Town of Framingham, Massachusetts

ENERGY REDUCTION PLAN

In fulfillment of the

MASSACHUSETTS GREEN COMMUNITIES GRANT PROGRAM
CRITERIA 3

Prepared by

Town of Framingham, Massachusetts

With support from

Peregrine Energy Group, Inc.
Boston, Massachusetts

October 30, 2013

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Purpose and Acknowledgements

The Town of Framingham has completed and adopted this Energy Reduction Plan ("ERP") for submission to the Massachusetts Department of Energy Resources in fulfillment of Criteria 3 of the requirements for Green Community designation.

The Town views the formulation of this Energy Reduction Plan as an important component of the Town's parallel intiative to develop a 20-Year Plan for Town Buildings. As part of that effort, Town staff have been inventorying major facilities across the Town and preparing condition reports that identify operational issues and opportunities for improvement and infrastructure renewal needs. Energy use and energy systems are an important component of this effort.

Further, Framingham was a participant in the 2011 initiative by the Metropolitan Area Planning Council ("MAPC") to qualify an energy services company ("ESCO") to provide energy management services to member cities and towns. The Town has been in discussions with Ameresco, Inc., the vender chosen by MAPC, about entering into a self-funding energy savings performance contract to implement energy efficiency and energy infrastructure improvements to municipal and school buildings. Executing such a performance contract could be a significant part of the Town's strategy to achieve the 20% reduction in energy use specified in this Energy Reduction Plan.

We acknowledge that the Town in the past has not been particularly systematic in its treatment of energy as an operating expense. A historic silo-oriented mentality has left individual departments to track and manage energy use and cost and there has been no comprehensive accounting of energy consumed by the Town for buildings, water and wastewater pumping, vehicle use by multiple departments, and street lighting. An additional dividend of creating this plan has been making use of the MassEnergyInsight tool provided by the Department of Energy Resources to match utility accounts to buildings, etc., to develop a comprehensive understanding of the Town's very signficant energy use and expense, and to track our progress toward reducing energy use across our portfolio.

Finally, we want to credit our School Department for the efforts they have undertaken over the past five years and more to identify and implement energy efficiency opportunities. The Town has been able to choose FY2011 as its baseline year for this Plan because of improvements made to date in our schools by the School Buildings and Grounds Department. We have been told by NSTAR that Framingham has received more incentives for energy improvements than any other city or town in its territory. That has enabled the Town to continuously lower energy use in schools and use those funds for other educational purposes.

We attach, as Appendix A, a letter from our Town Manager Robert Halpin verifying the Board of Selectmen's adoption of this Energy Reduction Plan, as well a letter from the School Superintendent confirming the School Committee's endorsement of the Plan.

Preparation of this Plan has been a collaboration of Town and School Department officials and consulting energy professionals. They include:

- **Robert J. Halpin,** Town Manager
- **Jennifer Thompson**, Assistant Town Manager
- **Mathew Torti**, Director, School Buildings and Grounds
- **Rich Camerata, Timothy Rivers, Ernest Moreau,** Schools Buildings and Grounds Department
- **James Paolini,** Town Facilities Director
- **Ashley Borges,** Office Manager, Facilities Management
- **Ed Burman**, Logistics Officer, Framingham Police Department
- **Michael Donnelly**, Chief Executive Officer, Framingham Police Department
- **John Magri**, Deputy Chief, Framingham Fire Department
- **Jennifer Pratt**, Assistant Chief Financial Officer
- **Erika Oliver Jerram**, Senior Planner, Community and Economic Development Department
- **Frederick J. Davies**, Director, Fleet, Facilities, and Communications Division, Department of Public Works
- **Peter Lampasona**, Operations Manager, Water & Sewer Division, Department of Public Works
- **Peregrine Energy Group, Inc.**, Consultant to the Town of Framingham
- **Ameresco, Inc.**, Contractor to the Town of Framingham for the preparation of an Investment Grade Audit for a potential performance contract

Executive Summary

About the Town of Framingham

Framingham is located 20 miles west of Boston in Middlesex County, mid-way between Boston and Worcester. It is bordered by Southborough and Marlborough on the west; Sherborn and Ashland on the south; Natick on the east; Wayland on the northeast; and Sudbury on the north.

The Town of Framingham is intersected by a number of major transportation corridors, including Route 9 and the Massachusetts Turnpike, which pass east-to-west through the middle of the town. The Town also connects Boston to Worcester by rail. These transportation routes have made Framingham a commercial and business center as well as an attractive home for commuters.

South Framingham includes Downtown Framingham (the town government seat), and the villages of Coburnville, Lokerville and Salem End Road. North Framingham includes the villages of Nobscot, Pinefield, Ridgefield and Saxonville plus Framingham Center (the physical center of town, featuring the town commons).

The Town's population was 68,318 as of the United States 2010 Census. During the post–World War II baby boom, Framingham, like many other suburban areas, experienced a large increase in population and housing. While other communities of it's size have opted to become a City, Framingham has remained a Town, governed by a Board of Selectmen and a Town Meeting made up of elected representatives. The Town is administered by a professional Town Manager.

Framingham was placed at # 36 on 'Best Places to Live in US' by CNN Money magazine in 2012.

Summary of Municipal Energy Uses

Buildings

With a population of nearly 70,000, the Town of Framingham has a very large portfolio of buildings. The Town is including 37 buildings in its Energy Reduction Plan that are regularly occupied, in addition to seasonal and unoccupied special purpose structures (e.g. bath houses, pump stations) that are included under the pumping and open space categories. Buildings account for 67% of Town energy use on an MMBtu basis. Town buildings are described below.

Like most cities and towns, Framingham's municipal building stock and building uses have evolved over time as population segments have grown and new municipal responsibilities have emerged. Numbers of Town buildings have been and continue to be repurposed. The Athenaeum in Framingham's Village of Saxonville, for example, built before the Civil War as a Village Hall, has over the course of its life housed town offices, school rooms, a jail, a performance space during the late 19th century, and for many years the Grand Army of the Republic civil war veterans and later the American Legion. Now, after almost 15 years of disuse, it is about to be reborn again as the Athenaeum Community Hall and will serve as a community center and performance arts venue once again.

One result of extensive building adaptive reuse and repurposing over time has been, in some cases, the modernization of older systems when buildings change hands, and, in other cases, the re-partitioning of building spaces into configurations that were never intended and which are not well supported by mechanical systems. And sometimes, both situations have resulted.

The main seat of Town government is Memorial Hall in Downtown Framingham. Dating to 1926, Memorial Hall includes offices, meeting rooms, and a large auditorium used for Town Meeting and other functions. The Town's School Department has the most buildings with 15 schools, including 10 buildings that house elementary school classrooms, three middle schools, a high school, an alternative high school, and an administration building that was formerly an elementary school. One of the middle schools (Fuller) is scheduled for replacement during the period covered by this Plan. All of the schools have had additions and/or renovations since their original construction, which was primarily in the 1960s and 1970s when the Town's population mushroomed with baby boomers).

