

MARTHA'S VINEYARD - GETTING TO 100% RENEWABLE

Building a clean energy future

OUR SHARED RESPONSIBILITY

March 2024



A Time of Transition

The climate is changing and the impacts are increasingly severe. It is also clear that the major cause is the emission of carbon dioxide into the atmosphere by burning fossil fuels. **Curbing emissions requires action on the national and international levels, but action at the local level also plays a critical role. What can we do on our island of Martha's Vineyard?**

The Island set a goal of achieving 100% Renewable by 2040; the State of Massachusetts set a similar goal for 2050. This **Getting to 100% Renewable** document builds on the Vineyard's commitment to reduce our contribution to climate change as reflected by the **non-binding resolution that was passed at each of the six town meetings in 2021-22.**



THE TOWN MEETING RESOLUTION

Reduce fossil fuel use on the Island, from a 2018 baseline:

- 50% by 2030
- 100% by 2040

Increase the fraction of our electricity use that is renewable:

- To 50% by 2030
- To 100% by 2040

All six towns have joined the State's Green Communities program which requires a 20% reduction in energy use in town buildings and establishes the State Stretch Code as the required standard for energy efficiency in all buildings.

100% Renewable

What exactly does 100% Renewable mean for our island community? Why does our local goal matter? How will we get there and what do we need to do to reach that goal?

This Getting to 100% Renewable document aims to show you our current energy situation and to suggest how you can help us to reach this important goal.

Reaching “100% Renewable” means we get all our energy from renewable sources. For our Island community, it means moving away from burning fossil fuels by transitioning to all-electric and providing our needed power from renewable sources. This requires a major shift in the way we heat our homes and hot water, how we get around, and where our energy comes from. It also presents a huge opportunity to change our community for the better. In achieving this goal, we will have cleaner air, healthier people, and a more equitable and prosperous community for everyone. Some of this renewable power will come from Island solar arrays and locally sited offshore wind projects; some will come from a cleaner, greener electrical grid.

Why “100% Renewable?”

Climate scientists have made it clear that we need to decarbonize by 2050, or sooner, to avoid catastrophic climate change.

In summer 2023, the impacts of climate change were everywhere. The NY Times reported, “The eastern part of the country experienced unprecedented flooding. In Hawaii and the Northwest, fires did untold damage. In the Midwest, smoke hung over towns and cities.”

“In the Southwest, places like Phoenix and Texas endured record-breaking stretches of heat. In Florida, the water temperature rose so high that it was unsafe to swim. Storms became increasingly dangerous.”*

According to Bill McKibben, environmental author and activist, “The most important thing that happened in 2023 was the heat. By far, it was hotter than it has been in the last 125,000 years... Every month since May has been the hottest ever recorded. Ocean temperatures set a now all-time mark, over 100 degrees.”

Evidence indicates that we are close to the point when the planet will pass 1.5° Celsius in warming from pre-industrial levels—a tipping point that experts say we should not exceed if we are to avoid the worst impacts of climate change. We have gotten here by burning fossil fuels - coal, oil, and gas- since the mid-1800s. **The longer we wait to cut our emissions, the more we harm the livability of the planet for today’s and future generations.**

Climate change is a global problem that requires local action. It also presents an opportunity to reimagine the Vineyard’s future and to make the community safe and equitable for all who live and work here.

*Esau McCaulley, “Nature is Profoundly Broken,” NY Times, 12/18/23

Where are we now?



This Getting to 100% Renewable document draws from the work of a number of Island groups to introduce our current energy picture and what needs to be done.

In 1998, the first grid-tied solar array was installed on the Vineyard. There are now over 1,500 solar arrays here, generating 10% of our power. The first offshore wind farms in the country are being erected south of the Island, adding significantly to our region's green electrical supply. Vineyard Wind I alone will provide enough to power ALL the homes of Cape Cod, the Vineyard, Nantucket, and parts of Plymouth County.

Key Island organizations are working together to address climate change.

Martha's Vineyard Commission (MVC), our regional planning agency, has two positions specifically focused on climate work: an Energy Planner who works at the regional level on our Island's transition to all-electric power and our energy resilience; and a Climate Change Coordinator who focuses on the Island's climate adaptation.

Vineyard Power, a non-profit, is focused on supporting the transition of residences and small businesses to 100% electric and ensuring equitable access for all. In addition, they are supporting the installation of resilience strategies at the Island's critical facilities.

The Vineyard Sustainable Energy Committee (VSEC), comprised of representatives from each of the town energy committees, meets monthly and was responsible for the adoption of 100% renewable resolution in our six towns. A number of its members were part of an **Energy Working Group**, which prepared a report in 2019 that analyzed the Island's energy use and made projections about future energy use.

The **Climate Action Task Force (CATF)**, at the MV Commission, meets monthly to discuss and advance Vineyard actions that address climate change.

The 2022 **Climate Action Plan (CAP)** is a regional, 20-year-plan developed through the MVC by a group of over 100 local residents and 20 local organizations with specific climate knowledge. The Energy Transformation section lays out a series of goals and actions to transition away from fossil fuels.

