

# Island Energy Update 2022

## *Vineyard Sustainable Energy Committee*

### **Introduction**

In 2017, the leaders of our town energy committees came together to establish an all-Island group as a coordinated response to the accelerating climate crisis. Through joint projects and sharing of best practices in furthering energy sustainability and resilience for our threatened island home, this group, the Vineyard Sustainable Energy Committee (VSEC), remains a key element of a now-flourishing energy community that includes Vineyard Power (established as a cooperative in 2009 and a founding member of VSEC) and the MVC's Climate Action Task Force (2019).

Three major joint projects have been successfully carried out:

- Enrolling all six Island towns in the Commonwealth's Green Communities program, resulting in state energy efficiency grants for the towns that so far total more than \$1M;
- Developing aspirational energy transformation goals for the Island that have been adopted by all six towns through Town Meeting votes; and
- Creating an Island energy consumption model that allows us to measure our progress in achieving those goals.

This report is a very condensed retrospective view of the accomplishments of our Island energy community over the past 5 years. That community has already moved on to the next steps in our energy transition, addressing energy efficiency, electrification of transportation and building energy equipment, additions to on-Island renewable energy sources, and especially increasing the resilience and affordability of our local energy system.

### **Progress Toward Our Energy Goals**

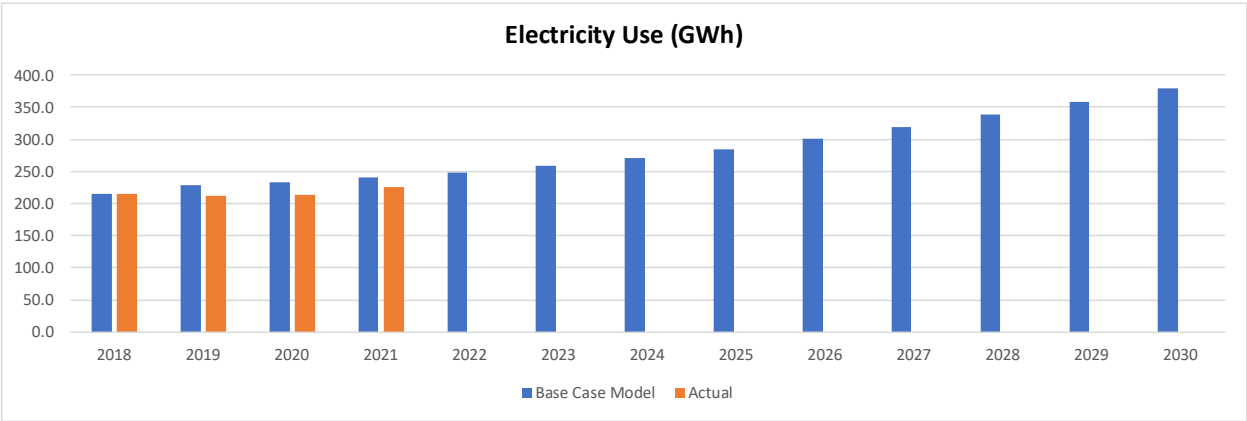
The long-term aspirational energy goals adopted by the towns are simply stated: we want to lower our fossil fuel use (transportation, including the SSA, and building heating) by 50% by 2030 and 100% by 2040, and we want to have 50% renewably-generated electricity by 2030 and 100% by 2040.

Our detailed energy use model considers population and building growth as well as adoption rates for electric vehicles and electric (heat pump) building heating and cooling. Given input assumptions, energy use by type (fossil fuels, electricity) by year is calculated. We have chosen to work primarily with business-as-usual assumptions, which provide our expected energy profile given national and state energy transformation plans. This "base case" will not meet the goals for our community, but does provide a benchmark that will be meaningful for the early years of our energy system transformation.

Note that energy system resilience is not included in this update report, but is very important in light of the increased frequency and severity of climate change driven weather events. It will be a major focus going forward and will be included in future updates.

**Electricity Use and Renewable Fraction**

Replacing fossil fuel in transportation and buildings with electricity over the next two decades will more than double the Island’s electricity use by 2040. The chart below shows the measured annual electricity consumption for 2018 through 2021 compared to the base case up to 2030.



Noting that the data for 2020 and 2021 were no doubt impacted by the COVID pandemic, conclusions about our progress in energy transformation are questionable.

