRPC to quantify progress.

<u>Heating, Cooling, and Sealing the Cracks:</u> One of the best ways to increase energy efficiency is to seal our homes and prevent heat from escaping. In the preliminary town plan survey on energy, 57% of respondents had performed weatherization improvements. The 41% who had not cited mainly financial barriers and a lack of information. The Town should work to educate the community on weatherization programs and financial incentive programs to reduce thermal use

and promote cost savings. Examples of outreach include providing an energy clearinghouse in Planning and Zoning to inform applicants of existing efficiency programs and financial incentives as well as continuing to partner with Champlain Housing Trust, Efficiency Vermont, GMP, and others to promote their weatherization programs.

Tables 1 and 2 outline possible improvements for residential, commercial, and industrial sectors in Colchester to reach 2025, 2035, and 2050 benchmarks. It is likely that weatherization improvements alone will not achieve these benchmarks. Improvements to local building codes may help increase efficiencies in thermal system incrementally. During the term of this plan, Planning and Zoning Staff should evaluate the benefit of additional code requirements to improve energy efficiency while considering affordability. Codes should not be barriers to new technologies but encourage them. To this end, the Town should be supportive of Act 250 amendments to remove historic permit restrictions on electricity as a thermal source provided it is efficient. Similarly, the production of biomass fuels from forestry activities (see Our Environment Chapter) could be an affordable way to increase the amount of renewable fuels and help meet targets. Bridge technologies that assist in reducing reliance on fuel oils and natural gas are needed. Unless the cost of current fuel sources increase dramatically, it is unlikely that significant progress will be made in the thermal sector during the term of this plan even with increased weatherization efforts. Colchester will continue to work with regional and State partners to encourage the use of new thermal technologies such as heat pumps and plants.

Projected Colchester Residential Thermal Energy Use			
	2025	**2035**	**2050**
Total Residential Thermal Energy Use (MMBtus[1])	577,688	489,812	339,125
Percent of Residences Weatherized by Target Year (%)	14%	36%	100%
Energy Saved by Weatherization by Target Year (MMBtus)	26,966	73,656	230,543
Percent of Residences using Heat Pumps (%)	18%	37%	60%
Residential Thermal Energy Use from Heat Pumps (MMBtus)	37,442	77,032	112,939
Residences Using Wood Heating (%)	14%	14%	14%
Residential Thermal Energy Use from Wood Heating (MMBtus)	106,085	106,187	93,298

(Table 1, Source: CCRPC LEAP Model, VT Department of Public Service)

Projected Colchester Commercial & Industrial Thermal Energy Use			
	2025	**2035**	**2050**
Total Commercial and Industrial Thermal Energy Use (MMBtu[1])	330,090	314,410	278,101
Percent of Commercial and Industrial Establishments Weatherized by Target Year	20%	22%	39%
Energy Saved by Weatherization by Target Year (MMBtu)	17,744	24,603	59,292
Commercial and Industrial Establishments Using Heat Pumps (%)	22%	35%	39%
Commercial and Industrial Thermal Energy Use by Heat Pumps (MMBtu)	26,766	52,911	79,056
Commercial and Industrial Establishments Using Wood Heating (%)	9%	10%	11%
Commercial and Industrial Thermal Energy Use Attributable to Wood Heating (MMBtu)	39,941	55,013	80,541

(Table 2, Source: CCRPC LEAP Model, VT Department of Public Service, VT Department of Labor)

1: MMBtu stands for One Million British Thermal Units. One Btu is the amount of heat necessary to raise one pound of water's temperature by one degree Fahrenheit.

Per capita energy consumption must be reduced 25% by 2030 and by one-third by 2050 (Tables 3 with industrial electric use and 4 without industrial) in order to reduce per capita energy usage up to 43% by 2050 to meet these statewide goals.