The Island Climate Action Network (ICAN) shares information about Island climate initiatives via a monthly newsletter.

Our Energy Supply

Electricity

As an island with no power plants, we get our electricity primarily from the mainland via undersea cables. We are part of the New England electrical grid, managed by ISO New England. The current, predominant fuel source for electricity generation is natural gas, which, among other things, makes the cost of our electricity subject to natural gas supply fluctuations. But a growing amount of our region's electricity is being generated from renewable resources.

We import most of our electricity and all our propane, oil, gasoline, diesel, aviation gas, and jet fuel to power our buildings, transportation, and other energy needs.

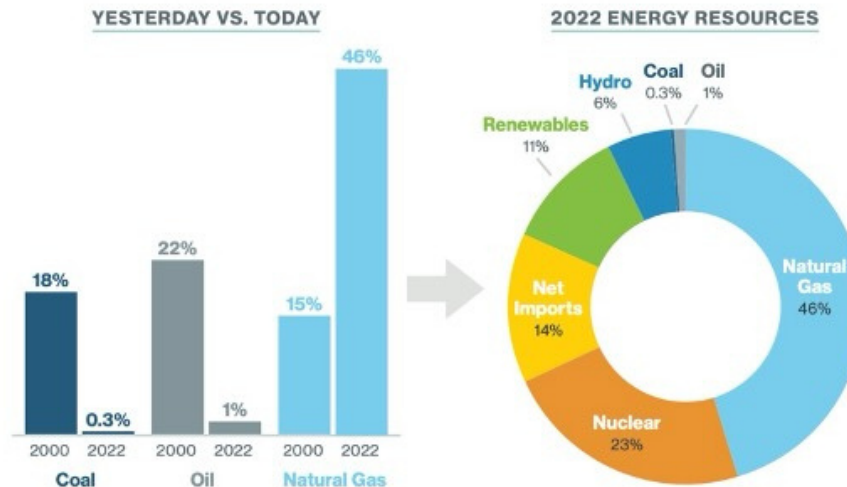
A Major Energy Transformation is Underway

This chart from ISO New England shows our energy sources today and what they will be in the future. We now burn almost no coal to make electricity.

New England has shifted away from older coal- and oil-fired generation to cleaner burning natural gas.

Most of today's electricity comes from lower-emitting energy resources.

The region is transitioning to large-scale clean and renewable energy.



The amount of electricity produced by generators in New England and imported from other regions to satisfy all residential, commercial, and industrial customer demand in New England. This is called Net Energy for Load (NEL).

LOOKING TO THE FUTURE

- Wind power dominates new resource proposals: nearly 16,000 MW
- Solar power is growing rapidly: ISO-NE forecasts nearly 12,000 MW within a decade
- Battery storage technologies are emerging at the customer and grid level: more than 11,000 MW proposed
- New transmission proposals would provide access to additional clean or renewable energy in New England or Eastern Canada

Our Electricity Structure

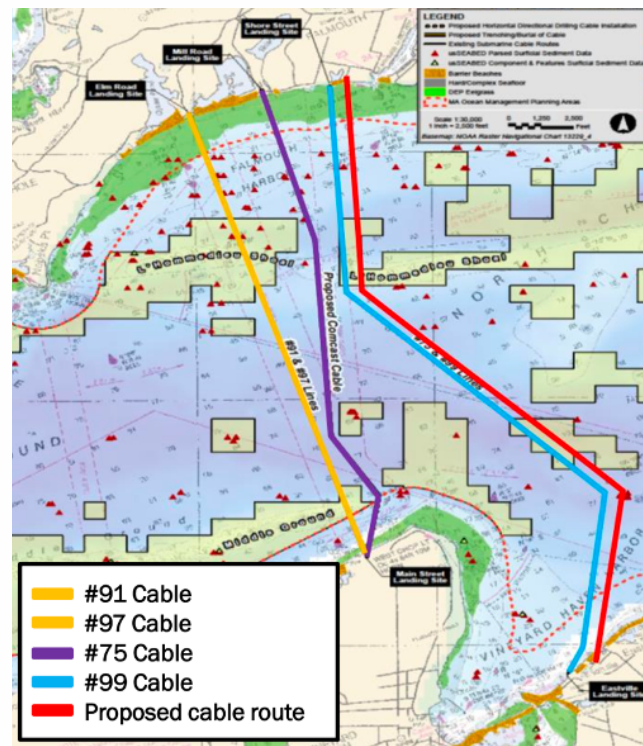
Since 1998, electricity supply in Massachusetts has operated as a competitive market where consumers are free to choose their electricity supplier. The Cape Light Compact (CLC) was formed at that time to serve as a municipal aggregator for all the Cape and Vineyard towns to get the best possible electrical rates for our area's ratepayers. The CLC is our default electrical supplier, but customers can opt out of the CLC and choose another competitive power supplier, if they wish.

