MARTHA'S VINEYARD-GETTING TO NET ZERO

Building a clean energy future

OUR SHARED RESPONSIBILITY

MARTHA'S VINEYARD COMMISSION

A Time of Transition

We all know that 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 is also very important. What can we do on our island of Martha's Vineyard?

The island is striving to achieve net zero carbon emissions by 2040 as is the State of Massachusetts by 2050. This **Getting to Net Zero** document builds on the Vineyard's commitment to slow climate change as evidenced by a non-binding resolution that was passed at each of the six Town Meetings in 2021-22.

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 Building Stretch Code as the required standard for energy efficiency in all buildings.

Net Zero

What exactly does Net Zero 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 Net Zero Action document aims to show you our current energy situation and to suggest how you can help us to reach this important goal.

Reaching "net zero" means that our island will reduce its greenhouse gas emissions as much as possible and offset any remaining emissions by 2040 or sooner. This requires a major shift in the way we heat and cool our homes, how we get around, and where our energy comes from. It also presents a huge opportunity to change our community for the better. By achieving net zero emissions, we can also have cleaner air, healthier people, and a more equitable and prosperous community for everyone.

Why "Net Zero?"
Climate scientists have made it clear that we need to reduce global emissions to net zero by 2050, or sooner, to avoid catastrophic climate change.

We know that we are close to the point when the planet will pass 1.5° Celsius in warming—a target that experts say we should not exceed in order 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 future generations.**

Climate change is a global problem but local action is necessary as well. We need to lessen our contribution to it and to lead others to do likewise. **Climate change presents an opportunity to re-imagine the Vineyard's future and to make the community safe and equitable for all who live and work here.**

Where are we now?

This Getting to Net Zero document takes the work of the CATF, the Energy Working Group and the CAP 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 1000 solar arrays here, generating 6% of our power. The first large offshore wind farm in the country is being erected southwest of the island, and it will contribute 800 megawatts (MW) to our region's power supply.

The **Climate Action Task Force (CATF)**, a committee housed at the MV Commission, has been meeting since 2019 to forward Vineyard actions that address climate change. A subcommittee, the **Energy Working Group,** prepared a report in 2019 that analyzed the island's energy use and made projections about future energy use.

In 2022, the **Climate Action Plan (CAP)** was completed. The CAP has six sections, one of which addresses Energy Transformation: put together by a group of islanders with knowledge about this topic. It lays out a series of goals and actions to address our need to transition away from the use of fossil fuels to lessen the advance of climate change.
https://thevineyardway.org/detailed-action-plan

Our Energy Supply

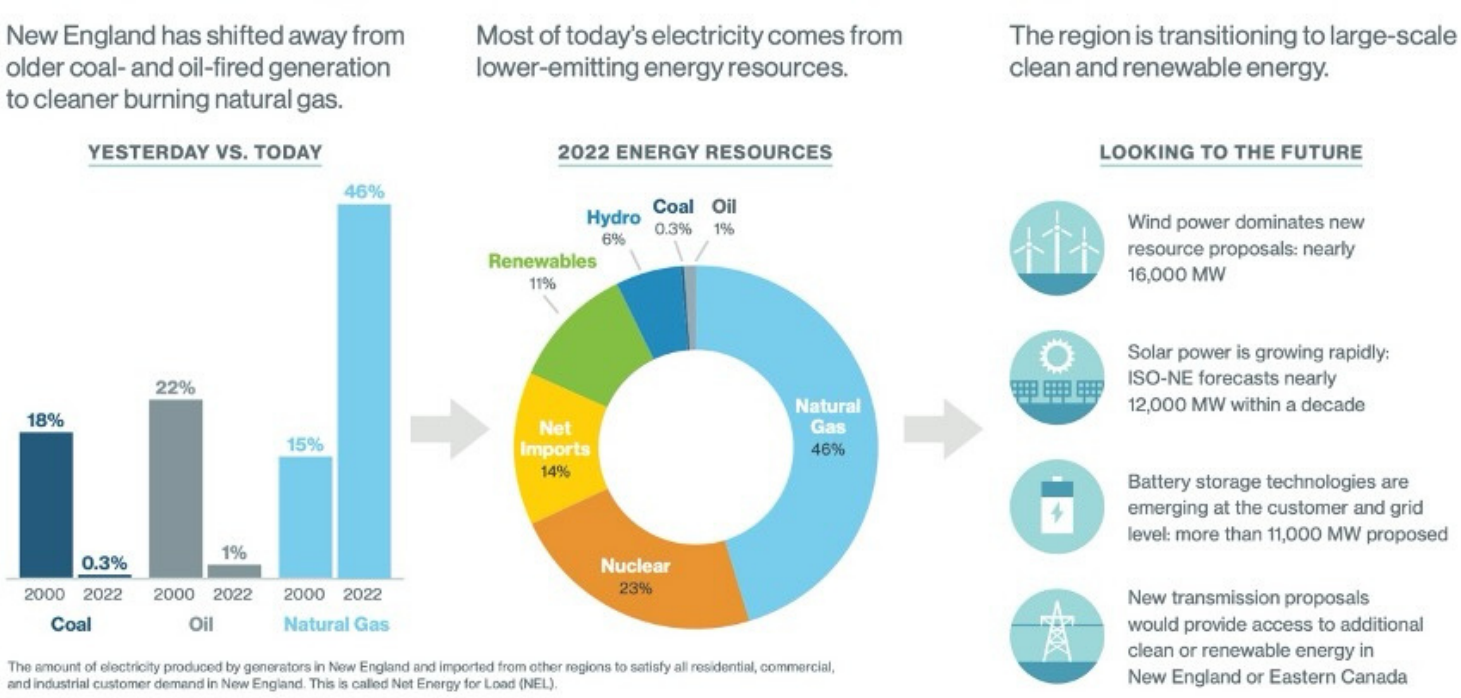
We import most of our electricity and all propane, oil, gasoline, diesel, aviation gas and jet fuel to power our buildings, transportation and other energy needs.

