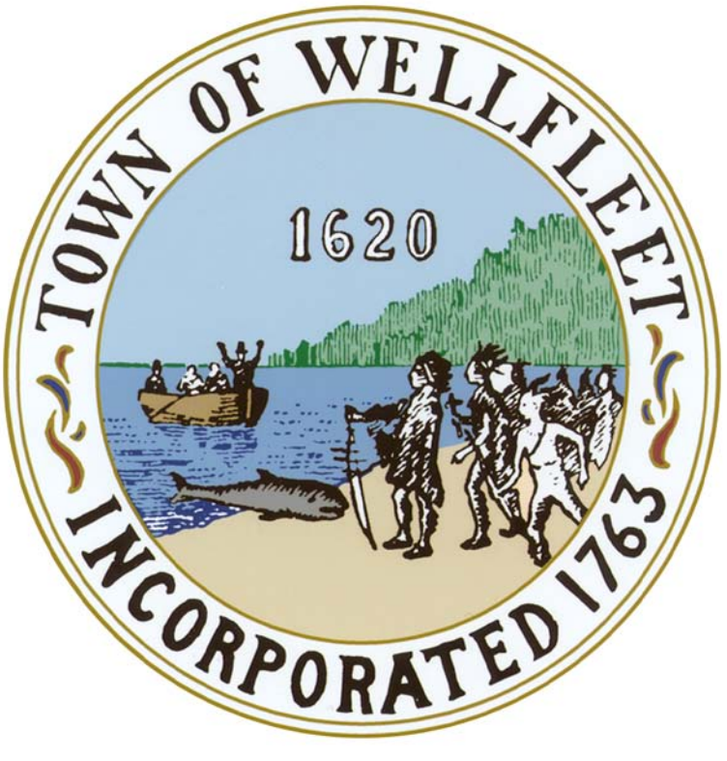
Town of Wellfleet Energy Reduction Plan



Town of Wellfleet
Town Hall
300 Main Street
Wellfleet, MA 02667

Town of Wellfleet Energy Reduction Plan (ERP)

I. PURPOSE AND ACKNOWLEDGEMENTS

A. Letters from Both General Government and School District Verifying Adoption of the ERP

General Government – Please see attached Wellfleet Board of Selectmen ERP approval.

Regional School Districts – The Wellfleet Elementary School is part of the Nauset Regional School District and will be included in this Energy Reduction Plan.

B. List of Contributors that Participated in the Baseline and ERP Process

- *Marcus Springer*, Wellfleet Energy Committee
- *Larry Franke*, Wellfleet Energy Committee
- *Richard Elkin*, Wellfleet Energy Committee
- *Harry Terkanian*, Wellfleet Town Administrator

II. EXECUTIVE SUMMARY

A. Narrative Summary of the Town - The Town of Wellfleet is situated in Barnstable County. According to the 2013 Town Census, there are 3,191 residents in Wellfleet. Wellfleet has a total area of approximately 20.47 square miles. Of this total, about 12.5 square miles are within the Cape Cod National Seashore boundaries.