Eversource, our distributor of power, is regulated by the Department of Public Utilities (DPU), via a board of three commissioners appointed by the Secretary of Energy and Environmental Affairs. The DPU approves Eversource's distribution charges to reflect the costs of maintaining and improving the electric infrastructure (sub-stations, poles, and wires). The rates for electricity supply, as opposed to distribution services, are approved by the DPU after a market-based bidding process.

Eversource provides most of the infrastructure needed to transmit and distribute our power,* using a network of local substations. With no bulk substations on the Vineyard, we get our power from a Falmouth bulk substation via four 23 kilovolt submarine cables. The cables land on West Chop, and on East Chop, near the hospital. These cables are of different ages and cannot offer the full power supply that they originally were designed for. **Two new cables will be installed by 2025.**

Eversource meets quarterly with the MVC Energy Planner, representatives from each Town, the County, Climate Action Task Force, and Vineyard Power. These talks center around grid modernization and improving the resilience of our electrical infrastructure.

*Off of their utility lines, there are also privately-owned electrical lines.



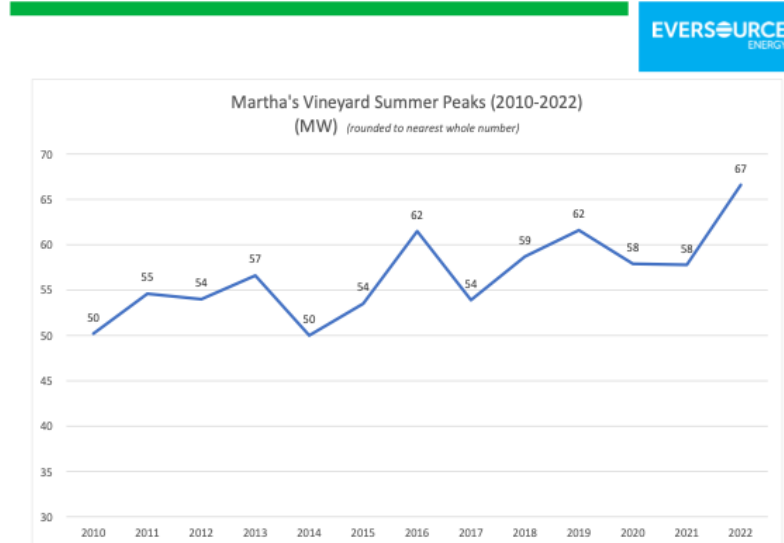
The two new cables will replace one existing cable and add a fifth cable. Eversource says that, together, the five cables will have a rated capacity able to provide 140% of the utility's predicted usage for us in 2050. These cable additions will allow for the decommissioning of the diesel generators that Eversource uses here.

**Our electrical use has increased by 17% over the last 10 years.
Our peak demand increased 24% over the same time period.**

Peak Demand

Electrical infrastructure is designed to handle peak demand. Because of the growth of our population, increased numbers of seasonal visitors and increasing electrification, our four cables no longer satisfy our summer peak demand, when our population is greatest, air conditioning is in use, and more electric vehicles are being charged.

Electricity Use and Peak Demand



Our Distribution System

At present, most wires are above ground and connected by poles. As we increase our electrical use, some poles and distribution lines will need upgrading. While desirable for us, most undergrounding is deemed to be cost-prohibitive for Eversource, as defined by the DPU's least-cost regulations. If an individual, association, or town wishes to move electrical service underground, they must pay the additional costs.

As we transition to all-electric, we will use significantly greater amounts of electricity for heat pumps (to provide heat, AC, and hot water), induction cooking and electric vehicle charging. The two new cables will provide more than enough power for this transition.

As we transition to all-electric, Eversource will continue to be the distributor of our power, and electrical rates will continue to be competitively priced.

Fuel Supply



Our fuels are shipped to us via the Steamship Authority and on barges run by RM Packer Company. The Vineyard has 9 gas stations providing gas and diesel, 4 propane companies, and 2 heating oil companies. In addition, aviation gas and jet fuel are provided at the airports.

Emissions

Every day, Vineyard residents, businesses, towns, schools, and others rely on fossil fuels to heat their buildings and hot water, keep the lights on, power electronics, and drive vehicles. In doing so, we release greenhouse gas (GHG) emissions, principally carbon dioxide.

The Steamship vessels contribute significantly to our GHG emissions, which is unique to our and other island communities. Reducing their emissions will also result in better air quality in the port towns.

In 2018, **the Energy Working Group*** worked to identify the primary sources of emissions across our island and to calculate a baseline for future emission reductions.

In addition to our local GHG emissions, the things we buy that are then shipped to us, the food we eat if grown using conventional farming practices, the meat we consume coming from animals that are kept penned in feed lots, the construction materials we import to build houses and other buildings here, the materials we import to maintain pristine landscapes, AND the shipping of trash, recyclables, and septage waste off-island are ALL part of our contribution to climate change.