Projected Colchester Total Energy Use Per Capita (Including Industrial Electric Use), 2015-2050				
	2015	**2025**	**2035**	**2050**
Total Energy Use (MMBtu)	2,223,480	2,100,108	1,864,466	1,605,925
Population	17,383	17,953	18,296	19,119
Total Energy Use Per Capita (MMBtu)	128	117	102	84
Reduction in Total Energy Use Per Capita from 2015 benchmark	--	-9%	-20%	-34%

(Table 3, Source: CCRPC LEAP Model)

Projected Colchester Total Energy Use Per Capita (Excluding Industrial Electric Use), 2015-2050				
	2015	**2025**	**2035**	**2050**
Total Energy Use (MMBtu)	2,141,906	1,984,386	1,714,835	1,405,073
Population	17,383	17,953	18,296	19,119
Total Energy Use Per Capita (MMBtu)	123	111	94	73
Reduction in Total Energy Use Per Capita from 2015 benchmark	--	-14%	-27%	-43%

(Table 4, Source: CCRPC LEAP Model)

The LEAP model assumes that Colchester's population will continue to grow, but the total energy use will decline. Engagement and education of residents towards these goals will prove difficult until energy prices increase and trigger private action. In the interim, the Town can provide information and education so that when individuals and businesses are making decisions to replace or invest in substantial repairs, they have the opportunity to make investments that will save them money considering both the energy cost and equipment purchase.

Electricity usage: As innovation in the transportation sector and home cooling and heating move these sectors toward greater electrical use, demands on the grid will increase. Unlike numbers in the previous thermal category, future demands on electricity are rising,. By 2050, residents of Colchester can be expected to be using 231,516 MWh[2] (Megawatt hours) of electricity, compared to 138,439 MWh in 2025. Greater efficiency could lead to 41,329 MWh being saved in 2050 (Table 5 below). The Town will continue to promote the Vermont Community Energy Dashboard to increase awareness of energy generation as well as efficiency projects.

Projected Colchester Electrical Energy Use 2025-2050			
	2025	**2035**	**2050**
Without Industrial (MWh[2])	104,523	133,222	172,649
Industrial Only (MWh)	33,916	43,855	58,867
Total (MWh)	138,439	177,077	231,516
Total Electric Energy Saved (MWh)	10,946	22,097	41,329
Increased Residential Electric Efficiency (%)	30%	58%	98%
Increased Commercial and Industrial Establishments Electric Efficiency (%)	30%	58%	98%

(Table 5, Source: CCRPC LEAP Model)

2: MWh stands for Megawatt-hours, a measure of power (megawatts) over time (hours). Residents may be more familiar with the Kilowatt-hour (kWh), which is the measure often associated with electric bills.

Transportation trends: Transportation continues to be a significant factor in Vermont's emissions. According to the 2017 Vermont Transportation Energy Profile, Vermonters averaged 11.68 thousand vehicle miles of travel (VMT) per capita compared with the nationwide average of 9.63 thousand VMT per capita. While electricity as a fuel source is becoming more common, great strides would need to be made to increase to 6% in 2025 and 89% of total fleet in 2050. A majority, 71.70%, of community members polled in the development of the Town Plan noted that they would be willing to buy a more efficient, possibly electric, car as well as bike and walk to reduce their personal impacts from transportation.

The Town identified an additional park and ride facility with electric vehicle charging station near Exit 16 and has been working with the State to this end despite the loss of grand list revenue

from this site. The park and ride is expected to open in early 2019. The Town will continue to work with the State to investigate additional park and ride sites. The Town will also continue to work with other partners such as Green Mountain Transit to support mass transit options. Multiuse paths will continue to be implemented through leveraging grants with the Capitol Transportation Plan to increase opportunities for bike and pedestrian use. Electric car charging stations should be included into parking standards within the Development Regulations and current transportation demand management incentives should be continued such as closing businesses prior to peak times of traffic or bus passes for employees. The Getting There section of this plan includes many more specifics on energy in the transportation sector.