There are five fire stations, including the Fire Department Headquarters, and one Police Station downtown in what was formerly a State Armory. There is a large Town yard that is home to the Department of Public Works including the Water and Sewer Division which manages the pumping stations throughout the Town that interface with MWRA water and wastewater facilities and maintain water pressure for residences. Also included in Public Works is the Sanitation Department which has a large transfer station and recycling facility at the location of

the now inactive Town incinerator. There is a also a Parking Garage in Downtown Framingham that provides parking for commuter rail passengers.

Currently, there are two active libraries, one of which is a branch library named for astronaut Christa McAulifee that will be replaced within three years with a new building that has been approved by voters. A historic former library building (the Old Edgell Library) and historic former school (the Academy Building) currently house the Framingham History Center. The History Center also oversees another former Village Hall in Framingham Center for the Town.

There is a large and active Parks and Recreation Department in town that operates many parks, lakeside beaches, a skating arena (Loring), a modern athletic field with grandstands (Bowditch) and additional facilities at the former site of Cushing Hospital that is now owned by the Town. And there is a Senior Center that is used extensively by a growing elder population.

As noted earlier, the Town has reinvested extensively in schools with a range of mechanical and lighting system upgrades, building automation systems, and additions and renovations. Nevertheless, there is more that can be done to reduce energy use. On the other hand, some municipal buildings are older and have not been updated extensively, while others have been renovated, but have operational problems.

Building use is continuing to shift, and buildings that will be taken out of use and disposed of during the period covered by the ERP have been excluded from the baseline and the Plan (Danforth Building and Maynard Building). Two buildings (Fuller Middle School and McAuliffe Library) will be replaced with new state-of-the-art buildings during this period that meet the stretch code.

All Town and school buildings are heated with natural gas, except for the small Old Edgell Library which will be converted from heating oil over the the next year. Village Hall was oil heated in 2011, our baseline year, but has since been converted to natural gas.

We are told by Peregrine that Framingham schools have Energy Use Index ratings (“EUIs”) that, as a group, are as good as any they have seen across Massachusetts. Improvements undertaken prior to and since FY2011 have resulted in FY2013 EUI scores below 50 in a number of schools, in the low to mid-50s in others, and no higher than 62 in any. The exception is the Fuller Middle School, the former Framingham South High School, that has been scheduled for replacement for some time. Cameron Middle School and Framingham High School, both renovated extensively, have EUI’s today in the high 40s.

The performance of Town buildings has more room for improvement, and the opportunities identified in this plan will result in significant additional energy reductions over the remaining years covered by this Plan. Reductions identified come from building assessments completed by Peregrine Energy Group, Inc. as part of the ERP development process, and also from the

Investement Grade Audit that the Town engaged Ameresco, Inc. to complete as part of our evaluation of the merits of proceeding with a performance contract under Chapter 25A.

Vehicles

The Town of Framingham has a combined total of 280 vehicles, of which 195 were exempt and 85 were non-exempt. Non-exempt vehicles by department: Parks and Recreation (3); Police (28); Public Schools (14); Public Works (26); Inspectional Services (11); Library (1); Edgell Grove Cemetary (1); additional miscellaneous (1). Vehicles account for almost 24% of Town energy use during the baseline year. Vehicles used nearly 190,000 gallons of unleaded gasoline and just over 167,000 gallons of diesel fuel, which represent almost identical quantities on an MMBtu basis.

Water and Wastewater

Framingham does not operate either water or wastewater treatment plants. Framingham is an MWRA community and uses the MWRA for both water supply and wastewater treatment.

Pumping to connect Moving water to and sewage from Town residences and businesses requires an extensive pumping network. There are 41 active sewage pumping facililites, five of which have natural gas fired heaters. There are 15 water pumping facilities, either tanks or buildings, four of which have natural gas fired heaters. Pumping accounted for 5.7% of use.

Streetlights and Traffic Signals

There are 4,871 cobra-style streetlights in Framingham, all high pressure sodium and all owned by the Town, consuming an average of 1,680,000 kWh annually. 86% of streetlights are equal to or less than 50 watts. The remaining 14% are equal to or more than 100 watts.

The Town has 44 signalled intersections it is responsible for, many of which have multiple ground-based and hanging signal heads, as well as PED signals. There are also warning signals associated with all Town schools. Generally, all traffic signals have been converted to LED technology.

Street lighting, including traffic signals, accounts for just over 3% of energy use.

Table 1: Summary of Municipal Energy Users

Buildings	**Number**	**Ownership**
Oil Heat	1	Muni
Natural Gas Heat	36	Muni
Electric Heat	0	Muni
Unheated	0	Muni
Water and Sewer		
Wastewater Treatment Plant	0	Muni
Drinking Water Treatment Plant	0	Muni
Pumping Stations	56	Muni
Vehicles	220	
Non-Exempt	95	Muni
Exempt	185	Muni
Streetlights	4,871	Muni
Traffic Signals (intersections)	44	Muni

Summary of Energy Use Baseline and Plans for Reductions

Framingham has selected FY2011 as its baseline year, to be able to take credit for energy reductions in Town and School buildings achieved since that time. From FY2011 to the end of FY2013, energy use in buildings declined by over 11%. School building reductions were the primary contributer to this decline, with extensive investments in new interior lighting, including LEDs, conversion of building energy management systems to direct digital control (DDC), replacement of roof top units with more efficient equipment, installation of drives on motors and pumps, and refining building schedules and setpoints to minimize unnecessary building heating and cooling. During this same period, most of the other energy use, for streetlighting, vehicles, and pumping, stayed flat.

Looking forward, Framingham is pursuing a two-pronged strategy to realize additional energy reductions in buildings.

Performance contracting. In late 2012, the Town entered into a contract with Ameresco, Inc. to develop an investment grade audit of Town and school buildings that would identify energy conservation measures that could be implemented through an energy saving performance contract. Framingham had been part of a group of cities and towns belonging to the Metropolitan Area Planning Council (MAPC) that had opted in to being covered by a Request for Qualifications issued by MAPC in 2011 for Performance Contracting under Chapter 25A, section

11I. Ameresco, inc. was authorized through that qualification process to approach the participating communities and offer energy management services. In late 2012, Framingham and Ameresco contracted for the investment grade audit. Since that time, Ameresco has performed site visits and analyzed energy use in most buildings and prepared recommendations for consideration by Town representatives. This has been an iterative process which is still ongoing as the Town considers what is the optimal set of projects it may want Ameresco to implement and what projects the Town can address itself through ongoing building repairs and maintenance efforts and traditional capital appropriations.

20-Year Building Plan. The Town has initiated a detailed survey of Town buildings to assess their existing condition and near-term and long-term capital needs. The goal of this process is to identify immediate necessary improvements, to anticipate and budget for future building needs, and to secure information relevant to decisions about long-term use or disposition of buildings. The School Buildings and Grounds Department, which includes senior trades people, have been touring each building and preparing these analyses. In the course of this effort, immediate energy savings opportunities have been identified and pursued in many buildings, much as has been done in Framingham's schools for many years. At the same time, the Town has hired a new Facilities Director responsible for Town buildings that is taking the lead in execution of plans that are being developed. This position corresponds to a like Facilities Director position in the School Department.