B. Summary of Municipal Energy Uses

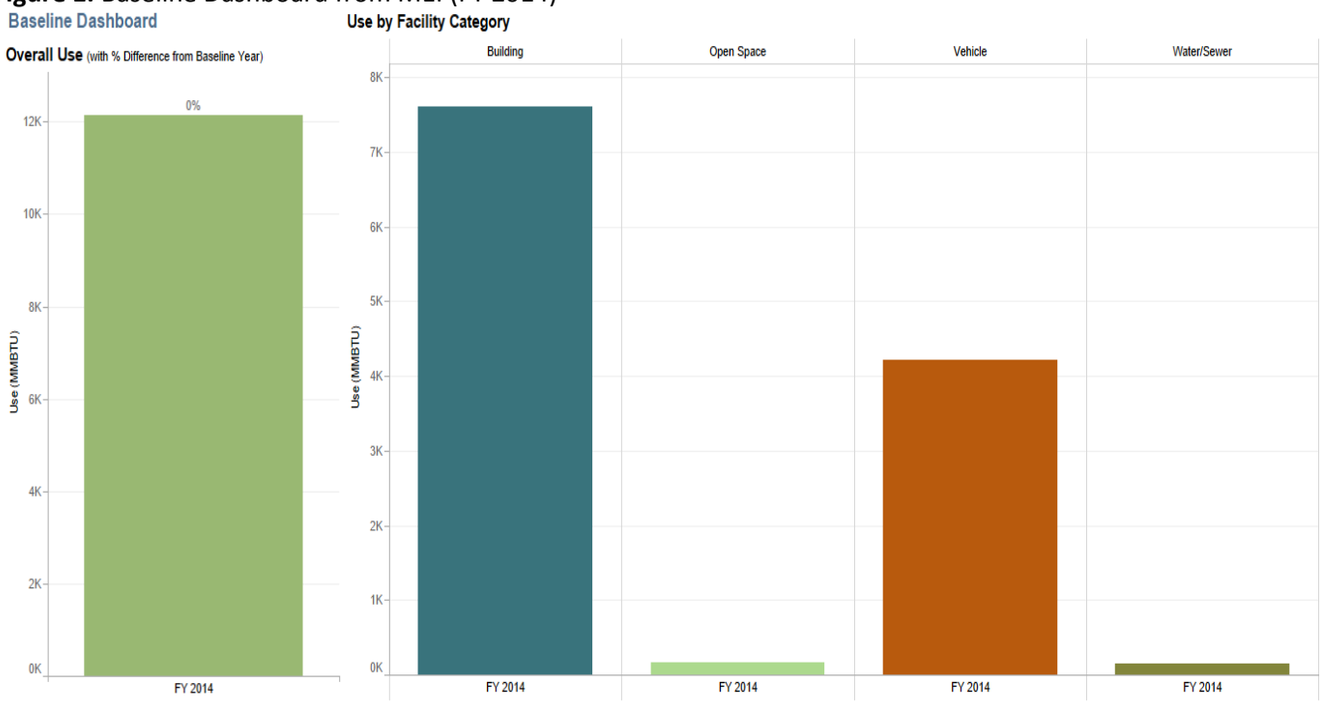
- Total Number of Municipal Buildings – The Town of Wellfleet has ten municipal buildings and a Transfer Station. Five of the buildings are heated with oil and the Fire Station and Council on Aging buildings are heated with propane. The Department of Public Works building is heated with a oil boiler the uses waste motor oil and regular #2 fuel oil. All buildings have electricity.
- Building Renovations – Wellfleet is currently in the design phase of a Police Department building renovation. The Town also has one building that had been until recently used as a Shellfish building and is currently unused and scheduled for demolition. Wellfleet will ensure that DOER's *Buildings Stock Changes Guidance* is followed and the project complies with 780 CMR 115.AA, the Massachusetts Stretch Energy Code.
- Total Number of Vehicles – Wellfleet is responsible for 49 vehicles, of which 2 are in the non-exempt category as defined the GCA Criteria 4.
- Total Number of Street Lights – Wellfleet has 233 street lights which are owned by Commonwealth Electric Company. And although Wellfleet pays the electric charges on these lights, the street lights are excluded from this ERP. Wellfleet does not own any traffic lights.
- Water and Sewer – Wellfleet owns and operates a municipal water system that serves the downtown area and other areas of the Town. Future expansion of the water system is planned for additional areas of the Town. Wellfleet has 4 beach and 1 public restroom buildings that have electric service to provide water for restroom use. Wellfleet does not have a public sewer system.

Table 1: Summary of Municipal Energy Users

	Number	Ownership
Buildings		
Oil Heat	5	Muni
Oil Heat	1	RSD
Natural Gas Heat	0	
Propane Heat	2	Muni
Biomass Heat	0	
Other Heat Type	0	
Vehicles		
Non-Exempt	2	Muni
Exempt	47	Muni
Exempt	0	RSD
Street Lights	233	Utility (excluded) Commonwealth Electric Co
Open Space		
Marina Pier	1	Muni
Water and Sewer		
Drinking Water Treatment Plant	0	Muni
Beach and Public Restrooms	5	Muni
Pumping Stations	4	Muni

C. Summary of Energy Use Baseline and Plans for Reductions

Figure 1. Baseline Dashboard from MEI (FY 2014)



Drill down by Facility Category (showing Use (MMBTU))
Hover over Facility Category and Subcategory and click the plus or minus signs to expand and collapse the table.

Facility Categ..	FY 2014
Building	7,609
Open Space	162
Vehicle	4,225
Water/Sewer	151

Drill down by Department (showing Use (MMBTU))
Hover over Department, Complex, etc. and click the plus or minus signs to expand and collapse the table.

