Attachment A1: Table 4: Proposed ERP Activities with Energy Reductions

Attachment A1: Table 4: Proposed ERP Activities with Energy Reductions

Table 4 - Town of Framingham Energy Reduction Plan

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 Natural Gas Savings (therms)	Projected Annual Cost Savings ($)	Total Installed Cost ($)	Green Community Grant ($)	Utility Incentives ($)	Other Grants ($)	Net Town Cost ($)	Funding Source(s) for Other Grants and Net Town Costs	Source for Projected Savings
Juniper ES	*DDC controls*	*2011*	13,074	3,747	Not available	Not available		$7,016		Not available		*NSTAR incentive applications*
King Administration	*DDC controls*	*2011*	47,340	4,742	Not available	Not available		$16,577		Not available		*NSTAR incentive applications*
McCarthy ES	*DDC controls*	*2011*	106,679	7,319	Not available	Not available		$33,989		Not available		*NSTAR incentive applications*
Framingham HS	*Lighting upgrades in gym and café*	*2011*	80,100		Not available	Not available		$20,025		Not available		*NSTAR incentive applications*
Framingham HS	*Lighting upgrades (reflex lighting project)*	*2012*	24,436		Not available	Not available		$4,100		Not available		*NSTAR incentive applications*
Fuller MS	*Lighting upgrades (Public Access TV)*	*2012*	26,470		Not available	Not available		$6,618		Not available		*NSTAR incentive applications*
Barbieri ES	*DDC controls*	*2012*	20,950	7,411	Not available	Not available		$16,056		Not available		*NSTAR incentive applications*
Potter ES	*DDC controls*	*2012*	24,972	2,978	Not available	Not available		$10,842		Not available		*NSTAR incentive applications*
Brophy ES	*DDC controls*	*2012*	24,972	537	Not available	Not available		$7,790		Not available		*NSTAR incentive applications*
Sanitation Dept	*Lighting upgrades*	*2012*	28,151		Not available	Not available		$7,038		Not available		*NSTAR incentive applications*
Memorial Building	*Lighting upgrades*	*2013*	28,698		Not available	Not available		$7,174		Not available		*NSTAR incentive applications*
Juniper ES	*Lighting conversions from incand. To LED*	*2012*	17,936		Not available	Not available		$750		Not available		*NSTAR incentive applications*
Barbieri ES	*Lighting conversions from incand. To LED*	*2012*	17,936		Not available	Not available		$750		Not available		*NSTAR incentive applications*
King Administration	*Lighting conversions from incand. To LED*	*2012*	17,936		Not available	Not available		$750		Not available		*NSTAR incentive applications*
Brophy ES	*Lighting conversions from incand. To LED*	*2012*	17,936		Not available	Not available		$750		Not available		*NSTAR incentive applications*
Cameron MS	*Lighting conversions from incand. To LED*	*2012*	17,936		Not available	Not available		$750		Not available		*NSTAR incentive applications*
Hemenway ES	*Lighting conversions from incand. To LED*	*2012*	17,936		Not available	Not available		$750		Not available		*NSTAR incentive applications*
Potter ES	*Lighting conversions from incand. To LED*	*2012*	17,936		Not available	Not available		$750		Not available		*NSTAR incentive applications*
Wilson ES	*Lighting conversions from incand. To LED*	*2012*	17,936		Not available	Not available		$751		Not available		*NSTAR incentive applications*
Dunning ES	*Lighting conversions from incand. To LED*	*2012*	29,894		Not available	Not available		$1,250		Not available		*NSTAR incentive applications*
McCarthy ES	*Lighting conversions from incand. To LED*	*2012*	29,894		Not available	Not available		$1,251		Not available		*NSTAR incentive applications*
Fuller MS	*Lighting conversions from incand. To LED*	*2012*	59,787		Not available	Not available		$2,500		Not available		*NSTAR incentive applications*
Walsh MS	*Lighting conversions from incand. To LED*	*2012*	59,787		Not available	Not available		$2,501		Not available		*NSTAR incentive applications*
Framingham HS	*Lighting conversions from incand. To LED*	*2013*	11,794		Not available	Not available		$1,500		Not available		*NSTAR incentive applications*
McCarthy ES	*Exterior pole lights conversion fr HPS to LED*	*2014*	18,912		Not available	Not available		Not available		Not available		*NSTAR incentive applications*
Wilson ES	*Exterior pole lights conversion fr HPS to LED*	*2014*	7,893		Not available	Not available		Not available		Not available		*NSTAR incentive applications*
Dunning ES	*Exterior pole lights conversion fr HPS to LED*	*2014*	5,072		Not available	Not available		Not available		Not available		*NSTAR incentive applications*
Barbieri ES	*Rooftop unit replacements*	*2011*	25,000		Not available	Not available		Not available		Not available		*PEG estimates post-installation*
Barbieri ES	*Addition of drives to RTU motors*	*2012*	44,000		Not available	Not available		Not available		Not available		*PEG estimates post-installation*
Potter ES	*Installation of drives on HW pumps*	*2012*	4,000		Not available	Not available		Not available		Not available		*PEG estimates post-installation*
Brophy ES	*Installation of drives on HW pumps*	*2012*	4,000		Not available	Not available		Not available		Not available		*PEG estimates post-installation*
King Administration	*Installation of drives on HW pumps*	*2012*	2,000		Not available	Not available		Not available		Not available		*PEG estimates post-installation*
Dunning ES	*Installation of drives on HW pumps*	*2012*	4,000		Not available	Not available		Not available		Not available		*PEG estimates post-installation*
Hemenway ES	*Installation of drives on HW pumps*	*2012*	4,000		Not available	Not available		Not available		Not available		*PEG estimates post-installation*
Juniper ES	*Installation of drives on HW pumps*	*2012*	2,000		Not available	Not available		Not available		Not available		*PEG estimates post-installation*
Barbieri ES	*Installation of drives on HW pumps*	*2012*	3,000		Not available	Not available		Not available		Not available		*PEG estimates post-installation*
All Schools	*Misc O&M improvements*	*2011 - 2014*	143,850	13,402	Not available	Not available		Not available		Not available		
All Town buildings	*Misc O&M improvements*	*2011 - 2014*	75,322	5,482	Not available	Not available		Not available		Not available		
Barbieri ES	*Replace CRT Computer Screens*	*2015 / 2016*	4,000	-70	$900	$6,100		$0		$6,100		*Peregrine Bdg Assessments*
Barbieri ES	*Lighting Controls*	*2015 / 2016*	9,000	-100	$1,000	$40,000		$6,000		$34,000		*Peregrine Bdg Assessments*
Barbieri ES	*Recommission / Adjust Control Systems*	*2015 / 2016*	12,000	1,000	$2,600	$24,500		$0		$24,500		*Peregrine Bdg Assessments*
Barbieri ES	*Schedule Domestic Hot Water*	*2015 / 2016*	300	300	$400	$3,000		$0		$3,000		*Peregrine Bdg Assessments*
Barbieri ES	*Install Fan VFD*	*2015 / 2016*	9,600	0	$1,200	$30,000		$8,000		$22,000		*Peregrine Bdg Assessments*
Barbieri ES	*Walk-in Evaporator Control & ECM Motors*	*2015 / 2016*	3,000	0	$500	$6,000		$0		$6,000		*Peregrine Bdg Assessments*
Barbieri ES	*Reduce Airflow (Resheave and/or New Motor)*	*2015 / 2016*	900	600	$800	$5,000		$0		$5,000		*Peregrine Bdg Assessments*
Barbieri ES	*Infiltration Reductions*	*2015 / 2016*	15	900	$991	$9,048		$0		$9,048		*Ameresco IGA*
Barbieri ES	*Transformers*	*2015 / 2016*	45,920	0	$6,489	$53,291		$6,667		$46,625		*Ameresco IGA*
Barbieri ES	*Lighting System Improvements*	*2015 / 2016*	63,882	-557	$11,364	$84,321		$23,600		$60,721		*Ameresco IGA*
Brophy ES	*Replace CRT Computer Screens*	*2015 / 2016*	600	-10	$100	$900		$0		$900		*Peregrine Bdg Assessments*
Brophy ES	*Replace Refrigerator(s)*	*2015 / 2016*	800	0	$100	$1,000		$0		$1,000		*Peregrine Bdg Assessments*
Brophy ES	*Lighting Controls*	*2015 / 2016*	7,000	-100	$800	$30,000		$4,500		$25,500		*Peregrine Bdg Assessments*
Brophy ES	*Recommission / Adjust Control Systems*	*2015 / 2016*	3,000	900	$1,400	$25,000		$0		$25,000		*Peregrine Bdg Assessments*
Brophy ES	*Expand Central DDC Controls*	*2015 / 2016*	1,000	300	$500	$55,000		$0		$55,000		*Peregrine Bdg Assessments*
Brophy ES	*Schedule Domestic Hot Water*	*2015 / 2016*	300	200	$300	$3,000		$0		$3,000		*Peregrine Bdg Assessments*
Brophy ES	*Interlock Dishwasher EF*	*2015 / 2016*	300	400	$500	$5,000		$0		$5,000		*Peregrine Bdg Assessments*
Brophy ES	*Update Pipe Insulation*	*2015 / 2016*	0	300	$300	$5,000		$0		$5,000		*Peregrine Bdg Assessments*
Brophy ES	*Replace Motor*	*2015 / 2016*	400	0	$70	$750		$0		$750		*Peregrine Bdg Assessments*
Brophy ES	*Install 2-Way Valves*	*2015 / 2016*	2,700	0	$300	$8,000		$0		$8,000		*Peregrine Bdg Assessments*
Brophy ES	*Demand Control Ventilation*	*2015 / 2016*	1,980	611	$935	$12,256		$675		$11,581		*Ameresco IGA*
Brophy ES	*Infiltration Reductions*	*2015 / 2016*	50	3,499	$3,855	$21,787		$0		$21,787		*Ameresco IGA*
Brophy ES	*Lighting System Improvements*	*2015 / 2016*	21,966	0	$3,372	$32,279		$3,150		$29,129		*Ameresco IGA*

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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 Natural Gas Savings (therms)	Projected Annual Cost Savings ($)	Total Installed Cost ($)	Green Community Grant ($)	Utility Incentives ($)	Other Grants ($)	Net Town Cost ($)	Funding Source(s) for Other Grants and Net Town Costs	Source for Projected Savings
Cameron MS	*Replace CRT Computer Screens*	*2015 / 2016*	2,000	-30	$400	$3,500		$0		$3,500		*Peregrine Bdg Assessments*
Cameron MS	*Lighting Controls*	*2015 / 2016*	11,000	-200	$1,100	$40,000		$6,000		$34,000		*Peregrine Bdg Assessments*
Cameron MS	*Recommission / Adjust Control Systems*	*2015 / 2016*	2,000	140	$400	$25,000		$0		$25,000		*Peregrine Bdg Assessments*
Cameron MS	*Schedule Domestic Hot Water*	*2015 / 2016*	300	300	$400	$3,000		$0		$3,000		*Peregrine Bdg Assessments*
Cameron MS	*Install Pump VFD*	*2015 / 2016*	22,000	0	$2,700	$42,400		$16,200		$26,200		*Peregrine Bdg Assessments*
Cameron MS	*Walk-in Evaporator Control & ECM Motors*	*2015 / 2016*	3,000	0	$500	$6,000		$0		$6,000		*Peregrine Bdg Assessments*
Cameron MS	*Integrated and New Energy Management Systems*	*2015 / 2016*	1,000	100	$200	$121,603		$0		$121,603		*Ameresco IGA*
Cameron MS	*Demand Control Ventilation*	*2015 / 2016*	2,124	1,176	$1,536	$16,324		$675		$15,649		*Ameresco IGA*
Cameron MS	*Infiltration Reductions*	*2015 / 2016*	31	323	$358	$3,279		$0		$3,279		*Ameresco IGA*
Cameron MS	*Variable Frequency Drives For HW Pumps*	*2015 / 2016*	21,908	0	$2,498	$42,447		$16,200		$26,247		*Ameresco IGA*
Cameron MS	*Transformers*	*2015 / 2016*	39,254	0	$5,560	$43,005		$7,677		$35,328		*Ameresco IGA*
Cameron MS	*Lighting System Improvements*	*2015 / 2016*	44,273	-354	$8,539	$124,465		$10,325		$114,140		*Ameresco IGA*
Dunning ES	*Lighting Controls*	*2015 / 2016*	7,000	-100	$800	$40,000		$6,000		$34,000		*Peregrine Bdg Assessments*
Dunning ES	*Recommission / Adjust Control Systems*	*2015 / 2016*	1,000	2,000	$2,300	$20,000		$0		$20,000		*Peregrine Bdg Assessments*
Dunning ES	*Add Demand Control Ventilation*	*2015 / 2016*	500	300	$400	$8,200		$450		$7,750		*Peregrine Bdg Assessments*
Dunning ES	*Schedule Domestic Hot Water*	*2015 / 2016*	300	300	$400	$3,000		$0		$3,000		*Peregrine Bdg Assessments*
Dunning ES	*Update Pipe Insulation*	*2015 / 2016*	0	150	$170	$2,500		$0		$2,500		*Peregrine Bdg Assessments*
Dunning ES	*Integrated and New Energy Management Systems*	*2015 / 2016*	500	400	$500	$55,190		$0		$55,190		*Ameresco IGA*
Dunning ES	*Infiltration Reductions*	*2015 / 2016*	0	1,263	$1,390	$7,854		$0		$7,854		*Ameresco IGA*
Dunning ES	*Demand Control Ventilation*	*2015 / 2016*	490	312	$408	$8,211		$450		$7,761		*Ameresco IGA*
Framingham HS	*Change Operating Policy for Fume Hoods*	*2015 / 2016*	15,000	3,200	$6,000	$0		$0		$0		*Peregrine Bdg Assessments*
Framingham HS	*Close Doors to Conditioned Space*	*2015 / 2016*	4,000	0	$1,200	$0		$0		$0		*Peregrine Bdg Assessments*
Framingham HS	*Replace CRT Computer Screens*	*2015 / 2016*	2,000	0	$600	$4,500		$0		$4,500		*Peregrine Bdg Assessments*
Framingham HS	*Lighting Controls*	*2015 / 2016*	24,000	-400	$2,500	$100,000		$15,000		$85,000		*Peregrine Bdg Assessments*
Framingham HS	*Recommission / Adjust Control Systems*	*2015 / 2016*	18,000	3,500	$7,600	$75,000		$0		$75,000		*Peregrine Bdg Assessments*
Framingham HS	*Add HHW Reset*	*2015 / 2016*	0	1,100	$1,200	$15,000		$0		$15,000		*Peregrine Bdg Assessments*
Framingham HS	*Add Kitchen Exhaust Fan Control*	*2015 / 2016*	300	1,100	$1,300	$20,000		$0		$20,000		*Peregrine Bdg Assessments*
Framingham HS	*Schedule Domestic Hot Water*	*2015 / 2016*	300	400	$500	$5,000		$0		$5,000		*Peregrine Bdg Assessments*
Framingham HS	*Install Fan VFD*	*2015 / 2016*	11,000	0	$2,400	$30,000		$2,000		$28,000		*Peregrine Bdg Assessments*
Framingham HS	*Vending Machine Controller*	*2015 / 2016*	2,800	0	$500	$2,000		$0		$2,000		*Peregrine Bdg Assessments*
Framingham HS	*Walk-in Evaporator Control & ECM Motors*	*2015 / 2016*	3,000	0	$500	$6,000		$0		$6,000		*Peregrine Bdg Assessments*
Framingham HS	*Integrated and New Energy Management Systems*	*2015 / 2016*	5,000	500	$1,200	$329,310		$0		$329,310		*Ameresco IGA*
Framingham HS	*Demand Control Ventilation*	*2015 / 2016*	2,251	1,477	$1,881	$16,492		$900		$15,592		*Ameresco IGA*
Framingham HS	*Infiltration Reductions*	*2015 / 2016*	9	6,480	$7,129	$62,743		$0		$62,743		*Ameresco IGA*
Framingham HS	*Transformers*	*2015 / 2016*	87,168	0	$12,356	$80,714		$15,253		$65,462		*Ameresco IGA*
Framingham HS	*Lighting System Improvements*	*2015 / 2016*	109,000	-1,164	$23,931	$193,954		$50,405		$143,549		*Ameresco IGA*
Fuller MS	***Construction of new replacement building***	*2016*	124,651	45,867	$50,453					$0		*PEG estimate of 20% elec and 40% gas reduction*
Hemenway ES	*PC Load Management*	*2015 / 2016*	3,000	-30	$300	$4,500		$0		$4,500		*Peregrine Bdg Assessments*
Hemenway ES	*Lighting Controls*	*2015 / 2016*	6,000	-100	$600	$40,000		$6,000		$34,000		*Peregrine Bdg Assessments*
Hemenway ES	*Recommission / Adjust Control Systems*	*2015 / 2016*	4,000	1,600	$2,300	$21,100		$0		$21,100		*Peregrine Bdg Assessments*
Hemenway ES	*Schedule Domestic Hot Water*	*2015 / 2016*	300	300	$400	$3,000		$0		$3,000		*Peregrine Bdg Assessments*
Hemenway ES	*Update Pipe Insulation*	*2015 / 2016*	0	150	$200	$2,500		$0		$2,500		*Peregrine Bdg Assessments*
Hemenway ES	*Convert Electric Heating to Gas*	*2015 / 2016*	22,000	-900	$2,500	$150,000		$0		$150,000		*Peregrine Bdg Assessments*
Hemenway ES	*Demand Control Ventilation*	*2015 / 2016*	862	436	$594	$8,205		$450		$7,755		*Ameresco IGA*
Hemenway ES	*Infiltration Reductions*	*2015 / 2016*	20	1,345	$1,482	$9,234		$0		$9,234		*Ameresco IGA*
Hemenway ES	*Lighting System Improvements*	*2015 / 2016*	20,389	-228	$4,724	$36,659		$7,135		$29,524		*Ameresco IGA*
Juniper ES	*Replace Refrigerator(s)*	*2015 / 2016*	2,400	0	$360	$3,000		$0		$3,000		*Peregrine Bdg Assessments*
Juniper ES	*Lighting Controls*	*2015 / 2016*	6,000	-100	$600	$35,000		$5,300		$29,700		*Peregrine Bdg Assessments*
Juniper ES	*Recommission / Adjust Control Systems*	*2015 / 2016*	500	2,400	$2,700	$21,100		$0		$21,100		*Peregrine Bdg Assessments*
Juniper ES	*Schedule Domestic Hot Water*	*2015 / 2016*	300	400	$500	$3,000		$0		$3,000		*Peregrine Bdg Assessments*
Juniper ES	*Update Pipe Insulation*	*2015 / 2016*	0	300	$300	$5,000		$0		$5,000		*Peregrine Bdg Assessments*
Juniper ES	*Install Boiler Isolation Valves*	*2015 / 2016*	0	400	$400	$5,000		$0		$5,000		*Peregrine Bdg Assessments*
Juniper ES	*Demand Control Ventilation*	*2015 / 2016*	662	231	$329	$4,086		$225		$3,861		*Ameresco IGA*
Juniper ES	*Infiltration Reductions*	*2015 / 2016*	0	381	$419	$2,523		$0		$2,523		*Ameresco IGA*
Juniper ES	*Lighting System Improvements*	*2015 / 2016*	31,656	-155	$5,143	$50,735		$6,565		$44,170		*Ameresco IGA*
King Administration	*Replace Refrigerator(s)*	*2015 / 2016*	800	0	$100	$1,000		$0		$1,000		*Peregrine Bdg Assessments*
King Administration	*Lighting Controls*	*2015 / 2016*	6,000	-100	$600	$35,000		$5,300		$29,700		*Peregrine Bdg Assessments*
King Administration	*Recommission / Adjust Control Systems*	*2015 / 2016*	11,000	1,200	$2,700	$21,200		$0		$21,200		*Peregrine Bdg Assessments*
King Administration	*Schedule Domestic Hot Water*	*2015 / 2016*	300	300	$400	$3,000		$0		$3,000		*Peregrine Bdg Assessments*
King Administration	*Update Pipe Insulation*	*2015 / 2016*	0	30	$30	$500		$0		$500		*Peregrine Bdg Assessments*
King Administration	*Install Boiler Isolation Valves*	*2015 / 2016*	0	400	$440	$5,000		$0		$5,000		*Peregrine Bdg Assessments*
King Administration	*Demand Control Ventilation*	*2015 / 2016*	1,203	610	$877	$8,220		$450		$7,770		*Ameresco IGA*
King Administration	*Infiltration Reductions*	*2015 / 2016*	30	194	$218	$1,873		$0		$1,873		*Ameresco IGA*
King Administration	*Lighting System Improvements*	*2015 / 2016*	9,308	0	$1,906	$22,509		$700		$21,809		*Ameresco IGA*

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McCarthy ES	*Lighting Controls*	*2015 / 2016*	10,000	-200	$1,000	$60,000		$9,000		$51,000		*Peregrine Bdg Assessments*
McCarthy ES	*Recommission / Adjust Control Systems*	*2015 / 2016*	32,000	-40	$3,900	$40,900		$0		$40,900		*Peregrine Bdg Assessments*
McCarthy ES	*Schedule Domestic Hot Water*	*2015 / 2016*	300	300	$400	$3,000		$0		$3,000		*Peregrine Bdg Assessments*
McCarthy ES	*Update Pipe Insulation*	*2015 / 2016*	0	300	$300	$5,000		$0		$5,000		*Peregrine Bdg Assessments*
McCarthy ES	*Demand Control Ventilation*	*2015 / 2016*	1,297	1,340	$1,621	$8,147		$450		$7,697		*Ameresco IGA*
McCarthy ES	*Infiltration Reductions*	*2015 / 2016*	261	2,907	$3,227	$18,693		$0		$18,693		*Ameresco IGA*
McCarthy ES	*Variable Frequency Drives For HW Pumps*	*2015 / 2016*	11,395	0	$1,299	$17,940		$6,300		$11,640		*Ameresco IGA*
McCarthy ES	*Transformers*	*2015 / 2016*	66,948	0	$9,481	$85,115		$9,596		$75,519		*Ameresco IGA*
McCarthy ES	*Lighting System Improvements*	*2015 / 2016*	55,029	-495	$9,981	$81,099		$12,400		$68,699		*Ameresco IGA*
McCarthy ES	*Integrated and New Energy Management Systems*	*2015 / 2016*	31,958	-35	$3,605	$40,891		$0		$40,891		*Ameresco IGA*
Potter ES	*Integrated and New Energy Management Systems*	*2015 / 2016*	2,664	549	$958	$54,418		$0		$54,418		*Ameresco IGA*
Potter ES	*Infiltration Reductions*	*2015 / 2016*	0	906	$997	$11,602		$0		$11,602		*Ameresco IGA*
Potter ES	*Lighting System Improvements*	*2015 / 2016*	8,252	0	$1,281	$13,756		$900		$12,856		*Ameresco IGA*
Potter ES	*Lighting Controls*	*2015 / 2016*	0	0	$0	$17,471		$0		$17,471		*Ameresco IGA*
Potter ES	*Demand Control Ventilation*	*2015 / 2016*	2,093	280	$586	$12,485		$675		$11,810		*Ameresco IGA*
Stapleton ES	*Demand Control Ventilation*	*2015 / 2016*	1,047	262	$427	$4,090		$225		$3,865		*Ameresco IGA*
Stapleton ES	*Lighting System Improvements*	*2015 / 2016*	31,661	-303	$6,891	$70,173		$7,210		$62,963		*Ameresco IGA*
Stapleton ES	*Recommission / Adjust Control Systems*	*2015 / 2016*	1,866	1,690	$2,106	$21,078		$0		$21,078		*Ameresco IGA*
Thayer Alt. HS	*Infiltration Reductions*	*2015 / 2016*	0	311	$350	$3,617		$0		$3,617		*Ameresco IGA*
Thayer Alt. HS	*Lighting System Improvements*	*2015 / 2016*	7,025	-45	$1,553	$11,661		$1,905		$9,756		*Ameresco IGA*
Thayer Alt. HS	*Steam Trap Replacements*	*2015 / 2016*	0	563	$632	$11,523		$1,100		$10,423		*Ameresco IGA*
Walsh MS	*Shutdown Boiler Plant at Night*	*2015 / 2016*	0	1,300	$1,400	$0		$0		$0		*Peregrine Bdg Assessments*
Walsh MS	*Recommission / Adjust Control Systems*	*2015 / 2016*	6,000	2,300	$3,300	$51,000		$0		$51,000		*Peregrine Bdg Assessments*
Walsh MS	*Add Kitchen Exhaust Fan Control*	*2015 / 2016*	200	800	$900	$20,000		$0		$20,000		*Peregrine Bdg Assessments*
Walsh MS	*Schedule Domestic Hot Water*	*2015 / 2016*	300	300	$400	$3,000		$0		$3,000		*Peregrine Bdg Assessments*
Walsh MS	*Update Pipe Insulation*	*2015 / 2016*	0	75	$80	$500		$0		$500		*Peregrine Bdg Assessments*
Walsh MS	*Replace Motor*	*2015 / 2016*	1,600	0	$200	$2,500		$0		$2,500		*Peregrine Bdg Assessments*
Walsh MS	*Replace Domestic Hot Water System*	*2015 / 2016*	0	600	$700	$35,000		$0		$35,000		*Peregrine Bdg Assessments*
Walsh MS	*Seal Windows*	*2015 / 2016*	0	500	$600	$10,000		$0		$10,000		*Peregrine Bdg Assessments*
Walsh MS	*Demand Control Ventilation*	*2015 / 2016*	5,620	5,331	$6,505	$29,104		$900		$28,204		*Ameresco IGA*
Walsh MS	*Lighting System Improvements*	*2015 / 2016*	22,347	0	$3,108	$43,473		$1,725		$41,748		*Ameresco IGA*
Wilson ES	*Recommission / Adjust Control Systems*	*2015 / 2016*	3,700	400	$900	$25,000		$0		$25,000		*Peregrine Bdg Assessments*
Wilson ES	*Schedule Domestic Hot Water*	*2015 / 2016*	300	400	$500	$5,000		$0		$5,000		*Peregrine Bdg Assessments*
Wilson ES	*Install Pump VFD*	*2015 / 2016*	4,800	0	$600	$40,700		$15,000		$25,700		*Peregrine Bdg Assessments*
Wilson ES	*Integrated and New Energy Management Systems*	*2015 / 2016*	1,000	200	$300	$121,603		$0		$121,603		*Ameresco IGA*
Wilson ES	*Demand Control Ventilation*	*2015 / 2016*	1,172	1,091	$1,334	$12,284		$675		$11,609		*Ameresco IGA*
Wilson ES	*Infiltration Reductions*	*2015 / 2016*	153	1,406	$1,564	$15,667		$0		$15,667		*Ameresco IGA*
Wilson ES	*Variable Frequency Drives For HW Pumps*	*2015 / 2016*	16,157	0	$1,842	$40,728		$15,000		$25,728		*Ameresco IGA*
Wilson ES	*Transformers*	*2015 / 2016*	32,849	0	$4,659	$32,881		$6,061		$26,821		*Ameresco IGA*
Wilson ES	*Lighting System Improvements*	*2015 / 2016*	72,312	-675	$13,712	$99,089		$16,115		$82,974		*Ameresco IGA*
Academy Building	*Infiltration Reductions*	*2015 / 2016*	28	107	$126	$1,710		$0		$1,710		*Ameresco IGA*
Academy Building	*Roof Insulation*	*2015 / 2016*	41	214	$249	$4,105		$0		$4,105		*Ameresco IGA*
Animal Control	*PC Load Management*	*2015 / 2016*	186	-4	$33	$46		$0		$46		*Ameresco IGA*
Animal Control	*Programmable Thermostats*	*2015 / 2016*	2,302	233	$718	$1,266		$25		$1,241		*Ameresco IGA*
DPW Garage	*Infiltration Reductions*	*2015 / 2016*	10	180	$199	$1,553		$0		$1,553		*Ameresco IGA*
DPW Garage	*PC Load Management*	*2015 / 2016*	4,927	-108	$535	$1,214		$0		$1,214		*Ameresco IGA*
DPW Garage	*Transformers*	*2015 / 2016*	15,394	0	$2,527	$17,381		$2,121		$15,260		*Ameresco IGA*
DPW Garage	*Lighting System Improvements*	*2015 / 2016*	47,710	-254	$9,133	$65,419		$8,260		$57,159		*Ameresco IGA*
DPW Office	*PC Load Management*	*2015 / 2016*	1,496	-30	$165	$344		$0		$344		*Ameresco IGA*
DPW Office	*Lighting System Improvements*	*2015 / 2016*	2,922	-31	$754	$5,411		$1,355		$4,056		*Ameresco IGA*
Old Edgell Library (Hist. Ctr.)	*Oil to Gas Conversion*	*2015 / 2016*	0	-6,793	$9,508	$27,220		$0		$27,220		*Ameresco IGA*
Old Edgell Library (Hist. Ctr.)	*New HVAC Systems*	*2015 / 2016*	0	-6,793	$9,508	$73,288		$0		$73,288		*Ameresco IGA*
Old Edgell Library (Hist. Ctr.)	*Lighting System Improvements*	*2015 / 2016*	2,323	0	$491	$5,576		$675		$4,901		*Ameresco IGA*
Old Edgell Library (Hist. Ctr.)	*Programmable Thermostats*	*2015 / 2016*	2,683	0	$3,602	$1,872		$50		$1,822		*Ameresco IGA*
Fire_1	*Vending Misers*	*2015 / 2016*	1,332	-28	$146	$456		$115		$341		*Ameresco IGA*
Fire_1	*Lighting System Improvements*	*2015 / 2016*	6,686	-51	$1,320	$10,928		$1,230		$9,698		*Ameresco IGA*
Fire_5	*Boiler Replacements*	*2015 / 2016*	0	666	$748	$115,329		$4,000		$111,329		*Ameresco IGA*
Fire_5	*Lighting System Improvements*	*2015 / 2016*	6,462	-27	$1,119	$9,704		$275		$9,429		*Ameresco IGA*
Fire_7	*Lighting System Improvements*	*2015 / 2016*	2,859	-9	$624	$5,898		$90		$5,808		*Ameresco IGA*
Fire_HQ	*Integrated and New Energy Management Systems*	*2015 / 2016*	27,482	3,355	$7,336	$71,064		$2,700		$68,364		*Ameresco IGA*
Fire_HQ	*Infiltration Reductions*	*2015 / 2016*	192	819	$926	$11,647		$0		$11,647		*Ameresco IGA*
Fire_HQ	*Vending Misers*	*2015 / 2016*	2,006	-42	$220	$451		$115		$336		*Ameresco IGA*
Fire_HQ	*PC Load Management*	*2015 / 2016*	1,049	-22	$115	$294		$0		$294		*Ameresco IGA*
Fire_HQ	*Transformers*	*2015 / 2016*	11,834	0	$1,943	$13,025		$1,616		$11,408		*Ameresco IGA*
Fire_HQ	*New HVAC Systems*	*2015 / 2016*	7,000	600	$1,500	$242,885		$0		$242,885		*Ameresco IGA*
Fire_HQ	*Lighting System Improvements*	*2015 / 2016*	31,742	-164	$6,050	$54,356		$8,825		$45,531		*Ameresco IGA*
Fire_HQ	*Demand Control Ventilation*	*2015 / 2016*	788	321	$458	$25,749		$450		$25,299		*Ameresco IGA*
Fire_HQ	*Variable Frequency Drives For HW Pumps*	*2015 / 2016*	5,395	0	$716	$16,588		$1,200		$15,388		*Ameresco IGA*