Electricity

As an island with no baseload power plants, we get our electricity primarily from the mainland via undersea cables. We are part of the northeast electrical grid, managed by ISO New England. Our 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 electricity is being generated from renewable resources.

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.



Electricity from Renewable Sources

SOLAR

The first grid-tied solar array was installed on the Vineyard in 1998. It was a 1 kilowatt array. Between 2003 and 2021, a total of 1127 solar arrays have been installed. **We now have 20 megawatts (MW) of solar,** providing approximately 6% of our power needs.
The goal is to produce at least 15% of our power from on-island solar.

WIND

Vineyard Wind I will be the first commercial scale US offshore wind project. 13.8 miles south of the Vineyard, it consists of 62 wind turbines each capable of generating 13 megawatts (MW) of electricity. **The project will produce 800 MW**: enough to power all the homes on Martha's Vineyard, Nantucket, Cape Cod, and parts of Plymouth County.

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 hours. Peak usage is from 4:00-8:00 pm and greatest in the winter and summer months.
Energy storage will be a significant component in our energy future to have enough power when needed.

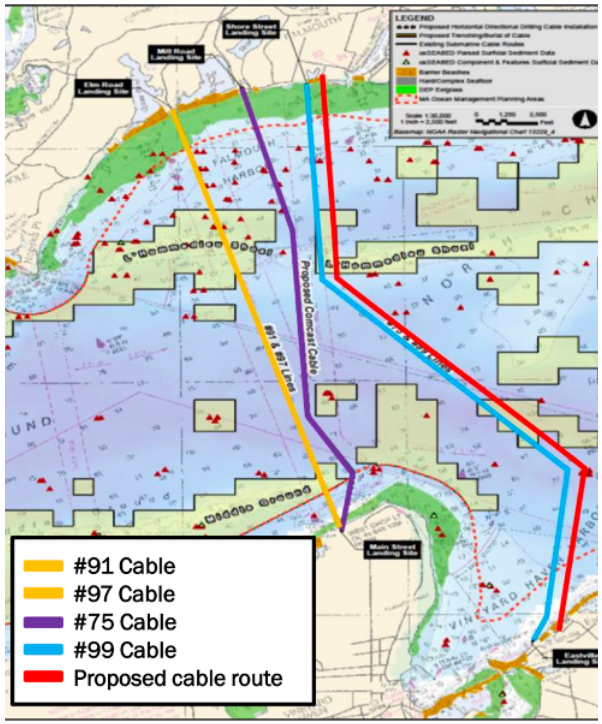
Our Electricity Structure

Since 1998, electricity supply in Massachusetts has been competitive. Eversource is our distributor of power. 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 power supplier if they wish.

Eversource is regulated by the Department of Public Utilities (DPU), a board of three 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 (poles and wires). The rates for electricity supply, as contrasted to distribution services, are approved by the DPU after a market-based bidding process.

Eversource provides all the infrastructure needed to distribute and transmit 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 in 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 are to be installed by 2025.**