Department	FY 2014
DPW	8,602
Marina	190
School	3,228
Water System	126

Table 2: Summary of Municipal Energy Use Baseline

BASELINE YEAR FY2014	MMBtu Used in Baseline Year	% of Total MMBtu Baseline Energy Consumption	Projected Planned MMBtu Savings[1]	Savings as % of Total MMBtu Baseline Energy Consumption
Buildings	**7,770**	**63.1%**	**1939.2**	**15.7%**
Vehicles	**4,225**	**34.4%**	**0**	**0**
Water/Sewer/Pumping	**151**	**1.2%**	**0**	**0**
Open Space[2]	**162**	**1.3%**	**0**	**0**
Total	**12,308**	**100%**		**15.7%**

(1) Projected planned energy savings are discussed in more detail later in this plan and are presented in Table 4.
(2) Open Space consists of parking, boat ramp, lighting, boat dock water pump and fuel dock.

III. ENERGY USE BASELINE INVENTORY

A. Identification of the Inventory Tool Used - The Town of Wellfleet used the Department of Energy Resources (DOER) MassEnergyInsight (MEI) web-based energy use analysis tool.

B. Identification of the Baseline Year – Fiscal Year (FY) 2014 will serve as the baseline year. FY 2014 ran from July 1, 2013 to June 30, 2014.

C. Municipal Energy Consumption for the Baseline Year (FY 2014) –During the baseline year, FY 2014, the total energy use in municipal vehicles and facilities in the Town of Wellfleet was 12,308 MMBtu. Tables 3, 3a and 3b present energy use for each municipal facility in Native Units and MMBtu. The MEI Tables 3a and 3b do not include energy from renewable sources at the Fire Station and Library.

Buildings: The ten municipal buildings and transfer station in Wellfleet used a total 7,770 MMBtu of energy in FY 2014, accounting for 63.1% of all municipal energy use. The buildings with the largest energy consumption were the Elementary School (3,228 MMBtu) and Fire Station (1,399 MMBtu) followed by the DPW building (858 MMBtu) Police Station(662 MMBtu), Council on Aging building (600 MMBtu), Town Hall (338 MMBtu) and the Transfer Station (121 MMBtu).

Street /Traffic Lights: There are 233 street lights in Town which belong to the Commonwealth Electric Company. Per the DOER Criteria 3 Guidelines the street light energy usage is excluded from this ERP. The traffic lights are owned and operated by the Commonwealth of Massachusetts.
All of these lights used 341.2 MMBtu of energy in FY 2014, accounting for approximately 2.7% of the Town's energy use. Even though street lights are owned by the utility company, the Town of Wellfleet in cooperation with Commonwealth Electric Company has completed in the spring of 2014 a high efficiency lamp replacement program to reduce the energy consumption of the Town's street lights.

Vehicles: Municipal vehicles are the largest users of municipal energy in Wellfleet, accounting for 34.4% of the baseline total which is the equivalent of 4225 MMBtu. Approximately 56% of this energy use is in the form of diesel fuel (as opposed to gasoline). The fuel used by the Fire Department ambulance service was not included in Table 3. The ambulance service is mostly reimbursed for fuel usage by insurance companies and other parties.

Water/Sewer Facilities: The Town of Wellfleet has one municipal water system. The Wellfleet Municipal Water System used 151 MMBtu of energy in FY 2014, accounting for 1.2% of the Town's overall energy use.

Open Space: The Open Space classification is the Marina Pier area consisting of parking, boat ramp, lighting, boat dock water pump and fuel dock. The classification does not include the Marina Shellfish & Beach Sticker building. The Marina Pier used 162 MMBtu of energy in FY 2014, accounting for 1.3% of the Town's overall energy use.

The Town of Wellfleet currently utilizes energy obtained from renewable sources at the Fire Station and Library. In calendar year 2013 the Fire Station produced 20,578 KWH from PV solar panels and the Library produced 26,795 KWH from PV solar panels.