Attachment A1: Table 4: Proposed ERP Activities with Energy Reductions

Table 4 - Town of Framingham Energy Reduction Plan

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 Natural Gas Savings (therms)	Projected Annual Cost Savings ($)	Total Installed Cost ($)	Green Community Grant ($)	Utility Incentives ($)	Other Grants ($)	Net Town Cost ($)	Funding Source(s) for Other Grants and Net Town Costs	Source for Projected Savings
Henry St. Garage	*Lighting System Improvements*	*2015 / 2016*	3,607	-40	$603	$4,936		$1,200		$3,736		*Ameresco IGA*
Main Library	*Schedule Domestic Hot Water*	*2015 / 2016*	300	400	$500	$5,000		$0		$5,000		*Peregrine Bdg Assessments*
Main Library	*Update Pipe Insulation*	*2015 / 2016*	0	50	$60	$500		$0		$500		*Peregrine Bdg Assessments*
Main Library	*Replace Motor*	*2015 / 2016*	700	0	$130	$4,500		$0		$4,500		*Peregrine Bdg Assessments*
Main Library	*Replace Boiler Plant*	*2015 / 2016*	0	2,100	$2,300	$253,300		$15,000		$238,300		*Peregrine Bdg Assessments*
Main Library	*Integrated and New Energy Management Systems*	*2015 / 2016*	66,895	3,106	$10,941	$353,193		$13,500		$339,693		*Ameresco IGA*
Main Library	*Infiltration Reductions*	*2015 / 2016*	107	329	$374	$2,908		$0		$2,908		*Ameresco IGA*
Main Library	*Boiler Replacements*	*2015 / 2016*	0	2,147	$2,362	$253,321		$15,000		$238,321		*Ameresco IGA*
Main Library	*PC Load Management*	*2015 / 2016*	9,562	-193	$863	$2,397		$0		$2,397		*Ameresco IGA*
Main Library	*Lighting System Improvements*	*2015 / 2016*	19,908	-183	$3,375	$26,807		$400		$26,407		*Ameresco IGA*
Main Library	*Variable Frequency Drives For HW Pumps*	*2015 / 2016*	10,079	0	$1,134	$22,996		$6,900		$16,096		*Ameresco IGA*
McAuliffe Library	***Construction of new replacement building***	*2016*	13,019	1,137						$0		*PEG estimate of 20% elec and 40% gas reduction*
Memorial Hall	*Schedule Domestic Hot Water*	*2015 / 2016*	300	400	$500	$5,000		$0		$5,000		*Peregrine Bdg Assessments*
Memorial Hall	*Update Pipe Insulation*	*2015 / 2016*	0	150	$170	$5,000		$0		$5,000		*Peregrine Bdg Assessments*
Memorial Hall	*Convert to Hot Water Heating System*	*2015 / 2016*	-5,000	2,200	$1,800	$750,000		$0		$750,000		*Peregrine Bdg Assessments*
Memorial Hall	*Seal Shaft / Fireplace*	*2015 / 2016*	0	50	$60	$500		$0		$500		*Peregrine Bdg Assessments*
Memorial Hall	*Insulate Attic, Misc*	*2015 / 2016*	0	300	$300	$20,000		$0		$20,000		*Peregrine Bdg Assessments*
Memorial Hall	*Integrated and New Energy Management Systems*	*2015 / 2016*	5,979	8,161	$9,771	$53,037		$2,250		$50,787		*Ameresco IGA*
Memorial Hall	*Infiltration Reductions*	*2015 / 2016*	19	124	$139	$1,162		$0		$1,162		*Ameresco IGA*
Memorial Hall	*Vending Misers*	*2015 / 2016*	7,844	-167	$857	$1,339		$390		$949		*Ameresco IGA*
Memorial Hall	*PC Load Management*	*2015 / 2016*	15,385	-327	$1,682	$3,625		$0		$3,625		*Ameresco IGA*
Memorial Hall	*Steam Trap Replacements*	*2015 / 2016*	0	2,676	$2,944	$114,304		$9,800		$104,504		*Ameresco IGA*
Park and Rec Office	*PC Load Management*	*2015 / 2016*	987	-20	$108	$227		$0		$227		*Ameresco IGA*
Park and Rec Office	*Transformers*	*2015 / 2016*	6,639	0	$1,090	$8,356		$1,010		$7,345		*Ameresco IGA*
Park and Rec Office	*Lighting System Improvements*	*2015 / 2016*	6,277	0	$952	$8,821		$525		$8,296		*Ameresco IGA*
Park and Rec Office	*Infiltration Reductions*	*2015 / 2016*	41	94	$111	$2,766		$0		$2,766		*Ameresco IGA*
Pearl St. Garage	*Lighting System Improvements*	*2015 / 2016*	31,157	0	$4,452	$28,808		$4,570		$24,238		*Ameresco IGA*
Police HQ	*Add Occupancy Based HVAC Control*	*2015 / 2016*	5,000	500	$1,200	$10,000		$0		$10,000		*Peregrine Bdg Assessments*
Police HQ	*Install Fan VFD*	*2015 / 2016*	40,000	0	$4,900	$10,000		$0		$10,000		*Peregrine Bdg Assessments*
Police HQ	*Replace Motor*	*2015 / 2016*	800	0	$120	$2,500		$0		$2,500		*Peregrine Bdg Assessments*
Police HQ	*Add / Replace Door Seals & Align Doors*	*2015 / 2016*	50	100	$120	$1,500		$0		$1,500		*Peregrine Bdg Assessments*
Police HQ	*Attention to Overhead Door Seals*	*2015 / 2016*	0	100	$110	$500		$0		$500		*Peregrine Bdg Assessments*
Police HQ	*Integrated and New Energy Management Systems*	*2015 / 2016*	59,108	1,784	$9,805	$196,935		$0		$196,935		*Ameresco IGA*
Police HQ	*Infiltration Reductions*	*2015 / 2016*	51	186	$211	$1,965		$0		$1,965		*Ameresco IGA*
Police HQ	*Vending Misers*	*2015 / 2016*	616	-13	$68	$452		$115		$337		*Ameresco IGA*
Police HQ	*PC Load Management*	*2015 / 2016*	4,187	-87	$460	$1,585		$0		$1,585		*Ameresco IGA*
Police HQ	*Roof Insulation*	*2015 / 2016*	166	261	$309	$7,996		$0		$7,996		*Ameresco IGA*
Police HQ	*New HVAC Systems*	*2015 / 2016*	700	50	$140	$48,652		$0		$48,652		*Ameresco IGA*
Police HQ	*Lighting System Improvements*	*2015 / 2016*	72,151	-730	$13,177	$71,179		$7,590		$63,589		*Ameresco IGA*
Police HQ	*Variable Frequency Drives For HW Pumps*	*2015 / 2016*	8,932	0	$1,185	$47,745		$9,300		$38,445		*Ameresco IGA*
Sanitation Dept. Lower	*Lighting System Improvements*	*2015 / 2016*	24,151	-33	$3,986	$37,002		$3,425		$33,577		*Ameresco IGA*
Sanitation Dept. Upper	*Lighting System Improvements*	*2015 / 2016*	2,816	0	$1,009	$6,063		$1,405		$4,658		*Ameresco IGA*
Callahan Senior Ctr	*Vending Misers*	*2015 / 2016*	2,645	-52	$294	$454		$115		$339		*Ameresco IGA*
Callahan Senior Ctr	*PC Load Management*	*2015 / 2016*	757	-15	$84	$182		$0		$182		*Ameresco IGA*
Callahan Senior Ctr	*Airflow Corrections*	*2015 / 2016*	0	10	$11	$520		$0		$520		*Ameresco IGA*
Callahan Senior Ctr	*Lighting System Improvements*	*2015 / 2016*	28,381	-147	$5,927	$53,555		$10,015		$43,540		*Ameresco IGA*
	BUILDINGS SUBTOTAL		**3,047,612**	**169,862**	**$466,372**	**$6,917,426**	**$0**	**$625,328**	**$0**	**$6,444,326**		
	TOTAL BUILDING MMBtu SAVINGS	**28866.92746**	**10398.45045**	**16986.20665**								
Street	*Street Lighting Improvements*		919,905	0	$141,408	$1,686,017		$229,976		$1,456,040		*Siemens analysis of savings potential*
	STREET AND TRAFFIC LIGHTS SUBTOTAL		**919,905**	**0**	**141,408**	**1,686,017**	**0**	**229,976**	**0**	**1,456,040**		
	TOTAL STREET AND TRAFFIC LIGHT MMBtu SAVINGS	**3138.71586**	**3138.71586**	**0**								
Parks	*Lighting conversions to LED*	*2015 / 2016*	60,000									*LA Case Study; ERP Appendix B*
Park buildings	*improved operations and maintenance practices*	*2015 / 2016*		729.6								*Included in 5% estimates*
	OPEN SPACE SUBTOTAL		**60,000**	**730**	**0**	**0**	**0**	**0**	**0**	**0**		
	TOTAL OPEN SPACE MMBtu SAVINGS	**277.68**	**204.72**	**72.96**								
Water and sewer pumping	*Improved O&M*	*2011-2013*	60,568	489								*MEI Table 3*
Water and sewer pumping	*pump station heating system upgrades*	*2011-2013*		489								*MEI Table 3*
Water and sewer pumping	*Installation of drives*	*2011-2013*	45,427									*MEI Table 3*
Water and sewer pumping	*Improved O&M*	*2014 - 2016*	30,284	489								*Included in 5% estimates*
Water and sewer pumping	*pump station heating system upgrades*	*2015 / 2016*		489								*Included in 5% estimates*
Water and sewer pumping	*Installation of drives*	*2015 / 2016*	45,427									*Included in 5% estimates*
	WATER/SEWER/PUMPING SUBTOTAL		**181,706**	**1,956**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**		
	TOTAL PUMPING MMBtu SAVINGS	**815.580872**	**619.980872**	**195.6**								
Vehicles	*purchase of more efficient vehicles*	*2014 - 2016*										*FuelEconomy.gov; ERP Appendix B*
Vehicles	*improved operations and maintenance practices*	*2014 - 2016*										*FuelEconomy.gov; ERP Appendix B*
	VEHICLES SUBTOTAL		**620**	**196**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**		
	TOTAL VEHICLE MMBtu SAVINGS	**7009.804375**	**2.115374735**	**19.56**								
	TOTAL		**4,209,842**	**172,743**	**$607,780**	**$8,603,443**	**$0**	**$855,304**	**$0**	**$7,900,366**		
	TOTAL FRAMINGHAM MMBtu SAVINGS	**40108.70857**	**14363.98256**	**17274.32665**								

Attachment A2: MEI Energy Use FY11 vs FY13 -

MEI Table 3 Comparison FY2011 vs. FY2013 (MMBTUs Used) showing effects of ECMs installed

		2011 Electric	2011 Gas	2011 Total	2013 Electric	2013 Gas	2013 Total	Percent Reduction	2011 to 2013 improvements
Buildings	**Barbieri ES**	3,143	3,993	7,136	3,160	2,874	6,033	**15.46%**	**DDC controls; LED lighting; new RTUs; drives**
	Walsh MS	1,954	8,277	10,231	1,807	7,230	9,037	**11.67%**	**LED lighting**
	Mary E Stapleton ES	561	3,886	4,447	600	3,371	3,972	**10.68%**	**O&M**
	Cameron MS	2,192	3,610	5,801	2,075	3,480	5,555	**4.24%**	**LED lighting**
	Potter Road ES	579	1,756	2,334	459	2,455	2,914	**-24.85%**	**DDC controls; LED lighting; drives**
	Brophy ES	816	3,079	3,895	709	2,718	3,427	**12.02%**	**DDC controls; LED lighting; drives**
	Woodrow Wilson ES	1,766	3,625	5,391	1,652	3,360	5,012	**7.03%**	**LED lighting**
	Hemenway ES	588	3,378	3,967	596	3,233	3,829	**3.48%**	**LED lighting; drives**
	Framingham HS	7,803	13,180	20,983	7,197	11,735	18,931	**9.78%**	**Lighting upgrades; LED lighting**
	Charlotte A Dunning ES	479	3,179	3,658	560	2,964	3,524	**3.66%**	**LED lighting; drives**
	Miriam F McCarthy ES	2,138	5,105	7,243	2,143	3,137	5,280	**27.10%**	**DDC controls; LED lighting**
	Memorial Building	1,928	3,839	5,767	1,820	2,630	4,450	**22.84%**	**Lighting upgrades; O&M**
	Main Library		2,223	2,223		1,937	1,937	12.87%	
	Station 1	344	1,068	1,412	343	983	1,326	6.09%	
	Station 5	237	751	988	236	764	1,000	-1.21%	
	Station 7	96	398	494	92	374	466	5.67%	
	Station 2	117	1,142	1,258	113	970	1,083	13.91%	
	DPW Headquarters	1,993	3,805	5,798	2,134	2,743	4,877	**15.88%**	**O&M**
	Callahan Senior Center	712	1,001	1,713	651	816	1,467	**14.36%**	**O&M**
	Juniper Hill	395	2,479	2,873	395	2,365	2,760	**3.93%**	**DDC controls; LED lighting; drives**
	Cushing Memorial Chapel		340	340		304	304	10.59%	
	Loring Arena	2,020	2,180	4,200	1,948	2,071	4,019	4.31%	
	Academy Building	1	274	275	0	207	207	24.73%	
	Village Hall	18		18	17		17	5.56%	
	Pearl Street Garage	389		389	374		374	3.86%	
	Park & Recreaton Office	52	276	327		280	280	14.37%	
	Framingham Alternative High School	68	515	583	79	478	557	4.46%	
	Fire Department HQ	893	2,078	2,971	912	1,489	2,401	19.19%	
	Police HQ	1,966	1,601	3,568	2,035	1,839	3,874	-8.58%	
	Henry St. Garage	155	755	910	151	650	800	12.09%	
	Sanitation Department	865	150	1,015		461	461	**54.58%**	**Lighting upgrades**
	King Admin Bdg (School Dept)	637	4,849	5,487	591	3,057	3,648	**33.52%**	**DDC controls; LED lighting; drives**
	Athenaeum Hall	0		0	1		1	**Mothballed**	
	Old Edgell Library	76		76	68		68	10.53%	
	Police Kennel	58	163	221	59	160	219	0.90%	
	Building Total	**35,039**	**82,955**	**117,992**	**32,977**	**71,135**	**104,110**	**11.77%**	
Open Space	Cushing Academy Building #3	44	101	145	44	93	137	5.52%	

MEI Table 3 Comparison FY2011 vs. FY2013 (MMBTUs Used)
showing effects of ECMs installed

		2011 Electric	2011 Gas	2011 Total	2013 Electric	2013 Gas	2013 Total	Percent Reduction	2011 to 2013 improvements
	Cushing Middle Building #2	20	385	405	13	381	394	2.72%	
	Cushing Building #1 Shops and Play Group	33		33	21		21	36.36%	
	Farm Pond Park	110		110	90		90	18.18%	
	Cushing Memorial Park	89		89	59		59	33.71%	
	Winch Park	43		43	38		38	11.63%	
	Beaver St Park	28		28	26		26	7.14%	
	Bowditch Field	62		62	61		61	1.61%	
	Victory Field	0		0	0		0	#DIV/0!	
	Learned Park	14		14	7		7	50.00%	
	Butterworth Park	0		0	0		0	#DIV/0!	
	Reardon Park	7		7	7		7	0.00%	
	Saxonville Beach	1		1	2		2	-100.00%	
	Longs Playground	14		14	19		19	-35.71%	
	Edgell Grove Cemetery	26		26	15		15	42.31%	
	Open Space Total	**489**	**486**	**976**	**402**	**474**	**875**	**10.35%**	
Water/Sewer	1179 Grove- Doeskin	110	27	137	142	29	171	-24.82%	
	3 Speen Street Sewer Station	295	74	368		78	78	78.80%	
	68 Florita Sewer Station	194		194	230		230	-18.56%	
	26 Arsenal Rd	50	1	50		0	0	**closed**	
	801 Pleasant Sewer	102		102	84		84	17.65%	
	New York Avenue Sewer Station	205		205	171		171	16.59%	
	1011 Pleasant St	2,048	256	2,304	1,821	72	1,893	17.84%	
	16 Gate St Sewer Station	135	39	174	121	37	158	9.20%	
	300 Winter St Water Station	47		47	58		58	-23.40%	
	Other Pumping Accounts	0	62	62		55	55	11.29%	
	68R Hemenway - New Building	422		422	467		467	-10.66%	
	139 Elm St	567	216	783	569	161	731	6.64%	
	529 Grove St	1,049	71	1,120	682	200	881	21.34%	
	700-742 Worcester Road	499	62	560	383	131	514	8.21%	
	663 Edgel Rd Water Pumping Sta	1,770	168	1,937	1,703	182	1,885	2.68%	
	Goodnow Lane PS (water)	114		114	136		136	-19.30%	
	Shady Lane Pump Station	14		14	14		14	0.00%	
	Lomas Sewer Pumping	46		46	43		43	6.52%	
	Perry Henderson Sewer Pumping	13		13	18		18	-38.46%	
	Flanagan Sewer Pumping	30		30	60		60	-100.00%	
	Lavelle Sewer Pumping	29		29	30		30	-3.45%	
	McQuin Sewer Pumping	29		29	20		20	31.03%	

MEI Table 3 Comparison FY2011 vs. FY2013 (MMBTUs Used)
showing effects of ECMs installed

	2011 Electric	2011 Gas	2011 Total	2013 Electric	2013 Gas	2013 Total	Percent Reduction	2011 to 2013 improvements
Sage Sewer Pumping	4		4	3		3	25.00%	
Victor Pump Station	22		22	13		13	40.91%	
Brownlea Pump Station	29		29	26		26	10.34%	
Larnis Sewer Pumping	33		33	29		29	12.12%	
Overlook Pump Station	3		3	4		4	-33.33%	
Little Farms Sewer Pumping	18		18	36		36	-100.00%	
Lowther Pump Station	7		7	8		8	-14.29%	
Nine Ninety Pump Station	9		9	10		10	-11.11%	
Watson Place Pump Station	1,237		1,237	1,088		1,088	12.05%	
Indian Head Tank	38		38	42		42	-10.53%	
Eaton Road Pump Station	25		25	58		58	-132.00%	
Nob Hill Pump Station	55		55	17		17	69.09%	
Garvey Sewer Pump Station	18		18	14		14	22.22%	
Bebee Tank	20		20	37		37	-85.00%	
Blackberry Sewer Pumping	28		28	23		23	17.86%	
Oakcrest Pump Station	278	5	282	294	1	295	-4.61%	
Checkerberry Tank	20		20	25		25	-25.00%	
WJH	95		95	81		81	14.74%	
Salem End Pump Station	43		43	39		39	9.30%	
Goodnow Tank	53		53	35		35	33.96%	
Edgewater 1 Sewer Pump	6		6	8		8	-33.33%	
Fenelon Sewer Pump	11		11	7		7	36.36%	
Cypress St Pump Station	20		20	25		25	-25.00%	
Weld Sewer Pumping	35		35	32		32	8.57%	
Carter Drive Pump	54		54	64		64	-18.52%	
A Street Pump Station				1,133	1,542	2,676	**opened 2012**	
Fenwick sewer pumping	262		262	290	5	295	-12.60%	
Kittridge Rd	49		49	43		43	12.24%	
Water/Sewer Total	**10,240**	**978**	**11,219**	**10,238**	**2,493**	**12,730**	**-13.47%**	
Grand Total	**45,768**	**84,419**	**130,187**	**43,617**	**74,102**	**117,715**	**9.58%**	

NOTE: Shaded cell indicates data problem

Appendix A1: BOS letter

TOWN OF FRAMINGHAM

Memorial Building, 150 Concord Street, Room 121, Framingham, MA 01702
508-532-5400 | 508-532-5409 (fax) | selectmen@framinghamma.gov | www.framinghamma.gov

Town Manager
Robert J. Halpin

Assistant Town Manager
Jennifer L. Thompson

Board of Selectmen
Dennis L. Giombetti, Chair
Laurie Lee, Vice Chair
Michael J. Bower, Clerk
Charles J. Sisitsky
Jason A. Smith

October 23, 2013

Ms. Jan Pfister, Grant Coordinator
Massachusetts Department of Energy Resources
Green Communities Division
100 Cambridge Street, Suite 1020
Boston, MA 02114

Ms. Pfister:

Framingham's Board of Selectmen met on October 8, 2013 and, as part of the agenda at that public meeting, reviewed and considered the Energy Reduction Plan being proposed by the Town of Framingham as part of our Green Community Application.

Framingham will be establishing FY2011 as its baseline year to capture energy reductions implemented over the last two years. We have developed a plan to achieve the remainder of our 20% reduction by the end of FY2016.

The Board of Selectmen endorsed and adopted this Energy Reduction Plan at the October 8, 2013 meeting and has authorized me to submit the plan as part of Framingham's Green Community Application.

We look forward to working with the Department of Energy Resources as we move forward with energy reduction plan implementation and other Green Community activities.

Sincerely,

Robert Halpin
Town Manager

BOARD OF SELECTMEN
OPEN SESSION MEETING MINUTES
OCTBER 8, 2013
ABLONDI MEETING ROOM

Attendance: Laurie Lee, Vice Chair; Michael J. Bower, Clerk; Charles J. Sisitsky, Member; Jason Smith, Member

Absent: Dennis L. Giombetti, Chair

Staff: Robert Halpin, Town Manager; Jennifer L. Thompson, Assistant Town Manager; Alice Clapper, Administrative Assistant

In Mr. Giombetti's absence, Ms. Lee called the meeting to order at 7:00 p.m. and read the agenda for open session into the record.

Public Participation:
No public participation.

Town Manager's Report
Mr. Halpin reported on the following: Comcast I-Net Negotiations; MetroWest RTA Groundbreaking; Cushing Memorial Park Master Plan and Emeritus at Farm Pond; Transportation and Development at Tech Park/9-90 Corporate Center; Risk Assessment Audit Recommendation; Chapter 43 D Approval; TJX 2012 TIF Report; Ashland Medical Marijuana District; Meeting with DEP regarding General Chemical. A copy is available in the Board of Selectmen/Town Manager's Office for review. Ms. Lee asked if the placement of marijuana districts near Framingham's boundaries is a trend of other abutting towns. The Town needs to be watchful of this matter. The Town Manager commented that he and Natick officials have been working collaboratively on this issue.

Ms. Clapper noticed that Mr. Joel Winett used the Open Meeting Documents Book. This was the first time ever anyone, but Ms. Clapper has touched that book.

Public Hearings
Consideration of Amendment to Entertainment License & Sunday Entertainment License – Tropical Café, 85 Hollis Street (continued from 10/01/2013)
Ms. Lee stated this was continued from the October 1, 2013 meeting because additional information was requested with regard to the floor plans. She stated the request for a change in hours was denied on October 1, 2013. A letter from the applicant's attorney stated a requested to have this matter continued until October 22, 2013.

Move: to continue the hearing until October 22, 2013 at 7:00 p.m.
Motion: Mr. Smith Second: Mr. Bower
Vote: 4-0-0

Consideration of Carnival License @ Pinefield Plaza – Cushing Amusements/Rotary Club
Attorney Matt Jones, Rotary Club President Elect, stated the Rotary Club is partnering with Cushing Amusements in requesting a Carnival License at the Pinefield Plaza to run

starting October 18, 2013 to October 20, 2013. The Police and Fire Department requirements were noted for the record. Mr. Jones reviewed the incident of earlier this year (possible playing of offensive music) and assured the Board that the carnival will be run with the highest of standards.

Move: to approve
Motion: Mr. Smith Second: Mr. Bower
Vote: 4-0-0

Consideration of Change of Manager & Assistant Manager - All Alcohol Restaurant License & Common Victualer License – 99 Restaurant & Pub, 659 Worcester Road
Operations Director, Stephen McGovern reviewed the request and introduced Mr. Paul Panarelli and Ms. Elizabeth Lee who were requesting the changes in manager and assistant manager, respectively. It was noted a Police Department approval was pending for each to register with the PD for their alcohol server ID's. The applicants stated that they would be receiving their TIP certification from the FPD on Thursday October 10.

Move: to approve Paul Panarelli as Manager
Motion: Mr. Smith Second: Mr. Bower
Vote: 4-0-0

Move: to approve Elizabeth Lee as Assistant Manager
Motion: Mr. Smith Second:
Vote:

Long Range Financial Presentation
Ms. Mary Ellen Kelley, Chief Financial Officer, reviewed the Long Range Financial Plan in a PowerPoint presentation, which included: Overview; Base Forecast; FY15-19 Projected Budget Expenditures and Revenues; Consequence of Debt Service Limit; Health Insurance costs (no change); Reducing the Levy; Reducing the Levy (2%); Reducing the Levy (1.5%); Reducing Health Insurance Costs; Forecast with Reduced Health Insurance; Other Post-Employment Benefits (OPEB); OPEB Funding Schedules Over Time; Funding OPEB; Reduce Health Insurance & Fund OPEB; and Pensions.

A brief discussion ensued.

Mr. Bower requested that the Water and Sewer Enterprise Long Range Plans along with the projected 5 to 10 year growth rates in water and sewer rates be provided to the board before the tax rate hearing in December.

Mr. Smith commented that he was concerned about the taxpayers and the increases they have faced in previous years.

Mr.Smith and Mr. Sisitsky asked for clarifications on the tax rate hearing in December.

Mr. Sisitsky questioned how the $409,000 in surplus revenue will be handled. Would it be used to alleviate the tax liability? Would it be spent?

Mr. Bower commended the past boards and past and current administrations for their outstanding efforts in creating a coordinated, centralized and prioritized approach to capital project planning. He asked the CFO to emphasize in her presentation to Town Meeting the fact that the Fuller Middle School replacement project should be handled as a debt exclusion so as to not undermine the outstanding capital program in place.

Article #9 Energy Services Contract and Green Communities Energy Reduction Plan
Mr. Halpin gave a brief statement with regard to the terms of the energy contract and Town Meeting must vote to waive the restriction for a contract being more than five years. A proposed contract will be brought to a future Town Meeting for discussion and review. It was confirmed Town Counsel will review the contract.

Mr. Bower asked the administration to emphasize in their presentation to Town Meeting the comments contained in the backup materials for the Town Meeting: "In seeking approval to extend the term of the contract beyond 5 years to not more than 20 years, it is completely understood that the Annual Town Meeting in 2014 will have the final say on whether to approve the actual contract and to appropriate the required funding to implement it."

Move: to support
Mr. Sisitsky Mr. Bower
Vote: 4-0-0

Mr. Steve Wiseman, Town's Owner Agent, Vice President, Peregrine Energy Group, Inc. presented an overview of Green Communities Energy Reduction Plan that included: Purpose of Presentation; Criteria 3: Energy Reduction Plan; Framingham Energy Use Baseline; Framingham FY11 Energy Use; Energy Reduction since FY11; Proposed Town Building Reductions; Proposed School Building Reductions; Proposed Vehicle Fuel Reductions; Proposed Street Lighting Reductions; Proposed Pumping Reductions; Energy Reduction Summary.

Move: to support Article #9 and to authorize the Town Manager to submit the plan as part of Framingham's Green Community Application
Motion: Mr. Sisitsky Second: Mr. Bower
Vote: 4-0-0

Review of Fall Special Town Meeting Warrant Articles:
Article #7 Appropriation of Mitigation Funds
Ms. Kelley stated Article #7 was for an appropriation of $1,574,000 mitigation funds for traffic improvements for 2 School Street and Danforth Green that was part of the Planning Board decisions.

Move: to support Article #7
Motion: Mr. Sisitsky Second: Mr. Bower
Vote: 4-0-0

Article #15 Route 126 Highway Alterations
Mr. William Sedewitz, P.E., Chief Engineer, DPW reviewed the project and stated that this was for Town Meeting to vote to hear a report from the BoS relative to the laying out of Concord Street, Hollis Street, Waverly Street, Howard Street and Union Avenue.

Mr. Sedewitz stated that of the 12 easements approved, 11 were for private property.

Move: to make a report to Town Meeting
Motion: Mr. Sisitsky Second: Mr. Bower
Vote: 4-0-0

Article #18 Amend General Bylaws: Article 1§5.10 Regarding Committee Meeting Minutes
Mr. Winett, Rules Committee Chair, reviewed the purpose of the amendment to the General Bylaws with regard to meetings and minutes for Standing Committees.

Mr. Winett requested that the Board of Selectmen include a similar mandate for the production of meeting minutes to its appointed committees.
Mr. Sisitsky and Ms. Lee explained that the board typically takes no action on matters pertaining to the governance of Town Meeting.
Move: to take no position on Article #18
Motion: Mr. Sisitsky Second: Mr. Smith
Vote: 4-0-0

Article #19 Amend General Bylaws, Article V, §21: Demolition Delay Bylaw
Dr. Frederick Wallace, Town Historian, and Chair of Historical Commission gave a brief history of the demolition delay bylaw and the purpose of the amendment to the same.

Move: to support
Motion: Mr. Sisitsky Second: Mr. Smith
Vote: 4-0-0

Approval of Minutes:
09/24/2013 Executive Session
Move: to approve but not release
Motion: Mr. Smith Second: Mr. Bower
Vote: 4-0-0

09/24/2013 Open Session
Move: to approve
Motion: Mr. Smith Second: Mr. Bower
Vote: 4-0-0

Selectmen Reports
Mr. Bower stated that Government Study Committee voted to refer back the donation bins and is calling a meeting on Monday. Ms. Lee said she will be in attendance at that

meeting. Mr. Halpin stated he had a meeting with Town Counsel who will be clarifying some of the issues raised and will be attending additional meetings with other committees. Mr. Bower stated he doesn't want to have it referred back because it would be an additional six months before the matter could go before Town Meeting and additional donation bins could be added in Town.

Mr. Sisitsky reminded viewers about the upcoming Special Election next Tuesday and reviewed changes within some of the polling location buildings.

Move: to adjourn at 8:40 p.m.
Motion: Mr. Smith Second: Mr. Sisitsky
Vote: 4-0-0

Respectfully submitted,
Alice Clapper

Reviewed by,
Michael J. Bower, Clerk

Please note that streaming video of this meeting can be found at:
http://www.framinghamtv.com/streaming2.htm
Delay in posting of Board of Selectmen videos may occur due to technical issues.

The following agenda item documents were included in the Board of Selectmen's packets or were presented during the meeting and are available in the Board of Selectmen's office upon request.

1. Town Manager's Report
2. Email regarding the Consideration of Amendment to Entertainment License & Sunday Entertainment License – Tropical Café, 85 Hollis Street – Continued from 10/1/13
3. Application for Consideration of Carnival License @ Pinefield Plaza – Cushing Amusements/Rotary Club
4. Application for Consideration of Change of Manager & Assistant Manager - All Alcohol Restaurant License & Common Victualer License – 99 Restaurant & Pub, 659 Worcester Road
5. Long Range Financial Presentation
6. Article #9 Energy Services Contract and Green Communities Energy Reduction Plan Presentations
7. Article #7 Appropriation of Mitigation Funds
8. Article #15 Route 126 Highway Alterations
9. Article #18 Amend General Bylaws: Article 1§5.10 Regarding Committee Meeting Minutes
10. Article #19 Amend General Bylaws, Article V, §21: Demolition Delay Bylaw
11. Approval of Meeting Minutes - Open Session 09/24/2013, Executive Session 09/24/2013

Appendix A2: School committee letter -

Framingham Public Schools

King Administration Building
454 Water Street
Framingham, Massachusetts 01701
Telephone: 508-626-9117 Fax: 508-877-4240
Stacy L. Scott, Ed.D., Superintendent of Schools

October 24, 2013

Ms. Jan Pfister, Grant Coordinator
Massachusetts Department of Energy Resources
Green Communities Division
100 Cambridge Street, Suite 1020
Boston, MA 02114

Dear Ms. Pfister:

Framingham's School Committee met on October 22, 2013 and, as part of the agenda at that public meeting, reviewed and considered the Energy Reduction Plan being proposed by the Town of Framingham as part of our Green Community Application.

Framingham will be establishing FY2011 as its baseline year to capture energy reductions implemented over the last two years. We have developed a plan to achieve the remainder of our 20% reduction by the end of FY2016.

The School Committee endorsed and adopted this Energy Reduction Plan at the October 22, 2013 meeting and has authorized me to submit the plan as part of Framingham's Green Community Application.

We look forward to working with the Department of Energy Resources as we move forward with energy reduction plan implementation and other Green Community activities.

Sincerely,

Dr. Stacy L. Scott
Superintendent of Schools

SLS/JT/np

SCHOOL COMMITTEE **ACTIONS**

FRAMINGHAM PUBLIC SCHOOLS FRAMINGHAM, MASSACHUSETTS

School Committee Office **October 28, 2013**

On Tuesday, October 22, 2013, the School Committee held its regular meeting in the Blumer Room of the Memorial Building with all members present. The following actions were taken:

VOTE TO ENDORSE TOWN OF FRAMINGHAM'S ENERGY REDUCTION PLAN: Moved by Ms. Phalen, seconded by Dr. Silverman, that the School Committee vote to accept Town of Framingham's Energy Reduction Plan and the Town's proposal to seek designation of Framingham as a Green Community by the Commonwealth of Massachusetts. Vote in favor was 7-0, with Ms. Connolly, Ms. Hugo, Mr. Limeri, Mr. Miles, Ms. Phalen, Dr. Silverman and Mr. Taggart in favor.

REVISED POLICY ACAB (POLICY AND GRIEVANCE PROCEDURES FOR DISCRIMINATION INCLUDING HARASSMENT AND RETALIATION – FIRST READING: Moved by Mr. Limeri, seconded by Ms. Phalen, that the School Committee approve revised Policy ACAB (Policy and Grievance Procedures for Discrimination Including Harassment and Retaliation) for a first reading. Vote in favor was 7-0, with Ms. Connolly, Ms. Hugo, Mr. Limeri, Mr. Miles, Ms. Phalen, Dr. Silverman and Mr. Taggart in favor.

REVISED POLICY JICFB (BULLYING PREVENTION) – FIRST READING: Moved by Mr. Limeri, seconded by Ms. Phalen, that the School Committee approve revised Policy JICFB (Bullying Prevention) for a first reading. Vote in favor was 7-0, with Ms. Connolly, Ms. Hugo, Mr. Limeri, Mr. Miles, Ms. Phalen, Dr. Silverman and Mr. Taggart in favor.

MINUTES FOR APPROVAL: Moved by Ms. Phalen, seconded by Mr. Taggart, that the School Committee vote to approve the minutes of October 1, 2013, with revisions to page two, line 70. Vote in favor was 6-0-1, with Ms. Connolly, Ms. Hugo, Mr. Limeri, Ms. Phalen, Dr. Silverman and Mr. Taggart in favor; Mr. Miles abstaining.

Moved by Ms. Phalen, seconded by Mr. Limeri, that the School Committee approve the executive session minutes of October 1, 2013. Vote in favor was 6-0-1, with Ms. Connolly, Ms. Hugo, Mr. Limeri, Ms. Phalen, Dr. Silverman and Mr. Taggart in favor; Mr. Miles abstaining.

Moved by Ms. Phalen, seconded by Mr. Taggart, that the School Committee approve the open session minutes of October 8, 2013, with a revision to page one, line 31. Vote in favor was 7-0, with Ms. Connolly, Ms. Hugo, Mr. Limeri, Mr. Miles, Ms. Phalen, Dr. Silverman and Mr. Taggart in favor.

ADJOURNMENT: Moved by Mr. Taggart, seconded by Mr. Miles, that the School Committee adjourn. Vote in favor was 7-0, with Ms. Connolly, Ms. Hugo, Mr. Limeri, Mr. Miles, Ms. Phalen, Dr. Silverman and Mr. Taggart in favor.

Upcoming Regular Meetings

Tuesday, November 5
Tuesday, November 19

Appendix C1: Ameresco Building Assessment

Executive Summary

The Metropolitan Area Planning Council (MAPC) issued a Request for Qualifications (RFQ) to Energy Service Companies (ESCos) to provide for Comprehensive Energy Management Services for 14 of its member communities. Ameresco submitted a proposal and was subsequently awarded the contract.

The program utilizes a multiple step design/development process beginning with a Preliminary Energy Audit (PEA) and followed by a refined and detailed Investment Grade Audit (IGA). This IGA is a key step in developing a successful energy savings and infrastructure improvement project focusing on the exact needs and desires of the Town. The purpose of the IGA is to analyze and quantify the feasibility of installing certain improvements or energy conservation measures (ECMs) throughout the Town of Framingham. The IGA will form the basis for the subsequent Energy Services Agreement (ESA) which will enable the design and construction phase.

This IGA quantifies how the Town will be able to reduce utility costs by well over $300,000 annually, through the acquisition of approximately $3.6 million dollars in capital improvements. This investment however, will be budget-neutral to the Town. The Town will achieve these improvements via a Performance Contact designed to extract energy inefficiencies in the current utility operating budgets to self-fund the project from future energy savings. Payment will be made over time utilizing Ameresco's guaranteed annual energy savings for security.

Table ES.1

Financing Term (after construction)	12 years
Estimated Tax-exempt Interest Rate	3.00%
Total Project Cost	$3,657,429
Estimated Utility Rebates	$327,305
Net Assumed Capital Cost	$3,330,124
Guaranteed Cost Savings / Year 1	$341,623
Net Excess Cumulative Cash Flow	$386,915

In collaboration with and by direction of the Town, Ameresco has conducted an IGA on the buildings below. The table provides the square footage for each building analyzed, along with the energy performance of each building, in terms of fossil fuel and electricity usage per square foot. Energy performance is the ratio of yearly energy use by square footage and is a good indicator of how well a building performs.

Facility Name	Gross Square Feet	Fuel MBTU / g.s.f.	Electric MBTU / g.s.f.	Total EUI MBTU / g.s.f.
Memorial Building	76,453	50.2	25.2	75.4
Main Library Building	53,000	41.9	36.0	77.9
Fire Department Headquarters	24,829	83.7	36.0	119.7
Engine #1	8,516	125.4	40.4	165.8
Engine #2	5,332	54.4	21.9	76.2
Engine #5	11,616	64.6	20.4	85.1
Engine #7	4,404	90.4	21.9	112.3
Police Station	42,336	37.8	46.4	84.3
Callahan Senior Center	24,724	40.5	28.8	69.3
Pearl Street Garage	24,000	0.0	16.2	16.2
Animal Control Building	1,300	125.3	44.6	169.9
Old Edgell Library	4,500	180.3	17.0	197.3
Academy Building	4,515	60.7	11.6	72.3
Park Department Headquarters	6,500	42.4	25.5	67.9
Barbieri Elementary School	112,000	35.6	28.1	63.7
Brophy Elementary School	68,000	45.3	12.0	57.3
Cameron Middle School	114,000	31.7	19.2	50.9
Dunning Elementary School	61,500	51.7	7.8	59.5
Framingham High School	396,000	33.3	19.7	53.0
Hemenway Elementary School	61,500	54.9	9.6	64.5
Juniper Hill Elementary School	44,300	55.9	8.9	64.9
King Administration Building	50,000	97.0	12.7	109.8
McCarthy Elementary School	95,936	53.2	22.3	75.5
Potter Road Elementary School	63,600	27.6	9.1	36.7
Stapleton Elementary School	59,600	65.2	9.4	74.6
Thayer Campus of FHS	10,800	47.7	6.3	54.0
Walsh Middle School	201,000	41.2	9.7	50.9
Woodrow Wilson Elementary	140,695	25.8	12.8	38.6
DPW Headquarters	73,638	51.7	31.0	82.7
Henry Street Garage	6,134	123.1	23.6	146.7
Sanitation Department - Upper	4,950	30.3	174.8	205.1
Sanitation Department - Lower	6,720	0.0	0.0	0.0
DPW Office	5,040	0.0	0.0	0.0
Totals	**1,867,438**			

Ameresco developed a comprehensive baseline for each facility, the details of which can be found in Section 1. The total amount of utility usage for the Fiscal Year 2011 was 10,371,681 kWh, 795,830 Therms of natural gas, and 5,850 gallons of #2 fuel oil.

A wide-range of energy conservation measures (ECMs) were identified, evaluated, and presented for consideration. The comprehensive development process of the IGA included input from Town personnel in order to refine the ECMs and overall scope of the project to match the infrastructure need of the facilities. This IGA outlines and describes 16 distinct ECMs across all facilities as listed in the matrix on the following page. The subsequent page lists the cost and savings for each of the measures across all facilities.