Addressing the desire to reduce transportation, the Town has encouraged concentrated growth in the Severance Corners neighborhood and its village areas. This cluster-type development aims to reduce vehicle miles driven while also building tight-knit communities. Many other energy savings through land use such as clustering development can be found in the Lands of Colchester section of this plan. Projections and necessary milestones can be found in Table 6 (below).

Projected Colchester Transportation Energy Use, 2025-2050			
	2025	**2035**	**2050**
Total Light Duty Transportation Energy Use (MMBtu)	719,976	456,057	198,768
Electricity Used for Light Duty Transportation (MMBtu)	9,601	66,180	139,675
Light Duty Electric Vehicles (% of Vehicle Fleet)	6%	41%	89%
Biofuel Blended* Energy Used for Light Duty Transportation (MMBtu)	710,375	389,877	59,093
Biofuel Blend*Light Duty Vehicles (% of Vehicle Fleet)	94%	59%	11%
Heavy-Duty Transportation Energy Use from Biodiesel (Percent of Total)	33%	58%	96%
Heavy-Duty Transportation Energy Use from Fossil Fuel (Percent of Total)	67%	42%	4%

(Table 6, Source: LEAP Model, VTrans)

Greenhouse Gas Emissions: A byproduct of reducing energy use and fossil fuels is the reduction of greenhouse gas emissions. The Statewide goal to reduce these emissions 75% by 2050 can be advanced by reducing energy use. The Town has begun monitoring greenhouse gas (GHG) emissions in carbon dioxide equivalent (CO_2e) from municipal operations through a tool called ClearPath created by Local Governments for Sustainability USA (ICLEI). The Town may consider joining ICLEI during the term of this plan to receive technical support for its energy efforts. By continuing to update this database, Colchester will be better able to make decisions regarding vehicle efficiency and implement strategies to reduce emissions.

The Town of Colchester sold off older vehicles in 2015 as a cost saving measure, reducing the number of vehicles owned by the Town and saving money on the ownership costs by moving to a

mileage reimbursement system for Town travel that does not require a Town vehicle. This reduces costs borne directly by the Town and reduces overall energy consumption considering fewer vehicles are required to meeting the Town's needs. The Town replaced its Police fleet of Chevy Tahoe with a mixed fleet of smaller vehicles: Ford Explorers and mid-sized Chevy Sedans. The Town is now replacing its highest mileage vehicles, the police patrol vehicles, every four years. This gives the Town both reliability and better mileage, where it matters the most. We also no longer continue to pass down vehicles in Town so our fleet is smaller, newer and more energy efficient. The Town will continue to maintain information on the efficiency of its vehicles to continue to improve and optimize its fleet efficiency.

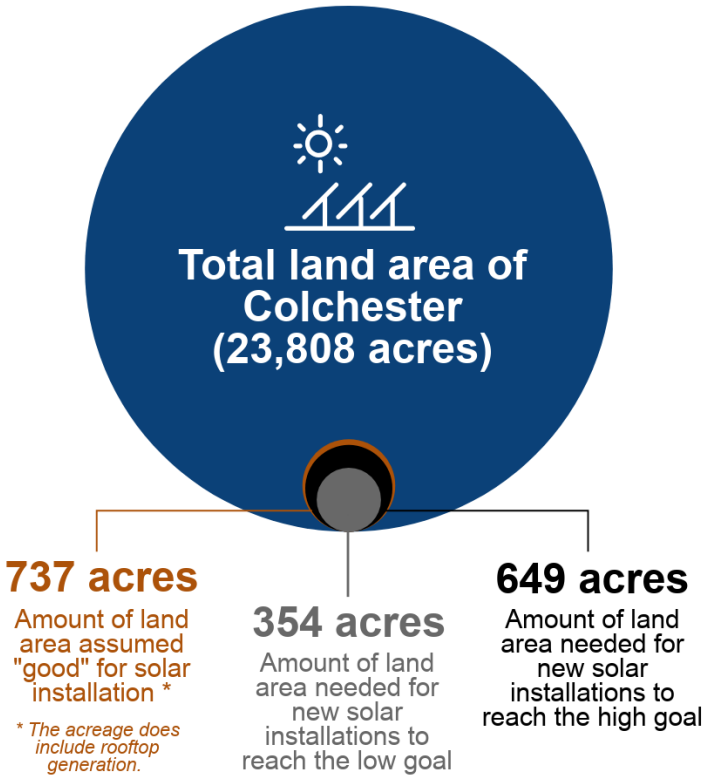
Other means of reducing GHG emissions include reducing food waste. Local agricultural productions should continue to be supported to reduce energy costs in food production. The Food and Agriculture Organization of the United Nations estimates that one third of food produced for human consumption is wasted. The Colchester Food Shelf promotes gleaning, or taking food that would otherwise be wasted, and providing the food to residents in need. This effort should be sustained as it reduces both GHG from food production as well as decomposition and benefits the community in many ways socially and economically.

