



ENERGY

CHARLESTOWN COMPREHENSIVE PLAN

A description of Charlestown's unique energy history, both conventional and alternative sources, and recommendations to achieve the goal of meeting future energy needs in an efficient and environmentally sustainable manner.

Cover Photo: Frances Topping

ENERGY CHAPTER

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CHARLESTOWN COMPREHENSIVE PLAN

CHAPTER 6. ENERGY

Planning Commission Final Draft; December 2019

INTRODUCTION

As with every other community in the state, energy production and use in Charlestown is in a period of change, with major implications for the future. Energy use is inextricably linked with the town's environment; climate change is a global problem that all communities, large and small, need to play a role in addressing. In Charlestown where natural resources are important to drinking water, wildlife and the tourism based economy, alternative energy solutions to climate change must also be consistent with other goals for the protection of the local environment.

Energy in Charlestown has an important history. The forests have been managed for firewood for thousands of years. The Pawcatuck River powered grist and textile mills. In the 20th century, two nuclear power plants were proposed for the edge of Ninigret Pond. In the 21st century, utility scale wind turbines have been proposed close to Ninigret National Wildlife Refuge and utility scale solar facilities have been proposed for Charlestown's farms and forests. All of these have inspired passion in Charlestown's citizens when natural resources appear to be threatened.

Despite a history of controversial energy proposals, both the town government and the citizens of Charlestown have been leaders in energy efficiency and the use of alternative energy. Charlestown's dark sky initiative saves electricity while protecting human and wildlife health as well as the view of the stars. PRISM, the Partnership for Rhode Island Street Light Management, was conceived in Charlestown in 2016 under the leadership of the Charlestown Town Council. Over 300 Charlestown households participated in RI Energy Challenge's "*Find Your Four*" campaign. In 2017, Charlestown had one of the state's most successful local *Solarize RI* campaigns, with over 55 households signing contracts for solar energy systems. Charlestown is also a designated Property Assessed Clean Energy (PACE) community, allowing use of innovative financing for energy system improvements to commercial property through the Rhode Island Infrastructure Bank.

RELATIONSHIP TO OTHER CHAPTERS

This chapter, which describes Charlestown's energy history and proposals for the future, particularly in the area of alternative energy, complements four others:

Natural Resources Chapter

The importance of Charlestown’s forests, wetland systems, and wildlife habitats and corridors are discussed in detail in the Natural Resources chapter. If not managed well, energy production in Charlestown could threaten these resources. The Nature Conservancy has cautioned that “energy sprawl”, which is defined as widespread energy infrastructure development, is one of the most fundamental challenges that nature and humanity face in the coming decades.¹ But energy production may also represent an opportunity to manage growth and protect Charlestown’s natural resources. This chapter will discuss how to use energy production to protect local natural resources, while the Natural Resources chapter catalogs those resources and explains their importance.

Services and Facilities Chapter

Energy production, while principally a private enterprise (although publicly regulated) is most closely aligned with community services and facilities. Many of these services have an energy component. The town also has a role in managing its own buildings and grounds in a manner that conserves energy. Public facilities and infrastructure and related issues are described in the Services and Facilities chapter.

Natural Hazards Chapter

The changing weather patterns brought on by climate change will affect all communities in Rhode Island. As a coastal community, Charlestown is also susceptible to the impacts of sea level rise, and the 20 year horizon of the comprehensive plan must address this eventuality. Climate change is driven by energy use; it is primarily a result of energy production from conventional sources like fossil fuels, although it occurs on a macro rather than micro scale. The impacts of climate change on Charlestown and its coastal areas are discussed in detail in the Natural Hazards chapter.

Transportation Chapter

Transportation accounts for more than 30% of the energy used in Rhode Island. In Charlestown that percentage may be even higher as a community with very limited public transportation. The Transportation chapter discusses plans for bicycle and pedestrian paths for residents and tourists, as well as policies to support ride hailing and ride sharing services. If successful, those efforts will offset some of the energy used for transportation in Charlestown.

¹ <https://www.nature.org/magazine/archives/energy-sprawl.xml>

EXISTING CONDITIONS

Energy use in Charlestown is typical, consisting predominantly of electricity provided by National Grid and propane and fuel oil for space and domestic water heating. As a rural community, Charlestown also has many homes where wood is the primary or secondary heat source.

Municipal Energy Use

Charlestown has made progress to reduce municipal energy use in its buildings and streetlights as described in this section.

Municipal Buildings Energy Audits and Improvements

On behalf of the towns and school districts that make up Washington County, the Washington County Regional Planning Council received funding under the federal Energy Efficiency and Conservation Block Grant program (an energy initiative of the American Recovery and Reinvestment Act of 2009) to undertake a series of energy audits of, and improvements to, municipal buildings through a process called performance contracting.

The energy audit, completed in 2012², identified many opportunities to reduce energy costs within town buildings, which included the Town Hall, Senior/Community Center, Charlestown Animal Shelter and Charlestown Police Station. These included a new boiler and installation of a new “energy management system” in town hall, use of programmable thermostats in the Senior/Community Center and the animal shelter, and a number of capital upgrades to all of the town buildings – lighting retrofits, weatherization, pipe insulations, etc.

After completion of the audit, the energy services company recommended the specific projects and then was responsible for their completion. The costs of the improvements are covered by the savings in energy costs over a 20 year period.