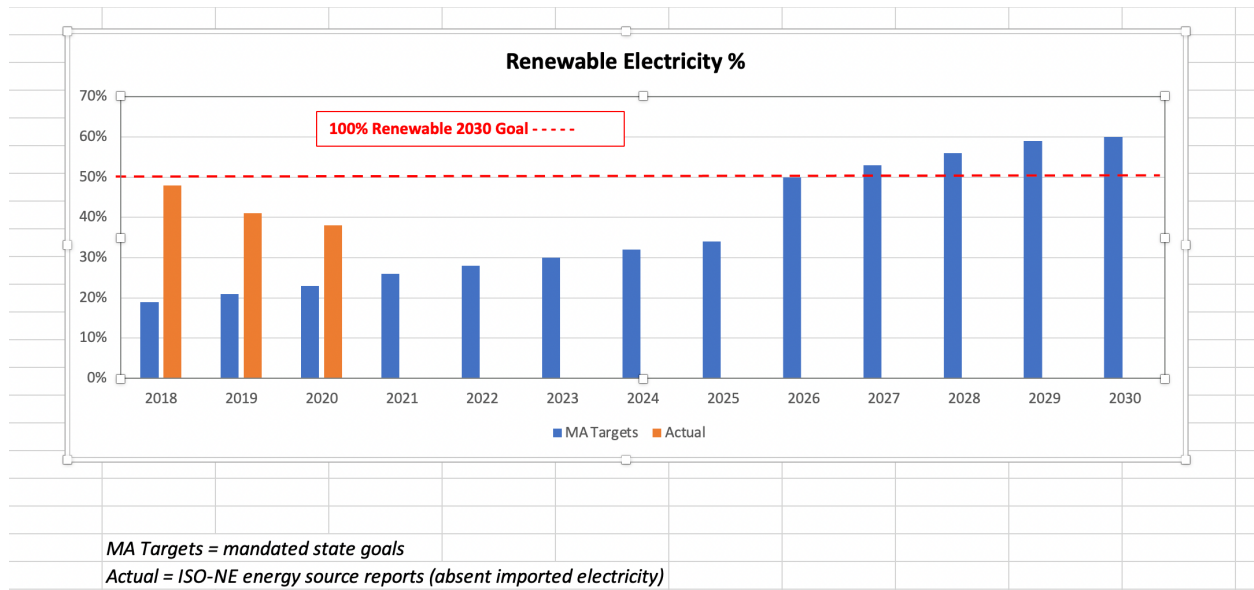
Eversource is the Island’s electric distribution utility. They, in turn, are governed by the Commonwealth’s Department of Public Utilities and the state’s climate change mitigation plans – which mandate the minimum fraction of the supply that is renewable. The chart below shows the Massachusetts targets and the renewable fraction as measured by ISO-New England.

Two important notes:

- The renewable fraction includes power generated by the Pilgrim nuclear plant prior to its closure. Thus, once it closed, the renewable fraction, which had been almost 50%, actually declined. The decline will not continue.
- A small fraction of ISO-New England’s supply crosses regional boundaries. This will impact the renewable fraction, but not significantly
- If MA statutes are followed, the 50% by 2030 goal will easily be met.

An obvious question at this point would be: if we are doubling our electricity use over the coming decade+, will we have enough power supply from Eversource? Utilities provide power based on the peak demand, which will increase as we electrify vehicles and buildings. Our energy community has worked closely with Eversource on this issue over the last two years.

They now have a project underway to add a fifth submarine cable and another to replace an existing cable that is at end-of-life and operating a half capacity. When these projects are complete, we expect that sufficient power will be available in excess of the base case for at least 10 years – at that point, though, additional cables and/or increased capacity cables will be needed.



