



MEMORANDUM

TO: Libby Gibson, Town Manager
 FROM: Lauren Sinatra, Energy Coordinator
 RE: Update of Energy Office Activities: Third Quarter of FY2016
 DATE: April 26, 2016

This memorandum provides a brief summary update of the ongoing activities of the Energy Office through the third quarter (Q3) of FY2016 (January 1, 2016 through March 31, 2016). The Energy Office will be prepared to discuss these items with the Board of Selectmen on May 4, 2016.

Announcements

- ATM Articles approved on April 2, 2016 by unanimous vote (descriptions included in Appendix):
 - Article 90: Lease of Town Land (at Surfside Wastewater Plant) for Solar-PV Projects
 - Article 91: PILOT (payments in lieu of taxes) Agreements for Renewable Energy Facilities
 - Article 92: Net Metering Credit Purchase Agreement
 - Article 104: Municipal Electricity Aggregation
- National Grid residential electric rates drop from 13.129¢/kWh to 8.042¢/kWh on May 1, 2016 until October 31, 2016. This rate is 13% less than the rate charged in May 1-October 31, 2015 (9.257¢/kWh).
- BOEM Federal Offshore Wind Project Developers received a year-long extension to submit a Site Assessment Plan, originally due on April 1, 2016.
- National Grid has hired a Washington D.C. based non-profit company called Smart Power to help with a local energy awareness campaign (DemandLink Nantucket) to help “empower the Nantucket community” to defer the need for a 3rd undersea cable through more cost-effective and environmentally conscious alternatives. Smart Power has recently hired Nantucket resident Kim Horyn to manage their community outreach efforts; she will be present to introduce “DemandLink Nantucket.”

Municipal Facilities: Energy Efficiency and Conservation Efforts

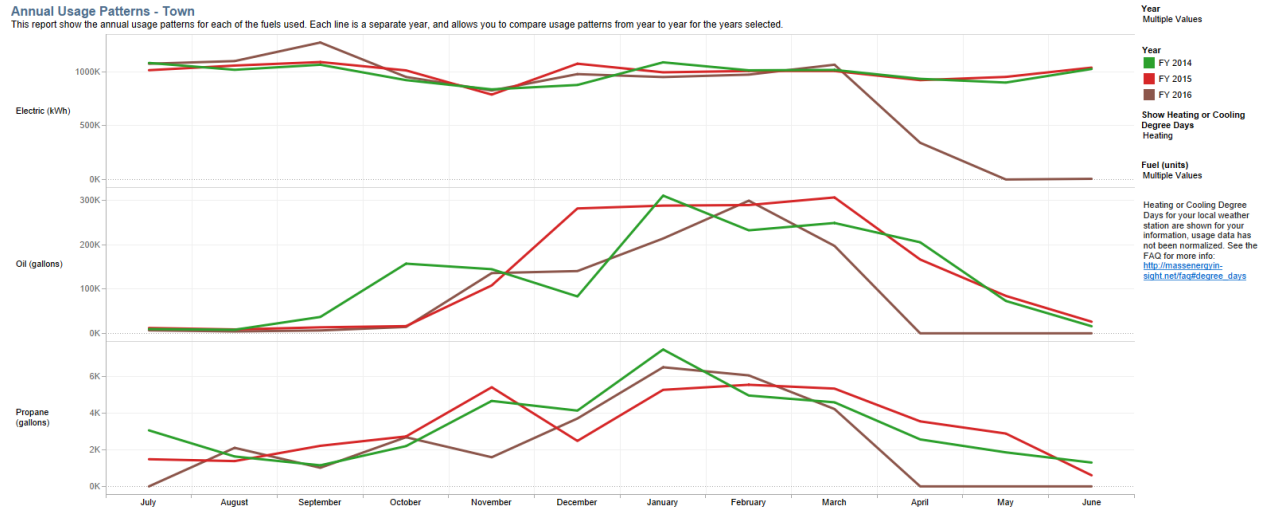
1. Monitoring of Town energy consumption*

	Q3-FY2015	Q3-FY2016	Difference in Use	Difference in Cost
Electricity, kWh	3,003,981 kWh	2,936,281 kWh	-2.25%	-5%
Heating oil, gallons	98,092 gallons	78,826 gallons	-20%	-47%
Propane, gallons	16,120 gallons	16,749 gallons	+4%	-19%

*Source: MassEnergy Insight data totals as of **March 31, 2016**, based upon National Grid data (automatically updated in software on a monthly basis), and quarterly delivery records supplied by Yates Gas and Harbor Fuel (input manually by Energy Coordinator).