Based on energy audits conducted on an as-needed basis through RISE Engineering, the town has also completed a number of energy efficiency improvements to its municipal and recreational buildings, primarily for energy efficiency lighting. These include conversion of exterior building and parking lot lighting to LED at the Town Hall and Senior/Community Center, the installation of an emergency generator at the Senior/Community Center, and most recently, the conversion of interior building lighting at the Town Hall to LED.

² Town of Charlestown Detailed Energy Audit Report: February 2012, Johnson Controls, Inc.

Partnership for Rhode Island Streetlight Management

The Partnership for Rhode Island Streetlight Management (PRISM)³ was first conceived by members of the Charlestown Town Council in cooperation with the Washington County Regional Planning Council (WCRPC). As of September 2016, it has become a statewide program, lowering energy use and providing significant cost savings. PRISM allows municipalities to purchase and control their own streetlights, remove any unneeded lights, and include energy efficient lamps and dimming controls on existing streetlights. In Charlestown the fixtures are designed to shield the lights to reduce light pollution and protect the dark skies. Charlestown will save an average of \$12,000 in annual maintenance costs and an average of \$27,000 in annual electrical costs by owning and controlling its own streetlights. LED lighting will increase annual energy savings by 60% or more. Charlestown's streetlights now include an "Intelligent Streetlighting" system that dims the lighting by 50% from 11 pm to 5 am, a reduction in energy use that translates to an additional savings of over \$30, 000 each year.

Energy Policies and Programs in Charlestown

Dark Sky Ordinance

The Charlestown Dark Sky Lighting ordinance⁴, which regulates the installation of outdoor commercial and municipal lighting, is intended to protect Charlestown's unique dark sky for astronomy purposes, to protect residents and the surrounding environment from the effects of light pollution, and to also promote energy efficient and sustainable lighting practices. New lighting fixtures and installations compliant with the standards of the International Dark Sky Association are required. This regulation reflects Charlestown's overall sustainability ethic. In addition to the ordinance, a brochure was created to educate the public entitled: "*Good Neighbor Outdoor Lighting - A Guide for Businesses, Homeowners, and Builders*".

Rhode Island Energy Challenge by National Grid

Charlestown citizens are committed to energy efficiency initiatives as demonstrated by the town's successful participation in the "Rhode Island Energy Challenge *"Find Your Four"* campaign (find four simple ways to save energy in your home) promoted by National Grid. The challenge requires that five percent of Charlestown residents sign up for the statewide energy efficiency campaign. As of August 2016, over 300 Charlestown households participated, and as a result, the town received a \$5,000 grant that was earmarked for the purchase of energy efficient lighting.

³ <http://www.prismstreetlights.org/>

⁴ <https://ecode360.com/16099584>

Solarize Charlestown

In 2017 the Rhode Island Office of Energy Resources and Commerce RI selected Charlestown to participate in a “Solarize” program to make solar energy more affordable to residents and small businesses, and to simplify the process of finding a contractor and installing solar panels for personal electric generation. Over 320 households requested solar assessments during the sign-up period. Those leads resulted in 58 rooftop solar contracts which is the highest per capita participation of any municipality in the state solarize program. Charlestown had a very strong marketing program that used popular local social media sites, direct mailing, email, letters to the editor, and neighborhood associations. Most of the contracts received incentive funding under Rhode Island’s Renewable Energy Growth Program (REG).

Community Development Block Grants

Over the years the town has allocated federal Community Development Block Grant (CDBG) funds for weatherization of qualifying low and moderate income housing as approved by the Town Council and managed by the Washington County Community Development Corporation (WCCDC). Since 2011, the CDBG Home Repair program has completed repairs on 56 units in Charlestown, 45 of these were single family homes and 11 were in multifamily dwellings. A total of \$365,000 was spent.

Each building is inspected for code compliance and all “necessary and reasonable” repairs are addressed. Windows and doors are replaced with energy efficient models as needed. All new products installed are specified to meet water saving and energy star requirements. The WCCDC works in conjunction with the Tri County Community Action Weatherization Program. Tri County’s program completes the insulation and heating system upgrades needed if the client qualifies, which they often do.

State Energy Plans, Policies and Programs

These State of Rhode Island efforts on energy influence local energy policy. There are several planning and policy documents which guide energy use and production at the local level.

Energy 2035, Rhode Island State Energy Plan, a State Guide Plan Element

The Rhode Island State Energy Plan, updated in late 2015 with a 20 year planning horizon, has a vision of a secure, cost-effective and sustainable energy system in Rhode Island across all sectors – electricity, heating and transportation. Energy 2035⁵ encourages communities to adopt local

⁵ <http://www.planning.ri.gov/documents/LU/energy/energy15.pdf>

siting standards for renewable energy that best fit their municipal energy needs, capacities and resources. The goals and policies of Energy 2035 are reflected in this chapter.

Rhode Island Renewable Energy Siting Partnership

In 2011 the University of Rhode Island (URI) was asked by the Governor and the state Office of Energy Resources (OER) to provide technical expertise regarding the effects renewable energy may have on the people, wildlife and natural resources of Rhode Island. A resulting stakeholder and public engagement process brought together a diverse group of constituents including representatives from municipalities, relevant government agencies, non-governmental organizations, utilities, land trusts, chambers of commerce, tourism groups and businesses. The purpose of this Rhode Island Renewable Energy Siting Partnership (RESP)⁶ was to provide siting guidance and data to local communities considering renewable energy development, and to inform local deliberation about whether to pursue renewable energy opportunities and what to consider when siting them. It was a collaborative effort with OER and the RI Statewide Planning Program.