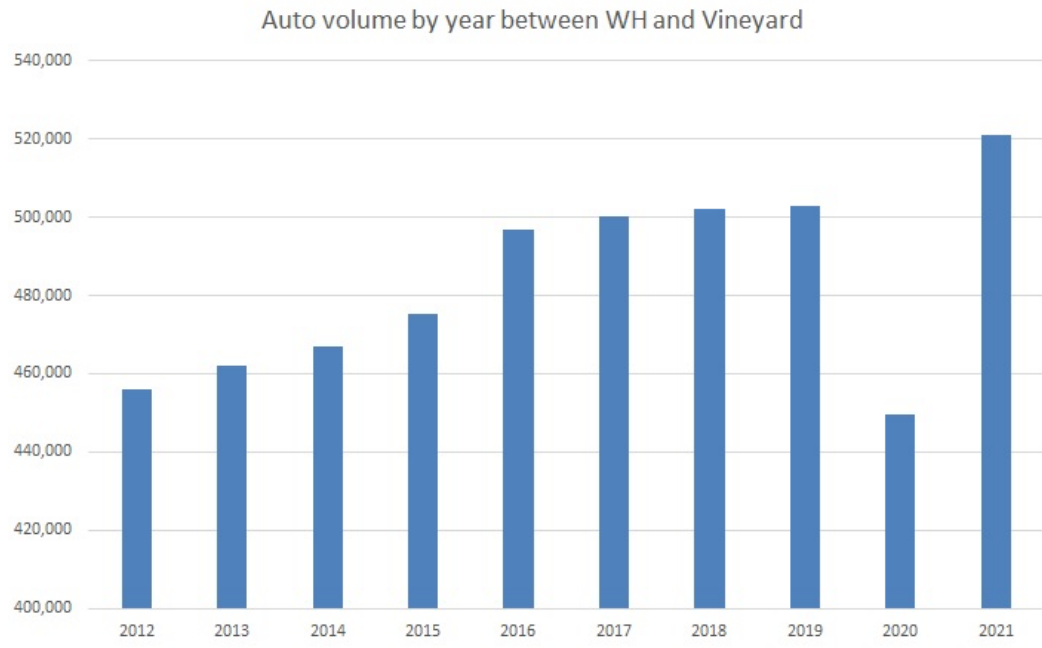
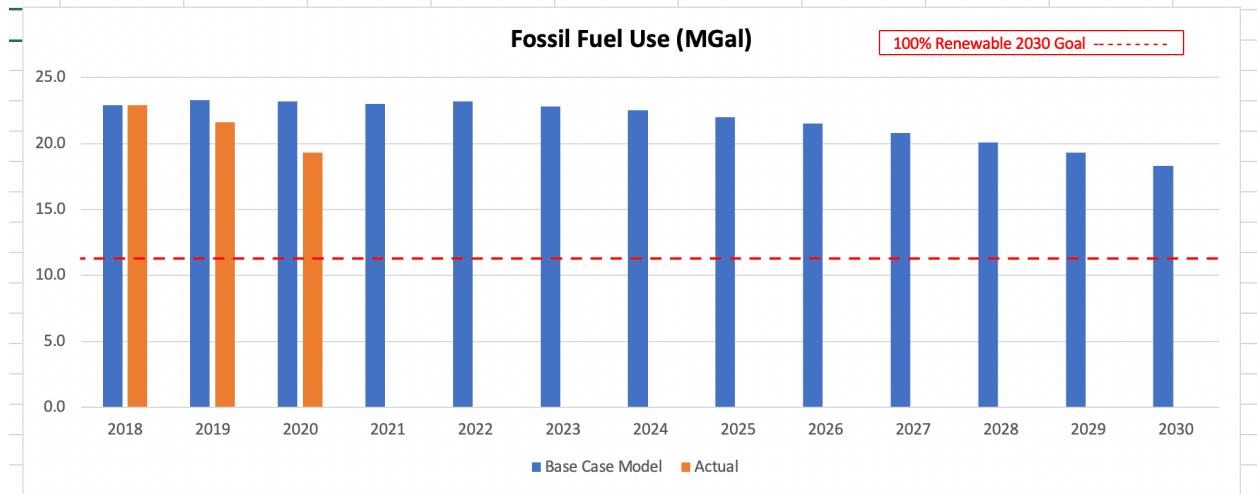
### **Fossil Fuel Use and CO<sub>2</sub> Emissions**

The ultimate goal of electrifying vehicles and building heating is to lower the Island’s use of fossil fuel and thus greenhouse gas emissions. Fossil fuel tracking includes:

- Fuels transported to the Island by the Steamship Authority (SSA)
- Fuels transported by the R. M. Packer company
- Bus fuel for the SSA shuttles