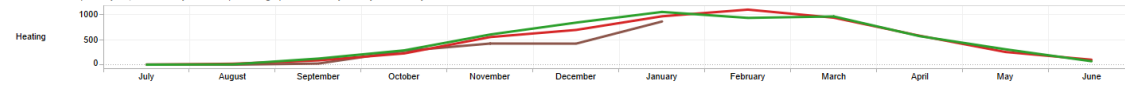
Annual Usage Patterns - Town

This report shows the annual usage patterns for each of the fuels used. Each line is a separate year, and allows you to compare usage patterns from year to year for the years selected.

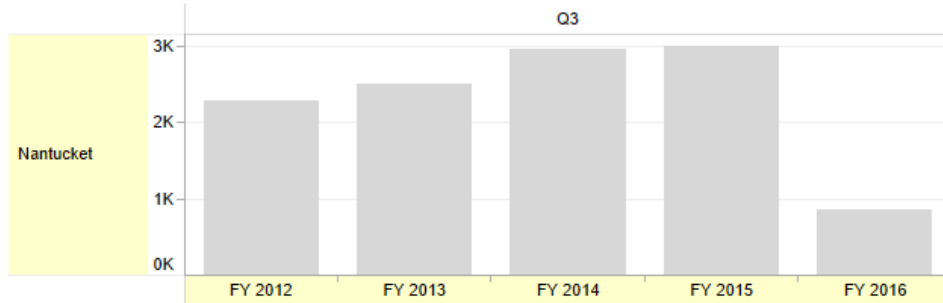


Heating Degree Days by Month

Each line is a separate year, and allows you to compare usage patterns from year to year for the years selected.

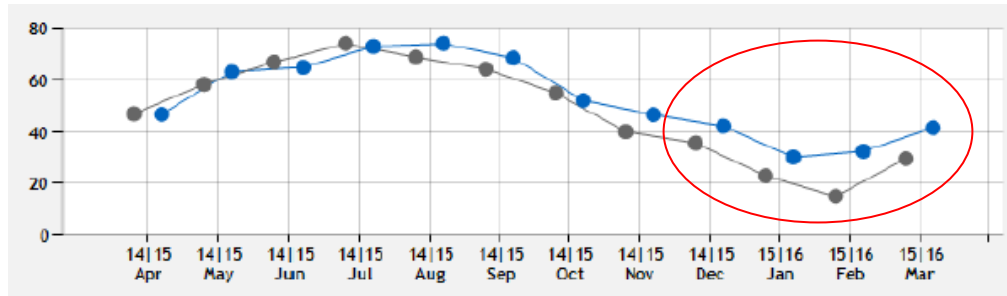


Heating Degree Days Quarter to Quarter



Temperatures:

- Current year
- Previous year



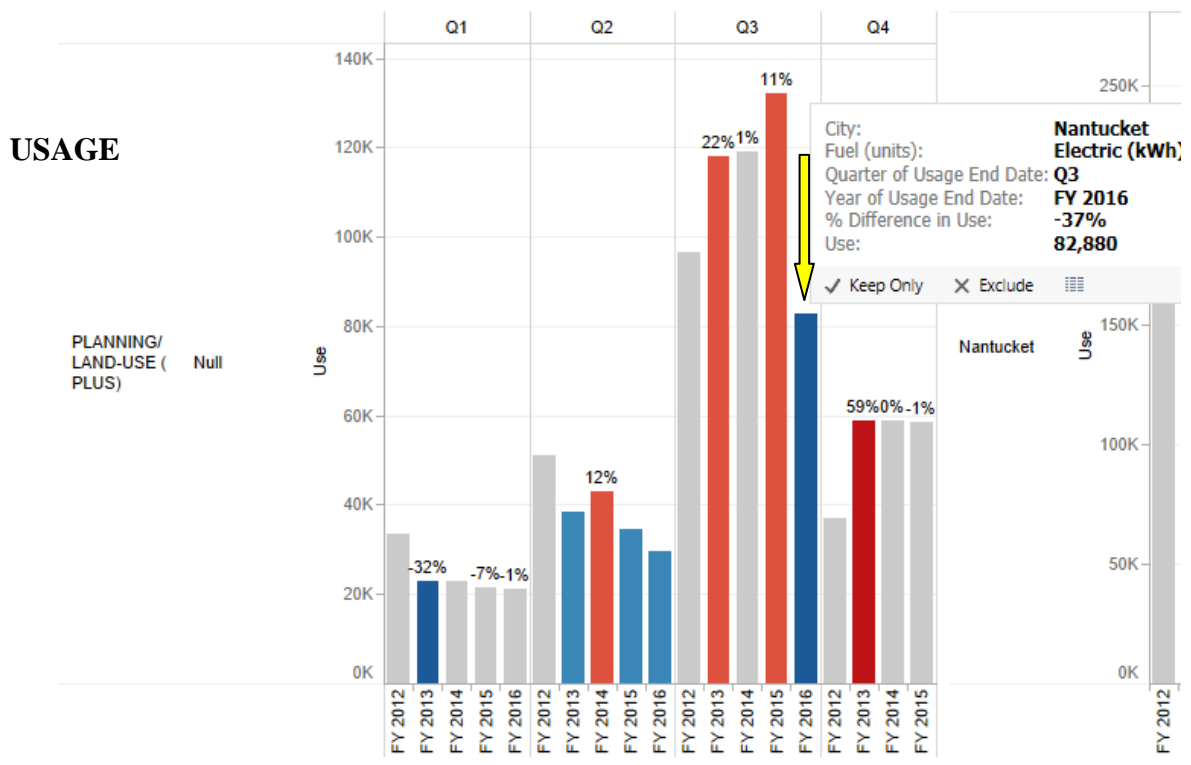
Notable trends: There were above average temperatures in Nantucket during the months of December through March 2016. Electric usage decreased 2.25% and Heating Oil usage decreased 20% in Q3 of FY2016 vs. Q3 FY2015, as there were significantly less “Heating Degree Days” (70%) this year vs. last year. As a result, it would be assumed that certain municipal buildings should have lower loads attributable to decreased heating costs:

- **Our Island Home:** 6% decrease in electricity; 20% reduction in oil; 13% reduction in propane
- **Landfill C&D building:** 23% decrease in electricity
- **Surfside Wastewater Treatment Plant:** 6% decrease in electricity; 22% reduction in oil
- **Composting Facility:** 9% increase in electricity
- **Landfill MRF:** 17% decrease in electricity
- **Finance Building 37 Washington Street:** 32% decrease in electricity
- **Nantucket High School:** 6% increase in electricity; 18% reduction in oil; 127% increase in propane
- **Nantucket Elementary School:** 8% increase in electricity; 1% reduction in oil
- **Nantucket Fire Station:** 26% increase in electricity; 50% decrease in oil
- **Town Hall Complex:** 3% decrease in electricity; 3% increase in oil
- **Airport Terminal:** 1% decrease in electricity; 22% decrease in propane
- **Public Safety Facility:** 0% difference in electricity; 153% increase in propane

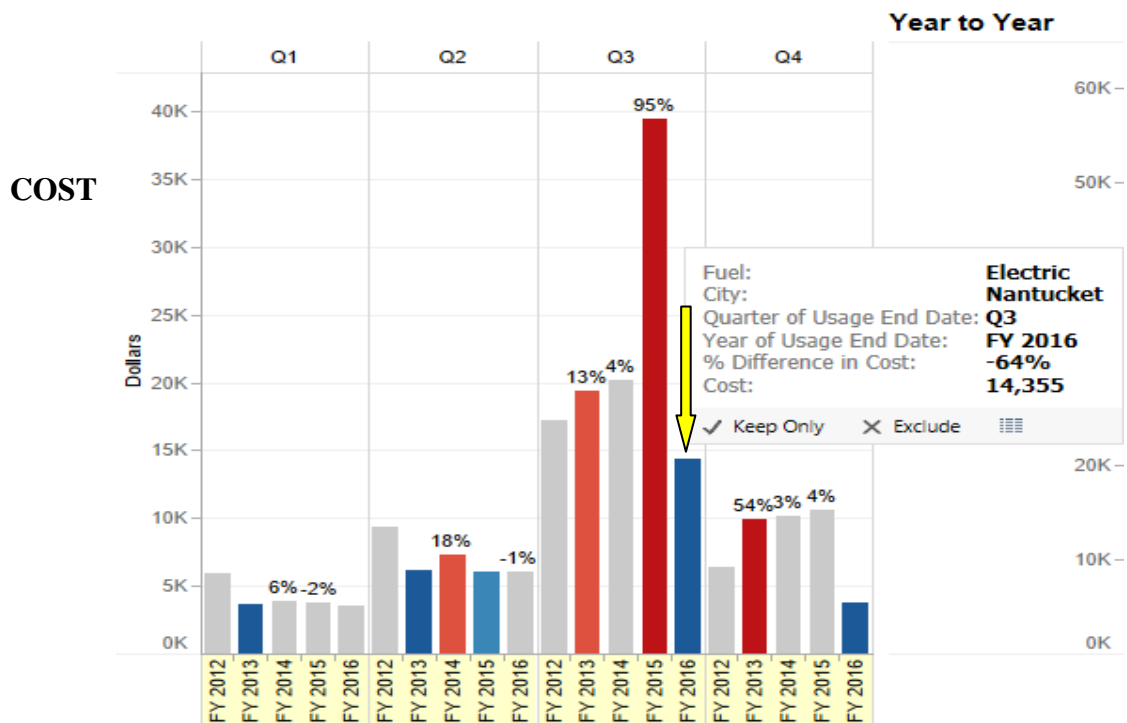
2. Energy assessments and energy efficiency upgrades at Municipal facilities