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



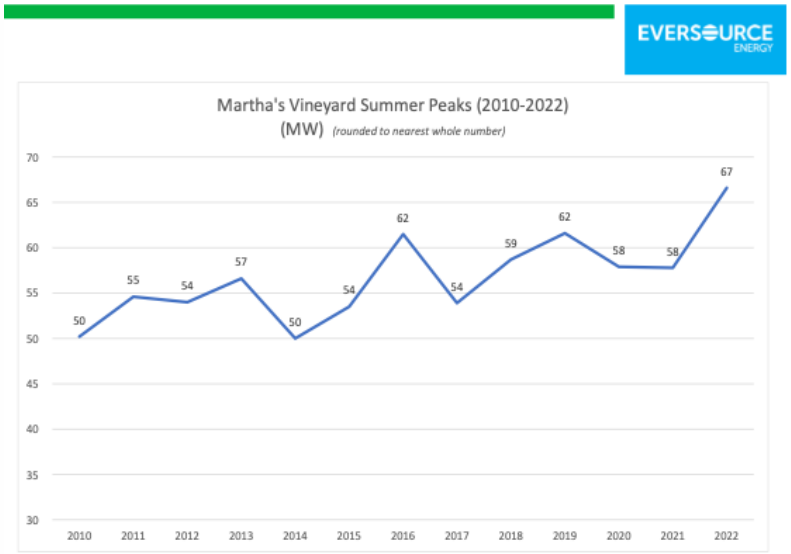
Eversource meets quarterly with the MVC Energy Planner, representatives from each Town, the County, Climate Action Task Force and Vineyard Power. These talks center around grid modernization and improving the resilience of our electrical infrastructure.

Our electrical use has increased by 17% over the last 10 years.

Peak Demand

Electrical infrastructure is designed to handle peak demand. Because of the growth of our population and increased numbers of seasonal visitors, our four cables no longer satisfy our summer peak demand when our population is greatest, when 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.

The two new cables will replace one existing and add a fifth cable. Together, the five cables will have a rated capacity able to provide 140% of our predicted usage in 2050.* These cable additions will allow them to remove the diesel generators that Eversource has installed here.

This prediction assumes significantly greater use of electricity for heat pumps- for heat, AC and hot water, induction stoves and for electric vehicles.

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 3 heating oil companies. In addition, aviation gas and jet fuel are provided at the airports.

Emissions

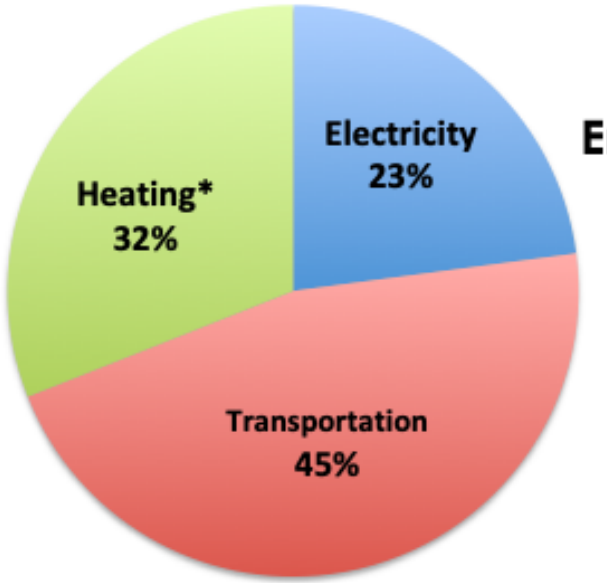
Every day, Vineyard residents, businesses, towns, schools, and others rely on fossil fuels to heat and cool their buildings, keep the lights on, power electronics, and drive vehicles. In doing so, we release greenhouse gas emissions, principally carbon dioxide.

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

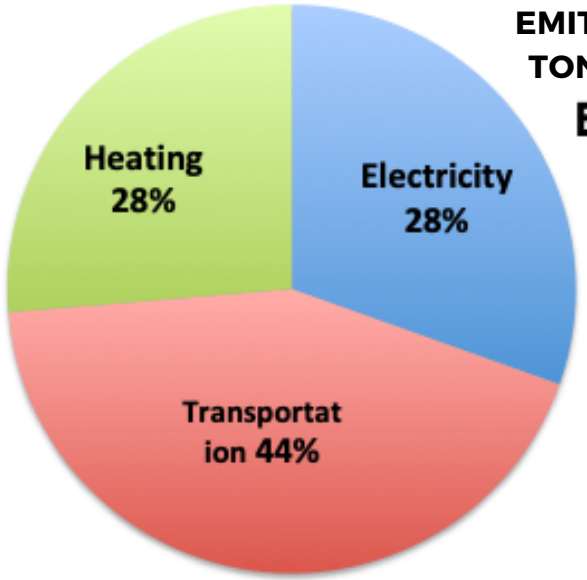
In 2018, **the Energy Working Group*** worked to identify the primary sources of emissions across our island and to calculate a baseline for future emission reductions. This is the most recent year for which complete data is available.

**Rob Hanneman, Mark Rosenbaum. Richard Andre, Alan Strahler, Tom Soldini, Kate Warner (at beginning)*

Energy Use and Greenhouse Gas Emissions, 2018



Energy



IN 2018, WE EMITTED 280,000 TONNES OF CO2

Emissions

Transportation	Million Gallons
Gasoline	7.23
Diesel	3.02
SSA Marine Diesel	1.46
MVY Jet Fuel	0.70
MVY Aviation Gas	0.09

Buildings	Million gallons
Fuel Oil	2.49
Propane	7.88

We are working to establish a good system for gathering fuel data on an annual basis.