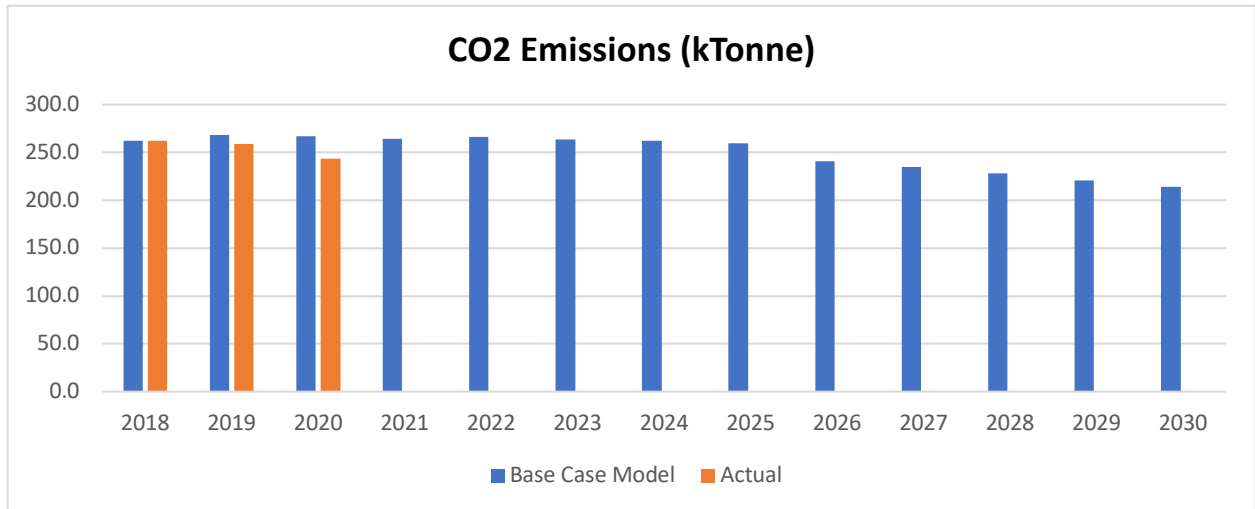
These fuels include gasoline, propane, diesel oil, home heating oil, and jet fuel.

The chart below shows fossil fuel use in millions of gallons from 2018 through 2020 along with the base case predictions and the 2030 goal. Although the trend of the data suggests that we are making good progress on meeting the 2030 fossil fuel goal, the trend is misleading, as the pandemic almost certainly impacted fossil fuel use, as can be inferred from the auto traffic figures posted by the SSA for 2020 indicate in the chart below. (Thanks to Professor Nathaniel Trumbull for the latter charts taken from published SSA figures. Truck traffic to MV declined similarly to the auto traffic.)



Improvements in our approach to tracking fossil fuel use in the future include clarification by the SSA regarding fossil fuel transport (they currently decline to provide us with anything but truck sizes, and contents must be inferred), accessing state RMV data regarding EV registrations in Dukes County, and tracking heat pump and heat pump water heater installations.

Fossil fuel use can be related to greenhouse gas emissions in a straightforward manner. We currently use CO<sub>2</sub> emissions as a proxy for overall GHG emissions. Our emissions history in thousands of metric tons is shown in the chart below along with the base case results for 2018 – 2030. The caveats described for fossil fuel use apply equally to CO<sub>2</sub> emissions.



*(Thanks to Richard Andre, Rob Hannemann, Marc Rosenbaum, Tom Soldini, Alan Strahler, and Kate Warner for their many hours of work in developing the data and approach for modeling the Island’s energy system. Luke Lefeber translated those ideas into a computer model and continues to support and develop that model.)*

### **Town-by-Town Accomplishments**

Developing goals and models is essential for transforming our energy system, but that is only the starting point. The town energy committees (and their leaders, who participate in VSEC) accomplished a great deal through substantive projects over the past 5 years.

These accomplishments are described in the pages that follow. Thank you to all that are making our response to the climate crisis real through their work every day.

## AQUINNAH CLIMATE AND ENERGY COMMITTEE ACHIEVEMENTS 2018 TO PRESENT

### THE COMMITTEE

Bill Lake and Noli Taylor were approved by the Aquinnah Select Board to form the Climate and Energy Committee in 2018, with a mandate that includes both mitigation of and adaptation to climate change. Present membership of the Committee now includes also Forrest Filler, Meghan Gombos, and Molly Purves.

### MILESTONES

#### GREEN COMMUNITIES PROGRAM

##### 2018

- The Committee began to prepare for the Town to file an application with the Commonwealth to be designated a Green Community under G.L. c. 25A, section 10.
- The Committee and the Town received help from Cape Light Compact in preparing the Green Community application under a Regional Energy Planning Assistance (REPA) grant.

