

ENERGY COMMITTEE
ENERGY ACTIONS REPORT
TO THE TOWN OF EDGARTOWN
JANUARY, 2024

Read What Your Town Has Accomplished

Questions Answered Inside:

- *What are the town's Energy Goals? What are the Commonwealth's Energy Goals?*
- *How does the Commonwealth help our community save energy and energy cost for homes and other buildings?*
- *What kinds of dollar incentives does Cape Light Compact provide town residents to save energy?*
- *How is the Commonwealth's Green Communities Program helping the Town to save more than \$100,000 per year in energy costs?*
- *How have the Town's two solar fields produced more than \$2,100,000 of income for the Town?*
- *How will the Town gain about \$14,500,000 over 25 years from its new solar project on the closed Meshacket Landfill?*
- *Where are the Town's electric vehicle chargers and how much energy have they provided to motorists?*
- *How has the Town supported Vineyard Transit's move to an all-electric bus fleet?*
- *What has the Town done to support offshore wind energy and what benefits will the Town reap?*
- *What are the Town's plans to heat and cool its buildings without fossil fuels and add solar power with battery storage for resilience when line power fails?*

Energy Actions Report

An Overview of Edgartown's Commitment and Actions
To Save Energy, Reduce Fossil Fuel Use,
And Provide Renewable Energy
For a Sustainable, Resilient Future



Edgartown Energy Committee
January, 2024
Version 2.5

Energy Actions Report

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INTRODUCTION

Preamble

- As Edgartown continues to grow, its energy use must become more sustainable and resilient in order to reduce its impact on and mitigate the effects of climate change. This means both reducing energy consumption and shifting from fossil fuel energy to renewable electric energy. Adding local energy generation, especially solar power, is needed as well. The transition from fuel-powered vehicles to battery electric vehicles must also be supported and encouraged. These actions apply to both the broader Edgartown community and the town's municipal government. All of these actions can also improve the resilience of private and municipal assets to critical events such as severe storms and flooding.

Resumé

- The purpose of this report is to take stock of the town's actions to provide for Edgartown's sustainable energy future. It begins with relevant background information, notably our town's energy goals and those of the Commonwealth. Building energy standards and how they are evolving are described, along with conservation of energy by improving energy efficiency of existing buildings. The role of Cape Light Compact in providing incentives to encourage energy savings is presented.
- Municipal achievements are next, including Edgartown's becoming a Green Community. Solar energy generation by existing and future municipal solar energy projects follows, along with support for electric vehicles, electric public transit, and offshore wind. Lastly, municipal energy savings action plans are identified to chart the pathway forward.
- The treatment is designed for an interested layperson who would like a general understanding of the energy issues and actions involved in the town's pursuit of its sustainable energy future.

BACKGROUND

Edgartown's Energy Goals

- At the Edgartown's 2021 Annual Town Meeting, the meeting adopted by acclamation the aspirational goals to:
 - Reduce town fossil fuel use by 50% by 2030 and 100% by 2040
 - Increase the proportion of renewable electric energy consumed to 50% by 2030 and 100% by 2040.
- The adoption provides a mandate for action by the town and its citizens and guides municipal planning toward achieving the goals.

The Commonwealth's Energy Goals

- The Massachusetts Clean Energy and Climate Plan for 2050, adopted in 2022, details the actions the Commonwealth will undertake to put the Commonwealth on a pathway to achieve Net Zero greenhouse gas emissions by 2050.
- Net Zero greenhouse gas emissions are defined by statute as “an annual level of greenhouse gas emissions that is equal to the annual level of greenhouse gases stored within or attributable to the actions of the Commonwealth.”
- While defined differently from the town’s aspirational goals, Net Zero emissions by 2050 is a clearly less aggressive goal. Still, the Commonwealth plan and supporting legislation will provide opportunities for funding the programs and facilities needed for Edgartown to achieve its own goals.
- The Commonwealth’ Department of Public Utilities also requires electric power providers to procure and supply a minimum proportion of clean energy. In 2023, the standard is 59.2 percent, increasing to 69.5 percent by 2026.
- In addition, Governor Healey has pledged a 100% clean energy supply by 2030. If fulfilled, this promise means that Edgartown will automatically meet its 2030 and 2040 goals for renewable electricity.