Renewable Energy: Renewable technologies have continued to become more cost-effective in recent years. Local renewable sources such as solar, wind, and biomass have the potential to help Colchester meet the State's goals. In 2018, 12,928 MWh of energy production in Colchester was energy generated from renewable resources. By 2050, LEAP estimates public and private sectors will need to generate between 54,276 MWh to 99,499 MWh from new renewable resources in Colchester in order to meet these goals.

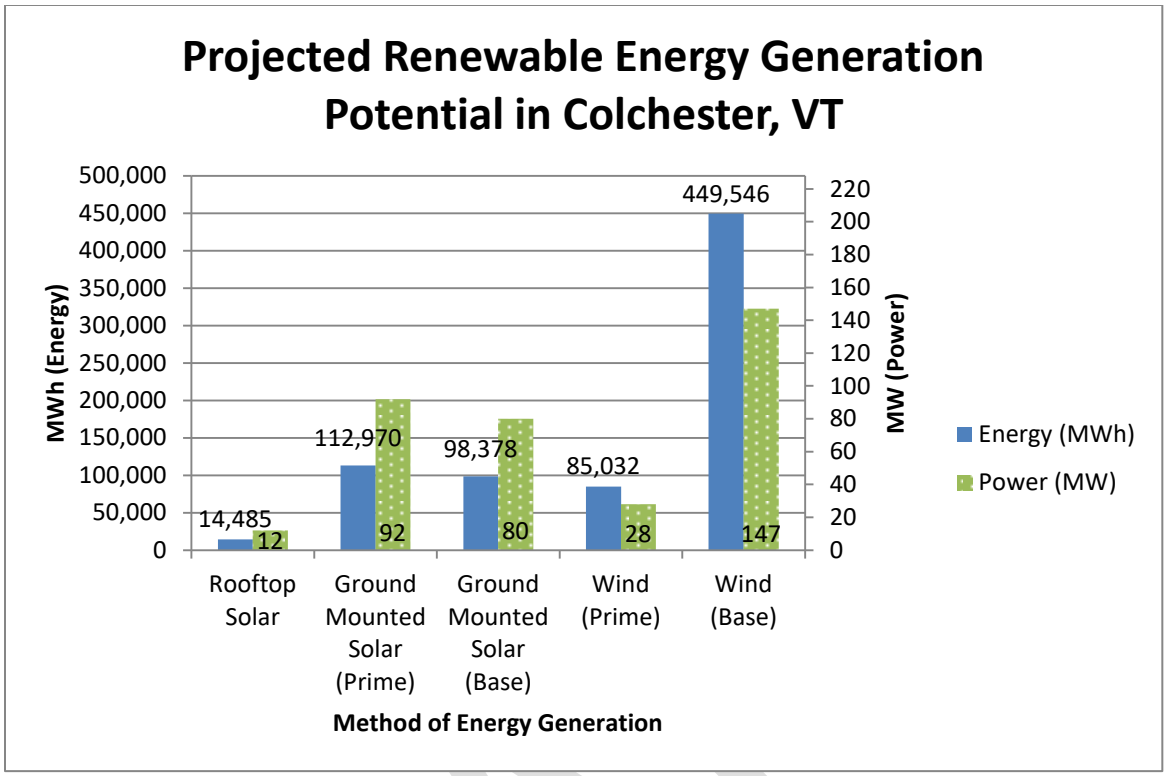
CCRPC generated estimations of what energy production could be on possible solar and wind sites maps in the 2018 ECOS Plan. The documentation on each map (solar and wind sites) was split into two categories. "Prime" renewable energy showed locations where there were no constraints present on sites. "Base" renewable energy locations outlined areas with a high potential, but possible constraints. Using only "Prime" locations, the goals outlined in the ECOS Plan could be accomplished The constraints outlined by the CCRPC are important to Colchester's natural landscape, and as such, the Town has chosen to focus all renewable energy generation in areas free of those constraints. The following sections provide more information on solar and wind applicability in Colchester:

Solar: The CCRPC ECOS Plan notes that Colchester has 5,550 prime and base acres available for solar usage (not including rooftops), with a potential of 172 MW of capacity of capacity and an annual generation potential of 211,348 MWh. This meets both the low and high targets for renewable energy usage in the ECOS plan. Water Protection and Shoreland Overlay Districts will be a constraint for the potential to complete solar projects. It is worthwhile to explore the possibilities of rooftop solar on current buildings in the Town to meet this demand.

After carefully reviewing alternatives including long term power purchase agreements, private development on Town land, and Town development on Town land, the Selectboard chose to permit and develop their own solar generation facilities in order to reap the maximum financial benefit. In 2018, the Town constructed two 150 kW solar photovoltaic generation facilities: one on Malletts Bay Avenue, which is expected to produce 242,000 kWh of energy and one on Roosevelt Highway, which is expected to produce 237,734 kWh of energy. When complete, they will produce energy equivalent to 60% of the Town's annual electricity use. The two facilities will produce savings of about $1,000,000 over their 25 year expected life, after payback of all capital and operating expenses. During the term of this plan, the Town will seek another solar facility to approach a goal of producing electrical energy close to the total amount consumed by the Town government.

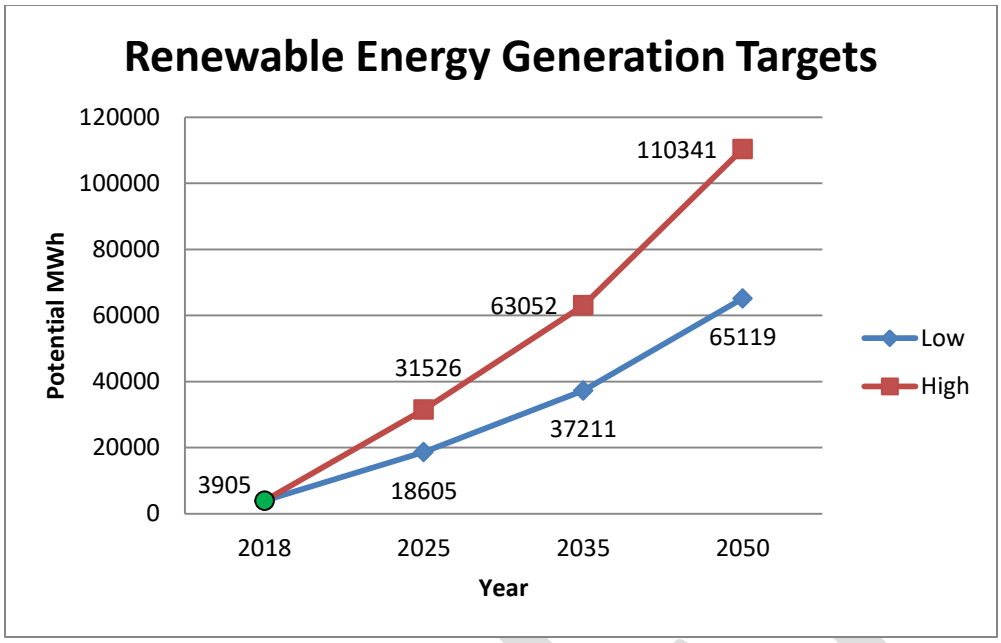


Wind: The ECOS Plan notes that Colchester has 4,359 prime and base acres available for wind usage, with a potential of 175 MW of capacity and an annual generation potential of 534,578 MWh. Using all available acreage would meet both the low and high targets for renewable energy usage in the ECOS plan. At this time Colchester's low level elevations combined with state and local constraints diminish the viability of commercial scale wind operations. Single turbines to serve the immediate needs of a particular property will continue to be viable.



(Figure 2, Source: CCRPC and Department of Public Service)

Several programs in Vermont provide residential and commercial renewable energy investment opportunities including but not limited to Federal tax credit incentives for solar installation, Efficiency Vermont's incentive rebates for efficiency practices, and bank/credit union loans for weatherizing and installing renewable energy resources. Typically homeowners can obtain reasonable interest rates on home improvements as they improve the value of their properties and are backed by the value of the property. Incentives that are available to residents of all financial backgrounds help to promote affordable energy and should be encouraged.



(Figure 2, Source: CCRPC Modeling & LEAP Model)