In August 2013, Framingham also engaged Peregrine Energy Group, Inc. as its consulting engineer to identify specific opportunities for energy reduction in Town and school buildings and to help prepare the Town's Green Community Energy Reduction Plan. Peregrine's responsibilities to the Town also included serving as Owner's Agent for the Town's engagement with Ameresco, helping to manage and guide the investment grade audit process, to secure optimal results for the Town, and to decide when specific energy efficiency and infrastructure improvements were best achieved through a performance contract or other means.

Peregrine conducted its own site visits of major facilities to be included in Framingham's energy reduction plan, assessed the relative operating efficiency of buildings and systems, and identified and quantified energy reduction opportunities. Peregrine also critiqued Ameresco's Investment Grade Audit findings and recommendations and integrated them into a master list of projects that the Town could pursue to achieve a 20% energy reduction goal by 2016.

These combined recommendations, summarized in this document, coupled with improvements already implemented since FY2011, will result in energy reductions in buildings of nearly 22% against the FY2011 baseline consumption. Anticipated energy savings assume the replacement of two current Town buildings by 2016, the McAuliffe Branch Library (built in 1963) and Fuller Middle School (built in 1958), with new facilities that meet stretch code requirements.

Other planned energy reductions include:

- For Vehicles, a 15% improvement in fuel efficiency through replacement of older vehicles with new, more fuel efficient models, better fleet maintenance, and reduced idling and other operational adjustments.
- For Street lighting, conversion of all streetlights to LED, resulting in a 50% reduction in electricity consumption for this end use.

In total, anticipated energy reductions under Framingham's proposed 5-year plan, ending in 2016, will equal 20% of the FY2011 baseline.

Table 2 below summarizes Framingham's plans for energy reduction.

Table 2: Framingham Energy Use Baseline and Plans for Reduction

BASELINE: FY 2011	MMBtu Used in Baseline Year	% of Total MMBtu Baseline Energy Consumption	Projected Planned MMBtu Savings	Savings as % of Total MMBtu Baseline Energy Consumption
Buildings	133,093	67.1%	28,867 (21.7%)	14.6%
Vehicles	46,797	23.6	7,010 (15.0%)	3.5%
Streetlights	5,732	2.9%	2,866 (50.0%)	1.4%
Traffic Signals	483	0.2%	0 (0.0%)	0.0%
Water/Sewer	11,311	5.7%	816 (7.2%)	0.4%
Open Space	976	0.5%	277 (28.4%)	0.1%
Total	**198,392**	**100%**	**39,836**	**20.1%**

Energy Use Baseline Inventory

Inventory Tool Used

The Town of Framingham will be using MassEnergyInsight as its inventory tool. Initial MEI set ups of all Town buildings and other accounts have been completed. While some additional clean-up is needed to add acounts to the system and associate a few utility accounts with end uses, almost all energy use is accounted for in the system except for vehicle fuel.

Because energy use data has never been available to Town departments for the buildings and facilities they manage, there is great interest in having access to MEI. Anticipated users include: Town Facilities Director, School Buildings and Grounds, Department of Public Works, and the Community and Economic Development Department.

Baseline Year

As noted earlier, Framingham will use FY 2011 as its baseline year.

Municipal Energy Consumption for the Baseline Year

Table 3 below, based largely on energy use information extracted from MassEnergyInsight, shows the Town of Framingham's energy use during FY2011 (our baseline year) in native units and MMBtus.

Table 3: Framingham Energy Use Baseline FY2011

Town of Framingham FY2011	Electricity		Natural Gas		#2 Distillate Fuel Oil		Propane		Gasoline		Diesel		Renewable Energy - Electric		Renewable Energy - Thermal[1]		Total MMBtu
	kWh	MMBtu	Therms	MMBtu	Gallons	MMBtu	Gallons	MMBtu	Gallons	MMBtu	Gallons	MMBtu	kWh	MMBtu	Gallons	MMBtu	
Barbieri ES	921,240	3,143	39,925	3,993		0		0		0		0		0			7,136
Walsh MS	572,604	1,954	82,771	8,277		0		0		0		0		0			10,231
Mary E Stapleton ES	164,288	561	38,862	3,886		0		0		0		0		0			4,447
Cameron MS	642,312	2,192	36,097	3,610		0		0		0		0		0			5,801
Potter Road ES	169,560	579	17,559	1,756		0		0		0		0		0			2,334
Brophy ES	239,256	816	30,790	3,079		0		0		0		0		0			3,895
Woodrow Wilson ES	517,660	1,766	36,246	3,625		0		0		0		0		0			5,391
Hemenway ES	172,441	588	33,783	3,378		0		0		0		0		0			3,967
Framingham HS	2,286,960	7,803	131,795	13,180		0		0		0		0		0			20,983
Charlotte A Dunning ES	140,440	479	31,793	3,179		0		0		0		0		0			3,658
Fuller MS	623,256	2,127	114,666	11,467		0		0		0		0		0			13,593
Miriam F McCarthy ES	626,712	2,138	51,047	5,105		0		0		0		0		0			7,243
Juniper Hill ES	115,749	395	24,785	2,479		0		0		0		0		0			2,873
Memorial Building	564,960	1,928	38,392	3,839		0		0		0		0		0			5,767
Main Library		0	22,226	2,223		0		0		0		0		0			2,223
McAuliffe Library	65,097	222	2,842	284		0		0		0		0		0			506
Station 1	100,875	344	10,679	1,068		0		0		0		0		0			1,412
Station 5	69,581	237	7,506	751		0		0		0		0		0			988
Station 7	28,245	96	3,980	398		0		0		0		0		0			494
Station 2	34,163	117	11,417	1,142		0		0		0		0		0			1,258
DPW Headquarters	584,160	1,993	38,053	3,805		0		0		0		0		0			5,798
Callahan Senior Center	208,720	712	10,013	1,001		0		0		0		0		0			1,713
Cushing Memorial Chapel	19,865	68	3,400	340		0		0		0		0		0			408
Loring Arena	592,160	2,020	21,799	2,180		0		0		0		0		0			4,200
Academy Building	195	1	2,742	274		0		0		0		0		0			275
Village Hall	5,396	18		0	848	118		0		0		0		0			136
Pearl Street Garage	114,120	389		0		0		0		0		0		0			389
Park & Recreaton Office	15,121	52	2,759	276		0		0		0		0		0			327
Framingham Alternative High School	19,800	68	5,153	515		0		0		0		0		0			583
Fire Department Headquarters	261,840	893	20,776	2,078		0		0		0		0		0			2,971
Police HQ	576,320	1,966	16,011	1,601		0		0		0		0		0			3,568
Henry St. Garage	45,491	155	7,549	755		0		0		0		0		0			910
Sanitation Department	253,560	865	1,498	150		0		0		0		0		0			1,015
King Administration Building (School Dept)	186,784	637	48,493	4,849		0		0		0		0		0			5,487
Athenaeum Hall	139	0		0		0		0		0		0		0			0
Old Edgell Library	22,398	76		0	5,850	813		0		0		0		0			890
Police Kennel	16,987	58	1,629	163		0		0		0		0		0			221
Subtotal for Buildings	10,978,455	37,458	947,036	94,704	6,698	931	0	0	0	0	0	0	0	0	0		133,093
Drinking/Wastewater Treatment Plant(s)		0		0		0		0		0		0		0			0
Pumping in Aggregate	3,028,437	10,333	9,784	978		0		0		0		0		0			11,311
Open Space[2]	143,415	489	4,864	486		0		0		0		0		0			976
Vehicles in Aggregate		0		0		0		0	189,757	23,530	167,391	23,267		0			46,797
Street and Traffic Lights in Aggregate	1,821,615	6,215		0		0		0		0		0		0			6,215
Total Energy Use	15,971,922	54,496	961,684	96,168	6,698	931	0	0	189,757	23,530	167,391	23,267	0	0	0	0	198,393