AMERESCO
Green • Clean • Sustainable

Table ES.2: ECM Matrix

Town of Framingham Energy Conservation Measures (ECMs)	Lighting System Improvements	Lighting Controls	Integrated and New Energy Management Systems	Programmable Thermostats	Demand Control Ventilation	Infiltration Reductions	Boiler Replacements	Oil to Gas Conversion	Variable Frequency Drives For Pumps	Vending Misers	PC Load Management	Roof Insulation	Nevins Hall AHU Rehabilitation	Transformers	Retrocommissioning	Airflow Corrections	
Facility	**1**	**2**	**3**	**4**	**5**	**6**	**8**	**9**	**11**	**14**	**15**	**17**	**18**	**19**	**23**	**25**	
Memorial Building	X		X			X				X	X		X				
Main Library Building	X	X	X			X	X				X						
Fire Department Headquarters	X	X	X		X	X				X	X			X			
Engine #1	X									X							
Engine #2	X	X															
Engine #5	X						X										
Engine #7	X																
Police Station	X	X	X			X				X	X	X					
Callahan Senior Center	X	X								X	X					X	
Pearl Street Garage	X																
Animal Control Building				X							X						
Old Edgell Library	X			X				X									
Academy Building						X						X					
Park Department Headquarters	X	X									X			X			
Barbieri Elementary School	X					X								X	X		
Brophy Elementary School	X				X	X									X		
Carreron Middle School	X				X	X			X					X			
Dunning Elementary School	X				X	X									X		
Framingham High School	X				X	X								X			
Hemenway Elementary School	X				X	X									X		
Juniper Hill Elementary School	X				X	X									X		
King Administration Building	X				X	X									X		
McCarthy Elementary School	X				X	X			X					X	X		
Potter Road Elementary School	X				X	X											
Stapleton Elementary School	X				X										X		
Thayer Campus of FHS	X					X											
Walsh Middle School					X										X		
Woodrow Wilson Elementary	X				X	X			X					X			
DPW Headquarters	X	X				X					X			X			
Henry Street Garage	X	X															
Sanitation Department - Upper	X	X															
Sanitation Department - Lower	X	X															
DPW Office	X										X						

Table ES.3: Cost and Savings by Measure

Ecm #	ECM Name	Annual kW	Total kWh	Natural Gas (Therms)	#2 Fuel Oil (Gallons)	Energy Savings	O&M Savings	Total Project Savings	Total Project Costs	SPB
1	Lighting System Improvements	2,238.7	813,269	(5,687)	(8)	$ 141,394	$ 11,435	$ 152,829	$ 1,312,810	8.59
2	Lighting Controls	-	19,908	(209)	-	$ 2,327	$ -	$ 2,327	$ 24,164	10.39
3	Integrated and New Energy Management Systems	-	159,464	16,406	-	$ 37,853	$ -	$ 37,853	$ 889,015	23.49
4	Programmable Thermostats	-	4,984	233	877	$ 4,320	$ -	$ 4,320	$ 3,139	0.73
5	Demand Control Ventilation	-	21,592	13,478	-	$ 17,493	$ -	$ 17,493	$ 166,008	9.49
6	Infiltration Reductions	-	976	21,659	-	$ 23,956	$ -	$ 23,956	$ 186,994	7.81
8	Boiler Replacements	-	-	2,813	-	$ 3,110	$ -	$ 3,110	$ 322,236	103.60
9	Oil to Gas Conversion	-	-	(6,793)	4,898	$ 9,508	$ -	$ 9,508	$ 21,856	2.30
11	Variable Frequency Drives For HW Pumps	-	49,461	-	-	$ 5,639	$ -	$ 5,639	$ 101,093	17.93
14	Vending Misers	-	14,444	(302)	-	$ 1,585	$ -	$ 1,585	$ 3,155	1.99
15	PC Load Management	-	38,536	(805)	-	$ 4,046	$ -	$ 4,046	$ 9,923	2.45
17	Roof Insulation	-	207	475	-	$ 558	$ -	$ 558	$ 12,117	21.72
18	Nevins Hall AHU Rehabilitation	-	(4,522)	(622)	-	$ (1,284)	$ -	$ (1,284)	$ 26,733	(20.81)
19	Transformers	420.1	306,006	-	-	$ 44,104	$ -	$ 44,104	$ 333,617	7.56
23	Retrocommissioning	-	72,211	15,071	-	$ 25,619	$ -	$ 25,619	$ 244,049	9.53
25	Airflow Corrections	-	-	10	-	$ 11	$ -	$ 11	$ 520	46.26
		2,659	**1,496,536**	**55,728**	**5,766**	**$ 320,238**	**$ 11,435**	**$ 331,672**	**$ 3,657,429**	**11.03**

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Table ES.4: Project Pro-Forma

Town of Framingham - Pro-Forma

Initial Project Costs:	
Implementation costs	$ 3,657,429
Total Initial Project Costs	**$ 3,657,429**
Utility Rebates	$ 327,305
Total Rebates	**$ 327,305**
Net Project Costs after rebates	**$ 3,330,124**

Financial Assumptions	
Term of Project {yrs}	12.0 yrs
Term of Financing {yrs}	12.0 yrs
Estimated Financing Rate	3.00%
Payments per year (frequency)	4
Discount Rate	3.00%
Average Energy escalation rate {annual}	3.00%
Average Cost escalation rate {annual}	3.00%
Project Simple Payback	11.03

Pro-forma			Year									
		Initial Values	1	2	3	4	5	6	7	8	9	10
1	Annual energy costs without improvements	$ 2,380,362	$ 2,451,773	$ 2,525,326	$ 2,601,086	$ 2,679,119	$ 2,759,492	$ 2,842,277	$ 2,927,545	$ 3,015,372	$ 3,105,833	$ 3,199,008
2	Annual energy costs with improvements	$ 2,060,125	$ 2,121,928	$ 2,185,586	$ 2,251,154	$ 2,318,688	$ 2,388,249	$ 2,459,897	$ 2,533,693	$ 2,609,704	$ 2,687,995	$ 2,768,635
3	Annual energy cost savings (1-2)	$ 320,238	$ 329,845	$ 339,740	$ 349,932	$ 360,430	$ 371,243	$ 382,381	$ 393,852	$ 405,668	$ 417,838	$ 430,373
4	O&M Savings	$ 11,435	$ 11,778	$ 12,131	$ 12,495	$ 12,870	$ 13,256	$ 13,654	$ 14,063	$ 14,485	$ 14,920	$ 15,367
5	Total Project Savings	$ 331,672	$ 341,623	$ 351,871	$ 362,427	$ 373,300	$ 384,499	$ 396,034	$ 407,915	$ 420,153	$ 432,757	$ 445,740
6	Payments for financing equipment		$ 289,589	$ 299,244	$ 309,189	$ 319,432	$ 329,982	$ 340,849	$ 352,041	$ 363,570	$ 375,444	$ 387,675
7	Payments for Ongoing Services	$ 19,214	$ 19,791	$ 20,384	$ 20,996	$ 21,626	$ 22,275	$ 22,943	$ 23,631	$ 24,340	$ 25,070	$ 25,822
8	Net annual benefits		$ 32,243	$ 32,243	$ 32,243	$ 32,243	$ 32,243	$ 32,243	$ 32,243	$ 32,243	$ 32,243	$ 32,243
9	Cumulative cash flow	**$ 386,915**	$ 32,243	$ 64,486	$ 96,729	$ 128,972	$ 161,215	$ 193,458	$ 225,700	$ 257,943	$ 290,186	$ 322,429
10	**Net Present Value of cash flow**	**$ 320,946**										
11	Interest Rate	3.00%										
12	Discount Rate	3.00%										

Line #	11	12	Totals
1	$ 3,294,978	$ 3,393,827	$ 34,795,637
2	$ 2,851,694	$ 2,937,245	$ 30,114,470
3	$ 443,284	$ 456,582	$ 4,681,167
4	$ 15,828	$ 16,303	$ 167,152
5	$ 459,112	$ 472,886	$ 4,848,319
6	$ 400,272	$ 413,248	$ 4,180,534
7	$ 26,597	$ 27,395	$ 280,870
8	$ 32,243	$ 32,243	$ 386,915
9	$ 354,672	$ 386,915	
10			
11			
12			

Notes:
1 This Proforma Cash Flow reflects an estimated tax exempt lease rate of 3%. The actual rate will increase or decrease based on market conditions and customer credit rating at the time of lease funding.
2 Savings are based on current utility rate structures and usage information provided for purposes of this project.

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Energy Conservation Measures

The following ECM descriptions are intended to provide a high level overview. In general the ECMs are designed to deliver many technical, financial, and environmental benefits to the Town of Framingham that include:

- Better learning and working environment for students and staff;
- Improved energy efficiency and operation of existing systems;
- New energy efficient equipment and systems;
- Performance Guarantee of energy savings; and
- Reduction of Greenhouse gasses and emissions.

ECM 1: Lighting System Improvements

Ameresco proposes to install a state-of-the-art lighting system for the Town of Framingham. The project replaces or upgrades approximately 9,700 existing fixtures and will enhance the quality, consistency, and color rendering of the lighting system, while meeting all applicable codes and standards.

Figure 1.1:.New light fixtures will improve aesthetics and provide substantial energy savings.

Our in-house lighting experts completed a survey of your facilities. We identified over 17,000 different lamp/ballast/fixture combinations, the majority of which are linear fluorescent, which provide general lighting in key areas such as classrooms, offices & halls. Approximately 61% of linear fluorescent fixtures use standard-grade T8s on electronic ballasts with a mixture of ballast factors. In addition to standard grade T8 lamps, a significant amount of energy efficient lamps were found throughout the Town of Framingham buildings. 25% of the linear fluorescent lamps were found to be either 30w or 28w energy efficient lamps on a mixture of ballast factors. High-intensity discharge (HID) lamps are used in some repair garages such as those found at the DPW Headquarters as well as for exterior lighting throughout the town. Color rendition is fair to poor depending on lamp quality and age, which unfortunately can be a characteristic of HID lamps.

Although the lighting system is generally performing as designed, improvements are possible.

ECM 2: Lighting Controls

Ameresco proposes to install new lighting controls in the Town buildings to ensure that lighting does not operate unnecessarily. Energy waste occurs when a fixture is energized but not used and when illuminance exceeds what is necessary for task performance. Ameresco noted that some occupants are not careful about turning off lights when they leave the room, making automated controls advantageous.

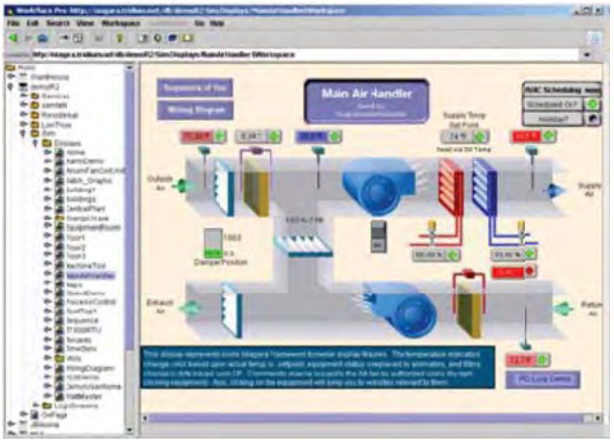
Figure 2.1:.Ceiling mounted occupancy sensors such as this one will be employed in a number of areas. These type of sensors significantly reduce run hours and provide substantial energy savings.

Ameresco proposes to install 122 local lighting controls employing a variety of strategies, each of which was customized to the unique space. We selected appropriate areas that contain several controllable fixtures, which have intermittent occupancy, and where a safety hazard will not be created if the sensor inadvertently turns the lights off. Applicable areas include offices, baths, cafeterias, and libraries.

Bathrooms or other areas without direct line-of-sight to the sensor, will receive dual-technology sensors that "listen" for activity in addition to "looking" for motion. The fluorescent high-bays in garage areas will each have motion sensors, allowing each one to operate independently for maximum savings and flexibility. For some mechanical spaces, programmable timers will be installed. Staff will simply push the button to receive a preset amount of time. They can see the time running as it counts down on the display. Before the time runs out, the lights will flash, indicating that the occupant has a few minutes before the timer automatically turns off the lights.

ECM 3: Integrated and New Energy Management Systems

Ameresco proposes to update the existing EMS systems installed in Memorial Hall, Fire Department Headquarters and Police Station and add new EMS systems to the Main Library Building.



e existing

The proposed EMS would be "open protocol" and "interoperable" with other manufacturer's products. This feature would allow products from any vendor to be installed as the system is maintained or expanded in the future. The recommended EMS would be password accessible from any Internet-enabled personal computer with web browsing software and would provide reduced energy consumption, increase system reliability and improve occupant comfort. The proposed EMS will provide dynamic systems control and utility consumption reporting capabilities for the entire Town.

Under the proposed EMS, Ameresco would install a new open protocol EMS that would be installed on top of existing pneumatic controls for the air handling units and other control valves, as well as exhaust fans and circulator pumps. All existing pneumatic logic controllers will be removed with the exception of existing pneumatic thermostats controlling unit ventilators and cabinet heaters. All pneumatic controls in the boiler rooms will be replaced with only the pneumatic valve actuators being reused.

ECM 4: Programmable Thermostats

Figure 4.1: Existing Mercury Non-programmable thermostat in the Old Edgell Library

Ameresco identified two (2) non-programmable thermostats at Old Edgell Library. Each thermostat controls a hot water heated, DX-cooled Fan Coil Unit in the attic space. Ameresco identified two (2) thermostats at the Animal Control Building. One controls a gas-fired Roof Top Unit (RTU) that serves the kennel area and is programmable. The other controls the RTU serving the office space and is non-programmable. The thermostats are set to maintain one temperature at all times, and need to be turned down manually to get any night setback savings.

Ameresco proposes to install and program new 7-day programmable thermostats at the Old Edgell Library and Animal Control Building to replace existing thermostats. Energy will be saved by setting back temperatures at night when the buildings are unoccupied. Ameresco will work with the Framingham Historical Society to find a suitable setback temperature to preserve the art collections. The old thermostats will be properly disposed of.

ECM 5: Demand Controlled Ventilation

Figure 5.1: Existing Air Handling Unit serving Cameron Middle School

Ameresco identified energy saving opportunities in a number of buildings through the installation of demand control ventilation (DCV) controls. DCV controls modulate the amount of outdoor air supplied to a space to maintain a required ventilation rate (CFM per person) based on the actual occupancy at that time. This strategy saves energy by reducing the amount of outdoor air that is conditioned during low occupancy periods.

Ameresco identified thirty-five (35) pieces of air handling equipment at School buildings and eight (8) at the Fire Headquarters that can be upgraded with DCV controls. All spaces have a high occupant density that varies throughout the day and all spaces are supplied with a large volume of air. These units currently use a mix of variable air volume and constant air volume strategies.

There are concerns at the Fire Headquarters that too much outdoor air is being brought into the building. This is thought to contribute somewhat to the high humidity problems the building has experienced.

CO_2 sensors will be installed to monitor CO_2 levels in the spaces and control ventilation rates for each occupied space according to ASHRAE Standard 62 requirements. The sensors will be wired back to existing AHU controllers. The existing controls will be modified and programmed to control the outdoor air dampers via CO_2 levels. The new sensors will have the capability to override the outdoor air dampers based on CO_2 control algorithm.

ECM 6: Infiltration Reductions

ry School

The buildings throughout the Town were built at various times. Construction and energy standards have changed significantly through the years. One of the most common areas for air infiltration is where the outside walls connect with the roof. This intersection was typically not sealed during construction before energy codes began calling for it. Other sources of infiltration typically include poor weatherstripping of doors and windows and wall and roof penetrations.

Ameresco proposes to reduce the infiltration of outside air and the leaking of conditioned air by performing weatherization techniques throughout most of the heated and cooled buildings across town. The reduction of outdoor air infiltrating occupied conditioned space will improve occupant comfort and will reduce heating and cooling costs.

ECM 8: Boiler Improvements

at

The Main Library is heated by a circa 1978 Cleaver Brooks CB-200-60 firetube hot water boiler. The boiler serves VAV box reheat coils and perimeter heating throughout the building. Fire Engine #5 is served by a Weil-McLain LGB-6 hot water boiler built in 1987. The boiler provides hot water to three different zones. The boilers installed are near the end of their useful lives and will require expensive repairs in the near future.

Ameresco proposes replacing the existing boilers at the Main Library and at Fire Engine #5 with new, more efficient, condensing, gas-fired hot water boilers.

The new condensing boilers will be much smaller and significantly more efficient than the existing boilers. The new boilers have a much wider range of modulation, minimizing cycling during shoulder months. The two boiler system for the Library will also provide redundancy and deliver heat even if one boiler is down for maintenance.

ECM 9: Oil to Gas Conversion

The Old Edgell Library is heated by an American Standard cast-iron hot water boiler with a Beckett oil burner. The building was originally heated by radiators throughout, but now hot air is supplied by two Fan Coil Units (FCU) in the attic space. These FCUs have hot water coils that are fed from the existing boiler. Ameresco proposes to replace the burners and convert heating fuel from oil to gas to take advantage of lower fuel costs in terms of cost per BTU. The existing boiler will be reused and retrofit with a new Carlin (or similar), single nozzle, air-atomizing burner. In addition, the fire box in the existing boiler will be rebuilt as part of this measure.

Figure 9.1: Existing oil burner installed in the Old Edgell Library

ECM 11: Variable Frequency Drives

Ameresco identified pumps located at the Cameron Middle School, McCarthy Elementary School and Wilson Elementary School are good candidates for variable frequency drives (VFDs). The installation of VFDs and controls will motors to modulate with varying load more efficiently than the existing methods of control, which will reduce electrical energy and to improve system efficiency. Ameresco proposes to install ten (10) VFDs and integrate their control to the existing EMS system. The VFD's will also provide the motors with soft-start capability, which will help to decrease spikes in power draw and decrease mechanical stress to equipment. Electric energy savings will be realized because of the reduced power consumption of the motors controlled by the VFDs.


Figure 11.1: Existing Pump located at the Cameron Middle School

ECM 14: Vending Machine Controls

Vending machines were found throughout the Town's buildings. The vending machines are typically stocked with soda, juice and sport/energy drinks and are cooled and illuminated year-round regardless of occupancy. Snack vending machines were also found in the same areas. Ameresco proposes to install 8 occupancy sensing, plug load controllers to reduce the unnecessary operation of the Town's vending machines during unoccupied periods. Each vending machine controller will save energy used by the refrigerated vending machine during unoccupied hours without compromising product quality. The controller will use a sensor to detect when the space is unoccupied and turn off the vending machine. Existing non-refrigerated snack machines will also be controlled. As reported by the American Council for an Energy Efficient Economy (ACEEE), the 2.5 million vending machines operating in the U.S. consume nearly $600 million in energy and demand costs. Since Town buildings are not constantly occupied, the Town's refrigerated vending machines consume more energy than needed.

Figure 14.2: Beverage and Snack Vending Machine located at the Memorial Building

ECM 15: PC Load Management

Most Town employees use personal computers for their daily work. Some of these computers are left on even when the user is not present.

Ameresco proposes to install a client/server software application that will manage the power consumption of computers located throughout the Town of Framingham buildings. Ameresco identified 436 Windows-based personal computers (PCs) of various models located at a number of Town buildings. This software will save energy and money by reducing the time the computers spend in higher power modes while not in use. These packages are easy-to-deploy software utilities that address network energy waste and reduce operating costs without impacting computer users. The applications manage and minimize the energy consumed by the network's clients through one centralized interface.

Figure 15.1: Energy Star qualified products such as Power Save can help meet the strict energy efficiency guidelines set by the U.S. EPA and U.S. DOE.

The software is fully configurable by Information Technology (IT) personnel and provides a means to schedule software updates as well as to reduce energy and power consumption. The software detects user presence by tracking inputs such as mouse movement or use of the keyboard. During unoccupied periods the software resets parameters to reduce lower power consumption after a period of time specified by the IT department.

ECM 17: Roof Insulation

Ameresco proposes increasing existing attic insulation above sections of the Police Station and Academy Building to reduce the conduction of heat out of the building during the heating season. This will reduce the amount of heat that is required from the heating system to keep interior spaces at a comfortable temperature. This increase in thermal resistance will have a similar benefit during the cooling season.

Figure 17.1: Police Station

The identified sections at the Police Station are on top of flat attic section above original armory building section and the Academy building on top of flat attic section. The sections are believed to have little or no existing attic insulation, based on conversations with building staff and on the age of the building. The attic spaces are naturally ventilated, and so remain at roughly outdoor air temperatures. The lack of insulation allows heat to escape the building through these areas.

ECM 18: Nevins Hall AHU Rehabilitation

When originally built, Nevins Hall received fresh outdoor air through several sidewall diffusers supplied by a large Air Handling Unit (AHU). This same unit also provided air to sidewall diffusers serving the basement level Banquet Hall. Building air from these two halls was exhausted through an exhaust plenum penthouse located near the projection booth. These systems would run to bring in ventilation air to the spaces while maintaining a slightly positive pressure in the building.

Presently, the basement Banquet Hall has been sectioned into office and meeting space. The large air handler has been fitted with a new motor and modern DDC controls and the ductwork has been cleaned, but the unit has not been turned on. There is still concern over the amount of dust in the system, and temporary filters have been placed over all of the air diffusers in the basement and Nevins Hall.

Figure 18.1: Existing return air damper in HV-1 Mixed Air plenum

Ameresco proposes to recommission HV-1 and its associated exhaust fan back into working order. The return and outdoor air dampers will be replaced and minor damage to existing ductwork will be repaired. The fan motor will be reconnected to provide the correct amount of outdoor air during events in Nevins Hall.

Ameresco proposes performing mechanical work necessary to startup and use the Nevins Hall AHU. Inoperable Outdoor Air and Return Air dampers will be replaced and new belts will be installed on both the AHU supply fan and exhaust fan. Supply air will be cut-off from the basement level using existing dampers in the ductwork in order to direct all of the supply air into Nevins Hall. Once startup of the AHU and exhaust fan has been completed and the air is determined to be sufficiently clean, the temporary air filters on the diffusers will be removed.

Ameresco proposes to install demand control ventilation (DCV) on the Nevins Hall AHU. New CO_2 sensors will be located in the occupied space, and the outdoor air damper actuator will be tested for proper operation (modulating). New CO_2 sensors will be installed to monitor CO_2 levels in the space and control ventilation rates for the occupied space according to ASHRAE Standard 62 requirements. The sensors will be wired back to the existing AHU controller. The existing controls will be modified and programmed to control the outdoor air damper via CO_2 levels. The new sensors will have the capability to override the outdoor air dampers based on CO_2 control algorithm.

ECM 19: Transformer Replacement

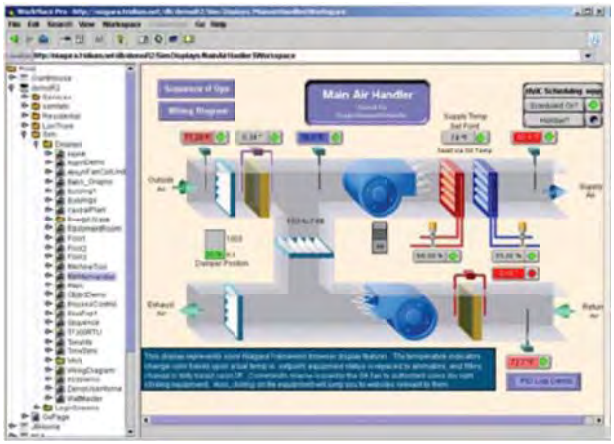
Most transformers in use today in the Town are estimated to be loaded at about 5% - 30% of their total capacity which is typical of other buildings. These loadings are based on spot measurements taken during the audit. These transformers are designed to be able to transform the electricity up to design ratings and are most efficient at or around the design rating. Operating at low levels for normal transformers is inefficient. The standard low voltage step-down transformer is widely considered a commodity and as such the only perceived differentiator is price – lowest purchase cost typically wins. Commercial transformer specifications rarely require a minimum efficiency. As one would expect, building a less efficient transformer is cheaper than building a more efficient one, so a typical low-first-cost transformer will have a low up-front cost but high operating cost, with the lifetime cost of the operating losses exceeding the purchase cost many times over.

Figure 19.1: New energy efficient transformers will be installed in place of existing standard efficiency transformers

The standard transformer is built to deliver its nameplate kVA rating under linear load only and is UL listed on this basis. As it has the lower purchase price on the market, it represents the majority of transformer purchases across the country. Along with the high operating cost goes substantial lost capacity and distortion of the voltage to connected equipment. Most of the transformers are oversized. Some of the transformers installed in schools, such as Barbieri, are not code compliant.

Ameresco proposes to replace a total of thirty-six (36) existing step-down transformers with new energy-efficient transformers throughout the Town. All of the transformers are dry-type indoor transformers that step-down 480 volt power to 208Y/120 volt power. Ameresco proposes to replace these transformers with new premium efficiency units that will reduce the electric losses and lower the cooling load of some of the equipment rooms.

ECM 23: Retrocommissioning



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Ameresco proposes to recommission the existing EMS systems installed at the School Buildings.

The School Buildings have a comprehensive Energy Management System, manufactured by AEM. Based on Ameresco's review of measured space temperatures and occupancy schedules, there appear to be opportunities to further optimize the operation of the EMS. Heating schedules start well before students arrive and continue after the end of class, indicating that optimal start/stop is not being utilized. Also, nighttime temperatures can be set back further, increasing energy savings. These schedules and setpoints have most likely been set to mitigate occupant complaints, but a comprehensive review and resetting of all control systems will help to generate further savings.

Ameresco proposes recommissioning the School Buildings' existing Tridium Niagara^{AX} systems. This work includes performing a full point to point checkout and generating a commissioning report on the condition of existing control equipment. All sequences, schedules, and occupied and unoccupied temperature setpoints will be evaluated and modified to increase energy efficiency while maintaining occupant comfort. Optimum Start/Stop will be utilized wherever appropriate to minimize heating during unoccupied hours while still assuring that temperatures are at an acceptable level by the time staff and students arrive.

ECM 25: Airflow Corrections

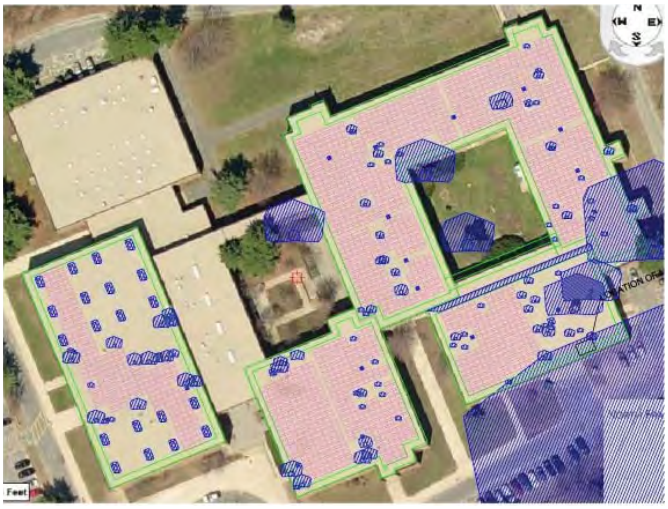
A RTU serves the first floor kitchen area, the main entry lobby and a second floor mezzanine, open to the lobby. Thermostats controlling the temperature of supply air to these spaces are located on the first floor. The mezzanine area is chronically overheated, consistently staying between 85ºF-90ºF during the heating season. This is due to warm air from the lobby rising into the mezzanine area but also because of a large supply diffuser located at the mezzanine. Because this diffuser is located closest to the RTU, it receives the highest pressure air and there is a large amount of warm air blowing into the space, even with a face damper closed. Ameresco proposes to optimize the duct layout of the Roof Top Unit (RTU) serving the entry lobby and 2nd floor mezzanine of the Senior Center. This will be done to cut off supply of air to the mezzanine and increase airflow to the lobby area in order to remediate the extreme overheating of the mezzanine area.

Solar PV

Ameresco proposes two options to design, construct, operate and maintain solar PV systems in the Town of Framingham. Option 1 includes (4) four solar PV installations: on the land adjacent to the Walsh Middle School, the roof of DPW Facility, the roof of the Callahan Senior Center, and on the light poles around the Walsh Middle School. Option 2 includes (5) five solar PV installations: the same locations as Option 1 plus the roof of the Walsh Middle School.

The solar PV systems provide the following benefits: a) immediate electricity cost savings without capital investment from the Town; b) a hedge against future electricity price volatility, c) a solar learning center with educational information and a viewing area.

Section 8 of this IGA will form the basis for the subsequent Power Purchase Agreement (PPA) which will enable the design and construction phase.



Walsh Middle School roof. The pink sections show the location of the solar PV array.

Option 1

- **System size:** 749 kW solar PV
- **First Year Power Price:** $0.0809/kWh
- **Capital cost**: $0 with a PPA
- **Operating cost savings:** $76,155 in year 1
- **Cumulative 20-year savings:** $1,759,243

Option 2

- **System size**: 1,204 kW solar PV
- **First Year Power Price:** $0.0706/kWh
- **Capital cost**: $0 with a PPA
- **Operating cost savings**: $134,508 in year 1
- **Cumulative 20-year savings**: $3,107,256

Summary

Ameresco has presented a complete and comprehensive IGA that addresses the needs of the Town and provides realistic solutions. The ECMs identified present very viable and needed solutions for the continued effective operations of the Town and School facilities. The final accepted IGA will form the basis for the scope-of-work under the subsequent ESA, whereby Ameresco will provide design, acquisition, installation, modification, commissioning and training for the ECMs as presented herein.

This is an important project for the Town and one that requires an Energy Services Company (ESCo) with significant expertise. The Ameresco team has extensive experience with Performance Contracting projects in municipalities and school districts in the Boston metropolitan area, throughout the Commonwealth and North America. We have the proven commitment, experience, resources, technical expertise and financial capability out of our corporate headquarters in nearby Framingham, to successfully execute this project over the full contract term. We are ready and eager to begin implementation so that the Town may secure current low cost financing and realize the overall benefit of improved facilities within the next 12 months.

Section 1: Baseline

Overview

Ameresco performed an Investment Grade Audit (IGA) for the Town of Framingham, Massachusetts. The Town of Framingham is located in Eastern Massachusetts, West of Boston. The Town buildings are comprised of schools, fire and police stations, a library, an animal control center, historic buildings, a senior center, public works buildings, and the Town Hall.

Ameresco performed a Preliminary Energy Audit (PEA) for the Town of Framingham on approximately thirty-eight (38) buildings throughout the Town, including fourteen (14) school buildings and twenty-four (24) Town facilities. The total area of building space audited was approximately 1,923,500 square feet. After review of the facilities with Town personnel, the Town narrowed down the list to thirty-three (33) facilities to focus on during the Investment Grade Audit (IGA) phase. The list consisted of fourteen (14) school buildings and nineteen (19) Town facilities. The area of building space included the IGA phase is approximately 1,867,438 square feet.

As part of the IGA, Ameresco developed a baseline model for each facility. A breakout of demand, on-peak and off-peak charges was not available for school buildings, only total usage and cost. The baseline developed for each building is based on fiscal year 2011 (FY11) utility data. The total amount of utility usage for the Fiscal Year 2011 was 10,371,681 kWh, 795,830 Therms of natural gas, and 5,850 gallons of #2 fuel oil. The total utility cost for this time period was $2,743,492.

The baseline utility cost shown in the proforma located in Section 4 is based on current utility rates and does not include customer charges. Further, many of the tariffs the buildings receive electricity and natural gas under include block rate structures. These structures charge different rates depending on how much is used. Ameresco is only including rates that reflect blocks that will be affected by the ECMs. These rates are shown in Section 7 in the Utility Rate Table. The baseline utility cost shown in the proforma located in Section 4 is the product of the baseline utility energy units multiplied by the utility rates shown in Section 7.

Table 1 gives the square footage for each facility analyzed, along with the energy performance of each building, in terms of fossil fuel and electricity usage per square foot. Energy performance is the ratio of yearly energy use by square footage and is a good indicator of how well a building performs. The energy performance of each of the municipal and school buildings was calculated from the utility information provided by Town personnel and directly from the utility companies.

The total mbtu/gsf represents the total energy usage for the entire facility on a square foot basis. The total energy usage for the entire facility on a square foot basis is the addition of both electrical and fossil fuel performance (mbtu/gsf) if applicable. In most of the buildings evaluated, the primary source for space heating is either natural gas or # 2 fuel oil. Electric heating is used at a few locations. Electric cooling is utilized to varying degree in all municipal buildings, either via central chillers or local space coolers. Buildings with larger central cooling systems operate at a higher annual electrical mbtu/gsf.

Table 1: List of Audited Buildings and Energy Performance

Facility Name	Gross Square Feet	Fuel MBTU / g.s.f.	Electric MBTU / g.s.f.	Total EUI MBTU / g.s.f.
Memorial Building	76,453	50.2	25.2	75.4
Main Library Building	53,000	41.9	36.0	77.9
Fire Department Headquarters	24,829	83.7	36.0	119.7
Engine #1	8,516	125.4	40.4	165.8
Engine #2	5,332	54.4	21.9	76.2
Engine #5	11,616	64.6	20.4	85.1
Engine #7	4,404	90.4	21.9	112.3
Police Station	42,336	37.8	46.4	84.3
Callahan Senior Center	24,724	40.5	28.8	69.3
Pearl Street Garage	24,000	0.0	16.2	16.2
Animal Control Building	1,300	125.3	44.6	169.9
Old Edgell Library	4,500	180.3	17.0	197.3
Academy Building	4,515	60.7	11.6	72.3
Park Department Headquarters	6,500	42.4	25.5	67.9
Barbieri Elementary School	112,000	35.6	28.1	63.7
Brophy Elementary School	68,000	45.3	12.0	57.3
Cameron Middle School	114,000	31.7	19.2	50.9
Dunning Elementary School	61,500	51.7	7.8	59.5
Framingham High School	396,000	33.3	19.7	53.0
Hemenway Elementary School	61,500	54.9	9.6	64.5
Juniper Hill Elementary School	44,300	55.9	8.9	64.9
King Administration Building	50,000	97.0	12.7	109.8
McCarthy Elementary School	95,936	53.2	22.3	75.5
Potter Road Elementary School	63,600	27.6	9.1	36.7
Stapleton Elementary School	59,600	65.2	9.4	74.6
Thayer Campus of FHS	10,800	47.7	6.3	54.0
Walsh Middle School	201,000	41.2	9.7	50.9
Woodrow Wilson Elementary	140,695	25.8	12.8	38.6
DPW Headquarters	73,638	51.7	31.0	82.7
Henry Street Garage	6,134	123.1	23.6	146.7
Sanitation Department - Upper	4,950	30.3	174.8	205.1
Sanitation Department - Lower[1]	6,720	0.0	0.0	0.0
DPW Office[2]	5,040	0.0	0.0	0.0
Totals	**1,867,438**			

Using information from the energy performance table along with investigating the existing conditions of equipment and systems, Ameresco has identified several key opportunities to reduce utility costs for each

[1] Sanitation Department Upper and Lower buildings utilities are fed from same meter
[2] DPW Office utilities are supplied from DPW Headquarters

facility. Many of those savings opportunities have been captured in the Energy Conservation Measures (ECM) and are detailed in Section 3.

Baseline Information

The baseline utility data for this Investment Grade Audit is based on the Fiscal 2011 energy data (*July 2010 through June 2011*). Complete information was available for fiscal year 2012 however this year had an unusually low number of annual heating degree days (HDD), which would require a large weather adjustment in order to match 30-year average weather conditions for Framingham, Massachusetts. Instead fiscal year 2011 was used since its annual (HDD) closely matched the 30-year average weather conditions and we believe it still closely represents current operational conditions. For annual energy usage see the table at the end of this section.

Utilities are supplied through a number of different providers. At present, NStar provides delivery services while TransCanada provides commodity (supply) for electricity. Natural Gas is delivered by NStar and supplied by Spark Energy for all buildings except the Animal Control Building and Henry Street Garage, where it is supplied by NStar. Fuel Oil is supplied to the Old Edgell Library by Holliston Oil. For annual energy usage at each facility, see Table 2.

Table 2: Annual Energy Use by Facility

Facility Name	Natural Gas Usage (Therms)	#2 Fuel Oil Usage (Gallons)	Electric Usage (kWh)	Annual Electric Demand (kW)
Memorial Building	38,392	0	564,960	1,640.4
Main Library Building	22,226	0	558,300	1,663.0
Fire Department Headquarters	20,776	0	261,840	636.0
Engine #1	10,679	0	100,875	227.9
Engine #2	2,898	0	34,163	18.0
Engine #5	7,506	0	69,581	221.3
Engine #7	3,980	0	28,245	0
Police Station	16,011	0	576,000	1,264.8
Callahan Senior Center	10,013	0	208,720	830.4
Pearl Street Garage	0	0	114,120	180.8
Animal Control Building	1,629	0	16,987	0
Old Edgell Library	0	5,850	22,398	0
Academy Building	2,742	0	15,351	0
Park Department Headquarters	2,759	0	48,568	203.4
Barbieri Elementary School	39,925	0	921,240	0
Brophy Elementary School	30,790	0	239,256	0
Cameron Middle School	36,097	0	642,312	0
Dunning Elementary School	31,793	0	140,440	0
Framingham High School	131,795	0	2,286,960	0
Hemenway Elementary School	33,783	0	172,441	0
Juniper Hill Elementary School	24,785	0	115,749	0
King Administration Building	48,513	0	186,784	0
McCarthy Elementary School	51,047	0	626,712	0
Potter Road Elementary School	17,559	0	169,560	0
Stapleton Elementary School	38,862	0	164,288	0
Thayer Campus of FHS	5,153	0	19,800	0
Walsh Middle School	82,771	0	572,604	0

Woodrow Wilson Elementary	36,246	0	527,660	0
DPW Headquarters	38,053	0	669,752	1,915.4
Henry Street Garage	7,549	0	42,455	116.7
Sanitation Department	1,498	0	253,560	502.0
Totals	**795,830**	**5,850**	**10,371,681**	**9,420.1**

Each ECM presented in this audit was explicitly "baselined" by a "temperature bin" analysis for temperature variant loads and by a fixed baseline for constant loads. Straightforward electrical saving ECMs such as lighting retrofits and motor replacements were analyzed by a combination of known operating hours, field measurements and engineering calculations. The baseline operating hours for each location or a portion thereof was determined from information from the Town and review of metered data acquired during the Investment Grade Audit. Energy cost savings for each ECM was calculated with the energy rates outlined in this section.