The Town of Colchester will continue to track energy production and conservation progress and will update targets with population and electricity consumption in this Plan as it evolves to the target year 2050.

Preferred site designation: As Vermont experienced a growth in renewable energy generation, Act 174 of 2016 was established to create the framework for a new set of municipal and regional energy planning standards. In accordance with rules established by the Public Utility Commission (PUC), net-metering renewable energy projects that are large enough to produce between 150 and 500 kilowatts must be built on "preferred sites." While the PUC does not regulate non-net-metering developments over 500 kW, the PUC has given communities the ability to define what a preferred site may look like. The process of determining preferred sites must evaluate the constraints and the impact on the site itself as well as the impact it has on the community and culture of the area.

When identifying preferred sites for net-metering renewable energy generation, it should be noted that the State designates development in already-developed areas (on structures, in parking lots, on landfills, over sand-gravel pits, etc.) as preferred sites by right. Sites that are not designated by the State as by-right preferred sites may be designated by municipalities as preferred sites. On CCRPC MAP sites located in the "base" areas may be considered but ultimately discouraged in order to preserve the agricultural and natural aesthetic of the Town. Physical and visual impacts should be minimized when these areas are developed. As these lands are ecologically important, care should be taken to avoid development for energy generation in

these areas. The Town should prioritize conservation of these areas and focus development in other, already developed, or non-constrained areas.

The Town of Colchester has developed the Preferred Site Designation Scorecard to evaluate which sites should be given this status as well as what projects conform to this plan. The Scorecard is hereby incorporated by reference into this plan and will be adopted simultaneously with the plan. This Scorecard may be amended by the Colchester Selectboard in consultation with the Planning Commission. Sites are deemed to be preferred sites if judged to have sufficient points by the Colchester Planning and Zoning staff. An affirmative determination by staff shall mean a preferred site designation by the community. If sites are deemed to be marginal or not sufficient by staff, based upon the point system, the applicant may request the Colchester Planning Commission consider the project. If the Colchester Planning Commission utilizes the Score Card to provide the project preferred site designation, the site will be designated as a preferred site by the Selectboard.