Table 3: Energy Use
Baseline FY 2014

	Electricity		#2 Fuel Oil		Propane		Gasoline		Diesel		Electric Renewable Energy		Total MMBtu
	kWh	MMBtu	Gallons	MMBtu	Gallons	MMBtu	Gallons	MMBtu	Gallons	MMBtu	kWh	MMBtu	
School	196440	670.253	18403	2558.02		0		0		0		0	3228.2703
Town Hall	50345	171.777	1194	165.966		0		0		0		0	337.74314
Library	44720	152.585	1937	269.243		0		0		0	26795	91.4245	513.25218
Council on Aging	71800	244.982		0	3901	354.991		0		0		0	599.9726
DPW Barn	116144	396.283	3319	461.341		0		0		0		0	857.62433
Fire Station	111120	379.141		0	10441	950.131		0		0	20578	70.2121	1399.4846
Shellfish/Beach Sticker	8229	28.0773		0		0		0		0		0	28.077348
Shellfish Bldg - old	4185	14.2792	62	8.618		0		0		0		0	22.89722
Old Fire Station	72	0.24566		0		0		0		0		0	0.245664
Transfer Station	35422	120.86		0		0		0		0		0	120.85986
Police Station	87803	299.584	2606	362.234		0		0		0		0	661.81784
SUBTOTAL FOR BUILDINGS	726280	2478.07	27521	3825.42	14342	1305.12	0	0	0	0	47373	161.637	7770.245
Drinking Water/Beach Restrooms	44246	150.967		0		0		0		0		0	150.96735
Open Space - Marina Pier	47446	161.886		0		0		0		0		0	161.88575
Vehicles in Aggregate		0		0		0	15054	1866.7	16965	2358.1		0	4224.831
Street and Traffic Lights in Aggregate (excluded)		0		0		0		0		0		0	0
TOTAL ENERGY CONSUMPTION	817972	2790.92	27521	3825.42	14342	1305.12	15054	1866.7	16965	2358.1	47373	161.637	12307.929

Table 3A: Municipal Energy Consumption for Baseline Year FY 2014 (Native Fuel Units)

ERP Guidance Table 3a - Municipal Energy Consumption for 2014 (Native Fuel Units)

		2014				
		Electric (kWh)	Oil (gallons)	Gasoline (gallons)	Diesel (gallons)	Propane (gallons)
Building	Council On Aging	71,800				3,901
	Town Hall	50,345	1,194			
	Library	44,720	1,937			
	Police Station	87,803	2,606			
	Wellfleet ES	196,440	18,403			
	DPW Highway Barn	116,144	3,319			
	New Fire Station	111,120				10,441
	Shellfish Building	4,185	62			
	Old Fire Substation - South We..	72				
	Transfer Station and Compacto..	35,422				
	Shellfish & Beach Sticker Buildi..	8,229				
	Total	**726,280**	**27,521**			**14,342**
Open Space	Marina Pier	47,446				
	Total	**47,446**				
Vehicle	Vehicle			15,054	16,965	
	Total			**15,054**	**16,965**	
Water/Sewer	Baker's Field Rec Bldg	4,900				
	Ballfield Irrigation Pump	2,037				
	Gull Pond Restroom	36				
	Maguire Landing Restroom	72				
	Newcomb Beach Restroom	76				
	White Crest Restroom	143				
	Grist Mill Way Pump Station	9,573				
	Water Tank	7,007				
	Boy Scout Camp Well Field	20,402				
	Total	**44,246**				
Grand Total		**817,972**	**27,521**	**15,054**	**16,965**	**14,342**

Table 3B: Municipal Energy Consumption for Baseline Year FY 2014 (MMBtu)

ERP Guidance Table 3b - Municipal Energy Consumption for 2014 (MMBTU)

Please make sure that any data submitted to DOER contains complete Data!

		2014					
		Diesel	Electric	Gasoline	Oil	Propane	Total
Building	Council On Aging		245			355	**600**
	Town Hall		172		166		**338**
	Library		153		269		**422**
	Police Station		300		362		**662**
	Wellfleet ES		670		2,558		**3,228**
	DPW Highway Barn		396		461		**858**
	New Fire Station		379			950	**1,329**
	Shellfish Building		14		9		**23**
	Old Fire Substation - South We..		0				**0**
	Transfer Station and Compacto..		121				**121**
	Shellfish & Beach Sticker Buildi..		28				**28**
	Total		**2,478**		**3,825**	**1,305**	**7,609**
Open Space	Marina Pier		162				**162**
	Total		**162**				**162**
Vehicle	Vehicle	2,358		1,867			**4,225**
	Total	**2,358**		**1,867**			**4,225**
Water/Sewer	Baker's Field Rec Bldg		17				**17**
	Ballfield Irrigation Pump		7				**7**
	Gull Pond Restroom		0				**0**
	Maguire Landing Restroom		0				**0**
	Newcomb Beach Restroom		0				**0**
	White Crest Restroom		0				**0**
	Grist Mill Way Pump Station		33				**33**
	Water Tank		24				**24**
	Boy Scout Camp Well Field		70				**70**
	Total		**151**				**151**
Grand Total		**2,358**	**2,791**	**1,867**	**3,825**	**1,305**	**12,146**