Energy Standards for Building Construction

- The Commonwealth sets energy standards for new residential and commercial buildings as well as alterations, additions, and changes of use for existing buildings. These are included in the energy code contained within the Commonwealth’s building code. The standards assure that the town will follow an upward path in building energy efficiency and conservation.
- By legislative mandate, these energy standards become more stringent with time, ensuring increasing energy savings and reducing energy costs.
- The energy code requires math modeling of the energy losses of new buildings from original plans, followed by measurements and testing that confirm that the built structure meets the standard.
- Edgartown has opted in to enhanced versions of the Commonwealth’s energy code as they appear. The enhanced version is referred to as the Stretch Code.
- Climate Act of 2021 mandated new standards and a new version of the Stretch Code that will become effective on July 1, 2024. The new version increases energy savings by about 7 percent.
- The new standard also accommodates net-zero buildings, which draw on their own energy sources (e.g., solar, geothermal) and energy-use reducing designs to be energy self-sufficient.
- It also accommodates passive house standards, which are designed for very low energy loss, ensuring very low energy consumption.
- Many Massachusetts communities are now requesting the ability to ban fossil fuel use in building construction, addition, and renovation by change in local bylaws. The Commonwealth is allowing a pilot trial with ten test communities to study the impact of such a change. If enabled, Edgartown will likely follow their example.

Energy Conservation for Existing Buildings

- For a town without energy-consuming industry, reducing energy consumption also requires making existing buildings more energy efficient.
- Investments in enhanced weatherization of homes and businesses by improving insulation and sealing of air leaks have a rapid payback through energy cost savings. Once costs are recaptured, energy cost savings continue through the life of the building.
- Investments in more energy-efficient equipment, such as heat pumps for space heating, air conditioning, and heating domestic hot water, also pay for themselves.
- Energy Star appliances, LED lighting, and electric charging equipment for fully electric and plug-in hybrid vehicles also save energy and reduce cost.

Cape Light Compact and Vineyard Power

- The town's Energy Committee works closely with Cape Light Compact (CLC), a state-chartered organization that provides incentive payments to increase energy efficiency. The incentives are available to building owners, consumers, and municipalities on Cape Cod and Martha's Vineyard.
- The Compact's incentive funds are provided by the Mass Save program, which charges all electric rate payers about 1.7 cents per kilowatt-hour for energy efficiency improvements. This amount appears on electric bills.
- The Compact provides free home energy assessments that identify possible weatherization and other energy-saving steps that building owners can take.
- Rebates on energy saving equipment, such as heat pumps for heating and cooling, and Energy Star appliances, are also provided by the Compact.
- Incentive funds also cut municipal energy costs by supporting the purchase of energy-saving town equipment, such as the high efficiency water and sludge pumps used by the town's Water and Wastewater Departments.
- In addition, Cape Light Compact can supply electric power to Cape and Island customers. Its basic power product is 100 percent renewable and presently is slightly cheaper than Eversource's default supply.
- The Island's Vineyard Power Cooperative recently joined the Mass Save Community First Partnership to support and implement energy efficiency outreach across the Island. It is partnering with Cape Light Compact to promote the Compact's and Mass Save's energy efficiency incentives and home energy assessments.

MUNICIPAL ACHIEVEMENTS

Edgartown as a Green Community

- After four years of work and study by the Town's Energy Committee, Edgartown joined the majority of Massachusetts towns and cities as a designated member of the Commonwealth's Green Communities program in 2022.
- By providing a plan to reduce municipal energy consumption by 20 percent over five years, the Green Communities program awarded the Town a Designation Grant of \$132,000 to spend on energy conservation measures.
- About \$88,000 of the Designation Grant funding has provided new, dimmable LED lighting for the Edgartown School's classrooms and educational spaces. The remaining

\$44,000 contributed to the purchase of six new wastewater pumps at a total cost of about \$420,000. In addition, Cape Light Compact covered the full cost of \$151,000 for improvements to the school's ventilation and building control system.

- These Green Community and Compact projects will provide an estimated savings to the Town of about \$100,000 per year. Total energy savings will be approximately 4,100 MMBTU per year, which is enough energy to power the energy needs of about 38 average Massachusetts homes per year.

Edgartown Energy Generation – Katama Farm and Nunnepog Well Solar Fields

- The Town has two large solar fields that came into operation in 2014. These facilities generate renewable energy that is sold to the Eversource power grid. The Katama Farm solar field has a production capacity of 1.270 megawatts and has generated 12.5 gigawatt-hours of electricity through June, 2023. The Nunnepog Well solar field is somewhat larger, with a production capacity of 1.440 megawatts, and it has generated 13.3 gigawatt-hours through June, 2023. The total of 25.8 gigawatt-hours is enough energy to supply 806 Massachusetts homes for a single year.
- By the close of June, 2023, the fields earned more than \$2,100,000 in benefits to the town. This renewable energy reduced greenhouse gas emissions by about 18,200 metric tons – equivalent to not burning over 20 million gallons of gasoline.