In December 2012 the RESP produced a two volume, over thousand page report. The first volume, a summary report, addresses the siting issues of wind energy, landfill solar and hydropower. This was supported by the second volume, a series of technical reports, mostly focusing on the siting of wind energy facilities and their impacts. This work relied on a team of skilled professionals including staff at the Coastal Resources Center, scientists at URI and the Graduate School of Oceanography, Roger Williams Law School, Coastal Resources Management Council, Department of Environmental Management, Economic Development Corporation (now Commerce RI), and others. This chapter relies on science provided in the RESP.

The Rhode Island Greenhouse Gas Emissions Reduction Plan

The Rhode Island Greenhouse Gas Emissions Reduction Plan, adopted in December 2016⁷, includes strategies, programs and actions to meet the targets for greenhouse gas (GHG) emissions reductions as established by the Resilient Rhode Island Act.

The “Land Use Conservation” strategy of the plan states:

Land use conservation strategies preserve natural systems and environments that provide carbon dioxide “sinks,” helping to reduce the state’s net GHG footprint. Strategies include protecting existing forest acreage, reforestation, conservation of riparian buffers, enhanced forest management programs (on both private and public lands), reductions in

⁶ http://www.crc.uri.edu/projects_page/rhode-island-renewable-energy-siting-partnership-resp/

⁷ <http://climatechange.ri.gov/documents/ec4-ghg-emissions-reduction-plan-final-draft-2016-12-29-clean.pdf>

soil erosion to minimize losses in soil carbon storage, coastal wetland protection (e.g. blue carbon), and enhanced urban tree canopies. Scenario modeling results indicate that achieving the Resilient Rhode Island GHG targets could likely require no net future loss of forest or cropland. Policymakers could aim to align future local and state conservation policies with this broader goal, and adoption of a “no net-loss of forests” policy.

As a community outside of the Urban Services Boundary as described in the RI State Land Use Policies and Plan (“Land Use 2025”)⁸, Charlestown is already meeting the above strategies of the GHG emissions plan. Over 35% of the town is protected conservation land that includes forest and farmland. The existing land cover indicates that approximately 70% of the town is forested with many areas in un-fragmented tracks of over 100 acres. Many of these forested areas are managed for firewood production. The town has maintained its traditional development pattern of density in villages and low density residential development outside the villages and commercial areas. Bike paths have been created and more are planned. The dark sky ordinance and policies encourage energy efficient lighting.

In order to achieve the GHG emissions plan goal of no net future loss of forest or cropland, Charlestown will need to continue to acquire land for permanent conservation, direct development away from the remaining undeveloped land, and continue to concentrate development in the villages and existing neighborhoods using tools such as transfer of development rights and neighborhood infill, as well as mandating cluster or conservation development that protects most of the land that is slated for residential subdivisions.

In order to achieve both no net forest/cropland loss and increased energy production, Charlestown will have to find solutions to these two goals that achieve both simultaneously.

RI Infrastructure Bank Programs

Efficient Buildings Fund:

The town has also made application to the Efficient Buildings Fund, a statewide loan program available to municipalities to complete energy efficiency and renewable energy projects. Applications are made to the Office of Energy Resources with funding through the RI Infrastructure Bank.

Property Assessed Clean Energy:

Property Assessed Clean Energy (PACE) is a financing program of the RI Infrastructure Bank that allows commercial and multi-family property owners to receive funding for energy efficiency and

⁸ http://www.planning.ri.gov/documents/guide_plan/landuse2025.pdf

renewable energy improvements that is repaid in conjunction with local property taxes. Owners repay the cost of eligible improvements (energy efficient boilers and furnaces, building retrofits, automated building controls, insulation, solar PV systems, etc.) over a period of up to 25 years through an assessment that is added to the property tax bill. Resulting energy savings typically outweigh the annual assessment payment. Charlestown enrolled in the PACE program in 2016.

Renewable Energy Siting Stakeholder Group

In response to the state’s commitment to the development of clean renewable energy sources while protecting natural resources and the character of its communities, as outlined in *Energy 2035*, and in anticipation of legislation supporting this goal through renewable energy siting regulations, the OER and DEM formed an ad-hoc group of stakeholders to discuss energy siting needs, challenges and issues. This group met in the late summer and fall of 2017, throughout 2018 and into 2019. There was much work and discussion on drafting energy siting legislation with the primary focus on commercial solar installations.

In March 2018, the stakeholders group adopted the “Rhode Island Principles for Renewable Energy Siting” as a holistic framework to integrate competing interests in drafting policies and practices to facilitate the development of renewable energy in the state. This Energy chapter is intended to implement these principles in Charlestown by planning for local energy production that assists in achieving state renewable energy goals while protecting Charlestown’s open spaces, forests and farmland and ensures local control over land use decisions. The principles are listed in Appendix EN-1.

The OER and the Division of Statewide Planning, in coordination with DEM, also hosted a series of community-oriented public meetings around the state in the summer and fall of 2018 with the goal of developing renewable energy siting guidelines and the drafting of model ordinances relating to taxation and zoning.

ENERGY IN CHARLESTOWN: HISTORY, ISSUES AND OPPORTUNITIES

The following section is a history of the types of energy production proposed or developed in Charlestown, and a discussion of the opportunities associated with each. These histories can help to inform future decisions about fuel types and energy production in general.

In producing energy, Charlestown will seek solutions that protect or enhance its natural resources. When proposed energy facilities threaten the local environment, they have been met with stiff opposition from Charlestown’s residents. Two examples of natural resource conflict discussed below are nuclear power and utility scale wind.