Table 4: Estimated Energy Savings in Wellfleet Municipal Facilities

Energy Conservation Measures Data												
Measure		Status	Energy Data			Financial Data					Reference Data	
Category/Building	Energy Conservation Measure	Status (Completed with month/year or planned Qtr/year)	Projected Annual Electricity Savings (kWh)	Projected Annual Oil Savings (gallons)	Projected Annual Propane Savings (gallons)	Projected Annual Cost Savings ($)	Total Installed Cost ($)	Green Community Grant ($)	Utility Incentives ($) CLC	Net Town Cost ($)	Funding Source(s) for Other Grants and Net Town Costs	Source for Projected Savings
Town Hall	*High Efficiency Chiller*	*2rd qtr 2015*	2,650			$477	$68,840	$65,222	$3,618	$0		CLC Energy Audit
Town Hall	*Fuel Conversion to Propane and High Efficiency Boiler*	*2rd qtr 2015*		172		$533	$15,757	$13,757	$2,000	$0		CLC Energy Audit
Town Hall	*Electronic Commutative Motors*	*2rd qtr 2015*	2,734			$492	$9,500	$9,500		$0		CLC Energy Audit
Library	*Demand Control Ventilation*	*2rd qtr 2015*	4,644			$1,321	$8,000		$8,000	$0		CLC Energy Audit
DPW Barn	*Oil to Propane Conversion*	*3rd qtr 2015*			0	$488	$28,015	$28,015		$0		CLC Energy Audit
DPW Barn	*High Efficiency Propane Boiler*	*3rd qtr 2015*			545.0	$1,392	$7,004	$4,004	$3,000	$0		CLC Energy Audit
DPW Barn	*Infrared Heating System for Large Maintenance Bay*	*3rd qtr 2015*			336.0	$1,041	$17,324	$14,324	$3,000	$0		CLC Energy Audit
Shellfish/Beach Sticker Bldg	*High Efficiency Heat Pump*	*3rd qtr 2015*	901			$171	$5,000	$4,500	$500	$0		CLC Energy Audit
Shellfish/Beach Sticker Bldg	*Wall Insulation*	*2rd qtr 2015*	904			$172	$945		$945	$0		CLC Energy Audit
Shellfish Bldg - old	*Decommissioning/Demolition*	*2rd qtr 2015*	4,185	700		$3,072				$0		
School	*Energy Management System DDC w/DCV*	*3rd qtr 2016*	1,897	2,992		$9,619	$302,118	$302,118		$0		CLC Energy Audit
School	*Variable Frequency Drives*	*3rd qtr 2015*	16,600			$2,988	$34,682	$34,682		$0		CLC Energy Audit
School	*Fuel Conversion to Propane and High Efficiency Boiler*	*3rd qtr 2015*			2,512	$5,131	$216,298	$167,786	$48,512	$0		CLC Energy Audit
School	*Energy Recovery Ventilation*	*2rd qtr 2015*		381		$1,182	$8,576		$8,576	$0		CLC Energy Audit
School	*Demand Circulator*	*3rd qtr 2015*	1,185	41		$340	$6,000	$6,000		$0		CLC Energy Audit
Council on Aging	*High Efficiency Condensing Propane Furnaces*	*3rd qtr 2016*			430	$842	$8,195	$4,195	$4,000	$0		CLC Energy Audit
Fire Station	*Energy Recovery Ventilation*	*2rd qtr 2015*	3,075		2,933	$6,333	$10,174		$10,174	$0		CLC Energy Audit
Fire Station	*RTU Optimizer Digi-VAV*	*2rd qtr 2015*	35,081		252	$5,756	$15,825		$15,825	$0		CLC Energy Audit
Police Station	*Decrease set points on heating system*	*2nd qtr 2018*		300		$1,146	$0			$0		Springer Architects AIA, LEED AP
Police Station	*Building Insulation*	*2nd qtr 2018*	15,804	470		$2,535	$33,400	$29,400	$4,000	$0		Springer Architects AIA, LEED AP
Police Station	*Retrofit to Stretch Code levels*	*2nd qtr 2018*	22,000	651		$841	$52,896	$52,896		$0		Springer Architects AIA, LEED AP
Police Station	*Increase cooling set points*	*2nd qtr 2018*		100		$411	$0			$0		Springer Architects AIA, LEED AP
BUILDINGS SUBTOTAL			**111,660**	**5,807**	**7,008.0**	**$46,283**	**$848,549**	**$736,399**	**$112,150**	**$0**		
STREET AND TRAFFIC LIGHTS SUBTOTAL			**0**	**0**	**0**	**$0**	**$0**	**$0**	**$0**	**$0**		
Marina	*Parking and area lighting lamp replacement*	*Complete August 2014*	**33,212**			$875	$0	$0	$0	$0		*CLC*
OPEN SPACE SUBTOTAL			**33,212**	**0**	**0**	**$875**	**$0**	**$0**	**$0**	**$0**		
VEHICLES SUBTOTAL			**0**	**0**	**0**	**$0**	**$0**	**$0**	**$0**	**$0**		
TOTAL Projected Savings			**144,872**	**5,807**	**7,008**	**$47,158**	**$848,549**	**$736,399**	**$112,150**	**$0**		
TOTAL MMBtu SAVINGS		**1939.204**	**494.303**	**807.173**	**637.728**							