The Energy Office continues to encourage and offer support for the implementation of several energy saving (incentivized) measures and upgrades at:

- **Planning and Land Use Services Building** (2 Fairgrounds Road)
 - Installation of wifi thermostats was completed at the all-electric facility on 12/22/15
 - Energy Coordinator actively manages thermostat set-points and calendar schedule
 - Electricity usage in Q3 FY12016 is **37% less** than in Q3 of FY2015; the electricity cost is **64% less (-\$25,049)**



PLUS Building at 2 Fairgrounds Road



PLUS Building at 2 Fairgrounds Road

- **Shellfish Propagation Facility:** Helped the Natural Resources department to secure **\$4,630**, or 55% of the equipment cost for new, high-efficiency LED algae grow lights.
- **Surfside Wastewater Treatment Plant:** Arranged for follow-up site assessment by Northern Energy Services on April 12th, with updated proposals for the Sludge Blower, Draft pumps, Aeration Blower, and LEAP MBR upgrade projects due by the end of May.
- **Our Island Home**
 - Working with Northern Energy Services (lead vendor for National Grid) on a proposal to upgrade/install an Energy Management System/Temperature control system that would provide common area cooling (with full control), a thermostat in every guest room (fully controlled), a fully-functioning and controlled energy recovery unit (ERU) in the attic, and new boilers with indirect hot water heaters (all fully controlled). The upgrades are applicable for generous utility incentives.
 - Additionally, the Energy Office staff is proposing to apply for a *solar hot water feasibility study grant* for Our Island Home, offered through the Massachusetts Clean Energy Center. The grant will fund a \$5,000 technical study, in exchange for a 2% cost share (\$250) from the Town. If the study identifies that a solar hot water project is financially viable, the Town will be eligible for a second round of construction funding (up to 65% of total cost). A 2-3 year payback on the system is likely.
- **37 Washington & Harbor Master Building**
 - Working with the facility department to install programmable lighting controls to avoid exterior lights being powered on 24/7.
- **New Fire Station**
 - Helping to identify lighting and mechanical utility incentives and to evaluate renewable energy opportunities on southerly facing garage bay roof.

3. Electric Vehicle Grant & Purchase



On November 24, 2015 the Energy Office was awarded a \$5,000 grant from the Massachusetts Department of Environmental Protection (MassDEP) to apply towards a purchase of a new, Plug-in Hybrid Electric Vehicle (PHEV) through the Massachusetts Electric Vehicle Incentive Program (MassEVIP).

The Energy Office helped select and acquire a 2016 Ford Fusion Energi on February 24, 2016, which is used primarily by the Director of Public Health for inspections

and administrative tasks. When necessary, the electric vehicle charges at the Town's electric vehicle charging station behind the Finance Building on 37 Washington Street.

According to the Director of Public Health: since the first charge, on February 24th, the vehicle has been driven for 221.3 miles, with 173.6 (79%) of those miles being driven as fully electric for a total of 84.8 kilowatt hours (~\$17). The vehicle still has about 5/8 of its original tank of gasoline as received from the dealer. The vehicle's computer claims to be averaging 54.9 miles per gallon, which translates to a savings of about 3.16 gallons of gasoline and 62.0624 pounds of carbon dioxide emissions (19.64 lb of CO₂/gallon/gas Source: EIA.gov).

4. Energy Efficient IT Settings

On January 15, 2016, the Energy Office worked with the Town IT Department to identify and implement a "Group Policy" to manage the energy consumption settings of all municipal staff computer monitors to do the following:

- After 5 minutes of no activity on a computer, the monitor brightness will be dimmed.
- After 10 minutes of no activity on a computer, the monitor will be put into a low energy mode (AKA Sleep Mode) – the screen will go black.
- The computer monitor will be restored to normal operating mode by moving the mouse.

While savings have not been quantifiable yet to date, Energy Star estimates savings of up to \$100 per computer every year by activating power management on both the monitor and computers.

5. LED Streetlights and Streetlamps

The Energy Office continues to investigate the economic and logistical feasibility of converting the Town's nearly 200 decorative streetlamps to LED, which could result in decreased maintenance and electricity costs and increased public safety.