Steamship vessels

Electrification of ferries is happening world-wide. The E-Ferry Ellen in Denmark has been on the water since 2018. The Washington State Ferry System, the largest ferry fleet in the US, has a plan underway to electrify. Maine State Ferry System has a hybrid vessel underway for one of their routes. These are just a few examples of many.

The Steamship Authority's vessels are responsible for approximately 11% 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 10 vessels, some of which travel both to the Vineyard and Nantucket, is a challenge. We are one of only a few ferry systems that relies on the "fare box" for our revenue. This model limits the funding sources available for making the required transition.

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 this is important is a good idea!

How do We Get There?

The basic principles of achieving net zero 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 net zero. It, and the work of the Climate Action Plan will be revisited as things evolve.

To reach our goal we will need to:

- Green our regional electrical supply and increase our local energy generation
- Make our homes and buildings super-energy-efficient
- Electrify heating, hot water, and cooking equipment
- Make walking, biking, and public transit the best ways to get around
- Electrify cars, trucks, buses, ferries and other means of transport

Resilience and Adaptation

TRANSITION TO A 100% CARBON-FREE ELECTRICAL SUPPLY

Increasing our on-island renewable energy generation, using solar canopies in parking areas for shading and energy production, transitioning all municipal buildings including schools to all-electric from renewable sources and supporting the greening of New England's electrical supply are all part of this.

MAKE OUR ELECTRICITY SUPPLY RESILIENT

Having a resilient energy supply for our critical needs during prolonged power failures is key. All the island's energy committees are thinking about where microgrids are needed. Microgrids which take advantage of power supply from generators, solar and battery storage provide greater resilience.

ENHANCE OUR NATURAL ABILITY TO CAPTURE & STORE CARBON

Trees and vegetation across the island and farms- if managed using regnerative agriculture practices- all can help with carbon sequestration. Salt marshes and wetlands are critical to absorbing increased precipitation. Preserving, protecting and enhancing those resources is key to successful adaptation to climate change.

Our Homes and Businesses

REDUCE BUILDING ENERGY USE AND MAXIMIZE SAVINGS

Most of the buildings we have here now will still be here in 2050 and beyond. Helping homeowners and businesses reduce these buildings' energy use by insulating them better and making them more airtight is essential.
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.

TRANSITION BUILDING ENERGY USE TO ALL-ELECTRIC

Helping homeowners, businesses and our large energy users transition to all-electric is key to our achieving net zero. **Vineyard Power offers information and coaching t**o help homeowners and small businesses. Energy assessments and rebates are available to all. Transitioning our schools to all electric- with both heat and AC- will make them both healthier and more comfortable and needs doing.

INVEST IN TRAINING A SKILLED WORKFORCE

We cannot achieve this transition without a trained and robust workforce. Electricians, plumbers, HVAC contractors, building auditors, insulators, solar and wind turbine installers are all key to this process. Plans are underway to introduce the value and opportunity of these island careers in the school system and to increase adult education on these topics.

Transportation

SUPPORT TRANSITION TO ELECTRIC VEHICLES

Having an island-wide network of EV chargers that serve us and our visitors is a key component in making this transition. It is predicted that 80% of charging will happen at homes but both Level 2 and fast chargers are needed to address the needs of the rest our community.
Electric school buses, having the towns commit to all-electric vehicles, offering electric rental cars for people to try are all part of this key transition.

REDUCE VEHICLE MILES TRAVELED PER CAPITA

Establishing a safe island-wide bike path/lane network would encourage reduced vehicle usage. Safe walking paths: sidewalks and trails support this as well. Creating housing development in walking distance of our town centers and developing programs that increase VTA bus ridership will help us with our traffic problems as well as lessen our contribution to climate change.

REDUCE WASTE AND SHIPMENT OF WASTE

We ship a tremendous amount of waste off-island- solid and construction waste, recyclables and septage waste at great cost. We import large amounts of landscaping materials. Are there ways that we could make use of more of this “waste” -- compost it and make our own landscaping material? Or reduce our generation of waste in other ways? A dedicated group is working on this.

How Can You Help Out?

- **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, hot water, get an induction stove, make your next car electric
- Participate in local and state rebate programs
- Attend Town meetings and vote for climate 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, board or committee has a representative who is active on the Net Zero Action Task Force?
- Advocate for and support policy and regulations that advance actions identified in this Net Zero plan
- **Small Businesses**
- 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**
- Share your commitments with employees and patrons
- Become part of the island's Green Business leadership Coalition?
- Help inform zoning and other regulations that support net zero
- 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