When planning for energy production, Charlestown will need to establish regulations that tie energy production to the “Land Use Conservation” strategies of the *Rhode Island Greenhouse Gas Emissions Plan*.

Biomass – Wood Heat

After the glaciers retreated and forests returned to Rhode Island, local inhabitants began using wood for heat and cooking. This practice has continued uninterrupted into the present.

Locally grown firewood lessens dependence on fossil fuels, makes the forests more productive, and creates local jobs through the sustainable management of forest land. As of 2018, over 1,700 acres of land in Charlestown are enrolled in the Farm Forest and Open Space (FFOS) program. Many of these are managed forest lands that produce firewood and lumber. Many other Charlestown land parcels not enrolled in FFOS are also managed as wood lots.



Sue Tremblay

Wood Pile on Parcel Managed as a Wood Lot

In addition to providing fuel, Charlestown’s forests play a critical role in mitigating the effects of climate change on both the natural and human environment. Healthy forest ecosystems sequester carbon. Trees help protect human health by moderating temperatures, especially during summer heat waves, and reducing air pollution that contributes to respiratory problems. Forested buffers keep streams and rivers cool, necessary for fish habitat, and prevent nutrient and sediment runoff from harming water quality. Forests provide recreation and scenic beauty and also serve as wildlife habitat. Charlestown’s forests are part of a corridor of forested open space that extends from the ocean in Charlestown up to the state border with Massachusetts. This forested corridor is critical to helping the state’s wildlife adapt to climate change.

Wood as a fuel source has some drawbacks, including gases, particulate matter and other pollutants. In 2009 Charlestown passed an ordinance to regulate outdoor hydronic heaters⁹. This ordinance requires a permit for such heaters and regulates their location, operation and use, including the types of materials which can be burned. Indoor woodstoves are not regulated beyond inspection for safe installation. Along with promoting firewood from local managed forests and working to connect local producers with consumers of firewood, the town should provide education on new wood burning appliances that provide increased efficiency and lowered emissions, and are safer to operate.

The Rhode Island Woods website¹⁰ provides property owners with information on forest management, and how to connect with forest managers and create markets for firewood and other woodland products. Charlestown should promote this website and similar information resources to make residents aware of sources of local firewood, and to help local forest owners maintain markets for their products.

Hydropower

The Pawcatuck River forms the northern boundary of Charlestown leading from Worden Pond to the confluence with the Wood River at Meadow Brook Pond in Richmond. Many of the dams built along the Pawcatuck were constructed to generate power for the grist and textile mills that grew up along the river's edge. In recent years, work to restore diadromous fish to the Pawcatuck River has resulted in the removal of several dams and construction of fish ladders where some dams will remain. Completion of the project will allow river herring and other migratory fish, such as American shad, American eel, and brook trout, access to spawning and rearing habitat in the upper Pawcatuck, Beaver, and Usquepaug Rivers, as well as the ancient glacial lake that is Worden Pond. As migratory fish are restored, some opportunities for hydropower have been removed. The Pawcatuck will only become a source of power again if that can be achieved without interfering with efforts to restore these fish populations.

Nuclear Power

In 1973 the US Navy announced that the Charlestown Naval Auxiliary Landing Field, a WW II-era naval training base lying along the shores of Ninigret Pond, was excess to their needs. The US General Services Administration then initiated the process of disposing the property. In response, the New England Power Company (now a subsidiary of National Grid) pursued acquisition of the base as the site to build two 1,150 megawatt nuclear power plants. The company planned to cool the power plants with water from Block Island Sound. After nearly six years of studies, passionate debate and litigation, the power plant proposal was dropped in favor of transferring the land to the

⁹ <https://ecode360.com/13939635>

¹⁰ <https://rhodeislandwoods.uri.edu/>

Town of Charlestown and the US Fish and Wildlife Service (by way of the US Department of Interior). These irreplaceable public lands are now the 230 acre Ninigret Park and the 380 acre Ninigret National Wildlife Refuge. Charlestown's opposition was the first successful campaign in the United States to halt the construction of a nuclear power plant. The years of environmental study to oppose the plants also launched a movement to preserve the coastal ponds.

Nuclear power seems highly unlikely to be proposed again for coastal Charlestown as the land and ponds are now protected as federal, state and local parks and refuges. But before the memory and details of this history are lost, the town should support a process to compile these studies and other documents and create a history of the nuclear power proposal. History is more likely to be repeated if it is allowed to be forgotten.

Utility Scale Wind Energy

From 2010 to 2013 two proposals for a total of five industrial scale wind turbines either adjacent to or near the Ninigret National Wildlife Refuge were proposed in Charlestown.

The first proposal for three utility scale turbines in Ninigret Park near Frosty Drew Observatory and Science Center, and adjacent to the National Wildlife Refuge, was initiated in 2010 by the Town Administrator in place at that time. Because the transference of the land to the town by the Department of Interior in 1981/82 came with a restriction that it be used exclusively for public park or recreation purposes, and also that any use be compatible with the adjoining wildlife refuge, the National Park Service formally opposed the placement of the turbines, thereby preventing any further consideration of the project.

A second proposal for two utility scale turbines on what is now the Charlestown Moraine Preserve, a 78 acre parcel with frontage on Route 1, was made by a private developer, also in 2010. These turbines were proposed just at or within the setback limits as recommended by the RESP (in draft form at that time) for National Wildlife Refuge properties, the coastal ponds and habitats for wading/shore birds. The proposal drew tremendous opposition from neighbors north and south of Route 1, with more than 400 residents regularly showing up for multiple public hearings.