Energy Reduction Plan for Framingham

Narrative Summary

Having chosen FY2011 as our baseline year, Framingham is already nearly halfway through the five year implementation period for our Energy Reduction Plan. Through FY2013, according to our MEI baseline report, reductions against baseline achieved in buildings are in the range of 11%, though we have achieved limited reductions during the plan period to date in the other major energy end uses (i.e., vehicles, pumping, and streetlighting).

Looking forward, Framingham's plan is to:

- Focus on specific capital projects identified by Ameresco in their investment grade audit that are consistent with the Town's 20-year Building Plan
- Implement additional lower cost operations and maintenance improvements ourselves
- Proceed with comprehensive retrocommissioning in all schools. as well as with installing Tridium EMS to enable portfolio-wide web-based building system management
- Continue to have in-house school Buildings and Grounds Department staff ensure that all existing and replacement building equipment is operating at maximum efficiency
- Proceed with conversion of streetlights to LED in the next year or so
- Improve our vehicle fleet management with an eye toward reducing fuel use, including better tracking and analysis of fuel consumption, reinforcement of energy reduction objectives with vehicle users, adoption of energy savings maintenance practices and materials where practical, and replacing end-of-life vehicles with more energy efficient models.

Our primary strategy for realizing additional reductions quickly is to proceed with a performance contract with Ameresco. Framingham's Special Town Meeting in October 2013 authorized the Town Manager to enter into negotiations with Ameresco for an energy saving performance contract of up to 20 years, subject to Town Meeting approval of any proposed contract by the next regular Town Meeting in April 2014.

With Town Meeting approval in hand next spring, we anticipate that many of the Ameresco projects will be completed by the end of FY2015. The Town's and School Department's Facilities Directors have been finalizing the performance contract energy conservation measures over the past three months, clarifying and refining the recommendations in the investment grade audit submitted by Ameresco in May 2013. Based on the most recent discussions between the Town and Ameresco, the following Table summarizes the energy conservation measures being being considered.

Ameresco Proposed Investment Grade Audit ECMs Being Evaluated by Town – October 2013