The Scorecard is a path to preferred sites for all alternative energy generation. While the card is designed primarily for solar, other facilities such as biomass, biogas, biofuel, and geothermal should be eligible too. Sites located within areas of local known constraints including slopes 20% or greater, floodplain, wetlands or surface water buffers, and the Shoreland District are not permissible sites. Projects that are designated as preferred sites will also be projects that conform to this plan.

POLICIES:

1. The Transportation Capital Plan should be used to leverage funding for the continued implementation of multi-use paths throughout the community.
2. The Town should continue to partner with Green Mountain Transit to provide mass transit options for residents.
3. Infill and cluster development, such as PUDs, should continue to be encouraged through the Development Regulations in conjunction with the Village Mixed Use and Growth Center areas to reduce energy needs and support densities that could, long term, support investments such as heat plants.
4. The Town should promote weatherization and other sustainable energy investments by the community and continue to serve as a model through implementing improvements and efficiencies to Town facilities.
5. The Town should consider joining ICLEI as a means of promoting sustainability and receiving technical support in its energy efforts.
6. Much of Colchester's economy has historically relied on agricultural production within the Town. The Town should continue to promote local food as a means to reduce carbon footprint associated with food production. Continued efforts by the Colchester Food Shelf to glean and reduce food waste should also continue to be supported as about one third of

the food produced for human consumption worldwide is wasted increasing both carbon and methane gas from production and discard.

7. While Act 250 has helped to promote stretch energy codes, many existing properties in Colchester are subject to pre-existing Act 250 permits that specifically ban electric heat. The conversion of these properties to electric heating may require work with the District Commission. The Town should be supportive of such modifications as electricity becomes an affordable thermal source and assist property owners with navigating this process.
8. Building codes and development requirements should be continuously re-evaluated to include new technologies that improve efficiency and the use of renewable resources. Barriers to the installation of heat pumps and other bridge technologies, especially for thermal use, should be reduced or eliminated.
9. At the time of the development of this plan, suitable metrics for many of these milestone are not yet identified. During the term of this plan, the Town should work with CCRPC to quantify progress.

ACTIONS:

1. While Colchester's building codes have stringent requirements for enhancing energy efficiency in construction, additional standards such as green construction or net zero requirements could be added to further reduce energy use related to buildings. During the term of this plan, Planning and Zoning Staff should work to evaluate the benefit of additional code requirements to reduce energy and increase sustainability in construction while considering the need for affordability.
2. The Town should designate an energy ombudsperson within Planning and Zoning to direct community members to sources of information regarding weatherization and other energy efficiency opportunities within a year of adoption of this plan.
3. The Town should evaluate the designation of the Planning Commission as an official energy committee to promote and evaluate energy planning on the behalf of the Town working with an ombudsperson in Planning and Zoning. The Town should partner with groups such as Button Up Vermont, Efficiency Vermont, GMP, the Champlain Office of Economic Opportunity (CVOEO), and pursue grants to promote information on weatherization and other energy improvements.
4. During the term of this plan, the Town should site another solar photo voltaic generation facility on Town land so as to approach a goal of producing electrical energy close to the total amount consumed by the Town directly.

5. The Town should continue to work with organizations such as the Champlain Housing Trust to make their existing properties more energy efficient and to provide other alternatives to home owners in our community through their programs.

6. The Development Regulations should be revised within three years to include standards for electric car charging stations and include further incentives within the parking standards for transportation demand management or other vehicle reductions.
7. The Town should continue to utilize ClearPath to monitor greenhouse gas emissions.
8. The Town should continue maintaining information on vehicle efficiency to improve the ClearPath model and inform decision making regarding the purchase of newer, more efficient, vehicles including electric vehicles.
9. The Town will continue to utilize the Vermont Community Energy Dashboard and keep updated with information on solar panel permits and other energy efficiency measures (retrofitting electric systems, replacing windows, etc.)..
10. The Town will implement a scorecard review process involving Planning and Zoning Staff and the Planning Commission to objectively assess sites for possible "preferred site" designation.