Following two years of legal wrangling in the town over the application for the two turbines, (which included consideration of the potential impacts of the turbines on wildlife), the Town Council in place in summer of 2013 made a decision to purchase the property for open space preservation. The Charlestown Moraine Preserve now protects groundwater, the coastal ponds, wildlife habitat and dark skies. It provides public access for passive recreation such as hiking, and visually protects nearly a mile of road frontage on Route 1, a state scenic highway.

In December 2012, the Rhode Island Renewable Energy Siting Partnership (RESP) report was published. Part of the report was the establishment of setbacks for wind turbines for the protection

of bird and bat populations. These setbacks include 1 kilometer (km) setbacks to National Wildlife Refuge properties and the coastal ponds and beaches, and lesser setbacks to any conservation land, contiguous forest, large grasslands, osprey and falcon nests, wetlands and other wildlife areas. Charlestown is so rich in these features that there is little area not inside these setbacks. These setbacks are shown in a table contained in Appendix E-2 which illustrate just some of the constraints to siting large-scale wind turbines in Charlestown.

In addition to concern with bird habitat, it is known that slow turning blades, resulting from low wind speeds, are correlated with higher bat fatality rates. The greatest bat fatality events occur when wind speeds are below 11 miles per hour (6 meters per second). Shutting down wind power generation during periods of slow wind speed, when bats are most prone to collision, has proven effective in reducing bat mortality. The RESP recommends a cut in (start up) speed of 6 meters per second to avoid bat mortality, but outside of the coastal areas the average wind speeds are lower than this. For example, the turbines proposed at the Charlestown Moraine Preserve had a cut in speed of 3 meters per second to take advantage of the lower wind in that location. Siting utility scale turbines in Charlestown in a manner which also protects wildlife would be a challenge.

The State Guide Plan element, Energy 2035, directs municipalities to use the RESP setbacks to guide the siting of large-scale wind turbines. When writing an ordinance for large-scale wind, the entire RESP document should be consulted.

Small Scale Wind Energy

Zoning regulations for small-scale wind turbines (“*Residential Wind Energy Facilities*”) have been in effect since late 2011¹¹. Drafted by the Charlestown Planning Commission, the regulations are intended to balance the right of the applicant to harness wind energy with the right of neighbors to the safety and enjoyment of their property. The Building Official is authorized to issue permits for any turbine that meets the height limits set for a primary structure. Specifications provided by the manufacturer are accepted measures in the application. To save on costs for electrical hook-up, no restriction is placed on proximity of the turbine to the residential structure. Taller turbines are a greater imposition on neighbors, and therefore require a special use permit. Since all of Charlestown must meet code for what is designated as a “High Wind Zone”, structural and electrical work must be certified by an engineer licensed in RI.

Utility Scale Solar Energy

As of late 2018, Charlestown had no regulations governing commercial solar installation in town, effectively prohibiting solar energy as an electric power production source. In 2017, a developer introduced a text amendment to the Charlestown Zoning Ordinance to facilitate a 5 megawatt solar

¹¹ <https://ecode360.com/14619502>

facility on farmland in Charlestown and potentially other parcels. The Town Council turned the text amendment down because of environmental and procedural concerns. Although this particular amendment did not become effective, the Town Council recognized the need for an ordinance to regulate the development of commercial solar energy systems in town.

In Charlestown, many large landowners have been approached by solar developers with unsolicited financial offers. Even in the absence of an ordinance to allow utility scale solar development, the pressure on landowners and the town was and is intense.

Charlestown's large-scale solar ordinance will need to be protective of forest and other natural resources. Charlestown should issue, such as Vermont does, a "certificate of public good" for large-scale solar projects that meet certain criteria. Projects that do not meet such criteria would not be approved. Possible criteria could include:

- Reuse – Landfill, gravel banks, or other degraded land would be prioritized (in concert with appropriate remediation).
- Growth management – Parcels developed for solar rather than housing could be protective of groundwater and might lessen other impacts of residential development. The area allowed for solar would be a function of the number of allowed houses on that parcel and the remaining land would be held in a temporary conservation easement for the life of the project. For any particular parcel, there should be a near equivalency between the area of disturbance expected for a residential subdivision and the area of disturbance for a solar installation. Under RIPDES regulations the town is currently seeing about 0.5 acres of allowed disturbance per single family home. Land is also cleared for road and drainage construction. Clearing for interconnection to the grid would also be counted against the total allowed area of disturbance.
- Land acquisition for conservation – If a modest portion of a parcel can be developed with solar, it could help to finance the permanent protection of the entire parcel including the remaining forested area. Such a scenario would further the goals of the RI Greenhouse Gas Emissions Reduction Plan by both preserving forest and replacing fossil fuels. Solar developers would have to partner with a government or conservation organization, and careful monitoring would have to be done to ensure that advance clearing to allow the solar placement does not occur.
- Government buildings – Federal solar incentives are based on tax credits and tax-exempt governments and organizations cannot take advantage of these. It might make sense for town government and others to lease rooftop space to a solar company.

- Government land – Non-forested areas of town lands which are not used for conservation or recreation could be used for smaller solar installations.

Zoning for large-scale solar projects requires specific development and approval standards, including but not limited to the following: visual buffers and other site standards to protect nearby residents and natural, scenic or historic areas; restrictions against forest clearing in excess of what would be expected by development following the underlying zoning; and a funding mechanism to ensure that removal and site restoration is achieved following the useful life of the solar facility.