Measure Number	Town/ School	Building	ECM Description	Measure Costs	kWh	$$$	Therms	$$$	Gals, #2	O&M Savings	Energy Savings	Total Savings	Rebates	Simple Payback (years)	Include? (1=yes)
1	S	Barberi	Lighting System Improvements - Option A	$ 84,321	63,882	11,311	(557)	(612)	-	$ 665	$ 10,699	$ 11,364	$ 23,600	5.34	1
1	S	Brophy	Lighting System Improvements - Option A	$ 32,279	21,966	2,915	-	-	-	$ 457	$ 2,915	$ 3,372	$ 3,150	8.84	1
1	S	Cameron	Lighting System Improvements - Option A	$ 124,465	44,273	7,960	(354)	(389)	-	$ 969	$ 7,570	$ 8,539	$ 10,325	13.37	1
1	S	FHS	Lighting System Improvements - Option A	$ 193,954	109,000	24,086	(1,164)	(1,281)	-	$ 1,126	$ 22,805	$ 23,931	$ 50,405	6.00	1
1	S	Hemenway	Lighting System Improvements - Option A	$ 36,659	20,389	4,725	(228)	(251)	-	$ 250	$ 4,474	$ 4,724	$ 7,135	6.25	1
1	S	Juniper	Lighting System Improvements - Option A	$ 50,735	31,656	4,781	(155)	(170)	-	$ 533	$ 4,611	$ 5,143	$ 6,565	8.59	1
1	S	King	Lighting System Improvements - Option A	$ 22,509	9,308	1,598	-	-	-	$ 307	$ 1,598	$ 1,906	$ 700	11.44	1
1	S	McCarthy	Lighting System Improvements - Option A	$ 81,099	55,029	9,799	(495)	(544)	-	$ 726	$ 9,255	$ 9,981	$ 12,400	6.88	1
1	S	Potter	Lighting System Improvements - Option A	$ 13,756	8,252	1,095	-	-	-	$ 187	$ 1,095	$ 1,281	$ 900	10.03	1
1	S	Stapleton	Lighting System Improvements - Option A	$ 70,173	31,661	6,662	(303)	(333)	-	$ 563	$ 6,328	$ 6,891	$ 7,210	9.14	1
1	S	Thayer	Lighting System Improvements - Option A	$ 11,661	7,025	1,487	(45)	(51)	-	$ 116	$ 1,436	$ 1,553	$ 1,905	6.28	1
1	S	Walsh	Lighting System Improvements - Option A	$ 43,473	22,347	2,548	-	-	-	$ 561	$ 2,548	$ 3,108	$ 1,725	13.43	1
1	S	Wilson	Lighting System Improvements - Option A	$ 99,089	72,312	13,623	(675)	(742)	-	$ 831	$ 12,881	$ 13,712	$ 16,115	6.05	1
1	T	DPW Garage	Lighting System Improvements - Option A	$ 65,419	47,710	8,672	(254)	(279)	-	$ 740	$ 8,393	$ 9,133	$ 8,260	6.26	1
1	T	DPW Office	Lighting System Improvements - Option A	$ 5,411	2,922	757	(31)	(34)	-	$ 31	$ 723	$ 754	$ 1,355	5.38	1
1	T	Edgell	Lighting System Improvements - Option A	$ 5,576	2,323	461	-	-	(8)	$ 59	$ 432	$ 491	$ 675	9.98	1
1	T	Fire 1	Lighting System Improvements - Option A	$ 10,928	6,686	1,270	(51)	(56)	-	$ 105	$ 1,215	$ 1,320	$ 1,250	7.35	1
1	T	Fire 5	Lighting System Improvements - Option A	$ 9,704	6,462	1,067	(27)	(30)	-	$ 82	$ 1,037	$ 1,119	$ 275	8.43	1
1	T	Fire 7	Lighting System Improvements - Option A	$ 5,898	2,859	567	(9)	(10)	-	$ 66	$ 558	$ 624	$ 90	9.31	1
1	T	Fire HQ	Lighting System Improvements - Option A	$ 54,356	31,742	5,686	(164)	(180)	-	$ 544	$ 5,506	$ 6,050	$ 8,825	7.53	1
1	T	Garage	Lighting System Improvements - Option A	$ 28,808	31,157	4,144	-	-	-	$ 308	$ 4,144	$ 4,452	$ 4,570	5.44	1
1	T	Henry	Lighting System Improvements - Option A	$ 4,936	3,607	619	(40)	(46)	-	$ 29	$ 574	$ 603	$ 1,200	6.20	1
1	T	Library	Lighting System Improvements - Option A	$ 26,807	19,908	3,332	(183)	(202)	-	$ 244	$ 3,131	$ 3,375	$ 400	7.82	1
1	T	Park	Lighting System Improvements - Option A	$ 8,821	6,277	853	-	-	-	$ 119	$ 833	$ 952	$ 525	8.72	1
1	T	Police	Lighting System Improvements - Option A	$ 71,179	72,151	13,254	(730)	(802)	-	$ 755	$ 12,451	$ 13,177	$ 7,550	4.85	1
1	T	Sani_Lower	Lighting System Improvements - Option A	$ 37,002	24,151	3,508	(39)	(37)	-	$ 515	$ 3,472	$ 3,986	$ 4,425	8.42	1
1	T	Sani_Upper	Lighting System Improvements - Option A	$ 5,063	2,816	968	-	-	-	$ 42	$ 968	$ 1,009	$ 1,465	4.61	1
1	T	Senior	Lighting System Improvements - Option A	$ 53,555	28,381	5,508	(147)	(162)	-	$ 581	$ 5,346	$ 5,927	$ 10,015	7.35	1
3	T	Fire HQ	Integrated and New Energy Management Systems	$ 71,084	27,482	3,646	3,355	3,690	-	$ -	$ 7,336	$ 7,336	$ 2,700	9.42	1
3	T	Library	Integrated and New Energy Management Systems	$ 353,193	66,895	7,524	3,106	3,417	-	$ -	$ 10,941	$ 10,941	$ 13,500	31.05	1
3	T	Memorial	Integrated and New Energy Management Systems	$ 53,057	5,979	793	8,161	8,976	-	$ -	$ 9,771	$ 9,771	$ 2,250	5.20	1
3	T	Police	Integrated and New Energy Management Systems	$ 196,935	59,108	7,843	1,764	1,962	-	$ -	$ 9,805	$ 9,805	$ -	20.06	1
5	S	Brophy	Demand Control Ventilation	$ 12,256	1,980	263	611	675	-	$ -	$ 938	$ 938	$ 675	12.38	1
5	S	Cameron	Demand Control Ventilation	$ 16,324	2,124	242	1,176	1,294	-	$ -	$ 1,536	$ 1,536	$ 675	10.19	1
5	S	FHS	Demand Control Ventilation	$ 16,452	2,251	257	1,477	1,625	-	$ -	$ 1,881	$ 1,881	$ 900	8.26	1
5	S	Hemenway	Demand Control Ventilation	$ 8,205	862	114	436	479	-	$ -	$ 594	$ 594	$ 450	13.06	1
5	S	Juniper	Demand Control Ventilation	$ 4,086	662	75	231	254	-	$ -	$ 329	$ 329	$ 225	11.73	1
5	S	King	Demand Control Ventilation	$ 8,220	1,203	207	610	671	-	$ -	$ 877	$ 877	$ 450	8.86	1
5	S	McCarthy	Demand Control Ventilation	$ 8,147	1,297	148	1,340	1,473	-	$ -	$ 1,621	$ 1,621	$ 450	4.75	1
5	S	Stapleton	Demand Control Ventilation	$ 4,090	1,047	139	262	288	-	$ -	$ 427	$ 427	$ 225	9.04	1
5	S	Walsh	Demand Control Ventilation	$ 29,104	5,620	641	5,331	5,865	-	$ -	$ 6,505	$ 6,505	$ 900	4.34	1
5	S	Wilson	Demand Control Ventilation	$ 12,284	1,172	134	1,091	1,200	-	$ -	$ 1,334	$ 1,334	$ 675	8.70	1
6	S	Barberi	Infiltration Reductions	$ 9,048	15	2	900	990	-	$ -	$ 991	$ 991	$ -	9.13	1
6	S	Brophy	Infiltration Reductions	$ 21,787	50	7	3,499	3,849	-	$ -	$ 3,855	$ 3,855	$ -	5.65	1
6	S	Cameron	Infiltration Reductions	$ 3,279	31	4	323	355	-	$ -	$ 358	$ 358	$ -	9.15	1
6	S	Dunning	Infiltration Reductions	$ 7,854	-	-	1,263	1,390	-	$ -	$ 1,390	$ 1,390	$ -	5.65	1
6	S	FHS	Infiltration Reductions	$ 62,743	9	1	6,480	7,128	-	$ -	$ 7,129	$ 7,129	$ -	8.80	1
6	S	Hemenway	Infiltration Reductions	$ 9,234	26	3	1,345	1,479	-	$ -	$ 1,482	$ 1,482	$ -	6.23	1
6	S	Juniper	Infiltration Reductions	$ 2,523	-	-	381	419	-	$ -	$ 419	$ 419	$ -	6.02	1
6	S	King	Infiltration Reductions	$ 1,873	30	5	194	213	-	$ -	$ 218	$ 218	$ -	8.59	1
6	S	McCarthy	Infiltration Reductions	$ 18,693	261	30	2,907	3,197	-	$ -	$ 3,227	$ 3,227	$ -	5.79	1
6	S	Potter	Infiltration Reductions	$ 11,602	-	-	906	997	-	$ -	$ 997	$ 997	$ -	11.64	1
6	S	Thayer	Infiltration Reductions	$ 3,617	-	-	311	350	-	$ -	$ 350	$ 350	$ -	10.34	1
6	S	Wilson	Infiltration Reductions	$ 15,667	153	17	1,406	1,547	-	$ -	$ 1,564	$ 1,564	$ -	10.02	1
6	T	Acad	Infiltration Reductions	$ 1,710	28	6	107	120	-	$ -	$ 126	$ 126	$ -	13.61	1
6	T	DPW Garage	Infiltration Reductions	$ 1,553	10	1	180	198	-	$ -	$ 199	$ 199	$ -	7.80	1
6	T	Fire HQ	Infiltration Reductions	$ 11,647	192	25	819	901	-	$ -	$ 926	$ 926	$ -	12.57	1
6	T	Library	Infiltration Reductions	$ 2,908	107	12	325	362	-	$ -	$ 374	$ 374	$ -	7.77	1
6	T	Memorial	Infiltration Reductions	$ 1,162	19	3	124	137	-	$ -	$ 139	$ 139	$ -	8.34	1
6	T	Police	Infiltration Reductions	$ 1,965	51	7	186	204	-	$ -	$ 211	$ 211	$ -	9.30	1
8	T	Fire 5	Boiler Replacements	$ 115,329	-	-	668	748	-	$ -	$ 748	$ 748	$ 4,000	148.77	1
8	T	Library	Boiler Replacements	$ 253,321	-	-	2,147	2,362	-	$ -	$ 2,362	$ 2,362	$ 15,000	100.90	1
8	T	Edgell	Oil to Gas Conversion	$ 27,220	-	-	(6,793)	(7,634)	4,698	$ -	$ -	$ 9,508	$ -	2.86	1
11	S	Cameron	Variable Frequency Drives For HW Pumps	$ 42,447	21,908	2,498	-	-	-	$ -	$ 2,498	$ 2,498	$ 16,200	10.51	1
11	S	McCarthy	Variable Frequency Drives For HW Pumps	$ 17,940	11,395	1,299	-	-	-	$ -	$ 1,299	$ 1,299	$ 6,300	8.96	1
11	S	Wilson	Variable Frequency Drives For HW Pumps	$ 40,728	16,157	1,842	-	-	-	$ -	$ 1,842	$ 1,842	$ 15,000	13.97	1
11	T	Library	Variable Frequency Drives For HW Pumps	$ 22,986	10,079	1,134	-	-	-	$ -	$ 1,134	$ 1,134	$ 6,900	14.20	1