At the same time, the Energy Office has initiated discussions with National Grid about the potential for the company to convert their nearly 600 overhead pole streetlights to LED as part of the "Non-Wires Alternative" pilot project. The regular process for converting overhead streetlights to LED would first require the municipality to purchase the streetlights from the utility company (cost quoted as \$95,470 in 2013) and to then take over full maintenance responsibilities in exchange for a lower electric rate. Due to the Town's strong preference for National Grid to continue to maintain the lights, there would be little likelihood for a LED streetlight conversion unless undertaken by the utility company.

Competitive Electric Supply Procurement

Rebidding Municipal Electric Supply

In the spring of 2012, the Town of Nantucket originally contracted with Titan Energy to facilitate a bid for the supply of electricity for all of the Town's municipal accounts, including those of Nantucket Public Schools,

Wannacommet Water Company, and the Nantucket Memorial Airport. The result of the process was a 24-month contract with Hess (now Direct Energy) and Liberty Power from December 2012 through December 2014. This contract performed very well against the utility and produced approximately \$615,000.00 savings as compared to National Grid’s standard supply service.

In 2014, the Town’s Energy Office engaged Titan Energy to issue a new bid for electricity supply services and secured a 23-month contract with Liberty Power beginning in December 2014. Despite facing record-high wholesale prices and unprecedented supply costs from the utility, this contract has also performed well and has thus far produced \$125,000.00 in savings as compared to National Grid’s standard supply service. These calculations are on-going as the contract does not expire until November 2016.

In November of 2015, the Energy Office staff and Titan Energy reconvened to discuss the Town’s options with regard to initiating the next round of electricity supply procurement in light of the recent decline in wholesale electricity prices. Titan Energy issued a formal RFP on February 8, 2016 and after a rigorous 3-week negotiation process, Town officials, with Titan’s guidance, selected the 24-month term with NextEra Energy Services from a list of the seven most-qualified providers of electricity supply in Massachusetts, including the Massachusetts Municipal Association (MMA)’s MUNEnergy Program from Constellation Energy (requested as a direct bid by the Energy Office). It was decided that the 24-month term offered the best balance between cost savings and price security. The contract with NextEra Energy Services was signed on March 10, 2016 and becomes effective in December 2016. The contract details and expected performance against the current contract are outlined below:

Supplier	Term	Volume (kWh)	Current Price (kWh)	New Price (kWh)	Total Savings
NextEra	24-months	24,227,468	\$0.10703	\$0.08292	\$584,124.25

Renewable Energy Initiatives

1. Municipal Solar-PV Development

The last several weeks have been both significant, yet regressive for the Town’s continuing efforts to develop solar PV on Town land. While all of the Town’s solar related articles passed at the 2016 annual Town meeting and Massachusetts solar legislation has both extended the SREC II incentive program and raised net-metering caps by 3% (although devaluing the net metering credits for non-municipal projects--including Community Solar-- by 40%), the news with the most consequence regards the sudden downfall of Sunedison, with whom the Energy Office and Airport staff had been working with on a solar airport proposal for over six months.

On April 21, 2016 Sunedison, the nation’s largest solar developer, officially filed Chapter 11 bankruptcy after a “buying binge” of poor investments and underbidding and over-valuing projects (see article in appendix). As

there is no indication of whether PowerOptions will sponsor another solar procurement on behalf of their non-profit and municipal members, the Town and Airport commission must decide whether to dedicate time and resources into preparing an RFQ to select another solar vendor in order to continue the project forward. The biggest hurdle to developing solar at the airport site (and nearly all other municipal land parcels) remains the Massachusetts Endangered Species Act mitigation requirements, which for the airport project would result in an estimated \$470,000 expense (assuming 2:1 ratio for 10 acres). With the airport project essentially now at square one, the Energy Office is re-evaluating all potential options for solar development now that ITC tax credit, net metering capacity, and SREC II have all been extended.

In the meantime, the Energy Office has engaged the National Grid solar development team in preliminary discussions about coordinating efforts to develop solar on Nantucket, one option for which might include having the Airport lease a site to National Grid to develop and manage their own solar facility, in accordance with the terms of a site lease. The next step is for the National Grid solar team to visit Nantucket in June to conduct preliminary solar site assessments.