Electricity

The buildings receive electricity supply from TransCanada at a price of $0.09755 per kWh. NStar electricity delivery is charged to the Town according to five delivery rates. Each delivery rate plus the supply cost is displayed in Table 3.

Table 3: Electric Rates (includes Supply and Delivery)

Electricity Charges	On-Peak (kWh)	Off-Peak (kWh)	Electric Demand (kW)
A9 – General (without a demand meter)	$0.1985	$0.1985	$0.00
B1 – General (with a demand meter)	$0.1717	$0.1717	$0.00[3]
B2 – General	$0.1327	$0.1327	$22.94
B3 – Time of Use	$0.1125	$0.1125	$21.05
B7 – Time of Use	$0.1140	$0.1140	$20.17

Table 4: Electric Rates by Building

Facility	A9	B1	B2	B3, G6	B7, B8
Memorial Building			X		
Main Library Building				X	
Fire Department Headquarters			X		
Engine #1			X		
Engine #2	X				
Engine #5			X		
Engine #7	X				
Police Station			X		
Callahan Senior Center			X		
Pearl Street Garage			X		
Animal Control Building	X				
Old Edgell Library	X				
Academy Building	X				
Park Department Headquarters			X		

[3] Charge for demand over 10.0 kW per month only

Facility	A9	B1	B2	B3, G6	B7, B8
Barbieri Elementary School				X	
Brophy Elementary School			X		
Cameron Middle School					X
Dunning Elementary School			X		
Framingham High School					X
Hemenway Elementary School			X		
Juniper Hill Elementary School					X
King Administration Building		X			
McCarthy Elementary School					X
Potter Road Elementary School			X		
Stapleton Elementary School			X		
Thayer Campus of FHS			X		
Walsh Middle School					X
Woodrow Wilson Elementary					X
DPW Headquarters			X		
Henry Street Garage		X			
Sanitation Department - Upper			X		
Sanitation Department - Lower			X		
DPW Office			X		

Natural Gas

Natural gas is supplied by Sparks Energy and delivered to the buildings by NStar, except for at the Animal Control Building and Henry Street Garage where it is both supplied and delivered by NStar. Each delivery rate plus the supply cost is displayed in Table 5.

Table 5: Gas Rates (includes Supply and Delivery)

Natural Gas Charges	Delivery ($/Therm)	Supply ($/Therm)	Total Cost
G-41 – Low Load Factor General Service Small	$0.3538	$0.7700	$1.1238
G-42 – Low Load Factor General Service Medium	$0.3300	$0.7700	$1.1000

Table 6: Gas Rates by Building

Facility	G-41	G-42
Memorial Building		X
Main Library Building		X
Fire Department Headquarters		X
Engine #1		X
Engine #2	X	
Engine #5	X	
Engine #7	X	
Police Station		X
Callahan Senior Center		X
Pearl Street Garage	X	
Animal Control Building	X	
Old Edgell Library	X	
Academy Building	X	
Athenaeum Hall	X	
Park Department Headquarters	X	
Barbieri Elementary School		X
Brophy Elementary School		X
Cameron Middle School		X

Facility	G-41	G-42
Dunning Elementary School		X
Framingham High School		X
Hemenway Elementary School		X
Juniper Hill Elementary School		X
King Administration Building		X
McCarthy Elementary School		X
Potter Road Elementary School		X
Stapleton Elementary School		X
Thayer Campus of FHS	X	
Walsh Middle School		X
Woodrow Wilson Elementary		X
DPW Headquarters		X
Henry Street Garage	X	
Sanitation Department - Upper	X	
Sanitation Department - Lower	X	
DPW Office		X

Fuel Oil

#2 Fuel Oil is delivered to the Old Edgell Library by Holliston Oil and the Fiscal 2011 average cost per gallon was roughly $3.500.

Water & Sewer Usage

Water and sewer service is provided to the Town and School buildings by the Town. Water consumption is recorded semi-annually. The Town is paying a very low bulk rate for both Water and Sewer usage and so no water conservation measures are proposed at this time.

End-Use Breakdown

A baseline model was developed for each audited building. Fiscal year 2011 utility data as previously described was used to calibrate the model(s). The energy end-use breakdown for natural gas, fuel oil and electricity was calculated from inventoried equipment ratings, local bin weather data, operational characteristics obtained from personnel, and building envelope characteristics. Where equipment data could not be obtained, engineering experience and judgment was used. The major fuel heating end-uses found in the municipal and school buildings audited includes Space Heating, (which consist of mechanical ventilation, conduction, and infiltration), Domestic Hot Water Usage, and Cooking. Electrical usage includes Lighting, Space Cooling, HVAC Fan/Pumps, Kitchen Equipment (includes cooking appliances, refrigeration, etc.), and Office Equipment (includes computers, copiers, etc.). The remaining energy was placed in the category of "Miscellaneous Loads" and includes other plug loads.

End-Use Graphs

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End-Use Information

Memorial Building

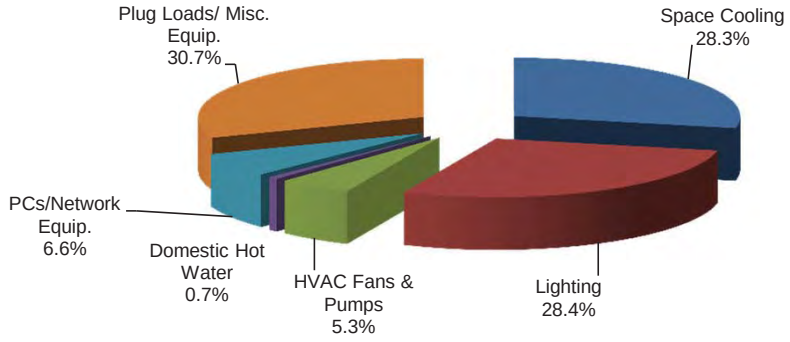
Electricity

Electricity Delivery: NSTAR
Electricity Supply: GLACIAL ENERGY
Electricity Accounts: 2654 296 1003

Fiscal Year 2011 Electrical Demand Consumption:	1,640	kW
Fiscal Year 2011 Electrical Energy Consumption:	564,960	kWh On-Peak
+	N/A	kWh Off-Peak
	564,960	kWh Total

Most Recent Fiscal Year Cost:	$	103,553	
Most Recent Year Blended Rate:	$	0.183	/ kWh

Electricity End-Use



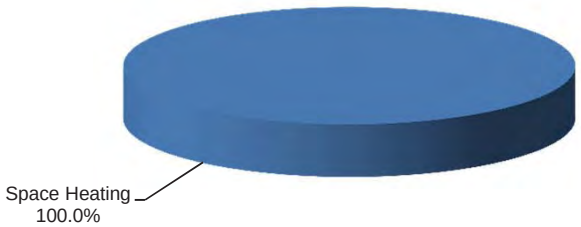
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: Direct Energy
Natural Gas Accounts: 1092 025 0015

Fiscal Year 2011 Natural Gas Consumption:	38,392	/ Therms
Incremental Consumption:	50.2	MBTU / SF

Fiscal Year 2011 Cost:	$	41,217	
Fiscal Year 2011 Blended Rate:	$	1.074	/ Therms

Natural Gas End-Use



End-Use Information

Main Library Building

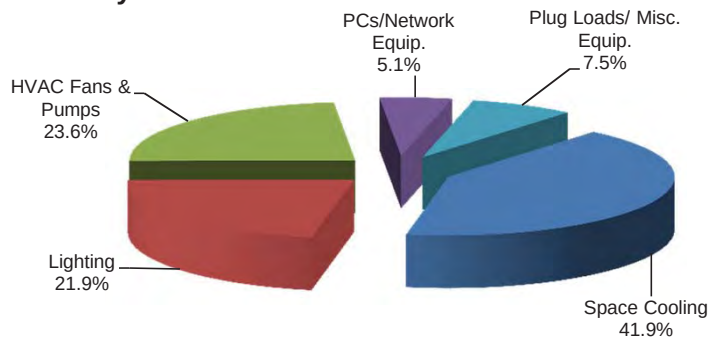
Electricity

Electricity Delivery: NSTAR
Electricity Supply: GLACIAL ENERGY
Electricity Accounts: 2654 293 1006

Fiscal Year 2011 Electrical Demand Consumption:	1,663	kW
Fiscal Year 2011 Electrical Energy Consumption:	558,300	kWh On-Peak
+	N/A	kWh Off-Peak
	558,300	kWh Total

Most Recent Fiscal Year Cost:	$ 100,191	
Most Recent Year Blended Rate:	$ 0.179	/ kWh

Electricity End-Use



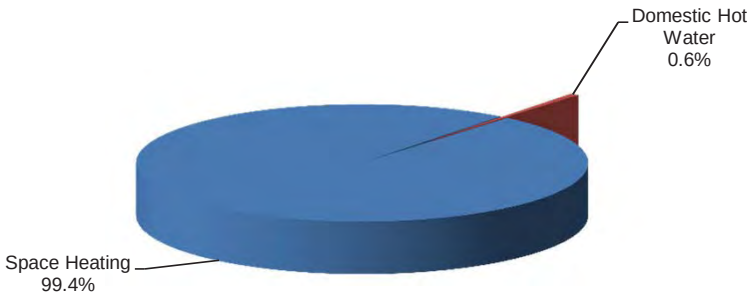
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: Direct Energy
Natural Gas Accounts: 1092 189 0017

Fiscal Year 2011 Natural Gas Consumption:	22,226	/ Therms
Incremental Consumption:	41.9	MBTU / SF

Fiscal Year 2011 Cost:	$ 23,707	
Fiscal Year 2011 Blended Rate:	$ 1.067	/ Therms

Fuel Oil End-Use



End-Use Information

Fire Department Headquarters

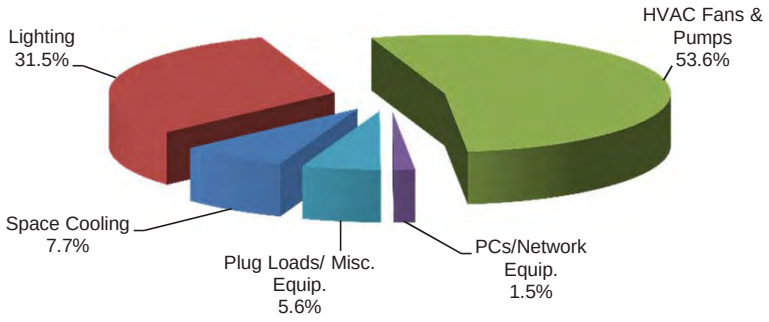
Electricity

Electricity Delivery: NSTAR
Electricity Supply: GLACIAL ENERGY
Electricity Accounts: 2654 352 1004

Fiscal Year 2011 Electrical Demand Consumption:	636	kW
Fiscal Year 2011 Electrical Energy Consumption:	261,840	kWh On-Peak
+	N/A	kWh Off-Peak
	261,840	kWh Total

Most Recent Fiscal Year Cost:	$	44,447
Most Recent Year Blended Rate:	$	0.170 / kWh

Electricity End-Use



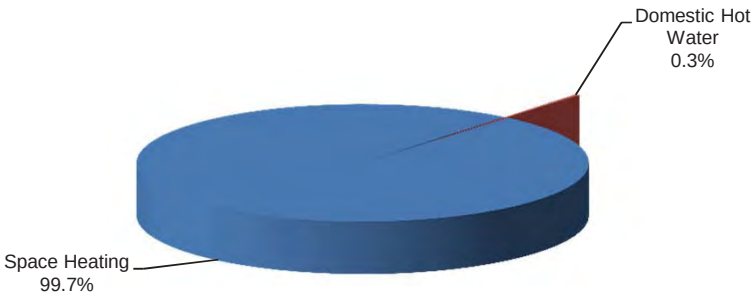
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: Direct Energy
Natural Gas Accounts: 1601 0720 015

Fiscal Year 2011 Natural Gas Consumption:	20,776	/ Therms
Incremental Consumption:	83.7	MBTU / SF

Fiscal Year 2011 Cost:	$	22,260
Fiscal Year 2011 Blended Rate:	$	1.071 / Therms

Natural Gas End-Use



End-Use Information

Engine #1

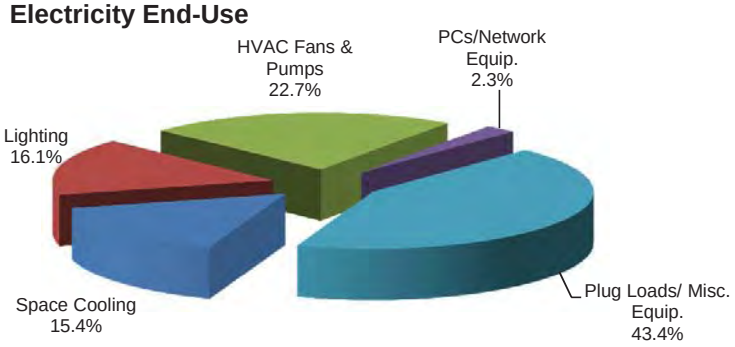
Electricity

Electricity Delivery: NSTAR
Electricity Supply: GLACIAL ENERGY
Electricity Accounts: 1098 822 1023

Fiscal Year 2011 Electrical Demand Consumption:	228	kW
Fiscal Year 2011 Electrical Energy Consumption:	100,875	kWh On-Peak
+	N/A	kWh Off-Peak
	100,875	kWh Total

Most Recent Fiscal Year Cost:	$	15,527	
Most Recent Year Blended Rate:	$	0.154	/ kWh

Electricity End-Use



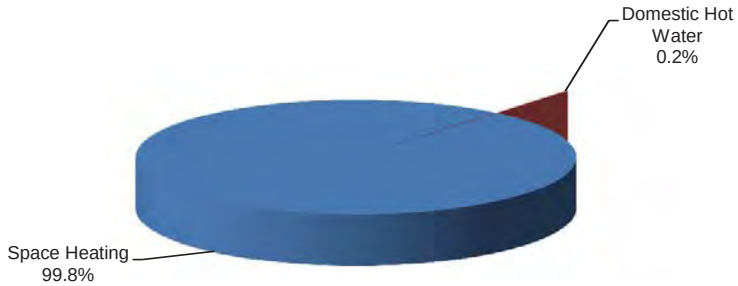
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: Direct Energy
Natural Gas Accounts: 1098 822 0017

Fiscal Year 2011 Natural Gas Consumption:	10,679	/ Therms
Incremental Consumption:	125.4	MBTU / SF

Fiscal Year 2011 Cost:	$	11,541	
Fiscal Year 2011 Blended Rate:	$	1.081	/ Therms

Natural Gas End-Use



End-Use Information

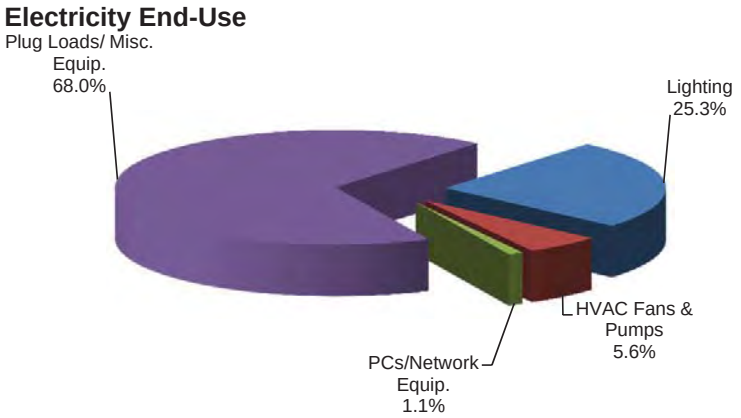
Engine #2

Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 189 1003

Fiscal Year 2011 Electrical Demand Consumption:	18	kW
Fiscal Year 2011 Electrical Energy Consumption:	34,163	kWh On-Peak
+	N/A	kWh Off-Peak
	34,163	kWh Total

Most Recent Fiscal Year Cost:	$	6,718	
Most Recent Year Blended Rate:	$	0.197	/ kWh

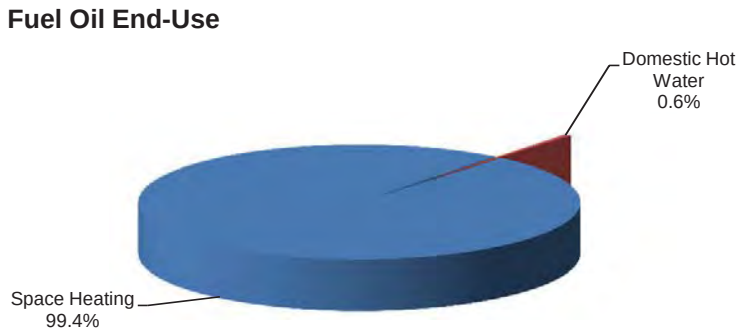


Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1091 980 0010

Fiscal Year 2011 Natural Gas Consumption:	2,898	/ Therms
Incremental Consumption:	54.4	MBTU / SF

Fiscal Year 2011 Cost:	$	3,325	
Fiscal Year 2011 Blended Rate:	$	1.147	/ Therms



End-Use Information

Engine #5

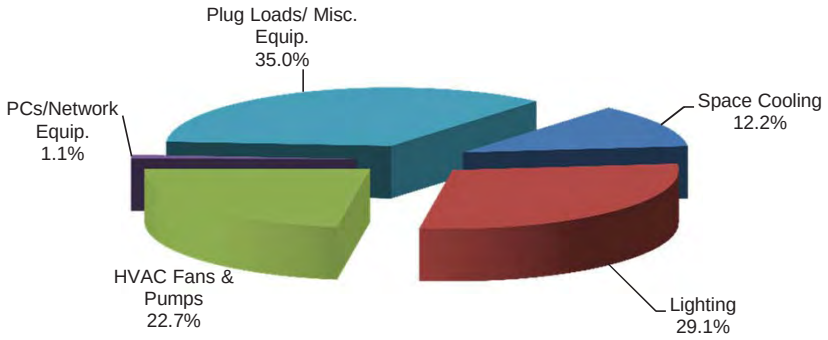
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 1091 021 1027

Fiscal Year 2011 Electrical Demand Consumption:		221	kW
Fiscal Year 2011 Electrical Energy Consumption:		69,581	kWh On-Peak
	+	N/A	kWh Off-Peak
		69,581	kWh Total

Most Recent Fiscal Year Cost:	$	11,584	
Most Recent Year Blended Rate:	$	0.166	/ kWh

Electricity End-Use



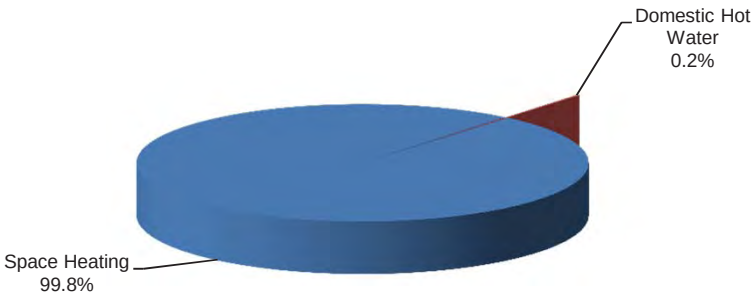
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1091 021 0011

Fiscal Year 2011 Natural Gas Consumption:		7,506	/ Therms
Incremental Consumption:		64.6	MBTU / SF

Fiscal Year 2011 Cost:	$	8,307	
Fiscal Year 2011 Blended Rate:	$	1.107	/ Therms

Natural Gas End-Use



End-Use Information

Engine #7

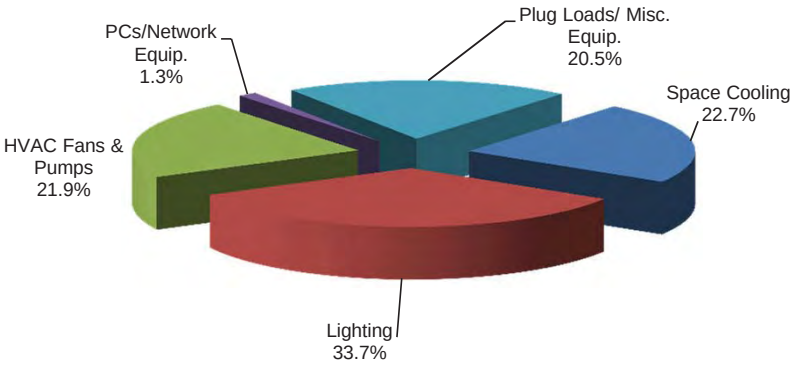
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 227 1007

Fiscal Year 2011 Electrical Demand Consumption:		N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:		28,245	kWh On-Peak
	+	N/A	kWh Off-Peak
		28,245	kWh Total

Most Recent Fiscal Year Cost:	$	5,466	
Most Recent Year Blended Rate:	$	0.194	/ kWh

Electricity End-Use



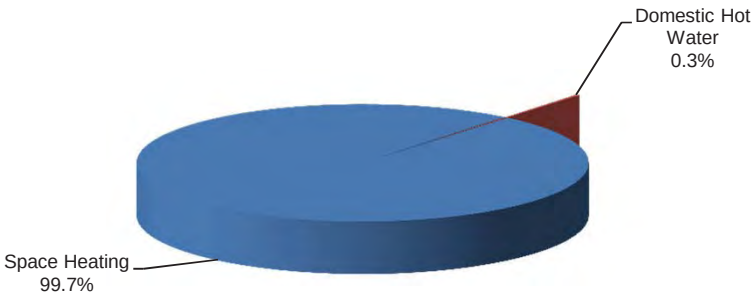
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1088 579 0013

Fiscal Year 2011 Natural Gas Consumption:		3,980	/ Therms
Incremental Consumption:		90.4	MBTU / SF

Fiscal Year 2011 Cost:	$	4,487	
Fiscal Year 2011 Blended Rate:	$	1.128	/ Therms

Natural Gas End-Use



End-Use Information

Police Station

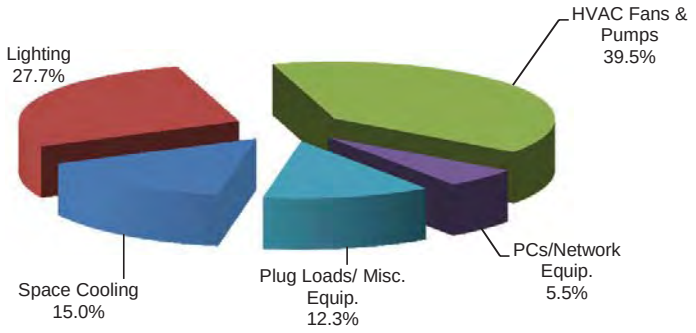
Electricity

Electricity Delivery: NSTAR
Electricity Supply: GLACIAL ENERGY
Electricity Accounts: 2824 029 0016

Fiscal Year 2011 Electrical Demand Consumption:	1,265	kW
Fiscal Year 2011 Electrical Energy Consumption:	576,000	kWh On-Peak
+	N/A	kWh Off-Peak
	576,000	kWh Total

Most Recent Fiscal Year Cost:	$	94,719	
Most Recent Year Blended Rate:	$	0.164	/ kWh

Electricity End-Use



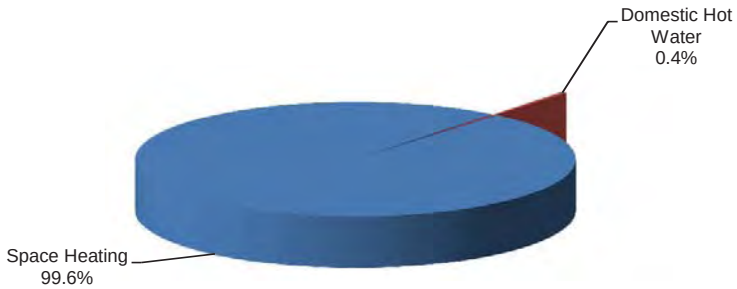
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1092 022 0026

Fiscal Year 2011 Natural Gas Consumption:	16,011	/ Therms
Incremental Consumption:	37.8	MBTU / SF

Fiscal Year 2011 Cost:	$	17,248	
Fiscal Year 2011 Blended Rate:	$	1.077	/ Therms

Natural Gas End-Use



End-Use Information

Callahan Senior Center

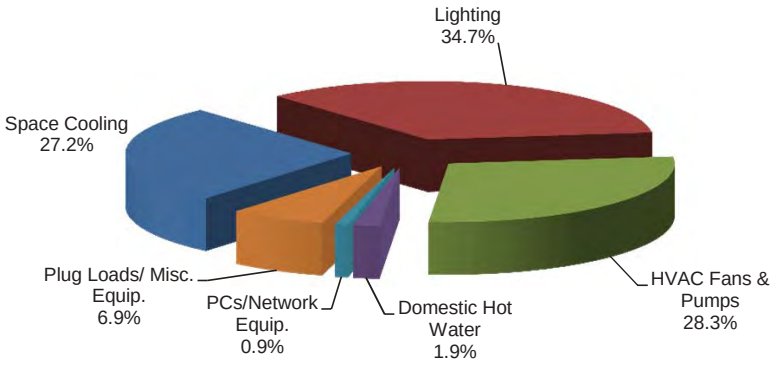
Electricity

Electricity Delivery: NSTAR
Electricity Supply: GLACIAL ENERGY
Electricity Accounts: 2647 326 1035

Fiscal Year 2011 Electrical Demand Consumption:	830	kW
Fiscal Year 2011 Electrical Energy Consumption:	208,720	kWh On-Peak
+	N/A	kWh Off-Peak
	208,720	kWh Total

Most Recent Fiscal Year Cost:	$	43,015
Most Recent Year Blended Rate:	$	0.206 / kWh

Electricity End-Use



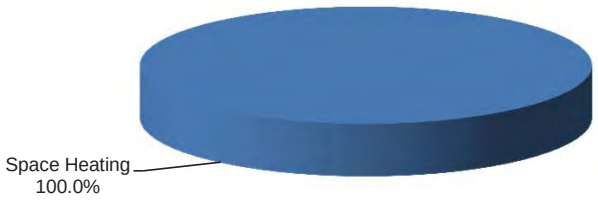
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1093 029 0050

Fiscal Year 2011 Natural Gas Consumption:	10,013	/ Therms
Incremental Consumption:	40.5	MBTU / SF

Fiscal Year 2011 Cost:	$	10,939
Fiscal Year 2011 Blended Rate:	$	1.092 / Therms

Natural Gas End-Use



End-Use Information

Pearl Street Garage

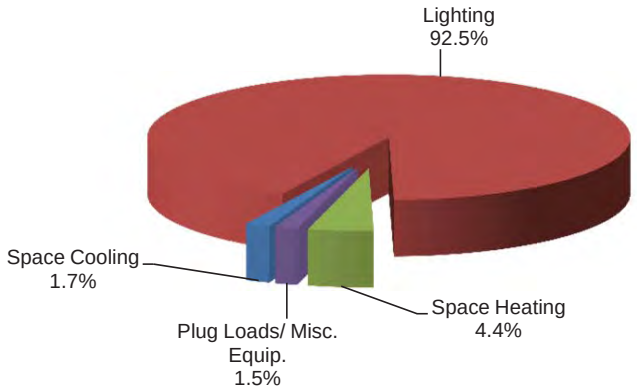
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 295 1004

Fiscal Year 2011 Electrical Demand Consumption:	181	kW
Fiscal Year 2011 Electrical Energy Consumption:	114,120	kWh On-Peak
+	N/A	kWh Off-Peak
	114,120	kWh Total

Most Recent Fiscal Year Cost:	$	15,911	
Most Recent Year Blended Rate:	$	0.139	/ kWh

Electricity End-Use



End-Use Information

Animal Control Building

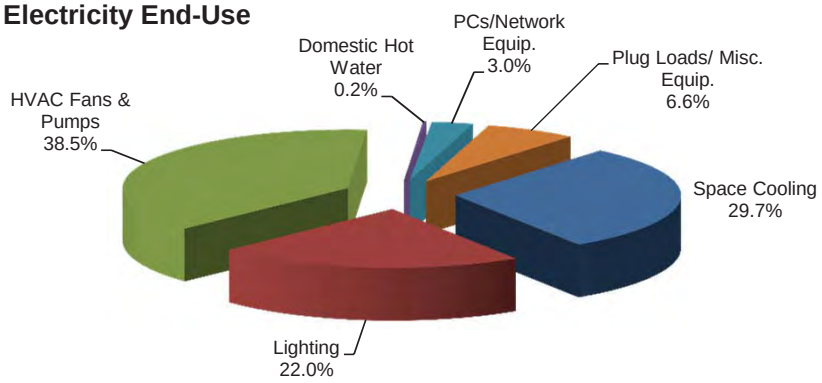
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2687 763 0017

Fiscal Year 2011 Electrical Demand Consumption:		N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:		16,987	kWh On-Peak
	+	N/A	kWh Off-Peak
		16,987	kWh Total

Most Recent Fiscal Year Cost:	$	3,381	
Most Recent Year Blended Rate:	$	0.199	/ kWh

Electricity End-Use



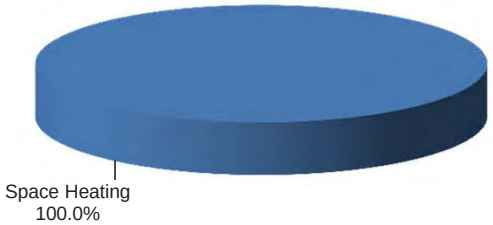
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 2691 289 0014

Fiscal Year 2011 Natural Gas Consumption:		1,629	/ Therms
Incremental Consumption:		125.3	MBTU / SF

Fiscal Year 2011 Cost:	$	1,993	
Fiscal Year 2011 Blended Rate:	$	1.223	/ Therms

Natural Gas End-Use



End-Use Information

Old Edgell Library

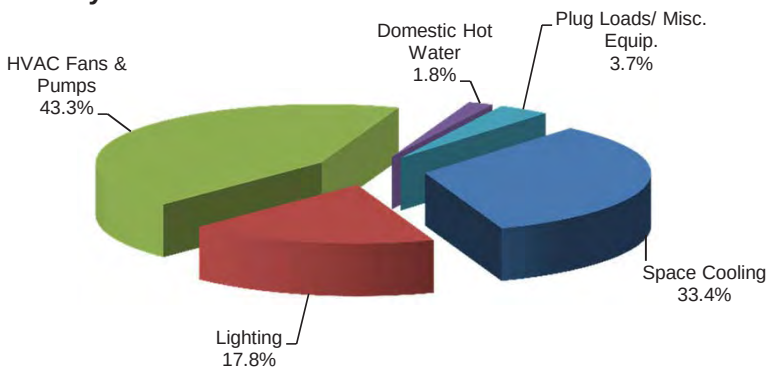
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 248 1002

Fiscal Year 2011 Electrical Demand Consumption:		N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:		22,398	kWh On-Peak
	+	N/A	kWh Off-Peak
		22,398	kWh Total

Most Recent Fiscal Year Cost:	$	4,366	
Most Recent Year Blended Rate:	$	0.195	/ kWh

Electricity End-Use



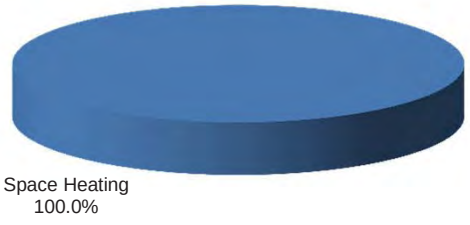
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 0

Fiscal Year 2011 Natural Gas Consumption:		-	/ Therms
Incremental Consumption:		180.3	MBTU / SF

Fiscal Year 2011 Cost:	$	-	
Fiscal Year 2011 Blended Rate:		#DIV/0!	/ Therms

Natural Gas End-Use



End-Use Information

Academy Building

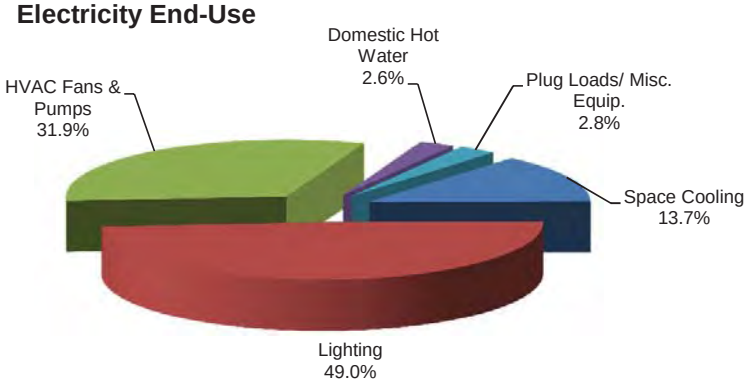
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2370 263 1005

Fiscal Year 2011 Electrical Demand Consumption:		N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:		15,351	kWh On-Peak
	+	N/A	kWh Off-Peak
		15,351	kWh Total

Most Recent Fiscal Year Cost:	$	4,364	
Most Recent Year Blended Rate:	$	0.284	/ kWh

Electricity End-Use



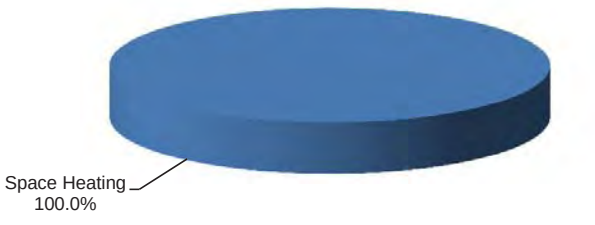
Fuel Oil

Fuel Oil Delivery: 0

Fiscal Year 2011 Fuel Oil Consumption:		N/A	Gallons
Incremental Consumption:		0	MBTU / SF

Most Recent Fiscal Year Cost:	$	-	
Most Recent Year Blended Rate:		#DIV/0!	/ gallon

Fuel Oil End-Use



End-Use Information

Park Department Headquarters

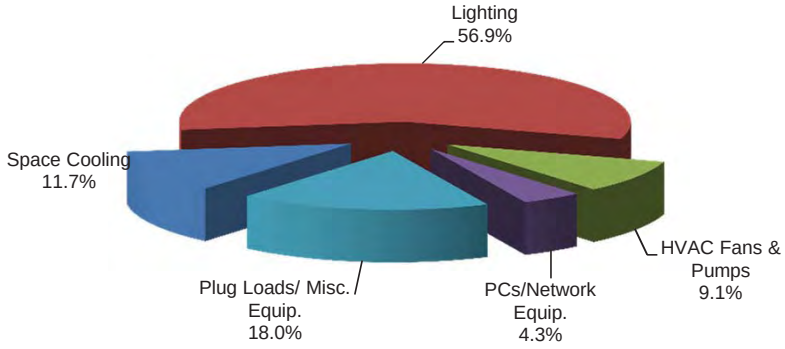
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2859 329 0019

Fiscal Year 2011 Electrical Demand Consumption:		203	kW
Fiscal Year 2011 Electrical Energy Consumption:		48,568	kWh On-Peak
	+	N/A	kWh Off-Peak
		48,568	kWh Total

Most Recent Fiscal Year Cost:	$	9,477	
Most Recent Year Blended Rate:	$	0.195	/ kWh

Electricity End-Use



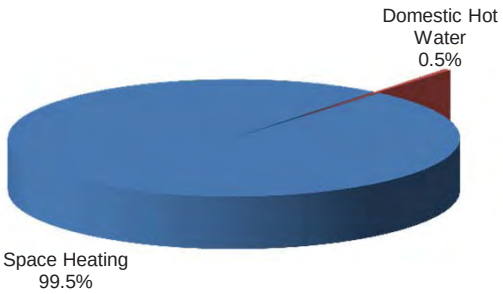
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1093 019 0011

Fiscal Year 2011 Natural Gas Consumption:		2,759	/ Therms
Incremental Consumption:		42.4	MBTU / SF