IV. ENERGY REDUCTION PLAN

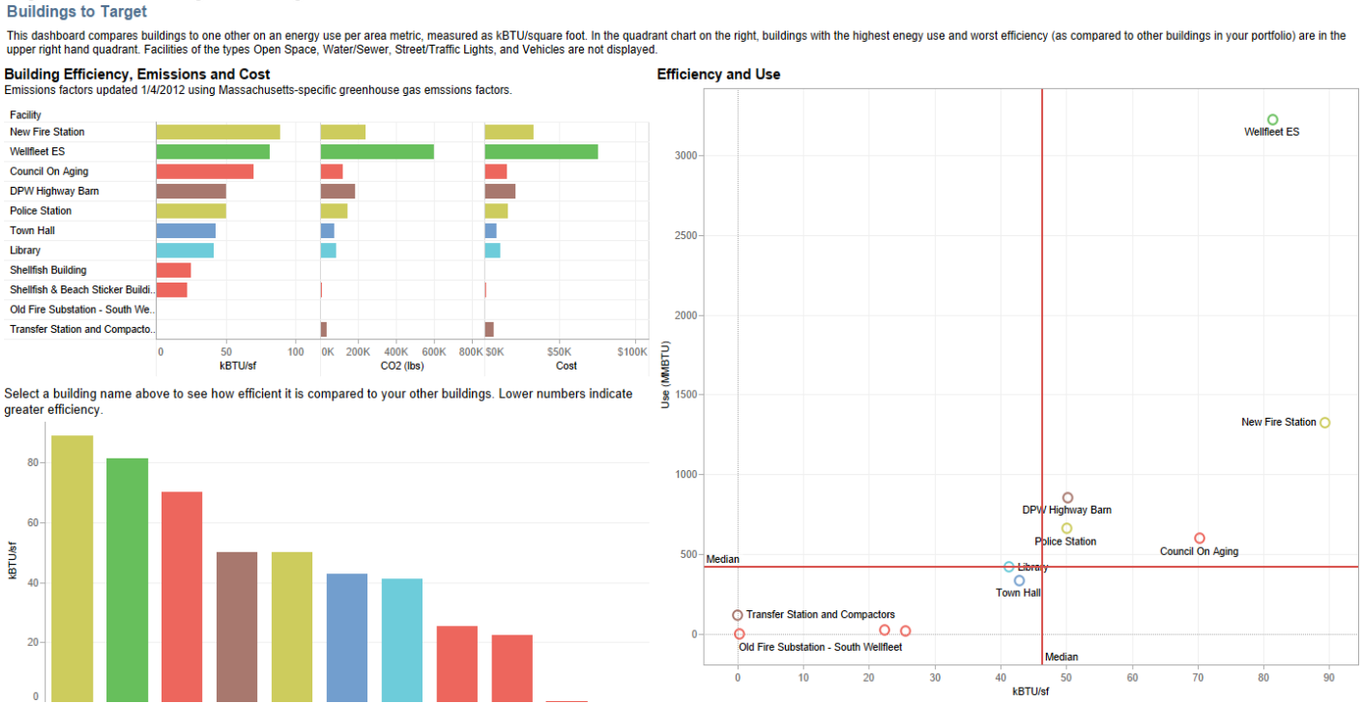
A. Narrative Summary –

1. Overview of Goals for years 1 – 3: This time period runs from FY 2015 to the end of FY 2017. Wellfleet's strategy will be to focus on fuel conversions, HVAC modifications and upgrading building envelopes. Undocumented measures will also be implemented in this period

2. Overview of Goals for Years 4-5: The goals for FY 2018 and FY 2019 are to complete any unfinished projects listed above, including modification to the police station.