2. Offshore Wind/ Inter-Island Planning Assessment

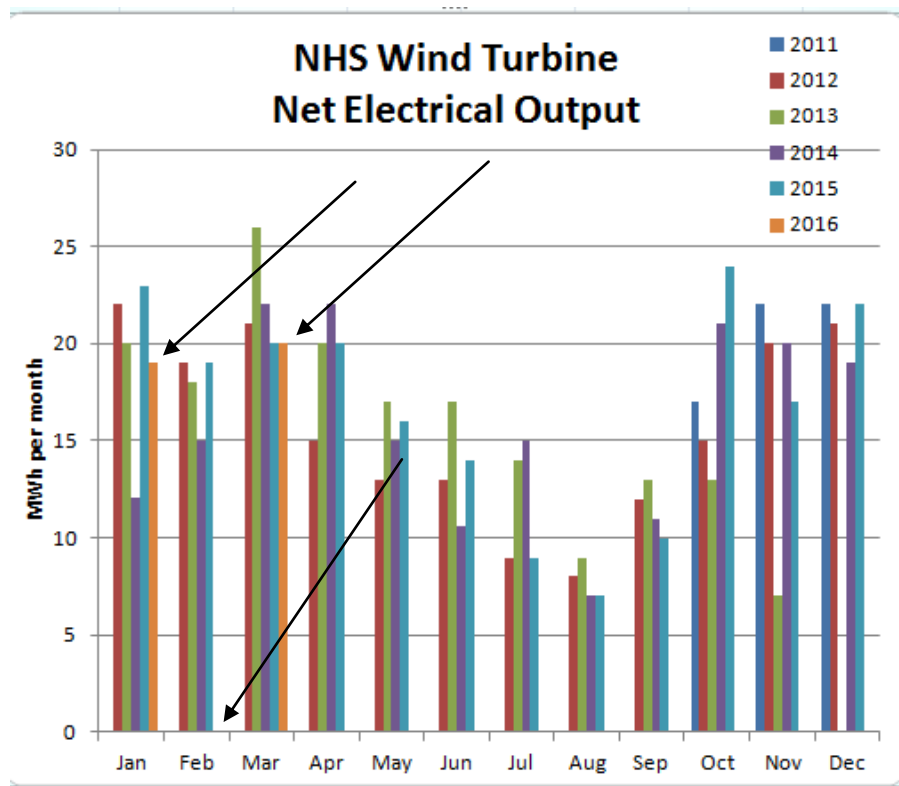
While DONG Energy and Offshore MW, the developers of the BOEM Federal Offshore Wind Project, have received a year-long extension to submit a Site Assessment Plan, originally due on April 1, 2016, the Energy Office is in the process of working with the Town of Edgartown and Vineyard Power to investigate the feasibility of an inter-island energy planning assessment, which could be funded by a Massachusetts Seaport Council grant.

The project being proposed would: conduct a master planning level analysis of energy resources on Nantucket and upgrades to the electricity infrastructure necessary to accommodate between 35 and 75 MW of renewable energy (including proposed offshore wind and tidal energy projects) to the system. In addition, the project would evaluate the potential for constructing an undersea cable to connect the islands of Nantucket and Martha's Vineyard to increase distribution reliability, resiliency, and flexibility. The Grant deadline is June 1, 2016 and will require letters of support from both public and private stakeholders on both islands.

3. Nantucket High School Wind Turbine update.

The 100kW wind turbine at Nantucket High School has generated 814MWh since it began operation in October of 2010. This equates to approximately \$162,000 in avoided electricity costs and \$46,607 in Class 1 Renewable Energy Certificate (REC) sales (facilitated by the Energy Office).

In Q3 of FY2016, the turbine only generated 39 megawatt hours (MWh), which is attributable to the turbine being out of operation for part of January and all of February.



Municipal Energy Policies

1. Home Energy Assessments as part of a Municipal Regulation to Control Air Pollution

The Energy Office staff continues to work with the Town’s Public Health Director to investigate the feasibility of requiring, or incentivizing, homes on septic systems to receive a no-cost, Mass Save home energy assessment upon a property transfer or renovation. According to MGL Chapter 111, Section 31C, a Board of Health may enact regulations to control air pollution if the regulation serves to prevent:

- 1) Nuisance to members of the town
- 2) Danger to the public health of the town; or
- 3) Detriment to public comfort and convenience in the Town

There are several reasons why the Energy Office and Health Department believe that a municipal policy to help reduce island-wide energy consumption may comply with the aforementioned regulations. Nantucket’s demand for electricity is growing more than five times the statewide average, with 78% of Nantucket’s “peak load” being attributable to the residential sector. Through the Mass Save program, a residence would immediately be outfitted with instant saving measures (such as unlimited LED bulbs) and receive a customized report with recommendations on increasing energy efficiency for no-cost. Not only would this energy audit be

informational and helpful for new home buyers, but it would help decrease summertime peak demand, helping to defer the need for a costly 3rd cable.

Additionally, more efficient homes would:

- Use less electricity, propane and oil, resulting in less emissions and better air quality. Reduced consumption of liquid fuels will also result in less fuel deliveries barged to the island, which is a significant source of local air pollution.
- Help to reduce the need for back-up diesel generation during peak load events, which would cause a public nuisance and increased air pollution in the historic downtown district (National Grid's roll-on diesel generators would be connected to the Candle Street substation)
- Lessen unnecessarily high energy costs, especially for tenants who are often times at the mercy of landlords to initiate or install energy efficient services and equipment.