Small Scale Solar Energy

In Charlestown the process to install solar panels for residential or small business use is fairly simple. Solar panels require a building permit for the structural portion and an electrical permit for the wiring. They are considered a part of the structure if they are secured to the building or an accessory structure if detached (ground-mounted). If roof mounted, the Building Department needs verification that the existing roof is designed for the added loads. If ground mounted, a site plan is required to verify that the structure meets the property line setbacks and the lot coverage limitations for the zoning district in which it is located. Both systems require a wiring schematic and certification that they are designed to meet the wind loads.

Such systems typically do not meet the entirety of the building’s electricity needs on an annual basis. For eligible customers, credit from National Grid is given during periods of excess energy production through net metering, a process which allows the customer to send unused energy to the grid, and receive credit (during a single billing period) when the energy produced from the solar panels exceeds the energy taken from the grid.

As described under the “Solarize Charlestown” program above (Existing Conditions section of this chapter), the interest in rooftop solar in Charlestown is great. If the incentives matched the demand, solar panels could be put on many hundreds more houses. When available, the current state and federal incentives make solar affordable and a good investment for homeowners.



Frances Topping Charlestown Home with Rooftop Solar Panels

In July 2018, OER, in coordination with the Distributed Generation Board, is proposing an increase in the number of megawatts of capacity available for rooftop solar under the 2019 Renewable Energy Growth Program. Under this proposal, the cap would be raised 27% to nearly 9 megawatts, allowing more homeowners across the state to access the program starting in the spring of 2019.

To facilitate roof-top solar, Charlestown should provide an informational brochure at the Town Hall on adding solar panels when a roof is replaced or including solar roofs in new house design. The town could also consider incentivizing solar roofs by reducing or eliminating building fees, particularly in cases where a new roof may be required to support the solar panels.

Many sites in town are also suitable for ground mounted solar arrays that are sized to serve on-site energy needs. There may also be a greater demand for ground-mounted systems as more automobiles are powered by electricity, and rooftop solar systems cannot produce all the power a family needs. Ground mounted systems as accessory structures can be encouraged by reviewing the applicable dimensional standards in the zoning ordinance, and considering adjusting minimum property line setbacks and maximum lot coverage requirements so as to make the systems easier to site.

Energy Efficiency

Recycling

At current loading rates it is estimated that the Central Landfill in Johnston, where waste is taken from Charlestown, will reach capacity in 2034. Increased recycling would help delay this. The town pays a tipping fee to the Rhode Island Resource Recovery Corporation (RIRRC) for waste taken to the site in Johnston, and those fees will increase significantly as the Central Landfill reaches capacity (see discussion in the Services and Facilities chapter).

Residents who take their own refuse to the Charlestown Residential Collection Center (CRCC) have a strong incentive to recycle. Recycling is free, while there is a fee per bag for solid waste. This incentive results in a high percentage of waste being recycled from the municipal drop-off program in Charlestown, over 30%. The CRCC also takes yard waste, which it composts and distributes back to interested residents.

Many residents contract with private waste haulers rather than make use of the CRCC. These private waste companies are required by state law to recycle, but it is unknown what their compliance is as many empty their trucks at transfer stations outside of Charlestown. Charlestown should work to ensure that these waste haulers are complying with state recycling laws.

Tourists and summer renters are likely not recycling at the same rate as local households and they account for the majority of the population in the summer. Additional publicity, enhanced public

education, and the strategic placement of recycling containers at key locations, such as beaches and tourist destinations, could all serve to increase the amount and type of recyclables the town brings to the state landfill in Johnston.

Composting

Charlestown is the composting center of Rhode Island by virtue of hosting both Earth Care Farm and the Worm Ladies of Charlestown.

Established in 1977, Earth Care Farm¹² is Rhode Island's oldest operating farm composter. The operation takes in about 10,000 cubic yards annually of organic matter otherwise destined for the state landfill. That material makes about 4,000 cubic yards of nutrient-rich compost. The compost is sold to home gardeners and landscapers to improve soil fertility, create a healthy habitat for microorganisms, and increase drainage, aeration and water holding capacity of soil. These are all factors that help soils better withstand weather extremes and disease associated with climate change. Earth Care Farm is eager to promote composting. They encourage visitors to stop in for a guided walk of the farm and to learn about composting techniques for the home.



Frances Topping

Compost Pile at Earth Care Farm

The Worm Ladies of Charlestown¹³ is a worm composting operation that started as a backyard project in the early 1990s. This business has grown to sell red wiggler worms by the pound, worm castings, indoor and outdoor worm bins, books on worm composting and other accessories. They run workshops and clinics on vermicomposting.

¹² <http://www.earthcarefarm.com/>

¹³ <https://www.wormladies.com/>

There are many homes in Charlestown already occupied by avid composters, but many more who are sending their kitchen waste to the landfill. With two such great leaders in composting in town, Charlestown should take an active role in encouraging and promoting composting by making these farm tours and workshops well known both locally and regionally. The town should consult with these businesses to learn if there are other strategies the town could use to increase composting in Charlestown.

National Grid Efficiency Incentives

National Grid has programs to promote energy efficiency. In 2012 National Grid provided \$158,000.00 in incentives to Charlestown residential, commercial, and industrial customers. Although these promotions are included in energy bills, many customers now use electronic bill payment through their bank accounts and may not be aware of the promotions. The town may want to coordinate with National Grid to help promote these incentives to raise awareness among Charlestown citizens.