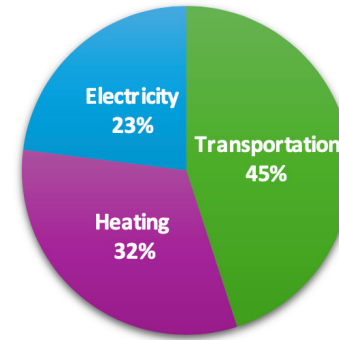
*Rob Hannemann, Marc Rosenbaum, Richard Andre, Alan Strahler, Tom Soldini, Kate Warner.

Energy Use and Greenhouse Gas Emissions

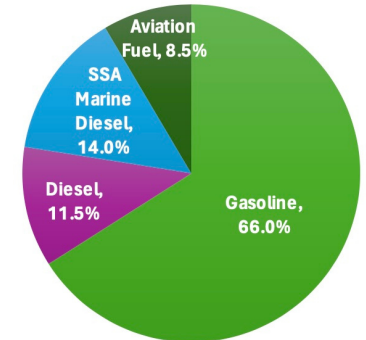
Energy Data

	Baseline		
	2018	2022	2023
Electricity Use (gigawatt-hours)	217.3	229.2	226.6
Renewables production	13.5	20.8	22.4
Transportation (million gallons)			
Gasoline	7.23	7.96	8.07
Diesel	3.02	1.74	1.40
SSA Marine Diesel	1.41	1.48	1.71
Aviation Fuel	0.79	1.00	1.04
Building Heating (Million gallons)			
Heating Oil	2.49	2.13	2.16
Propane	7.88	7.92	7.23

How We Use Energy

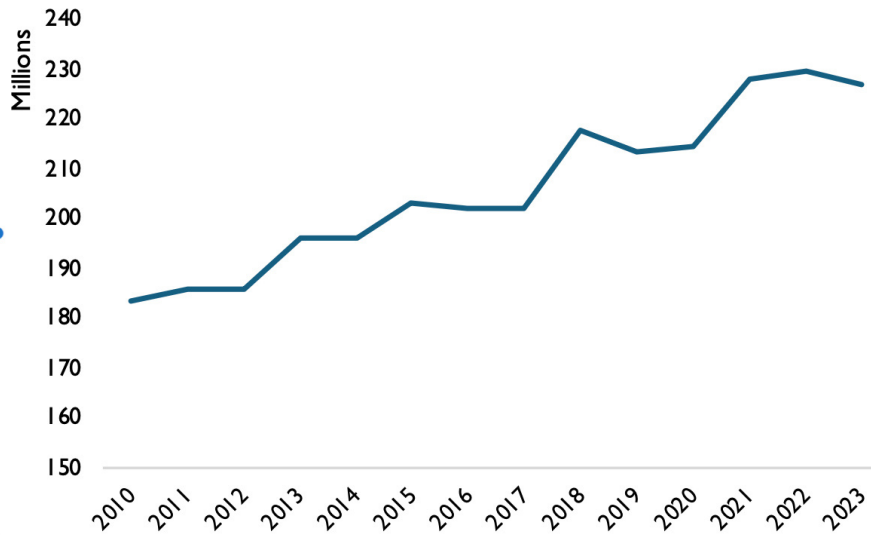


Trans. Energy Use, 2023

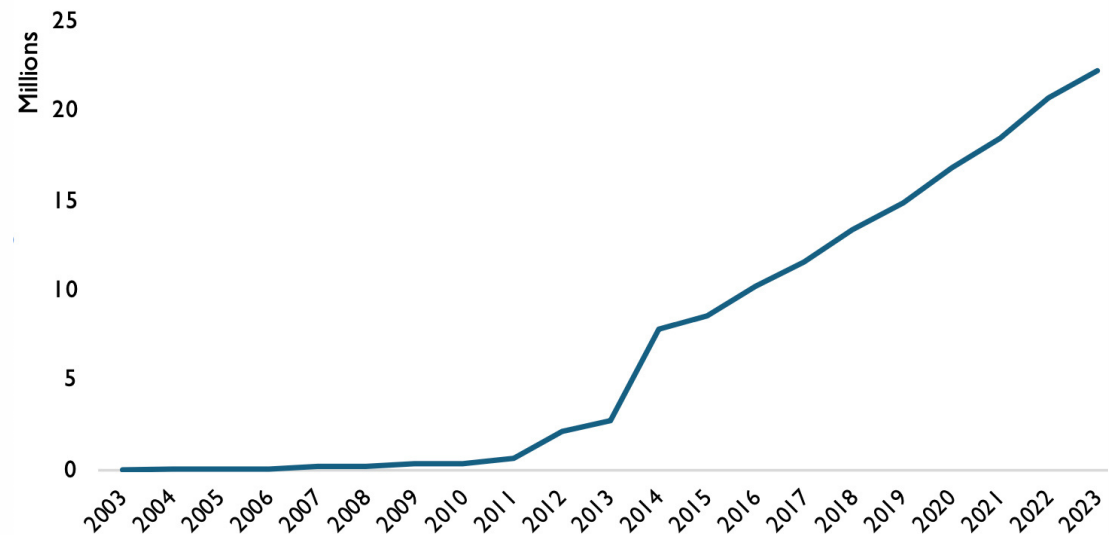


IN 2018, WE EMITTED 280,000 METRIC TONS OF CO2

Total Electricity Use (kWh)