Perhaps even more important to preventing danger to public health is the fact that an energy assessment includes a **combustion safety test**, which ensures that appliances such as heating systems, hot water heaters and stoves are operating safely and efficiently, without an excessive buildup of carbon monoxide. Discussions about the feasibility of this policy are ongoing and subject to input by the Board of Selectmen, Town Administration, National Grid, Town Counsel, and the general public.

Community-Wide Energy Initiatives

1. Community Choice Aggregation (CCA)/Municipal Aggregation

The Town of Nantucket issued an RFP for municipal electric aggregation consulting services in October and received three proposals by the due date on December-18th from Colonial Power Group, Good Energy and Peregrine Energy Group—the three leading aggregation consultants in the Commonwealth.

A selection committee was formed, comprised of Town staff and two resident taxpayers with financial expertise, including: Heidi Bauer (Procurement Officer), Lauren Sinatra (Energy Coordinator), Noah Karberg (Airport Environmental Coordinator), Peter McEachern (Finance Committee), and Peter Kaizer, Jr. (Capital Programs Committee).

The evaluation committee reviewed the proposals during the week of January 4, 2016 and invited the top two bidders—Colonial Power Group and Peregrine Energy—to an interview on January 29th. The committee unanimously agreed that Peregrine Energy, who specializes in individual Town Aggregations, should be awarded the contract.

The Energy Office put forth article 104 at the 2016 Annual Town meeting, which was unanimously approved to initiate the development of a municipal aggregation. Since then, the Energy Office has worked closely with Peregrine Energy Group on a marketing and outreach campaign, and to draft a "Nantucket Aggregation Plan," for public comment (until May-7th) and review by the Massachusetts Department of Energy Resources (DOER).

It is the goal of the Town and its consultants to secure Department of Public Utility (DPU) approval for the “Nantucket Aggregation Plan” and to select and negotiate for a competitive supply plan by the fall of 2016 so that a municipal aggregation program can launch by February 2017. Updates will be posted to the Town’s website: <http://nantucket-ma.gov/751/Municipal-Electricity-Aggregation>.

2. Mass Save Energy Efficiency Program: Residential & Business Energy Assessments

In 2016 to date, the Energy Office has worked with National Grid and Mass Save to publicize, schedule and arrange no-cost home energy assessments for 91 Nantucket households, which has resulted in the following no-cost measures:

- 4,690 LEDs installed
 - 86 wifi programmable thermostats (+\$200 value)
 - 8 dehumidifiers (+\$200 value)
 - Hybrid electric Heat-pump Water Heaters (\$3,000 value)
 - 165 Powerstrips installed
 - 148 Low-flow showerheads installed
 - 22 Insulation contracts and 22 free Air Sealing contracts issued
- A goal of 450 residential audits has been set for 2016.
 - The next scheduled residential energy assessment weeks will take place:
 - May 9-13, 2016
 - July 11-15, 2016
 - September 12-16, 2016

The Energy Office has also helped to coordinate business energy assessments for the VFW, Westmoor Club, Nantucket Ice Rink, Steamship Authority, Landmark House, and Coast Guard station. The next business/commercial energy audit week is May 16-19th.

Community Energy Education & Outreach Events

1. Local Contractor Energy Education Series

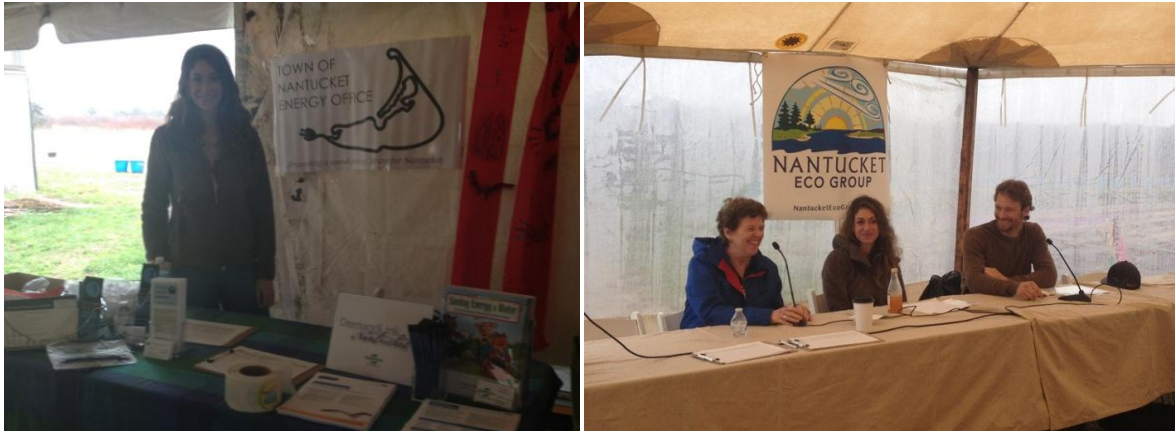
The Energy Office successfully collaborated with National Grid and the Nantucket Builders Association to coordinate and host three workshops on various energy topics, all of which were accredited for Construction Supervisor License continuing education credits:

- January 13, 2016: **“National Grid Presents: Electric Service Customer Fulfillment”**
- February 10, 2016: **“The Changing Energy Code (IECC2015) and the new Stretch Code”**
- March 9, 2016: **“Mass Save New Construction Program”**

Each workshop was very well attended by members of the Nantucket Builders Association and members of the public. The workshops were sponsored by National Grid as part of the “Non Wires Alternative” project as a means to increase contractor compliance with the changing energy codes.

2. Springfest

On April 23rd, Lauren Sinatra hosted an informational table and presented as a panelist at the first annual Springfest, an event hosted by the Nantucket Eco Group at the Cisco Sanctuary, which attracted approximately 200 attendees. Ms. Sinatra answered dozens of questions from residents and visitors about municipal aggregation, and other island energy efficiency and renewable energy projects.



3. Island Institute

On March 30th, the Energy Office hosted staff from the Island Institute of Maine along with representatives from the power companies of Monhegan Island, Isle au Haut, and Matinicus Island of Maine as part of the Island Institute's third annual Southern New England Exchange Trip. The Energy office helped coordinate meetings for the group with other Nantucket energy stakeholders, together sharing our experiences in using sound community outreach, long-term planning, and innovation to move energy goals forward.

4. Window air- conditioner recycling event

Similar to an event held in 2015, the Energy Office is currently working with National Grid to coordinate and host a public window air-conditioning recycling event in late June, which will incentive recycling of inefficient AC units in exchange for a donation to Family & Children Services of Nantucket.

National Grid Updates

The following are projects and initiatives led by National Grid for which the Energy Office closely monitors and provides constant feedback and support, where appropriate, in the best interests of the Nantucket community.

1. National Grid's "Non-Wires Alternative Pilot" Filing to Dept. of Public Utilities

National Grid is pursuing a Non-Wires Alternative (NWA) demonstration project on Nantucket, now called. This pilot encompasses the deployment and testing of distributed energy resources such as energy efficiency, demand response, renewable energy, energy storage, and volt VAR optimization, as well as targeted outreach to help educate and encourage energy efficient habits with customers. The NWA Pilot is intended to test and evaluate customer actions and behavior with the goal of achieving a reduction in peak loads of the Company's

distribution equipment in specific geographic areas as approved by the Department. National Grid formally filed its proposal for this pilot with the Massachusetts Department of Public Utilities on January 11th.

A procedural schedule set by the DPU on April 14th has a period of formal inquiry by interveners through June and an evidentiary hearing scheduled for July 14th. National Grid is planning to file a motion for interim approval of the pilot on April 15th so that the project can take advantage of implementation during the summer months of this year. Separately, in the fall of 2015, National Grid had filed a request for funding in support of its energy efficiency activities related to this pilot in its statewide 2016-2018 energy efficiency plan. On January 27th, National Grid received provisional approval for those plans and funding, pending the outcome of the NWA pilot filing.

2. Bunker Road Generation Project

- **Phase 1:** National Grid plans to replace at least one of the two aging 3MW diesel generation units with a new 10MW diesel generator. These generators have not been updated since 1987 and are in a significant state of decay.
 - Timeline:
 - June 2016 – National Grid to submit a request for proposal
 - September 2016 – National Grid to receive responses and review
 - March 2017 – Engineering Design Complete
 - July 2017 – Commencement of Construction
- **Phase 2:** National Grid is submitting a request for information for **battery storage** (to which an airport solar project could provide supplemental power). If this option is not a viable solution, the company will install a second 10MW generator at Bunker Road.
 - Timeline:
 - April 28, 2016 – National Grid to submit a request for information
 - June – August 2016 – National Grid to receive responses and review

3. Candle Street Station Flood Mitigation Project

- The project team is currently reviewing and assessing the overall design for a short term flood mitigation solution. The work expected includes the installation of flood controls (examples: yard drains, HESCO bags, timber flood barrier, building dryproofing, etc.).
 - Timeline:
 - April/May 2016 – Team reviewing design
 - June 2016 – National Grid to schedule formal meeting with the Town to discuss plan
 - October 2016 – Construction Start (2-3 month build out)