Edgartown Energy Generation – The Meshacket Landfill Solar Project

- The Town is negotiating with a solar power developer to provide a new, large solar field atop the Town's closed landfill that will more than double the Town's solar output capacity. The proposed facility has a capacity of about 4 megawatts, and will generate about 5 gigawatt-hours of energy per year, which is enough energy to power about 150 Massachusetts homes per year. Production is scheduled to begin in late 2024.
- As is the case for the two earlier solar fields, the developer will sell the energy to suppliers through the Eversource grid, making more renewable energy available throughout the New England region. In return, the developer leases the landfill ground surface from the Town. Payments are estimated to be about \$14.5 million over the 24-year lease period.

Support for Electric Vehicle Charging and Transition to Town Electric Vehicles

- The Town provides Level-2 charging for battery-electric and plug-in hybrid vehicles at its Park and Ride lot adjacent to the Triangle. This level of charging allows a vehicle battery to store the energy needed for about 25 miles of travel for each hour of charging, depending on the vehicle.
- Four vehicles can be charged simultaneously. Vehicles pay for the electricity they consume according to a per-kilowatt-hour fee that recovers the Town's energy cost. The Energy Committee assists the Highway Department in managing and administering the chargers.
- Between completion of installation in mid-June, 2022, through July, 2023, the chargers provided 1,117 charging sessions and dispensed 15,203 kilowatt-hours of energy to vehicles, saving the emission of about 6.4 metric tons of greenhouse gases.

- To the extent that supporting grant funds become available in the future, the town will provide one or more additional Level-3 chargers, which charge vehicle batteries much more rapidly using direct current.
- Under the terms of the Green Communities agreement, the Town's light vehicle fleet will be converted to battery-electric and hybrid-electric vehicles as gasoline and diesel cars and light trucks age out of the fleet and new electric vehicle models are available.

Support for Electric Public Transit

- At the 2021 Annual Town Meeting, the town affirmed the plans of the Martha's Vineyard Transit Authority (VTA) to place inductive electric bus chargers at the Church Street Bus Station and Visitor Center.
- During short periods of idling, the VTA's electric buses park over charging units embedded in the Church Street pavement and receive incremental battery charges. The many small increments are sufficient to keep the electric buses running for 12-14 hours per day without returning to the VTA yard for a full battery charge.
- The Church Street bus charging facility is an important milestone in the full electrification of the VTA fleet, which is expected by 2027.

Support for Offshore Wind and Benefits

- At least three large offshore wind facilities intend to send power to the New England grid through cables lying beneath Edgartown waters in Muskeget Channel. The Vineyard Wind-1 Project, located about 15 miles south of the Island, will provide clean energy for over 400,000 homes and businesses across the Commonwealth. It is currently in construction and will begin producing power in early 2024 as turbines come on line.
- Although the Town's Conservation Commission initially denied a permit for Vineyard Wind's power cables, the Town ultimately accepted the judgment of the Commonwealth's Energy Facilities Siting Board to allow cable placement within the channel bed. A permit for cables by a second offshore wind project was also rejected by the Conservation Commission in early 2023, but it is likely to be subject to similar action.
- Through a Community Benefit Agreement with Vineyard Wind-1, Vineyard Power will receive \$7,500,000 over twenty years for Island towns. The funds will go largely to adding solar power and batteries for resilience to Island town facilities, including Edgartown, and to reduce the electric bills of low-income households. Two other offshore wind projects are expected to provide similar amounts of funding, netting a total of \$22,000,000 over twenty years.

Energy Committee Outreach to the Edgartown Community

- The Energy Committee has several pathways for outreach to the Edgartown Community. The goals of outreach are to make Edgartown citizens more aware of the Town's energy efforts and to promote energy savings by the community at large.
- The Committee's home page on the Town website provides updates to Committee and Town actions, including solar projects, Green Communities news, EV chargers information, and a list of useful links. The Committee also promotes energy savings and incentives by posts on its Facebook page.

- In addition, the Committee provides occasional updates to the Edgartown Selectboard on its progress with various projects.