Barriers to Efficiency

Charlestown should consider prohibiting developers from adding covenants to subdivisions that encourage energy use or discourage efficiency. These include items such as mandating large house sizes or prohibiting clothes lines or solar panels.

Transportation

Charlestown will continue to work to reduce vehicle miles traveled. It will continue to develop bicycle paths and lanes and connected hiking trails to encourage these forms of transportation where possible in and around town. It will encourage and promote ride hailing and sharing services to help connect Charlestown residents with Amtrak stations in West Kingston and Westerly and public transportation in more densely developed communities. This topic is discussed in depth in the Transportation chapter.

Energy 2035 Strategies

Energy 2035, the statewide energy plan, recommends six strategies for municipalities to consider as energy implementation actions to be included in comprehensive plans. These strategies are listed below, and many have already been achieved or implemented in Charlestown:

1. Conduct a municipal energy use baseline and develop a plan to reduce public sector energy consumption

Energy audits for municipal buildings are on-going, along with energy efficiency improvements.

2. Seek Property Assessed Clean Energy (PACE) designation for the community

Charlestown is open to making use of this financing program in response to interest on the part of commercial and multi-family residential property owners.

3. Adopt zoning and siting standards for renewable energy projects

Charlestown is committed to maintaining and strengthening such standards for both small-scale wind and solar. Zoning regulations for large-scale renewable energy will be written to implement this and related chapters of the comprehensive plan.

4. Use an expedited application and permit process for renewable energy facilities

Charlestown follows all state mandated streamlined solar permitting application processes (see OER regulations establishing the statewide solar energy permit application process covering both building and electrical permit aspects of solar energy systems; 300-RICR-00-00-3).

5. Replace end-of-life municipally-owned vehicles with high fuel efficiency and/or electric vehicles

All town vehicles purchased are as high efficiency as the market offers for each type of vehicle. In particular, the trucks and specialized street machines used by the Public Works Department are as efficient as practicable for the purpose intended.

6. Adopt zoning and land use policies that preserve open space and promote compact growth

Charlestown's long-standing land use practices are to preserve open space and promote compact growth. Most businesses and dense development are concentrated in the historic villages. Cluster design is mandated for all major subdivisions, and residential compounds are encouraged as a way to reduce density in rural areas. In addition, regulations for the siting of large scale solar energy systems will be done in a manner consistent with the goal of preserving open space by directing installations to land already disturbed or cleared, or limiting clearing for the installation to that which would otherwise occur under a residential subdivision.

ENERGY: GOAL, POLICIES AND ACTIONS

GOAL: **Ensure that Charlestown’s future energy needs are met in an efficient and environmentally sustainable manner.**

POLICIES AND ACTIONS

Policy 1.1 Promote conservation and energy efficiency.

Charlestown must consider energy efficiency in all municipal projects and purchases, and encourage energy efficiency by residences and businesses, by promoting conservation as a lifestyle and business choice.

Action 1 Complete remaining energy efficiency improvements to all municipal buildings as recommended by the on-going energy audits.

Action 2 Continue the policy of replacing town automobiles with the most fuel efficient models as feasible.

Action 3 Continue to use CDBG funds to assist low and moderate income households to increase the energy efficiency of their homes.

Action 4 Explore the placement of recycling bins in various town locations to facilitate recycling by tourists and seasonal residents.

Action 5 Establish a composting program of public education and outreach.

It is recommended that the town take advantage of the presence in Charlestown of leaders in composting, such as Earth Care Farm and the Worm Ladies, to educate and encourage composting by more residents in Charlestown and other rural towns of the state.

Policy 1.2 Reduce local dependence on fossil fuels.

Action 1 Promote the Rhode Island Woods website and similar information resources to make residents aware of the sources of local firewood and to help local forest owners maintain markets for their forest products.

Action 2 Produce an informational brochure on the specifics and benefits of adding solar collectors when a new house is constructed or roof is replaced.

Action 3 Adopt a town ordinance that incentivizes solar roofs on both new and existing structures by reducing or eliminating fees, or providing other economic incentives.

Promoting and educating the public on rooftop solar installation can be done through the Building Department and on the Town of Charlestown website.

Action 4 Consider amending the zoning ordinance to allow reduced setbacks and greater lot coverages for ground mounted solar systems installed to meet on-site energy needs.

Action 5 Reduce or prohibit barriers to energy conservation and use of renewables in subdivision or land development covenants.

This action can be completed by the adoption of a town ordinance by the Town Council which prohibits such covenants from restricting the use of on-site renewables by homeowners associations, or by the establishment of such a policy by the Planning Commission when reviewing such documents.

Policy 1.3 **Maintain a regulatory environment that encourages alternative energy development while protecting natural and cultural resources.**

Action 1 Establish zoning which allows the installation of renewable energy systems in a manner which also protects the natural and cultural environment.

Any commercial solar zoning ordinance adopted by the town must provide visual buffers to protect nearby residents and natural, scenic or historic areas; must avoid the clearing of forests; is sized to have limits of disturbance that are no greater than what is expected by development following the underlying zoning; and that protects the remaining land with either temporary or permanent conservation easements.

Action 2 Enact zoning which directs commercial solar development to degraded land such as the landfill or gravel banks; or to parking lots or other already developed land.

The use table of the zoning ordinance must be evaluated to ensure that large commercial solar arrays are not just prevented in sensitive natural areas but encourage as a re-use of “compromised” land.