Fiscal Year 2011 Cost:	$	3,166	
Fiscal Year 2011 Blended Rate:	$	1.148	/ Therms

Natural Gas End-Use



End-Use Information

Barbieri Elementary School

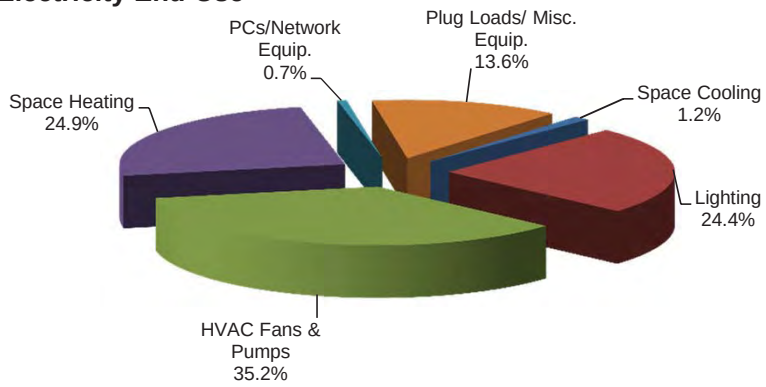
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 322 1001

Fiscal Year 2011 Electrical Demand Consumption:	N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:	921,240	kWh On-Peak
+	N/A	kWh Off-Peak
	921,240	kWh Total

Most Recent Fiscal Year Cost:	$	184,700
Most Recent Year Blended Rate:	$	0.200 / kWh

Electricity End-Use



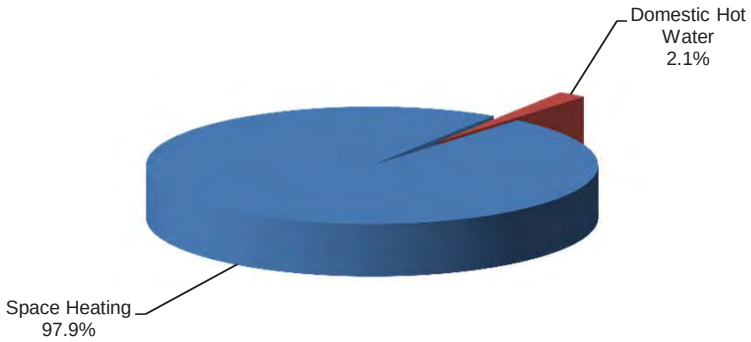
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1091 716 0011

Fiscal Year 2011 Natural Gas Consumption:	39,925	/ Therms
Incremental Consumption:	35.6	MBTU / SF

Fiscal Year 2011 Cost:	$	30,742
Fiscal Year 2011 Blended Rate:	$	0.770 / Therms

Natural Gas End-Use



End-Use Information

Brophy Elementary School

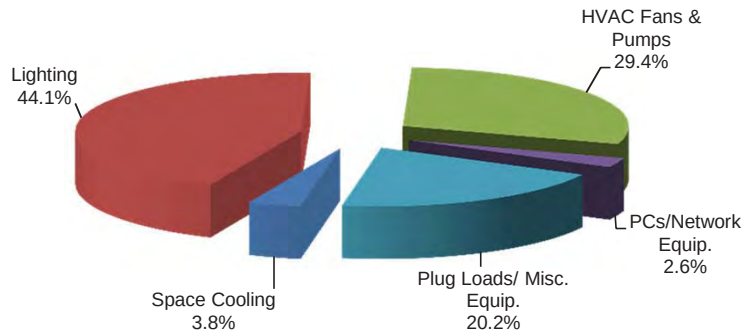
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 239 1003

Fiscal Year 2011 Electrical Demand Consumption:		N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:		239,256	kWh On-Peak
	+	N/A	kWh Off-Peak
		239,256	kWh Total

Most Recent Fiscal Year Cost:	$	45,087	
Most Recent Year Blended Rate:	$	0.188	/ kWh

Electricity End-Use



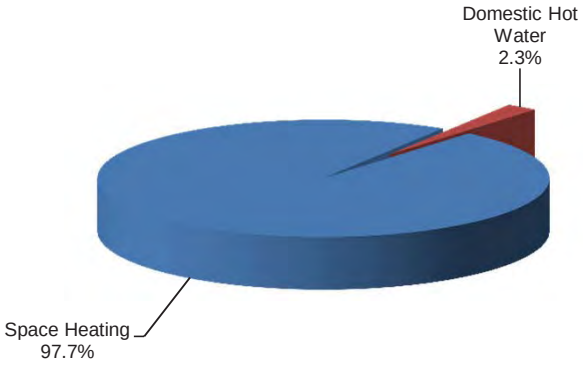
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1624 244 0010

Fiscal Year 2011 Natural Gas Consumption:		30,790	/ Therms
Incremental Consumption:		45.3	MBTU / SF

Fiscal Year 2011 Cost:	$	23,708	
Fiscal Year 2011 Blended Rate:	$	0.770	/ Therms

Natural Gas End-Use



End-Use Information

Cameron Middle School

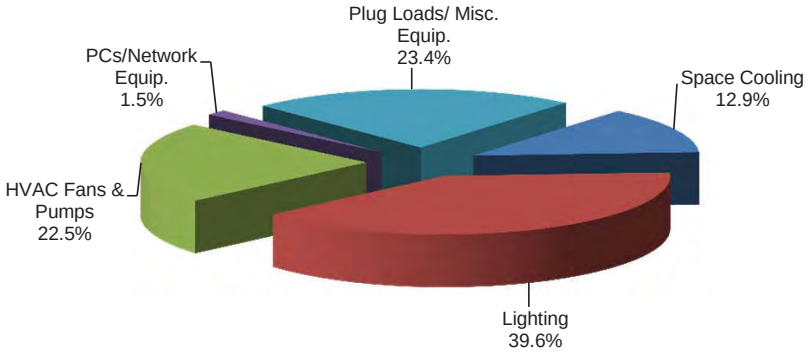
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 180 1002

Fiscal Year 2011 Electrical Demand Consumption:		N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:		642,312	kWh On-Peak
	+	N/A	kWh Off-Peak
		642,312	kWh Total

Most Recent Fiscal Year Cost:	$	158,900	
Most Recent Year Blended Rate:	$	0.247	/ kWh

Electricity End-Use



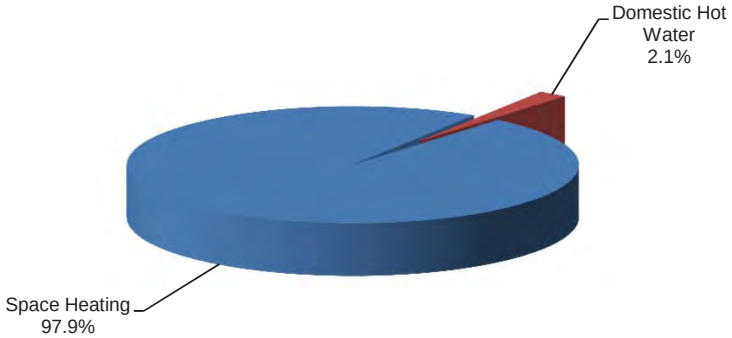
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1094 031 0039

Fiscal Year 2011 Natural Gas Consumption:		36,097	/ Therms
Incremental Consumption:		31.7	MBTU / SF

Fiscal Year 2011 Cost:	$	27,795	
Fiscal Year 2011 Blended Rate:	$	0.770	/ Therms

Natural Gas End-Use



End-Use Information

Dunning Elementary School

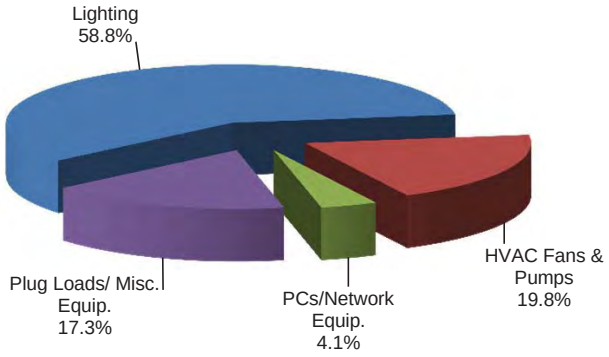
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 211 1005

Fiscal Year 2011 Electrical Demand Consumption:		N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:		140,440	kWh On-Peak
	+	N/A	kWh Off-Peak
		140,440	kWh Total

Most Recent Fiscal Year Cost:	$	25,419	
Most Recent Year Blended Rate:	$	0.181	/ kWh

Electricity End-Use



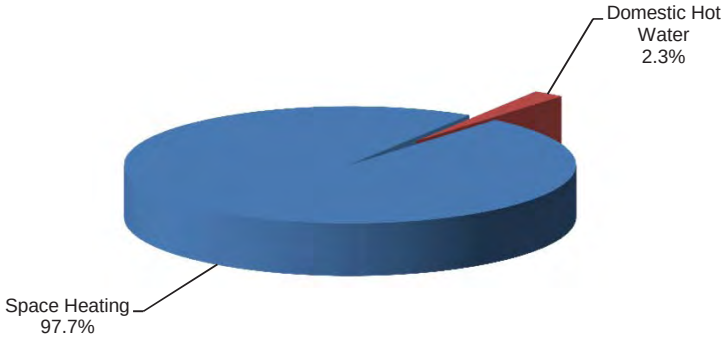
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1072 862 0021

Fiscal Year 2011 Natural Gas Consumption:		31,793	/ Therms
Incremental Consumption:		51.7	MBTU / SF

Fiscal Year 2011 Cost:	$	24,481	
Fiscal Year 2011 Blended Rate:	$	0.770	/ Therms

Natural Gas End-Use



End-Use Information

Framingham High School

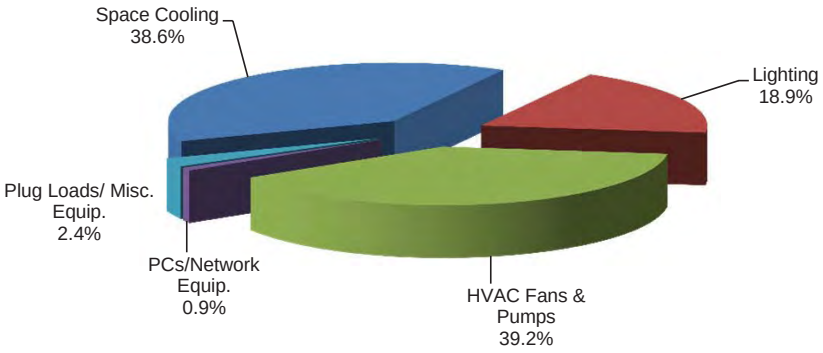
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2711 840 0012, 2711 839 0015

Fiscal Year 2011 Electrical Demand Consumption:	N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:	2,286,960	kWh On-Peak
+	N/A	kWh Off-Peak
	2,286,960	kWh Total

Most Recent Fiscal Year Cost:	$	464,158	
Most Recent Year Blended Rate:	$	0.203	/ kWh

Electricity End-Use



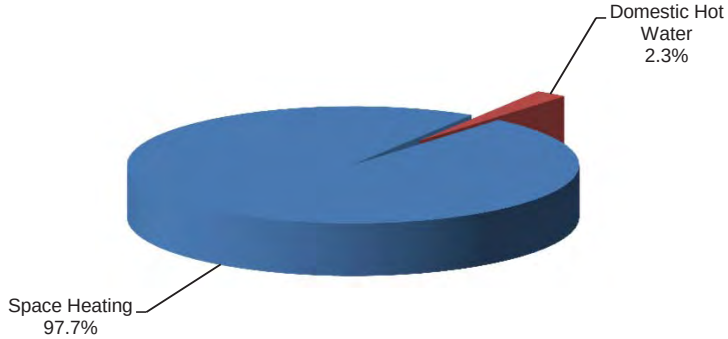
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 2721 466 0014

Fiscal Year 2011 Natural Gas Consumption:	131,795	/ Therms
Incremental Consumption:	33.3	MBTU / SF

Fiscal Year 2011 Cost:	$	101,482	
Fiscal Year 2011 Blended Rate:	$	0.770	/ Therms

Natural Gas End-Use



End-Use Information

Hemenway Elementary School

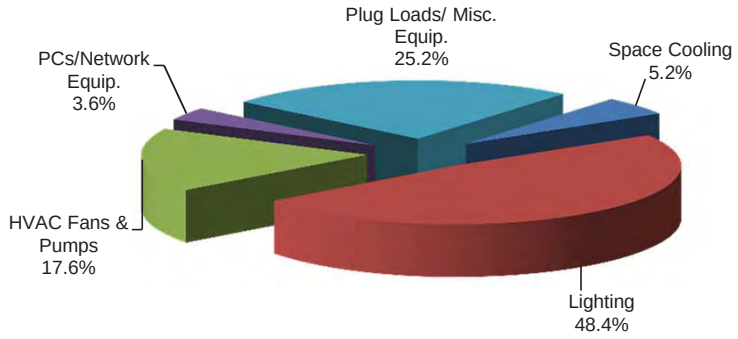
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 220 1004

Fiscal Year 2011 Electrical Demand Consumption:		N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:		172,441	kWh On-Peak
	+	N/A	kWh Off-Peak
		172,441	kWh Total

Most Recent Fiscal Year Cost:	$	32,942	
Most Recent Year Blended Rate:	$	0.191	/ kWh

Electricity End-Use



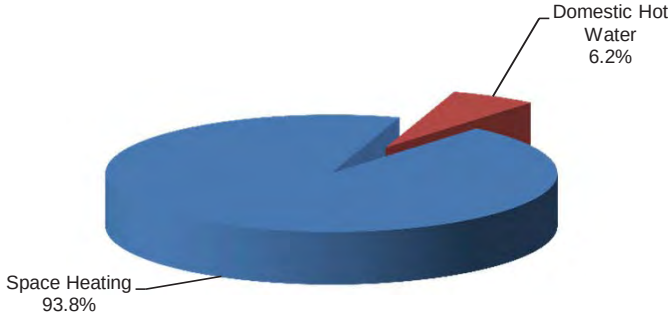
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1661 210 0012

Fiscal Year 2011 Natural Gas Consumption:		33,783	/ Therms
Incremental Consumption:		54.9	MBTU / SF

Fiscal Year 2011 Cost:	$	26,013	
Fiscal Year 2011 Blended Rate:	$	0.770	/ Therms

Natural Gas End-Use



End-Use Information

Juniper Hill Elementary School

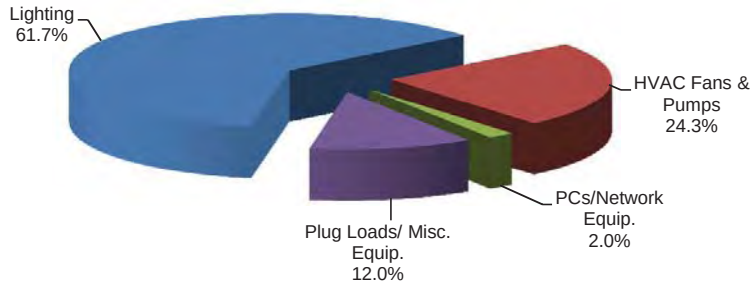
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 199 1001

Fiscal Year 2011 Electrical Demand Consumption:	N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:	115,749	kWh On-Peak
+	N/A	kWh Off-Peak
	115,749	kWh Total

Most Recent Fiscal Year Cost:	$	23,571	
Most Recent Year Blended Rate:	$	0.204	/ kWh

Electricity End-Use



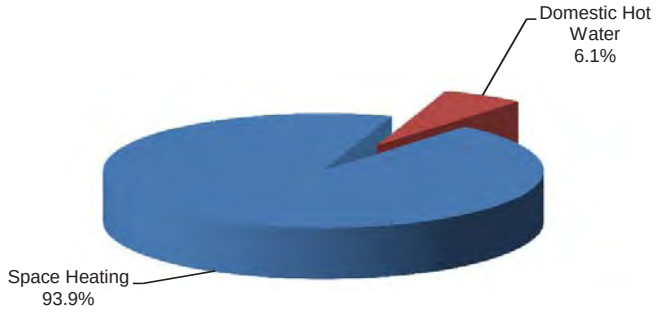
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1094 649 0017

Fiscal Year 2011 Natural Gas Consumption:	24,785	/ Therms
Incremental Consumption:	55.9	MBTU / SF

Fiscal Year 2011 Cost:	$	19,084	
Fiscal Year 2011 Blended Rate:	$	0.770	/ Therms

Natural Gas End-Use



End-Use Information

King Administration Building

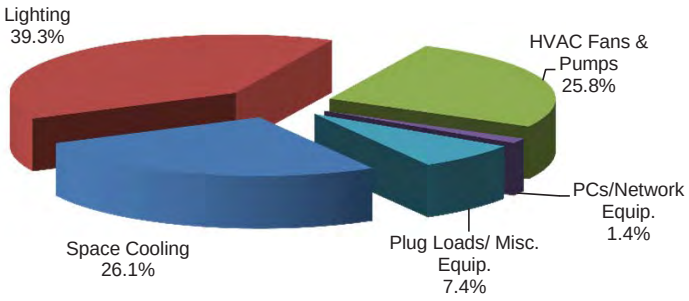
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 215 1001

Fiscal Year 2011 Electrical Demand Consumption:		N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:		186,784	kWh On-Peak
	+	N/A	kWh Off-Peak
		186,784	kWh Total

Most Recent Fiscal Year Cost:	$	37,785	
Most Recent Year Blended Rate:	$	0.202	/ kWh

Electricity End-Use



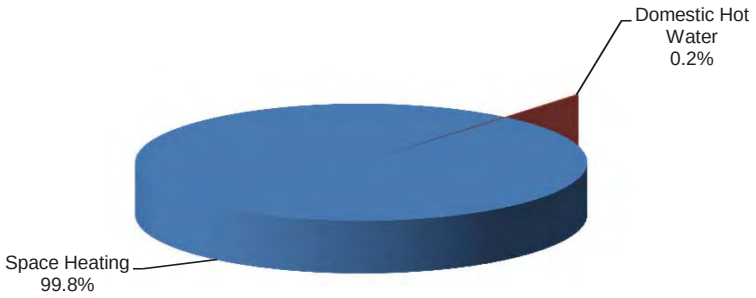
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1094 109 0010

Fiscal Year 2011 Natural Gas Consumption:		48,513	/ Therms
Incremental Consumption:		97.0	MBTU / SF

Fiscal Year 2011 Cost:	$	37,355	
Fiscal Year 2011 Blended Rate:	$	0.770	/ Therms

Natural Gas End-Use



End-Use Information

McCarthy Elementary School

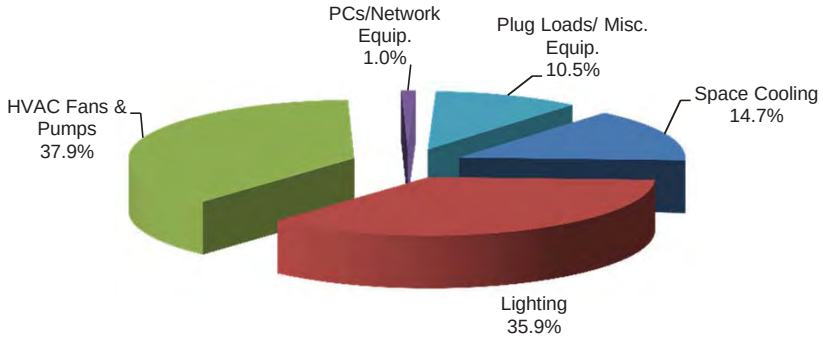
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 286 1005

Fiscal Year 2011 Electrical Demand Consumption:		N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:		626,712	kWh On-Peak
	+	N/A	kWh Off-Peak
		626,712	kWh Total

Most Recent Fiscal Year Cost:	$	120,935	
Most Recent Year Blended Rate:	$	0.193	/ kWh

Electricity End-Use



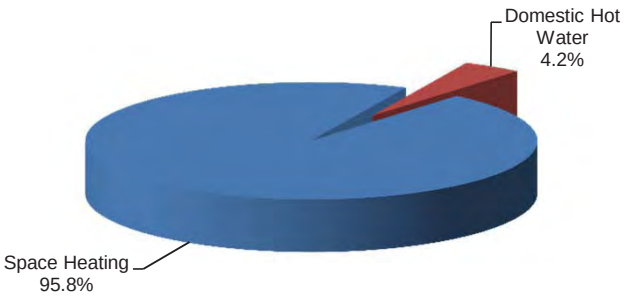
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1602 914 0023

Fiscal Year 2011 Natural Gas Consumption:		51,047	/ Therms
Incremental Consumption:		53.2	MBTU / SF

Fiscal Year 2011 Cost:	$	39,306	
Fiscal Year 2011 Blended Rate:	$	0.770	/ Therms

Natural Gas End-Use



End-Use Information

Potter Road Elementary School

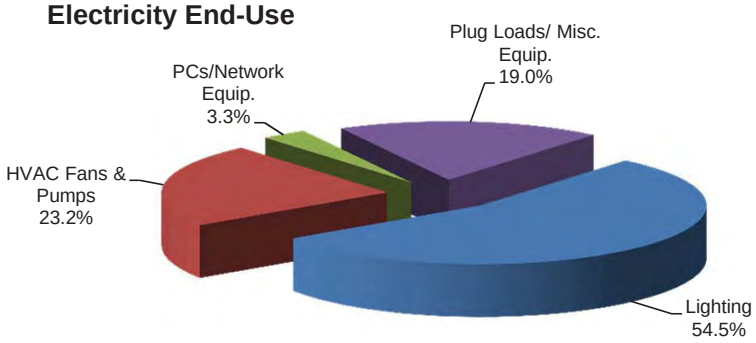
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 176 1008

Fiscal Year 2011 Electrical Demand Consumption:	N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:	169,560	kWh On-Peak
+	N/A	kWh Off-Peak
	169,560	kWh Total

Most Recent Fiscal Year Cost:	$	32,681
Most Recent Year Blended Rate:	$	0.193 / kWh

Electricity End-Use



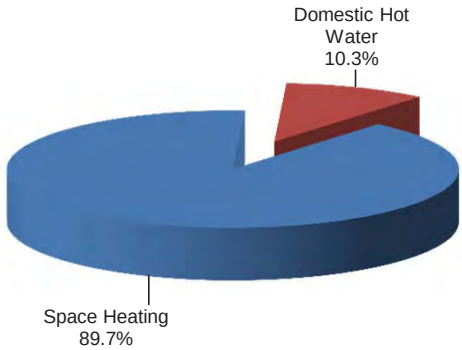
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1616 376 0016

Fiscal Year 2011 Natural Gas Consumption:	17,559	/ Therms
Incremental Consumption:	27.6	MBTU / SF

Fiscal Year 2011 Cost:	$	13,520
Fiscal Year 2011 Blended Rate:	$	0.770 / Therms

Natural Gas End-Use



End-Use Information

Stapleton Elementary School

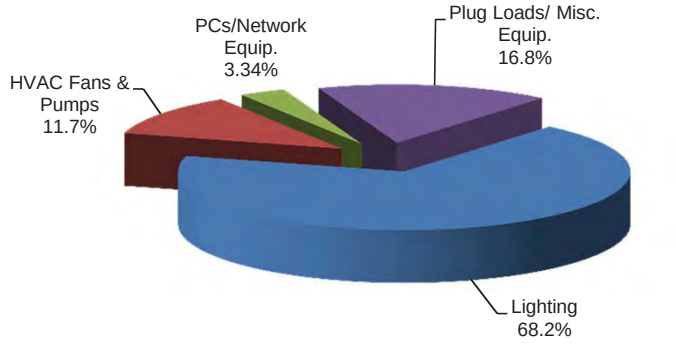
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 182 1000

Fiscal Year 2011 Electrical Demand Consumption:		N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:		164,288	kWh On-Peak
	+	N/A	kWh Off-Peak
		164,288	kWh Total

Most Recent Fiscal Year Cost:	$	32,984	
Most Recent Year Blended Rate:	$	0.201	/ kWh

Electricity End-Use



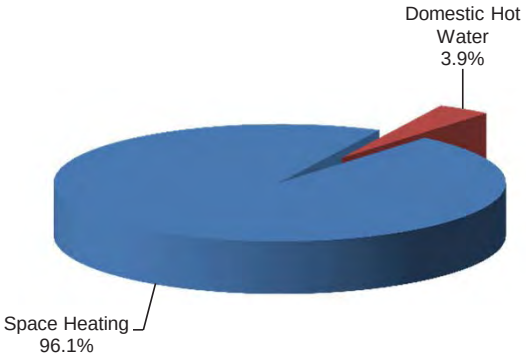
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1092 468 0019

Fiscal Year 2011 Natural Gas Consumption:		38,862	/ Therms
Incremental Consumption:		65.2	MBTU / SF

Fiscal Year 2011 Cost:	$	29,924	
Fiscal Year 2011 Blended Rate:	$	0.770	/ Therms

Natural Gas End-Use



End-Use Information

Thayer Campus of FHS

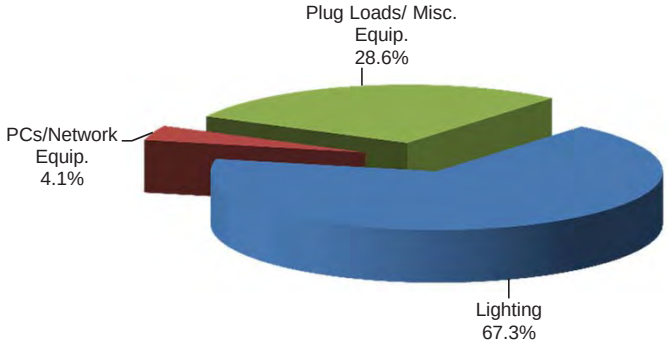
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 373 1009

Fiscal Year 2011 Electrical Demand Consumption:		N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:		19,800	kWh On-Peak
	+	N/A	kWh Off-Peak
		19,800	kWh Total

Most Recent Fiscal Year Cost:	$	3,693	
Most Recent Year Blended Rate:	$	0.187	/ kWh

Electricity End-Use



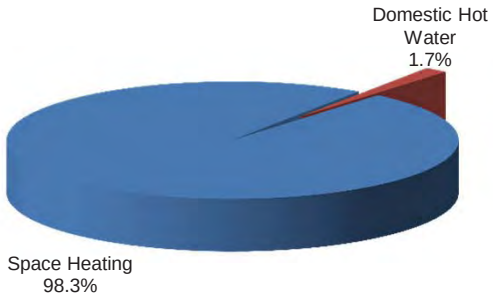
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1089 479 0020

Fiscal Year 2011 Natural Gas Consumption:	5,153	/ Therms
Incremental Consumption:	47.7	MBTU / SF

Fiscal Year 2011 Cost:	$	3,968	
Fiscal Year 2011 Blended Rate:	$	0.770	/ Therms

Natural Gas End-Use



End-Use Information

Walsh Middle School

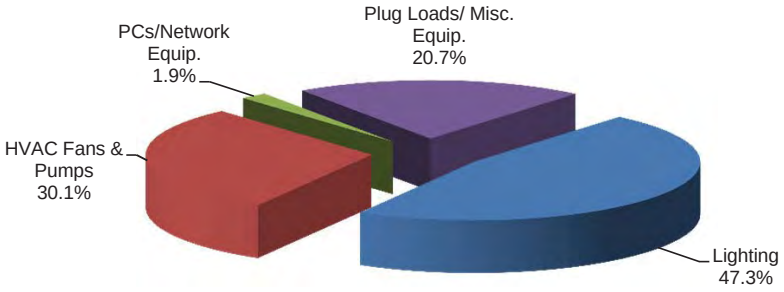
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 208 1000

Fiscal Year 2011 Electrical Demand Consumption:		N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:		572,604	kWh On-Peak
	+	N/A	kWh Off-Peak
		572,604	kWh Total

Most Recent Fiscal Year Cost:	$	112,853	
Most Recent Year Blended Rate:	$	0.197	/ kWh

Electricity End-Use



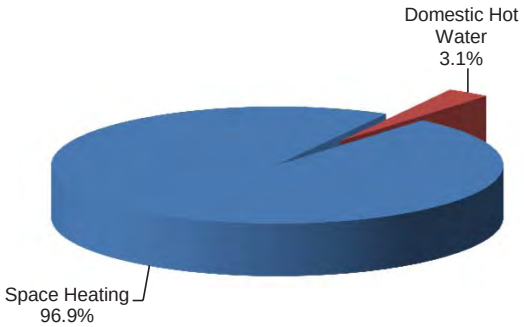
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1072 868 0025

Fiscal Year 2011 Natural Gas Consumption:		82,771	/ Therms
Incremental Consumption:		41.2	MBTU / SF

Fiscal Year 2011 Cost:	$	63,734	
Fiscal Year 2011 Blended Rate:	$	0.770	/ Therms

Natural Gas End-Use



End-Use Information

Woodrow Wilson Elementary

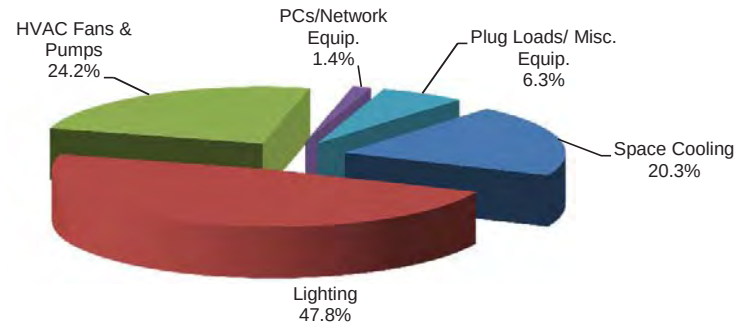
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 355 1001

Fiscal Year 2011 Electrical Demand Consumption:	N/A	kW
Fiscal Year 2011 Electrical Energy Consumption:	527,660	kWh On-Peak
+	N/A	kWh Off-Peak
	527,660	kWh Total

Most Recent Fiscal Year Cost:	$	127,553	
Most Recent Year Blended Rate:	$	0.242	/ kWh

Electricity End-Use



Fuel Oil

Fuel Oil Delivery: 0

Fiscal Year 2011 Fuel Oil Consumption:	N/A	Gallons
Incremental Consumption:	0	MBTU / SF

Most Recent Fiscal Year Cost:	$	-	
Most Recent Year Blended Rate:		#DIV/0!	/ gallon

Fuel Oil End-Use

End-Use Information

DPW Headquarters

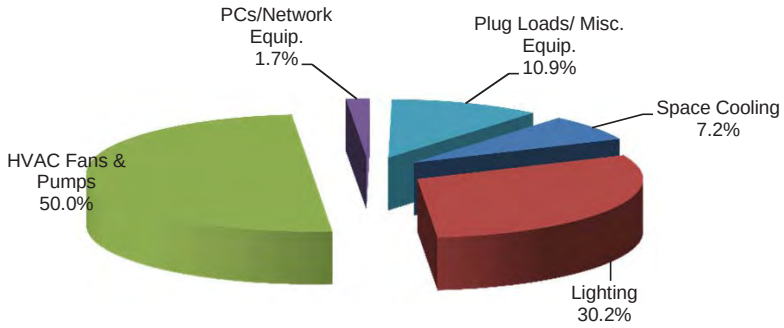
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 1613 2741 030, 2842 705 0027

Fiscal Year 2011 Electrical Demand Consumption:	1,915	kW
Fiscal Year 2011 Electrical Energy Consumption:	669,752	kWh On-Peak
+	N/A	kWh Off-Peak
	669,752	kWh Total

Most Recent Fiscal Year Cost:	$	125,617	
Most Recent Year Blended Rate:	$	0.188	/ kWh

Electricity End-Use



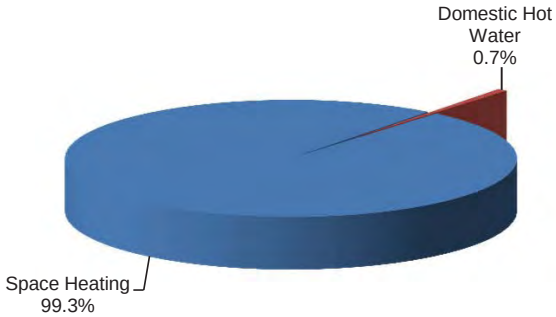
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1613 274 0024

Fiscal Year 2011 Natural Gas Consumption:	38,053	/ Therms
Incremental Consumption:	51.7	MBTU / SF

Fiscal Year 2011 Cost:	$	40,517	
Fiscal Year 2011 Blended Rate:	$	1.065	/ Therms

Natural Gas End-Use



End-Use Information

Henry Street Garage

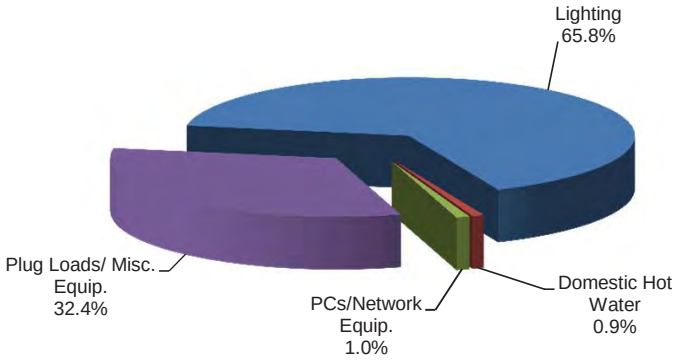
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2654 314 1001

Fiscal Year 2011 Electrical Demand Consumption:		117	kW
Fiscal Year 2011 Electrical Energy Consumption:		42,455	kWh On-Peak
	+	N/A	kWh Off-Peak
		42,455	kWh Total

Most Recent Fiscal Year Cost:	$	7,399	
Most Recent Year Blended Rate:	$	0.174	/ kWh

Electricity End-Use



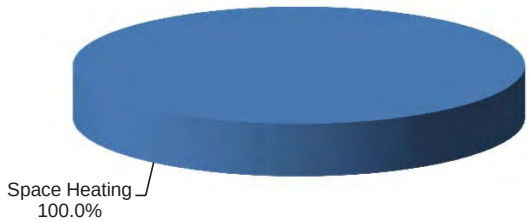
Natural Gas

Natural Gas Delivery Provider: National Grid
Natural Gas Supplier: National Grid
Natural Gas Accounts: 1092 2340 012

Fiscal Year 2011 Natural Gas Consumption:		7,549	/ Therms
Incremental Consumption:		123.1	MBTU / SF

Fiscal Year 2011 Cost:	$	14,155	
Fiscal Year 2011 Blended Rate:	$	1.875	/ Therms

Natural Gas End-Use



End-Use Information

Sanitation Department - Upper

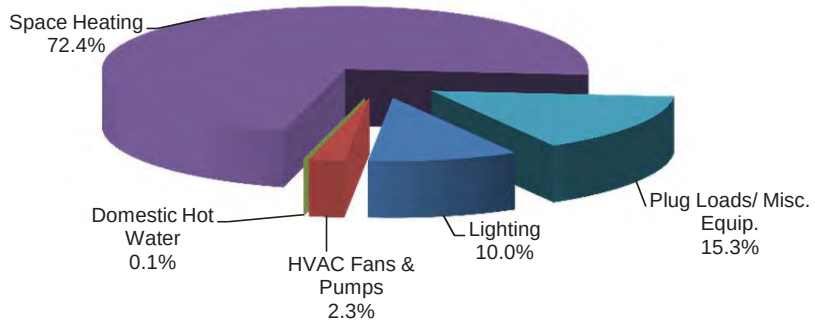
Electricity

Electricity Delivery: NSTAR
Electricity Supply: DIRECT ENERGY
Electricity Accounts: 2879 624 0019

Fiscal Year 2011 Electrical Demand Consumption:		502	kW
Fiscal Year 2011 Electrical Energy Consumption:		253,560	kWh On-Peak
	+	N/A	kWh Off-Peak
		253,560	kWh Total

Most Recent Fiscal Year Cost:	$	47,712	
Most Recent Year Blended Rate:	$	0.188	/ kWh