3. Identify Areas of Least Efficiency/Greatest Waste: It is very useful to gain an understanding of how municipal facilities, namely buildings, perform compared to each other. Figure 2, *Buildings to Target*, compares the energy consumption to the building's efficiency for all the buildings in Wellfleet. As shown in this Figure 2, the Elementary School and Fire Station are the largest users (of the buildings) of energy in Town. Their efficiency falls upper right of the medians indicate inefficiency in energy consumption and cost per square foot consumption. The Wellfleet Council on Aging building is the next highest user of energy but falls right of median square foot consumption indicating inefficiency. Specific energy saving strategies have been identified for each of these locations.

Figure 2. Buildings to Target from MEI



B. Getting to a 20% Energy Use Reduction Within the 5 Year Period Following the Baseline Year – The Town of Wellfleet is committed to reducing baseline (FY 2014) energy consumption by 20% over the five year period from FY 2015 to the end of FY 2019. A list of specific and documented strategies is presented in Table 4, and accounts For 15.7% of total projected savings. An additional 4.3% of projected energy savings include more general strategies which are discussed below.

1. Program Management Plan for Implementation, Monitoring and Oversight – The Town of Wellfleet's Town Administrator and Board of Selectmen will be responsible for securing the funds and general oversight of the energy efficiency projects.

The Town Administrator and Energy Committee will be responsible for maintaining energy use data in MEI as well as completing the DOER Green Communities Annual Reporting requirements.

2. Summary of Energy Audit(s) and Other Sources for Projected Energy Savings – Energy Audits were conducted in seven municipal building in Wellfleet by the Cape Light Compact (CLC) through Rise Engineering. Energy audits were conducted in 2014 at the Town Hall, Library, Department of Public Works building, Council on Aging building, Shellfish/Beach Sticker building, Fire Station and Wellfleet Elementary School.

These audits gathered data during site visit walkthroughs, review of utility bills and discussions with administration officials, staff, and building occupants. The data presented in these audits includes specific Energy Conservation Measures (ECM's) with detailed information about baseline energy use, projected usage savings and annual cost data. This information is contained in individual reports for each facility. Each of these reports is contained in the Appendix. Annual usage for calendar year 2013, cost estimates and annual cost savings were taken directly from these reports to estimate energy savings. In addition to the projected savings in audits, the parking and area lighting at the marina sodium lamps have been replaced with LED fixtures and lamp. This replacement at the marina, per CLC estimate, will reflect a reduction in annual energy consumption in excess of 114MMBtu. This ECM was begun in August 2015, in FY 2015, and was complete by September 2015.

3. Energy Conservation Measures (ECM) – A list of documented and itemized energy conservation measures is presented in Table 4. These measures account for 15.7% of the projected 20% of energy savings. This Table 4 contains detailed information such as project description, status, projected annual energy savings, projected annual cost savings, total project cost, incentives, financing information, funding sources and reference sources for all information. Specific ECM strategies outlined in Table 4, in combination with the strategies identified below, account for a projected annual energy reduction of 20%.

Additional ECM's will amount to a projected energy savings of 4.3% of the baseline total. The energy savings estimated for these ECM's will fall under the "undocumented 5%" category of the overall 20%. Specific strategies identified are discussed in more detail below.
In the baseline year of FY 2014 the 233 Town streetlight sodium bulbs were replaced with the LED fixture and lamps. The net annual energy reduction in future years is calculated to be 1.4%. Per the DOER Criteria 3 guidelines, these future calculations, using Tables 3 and Table 4 templates, include adding streetlight energy consumption to the baseline year energy consumption in Table 3 less CLC estimated post baseline year consumption in Table 4.

For the remaining 2.9%, of total energy reduction, the Wellfleet Energy Committee will also work to identify additional energy efficiency improvement projects that bring the Town up to a projected 20% energy savings. Specific measures will include at least the following:

- Installing or replacing thermal window treatment for all Town buildings.
- Replacing exterior doors with thermal doors and door sealing at for all Town buildings.
- Replace existing T-12 lighting with T-8 fixtures where possible.
- Replace incandescent lamps with compact fluorescent lamps where possible
- Use of building energy monitoring devices to identify inefficiencies and increase usage awareness.
- Developing educational programs for Town employees to increase awareness of energy consumption and methods to reduce energy consumption.