##### 2019

- At its May 2019 Town Meeting, the Town adopted bylaw amendments to (1) create a zone in which solar arrays may be installed as of right and (2) adopt the stretch building code, two principal qualifications for Green Community designation.
- In October 2019, the Town filed its application for Green Community designation, including an Energy Reduction Plan and Fuel-Efficient Vehicle Policy.

##### 2020

- The Town was designated a Green Community, receiving a designation grant of \$126,530. The grant has been used principally to convert the Town buildings from fossil fuels to electricity for heating, cooling, and hot water.

#### MVP DESIGNATION

##### 2020

- The Committee began the Community Resiliency Building planning process, looking to be designated a Municipal Vulnerability Preparedness (MVP) Community by the state's Executive Office of Energy and Environmental Affairs (EEA). The process involved a number of public listening sessions to gather public concerns about the community's vulnerabilities to climate change.
- On September 30, 2020, EEA designated the Town as an MVP Community.

#### COMMUNITY EMERGENCY RESPONSE TEAM

##### 2019

- The Committee led the creation of the island's first (and so far only) Community Emergency Response Team, to organize and train a group of volunteers to respond to climate or other emergencies in cooperation with professional first responders.

- The CERT was approved by the US Department of Homeland Security for participation in its national CERT program.

#### 2020-2022

- The CERT has been active in connection with recent severe storms on the island, including by opening an emergency shelter in the Aquinnah Town Hall.

#### 100 PERCENT RENEWABLE WARRANT ARTICLE

##### 2020

- The Committee placed the 100% Renewable MV resolution on the town warrant, and it was adopted at the Town meeting.

#### ELECTRIC VEHICLE CHARGERS

##### 2020

- The Committee sought and obtained approval for installation of dual level 2 chargers at the Town buildings and at the Gay Head Cliffs. The chargers are available to be used for free.

#### ENERGY SURVEY

##### 2021

- The Committee joined other town energy committees in distributing a survey questionnaire to town residents to gauge their understanding and interest in the transition to renewable energy for space and hot water heating, transportation, and resilience. The survey results are included in the Committee's report to the Town on its 2021 activities, which has been included in the Town's Annual Report.

#### ETIPP APPLICATION

##### 2022

- Together with the Chilmark Energy Committee, the Committee put together an application that the two towns submitted to the federal Energy Transitions Initiative Partnership Project (ETIPP) for technical assistance in formulating a detailed tactical plan to achieve the 100 percent renewable energy goal by 2040.

- 

#### ELECTRIFICATION WARRANT ARTICLES

##### 2022

- The Committee has placed in the warrant for the May 10, 2022 Aquinnah Town meeting an article requiring that new or substantially renovated buildings use electricity rather than fossil fuels for heating, cooling, and hot water.
- The Committee has placed in the same warrant an article requiring that new or substantially renovated buildings be made ready for an EV charger, with conduit to a convenient charging spot and a 240 volt breaker in the electrical panel.
- A companion article will authorize the Select Board to file with the state legislature a home rule petition requesting authority to put these two measures into effect.

## **Chilmark Energy Committee**

The Chilmark Energy Committee was formalized by the select board in late 2018. CEC members in 2022 are Rob Hannemann (chair), Mike Jacobs, Jerald Katch, Steve Lewenberg, and Hugh Weisman.

Emeritus members: Molly Doyle, Jonah Maidoff.

## **Green Communities Program**

Moving the town to membership in the Commonwealth's Green Communities Program was the first major effort by the committee.

*2018-2019:* Community outreach to communicate the benefits of becoming a Green Community

*2019:* Town meeting approval for a major element - the Stretch Building Code

*2020:* Other requirements were met, and Chilmark became the third Green Community on the Island. We received an initiation grant of \$126,430; this was directed toward upgrading the Chilmark School's building envelope and HVAC systems. At this point, that project is unfortunately still incomplete.

## **100% Renewable MV**

The second major effort of the Committee was to develop and pass a non-binding resolution at Town Meeting setting the community's aspirational goals in addressing climate change. These goals are focused on a 50% reduction in fossil fuel use by 2030 and the elimination of fossil fuel use by 2040, to be achieved by the electrification of transportation and building HVAC. A similar set of goals addressing "greening the electric grid" is included.