Policy 1.4 Support energy efficient land uses and lifestyles

Action 1 Continue to enact, amend (as needed) and implement zoning and subdivision regulations that preserve open space and promote compact growth.

It remains the policy of the town to conserve land in the rural and undeveloped areas of Charlestown while encouraging appropriate density of development in village centers, including Cross Mills, Carolina, and Shannock (see Land Use chapter), as a means to help reduce energy use, related to transportation in particular.

Action 2 Adopt and implement land use conservation strategies that reduce greenhouse gases.

In order to achieve the “Land Use Conservation” strategy of the Rhode Island Greenhouse Gas Emissions Reduction Plan, Charlestown will continue to acquire land for permanent conservation, including existing forest acreage, support reforestation, and continue to restrict the removal of trees and other vegetation as part of the review and approvals of new development.

Action 3 Continue to plan and develop town-wide biking and hiking routes.

As described in the Transportation chapter, Charlestown will continue its efforts to expand bicycling opportunities, in particular by coordinating with the RI Department of Transportation regarding existing and proposed bike routes, bike lanes and bike paths.

Action 4 Periodically review town ordinances to ensure that there are no local restrictions against ride-sharing or ride-hailing business.

Allowing ride hailing and ride sharing services that connect with public transportation in nearby communities, or that simply provide for travel needs on a case-by-case basis is a necessary component of reducing individual automobiles use.

Policy 1.5 Maintain an awareness of the history of energy proposals in Charlestown, such as the proposed nuclear power plant, and consider the environmental impacts of new energy technologies and proposals.

Given Charlestown’s active energy history, it shall be the policy of the town to document the past and to consider the future in light of the lessons learned.

APPENDIX EN-1

Rhode Island Principles for Renewable Energy Siting Renewable Energy Siting Stakeholder Committee, March 2, 2018

1. Accelerate the pace toward achieving Rhode Island's renewable energy and greenhouse gas reduction goals through thoughtful and strategic development of renewable energy projects of all sizes.
2. Build support for achieving Rhode Island's renewable energy and greenhouse gas reduction goals by increasing public understanding of the multiple benefits of renewable energy including to the economy, the environment, to promote equity and to cultivate climate resiliency.
3. Provide predictability, consistency and fairness in state and local rules, regulations, zoning and ordinances to support development of renewable energy projects.
4. Promote proactive, comprehensive utility distribution system planning.
5. Ensure that regulations governing renewables are applied in a fair and balanced manner with those governing other land uses, while recognizing that local zoning is the authority of communities to establish public health and safety standards.
6. Honor commitments to keep permanently protected land free from development.
7. Encourage renewable energy development on commercial and industrial zoned land, on already developed land, and in other locations with environmental alterations such as closed landfills, brownfields, parking lots, commercial and residential rooftops, sand and gravel pits.
8. Support the economic viability of farms through appropriate renewable energy development as a complementary use in a manner which keeps farms in agricultural production while preserving agricultural soils.
9. Promote policies that recognize ecological services and sensitivity as well as habitat connectivity in the siting of renewable energy projects.
10. Respect landowner rights to realize value from their property within the context of established planning and zoning principles.
11. Ensure equitable access to renewable energy installations for all consumers, and recognize that delaying the transition to renewable energy disproportionately burdens environmental justice communities.
12. Provide local governments with guidance on smart renewable energy siting and to ensure consistency between the state guide plan and local ordinances and policies. Establish a timeline for all municipalities to adopt renewable energy siting ordinances and associated processes.
13. Provide opportunities for state and municipal governments to lead by example and use renewables to exercise more control over their energy use and production in meeting their energy needs.

APPENDIX EN-2
 Recommended Setbacks from Large Scale Wind Turbines
 By Bird Species, Types and Habitats Documented in Charlestown

Species	Distance	Conservation Status	Comments
Piping Plover	1 km	Federally Threatened	Prevent impacts on coastal nesting beaches, foraging sites, and staging areas
Roseate Tern	1 km	Federally Endangered	Prevent impacts on roosting and staging areas
Peregrine Falcon	0.5 km	State Endangered	Avoid known nesting locations and concentration sites
Osprey	0.5 km	State Concern (rare or vulnerable)	Avoid known nesting locations
Least Tern	1 km	State Threatened	Prevent impacts on coastal nesting beaches, foraging sites, and staging areas
Coastal Ponds	1 km	Variety	Key nesting, foraging, and wintering habitat for a broad suite of species
National Wildlife Refuges	1 km	Variety	May contain critical habitats and listed species
State, Local and Private Conservation Areas	0.1 - 1 km	Variety	Buffer distances to be coordinated with manager of conservation land
Forest Birds	0.1 km	Variety	Recommend not constructing within Contiguous forests >100 acres, but turbines can be at edge of large forest patches.

Species	Distance	Conservation Status	Comments
Grassland Birds	0.1 km	Variety	Have buffer when grassland is >5 acres.
Scrub-Shrub Birds	0.1 km	Variety	Have buffer when shrubs are >3 Acres.
Wading-Shore Birds	1 km	Variety	Buffer for key stopover habitat during migration at coastal ponds and mudflats in southern RI.

Source: RESP document Chapter 1 Table 10 “Suggested siting considerations and distances from the nests of sensitive species of birds and sensitive habitats in Rhode Island”.

Note: 1km equals one kilometer or 3280.84 feet.

Note: This list does not include all species of conservation status in Charlestown