In addition to those measures identified in Table 4 and outlined above, the Town of Wellfleet has also adopted a Fuel Efficient Vehicle Policy (FEVP) which states that non-exempt vehicles will be replaced with more fuel efficiency models when commercially available and feasible. The Town will also evaluate an Anti-Idling Policy for Town-owned vehicles that are expected to have the greatest impact on energy consumption. Town vehicles account for 34% of all energy use in Town. After an initial thirty day educational period with help from the Energy Committee, it will be the responsibility of supervisors to enforce this policy. Department heads will be asked to monitor compliance and report to the Energy Committee after six months of this policy taking effect in order to make suggestions for improvements or changes.

C. Summary of Long-Term Energy Reduction Goals – Beyond 5 years

1. Municipal Buildings: Town buildings are the largest energy users after town vehicles. Therefore, our municipal buildings will continue to be an area of focus into the future. After the priority work of insulating and air sealing is underway, smaller but still significant projects can be undertaken in all buildings. Such projects would include energy conserving window treatments for smaller area windows where appropriate, upgrading storm windows and installing thermal entrance doors for the Town Hall. We also view training and education of building occupants as an ongoing energy reduction strategy.
2. Vehicles: The Town of Wellfleet will continue to monitor fuel efficient vehicles. When vehicles are taken out of service and, if the decision is made to replace them, they will be replaced with vehicles meeting the current energy efficient guidelines.

3. Street and Traffic Lighting: the Energy Committee will continue to work with the Police Chief and Board of Selectmen to find additional energy savings by using passive, reflective signage rather than lighting for roadway safety where ever possible.

4. Perpetuating Energy Efficiency: The Town of Wellfleet Energy Committee has considered creating an energy conservation savings reinvestment plan to help finance future energy efficiency and energy reduction projects. The Energy Committee will initiate discussions with the Town Administrator and the Board of Selectmen.

V. ONSITE RENEWABLE ENERGY PROJECTS & RENEWABLE ENERGY

The Town of Wellfleet is developing plans for a solar array on the Town's capped landfill. Also, in addition to completing the energy conservation measures described, Wellfleet will consider onsite generation of electricity by a PV array mounted on the Department of Public Works building roof.

VI. LIST OF RESOURCES

The Town of Wellfleet used the following people and resources to create this ERP:

Seth Pickering: Green Communities Regional Coordinator, Massachusetts Department of Energy Resources (DOER). Seth.Pickering@state.ma.us

Green Communities Grant Program Information and Guidance: MA DOER,
www.mass.gov/energy/greencommunities

Marcus Springer: RIBA, AIA, Leed AP

Energy Audit Reports, Energy Audit Reports, and Energy Audit Summary Report: Prepared by Rise Engineering at the request of Cape Light Compact as part of the MA DOER Energy Audit Program, 2014 (see Appendix).

MMBtu Conversion Chart1

Fuel Energy Content of Common Fossil Fuels per DOE/EIA

BTU Content of Common Energy Units – (1 million Btu equals 1 MMBtu)

- 1 kilowatt hour of electricity = 0.003412 MMBtu
- 1 therm = 0.1 MMBtu
- 1 ccf (100 cubic foot) of natural gas = 0.1028 MMBtu (based on U.S. consumption, 2007)
- 1 gallon of heating oil = 0.139 MMBtu
- 1 gallon of propane = 0.091 MMBtu
- 1 cord of wood = 20 MMBtu
- 1 gallon of gasoline = 0.124 MMBtu (based on U.S. consumption, 2007)
- 1 gallon of E100 ethanol = 0.084 MMBtu
- 1 gallon of E85 ethanol = 0.095 MMBtu
- 1 gallon of diesel fuel = 0.139 MMBtu
- 1 gallon of B100 biodiesel = 0.129 MMBtu
- 1 gallon of B20 biodiesel = 0.136 MMBtu
- 1 gallon of B10 biodiesel = 0.137 MMBtu
- 1 gallon of B5 biodiesel = 0.138 MMBtu

FOR MORE INFORMATION

Website:

www.mass.gov/energy/greencommunities

Town of Wellfleet Energy Reduction Plan
APPENDIX

Energy Audit Report, Wellfleet Elementary School

Energy Audit Report, Fire Station

Energy Audit Report, Department of Public Works Building

Energy Audit Report, Town Hall

Energy Audit Report, Shellfish/Beach Sticker Building

Energy Audit Report, Public Library

Energy Audit Report, Council on Aging

Energy Reductions ECM's for the Wellfleet Police Station