Estimated Solar Production (kWh), Cumulative



Steamship Vessels

Electrification of ferries is happening world-wide. The E-Ferry Ellen is a Danish car and passenger ferry that has been on the water since 2019. It is similar in size to one of our freight boats. Norway and Sweden also have all-electric ferries of similar size to ours. Lake Ontario has an operating hybrid-electric ferry, the Amherst Islander II, that will be a plug-in hybrid when the onshore infrastructure is in place. San Francisco has a fuel-cell powered vessel in operation. The Maine State Ferry system has two hybrid vessels being built. Galveston, TX has a vessel soon to be on the water. The Washington State Ferry System, the largest ferry fleet in the US, has a plan underway to electrify. These are just a few examples of many.

The Steamship Authority's vessels are responsible for 14% of our transportation emissions. The State climate goal requires decarbonization in all sectors by 2050. **The Conservation Law Foundation has confirmed that “the decarbonization requirement is economy-wide, so the Steamship Authority will need to decarbonize along with all their peer entities.”**

Figuring out how to transition our fleet of ten vessels, some of which travel to both the Vineyard and Nantucket, is a challenge. In addition, we need to provide onshore electrical infrastructure to charge the vessels if we are to greatly reduce emissions by using plug-in hybrids that can charge when in the port. We will also need to provide charging infrastructure for the passenger ferries that come to the Vineyard.

We are one of only a few ferry systems that relies on the “fare box” for our revenue. We do not get any State funding. This model limits the funding sources available for making the required transition—even if just for our capital expenses. Other ferry operators are connected to their State's Department of Transportation. We may need to consider this option.



How the Steamship will make the transition, including having the needed electrical infrastructure in the ports, is a pressing issue and just beginning to be considered. Letting the Steamship know that you support the transition to electric ferries encourages them move forward.

In this race to reduce our contribution to climate change and enable our species to continue to live on Earth, we need to do the best we can with the knowledge that we have, as technologies continue to evolve.

Energy Storage

Since most renewable energy is an intermittent resource, batteries are a key component in a renewable energy future: to store power for when it is needed. Battery technology is evolving as the electric vehicle market expands.

Lithium-ion batteries are currently considered to be the best solution because they can store a lot of energy in a small space. We all rely on them for our cell phones and laptops, and they are now also a key component for vehicles and stationary applications.

While lithium-ion batteries are not the perfect answer, they are a good solution to begin this transition. In the meantime, other alternatives are being researched and tested, and considerable thought is focused on how best to retrieve the precious components in batteries for recycling and re-use at the end of their useful life.

Concerns about the mining of lithium and cobalt and other minerals are valid and hopefully will be addressed to ensure the health and safety of the workers in those mines. We do have both lithium and cobalt available in the US, where we have more control over labor practices.

CONCERNS ABOUT FIRE are valid, but fires are not as frequent as with current technology. A 2023 study from the National Transportation Safety Board and Bureau of Transportation Statistics cited that there are about 1,530 fires/100,000 ICEs (internal combustion engines) sold. For electric vehicles it is 25/100,000 sold. [Institute of Electronic and Electrical Engineers](#)

Education and training are needed to better understand how to address battery fires when they do occur. Current, conventional fire-fighting methods are not applicable.

EVs

Electric vehicles- whether they be cars, trucks, buses, construction vehicles, ferries or planes- are all key parts of this transition. Electric cars have fewer moving parts, are quieter, require less maintenance, and have lower operating costs. **Currently, 5% of our vehicles are all-electric or hybrids.**



How do We Get There?



The basic principles of achieving 100% Renewable are clear and are outlined in the Massachusetts 2050 De-Carbonization Roadmap and Clean Energy and Climate Plan for 2050. We must change where our energy comes from and make our buildings and vehicles more efficient and cleaner.

A lot can change in 25 years. This document highlights what we know now about our energy picture and the path to 100% Renewable. It, and the work of the Climate Action Plan, will be revisited as things evolve.

To reach our goal we will need to:

- Reduce carbon emissions
- Increase local energy generation and resilience
- Reduce energy use in buildings
- Electrify heating, hot water, and cooking equipment
- Electrify all manner of vehicular travel
- Reduce our transportation energy usage

Reduce Carbon Emissions



TRANSITION TO A 100% CARBON-FREE ELECTRICAL SUPPLY

It is important, as we transition to all-electric, that the electricity we use is from renewable resources. Offshore wind, solar, and hydroelectric are New England's greatest possible resources. Battery storage at the customer and grid level will make it possible to store the power generated for when it is needed.

Increasing our on-island renewable energy generation by adding large solar arrays at the Edgartown and Oak Bluffs landfills, putting solar canopies over parking areas for energy generation and shading, adding arrays on roofs where possible and possibly employing "agrivoltaics" on farms all will help with this.