MUNICIPAL ENERGY SAVINGS ACTION PLANS

Electrification, Solar Energy, and Resilience for Town Buildings

- Many of the Town's buildings are heated by propane and fuel oil. To meet the town's goals to reduce fossil fuel consumption by 50 percent by 2030 and 100 percent by 2040, these heating systems will need to be replaced by more efficient electric heat pumps.
- While fossil-fuel powered boilers and furnaces can only convey the heat they generate by combustion, electric heat pumps simply move heat into and out of the building. As a result, they can be three to four times more efficient, saving significant energy and cost.
- Many town facilities also have rooftop and ground areas that are suitable for solar power development. Storage batteries are required components of such developments, allowing greater flexibility in providing constant solar power at the site. The renewable power can also be sold to the grid, helping to pay for the cost of development.

Microgrid Systems for Town Facilities

- Where solar power and batteries can be deployed, they can be part of a "microgrid" system. Using special purpose electrical equipment, the system can draw from on-site solar power, battery power, grid power, and a back-up generator at will. This allows the system to choose the lowest cost for the energy needed at any time of day or night.
- The system is referred to as a microgrid by analogy with a main power grid that draws on many sources of energy – such as solar fields, hydropower, wind power, and fuel burning power plants. In a similar fashion, the microgrid chooses among local energy sources depending on their cost and availability.
- The microgrid is designed for resilience. If grid power fails, the system switches to battery power automatically. If daylight is available, batteries are simultaneously recharged. If batteries become exhausted, the generator takes over.
- Most outages are handled without burning fossil fuel. For extended outages, less generator power and fuel are needed to ride out the emergency.

The Way Forward to a Fossil-Fuel Free Municipality

- With the help of the Energy Committee, the Town is now actively working to prepare for the coming conversion of Town facilities to all-electric energy with accompanying solar and battery power, and where possible, microgrid control equipment. The first steps are to develop plans for each facility.
- The Town is moving ahead with a new Firehouse and ultimately a renovated Police Headquarters on the Pease Point Way South campus. The Town has received a grant from the Commonwealth's Municipal Energy Technology Assistance (META) program for energy engineering consultants to integrate the planning for heat pumps to be used for heating and air conditioning with solar power and battery storage in a microgrid at the site.
- With funding from Cape Light Compact, energy engineers are providing strategic plans for the replacement of fossil-fuel burning heating equipment with electric heat pumps

and the addition of solar power with batteries at the Town's Wastewater Department and at the Chappaquiddick Fire Station.

- Additionally, a related Compact study will point the way to solar power and battery storage on the Library and Edgartown School campus for a possible microgrid.
- In early 2023, the Edgartown School received a federal grant for an energy consultant to plan for the conversion of the school's fuel-oil fired boilers to a modern HVAC system with year-round climate control. The consultant's report, received in September, led to a request for initial funds for a more detailed engineering plan in the FY2025 budget.
- In July, the Martha's Vineyard Commission received approval for federal planning assistance from the Department of Energy's Energy Transition Initiative Partnership Project to develop resilience plans for the Water Departments of Edgartown, Oak Bluffs, and Tisbury. The study will focus on pathways beyond fossil fuel generators to provide the large amounts of electric power needed to pump water to the residents of the three towns during an extended outage period when fossil fuels might run out.
- In August, Cape Light Compact approved an incentive payment of \$151,000 to replace the Edgartown School's heating and ventilation control systems, which is projected to save about \$46,000 per year in fuel oil costs. Work was completed in October.
- In September, the Town's request was approved for federal expert advice from the Department of Energy's Lawrence Berkeley Laboratory to plan the elimination of fossil fuel heating for the buildings on the Highway Department campus on Meetinghouse Way, accompanied by a microgrid powered by solar with battery storage.

CONCLUSION

- The facts and observations of this report have provided a background and an account of Edgartown's actions and future plans both as a community and as a municipality to reduce energy consumption. The town is clearly moving forward towards its goals:
 - By the actions of residents in conserving energy and reducing energy cost;
 - By the actions of the Commonwealth in requiring energy savings in buildings, in providing incentives for energy efficiency, and in requiring our electric power supply to become more renewable with time;
 - By municipal action in joining the Green Communities program, developing solar energy sources for renewable power, and supporting electric vehicles;
 - By municipal planning for the energy transition from fossil fuel use to full electrification of town buildings and facilities; and
 - By municipal action to add solar power and battery storage to that electrification transition in order to provide resilience in the face of prolonged grid outages.
- We hope the reader will agree that the town has accomplished a great deal so far. Although there is still a long road ahead, the Town of Edgartown stands ready to meet its commitments to a future of sustainable and resilient energy use.