The 100% Renewable resolution was approved in 2020; achieving the goals at the municipal level is a primary focus of the committee moving forward.

## **Projects Currently Underway**

- Completion of the Chilmark School project;
- Developing a resilience plan for town center municipal buildings (Town Hall, Firehouse, EMT headquarters), including solar PV and batteries (and eventually, a microgrid) with the assistance of the federal Energy Transformation Initiative Partnership Program for technical support;
- Installation of a DC Fast Charger for electric vehicles, assisted by a \$42,000 state grant.



## Oak Bluffs Climate & Energy Committee

Prior to 2019, the committee consisted of one member, Richard Toole.

In 2019, after completion of our 10-year Master Plan with the mandate to become a greener community, the OB Planning Board supported Richard Toole in the initiative toward receiving the Green Community designation through the state. Richard, with the help of Kate Warner began forming the Energy Committee which currently consists of Bill Cleary, Marilyn Miller, Craig Saunders, Peter Meleney, Simon Shapiro and Dion Alley.

2018 – All selected town buildings audited by Rise Engineering with support from Margaret Song of Cape Light Compact. Energy Reduction Measures were recommended with reports written on each building.

Solar Array installed on Fire Department Building

2019/2020 –

The Energy Committee began working toward the application to achieve the Green Community designation.

Rise Engineering began making no cost or low cost improvements to all our selected town buildings saving the town an estimated \$25,000 to \$40,000 in energy savings annually once completed.

All warrant articles brought to town meeting to support the Energy Committee efforts were unanimously supported by the voters, town management and the select board.

Application approved for a solar array at our designated site, the town landfill. Project on hold

2021-

Slowed by COVID 19 protocols, the committee continued working on the Green Community designation. The completed application was submitted to the state.

The Town Hall underwent a complete interior and exterior renovation. Its passive solar design meets all environmental /building standards for energy efficiency.

Solar array installed on Elementary School Building

Town energy survey conducted

2022-

Received the Green Community designation from the state awarded \$144,000 to reduce the energy consumption by 20% over the five-year period beginning in 2020.

Climate Action Plan introduced by the MV Commission

Now the real work begins...

## EDGARTOWN ENERGY COMMITTEE ACHIEVEMENTS 2018 TO 2022

### THE COMMITTEE

The present Edgartown Energy Committee includes members Jack Ensor, Ellen Price, Richard Price, Bonni Widdoes, and Alan Strahler (Chair). Participating members during the period 2019-2022 also included Kara Shemeth, Carla Cooper, and Kat Monterosso.

### MILESTONES

#### SOLAR DEVELOPMENT

2019

- The Energy Committee investigated a possible solar project at the Edgartown Library, but the Library did not wish to pursue it at that time.
- The Committee and Town Administrator (TA) began exploring a possible lease of the closed Meshacket Landfill for solar power development, planning a request for funding for a consultant to help with the project.

2020

- A warrant article for \$15,000 from free cash for a consultant for the landfill solar lease was placed on the Town Warrant and approved at Town Meeting. In Fall, 2020, the Committee assisted the TA in preparing a Request for Proposal (RFP) for relevant consultant services.

2021

- The consultant was selected and an RFP was prepared and posted with responses evaluated by a town committee including two members of the Energy Committee.

2022

- The vendor, Ameresco, was selected and the project began in January. An article for approval of the vendor's lease of the closed landfill was placed on the 2022 Town Warrant. Contract negotiations proceeded during 2022. At the close of the year, the final contract was awaiting signature at Ameresco.

#### GREEN COMMUNITIES PROGRAM

2018

- The Energy Committee began preparations for an application by Edgartown to join the Green Communities Program.

2019

- The Committee began work on joining the Green Communities Program.
- The Committee and the Town applied for and received a Regional Energy Planning Assistance (REPA) grant to support work by Cape Light Compact to help in preparing the Green Community application.
- Work began on building the town's FY2018 energy baseline, a requirement for Green Community application.

2020

- The required Energy Stretch Code bylaw was placed on the 2020 Town Warrant but later withdrawn and postponed due to Covid-19.
- Energy audits of town buildings began in early 2020 and were completed by the end of the year. No-cost contracts were prepared by Rise Engineering for all energy conservation measures completely covered by incentives from Cape Light Compact.

- Municipal energy baselines for FYs 2019 and 2020 were completed by late in the year.