OFFSHORE WIND

Vineyard Wind I is an 800 MW project that will produce as much power as is used by all the homes on the Vineyard, Nantucket, Cape Cod, and parts of Plymouth County. More offshore wind projects are coming, and Massachusetts announced its intention to increase utility procurement to a total of 9,200 MW by 2040. This would be the equivalent of roughly 65% of total MA electricity demand/ 4.8 million homes.

The required FAA lighting is projected to be on less than four hours/year: only when an aircraft triggers it.

Right Whale extinction is a concern for all. Their population is directly impacted by being struck by ships, entangled with fishing gear, and by the warming oceans driven by climate disruption which impacts where food is available.



ENHANCE OUR NATURAL ABILITY TO CAPTURE & STORE CARBON

Food, agriculture, and land use account for 25% of our nation's carbon emissions. Preserving, protecting, and enhancing our natural resources is key. Salt marshes and wetlands are critical to absorbing increased precipitation. Trees and vegetation across the island help with carbon sequestration. Preserving them if at all possible is the best practice. Farms- if managed using regenerative agriculture practices- can also help with carbon sequestration. The microbiome under the surface of the soil is rich with life and can absorb carbon and retain soil moisture if it is only minimally disturbed for planting. Using cover crops outside the growing season also helps preserve this essential web of life.

Increase Local Energy Generation and Resilience



SOLAR

Between 2003 and 2023, there were over 1500 solar arrays installed on-island. We now have 20 megawatts (MW) or 20,000 kilowatts (KW) of solar, providing approximately 10% of our electrical needs. **The goal is to produce at least 15% of our power from on-island solar.**

At present, we are having challenges with the interconnection of large solar arrays to the grid. To add more solar power to the grid, upgrades are needed at the Falmouth bulk substation. The additional cables planned for 2025 and changes to the Island's grid infrastructure are also needed.

These challenges with modernization of the electrical grid are happening across the country, not just here.



MAKE OUR ELECTRICITY SUPPLY RESILIENT

Prolonged power failures are a serious concern as climate change progresses and more extreme weather events occur. Having a resilient energy supply to provide power for both our critical needs and water during such times is key. Microgrids can provide power to individual and clusters of buildings using onsite renewable energy generation and batteries, coupled with existing generators. The Island's energy committees are thinking about where microgrids are needed.

Chilmark and Aquinnah, through a national grant, are already designing microgrids for their town centers. The down-island water departments are now also receiving support to find greater resilience strategies.



STORAGE

Renewable energy sources do not always provide power when it is most needed. Solar generates power primarily from 9:00 am-3:00 pm and does best in the spring, summer, and fall. The wind often blows at night and in the early morning and late afternoon hours. We use the most power from 3:00-8:00 pm, which is not a perfect match.

Energy storage will be a significant component of our energy future in order to ensure that we have enough power when we need it.

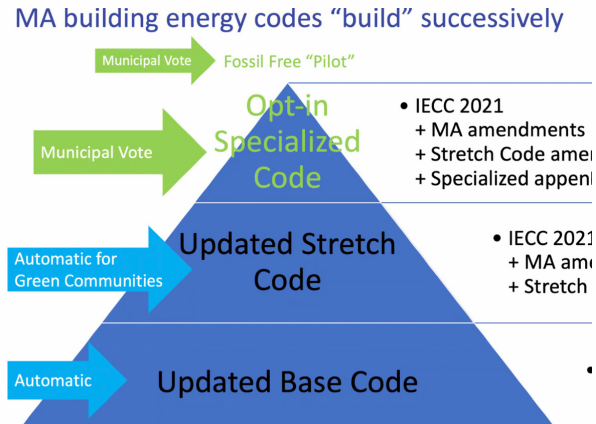
Battery technology is evolving, and stationary batteries may use iron and air or other technologies that are being developed to address this need.

Reduce Energy Use in Buildings



REDUCE BUILDING ENERGY USE AND MAXIMIZE SAVINGS

As of 2023, we have 19,275 houses and 2,016 non-residential buildings. Some houses that were originally seasonal are now being used year-round; many are heated and cooled even when unoccupied. Most of these buildings will still be around in 2050. If we are to meet the goal of 100% renewable by 2040, we must improve these existing buildings. Helping homeowners and businesses make their buildings more efficient by insulating them better and replacing fossil fuel heating systems is essential. **There are no-cost energy assessments and rebates through the Mass Save program, administered by the Cape Light Compact and energy coaching services provided by Vineyard Power to support this work.**



BUILD NEW BUILDINGS EFFICIENTLY

Adopting more energy-efficient building codes to ensure that new buildings are more energy-efficient and all-electric is significantly easier than improving existing buildings. The State has three levels of building codes: the Base, Stretch, and Specialized Codes. All Island towns are now using the Stretch Code as part of their Green Communities participation. The Stretch Code encourages the adoption of efficient, all-electric strategies; the Specialized Code, which a town can opt into, goes a little further. **Aquinnah is leading the way, having adopted the Specialized Code and as a participant in a Statewide 10 Town Pilot project requiring all-electric for new construction and major renovations.**



INVEST IN TRAINING A SKILLED WORKFORCE

We cannot achieve this transition without a trained and robust workforce. Building energy auditors, insulators, HVAC contractors, electricians, plumbers, and solar and wind turbine technicians are all key to this process. ACE MV and Vineyard Power are providing education to younger Islanders and adult re-learners about renewables such as solar and wind. They are introducing middle and high school students and adults to the value and opportunity of the Island career pathways that are available as we transition to a 100% non-fossil fuel-based economy.