Electricity End-Use



IGA Baseline Information

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Town of Framingham

Utility Data Summary

Fiscal 2011

			Cost		*Annual Electric*						*Annual Fossil Fuel*					*Performance*			*Rates*			
																			Electric		*Gas*	*#2 Oil*
Facility Name	ID	GSF Area (SF)	Annual Cost ($)	Unit Cost ($/SF)	Demand (kW)	Energy Consump (Peak kWh)	Peak Energy Cost $	Total Cost	W/Sqft	kWh/Sqft	Natural Gas (Therms)	Natural Gas Cost $	#2 Oil (Gallons)	#2 Oil Cost $	Total MMbtu	kWh/Sqft	Fossil Fuel (Mbtu/Sqft)	Annual EUI (Mbtu/Sqft)	$/kW	$/kWh Peak	$/Therms	$/Gallons
Memorial Building	Memorial	76,453	$144,770	$1.89	1,640.4	564,960	$103,553	$103,553	1.8	7.4	38,392	$41,217			3,839	7.4	50.2	75.4	$0.000	$0.1833	$1.074	$0.000
Main Library Building	Library	53,000	$123,898	$2.34	1,663.0	558,300	$100,191	$100,191	2.6	10.5	22,226	$23,707			2,223	10.5	41.9	77.9	$0.000	$0.1795	$1.067	$0.000
Fire Department Headquarters	Fire_HQ	24,829	$66,707	$2.69	636.0	261,840	$44,447	$44,447	2.1	10.5	20,776	$22,260			2,078	10.5	83.7	119.7	$0.000	$0.1697	$1.071	$0.000
Engine #1	Fire_1	8,516	$27,067	$3.18	227.9	100,875	$15,527	$15,527	2.2	11.8	10,679	$11,541			1,068	11.8	125.4	165.8	$0.000	$0.1539	$1.081	$0.000
Engine #2	Fire_2	5,332	$10,043	$1.88	18.0	34,163	$6,718	$6,718	0.3	6.4	2,898	$3,325			290	6.4	54.4	76.2	$0.000	$0.1967	$1.147	$0.000
Engine #5	Fire_5	11,616	$19,891	$1.71	221.3	69,581	$11,584	$11,584	1.6	6.0	7,506	$8,307			751	6.0	64.6	85.1	$0.000	$0.1665	$1.107	$0.000
Engine #7	Fire_7	4,404	$9,953	$2.26		28,245	$5,466	$5,466	0.0	6.4	3,980	$4,487			398	6.4	90.4	112.3	$0.000	$0.1935	$1.128	$0.000
Police Station	Police	42,336	$111,967	$2.64	1,264.8	576,000	$94,719	$94,719	2.5	13.6	16,011	$17,248			1,601	13.6	37.8	84.3	$0.000	$0.1644	$1.077	$0.000
Callahan Senior Center	Senior	24,724	$53,954	$2.18	830.4	206,720	$43,015	$43,015	2.8	8.4	10,013	$10,939			1,001	8.4	40.5	69.3	$0.000	$0.2061	$1.092	$0.000
Pearl Street Garage	Garage	24,000	$15,911	$0.66	180.8	114,120	$15,911	$15,911	0.6	4.8					0	4.8	0.0	16.2	$0.000	$0.1394	$0.000	$0.000
Animal Control Building	Animal	1,300	$5,373	$4.13		16,987	$3,381	$3,381	0.0	13.1	1,629	$1,993			163	13.1	125.3	169.9	$0.000	$0.1990	$1.223	$0.000
Old Edgell Library	Edgell	4,500	$23,131	$5.14		22,398	$4,366	$4,366	0.0	5.0			5,850	$18,764	811	5.0	180.3	197.3	$0.000	$0.1949	$0.000	$3.208
Academy Building	Acad	4,515	$7,517	$1.66		15,351	$4,364	$4,364	0.0	3.4	2,742	$3,153			274	3.4	60.7	72.3	$0.000	$0.2843	$1.150	$0.000
Park Department Headquarters	Park	6,500	$12,643	$1.95	203.4	48,568	$9,477	$9,477	2.6	7.5	2,759	$3,166			276	7.5	42.4	67.9	$0.000	$0.1951	$1.148	$0.000
Barbieri Elementary School	Barberi	112,000	$215,442	$1.92		921,240	$184,700	$184,700	0.0	8.2	39,925	$30,742			3,993	8.2	35.6	63.7	$0.000	$0.2005	$0.770	$0.000
Brophy Elementary School	Brophy	68,000	$68,796	$1.01		239,256	$45,087	$45,087	0.0	3.5	30,790	$23,708			3,079	3.5	45.3	57.3	$0.000	$0.1884	$0.770	$0.000
Cameron Middle School	Cameron	114,000	$186,694	$1.64		642,312	$158,900	$158,900	0.0	5.6	36,097	$27,795			3,610	5.6	31.7	50.9	$0.000	$0.2474	$0.770	$0.000
Dunning Elementary School	Dunning	61,500	$49,899	$0.81		140,440	$25,419	$25,419	0.0	2.3	31,793	$24,481			3,179	2.3	51.7	59.5	$0.000	$0.1810	$0.770	$0.000
Framingham High School	FHS	396,000	$565,640	$1.43		2,286,960	$464,158	$464,158	0.0	5.8	131,795	$101,482			13,180	5.8	33.3	53.0	$0.000	$0.2030	$0.770	$0.000
Hemenway Elementary School	Hemenway	61,500	$58,955	$0.96		172,441	$32,942	$32,942	0.0	2.8	33,783	$26,013			3,378	2.8	54.9	64.5	$0.000	$0.1910	$0.770	$0.000
Juniper Hill Elementary School	Juniper	44,300	$42,655	$0.96		115,749	$23,571	$23,571	0.0	2.6	24,785	$19,084			2,479	2.6	55.9	64.9	$0.000	$0.2036	$0.770	$0.000
King Administration Building	King	50,000	$75,140	$1.50		186,784	$37,785	$37,785	0.0	3.7	48,513	$37,355			4,851	3.7	97.0	109.8	$0.000	$0.2023	$0.770	$0.000
McCarthy Elementary School	McCarthy	95,936	$160,241	$1.67		626,712	$120,935	$120,935	0.0	6.5	51,047	$39,306			5,105	6.5	53.2	75.5	$0.000	$0.1930	$0.770	$0.000
Potter Road Elementary School	Potter	63,600	$46,202	$0.73		169,560	$32,681	$32,681	0.0	2.7	17,559	$13,520			1,756	2.7	27.6	36.7	$0.000	$0.1927	$0.770	$0.000
Stapleton Elementary School	Stapleton	59,600	$62,908	$1.06		164,288	$32,984	$32,984	0.0	2.8	38,862	$29,924			3,886	2.8	65.2	74.6	$0.000	$0.2008	$0.770	$0.000
Thayer Campus of FHS	Thayer	10,800	$7,661	$0.71		19,800	$3,693	$3,693	0.0	1.8	5,153	$3,968			515	1.8	47.7	54.0	$0.000	$0.1865	$0.770	$0.000
Walsh Middle School	Walsh	201,000	$176,587	$0.88		572,604	$112,853	$112,853	0.0	2.8	82,771	$63,734			8,277	2.8	41.2	50.9	$0.000	$0.1971	$0.770	$0.000
Woodrow Wilson Elementary	Wilson	140,695	$155,462	$1.10		527,660	$127,553	$127,553	0.0	3.8	36,246	$27,909			3,625	3.8	25.8	38.6	$0.000	$0.2417	$0.770	$0.000
DPW Headquarters	DPW_Garage	73,638	$166,134	$2.26	1,915.4	669,752	$125,617	$125,617	2.2	9.1	38,053	$40,517			3,805	9.1	51.7	82.7	$0.000	$0.1876	$1.065	$0.000
Henry Street Garage	Henry	6,134	$21,554	$3.51	116.7	42,455	$7,399	$7,399	1.6	6.9	7,549	$14,155			755	6.9	123.1	146.7	$0.000	$0.1743	$1.875	$0.000
Sanitation Department - Upper	Sani_Upper	4,950	$50,696	$10.24	502.0	253,560	$47,712	$47,712	8.5	51.2	1,498	$2,983			150	51.2	30.3	205.1	$0.000	$0.1882	$1.992	$0.000
Sanitation Department - Lower	Sani_Lower	6,720	$0	$0.00				$0	0.0	0.0					0	0.0	0.0	0.0	$0.000	$0.0000	$0.000	$0.000
DPW Office	DPW_Office	5,040	$0	$0.00				$0	0.0	0.0					0	0.0	0.0	0.0	$0.000	$0.0000	$0.000	$0.000
Totals		**1,867,438**	**$2,743,492**	**$1.47**	**9,420.1**	**10,371,681**	**$2,046,709**	**$2,046,709**	**0.4**	**5.6**	**795,830**	**$678,019**	**5,850**	**$18,764**	**80,394**	**5.6**	**43.1**	**62.0**	**$0.000**	**$0.1973**	**$0.852**	**$3.208**

Conversions

Electricity		3,413	BTU/kWh
Natural gas		100,000	BTU/Therms
Propane		91,300	BTU/Gallons
Steam		1,000,000	BTU/Mlbs
Fuel Oil, #2		138,700	BTU/Gallons
Fuel Oil, #4		145,000	BTU/Gallons
Fuel Oil, #6		150,000	BTU/Gallons
Miscellaneous		1	BTU/Misc

Fiscal HDD	
2010	5,284
2011	5,736
2012	4,603
Average	5,208
30-yr Avg.	5,630

Utility Baseline Backup Information

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Town of Framingham

Utility Data Summary

Fiscal Year 2011

	Weather	*Electric*											*#2 Fuel Oil*			*Natural Gas*			*Total*	*Total*
Date	HDD	kW	Peak kWh	Off-Peak kWh	Total kWh	Deliv $	Sup $	Off-Peak $	Total $	$/Peak kWh	/Off-Peak kW	$/kWh Blended	Gallons	$	$/Gal	Therms	$	$/Therm	MMBtu	$
Jul-10	2	911	677,738	47,163	724,901	42,814	127,435	4,601	$174,849	$0.1880	$0.0976	$0.2412	0	$0	$0.0000	3,272	$2,996	0.9157	327	$177,845
Aug-10	3	885	653,098	31,489	684,587	45,888	111,589	3,072	$160,549	$0.1709	$0.0976	$0.2345	0	$0	$0.0000	3,153	$2,865	0.9087	315	$163,414
Sep-10	34	901	802,053	31,324	833,377	48,846	156,590	3,056	$208,491	$0.1952	$0.0976	$0.2502	0	$0	$0.0000	4,038	$3,591	0.8892	404	$212,082
Oct-10	211	743	841,616	29,751	871,367	33,779	145,457	2,902	$182,138	$0.1728	$0.0976	$0.2090	289	$783	$2.7060	25,041	$20,324	0.8116	2,544	$203,245
Nov-10	466	705	862,942	35,879	898,821	26,011	135,916	3,500	$165,426	$0.1575	$0.0976	$0.1840	519	$1,449	$2.7895	67,176	$55,199	0.8217	6,790	$222,073
Dec-10	955	719	901,969	39,108	941,077	23,576	132,055	3,815	$159,446	$0.1464	$0.0976	$0.1694	1,194	$3,429	$2.8727	138,067	$115,859	0.8392	13,972	$278,734
Jan-11	1,033	752	848,028	40,557	888,585	26,859	127,351	3,956	$158,166	$0.1502	$0.0976	$0.1780	1,061	$3,233	$3.0468	165,986	$142,150	0.8564	16,746	$303,549
Feb-11	1,185	735	958,982	40,244	999,226	27,901	140,429	3,926	$172,256	$0.1464	$0.0976	$0.1724	1,006	$3,342	$3.3215	161,234	$139,150	0.8630	16,263	$314,748
Mar-11	826	700	854,607	42,113	896,720	25,195	128,257	4,108	$157,560	$0.1501	$0.0976	$0.1757	1,116	$3,997	$3.5825	116,369	$99,883	0.8583	11,792	$261,440
Apr-11	599	688	896,848	31,082	927,930	25,055	132,366	3,032	$160,452	$0.1476	$0.0976	$0.1729	386	$1,477	$3.8260	73,810	$63,318	0.8579	7,435	$225,248
May-11	344	753	745,836	21,899	767,735	24,887	122,111	2,136	$149,134	$0.1637	$0.0976	$0.1943	279	$1,055	$3.7830	29,548	$25,491	0.8627	2,993	$175,680
Jun-11	62	927	906,463	30,892	937,355	37,668	157,559	3,014	$198,241	$0.1738	$0.0976	$0.2115	0	$0	$0.0000	8,136	$7,194	0.8842	814	$205,435
Totals	**5,719**	**9,420**	**9,950,180**	**421,501**	**10,371,681**	**$388,478**	**$1,617,113**	**$41,117**	**$2,046,709**	**$0.1625**	**$0.0976**	**$0.1973**	**5,850**	**$18,764**	**$3.2075**	**795,830**	**$678,019**	**$0.8520**	**80,394**	**$2,743,492**

Town of Framingham

Utility Data Summary - Town Buildings

Fiscal Year 2011

	Weather	*Electric*									*#2 Fuel Oil*			*Natural Gas*			*Total*	*Total*
Date	HDD	kW	Peak kWh	Off-Peak kWh	Total kWh	Deliv $	Sup $	Off-Peak $	Total $	$/kWh Blended	Gallons	$	$/Gal	Therms	$	$/Therm	MMBtu	$
Jul-10	2	911	294,627	47,163	341,790	33,168	28,741	4,601	$66,510	$0.1946	0	$0	$0.0000	768	$1,068	1.3907	77	$67,578
Aug-10	3	885	304,617	31,489	336,106	36,219	29,715	3,072	$69,006	$0.2053	0	$0	$0.0000	542	$855	1.5771	54	$69,861
Sep-10	34	901	268,675	31,324	299,999	35,493	26,209	3,056	$64,758	$0.2159	0	$0	$0.0000	804	$1,100	1.3688	80	$65,858
Oct-10	211	743	225,645	29,751	255,396	23,442	22,012	2,902	$48,356	$0.1893	289	$783	$2.7060	4,081	$4,185	1.0254	448	$53,323
Nov-10	466	705	243,737	35,879	279,616	18,344	23,777	3,500	$45,621	$0.1632	519	$1,449	$2.7895	11,703	$12,484	1.0668	1,242	$59,554
Dec-10	955	719	246,076	39,108	285,184	18,210	24,005	3,815	$46,030	$0.1614	1,194	$3,429	$2.8727	29,056	$31,921	1.0986	3,071	$81,380
Jan-11	1,033	752	279,808	40,557	320,365	20,609	27,295	3,956	$51,861	$0.1619	1,061	$3,233	$3.0468	41,065	$45,961	1.1192	4,254	$101,055
Feb-11	1,185	735	278,717	40,244	318,961	20,755	27,189	3,926	$51,870	$0.1626	1,006	$3,342	$3.3215	41,952	$47,303	1.1275	4,335	$102,515
Mar-11	826	700	246,623	42,113	288,736	18,967	24,058	4,108	$47,133	$0.1632	1,116	$3,997	$3.5825	27,854	$31,726	1.1390	2,940	$82,857
Apr-11	599	688	266,738	31,082	297,820	19,032	26,020	3,032	$48,084	$0.1615	386	$1,477	$3.8260	16,756	$19,386	1.1570	1,729	$68,948
May-11	344	753	222,464	21,899	244,363	18,972	21,701	2,136	$42,810	$0.1752	279	$1,055	$3.7830	9,331	$9,924	1.0635	972	$53,788
Jun-11	62	927	286,647	30,892	317,539	30,432	27,962	3,014	$61,408	$0.1934	0	$0	$0.0000	2,799	$3,085	1.1020	280	$64,493
Totals	**5,719**	**9,420**	**3,164,374**	**421,501**	**3,585,875**	**$293,645**	**$308,685**	**$41,117**	**$643,447**	**$0.1794**	**5,850**	**$18,764**	**$3.2075**	**186,711**	**$208,998**	**$1.1194**	**19,483**	**$871,209**

Town of Framingham

Utility Data Summary - School Buildings

Fiscal Year 2011

	Weather	*Electric*			*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Total $	$/kWh Blended	Therms	$	$/Therm	MMBtu	$
Jul-10	2	383,111	$ 108,339	$0.2828	2,504	$ 1,928	0.7700	250	$110,267
Aug-10	3	348,481	$ 91,543	$0.2627	2,611	$ 2,010	0.7700	261	$93,553
Sep-10	34	533,378	$ 143,733	$0.2695	3,234	$ 2,490	0.7700	323	$146,223
Oct-10	211	615,971	$ 133,782	$0.2172	20,960	$ 16,139	0.7700	2,096	$149,921
Nov-10	466	619,205	$ 119,806	$0.1935	55,473	$ 42,714	0.7700	5,547	$162,520
Dec-10	955	655,893	$ 113,416	$0.1729	109,011	$ 83,938	0.7700	10,901	$197,355
Jan-11	1,033	568,220	$ 106,305	$0.1871	124,921	$ 96,189	0.7700	12,492	$202,494
Feb-11	1,185	680,265	$ 120,386	$0.1770	119,282	$ 91,847	0.7700	11,928	$212,233
Mar-11	826	607,984	$ 110,426	$0.1816	88,515	$ 68,157	0.7700	8,852	$178,583
Apr-11	599	630,110	$ 112,368	$0.1783	57,054	$ 43,932	0.7700	5,705	$156,300
May-11	344	523,372	$ 106,325	$0.2032	20,217	$ 15,567	0.7700	2,022	$121,892
Jun-11	62	619,816	$ 136,832	$0.2208	5,337	$ 4,109	0.7700	534	$140,942
Totals	**5,719**	**6,785,806**	**$1,403,262**	**$0.2068**	**609,119**	**$469,022**	**$0.7700**	**60,912**	**$1,872,283**

Town of Framingham

Utility Data Summary - Memorial Building

Fiscal Year 2011

	Weather	*Electric*						*Natural Gas*			*Total*	*Total*
Date	HDD	kW	Total kWh	Deliv $	Sup $	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	166	48,240	$6,369	$4,706	$11,075	$0.23	189	$206	$1.09	19	$11,281
Aug-10	3	151	52,680	$6,083	$5,139	$11,222	$0.21	0	$30	$0.00	0	$11,252
Sep-10	34	154	47,400	$6,026	$4,624	$10,650	$0.22	0	$30	$0.00	0	$10,680
Oct-10	211	126	42,600	$3,959	$4,156	$8,115	$0.19	208	$224	$1.08	21	$8,338
Nov-10	466	126	44,880	$2,838	$4,378	$7,216	$0.16	2,218	$2,261	$1.02	222	$9,477
Dec-10	955	131	45,360	$2,919	$4,425	$7,344	$0.16	7,853	$8,267	$1.05	785	$15,612
Jan-11	1,033	150	50,880	$3,435	$4,963	$8,399	$0.17	9,310	$9,985	$1.07	931	$18,383
Feb-11	1,185	131	48,840	$3,219	$4,764	$7,983	$0.16	9,505	$10,276	$1.08	951	$18,259
Mar-11	826	121	44,160	$2,942	$4,308	$7,250	$0.16	5,734	$6,211	$1.08	573	$13,461
Apr-11	599	113	58,800	$3,251	$5,736	$8,987	$0.15	3,347	$3,638	$1.09	335	$12,625
May-11	344	113	34,200	$2,528	$3,336	$5,864	$0.17	28	$58	$2.07	3	$5,922
Jun-11	62	160	46,920	$4,871	$4,577	$9,448	$0.20	0	$30	$0.00	0	$9,478
Totals	**5,719**	**1,640**	**564,960**	**$48,441**	**$55,112**	**$103,553**	**$0.18**	**38,392**	**$41,217**	**$1.07**	**3,839**	**$144,770**

Town of Framingham

Utility Data Summary - Main Library Building

Fiscal Year 2011

	Weather	*Electric*								*Natural Gas*		*Total*	*Total*
Date	HDD	kW	Peak kWh	Off-Peak kWh	Total kWh	Deliv $	Sup $	Total $	$/kWh Blended	Therm	$	MMBtu	$
Jul-10	2	169	27,647	40,273	67,920	$5,319	$2,697	$11,944	$0.18	0	$30	0	$11,975
Aug-10	3	170	25,117	25,043	50,160	$5,189	$2,450	$10,082	$0.20	0	$30	0	$10,112
Sep-10	34	171	24,302	24,478	48,780	$5,212	$2,371	$9,971	$0.20	0	$30	0	$10,001
Oct-10	211	154	29,053	23,207	52,260	$4,067	$2,834	$9,165	$0.18	1,264	$1,207	126	$10,373
Nov-10	466	127	28,756	20,024	48,780	$3,180	$2,805	$7,939	$0.16	2,159	$2,196	216	$10,135
Dec-10	955	111	22,157	16,843	39,000	$2,798	$2,161	$6,602	$0.17	3,739	$3,952	374	$10,554
Jan-11	1,033	105	21,831	17,649	39,480	$2,789	$2,130	$6,640	$0.17	4,467	$4,798	447	$11,438
Feb-11	1,185	103	21,870	17,490	39,360	$2,572	$2,133	$6,412	$0.16	4,206	$4,564	421	$10,976
Mar-11	826	99	22,372	19,328	41,700	$2,530	$2,182	$6,598	$0.16	3,127	$3,401	313	$9,999
Apr-11	599	98	21,815	16,525	38,340	$2,465	$2,128	$6,205	$0.16	1,991	$2,176	199	$8,382
May-11	344	146	25,691	15,169	40,860	$3,675	$2,506	$7,661	$0.19	851	$885	85	$8,546
Jun-11	62	210	27,845	23,815	51,660	$5,933	$2,716	$10,972	$0.21	422	$436	42	$11,408
Totals	**5,719**	**1,663**	**298,456**	**259,844**	**558,300**	**$45,729**	**$29,114**	**$100,191**	**$0.18**	**22,226**	**$23,707**	**2,223**	**$123,898**

Town of Framingham

Utility Data Summary - Fire Department Headquarters

Fiscal Year 2011

	Weather	*Electric*						*Natural Gas*			*Total*	*Total*
Date	HDD	kW	Total kWh	Deliv $	Sup $	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	61	25,040	$2,342	$2,443	$4,784	$0.19	129	$150	$1.17	13	$4,935
Aug-10	3	63	27,280	$2,518	$2,661	$5,179	$0.19	110	$133	$1.21	11	$5,312
Sep-10	34	64	24,560	$2,474	$2,396	$4,870	$0.20	144	$164	$1.14	14	$5,035
Oct-10	211	58	19,200	$1,695	$1,873	$3,568	$0.19	511	$506	$0.99	51	$4,074
Nov-10	466	50	19,360	$1,094	$1,889	$2,982	$0.15	1,341	$1,379	$1.03	134	$4,361
Dec-10	955	42	20,240	$1,001	$1,974	$2,975	$0.15	2,983	$3,159	$1.06	298	$6,135
Jan-11	1,033	49	22,320	$1,200	$2,177	$3,378	$0.15	4,081	$4,381	$1.07	408	$7,759
Feb-11	1,185	49	22,480	$1,257	$2,193	$3,450	$0.15	4,286	$4,650	$1.08	429	$8,100
Mar-11	826	44	18,960	$1,084	$1,850	$2,934	$0.15	3,334	$3,624	$1.09	333	$6,558
Apr-11	599	41	19,440	$1,052	$1,896	$2,948	$0.15	2,247	$2,452	$1.09	225	$5,401
May-11	344	55	19,840	$1,272	$1,935	$3,208	$0.16	1,332	$1,363	$1.02	133	$4,571
Jun-11	62	62	23,120	$1,914	$2,255	$4,170	$0.18	278	$297	$1.07	28	$4,467
Totals	**5,719**	**636**	**261,840**	**$18,905**	**$25,542**	**$44,447**	**$0.17**	**20,776**	**$22,260**	**$1.07**	**2,078**	**$66,707**

Town of Framingham

Utility Data Summary - Engine #1

Fiscal Year 2011

	Weather	*Electric*						*Natural Gas*			*Total*	*Total*
Date	HDD	kW	Total kWh	Deliv $	Sup $	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	24	11,170	$772	$1,090	$1,862	$0.17	93	$117	$1.26	9	$1,979
Aug-10	3	22	11,256	$752	$1,098	$1,850	$0.16	93	$117	$1.26	9	$1,967
Sep-10	34	23	9,827	$735	$959	$1,694	$0.17	136	$157	$1.15	14	$1,851
Oct-10	211	19	7,848	$475	$766	$1,241	$0.16	502	$498	$0.99	50	$1,738
Nov-10	466	18	7,546	$333	$736	$1,070	$0.14	882	$912	$1.03	88	$1,981
Dec-10	955	16	7,247	$304	$707	$1,011	$0.14	1,570	$1,677	$1.07	157	$2,688
Jan-11	1,033	19	7,900	$380	$771	$1,151	$0.15	1,708	$1,854	$1.09	171	$3,005
Feb-11	1,185	17	7,923	$363	$773	$1,136	$0.14	2,115	$2,310	$1.09	212	$3,446
Mar-11	826	17	6,957	$345	$679	$1,024	$0.15	1,302	$1,434	$1.10	130	$2,457
Apr-11	599	17	7,425	$349	$724	$1,073	$0.14	1,338	$1,473	$1.10	134	$2,546
May-11	344	16	7,363	$341	$718	$1,059	$0.14	741	$772	$1.04	74	$1,831
Jun-11	62	21	8,413	$535	$821	$1,355	$0.16	199	$221	$1.11	20	$1,577
Totals	**5,719**	**228**	**100,875**	**$5,686**	**$9,840**	**$15,527**	**$0.15**	**10,679**	**$11,541**	**$1.08**	**1,068**	**$27,067**

Town of Framingham

Utility Data Summary - Engine #2

Fiscal Year 2011

	Weather	*Electric*						*Natural Gas*			*Total*	*Total*
Date	HDD	kW	Total kWh	Deliv $	Sup $	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	1	4,798	$530	$468	$998	$0.21	29	$44	$1.52	3	$1,042
Aug-10	3	1	3,323	$377	$324	$701	$0.21	24	$39	$1.63	2	$740
Sep-10	34	1	2,713	$312	$265	$576	$0.21	29	$44	$1.52	3	$620
Oct-10	211	1	2,616	$258	$255	$513	$0.20	46	$61	$1.32	5	$574
Nov-10	466	1	2,326	$205	$227	$432	$0.19	173	$195	$1.13	17	$627
Dec-10	955	0	2,795	$242	$273	$515	$0.18	417	$463	$1.11	42	$977
Jan-11	1,033	2	2,967	$264	$289	$553	$0.19	596	$665	$1.12	60	$1,218
Feb-11	1,185	1	2,862	$260	$279	$539	$0.19	707	$794	$1.12	71	$1,334
Mar-11	826	1	2,574	$236	$251	$487	$0.19	476	$540	$1.13	48	$1,027
Apr-11	599	2	2,314	$214	$226	$440	$0.19	262	$304	$1.16	26	$744
May-11	344	3	2,428	$224	$237	$461	$0.19	102	$123	$1.21	10	$584
Jun-11	62	3	2,447	$264	$239	$503	$0.21	37	$53	$1.44	4	$556
Totals	**5,719**	**18**	**34,163**	**$3,386**	**$3,333**	**$6,718**	**$0.20**	**2,898**	**$3,325**	**$1.15**	**290**	**$10,043**

Town of Framingham

Utility Data Summary - Engine #5

Fiscal Year 2011

	Weather	*Electric*						*Natural Gas*			*Total*	*Total*
Date	HDD	kW	Total kWh	Deliv $	Sup $	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	25	9,827	$776	$959	$1,735	$0.18	46	$61	$1.32	5	$1,796
Aug-10	3	26	10,308	$834	$1,006	$1,839	$0.18	39	$54	$1.38	4	$1,893
Sep-10	34	24	7,950	$707	$776	$1,482	$0.19	55	$70	$1.27	6	$1,552
Oct-10	211	17	4,744	$333	$463	$795	$0.17	185	$199	$1.07	19	$994
Nov-10	466	16	4,375	$227	$427	$654	$0.15	679	$722	$1.06	68	$1,376
Dec-10	955	15	4,297	$218	$419	$637	$0.15	1,124	$1,221	$1.09	112	$1,858
Jan-11	1,033	16	4,992	$253	$487	$739	$0.15	1,505	$1,657	$1.10	151	$2,397
Feb-11	1,185	17	4,848	$282	$473	$754	$0.16	1,611	$1,790	$1.11	161	$2,545
Mar-11	826	15	4,100	$223	$400	$623	$0.15	1,214	$1,353	$1.11	121	$1,976
Apr-11	599	18	4,250	$269	$415	$684	$0.16	720	$809	$1.12	72	$1,492
May-11	344	14	3,900	$210	$380	$590	$0.15	216	$242	$1.12	22	$833
Jun-11	62	21	5,990	$465	$584	$1,049	$0.18	112	$130	$1.16	11	$1,179
Totals	**5,719**	**221**	**69,581**	**$4,797**	**$6,788**	**$11,584**	**$0.17**	**7,506**	**$8,307**	**$1.11**	**751**	**$19,891**

Town of Framingham

Utility Data Summary - Engine #7

Fiscal Year 2011

	Weather	*Electric*					*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Deliv $	Sup $	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	3,538	$384	$345	$729	$0.21	26	$41	$1.58	3	$770
Aug-10	3	3,080	$339	$300	$639	$0.21	26	$41	$1.58	3	$680
Sep-10	34	2,757	$304	$269	$573	$0.21	24	$39	$1.63	2	$612
Oct-10	211	2,035	$194	$199	$392	$0.19	113	$127	$1.13	11	$519
Nov-10	466	2,017	$168	$197	$365	$0.18	303	$330	$1.09	30	$695
Dec-10	955	2,147	$179	$209	$388	$0.18	591	$649	$1.10	59	$1,037
Jan-11	1,033	2,393	$204	$233	$438	$0.18	824	$913	$1.11	82	$1,351
Feb-11	1,185	2,273	$199	$222	$421	$0.19	837	$938	$1.12	84	$1,358
Mar-11	826	2,037	$179	$199	$378	$0.19	590	$665	$1.13	59	$1,043
Apr-11	599	2,022	$178	$197	$375	$0.19	416	$474	$1.14	42	$849
May-11	344	1,630	$145	$159	$304	$0.19	157	$181	$1.15	16	$484
Jun-11	62	2,316	$238	$226	$464	$0.20	73	$90	$1.23	7	$554
Totals	**5,719**	**28,245**	**$2,711**	**$2,755**	**$5,466**	**$0.19**	**3,980**	**$4,487**	**$1.13**	**398**	**$9,953**

Town of Framingham

Utility Data Summary - Police Station

Fiscal Year 2011

	Weather	*Electric*						*Natural Gas*			*Total*	*Total*
Date	HDD	kW	Total kWh	Deliv $	Sup $	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	149	67,440	$2,528	$6,579	$9,106	$0.14	84	$108	$1.29	8	$9,215
Aug-10	3	149	71,760	$6,495	$7,000	$13,495	$0.19	74	$99	$1.34	7	$13,594
Sep-10	34	151	60,960	$6,296	$5,947	$12,243	$0.20	145	$165	$1.14	15	$12,408
Oct-10	211	96	45,600	$3,305	$4,448	$7,753	$0.17	305	$314	$1.03	31	$8,067
Nov-10	466	84	40,320	$2,119	$3,933	$6,052	$0.15	868	$903	$1.04	87	$6,955
Dec-10	955	91	37,680	$2,156	$3,676	$5,831	$0.15	2,442	$2,592	$1.06	244	$8,423
Jan-11	1,033	67	37,680	$1,882	$3,676	$5,558	$0.15	3,140	$3,388	$1.08	314	$8,946
Feb-11	1,185	72	38,640	$2,068	$3,769	$5,837	$0.15	3,544	$3,850	$1.09	354	$9,688
Mar-11	826	72	34,560	$1,948	$3,371	$5,319	$0.15	2,367	$2,582	$1.09	237	$7,901
Apr-11	599	72	39,360	$2,089	$3,840	$5,929	$0.15	1,739	$1,905	$1.10	174	$7,834
May-11	344	127	44,160	$3,029	$4,308	$7,337	$0.17	1,008	$1,028	$1.02	101	$8,365
Jun-11	62	134	57,840	$4,615	$5,642	$10,258	$0.18	295	$314	$1.06	30	$10,571
Totals	**5,719**	**1,265**	**576,000**	**$38,530**	**$56,189**	**$94,719**	**$0.16**	**16,011**	**$17,248**	**$1.08**	**1,601**	**$111,967**

Town of Framingham

Utility Data Summary - Callahan Senior Center

Fiscal Year 2011

	Weather	*Electric*						*Natural Gas*			*Total*	*Total*
Date	HDD	kW	Total kWh	Deliv $	Sup $	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	106	19,520	$3,716	$1,904	$5,621	$0.29	21	$50	$2.37	2	$5,670
Aug-10	3	88	19,920	$3,149	$1,943	$5,092	$0.26	2	$32	$16.05	0	$5,124
Sep-10	34	98	18,080	$3,445	$1,764	$5,209	$0.29	48	$75	$1.56	5	$5,284
Oct-10	211	77	14,800	$2,051	$1,444	$3,494	$0.24	194	$211	$1.09	19	$3,705
Nov-10	466	52	14,960	$1,017	$1,459	$2,477	$0.17	775	$808	$1.04	78	$3,284
Dec-10	955	51	15,760	$1,026	$1,537	$2,563	$0.16	1,468	$1,570	$1.07	147	$4,133
Jan-11	1,033	46	18,160	$1,053	$1,772	$2,824	$0.16	1,871	$2,027	$1.08	187	$4,851
Feb-11	1,185	50	18,960	$1,177	$1,850	$3,026	$0.16	2,356	$2,570	$1.09	236	$5,596
Mar-11	826	50	16,880	$1,104	$1,647	$2,751	$0.16	1,585	$1,739	$1.10	159	$4,490
Apr-11	599	65	18,240	$1,364	$1,779	$3,143	$0.17	1,028	$1,138	$1.11	103	$4,282
May-11	344	59	15,040	$1,189	$1,467	$2,656	$0.18	445	$478	$1.07	45	$3,134
Jun-11	62	87	18,400	$2,363	$1,795	$4,158	$0.23	220	$242	$1.10	22	$4,399
Totals	**5,719**	**830**	**208,720**	**$22,654**	**$20,361**	**$43,015**	**$0.21**	**10,013**	**$10,939**	**$1.09**	**1,001**	**$53,954**

Town of Framingham

Utility Data Summary - Pearl Street Garage

Fiscal Year 2011

	Weather	*Electric*						*Total*
Date	HDD	kW	Total kWh	Deliv $	Sup $	Total $	$/kWh Blended	$
Jul-10	2	14	8,480	$393	$827	$1,220	$0.14	$1,220
Aug-10	3	13	8,760	$387	$855	$1,242	$0.14	$1,242
Sep-10	34	14	8,800	$401	$858	$1,260	$0.14	$1,260
Oct-10	211	15	8,880	$390	$866	$1,256	$0.14	$1,256
Nov-10	466	16	9,960	$373	$972	$1,344	$0.13	$1,344
Dec-10	955	16	9,840	$370	$960	$1,330	$0.14	$1,330
Jan-11	1,033	16	10,280	$395	$1,003	$1,397	$0.14	$1,397
Feb-11	1,185	17	10,320	$437	$1,007	$1,443	$0.14	$1,443
Mar-11	826	16	9,280	$389	$905	$1,294	$0.14	$1,294
Apr-11	599	16	10,240	$417	$999	$1,416	$0.14	$1,416
May-11	344	15	9,800	$392	$956	$1,348	$0.14	$1,348
Jun-11	62	15	9,480	$435	$925	$1,360	$0.14	$1,360
Totals	**5,719**	**181**	**114,120**	**$4,778**	**$11,132**	**$15,911**	**$0.14**	**$15,911**

Town of Framingham

Utility Data Summary - Animal Control Building

Fiscal Year 2011

	Weather	*Electric*					*Natural Gas*			*Total*	*Total*
Date	HDD	Peak kWh	Deliv $	Sup $	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	3,218	$351	$314	$665	$0.21	0	$15	$0.00	0	$680
Aug-10	3	2,602	$288	$254	$541	$0.21	0	$15	$0.00	0	$557
Sep-10	34	2,038	$227	$199	$426	$0.21	0	$15	$0.00	0	$441
Oct-10	211	1,097	$106	$107	$213	$0.19	27	$27	$1.00	3	$239
Nov-10	466	924	$82	$90	$172	$0.19	117	$118	$1.00	12	$289
Dec-10	955	964	$85	$94	$179	$0.19	262	$311	$1.19	26	$490
Jan-11	1,033	974	$88	$95	$183	$0.19	366	$435	$1.19	37	$618
Feb-11	1,185	1,052	$96	$103	$199	$0.19	357	$429	$1.20	36	$628
Mar-11	826	1,002	$92	$98	$190	$0.19	273	$332	$1.21	27	$522
Apr-11	599	887	$83	$87	$169	$0.19	184	$229	$1.24	18	$398
May-11	344	818	$77	$80	$157	$0.19	33	$44	$1.34	3	$201
Jun-11	62	1,411	$150	$138	$288	$0.20	10	$23	$2.27	1	$310
Totals	**5,719**	**16,987**	**$1,723**	**$1,657**	**$3,381**	**$0.20**	**1,629**	**$1,993**	**$1.22**	**163**	**$5,373**