Ameresco Proposed Investment Grade Audit ECMs Being Evaluated by Town – October 2013 (continued)

Measure Number	Town/ School	Building	ECM Description	Measure Costs	kWh	$$$	Therms	$$$	Gals, #2	O&M Savings	Energy Savings	Total Savings	Rebates	Simple Payback (years)	Include? (1=yes)
14	T	Fire_1	Vending Misers	$ 456	1,332	177	(28)	(31)	-	$ -	$ 146	$ 146	$ 115	2.34	1
14	T	Fire_HQ	Vending Misers	$ 451	2,006	266	(42)	(47)	-	$ -	$ 220	$ 220	$ 115	1.53	1
14	T	Memorial	Vending Misers	$ 1,339	7,844	1,041	(167)	(183)	-	$ -	$ 857	$ 857	$ 390	1.11	1
14	T	Police	Vending Misers	$ 452	616	82	(13)	(14)	-	$ -	$ 68	$ 68	$ 115	4.98	1
14	T	Senior	Vending Misers	$ 454	2,645	351	(52)	(57)	-	$ -	$ 294	$ 294	$ 115	1.15	1
15	T	Animal	PC Load Management	$ 46	186	37	(4)	(4)	-	$ -	$ 33	$ 33	$ -	1.40	1
15	T	DPW_Garage	PC Load Management	$ 1,214	4,927	654	(108)	(118)	-	$ -	$ 535	$ 535	$ -	2.27	1
15	T	DPW_Office	PC Load Management	$ 344	1,496	198	(30)	(33)	-	$ -	$ 165	$ 165	$ -	2.08	1
15	T	Fire_HQ	PC Load Management	$ 294	1,049	139	(22)	(24)	-	$ -	$ 116	$ 116	$ -	2.56	1
15	T	Library	PC Load Management	$ 2,397	9,562	1,075	(193)	(212)	-	$ -	$ 863	$ 863	$ -	2.78	1
15	T	Memorial	PC Load Management	$ 3,625	15,385	2,041	(327)	(360)	-	$ -	$ 1,682	$ 1,682	$ -	2.16	1
15	T	Park	PC Load Management	$ 227	987	131	(20)	(23)	-	$ -	$ 108	$ 108	$ -	2.10	1
15	T	Police	PC Load Management	$ 1,585	4,187	556	(87)	(96)	-	$ -	$ 460	$ 460	$ -	3.45	1
15	T	Senior	PC Load Management	$ 182	757	100	(15)	(16)	-	$ -	$ 84	$ 84	$ -	2.17	1
17	T	Acad	Roof Insulation	$ 4,105	41	8	214	241	-	$ -	$ 249	$ 249	$ -	16.51	1
17	T	Police	Roof Insulation	$ 7,996	166	22	261	287	-	$ -	$ 309	$ 309	$ -	25.87	1
18	T	Memorial	Nevins Hall AHU Renabilitation	$ 73,882	(4,522)	(600)	(622)	(684)	-	$ -	$ (1,284)	$ (1,284)	$ -	(57.52)	1
19	S	Barbieri	Transformers	$ 53,291	45,920	6,489	-	-	-	$ -	$ 6,489	$ 6,489	$ 6,667	7.19	1
19	S	Cameron	Transformers	$ 43,005	39,254	5,560	-	-	-	$ -	$ 5,560	$ 5,560	$ 7,677	6.95	1
19	S	FHS	Transformers	$ 80,714	87,168	12,356	-	-	-	$ -	$ 12,356	$ 12,356	$ 15,253	5.30	1
19	S	McCarthy	Transformers	$ 86,115	66,948	9,481	-	-	-	$ -	$ 9,481	$ 9,481	$ 9,596	7.97	1
19	S	Wilson	Transformers	$ 32,881	32,849	4,659	-	-	-	$ -	$ 4,659	$ 4,659	$ 6,061	5.76	1
19	T	DPW_Garage	Transformers	$ 17,381	15,384	2,527	-	-	-	$ -	$ 2,527	$ 2,527	$ 2,121	6.04	1
19	T	Fire_HQ	Transformers	$ 13,025	11,834	1,943	-	-	-	$ -	$ 1,943	$ 1,943	$ 1,616	5.87	1
19	T	Park	Transformers	$ 8,356	6,638	1,090	-	-	-	$ -	$ 1,090	$ 1,090	$ 1,010	6.74	1
25	T	Senior	Airflow Corrections	$ 520	-	-	10	11	-	$ -	$ 11	$ 11	$ -	46.29	1
26	T	Edgell	New HVAC Systems	$ 73,288	-	-	(6,793)	(7,634)	4,898	$ -	$ 9,508	$ 9,508	$ -	7.71	1
26	T	Fire_HQ	New HVAC Systems	$ 242,885	-	-	-	-	-	$ -	$ -	$ -	$ -	-	1
26	T	Police	New HVAC Systems	$ 48,652	-	-	-	-	-	$ -	$ -	$ -	$ -	-	1
27	T	Library	Ceiling Replacement	$ 416,480	-	-	-	-	-	$ -	$ -	$ -	$ -	-	1
29	T	Street	Street Lighting Improvements	$ 1,686,017	919,905	141,408	-	-	-	$ -	$ 141,408	$ 141,408	$ 229,976	10.30	1
Total Selected				$ 5,661,581	2,299,027	363,946	32,971	35,971	9,787	$ 11,483	$ 434,171	$ 445,654	$ 560,276	11.45	98 measures

Overview of Years 1 – 3 [FY2012 – FY2014]

During the three years since our FY2011 baseline year, the Town has aggressively proceeded on a number of fronts to both reduce energy use and set the stage for future energy reductions.