Electrify Heating, Hot Water, and Cooking



TRANSITION BUILDING ENERGY USE TO ALL-ELECTRIC

Transitioning our buildings to all-electric, with the electricity coming from renewable sources, is key to our achieving 100% renewable. The State Green Communities program is helping us achieve greater energy efficiency in municipal buildings. Newer municipal buildings are already being built as all-electric.

Transitioning our schools to all electric- with both heat and AC- will make them healthier and more comfortable.

Homes, large and small businesses, non-profits, and large energy users also need to transition.

No-cost energy assessments and rebates are available to all via the Cape Light Compact and Mass Save.



HEAT PUMPS, ELECTRIC WATER HEATERS

Cold climate, high efficiency, air source heat pumps are currently the most efficient way to heat, cool, and dehumidify our houses. Installation costs are cheaper than that of propane or oil-fired systems. They can replace your existing heating system or supplement it. They can be ducted or ductless. The ductless ones often use “mini-splits,” which can be wall hung, floor-mounted, or in the ceiling. Hybrid electric water heaters that also use heat pumps are the most efficient way to make hot water today. These water heaters, if installed in your basement, will also dehumidify the space. In both cases, there are rebates to help. **Vineyard Power** offers support for getting rebates.



INDUCTION STOVES

There have been numerous articles about the hazards of cooking with gas. Gas stoves emit pollutants, several of which are known to damage our lungs and exacerbate respiratory issues. Induction cooking utilizes magnetic current to heat pots and pans instead of using burners or flames. These stoves are up to three times more energy efficient than gas stoves and 10% more efficient than traditional electric ones, because they heat your cookware and food directly. They improve indoor air quality and are safer. Any flat bottomed pan that a magnet sticks to will work with an induction cooktop. *(The technology is different, so it may take a little while to learn.)* **Check an induction burner out of your library to try it out!**

Electrify All Manner of Vehicular Travel



CARS, TRUCKS

The electric vehicle market is rapidly expanding as battery technology improves. There are more vehicle choices and range is expanding. Lower cost vehicles and used vehicles are now available. With our relatively short trip distances, all electric vehicles are well-suited. Plug-in hybrids offer a good solution if driving off-island is a big concern: a 50-mile battery range will get most places on MV; the combustion engine can be used for longer trips. Towns committing to using all-electric municipal vehicles, and having electric rental cars are all part of this key transition.

An Islandwide network of EV chargers is a critical component. Most charging will occur at homes but Level 2 and Level 3 fast chargers are needed to serve the rest of us and our visitors.



BUSES, DELIVERY VEHICLES

The Vineyard Transit Authority leads the way in New England and is well on its way to electrifying its fleet of 32 buses by 2028. Increasing ridership on these buses would help us reduce our carbon emissions and improve our traffic situation. Our School District now has 2 out of 25 of its buses as electric and is trying to procure an EPA grant to acquire more.

Electric delivery vehicles are in early stages of adoption. Carriers like UPS, FedEx, and DHL are running early deployments to test performance and experience the benefits and challenges firsthand. UPS and FedEx are testing in Europe and in California; Amazon Prime is using electric vans for local deliveries in much of the US.



FERRIES, PLANES

The Steamship's first Strategic Plan includes a section "Enhance, Maintain and Green Our Infrastructure and Assets." The COO is now working on laying out a strategic plan for vessels that meets the State's requirements for 2050. The other smaller ferry companies will also need to come up with plans. Developing port infrastructure to support the electrification of all ferry vessels will be a critical aspect of this transition. Cape Air signed a Letter of Intent in 2022 to procure 75 nine-seater Eviation Alice aircraft that they say are a good fit for electric propulsion on routes less than 250 miles. Otherwise, it is anticipated that there will be a gradual shift toward better fuel efficiency for commercial and private jets.

Reduce our Transportation Energy Usage



REDUCE VEHICLE MILES TRAVELED PER CAPITA

We need to increase bus ridership.

We have a forward-thinking, public bus system that provides a good option for travel, particularly during the summer months when our traffic challenge is greatest.

Are there planning and policy changes we could make that support bus usage or multi-modal travel such as, biking and walking in combination with taking the bus?

Creating housing development within walking distance of town centers, “Park and Ride” lots outside town centers, and limiting vehicular access into town commercial centers might encourage people to take the bus. In other places, dedicated bus lanes make it faster to ride the bus than drive in your car. **Is there any way we could do this here?**



PROMOTE BIKING AND WALKING OPTIONS

Providing safe biking and walking options is another important strategy. In many communities, people of all ages commonly use bicycles for trips of 5 miles or less. A safe, island-wide network of bike paths and lanes would encourage reduced vehicle usage as does a network of walking options: sidewalks, paths and trails.

