

Energy Element – Executive Summary

Planning Commission Hearing Draft – July 2019

A summary of the Energy Element of the Jamaica Town Plan is presented in this section. The full Energy Element is attached as an Appendix to this plan. Jamaica's Energy Element addresses the need to reduce carbon-based pollution (CO₂) of the atmosphere with a realistically executable energy plan that preserves the nature of our town, prized by both our residents and many vacation homeowners. It is also intended to provide our residents the significant cost savings in energy costs that advances in energy technology will offer. Our goal is to meet the requirements of Act 174 which embodies the energy saving and sourcing goals of Vermont's 2016 Comprehensive Energy Plan in a manner that is consistent with Jamaica's long-standing Natural Resources, Land Use, and Economic Development policies. This Energy Element will be used as a tool to advance the economic and environmental well being of Jamaica, thereby improving the quality of life for its residents. Furthermore, these energy goals will reduce Jamaica'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 cost of energy in Jamaica, including residential, commercial and governmental use (for heating, electricity, transportation, etc.) is estimated to be \$3,897,193 per year. Because a large majority of this energy is imported from outside of Jamaica and Windham 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, or shift reliance to locally produced energy, can improve household financial security and strengthen the local economy.

The Energy Element has three major components, improving the efficiency of thermal and electrical energy usage, switching fuels for more efficient heating and transportation, and conversion to renewable energy sources for transportation, heating and electricity generation. The plan implements these components through a program of community outreach to bring energy saving measures to the community's attention and thereby promote the opportunity to reduce energy costs. The plan will meet the Windham Regional Commission's (WRC) allocation of transportation and home heating energy savings and renewable energy sourcing targets necessary to be Act 174 compliant in a manner consistent with preserving our town's rural nature and consistent with the pace at which enabling technology and low cost financing become available. Jamaica fully embraces the regional targets for renewable energy generation to be met by solar installations and residential wind generators, as well as the goals for energy conservation in home heating and transportation. These targets are summarized in table E1 below. Additionally, we will explore adding micro hydroelectric generation to our generation mix.

Preserving the Town's natural environment is essential to Jamaica's economy and tax base. Many visitors to our state and virtually all of the Town's residents value the area's natural beauty, including the state's most popular state park. For these reasons, commercial wind energy sources, which by their nature must be located on ridgelines on which the long established land use policies of our town plan prohibit development, are not considered appropriate for Jamaica and are therefore excluded under the provisions of this plan. While the Windham Regional Plan does not presently assign a target for wind-generated renewable energy, it is Jamaica's policy to meet regional community renewable energy targets with solar, residential wind, as defined in the full energy element, and possibly micro-hydroelectric generation and to exclude commercial wind development, also defined in the full energy element, as both unnecessary and inconsistent with long-standing Town land use policies. Residential wind development will be encouraged in areas specified by the Wind Potential and Resource map (maps 4 and 5 of Appendix A) of the Mapping Appendix of the Energy Element that are not constrained by Act 250 considerations or provisions of our town plan. It is further considered that the regional targets based on current commercially available technology may prove to be very conservative by 2050. Excluding commercial wind development does not interfere with the town's ability to reach its renewable energy targets.

The plan is realistically attainable. By design, some Act 174 targets for key dates are aspirational. Several enabling technologies are necessary to achieve large-scale penetration of renewable energy generation into the power grid. These include energy storage, power electronics, and smart grid architecture and technology, including grid control. Vermont's current limit on net metering, 15% of base load, is a reflection of the difficulty in accommodating the variable levels of renewable energy source output in the current power grid. Technologies that deal with the variable nature of renewable energy sources and exploit their geographical distribution are necessary to relaxing net-metering limits in order to achieve broad utilization of renewable energy sources. Similarly, conversion to electric, hybrid, or alternate fueled vehicles is dependent on market availability of alternative vehicles suitable for rural use, e.g. trucks, all wheel drive vehicles, and heavy utility vehicles. Improved energy storage is key to developing markets for these vehicles. These technologies are in various stages of research and commercial development with unknown maturity dates. Community outreach efforts will include maintaining awareness of maturation of these technologies so that opportunities based on their use are introduced to the community as soon as available.

The major benefit to our citizens' is reduced energy expenses. The cost of renewable energy continues to fall and is predicted ultimately to be much less expensive than fossil fuel-based sources. The combination of low-cost energy and the technology to deliver it to all domestic and industrial energy users will in turn spawn economic models with minimal capital expense and much reduced unit costs. The future difference between fossil fuel and renewable sources will be sufficient to finance the upfront capital costs of installations within unit costs and still offer users considerably less expensive energy unit costs than are currently possible. Both these developments, low unit costs and

amortization of capital conversion costs within the lower unit costs, will provide our residents' major cost saving opportunities while reducing CO₂ emissions. Our plan includes efforts to keep abreast of these much-anticipated technology and economic trends so that we may be able to take advantage of them as early as possible.

While Jamaica 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 Jamaica's local actions for increasing our energy efficiency and promoting renewable energy generation, and overall pathways to become more resilient. We will adopt policies to meet our specific goals as technology and economic developments permit.

The Windham region has been assigned goals for efficiency improvements, use of alternative fuels, and generation of renewable energy for the benchmark years 2025, 2035, and 2050. The Windham Regional Commission (WRC) has in turn apportioned these goals to each town. Meeting these specific goals will make our town's energy use compliant with Act 174 and Vermont's 2016 Consolidated Energy Plan. This plan commits Jamaica to meeting the goals assigned to it within the constraints imposed by the pace of introduction of enabling technologies and cost effectiveness. They are summarized in Table E1 below.

Category	2025	2035	2050
Efficiency Targets at Benchmark Years			
<u>Residential Thermal</u> : Estimated number/percent of houses to be weatherized to meet efficiency goals	94 / 9%	184 / 17%	377 / 36%
<u>Commercial Thermal</u> : estimated number/percent of commercial establishments to be weatherized	3 / 9%	6 / 16%	10 / 30%
<u>Electricity</u> : Estimated number/percent of kilowatt hours to be conserved annually and percentage of building upgrades	561,700 / 42%	917,900 / 68%	1,342,600 / 100%
Fuel Switching Targets			
<u>Residential and Commercial Fuel</u> : Estimated number of new wood pellet stoves and high efficiency wood boilers	280	266	266
<u>Residential and Commercial Fuel</u> : Estimated number of new heat pumps	87	172	24
<u>Transportation Fuel</u> : Estimated number of new electric vehicles	60	424	896
<u>Transportation Fuel</u> : Estimated number of new bio-diesel vehicles in town	92	176	304

Use of Renewable Energy			
<u>Transportation</u> : Percentage of total BTUs consumed	13%	31%	90%
<u>Heating</u> : Percentage of total BTUs consumed	56%	67%	93%
<u>Electricity</u> : Estimated number of MWh to be produced from residential and commercial solar, residential wind, and small hydroelectric generators	308	492	1,231

Table E1
Summary of Jamaica's commitment to meeting allocated energy goals