Town of Framingham

Utility Data Summary - Old Edgell Library

Fiscal Year 2011

	Weather	*Electric*					*#2 Fuel Oil*			*Total*
Date	HDD	Total kWh	Deliv $	Sup $	Total $	$/kWh Blended	Gallons	$	$/Gal	$
Jul-10	2	3,562	$387	$347	$734	$0.21	0	$0	$0.0000	$734
Aug-10	3	2,745	$303	$268	$571	$0.21	0	$0	$0.0000	$571
Sep-10	34	1,872	$209	$183	$392	$0.21	0	$0	$0.0000	$392
Oct-10	211	842	$85	$82	$167	$0.20	289	$783	$2.7060	$950
Nov-10	466	1,287	$110	$126	$236	$0.18	519	$1,449	$2.7895	$1,684
Dec-10	955	1,839	$154	$179	$334	$0.18	1,194	$3,429	$2.8727	$3,762
Jan-11	1,033	2,146	$184	$209	$393	$0.18	1,061	$3,233	$3.0468	$3,626
Feb-11	1,185	2,134	$187	$208	$395	$0.19	1,006	$3,342	$3.3215	$3,737
Mar-11	826	1,759	$156	$172	$327	$0.19	1,116	$3,997	$3.5825	$4,324
Apr-11	599	1,439	$129	$140	$269	$0.19	386	$1,477	$3.8260	$1,746
May-11	344	914	$85	$89	$174	$0.19	279	$1,055	$3.7830	$1,229
Jun-11	62	1,859	$193	$181	$374	$0.20	0	$0	$0.0000	$374
Totals	**5,719**	**22,398**	**$2,181**	**$2,185**	**$4,366**	**$0.19**	**5,850**	**$18,764**	**$3.2075**	**$23,131**

Town of Framingham

Utility Data Summary - Academy Building

Fiscal Year 2011

	Weather	*Electric*					*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Deliv $	Sup $	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	2,860	$566	$279	$845	$0.30	5	$20	$4.04	1	$865
Aug-10	3	2,208	$434	$215	$649	$0.29	5	$20	$4.04	1	$669
Sep-10	34	1,994	$392	$195	$587	$0.29	4	$19	$4.80	0	$606
Oct-10	211	1,305	$238	$127	$366	$0.28	61	$76	$1.24	6	$441
Nov-10	466	699	$123	$68	$191	$0.27	260	$285	$1.10	26	$477
Dec-10	955	713	$126	$70	$195	$0.27	437	$484	$1.11	44	$679
Jan-11	1,033	759	$133	$74	$207	$0.27	548	$612	$1.12	55	$819
Feb-11	1,185	834	$145	$81	$226	$0.27	550	$621	$1.13	55	$848
Mar-11	826	749	$131	$73	$204	$0.27	422	$480	$1.14	42	$685
Apr-11	599	857	$149	$84	$233	$0.27	321	$369	$1.15	32	$602
May-11	344	951	$164	$93	$257	$0.27	100	$121	$1.21	10	$378
Jun-11	62	1,422	$264	$139	$403	$0.28	29	$45	$1.55	3	$448
Totals	**5,719**	**15,351**	**$2,866**	**$1,497**	**$4,364**	**$0.28**	**2,742**	**$3,153**	**$1.15**	**274**	**$7,517**

Town of Framingham

Utility Data Summary - Park Department Headquarters

Fiscal Year 2011

	Weather	*Electric*						*Natural Gas*			*Total*	*Total*
Date	HDD	kW	Peak kWh	Deliv $	Sup $	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	21	4,493	$570	$438	$1,008	$0.22	38	$53	$1.39	4	$1,061
Aug-10	3	22	5,355	$624	$522	$1,146	$0.21	33	$48	$1.45	3	$1,194
Sep-10	34	21	3,872	$548	$378	$926	$0.24	38	$53	$1.39	4	$978
Oct-10	211	21	2,304	$420	$225	$645	$0.28	61	$76	$1.24	6	$721
Nov-10	466	14	3,750	$912	$366	$1,277	$0.34	178	$201	$1.13	18	$1,478
Dec-10	955	15	4,511	$222	$440	$662	$0.15	401	$445	$1.11	40	$1,108
Jan-11	1,033	14	4,856	$227	$474	$701	$0.14	548	$613	$1.12	55	$1,314
Feb-11	1,185	15	5,213	$266	$509	$775	$0.15	572	$646	$1.13	57	$1,420
Mar-11	826	13	3,697	$182	$361	$543	$0.15	440	$500	$1.14	44	$1,043
Apr-11	599	12	3,683	$173	$359	$533	$0.14	280	$324	$1.16	28	$856
May-11	344	14	3,127	$187	$305	$492	$0.16	117	$138	$1.18	12	$630
Jun-11	62	21	3,707	$408	$362	$769	$0.21	53	$69	$1.31	5	$839
Totals	**5,719**	**203**	**48,568**	**$4,739**	**$4,738**	**$9,477**	**$0.20**	**2,759**	**$3,166**	**$1.15**	**276**	**$12,643**

Town of Framingham

Utility Data Summary - Barberi Elementary School

Fiscal Year 2011

	Weather	*Electric*			*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	55,440	$15,054	$0.27	180	$139	$0.77	18	$15,192
Aug-10	3	52,440	$14,784	$0.28	164	$126	$0.77	16	$14,911
Sep-10	34	74,040	$20,575	$0.28	210	$162	$0.77	21	$20,737
Oct-10	211	70,920	$17,256	$0.24	1,528	$1,177	$0.77	153	$18,432
Nov-10	466	68,400	$14,339	$0.21	3,034	$2,336	$0.77	303	$16,675
Dec-10	955	76,680	$12,846	$0.17	6,660	$5,128	$0.77	666	$17,974
Jan-11	1,033	82,920	$14,339	$0.17	8,068	$6,212	$0.77	807	$20,551
Feb-11	1,185	116,160	$18,477	$0.16	8,159	$6,282	$0.77	816	$24,760
Mar-11	826	93,360	$15,335	$0.16	5,927	$4,564	$0.77	593	$19,899
Apr-11	599	78,720	$13,702	$0.17	4,330	$3,334	$0.77	433	$17,036
May-11	344	57,240	$11,499	$0.20	1,358	$1,046	$0.77	136	$12,544
Jun-11	62	94,920	$16,495	$0.17	307	$236	$0.77	31	$16,731
Totals	**5,719**	**921,240**	**$184,700**	**$0.20**	**39,925**	**$30,742**	**$0.77**	**3,993**	**$215,442**

Town of Framingham

Utility Data Summary - Brophy Elementary School

Fiscal Year 2011

	Weather	*Electric*			*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	8,168	$2,924	$0.36	90	$69	$0.77	9	$2,994
Aug-10	3	5,768	$1,174	$0.20	67	$52	$0.77	7	$1,226
Sep-10	34	12,008	$3,528	$0.29	134	$103	$0.77	13	$3,631
Oct-10	211	18,608	$3,812	$0.20	1,053	$811	$0.77	105	$4,622
Nov-10	466	24,608	$3,991	$0.16	3,228	$2,486	$0.77	323	$6,476
Dec-10	955	25,088	$4,153	$0.17	5,413	$4,168	$0.77	541	$8,321
Jan-11	1,033	26,048	$4,444	$0.17	5,231	$4,028	$0.77	523	$8,472
Feb-11	1,185	27,968	$4,802	$0.17	6,055	$4,662	$0.77	606	$9,464
Mar-11	826	23,288	$4,104	$0.18	4,000	$3,080	$0.77	400	$7,184
Apr-11	599	26,768	$4,458	$0.17	3,678	$2,832	$0.77	368	$7,291
May-11	344	21,008	$3,588	$0.17	1,489	$1,147	$0.77	149	$4,735
Jun-11	62	19,928	$4,109	$0.21	352	$271	$0.77	35	$4,380
Totals	**5,719**	**239,256**	**$45,087**	**$0.19**	**30,790**	**$23,708**	**$0.77**	**3,079**	**$68,796**

Town of Framingham

Utility Data Summary - Cameron Middle School

Fiscal Year 2011

	Weather	*Electric*			*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	42,504	$14,926	$0.35	134	$103	$0.77	13	$15,029
Aug-10	3	38,520	$11,545	$0.30	154	$119	$0.77	15	$11,664
Sep-10	34	58,992	$18,812	$0.32	188	$145	$0.77	19	$18,957
Oct-10	211	62,472	$16,575	$0.27	1,256	$967	$0.77	126	$17,542
Nov-10	466	60,168	$15,201	$0.25	3,681	$2,834	$0.77	368	$18,035
Dec-10	955	59,160	$10,885	$0.18	6,197	$4,772	$0.77	620	$15,656
Jan-11	1,033	46,536	$9,785	$0.21	6,609	$5,089	$0.77	661	$14,874
Feb-11	1,185	54,216	$11,019	$0.20	8,131	$6,261	$0.77	813	$17,280
Mar-11	826	51,048	$9,920	$0.19	4,605	$3,546	$0.77	461	$13,466
Apr-11	599	54,864	$10,712	$0.20	4,257	$3,278	$0.77	426	$13,989
May-11	344	44,952	$11,823	$0.26	587	$452	$0.77	59	$12,275
Jun-11	62	68,880	$17,698	$0.26	298	$229	$0.77	30	$17,927
Totals	**5,719**	**642,312**	**$158,900**	**$0.25**	**36,097**	**$27,795**	**$0.77**	**3,610**	**$186,694**

Town of Framingham

Utility Data Summary - Dunning Elementary School

Fiscal Year 2011

	Weather	*Electric*			*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	5,080	$1,606	$0.32	53	$41	$0.77	5	$1,647
Aug-10	3	4,560	$692	$0.15	2	$2	$0.77	0	$694
Sep-10	34	7,560	$2,130	$0.28	135	$104	$0.77	14	$2,234
Oct-10	211	11,400	$2,327	$0.20	551	$424	$0.77	55	$2,751
Nov-10	466	13,360	$2,180	$0.16	2,626	$2,022	$0.77	263	$4,202
Dec-10	955	14,960	$2,377	$0.16	5,948	$4,580	$0.77	595	$6,957
Jan-11	1,033	16,000	$2,518	$0.16	6,110	$4,705	$0.77	611	$7,223
Feb-11	1,185	16,520	$2,675	$0.16	6,519	$5,020	$0.77	652	$7,694
Mar-11	826	13,720	$2,283	$0.17	4,640	$3,573	$0.77	464	$5,856
Apr-11	599	14,840	$2,392	$0.16	3,645	$2,807	$0.77	365	$5,199
May-11	344	10,760	$1,909	$0.18	1,249	$962	$0.77	125	$2,870
Jun-11	62	11,680	$2,329	$0.20	315	$243	$0.77	32	$2,571
Totals	**5,719**	**140,440**	**$25,419**	**$0.18**	**31,793**	**$24,481**	**$0.77**	**3,179**	**$49,899**

Town of Framingham

Utility Data Summary - Framingham High School

Fiscal Year 2011

	Weather	*Electric*			*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	127,680	$34,666	$0.27	749	$577	$0.77	75	$35,243
Aug-10	3	119,440	$31,346	$0.26	765	$589	$0.77	77	$31,935
Sep-10	34	178,240	$45,534	$0.26	980	$755	$0.77	98	$46,288
Oct-10	211	217,320	$44,278	$0.20	4,491	$3,458	$0.77	449	$47,736
Nov-10	466	205,440	$38,092	$0.19	13,504	$10,398	$0.77	1,350	$48,491
Dec-10	955	231,720	$39,600	$0.17	24,236	$18,662	$0.77	2,424	$58,261
Jan-11	1,033	183,840	$35,256	$0.19	28,586	$22,011	$0.77	2,859	$57,267
Feb-11	1,185	223,200	$39,559	$0.18	25,774	$19,846	$0.77	2,577	$59,405
Mar-11	826	206,960	$37,480	$0.18	19,721	$15,185	$0.77	1,972	$52,666
Apr-11	599	212,280	$38,128	$0.18	9,378	$7,221	$0.77	938	$45,349
May-11	344	184,120	$36,385	$0.20	2,444	$1,882	$0.77	244	$38,267
Jun-11	62	196,720	$43,835	$0.22	1,167	$899	$0.77	117	$44,734
Totals	**5,719**	**2,286,960**	**$464,158**	**$0.20**	**131,795**	**$101,482**	**$0.77**	**13,180**	**$565,640**

Town of Framingham

Utility Data Summary - Hemenway Elementary School

Fiscal Year 2011

	Weather	*Electric*			*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	6,475	$2,000	$0.31	189	$146	$0.77	19	$2,146
Aug-10	3	2,977	$454	$0.15	182	$140	$0.77	18	$594
Sep-10	34	8,998	$2,569	$0.29	227	$175	$0.77	23	$2,743
Oct-10	211	13,888	$2,838	$0.20	853	$657	$0.77	85	$3,495
Nov-10	466	16,743	$2,877	$0.17	2,795	$2,152	$0.77	280	$5,030
Dec-10	955	18,693	$3,264	$0.17	5,732	$4,414	$0.77	573	$7,678
Jan-11	1,033	22,940	$3,929	$0.17	7,184	$5,532	$0.77	718	$9,461
Feb-11	1,185	23,317	$3,978	$0.17	6,718	$5,173	$0.77	672	$9,151
Mar-11	826	13,791	$2,657	$0.19	4,862	$3,744	$0.77	486	$6,400
Apr-11	599	17,309	$3,034	$0.18	3,450	$2,657	$0.77	345	$5,691
May-11	344	13,000	$2,405	$0.18	1,117	$860	$0.77	112	$3,265
Jun-11	62	14,310	$2,937	$0.21	474	$365	$0.77	47	$3,302
Totals	**5,719**	**172,441**	**$32,942**	**$0.19**	**33,783**	**$26,013**	**$0.77**	**3,378**	**$58,955**

Town of Framingham

Utility Data Summary - Juniper Hill Elementary School

Fiscal Year 2011

	Weather	*Electric*			*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	9,640	$2,591	$0.27	107	$82	$0.77	11	$2,673
Aug-10	3	8,364	$2,143	$0.26	99	$76	$0.77	10	$2,219
Sep-10	34	8,900	$2,565	$0.29	114	$88	$0.77	11	$2,653
Oct-10	211	8,123	$1,588	$0.20	551	$424	$0.77	55	$2,012
Nov-10	466	9,622	$1,678	$0.17	2,120	$1,632	$0.77	212	$3,311
Dec-10	955	11,804	$1,921	$0.16	4,509	$3,472	$0.77	451	$5,393
Jan-11	1,033	10,336	$1,756	$0.17	4,402	$3,390	$0.77	440	$5,145
Feb-11	1,185	11,304	$1,942	$0.17	5,227	$4,025	$0.77	523	$5,966
Mar-11	826	11,637	$1,996	$0.17	3,600	$2,772	$0.77	360	$4,768
Apr-11	599	10,325	$1,838	$0.18	2,980	$2,295	$0.77	298	$4,133
May-11	344	7,728	$1,487	$0.19	807	$621	$0.77	81	$2,108
Jun-11	62	7,966	$2,068	$0.26	269	$207	$0.77	27	$2,275
Totals	**5,719**	**115,749**	**$23,571**	**$0.20**	**24,785**	**$19,084**	**$0.77**	**2,479**	**$42,655**

Town of Framingham

Utility Data Summary - King Administration Building

Fiscal Year 2011

	Weather	*Electric*			*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	12,972	$3,946	$0.30	7	$5	$0.77	1	$3,951
Aug-10	3	14,052	$3,668	$0.26	29	$22	$0.77	3	$3,691
Sep-10	34	14,652	$4,647	$0.32	15	$12	$0.77	2	$4,659
Oct-10	211	13,572	$2,757	$0.20	1,672	$1,287	$0.77	167	$4,044
Nov-10	466	17,532	$2,747	$0.16	4,189	$3,226	$0.77	419	$5,972
Dec-10	955	16,972	$2,734	$0.16	7,721	$5,945	$0.77	772	$8,679
Jan-11	1,033	16,932	$2,691	$0.16	10,245	$7,889	$0.77	1,025	$10,579
Feb-11	1,185	18,012	$2,901	$0.16	8,904	$6,856	$0.77	890	$9,758
Mar-11	826	15,612	$2,611	$0.17	7,670	$5,906	$0.77	767	$8,517
Apr-11	599	17,412	$2,855	$0.16	2,419	$1,863	$0.77	242	$4,718
May-11	344	13,092	$2,237	$0.17	5,052	$3,890	$0.77	505	$6,127
Jun-11	62	15,972	$3,991	$0.25	590	$454	$0.77	59	$4,445
Totals	**5,719**	**186,784**	**$37,785**	**$0.20**	**48,513**	**$37,355**	**$0.77**	**4,851**	**$75,140**

Town of Framingham

Utility Data Summary - McCarthy Elementary School

Fiscal Year 2011

	Weather	*Electric*			*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	44,136	$9,802	$0.22	204	$157	$0.77	20	$9,959
Aug-10	3	39,744	$8,796	$0.22	176	$136	$0.77	18	$8,931
Sep-10	34	53,352	$11,735	$0.22	219	$169	$0.77	22	$11,904
Oct-10	211	57,432	$10,926	$0.19	2,230	$1,717	$0.77	223	$12,643
Nov-10	466	59,976	$10,334	$0.17	6,162	$4,745	$0.77	616	$15,079
Dec-10	955	57,240	$9,827	$0.17	8,560	$6,591	$0.77	856	$16,418
Jan-11	1,033	47,592	$8,788	$0.18	9,602	$7,394	$0.77	960	$16,182
Feb-11	1,185	52,992	$9,483	$0.18	9,826	$7,566	$0.77	983	$17,049
Mar-11	826	53,952	$9,784	$0.18	5,691	$4,382	$0.77	569	$14,166
Apr-11	599	53,616	$9,994	$0.19	6,646	$5,117	$0.77	665	$15,111
May-11	344	53,376	$10,208	$0.19	1,476	$1,137	$0.77	148	$11,345
Jun-11	62	53,304	$11,259	$0.21	255	$196	$0.77	26	$11,455
Totals	**5,719**	**626,712**	**$120,935**	**$0.19**	**51,047**	**$39,306**	**$0.77**	**5,105**	**$160,241**

Town of Framingham

Utility Data Summary - Potter Road Elementary School

Fiscal Year 2011

	Weather	*Electric*			*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	6,360	$2,235	$0.35	75	$58	$0.77	8	$2,293
Aug-10	3	4,440	$709	$0.16	77	$59	$0.77	8	$768
Sep-10	34	9,240	$2,765	$0.30	114	$88	$0.77	11	$2,853
Oct-10	211	14,280	$3,109	$0.22	698	$537	$0.77	70	$3,646
Nov-10	466	18,120	$3,032	$0.17	1,902	$1,465	$0.77	190	$4,496
Dec-10	955	17,880	$3,019	$0.17	3,264	$2,513	$0.77	326	$5,533
Jan-11	1,033	17,280	$2,963	$0.17	236	$182	$0.77	24	$3,144
Feb-11	1,185	17,400	$3,019	$0.17	2,161	$1,664	$0.77	216	$4,683
Mar-11	826	16,080	$2,887	$0.18	4,153	$3,198	$0.77	415	$6,084
Apr-11	599	18,720	$3,204	$0.17	3,537	$2,723	$0.77	354	$5,928
May-11	344	14,880	$2,682	$0.18	1,062	$818	$0.77	106	$3,500
Jun-11	62	14,880	$3,058	$0.21	280	$216	$0.77	28	$3,273
Totals	**5,719**	**169,560**	**$32,681**	**$0.19**	**17,559**	**$13,520**	**$0.77**	**1,756**	**$46,202**

Town of Framingham

Utility Data Summary - Stapleton Elementary School

Fiscal Year 2011

	Weather	*Electric*			*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	6,104	$2,480	$0.41	116	$89	$0.77	12	$2,569
Aug-10	3	3,944	$587	$0.15	119	$92	$0.77	12	$678
Sep-10	34	9,624	$2,922	$0.30	141	$109	$0.77	14	$3,031
Oct-10	211	15,704	$3,308	$0.21	1,164	$896	$0.77	116	$4,204
Nov-10	466	16,584	$2,883	$0.17	3,157	$2,431	$0.77	316	$5,314
Dec-10	955	16,984	$2,932	$0.17	7,704	$5,932	$0.77	770	$8,864
Jan-11	1,033	15,864	$2,919	$0.18	7,037	$5,418	$0.77	704	$8,338
Feb-11	1,185	16,344	$2,995	$0.18	8,096	$6,234	$0.77	810	$9,228
Mar-11	826	14,584	$2,713	$0.19	5,775	$4,447	$0.77	578	$7,160
Apr-11	599	18,024	$3,150	$0.17	4,060	$3,126	$0.77	406	$6,276
May-11	344	14,984	$2,764	$0.18	1,289	$993	$0.77	129	$3,757
Jun-11	62	15,544	$3,332	$0.21	204	$157	$0.77	20	$3,489
Totals	**5,719**	**164,288**	**$32,984**	**$0.20**	**38,862**	**$29,924**	**$0.77**	**3,886**	**$62,908**

Town of Framingham

Utility Data Summary - Thayer Campus of FHS

Fiscal Year 2011

	Weather	*Electric*			*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	1,120	$297	$0.27	3	$2	$0.77	0	$300
Aug-10	3	920	$264	$0.29	3	$2	$0.77	0	$266
Sep-10	34	1,800	$504	$0.28	5	$4	$0.77	1	$508
Oct-10	211	2,080	$481	$0.23	131	$101	$0.77	13	$581
Nov-10	466	1,800	$252	$0.14	416	$320	$0.77	42	$572
Dec-10	955	1,840	$257	$0.14	925	$712	$0.77	93	$969
Jan-11	1,033	1,720	$245	$0.14	1,037	$798	$0.77	104	$1,043
Feb-11	1,185	1,640	$238	$0.14	1,159	$892	$0.77	116	$1,130
Mar-11	826	1,520	$222	$0.15	789	$608	$0.77	79	$829
Apr-11	599	1,880	$270	$0.14	483	$372	$0.77	48	$642
May-11	344	1,520	$222	$0.15	152	$117	$0.77	15	$339
Jun-11	62	1,960	$443	$0.23	50	$39	$0.77	5	$482
Totals	**5,719**	**19,800**	**$3,693**	**$0.19**	**5,153**	**$3,968**	**$0.77**	**515**	**$7,661**

Town of Framingham

Utility Data Summary - Walsh Middle School

Fiscal Year 2011

	Weather	*Electric*			*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	25,212	$4,524	$0.18	565	$435	$0.77	57	$4,959
Aug-10	3	24,252	$4,568	$0.19	733	$564	$0.77	73	$5,132
Sep-10	34	49,572	$10,979	$0.22	681	$524	$0.77	68	$11,503
Oct-10	211	57,852	$11,192	$0.19	3,804	$2,929	$0.77	380	$14,121
Nov-10	466	57,132	$10,433	$0.18	5,965	$4,593	$0.77	597	$15,026
Dec-10	955	59,712	$10,835	$0.18	15,610	$12,020	$0.77	1,561	$22,855
Jan-11	1,033	43,332	$9,024	$0.21	24,063	$18,529	$0.77	2,406	$27,553
Feb-11	1,185	49,512	$9,847	$0.20	14,043	$10,813	$0.77	1,404	$20,661
Mar-11	826	50,232	$10,016	$0.20	11,603	$8,934	$0.77	1,160	$18,951
Apr-11	599	52,812	$10,285	$0.19	3,881	$2,988	$0.77	388	$13,274
May-11	344	49,512	$9,790	$0.20	1,216	$936	$0.77	122	$10,727
Jun-11	62	53,472	$11,358	$0.21	607	$467	$0.77	61	$11,825
Totals	**5,719**	**572,604**	**$112,853**	**$0.20**	**82,771**	**$63,734**	**$0.77**	**8,277**	**$176,587**

Town of Framingham

Utility Data Summary - Woodrow Wilson Elementary

Fiscal Year 2011

	Weather	*Electric*			*Natural Gas*			*Total*	*Total*
Date	HDD	Total kWh	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	32,220	$11,289	$0.35	32	$25	$0.77	3	$11,313
Aug-10	3	29,060	$10,813	$0.37	41	$32	$0.77	4	$10,845
Sep-10	34	46,400	$14,467	$0.31	71	$55	$0.77	7	$14,522
Oct-10	211	52,320	$13,338	$0.25	978	$753	$0.77	98	$14,091
Nov-10	466	49,720	$11,767	$0.24	2,694	$2,074	$0.77	269	$13,842
Dec-10	955	47,160	$8,767	$0.19	6,532	$5,030	$0.77	653	$13,796
Jan-11	1,033	36,880	$7,650	$0.21	6,511	$5,013	$0.77	651	$12,663
Feb-11	1,185	51,680	$9,451	$0.18	8,510	$6,553	$0.77	851	$16,004
Mar-11	826	42,200	$8,419	$0.20	5,479	$4,219	$0.77	548	$12,637
Apr-11	599	52,540	$8,346	$0.16	4,310	$3,319	$0.77	431	$11,665
May-11	344	37,200	$9,326	$0.25	919	$708	$0.77	92	$10,033
Jun-11	62	50,280	$13,921	$0.28	169	$130	$0.77	17	$14,051
Totals	**5,719**	**527,660**	**$127,553**	**$0.24**	**36,246**	**$27,909**	**$0.77**	**3,625**	**$155,462**

Utility Data Summary - DPW Headquarters

Fiscal Year 2011

	Weather	*Electric*						*Natural Gas*			*Total*	*Total*
Date	HDD	kW	Total kWh	Deliv $	Sup $	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	148	48,697	$5,955	$4,750	$10,705	$0.22	79	$104	$1.31	8	$10,809
Aug-10	3	153	52,595	$6,281	$5,131	$11,412	$0.22	112	$135	$1.20	11	$11,546
Sep-10	34	152	46,453	$6,027	$4,531	$10,559	$0.23	151	$171	$1.13	15	$10,730
Oct-10	211	130	37,101	$4,034	$3,619	$7,653	$0.21	469	$467	$1.00	47	$8,120
Nov-10	466	141	50,650	$3,669	$4,941	$8,610	$0.17	1,171	$1,208	$1.03	117	$9,818
Dec-10	955	150	53,019	$4,040	$5,172	$9,212	$0.17	4,543	$4,795	$1.06	454	$14,008
Jan-11	1,033	188	71,124	$5,479	$6,938	$12,417	$0.17	10,098	$10,800	$1.07	1,010	$23,217
Feb-11	1,185	186	69,842	$5,579	$6,813	$12,392	$0.18	9,360	$10,120	$1.08	936	$22,511
Mar-11	826	180	58,262	$4,875	$5,683	$10,558	$0.18	5,461	$5,917	$1.08	546	$16,475
Apr-11	599	169	64,640	$4,771	$6,306	$11,076	$0.17	1,767	$1,935	$1.10	177	$13,011
May-11	344	154	46,959	$3,764	$4,581	$8,345	$0.18	3,856	$3,889	$1.01	386	$12,234
Jun-11	62	164	70,410	$5,808	$6,868	$12,677	$0.18	986	$977	$0.99	99	$13,654
Totals	**5,719**	**1,915**	**669,752**	**$60,283**	**$65,334**	**$125,617**	**$0.19**	**38,053**	**$40,517**	**$1.06**	**3,805**	**$166,134**

Town of Framingham

Utility Data Summary - Henry Street Garage

Fiscal Year 2011

	Weather	*Electric*						*Natural Gas*			*Total*	*Total*
Date	HDD	kW	Total kWh	Deliv $	Sup $	Total $	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	9	3,627	$304	$354	$658	$0.18	27	$50	$1.87	3	$708
Aug-10	3	8	3,314	$293	$323	$616	$0.19	24	$46	$1.94	2	$662
Sep-10	34	10	2,943	$272	$287	$559	$0.19	29	$51	$1.77	3	$610
Oct-10	211	7	1,964	$183	$192	$374	$0.19	135	$178	$1.32	14	$552
Nov-10	466	11	2,702	$210	$264	$474	$0.18	579	$952	$1.64	58	$1,426
Dec-10	955	10	3,292	$238	$321	$559	$0.17	1,166	$2,207	$1.89	117	$2,766
Jan-11	1,033	15	6,254	$433	$610	$1,043	$0.17	1,569	$2,993	$1.91	157	$4,036
Feb-11	1,185	12	6,180	$394	$603	$997	$0.16	1,677	$3,216	$1.92	168	$4,213
Mar-11	826	13	6,179	$417	$603	$1,020	$0.17	1,248	$2,397	$1.92	125	$3,417
Apr-11	599	9	2,243	$180	$219	$399	$0.18	840	$1,619	$1.93	84	$2,017
May-11	344	6	1,573	$134	$153	$288	$0.18	211	$364	$1.73	21	$652
Jun-11	62	8	2,184	$199	$213	$412	$0.19	44	$81	$1.85	4	$494
Totals	**5,719**	**117**	**42,455**	**$3,258**	**$4,141**	**$7,399**	**$0.17**	**7,549**	**$14,155**	**$1.88**	**755**	**$21,554**

Town of Framingham

Utility Data Summary - Sanitation Department

Fiscal Year 2011

	Weather	*Electric*											*Natural Gas*			*Total*	*Total*
Date	HDD	kW	Peak kWh	Off-Peak kWh	Total kWh	Deliv $	Sup $	Off-Peak $	Total $	$/Peak kWh	$/Off-Peak kW	$/kWh Blended	Therm	$	$/Therm	MMBtu	$
Jul-10	2	19	2,470	6,890	9,360	$1,907	$241	$672	$2,820	$0.0976	$0.2721	$0.30	2	$18	$8.92	0	$2,838
Aug-10	3	19	2,314	6,446	8,760	$1,875	$226	$629	$2,729	$0.0976	$0.2717	$0.31	0	$15	$0.00	0	$2,745
Sep-10	34	18	2,154	6,846	9,000	$1,903	$210	$668	$2,781	$0.0976	$0.3100	$0.31	1	$16	$16.49	0	$2,797
Oct-10	211	23	3,656	6,544	10,200	$1,650	$357	$638	$2,645	$0.0976	$0.1746	$0.26	0	$15	$0.00	0	$2,660
Nov-10	466	50	9,225	15,855	25,080	$1,682	$900	$1,547	$4,129	$0.0976	$0.1677	$0.16	0	$15	$0.00	0	$4,144
Dec-10	955	71	14,215	22,265	36,480	$2,132	$1,387	$2,172	$5,690	$0.0976	$0.1528	$0.16	60	$128	$2.13	6	$5,818
Jan-11	1,033	66	14,292	22,908	37,200	$2,210	$1,394	$2,235	$5,839	$0.0976	$0.1564	$0.16	434	$839	$1.93	43	$6,678
Feb-11	1,185	65	14,446	22,754	37,200	$2,254	$1,409	$2,220	$5,883	$0.0976	$0.1537	$0.16	269	$529	$1.97	27	$6,412
Mar-11	826	60	13,095	22,785	35,880	$2,133	$1,277	$2,223	$5,633	$0.0976	$0.1697	$0.16	281	$552	$1.96	28	$6,185
Apr-11	599	58	9,083	14,557	23,640	$1,900	$886	$1,420	$4,206	$0.0976	$0.1563	$0.18	276	$542	$1.96	28	$4,748
May-11	344	31	4,070	6,730	10,800	$1,556	$397	$657	$2,609	$0.0976	$0.1613	$0.24	134	$237	$1.77	13	$2,846
Jun-11	62	22	2,883	7,077	9,960	$1,777	$281	$690	$2,749	$0.0976	$0.2395	$0.28	41	$77	$1.87	4	$2,825
Totals	**5,719**	**502**	**91,903**	**161,657**	**253,560**	**$22,978**	**$8,965**	**$15,770**	**$47,712**	**$0.0976**	**$0.0976**	**$0.19**	**1,498**	**$2,983**	**$1.99**	**150**	**$50,696**

Section 2:
Existing Conditions

Memorial Building

Building Characteristics

The Memorial Building, or Framingham Town Hall is old brick construction. It is a large three story building with a basement level and two upper levels. It contains the large Nevins Hall space as well as Municipal Office space. The building is occupied from 8:30 AM to 5:00 PM weekdays. The building encompasses approximately 76,453 square feet of floor space. The walls are furred out drywall over brick wall, although it is doubtful that there is much insulation in the wall. The attic over the rotunda entrance has some recently added cellulose insulation. The building's windows have been retrofitted with wood framed, double glazed upgrades.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The building is heated by two Smith 28HE-S/W-17 gas-fired steam boilers. The boiler supplies steam to radiators throughout the basement, Nevins Hall, and office spaces. The offices have recently been retrofitted with a variable refrigerant system capable of providing cooling, as well as heat pump heating. An existing Air Handling Unit is designed to bring ventilation air into Nevins Hall, but is no longer in use. All systems, including every radiator valve except for those in Nevins Hall, the basement, and the rotunda, are controlled from the buildings central EMS. Schedules and setpoints can be controlled through a connection to the buildings computer.

Energy Management Systems

This building has an existing DDC system that controls the steam boilers and perimeter radiators. It is currently being expanded to include the new variable refrigerant system being installed in office spaces. Office radiators have been updated with DDC actuators and hallway radiators have been fitted with standalone Thermostatic Radiator Valves. A few pneumatically actuated valves remain, on radiators in Nevins Hall, on basement hallway convectors, and on rotunda convectors. Because of the old and leaky pneumatic tubing, the pneumatic compressor runs continuously to try to maintain pressure.

Domestic Hot Water Systems

Domestic hot water for the building is provided by five small electric hot water heaters located next to bathrooms. Because of the short distance, no circulation pumps are necessary.

Lighting Systems

Offices use T12 troffers, standard T8 troffers, wraps, T5 "biax" wall wash fixtures. Halls use standard T8 old surface fixtures, troffers, coves, incandescent decorative fixtures, T12 old surface fixtures, compact fluorescent drums. Auditoriums utilize compact fluorescent decorative fixtures, exits. Storage areas utilize standard T8 troffers, old surface fixtures, wraps, T12 strips, troffers, incandescent surface fixtures. Baths use standard T8 troffers, T12 troffers, boxes. Mechanical areas have T12 old surface fixtures. Perimeters use MH floods, decorative fixtures, exterior fixtures, HPS exterior fixtures, incandescent surface fixtures, old wall mounted fixtures.

Main Library Building

Building Characteristics

The Main Library Building sits near the Memorial Building and Police Station, at the heart of Framingham. It is of brick construction and features two large, open levels plus a lower level, totaling approximately 53,000 square feet. The building is open from 9:00 AM to 9:00 PM Monday through Thursday, 9:00 AM to 5:00 PM Friday and Saturday and 1:00 PM to 5:00 PM on Sunday. There is a large garage bay with an overhead door for deliveries that serves as the book sale area.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The library has five large Roof Top Units (RTU) that provide ventilation air and DX cooling to the occupied space. The RTUs supply air to fifty-three (53) Variable Air Volume (VAV) Boxes. Each VAV Box has a damper and hot water reheat coil that modulate to provide the correct amount of heating or cooling air to individual areas. Each RTU has a Variable Frequency Drive (VFD) that modulates the volume of airflow to match the volume required by the VAV Boxes. A Cleaver Brooks CB-200-60 gas-fired hot water boiler provides hot water to the VAV Box reheats and the perimeter baseboard heaters, through two separate loops. Heating hot water is also pumped through a heat exchanger to produce domestic hot water to bathroom use during the heating season.

Energy Management Systems

This building has an existing Barber-Coleman Pneumatic system that controls fifty-three Variable Air Volume (VAV) Boxes and perimeter baseboard heating. Each VAV box has a pneumatic damper and reheat valve controlled by a local thermostat via a pneumatic controller. A new DDC system was installed with very limited control over the heating and cooling system. It has simple Start/Stop of the Boiler, Pumps and five Roof Top Units, turning them on during occupied hours and allowing the local pneumatic controls to maintain space temperature. During unoccupied hours the EMS shuts off the heating and cooling system, and uses a few digital space temperature sensors to turn the system back on if internal temperature drops below an unoccupied setpoint. No further DDC control of space temperatures is available.

Domestic Hot Water Systems

Domestic hot water for the building is provided by a 40 gallon electric hot water heater in the basement boiler room. The system features a hot water heat exchanger tied to the heating hot water system, so that

during the heating season domestic hot water can be produced by the gas fired boiler and stored in the electric tank. Hot water is circulated through the system by a small pump.