Dedicated ways for bicycling are a challenge on most of the island’s narrow roads, and a culture of sharing roadway space is important to cyclists’ safety.

How can we make the Vineyard a place where biking and walking are good options?

The MVC Bicycle and Pedestrian Advisory Committee is focused on this.



REDUCE WASTE AND SHIPMENT OF WASTE

We ship trash, construction waste, recyclables and septage waste off-island each year at great expense. About 30% of our municipal solid waste is food waste. Recycling markets are volatile. We import large volumes of landscaping materials.

Could we reduce the amount that we ship off-island? Could we compost some of this “waste” and meet our own demand for soil amendments?

Island Grown Initiative has been composting restaurant and residential food waste but their composter needs replacing. Finding a spot and funds for a larger composting facility is a challenge. The [MV Organics Recovery Committee](#) meets monthly to generate ideas as to how we can do better.

How Can You Help?

- **Islanders and Summer Visitors**

- Share your voice, get involved, act on choices under your control
- Get an energy audit, insulate your home, go solar, switch to heat pumps for heating, cooling and hot water, get an induction stove, make your next car electric
- Turn your heating and cooling off when not here or adjust temperature to reduce energy use
- Participate in local and state rebate programs
- Attend town meetings and support climate-related initiatives

- **Elected and Appointed Officials**

- Consider how the decisions you make on your board or committee will impact the Vineyard's climate goals
- Ensure your town boards and committees have climate on their mind when making decisions
- Advocate for and support policy and regulations that advance actions identified in this 100% Renewable plan and to meet the 2040 resolution goals

- **Small Businesses**

- Take steps to save energy and lower operating costs
- Share your commitments with employees and patrons
- Participate in the green economy, support our local economy
- Provide EV chargers for employees and patrons

- **Large Employers, Schools, and Other Large Energy Users**

- Take steps to save energy and lower operating costs
- Share your commitments with employees and patrons
- Help shape zoning and other regulations that support our Island's climate goals
- Assist employees in decarbonizing their homes and commute
- Work with other large businesses to share experiences and support community-wide GHG emissions reduction
- Provide EV chargers for employees and patrons



Resources

Martha's Vineyard Climate Action Plan

<https://www.thevineyardway.org/detailed-action-plan>

MA Decarbonization Roadmap for 2050

<https://www.mass.gov/info-details/ma-decarbonization-roadmap>

No-Cost Home Energy Assessments

<https://www.masssave.com/community-first/vineyard>

Residential Rebates and Incentives

<https://www.capelightcompact.org/resrebates/>

Cape Light Compact information for businesses

<https://www.capelightcompact.org/business/>

Vineyard Power Energy Coaching

<https://www.vineyardpower.com/energy-coach>

Information about Specialized Building Code

<https://www.mass.gov/doc/2023-stretch-energy-and-municipal-opt-in-specialized-building-code-faq/download>

Clean Energy Solutions for your Home from MA Clean Energy Center - *includes information on insulation, heat pumps, heat pump water heaters, induction stoves, solar, batteries, electric vehicles*

<https://goclean.masscec.com/clean-energy-solutions/>

Battery Safety information from IEEE: Institute of Electronic and Electrical Engineers

<https://spectrum.ieee.org/lithium-ion-battery-fires>



Energy Terms:

Kilowatt-hour (kWh): A kilowatt-hour is **1,000 watts used for one hour**. As an example, a 100-watt light bulb operating for 10 hours would use one kilowatt-hour.

Kilowatt (KW): A kW or kilowatt = **1000 watts** and is a unit of measurement for the rate of power an electrical device or load uses. The higher the kW of a device, the more electrical power is needed to operate it.

Megawatt (MW): a unit of power equal to **one million watts**, especially as a measure of the output of a power station.

Gigawatt (GW): a unit of electric power equal to **one billion watts**.

British Thermal Unit (Btu): a Btu is approximately equal to the energy released by burning a match. It is a measure of the heat content of fuels or energy sources. One Btu is the quantity of heat required to raise the temperature of one pound of liquid water by 1° Fahrenheit (F).

A single Btu is very small in terms of the amount of energy a single household or an entire country uses. In 2021, the United States used about 97.33 quadrillion Btu of energy.

You can use energy, or heat content, to compare energy sources or fuels on an equal basis. Fuels can be converted from physical units of measure (such as weight or volume) to a common unit of measurement of the energy or heat content of each fuel.

Btu conversion factors

Electricity	1 kilowatthour = 3,412 Btu
Motor gasoline	1 gallon = 120,214 Btu
Diesel fuel	1 gallon = 137,381 Btu
Heating oil	1 gallon = 138,500 Btu
Propane	1 gallon = 91,452 Btu
Wood	1 cord = 20,000,000 Btu <i>depending on moisture content of wood</i>