The School Department through its Buildings and Grounds Department has continued its program of replacing end-of-life HVAC equipment with new, more efficient or more appropriately-sized systems and also incorporating variable frequency drives on motors and pumps as appropriate to further optimize efficiency. They have initiated a program to convert building controls in schools to DDC, eliminating pneumatics and compressors. This effort will continue in Plan Years 4 and 5. There have also been many school lighting projects implemented, working through the NSTAR energy efficiency program. These have included replacement of exterior lights (wallpacks) with LED product as it has become available, moving to LED for parking lot lighting, and continuing to replace interior lights in schools with best available technology, including LED lamps.

Town buildings have suffered from some level of neglect in the recent past, from an energy efficiency perspective, due to lack of central leadership and resources. There have been improvements made in individual buildings during this period, but this has usually been initiated by individual departments rather than as part of a formal Town-wide plan. Specifically,

- Public Works has achieved significant reductions in its headquarter building through lighting upgrades
- Water and Sewer Division has been upgrading pumping stations, adding variable frequency drives, installing premium efficiency motors, and replacing heating systems
- The Police Station has begun the process of updating building controls and has also replaced lighting
- Memorial Hall has invested ARRA EECBG funds in HVAC improvements and has retrofitted light fixtures

More recently, at the direction of the Town Manager, the School Buildings and Grounds Department was deployed to assess the condition of major Town buildings as part of the 20-year Building Plan process, and this effort has identified numbers of opportunities for energy reductions in these buildings, often in the context of necessary repairs or rehabilitiation of under-performing mechanical equipment. In FY2014, the Town hired a new Facilities Director with extensive construction and management experience that will take the lead in Town building repairs and refurbishment. As part of this same initiative, the Town Manager began the Town's performance contracting initiative by entering into an investment grade audit contract with Ameresco.

Also, in preparation for the conversion of streetlights to LED, a test installation was completed in Framingham's Downtown area to guage the effectiveness of these lamps and their acceptability.

With the positive response received, the Town is prepared to move to Town-wide conversion in FY2015.

Overview of Goals for Years 4 – 5 [FY2015 – FY2016]

Years 4 and 5 of the Framingham's ERP will continue to be implementation years for energy reduction projects, perhaps most significantly through energy efficiency and infrastructure projects under the Ameresco performance contract. Also, the new Fuller Middle School and McAuliffe Library are scheduled for construction / completion in FY2015/16, resulting in significant energy savings compared to the 1950s and 1960s-vintage buildings they replace.

The streetlight LED conversion should be completed in FY2015. Because the Town has already implemented many of the building lighting retrofits that typically "fuel" the cash flow of performance contracts, Framingham will likely roll its streetlight conversion to LED into the Ameresco contract. This will allow savings realized from switching to LED to be credited towards long-payback infrastructure upgrades and help meet the Chapter 25A self-funding requirement.

School Buildings and Grounds has already requested funding through the FY2014 Town capital appropriations process for EMS upgrades in FY2015, installing a Tridium front end in schools that do not yet have such systems. Retrocommissioning will be occuring in all schools at the same time.

The Water and Sewer Division of Public Works has targeted additional pumping stations to receive VFDs and heating system upgrades during this period, and budget requests for these projects are included in the Town's capital appropriations plan.

School Buildings and Grounds has noted that anticipated savings in schools over the past couple of years has been offset by a significant increase in plugged in devices, installation of window air conditioners where central AC is not available, and expanded building hours of use for special programs. Staff hope to address these increases during this period through better policies governing use of plugged in devices and air conditioners, as well as better control and management of space conditioning in schools where special programs are held.

Given the significant contribution that vehicle fuel consumption makes to overall Town energy use, implementing a formal Town-wide vehicle management policy will be a critical part of the Town's energy reduction program during these two years. There has already been discussion about adopting Town-wide the fuel management technology now used by Public Works, to support better control and analysis of both the Fire Department and Police Department vehicle fuel use which currently is not being closely monitored.

Areas of Least Efficiency / Greatest Waste

Buildings

School buildings in Framingham has very good energy performance. While Town buildings are less efficient than school buildings, overall energy use in Framingham buildings is quite good. That being said, we believe that having a formal Energy Reduction Plan, achieving Green Community designation, and proceeding with the projects that have been identified will will help Framingham address outlying performers and better manage building energy use.

Lighting

The rapid improvements in LED technology and deep reductions in the cost of retrofitting streetlights with LED makes using high pressure sodium lights very "old school." Converting to LED in the next two years will result in 50% energy reductions in this end use.

Vehicles

Town vehicles, exempt and non-exempt, and the amount of fuel used to operate them are probably typical for cities and Towns in the State. We will implement policies and procedures which we hope will result in reductions to what is a very significant portion of the Town's overall energy consumption.

Getting to a 20% Energy Use Reduction within 5 Years

Buildings

The Ameresco investment grade audit and the building assessments completed by Peregrine have identified a range of opportunities that Framingham is committed to pursuing to reduce energy consumption over the remaining years covered by this plan.

Considering the combination of energy efficiency and infrastructure projects identified, there are two avenues that we will pursue to achieve further energy reductions. The first is to use annual operations and maintenance budgets, coupled with our formal capital improvement authorization process, to fund a portion of the projects identified. The second avenue we will use will be a performance contract with Ameresco. Given appropriations requests that have already been made for FY2015 as well as the progress made to date in negotiating a scope of work with Ameresco, we are confident that we will have the resources and means to realize the reductions identified.

Street and Traffic Lights

As noted above, Framingham plans to convert all streetlights to LED. Our latest thinking is to include the streetlight conversion project in the performance contract with Ameresco.

Vehicles

While the time is short to implement the vehicle policy we are proposing, we believe that we can put the strategies and policies in place over the next year that will lead to the forecasted savings. Naturally, the cycle for vehicle replacement across our fleet will be longer than the time remaining in our energy reduction plan; but we can begin to demonstrate that putting more efficient vehicles on the road will not adversely affect Town department's ability to meet their business objectives and serve their customers effectively. Similarly, we will take steps to institutionalize operations and maintenance policies that focus on energy efficiency.

The Town presently has three fueling "systems" in place. The Department of Public Works has a sophisticated "key system" for cars and drivers. This system, employed by Department of Public Works at its two diesel and two unleaded pumps at 100 Western Avenue, fuels vehicles run by Department of Public Works, School Department, Parks and Recreation, Building Services, Building Inspections, Library, Animal Control, and theEdgell Grove Cemetary. The Police Department has its own pump at the Police Station which is read daily to check total gallons pumped, but there is no vehicle-specific or driver tracking. The Fire Department has pumps at a number of stations, but there is no daily reading of pumped fuel nor vehicle-specific tracking. Together, Police and Fire Departments have 92 of the Town's 280 total vehicles

The strategy we plan to employ will be to put all vehicles and drivers on the FuelMaster system. Conversion of the Police Department and Fire Department pumps to FuelMaster will require installation of new pedestals and readers at those pumps and connecting those pumps via the internet to the main server for the system. Pump upgrades will likely also be required. By using FuelMaster for fuel management and tracking Town-wide, the Town can better monitor and compare fuel utilization over time and between vehicles and drivers.