2021

- The Energy Stretch Code bylaw was placed on the 2021 Town Warrant and adopted by voice vote at the annual Town Meeting in May.
- Energy audits were revisited for the Edgartown School and the Highway Department and new contracts provided.
- The FY2021 energy baseline was completed.
- A second REPA grant for help from Cape Light Compact on our Green Community Application was proposed and awarded.

2022

- The Edgartown Energy Reduction Plan and Fuel-Efficient Vehicle Policy were adopted by the Selectboard and the School Committee.
- The final application for Green Community status was submitted in May. The Town was subsequently accepted into the program with a designation grant of \$132,000.
- Funds were allocated to two Energy Savings Measures: New dimmable LED lighting for the Edgartown School, and replacement of sewage pumps at the Wastewater Department.

#### WARRANT ARTICLES AT TOWN MEETING

2020

- The Committee placed the “100% Renewable MV” article on the town warrant, but subsequently withdrew it due to Covid-19.

2021

- The Committee again placed the article on the annual town warrant. It was adopted by a voice vote at the 2021 Town Meeting.
- The Committee supported the warrant article allowing the VTA to install inductive bus chargers on Church Street, as well as an article requesting funds for two electric school buses for the MV Regional School District. Both passed by voice vote.

#### ELECTRIC VEHICLE CHARGERS

2019

- The Committee began work on securing vehicle chargers in the town for electric vehicles, contacting vendors regarding specifications and costs and working with Eversource for provide the power for the site.

2020

- The Committee placed an article on the annual Town Warrant requesting \$26,000 for purchase and ongoing 5-year costs of maintenance and software for 2 dual Level-2 chargers at the town Park and Ride Lot. However, the article was subsequently withdrawn due to budgetary concerns brought on by Covid-19's impact on town revenues.

2021

- The article for charger funding was then placed on the 2021 annual Town Warrant and was passed by voice vote.
- The Committee prepared an application by the town for a grant from the Commonwealth's Electric Vehicle Incentive Program for the cost of the necessary hardware and installation for the chargers. The grant request was approved.
- The Committee also prepared a similar application by the town for a grant for a Direct Current Fast Charger to its cover hardware cost and installation. It was subsequently denied in early 2022.

- The Committee applied for and received free installation of power supply equipment and connection to the grid by Eversource through its Make Ready EV program.

2022

- Two dual Level-2 chargers serving four parking spaces were installed at the Town Park and Ride in January. However, complications arose in providing power to the site and operation did not begin until late June.

#### ELECTRIFICATION OF TOWN BUILDINGS

2022

- The Committee assisted the town in applying for a Municipal Energy Technology Assistance (META) grant to plan an energy service facility, including solar photovoltaic power and battery storage and smart switching equipment for the Firehouse and Police Headquarters during upcoming replacement and renovation.
- The Committee requested the placement of a request of \$43,500 on the 2023 annual town warrant for a study producing individual plans for full electrification and solarization of other town buildings.
- The Committee assisted the Edgartown School in applying for a \$100,000 planning grant for replacing oil-fired heating with electric heating and air conditioning, including solar power and battery energy storage.

#### OTHER ACCOMPLISHMENTS

2021

- The Committee joined other town energy committees in providing a survey questionnaire to town residents to gauge their understanding and interest in the transition to electrical, renewable energy for space and hot water heating, transportation, and resilience. Respondents numbered 52 by the close of the year.
- The Committee proposed the formation of a Town Climate Committee to the Selectboard, which was approved. The Climate Committee was appointed in early 2022.

2022

- The Committee launched a new effort at community outreach, focused on home energy assessments, in connection with Vineyard Power.
- By letter and oral testimony, the Committee supported the permitting of the New England 1 Connector by the Martha's Vineyard Commission and the Edgartown Conservation Commission. The connector will bring power from the Park City Wind development to Eversource on Cape Cod under the floor of Muskeget Channel.

5/4/2022

## **TISBURY ENERGY COMMITTEE - A SHORT HISTORY**

### **(Energy Generation and Energy Conservation)**

#### **ELECTRIC GENERATION PROJECTS**

- Beginning about 2010 the Energy Committee was involved with The Cape and Vineyard Cooperative (CVEC) and as a result the town leased the land fill site next to the- Park and Ride lot to a third-party corporation for the purpose of installing a solar array of 1.2 megawatts and 3000 solar panels. For this lease the town is receiving approx. \$113,000 each year for 20 years. These funds are applied to the general town budget. To date the town has received more than \$700,000.