Additional elements of the vehicle program will include:

- A preventative maintenance schedule that better tracks repairs and preventative maintenance activities and closely monitors tire air pressures
- Using 100% synthetic oil to reduce fuel consumption by 2%, consistent with national studies, and also to reduce the number of oil changes annually, with a commensurate reduction in associated oil expense, labor, and disposal of the waste product.
- A no idle policy for employees to reduce pollution and unnecessary fuel consumption.
- Making our best efforts to match any and all equipment and vehicles purchased to the operations they are intended to perform and, further, training and reminding staff to schedule and deploy the most appropriate vehicles to perform the functions for which they are used.

Program Management Plan for Implementation, Monitoring, Oversight

Implementation

Framingham's Town Manager will have ultimate responsibility for Implementing this energy reduction plan, with responsibility for specific elements assigned to individual departments and personnel.

Buildings upgrades will be managed by the Town's Facilties Director and the School's Director of Buildings and Grounds. Both are already meeting regularly with Ameresco to finalize the scope for the anticipated performance contract and are also fully engaged in ongoing operations and maintenance and capital improvement projects under consideration.

As the performance contract proceeds to design and construction, the Facilities staff will become the Energy Management team working with Ameresco. In addition to these staff, the Town will engage an Owner's Agent to help optimize the results achieved. Together they will oversee Ameresco's implementation of individual energy conserving measures, including the design process, equipment selection, construction monitoring and oversight, and confirming that projects are properly commissioned.

For vehicle reductions, we anticipate that the Department of Public Works may have responsibility for supporting the activities of all other departments.

The streetlight conversion project, when implemented, will involve the Police Department, which presently has lead responsibility for streetlight management.

Monitoring

Framingham will use MassEnergyInsight to track ongoing energy use and report on actual changes in energy use.

The Energy Management team members will be responsible for supporting building owners and operators (i.e., the respective Town departments) to ensure that energy reduction strategies that are instituted under the plan continue to deliver savings. This will include:

- Checking in with building users regularly to identify building comfort or performance issues that could be indicators of equipment issues,
- Frequent confirmation of proper temperature settings and scheduling on programmable thermostats and other building management systems
- Preventative maintenance of building systems and timely replacement of worn components
- Issuing work orders for necessary repairs

Oversight

The Town Manager, or his designee, will track progress toward goals and the status of project implementation. Quarterly and annual reports on activities and accomplishments under the

Energy Reduction Plan will be disseminated to stakeholders and filed with the Department of Energy Resources' Green Communities program.

Summary of Energy Audits or Other Sources for Projected Energy Savings

Strategies for energy reduction in buildings were identified by Ameresco, Inc. and Peregrine Energy Group, Inc. The strategies include: attending to regular maintenance of wear items that reduce system efficiency, investing in equipment enhancements to increase efficiency, and using infrastructure modernization investment through the capital improvement process to increase equipment efficiency as well as reliability and performance.

Other sources of savings include conversion of streetlights to more efficient LED technology and ensuring that vehicles are optimally operated, maintained, and serviced. Further, as these vehicles are replaced at the end of their useful lives, they will be replaced with models that run more efficiently.

Energy Conservation Measures

The attached Table 4 (Attachment A) summarizes specific improvements, by technology or end use that the Town plans to pursue.

Long-Term Energy Reduction Goals – Beyond 5 years

Municipal Buildings

As the Town continues to renovate, add to, and replace facilities in the context of the 20-Year Building Plan, it intends to reduce the energy required per square foot of building area to carry on government and school functions. Our adoption of the stretch code will ensure that this efficiency improvement occurs as part of all major building construction.

Vehicles

We anticipate that all future vehicle purchases will be more efficient than our existing fleet. The Town will make both vehicle energy efficiency and life cycle cost key criteria for selecting new vehicles. We will ensure that new vehicles are well matched to the purposes for which they are intended so that operating efficiency is not sacrificed. Further, we will continue to encourage all vehicle users to operate their vehicles to minimize energy use to the greatest extent practical. And finally, the Town will enhance tracking systems for vehicle fueling and scheduled maintenance.

Street and Traffic Lighting

Having converted all street lighting to LED within the period of the plan, the Town has no further plans for this end use, other than to continue to ensure that any new lights that are added also use best available technology.

Perpetuating Energy Efficiency

The Town plans to integrate energy efficiency and additional reduction strategies where practical into future construction, purchasing, planning, and policy making. Older structures will be renovated or give way to newer ones over time, and our plan is to make energy efficiency and renewable energy development a part of future buildings to the full extent practical.

Onsite Renewable Energy Projects and Renewable Energy

Framingham intends to look for opportunities for self generation with photovoltaics on both Town and school buildings, coordinating this activity with roof replacement schedules. There are already proposals for installation of photovoltaics on school roofs that the Town and School Department are evaluating.

Attachment A

Table 4: Proposed ERP Activities with Energy Reductions

See accompanying electronic file of Table 4

Appendix A

Authorizations and Endorsements of Framingham's Energy Reduction Plan

Appendix B

Calculations and Methodologies for Energy Reduction Projections

Streetlight Conversion to LED

Framingham is assuming a 50% reduction in streetlight energy use from the conversion of existing high pressure sodium streetlights to LED technology. Framingham's 4,871 streetlights are 86% 50 watt HPS lamps. Our savings calculation assumed a 50% savings for the streetlights, netted out against the baseline year, for a total energy reduction of 3,139 MMBtus for this energy end use under the proposed Plan. The Clinton Climate Initiative's economic model for street light conversion, included in the March 2009 case study of the Town of Los Angeles, California, describes reductions in fixture watts from 43% for 50W HPS fixtures to 67% for 465W HPS fixtures from HPS to LED conversions, depending on the size of the lamps being replaced.

Vehicles

Framingham is projecting an energy reduction of 15% associated with improvements to vehicle operation and maintenance and ongoing replacement of vehicles with newer models. Vehicles accounted for 46,797 MMBtus of energy consumed in the baseline year, or 23.5% of the Town total. These measures are anticipated to result in at least a 20% reduction, through we are assuming more conservative savings. Savings have been developed using information from the federal fueleconomy.gov website (http://www.fueleconomy.gov/feg/pdfs/OwnerRelatedFuelEconomyImprovements.pdf)

Measure to be taken	Potential energy savings benefit
A Fleet Management System to better schedule and track repairs and preventative maintenance	4%
Closely monitoring tire air pressures; choosing fuel efficient tires	4%
Using 100% synthetic oil to reduce fuel consumption also to reduce the number of oil changes annually, with a commensurate reduction in associated oil expense, labor, and disposal of the waste product.	2%
A no idle policy[1]	10%

[1] http://aceee.org/sector/local-policy/case-studies/minneapolis-anti-idling-vehicle-ordin

Appendix C

Extracts from Ameresco and Peregrine Building Assessments

Siemens Streetlight Analysis