At various times during this contract with the owner of the solar array CVEC and Tisbury have the opportunity to buy out the solar array as so stated in the contract. If Tisbury did acquire this solar array then it would be possible to establish a micro grid with all the town buildings connected and then also add a battery backup system.

- At town meeting (2018) a warrant article was put forth and accepted to install a solar array on the Fire Station on Spring Street. This array was funded by the town at a cost of \$122,994 and consists of 114 panels. During the first year of operation the MA state SMART program paid Tisbury approx. \$10,000 for the electricity this array generated. Also, since the Fire station consumes the electricity that the array generates this offsets the need to purchase the same amount from Eversource thus saving money. During the first year the savings was estimated to be approx. \$7000. The pay out from the state SMART program will continue for 20 years and should total approx. \$200,000. Considering both the income from the state SMART and the savings in electric not purchased the

payback period for the initial Capital investment is expected to be 7-1/2 years.

The solar array project on the Fire Station should stand as a bench mark to measure other project handled through CVEC or other sources. As it stands now any project handled through CVEC that is smaller than 1 megawatt in size will not have a cash payout from the MA state SMART program. Also, projects handled through CVEC will be owned by a third party for the life of that contract. Most of these projects will be on town owned buildings. So, question, do we want solar arrays on town building owned by a third party?

## **ENERGY CONSERVATION PROJECTS**

- Tisbury received its first award as a Green Community on 7/24/2012 and received a check for \$140,000 for the installation of electric heat pumps at the Police Station. The oil-fired boiler system is still in place and serves as a backup system. Also, the boiler at the library was upgraded and the boiler at the senior center was converted from oil to propane with indirect hot water heating.
- About 2014 Tisbury opened a project with Cape Light Compact and converted all of the lights at the – Park and Ride lot to LED's. At about the same time and again thru Cape Light Compact all of the street lights in Tisbury were changed to LEDs with the exception of some privately owned lights.
- On 8/27/2020 Tisbury received a second award of \$63,621 as a Green Community to fund (2) Hybrid police vehicles, (2) EV charger, Heat Pump system, fuel conversion at the DPW, and funds for Administration assistance.
- Spring of 2022 Tisbury has applied for an award to install a heat pump system at the DPW building. This project should move along soon.

## **West Tisbury**

### **List of recent accomplishments (from about 2018)**

#### **Energy Committee**

- Passed goal of 100% Electric from Renewable Sources and 100% reduction in fossil fuel use by 2040 at October 2020 Town Meeting.
- Clean Energy and Resiliency (CLEAR) study (funded by Mass CEC) was completed March 2021. This report outlines what work needs to be accomplished to provide Town resilience in times of emergency.
- 5-Year Energy Plan: In keeping with findings of the CLEAR report, the Energy Committee has been developing a 5-year energy plan.
- Electric Vehicles/Chargers:
  - The Town now has 4 EV charger sites.
  - 2 hybrid police cruisers in fleet as of 2021.
  - 2 electric vehicles for use by Town Hall staff
- School: As of Summer 2021 the WT School is now part of our Green Communities designation. We are preparing to have an energy analysis done of the school as a first step towards making the building fossil-fuel-free
- Library - An RFP is being re-issued to seek proposals for a solar array with battery back-up at our Library which is our designated cooling shelter.
- Articles on warrant for Spring 2022 Town Meeting as Home Rule Petitions, following the lead of Aquinnah.
  - 100% Electric for new construction and major renovations
  - EV charger-ready article

#### **OUTREACH**

- Energy Questionnaire sent out with tax bills to homeowners.
  - Goal: to determine barriers to adoption of electric technologies (heat pumps, electric vehicles...)
- Information sessions
  - to share knowledge about our EC's experiences with electric technologies (air source heat pumps, hybrid electric water heaters and electric vehicles).
  - to inform residents and get feedback regarding our 100% Electric warrant articles.

#### **Climate Advisory Committee**

- Hurricane and Wildfire preparedness cards made, disseminated and posted on town website to inform our townspeople. Adapted by other towns/emergency managers for their use and also translated into Portuguese.
- Townspeople preparedness survey sent out with tax bill to determine who can help during emergencies and who needs help.
- Began outreach to road associations as a strategy for preparing for neighborhood resilience in times of emergency