Lighting Systems

Libraries use standard T8 boxes, troffers, strips, compact fluorescent cans, exits, MH cans, and incandescent cans. Offices have standard T8 troffers, boxes, valances, strips, compact fluorescent cans, surface fixtures, T12 valances. Storage areas utilize standard T8 strips, troffers, wraps, vapor tights, old surface fixtures, and compact fluorescent surface fixtures. Halls use standard T8 troffers, wraps, valances, compact fluorescent cans, exits, incandescent cans, decorative fixtures. Baths utilize standard T8 valances, vanities, compact fluorescent cans. Mechanical areas employ compact fluorescent surface fixtures, standard T8 wraps, and incandescent surface fixtures. Labs use standard T8 troffers. Kitchens employ standard T8 valances, troffers. Bedrooms have standard T8 valances. Perimeters have compact fluorescent cans, MH floods, HPS exterior fixtures.

Fire Department Headquarters

Building Characteristics

The Fire Department Headquarters is a modern building with a block façade which houses offices, an active fire station, and mechanic space for the Town's fleet of fire safety vehicles. The occupied part of the building is two stories, with the Fire Chief office and other office space on the second floor, and the kitchen, dayroom, and sleeping quarters on the first floor. Next to this section is a six bay apparatus floor and mechanic space. The mechanic space has a second story loft. Windows are double pane and operable.

The building has faced an ongoing humidity issue, with a large amount of air leaking into the building and moisture condensing on cooling equipment. Several large areas of infiltration have been sealed, including attic space vents and a walkway overhang. In 2010 a large remediation project was undertaken to remove and replace damaged building material.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

Ventilation and conditioned air is brought into the occupied space by Unit Ventilators (UV) and Fan Coil Units (FCU) above the ceilings. A Weil-McLain 788 gas-fired hot water boiler and Trane packaged rooftop chiller supply hot water and chilled water that flow through separate pipes throughout the building. Two in-line pumps on each system circulate water. Six ducted dehumidifiers have been installed above the ceilings of key areas in an effort to compensate for humidity issues.

Energy Management Systems

This newer building has an existing Tridium DDC system that controls the existing boiler, pumps, unit ventilators, and fan coil units. High humidity has been an issue in the building, and so six dehumidifiers we installed above the ceiling of key spaces. These are controlled by local humidistats set at various humidity levels and not tied back to the building EMS. Also because of humidity concerns, all heating and cooling

systems have been scheduled for 24/7 operation, even though large portions of the building are office space and only occupied during normal hours.

The building features some remaining pneumatic actuation. In the boiler room, three mixing and differential pressure valves on the hot and chilled water piping are pneumatically actuated. In the mechanic space, decontamination room, and watch's bathroom, fintube radiation is controlled by pneumatic thermostats and valves. In the mechanic space, these thermostats have been removed with either a bypass or nothing left in their place.

Domestic Hot Water Systems

Domestic hot water for the building is provided by an AO Smith gas-fired 80 gallon hot water heater in the boiler room. Hot water is moved through the system by a small circulator pump.

Lighting Systems

Halls use standard T8 troffers, compact fluorescent cans, sconces, efficient 4' T8 30w wraps. Offices use efficient 4' T8 30w troffers, standard T8 troffers. Storage areas utilize efficient 4' T8 30w strips, troffers, vapor tights, T12 strips, and standard T8 troffers. Classrooms have efficient 4' T8 30w troffers, incandescent cans, sconces. Parking garages utilize standard T8 industrials. Baths have efficient 4' T8 30w troffers, vapor tights, compact fluorescent cans, and standard T8 troffers. Shops employ standard T8 industrials. Kitchens utilize efficient 4' T8 30w troffers, standard T8 troffers. Gyms use efficient 4' T8 30w troffers. Bedrooms utilize efficient 4' T8 30w troffers. Mechanical areas have efficient 4' T8 30w strips, wraps. Perimeters have HPS old exterior fixtures, cans. Parking lots employ HPS parking/roadway fixtures.

Fire Station #1

Building Characteristics

The building is of typical brick construction with a mansard roof and rubber membrane flat portion. The building is two stories, with the living quarters situated above the 1st floor apparatus floor. Windows are single glaze. Like most fire stations, the station is staffed 24/7. The apparatus floor has three bays, with glass overhead doors on the front and back of the building.

Behind the station is a shop of garage-like construction. It has one small vehicle bay but consists mostly of shop space.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The building is heated by a Weil-McLain LGB-7 gas-fired hot water boiler which provides hot water to fintube baseboard throughout the living quarters and ceiling mounted unit heaters in the apparatus floor. The

building also contains a communications room and a server room, which are cooled by Mitsubishi and York split AC systems.

Energy Management Systems

Heating and cooling for the building is controlled by stand-alone non-programmable thermostats. Thermostats tied to hot water control valves on the fintube baseboard maintains a heating temperature in the occupied space while two thermostats in the communications room and server room control the AC units for those spaces.

Domestic Hot Water Systems

Domestic hot water for the building is provided by a Ruud gas-fired 50 gallon hot water heater in the boiler room.

Lighting Systems

Offices employ incandescent cans, standard T8 troffers, efficient 4' T8 30w troffers, valances. Parking garages employ standard T8 boxes. Baths utilize standard T8 troffers, vanities, strips, incandescent cans, efficient 4' T8 30w wraps, valances, vanities. Bedrooms employ incandescent surface fixtures, cans. Storage areas have standard T8 troffers, efficient 4' T8 30w troffers. Kitchens employ standard T8 troffers, efficient 4' T8 30w troffers, and incandescent cans. Mechanical areas have efficient 4' T8 30w strips. Halls use efficient 4' T8 30w wraps. Perimeters use incandescent cans, HPS exterior fixtures, MH floods.

Fire Station #2

Building Characteristics

Fire Station #2 is the oldest of the fire stations and is of a typical brick construction, with likely little or no insulation between the exterior brick and interior plaster walls. The building is two stories, with most of the living quarters above the three bay apparatus floor. It has a flat rubber membrane roof and newer double glassed metal framed windows.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The building is heated by two ceiling mounted, gas-fired furnaces that provide hot air, one to the apparatus floor and first floor and the other to the second floor. Their returns are connected directly to the interior space and they do not draw in any outdoor air.

Energy Management Systems

The two furnaces are controlled by two non-programmable thermostats, one on each floor. They maintain a constant temperature 24/7, although they can be manually set back at night.

Domestic Hot Water Systems

Domestic hot water for the building is provided by a Ruud gas-fired 40 gallon hot water heater in the basement.

Lighting Systems

Parking garages employ efficient 4' T8 30w strips. Storage areas use efficient 4' T8 30w wraps, strips, incandescent surface fixtures. Offices have efficient 4' T8 30w troffers. Halls use efficient 4' T8 30w troffers, incandescent surface fixtures. Bedrooms utilize efficient 4' T8 30w troffers. Gyms have efficient 4' T8 30w strips. Baths use standard T8 troffers. Kitchens employ efficient 4' T8 30w wraps. Mechanical areas utilize incandescent surface fixtures. Perimeters utilize HPS exterior fixtures, incandescent old wall mounted fixtures.

Fire Station #5

Building Characteristics

This fire station is typical brick construction. It is a split level, with living quarters besides and above the apparatus floor. A small watch room sits at the front of the apparatus floor while the boiler room is at the rear, accessible from outside. The building has a flat roof and newer double pane windows.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The building is heated with a Weil-McLain LGB-6 gas-fired hot water boiler. The hot water is circulated by three separate pumps to the apparatus floor, 1st/2nd/3rd floors, and Chief's office/dispatch. This water circulates through fintube baseboard around the perimeter of the occupied space as well as through ceiling mounted unit heaters in the apparatus floor.

Energy Management Systems

The three hot water circulation pumps operate based on Honeywell non-programmable thermostats located throughout the building. The pumps circulate water through their particular area on a call for space heating. Local control of space temperature is provided by thermostatic radiator valves (TRV) on the fintube baseboard piping. The TRVs shut off hot water flow to baseboard heaters once the space has reached its temperature setpoint. Several of thermostatic heads to these TRVs were noticed to be missing or damaged.

Domestic Hot Water Systems

Domestic hot water for the building is provided by an AO Smith gas-fired 75 gallon hot water heater in the boiler room.

Lighting Systems

Offices have efficient 4' T8 30w wraps, standard T8 troffers, compact fluorescent drums. Baths utilize compact fluorescent old drums, drums, incandescent cans, standard T8 vanities. Parking garages utilize efficient 4' T8 30w wraps, compact fluorescent drums, sconces. Halls employ compact fluorescent drums, old drums, efficient 4' T8 30w wraps, strips, vapor tights. Bedrooms utilize efficient 4' T8 30w wraps, compact fluorescent old drums, drums. Gyms employ efficient 4' T8 30w wraps, strips, compact fluorescent drums. Storage areas use compact fluorescent surface fixtures, incandescent surface fixtures. Kitchens utilize efficient 4' T8 30w valances, wraps. Shops use efficient 4' T8 30w strips. Walkways employ incandescent surface fixtures. Perimeters use incandescent wall mounted fixtures, decorative fixtures, surface fixtures, MH floods.

Fire Station #7

Building Characteristics

This fire station is of brick construction. It is one story, with the living quarters section next to the two-bay apparatus floor. The boiler room is located below grade and is accessible from the side of the building. The roof is flat with a rubber membrane. Windows are aluminum framed and double glazed.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The building is heated with a Burnham V905 gas-fired hot water boiler. The hot water is circulated two pumps to the apparatus floor and living quarters. This water circulates through fintube baseboard around the perimeter of the occupied space as well as through ceiling mounted unit heaters in the apparatus floor.

Energy Management Systems

The two hot water circulation pumps operate based on LUXPro non-programmable thermostats located throughout the building. The pumps circulate water on a call for space heating. Some cooling is provided by window air conditioning units. These are temperature controlled locally

Domestic Hot Water Systems

Domestic hot water for the building is provided by an AO Smith gas-fired 40 gallon hot water heater in the boiler room.

Lighting Systems

Parking garages utilize efficient 4' T8 30w strips, compact fluorescent drums. Offices use compact fluorescent drums, old drums, efficient 4' T8 30w wraps. Gyms have incandescent surface fixtures, compact fluorescent surface fixtures. Storage areas employ compact fluorescent surface fixtures, incandescent surface fixtures, efficient 4' T8 30w strips. Halls use compact fluorescent drums. Mechanical areas employ incandescent

surface fixtures, T12 old surface fixtures. Baths have standard T8 boxes, compact fluorescent cans. Bedrooms employ compact fluorescent drums. Kitchens utilize efficient 4' T8 30w wraps. Perimeters use HPS exterior fixtures, floods, incandescent decorative fixtures, wall mounted fixtures.

Police Station

Building Characteristics

This building was recently renovated to provide an all new interior while reusing the existing structure and exterior. It is a brick exterior with three floors plus a basement level. The building houses a booking area, holding cells, exercise space, offices, a shooting range, and mechanic garage. It has a sloped attic roof. Some areas of the building are staffed 24/7 while others are only occupied during normal business hours.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

This building is heated, cooled and ventilated primarily by a large Roof Top Unit (RTU). It supplies air to Variable Air Volume (VAV) Boxes, both Fan Powered (FBVAV) and non. There have been numerous and chronic comfort complaints from several areas of the building. These are due to both mechanical and controls issues.

During site visits it was discovered that the RTU Outdoor Air damper was closed, preventing fresh ventilation air from entering the space and disallowing the use of economizer 'free cooling'. This has exacerbated overheating issues in certain spaces, along with a general feeling of stuffiness. It was also discovered that the RTU return fan had been wired backwards, preventing Return Air from getting through the unit and back to the occupied space. With neither fresh Outdoor Air nor Return Air able to get through the RTU, it was unable to provide the proper amount of Supply Air.

Energy Management Systems

This renovated building has an existing Tridium DDC system that controls the existing boiler, chiller, pumps, RTU, and fan coil units. All of these systems are controlled by the central EMS but because of issues with the RTU, it is difficult to determine how well the sequences and schedules are working. The lack of proper airflow is indicated across all terminal units. A full point to point check of the system is necessary to ensure proper operation.

Domestic Hot Water Systems

Domestic hot water is generated by a 200MBH AO Smith hot water heater and stored in two 120 gallon tanks. This water is circulated throughout the system by a small circulator pump.

Lighting Systems

Offices have standard T8 troffers, wraps, compact fluorescent cans. Halls utilize compact fluorescent drums, cans, standard T8 troffers, tubes, and incandescent quartz indirects. Storage areas have standard T8 industrials, secure wraps, troffers, strips, vapor tights, compact fluorescent cans, drums, incandescent quartz floods, incandescent cans. Baths use compact fluorescent drums, squares, cans, standard T8 troffers. Classrooms use compact fluorescent cans, standard T8 indirects. Gyms utilize standard T8 troffers, compact fluorescent cans, MH troffers. Mechanical areas employ standard T8 strips. Shops utilize standard T8 industrials. Parking garages have standard T8 strips. Kitchens employ standard T8 troffers. Perimeters employ compact fluorescent exterior fixtures, MH cans, decorative fixtures, incandescent quartz floods. Parking lots use MH parking/roadway fixtures.

Callahan Senior Center

Building Characteristics

This building houses special services and activity space for seniors in the Town of Framingham, as well as offices for administrators. It is of modern block construction, two stories in some portions and single story in others. Most of the building has a flat rubber membrane roof, but some portions have a sloped attic roof. Windows are aluminum frame and double glazed. The batt insulation attached to the underside of the attic roof is not air sealed, and is missing entirely in spots.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The building is heated and cooled by seven (7) gas-fired, DX cooled, Roof Top Units (RTU). These RTUs are located on the flat sections of roof and provide ventilation and conditioned air to different spaces at the Senior Center. A small amount of electric baseboard heat is present in the main lobby.

Energy Management Systems

The seven (7) RTUs and electric baseboard heat are on the Tridium EMS. Thermostats are located throughout the building and their temperature sent back to each RTU to control the temperature of supply air. For RTUs serving multiple spaces with more than one thermostat, an average temperature of all appropriate spaces is calculated. Full scheduling and adjustment of space temperature setpoints is available.

Domestic Hot Water Systems

Domestic hot water for the building is provided by a small gas-fired hot water heater.

Lighting Systems

Offices utilize standard T8 troffers, wraps, incandescent cans, compact fluorescent exits. Halls utilize compact fluorescent cans, surface fixtures, standard T8 troffers, wraps. Classrooms utilize standard T8 troffers. Baths have standard T8 troffers, compact fluorescent cans. Auditoriums employ compact fluorescent sconces, cans. Labs employ incandescent cans, standard T8 wraps. Kitchens have standard T8 troffers,

compact fluorescent exits. Storage areas utilize standard T8 strips, wraps, troffers. Perimeters have MH exterior fixtures, compact fluorescent cans. Parking lots employ MH parking/roadway fixtures.

Pearl Street Garage

Building Characteristics

The Pearl Street Garage is a multilevel parking garage near the center of Town. It has a small toll attendant booth of concrete construction. The booth is only staffed during weekday mornings as tolls are only collected for the morning influx of commuters.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The booth is heated by a small electric space heater and cooled by a small window air conditioner.

Energy Management Systems

The heater and AC are controlled by local manual controls.

Domestic Hot Water Systems

There is no hot water at this facility.

Lighting Systems

Parking garages employ standard T8 vapor tights, MH parking/roadway fixtures, and incandescent old exterior fixtures. Halls use compact fluorescent squares. Offices employ standard T8 troffers.

Animal Control Building

Building Characteristics

The Animal Control Building consists of two sections, office space and the kennel. The office space is a small one story building with vinyl siding, a concrete foundation, double glazed windows and a flat roof. The kennel is of similar construction, but has several vertically sliding doors to allow dogs in and out. It also features a large skylight to allow daylighting.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The offices and kennel are each heated and cooled by a gas-fired DX cooled Roof Top Unit (RTU).

Energy Management Systems

The kennel RTU is controlled by a programmable thermostat and the office RTU is controlled by a non-programmable thermostat. Both thermostats are set to maintain a constant temperature and must be manually set back in order to achieve nighttime savings.

Domestic Hot Water Systems

Domestic hot water for the building is provided by an AO Smith gas-fired 80 gallon hot water heater with no circulator pump.

Lighting Systems

Storage areas utilize standard T8 troffers, vapor tights. Halls use standard T8 troffers. Kitchens employ standard T8 troffers. Offices have standard T8 troffers. Baths use standard T8 troffers. Perimeters utilize compact fluorescent exterior fixtures.

Old Edgell Library

Building Characteristics

The Edgell Memorial Library was built in 1872. It has a stone exterior with a plaster wall interior. It stands in the Centre Common and is currently used as a cultural community center by the Framingham History Center. It is used for local exhibitions, storage, and office space. The building's windows have been restored and are scheduled to get new storm windows. The space is mostly one floor with high ceilings. Two side sections are two-story and there is a large attic space above the whole building. The is no insulation in the attic space and the area is not well sealed.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The building was originally heated by a boiler in the basement and radiators located throughout the space. This system has been removed and a new hot water boiler was installed in place of the old one. The boiler feeds hot water to two DX cooled Fan Coil Units (FCU) in the attic space. Ductwork runs through the attic space and down to ceiling mounted supply diffusers. There is a long run of refrigerant piping from the FCUs to rooftop mounted condensing units. Because of the high ceilings and lack of insulation, the attic space stays very warm during the heating season while the occupied space below has a difficult time staying warm.

Energy Management Systems

The two FCUs are controlled by two non-programmable thermostats. These try to maintain a set temperature in the conditioned space, and have to be manually set back in order to achieve nighttime savings.

Domestic Hot Water Systems

There is no domestic hot water at this facility.

Lighting Systems

Galleries employ incandescent cans. Offices utilize T12 strips, incandescent old drums. Halls use incandescent cans, drums. Storage areas utilize T12 strips, old surface fixtures. Baths have incandescent surface fixtures. Perimeters use incandescent decorative fixtures, incandescent quartz floods, and HPS old exterior fixtures.

Academy Building

Building Characteristics

The Academy Building is another building in the Centre Common and is operated by the Framingham History Center as a museum. It has a stone exterior with a plaster wall interior. The first floor, second floor and basement house exhibit space. There is also some office space on the second floor. There is attic space above the second floor ceiling with little or no insulation.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The building is heated by a Lennox G11-200 gas-fired furnace in the basement. It supplies heated air through ductwork to all spaces in the building. The unit is also DX cooled and provides cooling to the building.

Energy Management Systems

The furnace is controlled by a programmable thermostat in the space. The thermostat is set to maintain 70ºF 24/7 as a fluctuation in temperature could damage the pieces on display.

Domestic Hot Water Systems

There is no domestic hot water at this facility.

Lighting Systems

Parking lots use MH parking/roadway fixtures. Perimeters employ incandescent quartz floods, HPS exterior fixtures.

Park Department Headquarters

Building Characteristics

The Park Department Headquarters is located adjacent to Bowditch Field. It is a brick building with a main level and basement. The basement has locker rooms, shop space, and a garage. The main level has office space and showers. Above the first floor is an attic with sloped roof. The locker room and showers were initially designed for use by teams using the Bowditch Field, but are used only occasionally now. The main office space is occupied during normal business hours.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The building is heated by three small gas-fired air handlers. A Trane air handler in the basement provides heating to that area. Two American Standard air handlers provide heating and DX cooling to the main floor office space. These air handlers sit in the attic and their ductwork runs through the attic to the appropriate spaces.

Energy Management Systems

The three air handling units are controlled by four programmable thermostats located throughout the building. Three of the thermostats are linked directly to the three air handlers, and the fourth thermostat, located in the conference room, controls a damper supplying air to that space.

Domestic Hot Water Systems

Domestic hot water is generated by a large 300MBH AO Smith gas-fired hot water heater and stored in a 120 gallon tank. The large capacity was designed for the shower facilities, which are hardly ever used.

Lighting Systems

Offices have efficient 4' T8 30w wraps, old surface fixtures. Baths employ efficient 4' T8 30w wraps, incandescent cans, compact fluorescent squares. Storage areas use standard T8 industrials, incandescent surface fixtures, efficient 4' T8 30w wraps, old surface fixtures, T5 troffers, compact fluorescent squares, and T12 strips. Halls have efficient 4' T8 30w old surface fixtures, wraps. Perimeters have HPS floods, incandescent old wall mounted fixtures, squares. Parking garages utilize standard T8 industrials. Driveways employ HPS decorative fixtures.

Department of Public Works Headquarters

Building Characteristics

This is a large building consisting of large garage and storage space along with office and administrative space. It is a combination of block and garage-style construction with metal siding. It has a flat rubber membrane over the entire building. The center space is office area and the southern garage is mechanic space. The much larger northern garage space is used for vehicle storage. There is a doublewide trailer building behind the headquarters which house exercise space.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The building is heated by three small gas-fired air handlers. A Trane air handler in the basement provides heating to that area. Two American Standard air handlers provide heating and DX cooling to the main floor office space. These air handlers sit in the attic and their ductwork runs through the attic to the appropriate spaces.

Energy Management Systems

The three air handling units are controlled by four programmable thermostats located throughout the building. Three of the thermostats are linked directly to the three air handlers, and the fourth thermostat, located in the conference room, controls a damper supplying air to that space.

Domestic Hot Water Systems

Domestic hot water for the building is provided by two gas-fired hot water heaters. One is a 120 gallon AO Smith hot water heater and the other is a 100 gallon State hot water heater.

Lighting Systems

Offices use standard T8 troffers, indirects. Shops utilize T5 bay fixtures, vapor tights, standard T8 industrials, strips, vapor tights, MH bay fixtures. Parking garages employ T5 bay fixtures, T12 strips. Storage areas have standard T8 strips, industrials, wraps, T5 bay fixtures, and indirects. Baths use standard T8 wraps, troffers, vanities, vapor tights, compact fluorescent drums. Classrooms employ T5 indirects. Gyms utilize T12 strips. Halls have standard T8 troffers. Cafeterias utilize standard T8 troffers. Kitchens have T5 indirects. Parking lots use LED parking/roadway fixtures. Perimeters employ MH parking/roadway fixtures.

Department of Public Works Offices

Building Characteristics

This building, located at 110 Western Avenue directly next to the DPW Headquarters building, is a small, one story building. It has metal siding above a block foundation and a slightly sloped roof. It houses office space for DPW staff and is occupied during normal business hours. Windows are aluminum framed and double paned.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

This building is heated and cooled by four gas-fired; DX cooled Roof Top Units (RTU).

Energy Management Systems

The four RTUs are controlled by four programmable thermostats. The thermostats are programmed for both cooling and heating setpoints to roughly the occupied hours.

Domestic Hot Water Systems

This is no domestic hot water at this building.

Lighting Systems

Offices have standard T8 troffers, indirects. Halls employ standard T8 troffers. Storage areas utilize standard T8 troffers. Baths use standard T8 troffers. Perimeters have compact fluorescent exterior fixtures.

Henry Street Garage

Building Characteristics

This mechanic garage is a two story tall cement block building. It has a flat roof and windows are double pane. Two overhead doors lead to the mechanic's garage, with loft bays above. Some windows and doors have been replaced.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The building is heated by two gas-fired furnaces, one heating the first floor and one heating the second. Two gas-fired unit heaters heat the maintenance garage and big garage, respectively

Energy Management Systems

Heat is controlled by simple non-programmable thermostats. They are set for a comfortable temperature and must be turned down at night to get any nighttime setback savings.

Domestic Hot Water Systems

Domestic Hot Water is generated and stored in a small 15 gallon 1.5kW electric hot water heater. No circulation pump is needed as this is not a large building.

Lighting Systems

Storage areas employ standard T8 wraps, strips, MH bay fixtures. Shops use standard T8 industrials. Offices employ standard T8 troffers, wraps. Halls have standard T8 troffers, wraps. Parking lots employ MH floods. Baths utilize standard T8 troffers. Perimeters use HPS exterior fixtures, floods, MH floods. Parking garages have standard T8 wraps.

Sanitation Department

Building Characteristics

The Sanitation Facility is spread over two buildings. The first is a multi-story incinerator plant with lockers, showers, and meeting space. The incinerator is no longer used although the building is still occupied occasionally as meeting space. The lower building is a much newer garage. It has a large garage bay with multiple overhead doors and a small office area. It has a metal frame and siding on top of a concrete foundation.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The original incinerator building is heated with electric resistance heaters. There is baseboard in the meeting room and unit heaters in the locker and shower area. The actual incinerator space is not heated. The lower garage is heated by a Carrier gas-fired, DX cooled furnace serving the office space and two gas-fired unit heaters serving the garage space.

Energy Management Systems

Electric heat for the Incinerator building is controlled by local non-programmable thermostats. The gas-fired furnace and garage unit heaters in the lower building are also controlled by non-programmable thermostats. These maintain one temperature, and would need to be manually set back at night in order to get nighttime savings.

Domestic Hot Water Systems

Domestic hot water for the old shower facilities is provided by an AO Smith gas-fired 38 gallon hot water heater. Hot water for the two bathrooms in the lower building is provided by a small electric hot water heater.

Lighting Systems

Mechanical areas have MH bay fixtures, incandescent surface fixtures, T12 strips. Halls have T12 old surface fixtures, wraps, standard T8 wraps, troffers. Storage areas have incandescent surface fixtures, standard T8 wraps, T12 old surface fixtures. Baths utilize incandescent old wall mounted fixtures, old drums, T12 old surface fixtures, standard T8 wraps. Parking garages utilize 150W Induction Lighting bay fixtures. Offices have standard T8 troffers, wraps.

Parking garages employ standard T8 strips. Offices utilize standard T8 troffers. Baths employ standard T8 troffers. Mechanical areas utilize standard T8 strips. Perimeters have HPS exterior fixtures, parking/roadway fixtures, floods. Parking lots have HPS parking/roadway fixtures. Driveways use HPS parking/roadway fixtures.

Barbieri Elementary School

Building Characteristics

The Barbieri Elementary School was built in 1974 as a Middle School. It is approximately 112,000 square feet spread over multiple levels with a very open layout. It is standard block construction with a brick exterior and flat rubber membrane roof. It has a large unconditioned storage warehouse that originally housed an indoor pool.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The building was originally heated entirely by electric baseboard heaters around the perimeter. Two Weil-McLain 88 gas-fired hot water boilers were installed to provide heating to eight (8) Roof Top Units (RTU). The RTUs provide DX cooling and ventilation air to the occupied spaces. The electric baseboard heat remains and is used only to provide auxiliary heating.

Energy Management Systems

The school has a new DDC Tridium EMS that can be accessed via the internet. All relevant equipment has been added to the system. All actuators on damper and valves are digital, and adjustments to temperature setpoints and schedules can be made remotely. The system is monitored by staff via a PC at the school facility offices at the Fuller Middle School. The Tridium system was installed on top of and integrated to existing Trane controllers on the RTUs.

Domestic Hot Water Systems

Domestic hot water is provided by an AO Smith hot water heater and storage tank in the boiler room.

Lighting Systems

Classrooms use efficient 4' T8 30w troffers, boxes, industrials, standard T8 troffers. Halls use efficient 4' T8 30w troffers, wraps, strips, incandescent cans. Offices use efficient 4' T8 30w troffers, strips, standard T8 troffers, and T5 "biax" indirects. Storage areas use efficient 4' T8 30w troffers, industrials, strips, T5 bay fixtures. Cafeterias use efficient 4' T8 30w troffers, wraps, standard T8 troffers. Libraries have efficient 4' T8 30w troffers. Auditoriums use LED cans, standard T8 boxes, efficient 4' T8 30w boxes. Baths have efficient 4' T8 30w troffers, strips, compact fluorescent squares, standard T8 troffers, vanities. Gyms use T5 bay fixtures, efficient 4' T8 30w troffers. Mechanical areas utilize efficient 4' T8 30w strips. Kitchens have efficient 4' T8 30w troffers. Perimeters utilize MH exterior fixtures, incandescent cans. Parking lots use MH parking/roadway fixtures, floods.

Brophy Elementary School

Building Characteristics

The Brophy Elementary School was built in 1968. It is approximately 68,000 square feet including two levels plus a modular building. It is standard block construction with a brick exterior and flat rubber membrane roof.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

In the main school, two Weil-McLain 88 gas-fired hot water boilers were installed to provide heating to five (5) Air Handling Units (AHU) serving the Cafetorium, Gymnasium and Locker Rooms, twenty-six (26) Unit Ventilators (UV) in the classrooms, and numerous fin tubes throughout the building. The modular classrooms are heated and cooled by two (2) Rheem Roof Top Units.

Energy Management Systems

The school has an older DDC Tridium EMS that can be accessed via VPN. All relevant equipment has been added to the system. All actuators on dampers and valves are digital, and adjustments to temperature setpoints and schedules can be made remotely. The system is monitored by staff via a PC at the school facility offices at the Fuller Middle School.

Domestic Hot Water Systems

Domestic hot water is provided by a Burnham hot water heater in the boiler room along with three (3) storage tanks. Two of the tanks are valved off and no longer used.

Lighting Systems

Classrooms use standard T8 wraps, LED cans. Halls utilize LED cans, standard T8 indirects, wraps, troffers, compact fluorescent decorative fixtures. Offices have standard T8 wraps, indirects, incandescent surface

fixtures, compact fluorescent squares. Baths have compact fluorescent drums, squares, standard T8 vanities. Gyms use T5 bay fixtures. Libraries employ standard T8 wraps. Storage areas utilize compact fluorescent surface fixtures, squares, standard T8 wraps. Kitchens employ standard T8 wraps, LED cans. Auditoriums have standard T8 strips, incandescent surface fixtures. Cafeterias employ standard T8 wraps. Mechanical areas utilize standard T8 strips, compact fluorescent surface fixtures. Parking lots use HPS floods, parking/roadway fixtures. Perimeters utilize MH exterior fixtures, incandescent squares.

Cameron Middle School

Building Characteristics

Cameron Middle School was built in 1973. It is approximately 114,000 square feet and two stories. It has one main building section with classroom and Gym space and an Auditorium at the far end. It is brick construction with a flat roof. It has newer double pane, metal framed windows that are operable in the classrooms.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The building is heated by two Smith 28A gas-fired hot water boilers and cooled by a Trane RTHB 300-ton chiller. Hot and chilled water is fed to seven (7) Air Handling Units (AHU) which provide heating, cooling, and ventilation air to the occupied spaces of the North and South Classrooms, Auditorium, Cafeteria, Gymnasium and Music Room. There are also fin tubes throughout the building that provide additional heating on the perimeter.

Energy Management Systems

The school has an older DDC Tridium EMS that can be accessed via VPN. All relevant equipment has been added to the system. All actuators on damper and valves are digital, and adjustments to temperature setpoints and schedules can be made remotely. The system is monitored by staff via a PC at the school facility offices at the Fuller Middle School.

Domestic Hot Water Systems

Domestic hot water is provided by two Raypak hot water heaters and two storage tanks in two separate boiler rooms.

Lighting Systems

Classrooms utilize efficient 4' T8 28w indirects, wallwash, coves, valances, troffers, boxes, standard T8 indirects, wallwash, coves, valances, troffers, compact fluorescent cans. Halls utilize compact fluorescent cans, sconces, drums, standard T8 coves, wallwash, troffers, boxes, efficient 4' T8 28w coves, troffers, T5 "biax" decorative fixtures. Offices use standard T8 indirects, troffers, wallwash, wraps, strips, compact fluorescent cans, efficient 4' T8 28w indirects, T5 "biax" decorative fixtures. Libraries use compact fluorescent cans, wall

mounted fixtures, T5 "biax" decorative fixtures, standard T8 wallwash. Auditoriums use LED cans, compact fluorescent sconces, incandescent cans. Cafeterias utilize compact fluorescent decorative fixtures, sconces, LED cans, standard T8 troffers. Baths utilize efficient 4' T8 28w troffers, standard T8 troffers. Kitchens use standard T8 troffers, boxes, compact fluorescent cans. Storage areas have standard T8 boxes, troffers, indirects, wraps. Labs have standard T8 indirects, wallwash, coves, and valances. Gyms have T5 bay fixtures. Mechanical areas have standard T8 wraps. Walkways use MH surface fixtures, incandescent cans. Parking lots utilize MH parking/roadway fixtures. Perimeters have compact fluorescent wall mounted fixtures, exterior fixtures, MH exterior fixtures.

Dunning Elementary School

Building Characteristics

Dunning Elementary School was built in 1965. It is approximately 61,500 square feet on one level. It is brick construction with a flat rubber membrane roof with gravel ballast. The windows are original single plane type with small operable sections.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

Two Weil-McLain 88 gas-fired hot water boilers were installed to provide heating to two (2) Heating and Ventilation Units(HV) that serve the Gym, thirty-three (33) Unit Ventilators (UV) in the classrooms, and numerous fin tubes throughout the perimeter of the building.

Energy Management Systems

The school has an older DDC Tridium EMS that can be accessed via VPN. All relevant equipment has been added to the system. All actuators on damper and valves are digital, and adjustments to temperature setpoints and schedules can be made remotely. The system is monitored by staff via a PC at the school facility offices at the Fuller Middle School.

Domestic Hot Water Systems

Domestic hot water is provided by a Burnham hot water heater and a storage tank in the boiler room.

Lighting Systems

Classrooms use efficient 4' T8 30w wraps, compact fluorescent drums. Halls utilize T5 "biax" indirects, compact fluorescent drums, decorative fixtures, efficient 4' T8 30w indirects. Offices utilize efficient 4' T8 30w old surface fixtures, wraps. Baths use T5 "biax" indirects, compact fluorescent drums, and efficient 4' T8 30w old surface fixtures. Auditoriums have efficient 4' T8 30w strips, incandescent cans. Cafeterias employ efficient 4' T8 30w wraps. Storage areas utilize efficient 4' T8 30w wraps, industrials, old surface fixtures, strips, LED surface fixtures, compact fluorescent squares. Gyms use T5 bay fixtures. Mechanical areas employ compact fluorescent surface fixtures, efficient 4' T8 30w strips. Labs have efficient 4' T8 30w

indirects, wraps. Kitchens employ efficient 4' T8 30w old surface fixtures. Driveways utilize MH parking/roadway fixtures. Perimeters use LED floods, squares, HPS exterior fixtures, incandescent exterior fixtures.

Framingham High School

Building Characteristics

Framingham High School was built in 1961 but has undergone major renovations throughout the years. It is approximately 396,000 square feet spread over two levels. It has classroom Wings A through K as well as two Gymnasiums, a library, a cafeteria, and a Wellness Center. It is block construction with a brick façade and has a flat rubber membrane roof with stone ballast.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The two boiler rooms at Framingham High School house five Weil-McLain 88 gas-fired hot water boilers that provide heat to four (4) AHUs serving the Gyms, twelve (12) Heat Recovery Units (HRU) serving the classroom wings, three (3) RTUs serving the Wellness Center, two (2) Heating and Ventilation Units and numerous fan coil units, VAV boxes and fin tubes located throughout the building. The VAV boxes modulated heating and cooling air provided by nine (9) gas-fired, DX cooled RTUs.

Energy Management Systems

The school has an older DDC Tridium EMS that can be accessed via VPN. All relevant equipment has been added to the system. All actuators on damper and valves are digital, and adjustments to temperature setpoints and schedules can be made remotely. The system is monitored by staff via a PC at the school facility offices at the Fuller Middle School.

Domestic Hot Water Systems

Domestic hot water is provided by a Lochinvar AWN, a PVI 20N, and a Ruud G91 hot water heater and two storage tanks located in two separate boiler rooms.

Lighting Systems

Classrooms have standard T8 indirects, troffers, and T5 "biax" indirects. Offices utilize T5 "biax" indirects, standard T8 indirects, troffers, and T12 indirects. Halls utilize compact fluorescent cans, standard T8 troffers. Labs use standard T8 troffers, indirects. Baths utilize standard T8 wraps, troffers, compact fluorescent cans. Storage areas employ standard T8 wraps, indirects, and troffers. Gyms use standard T8 bay fixtures. Auditoriums employ LED cans, compact fluorescent cans, standard T8 wraps, incandescent cans. Cafeterias employ standard T8 wraps, T5 "biax" indirects. Libraries have compact fluorescent cans, decorative fixtures,

and standard T8 coves. Kitchens utilize standard T8 troffers, coves, compact fluorescent cans. Mechanical areas employ standard T8 wraps.

Hemenway Elementary School

Building Characteristics

Hemenway Elementary School was built in 1961 and is virtually identical to Dunning Elementary School. It is approximately 66,500 square feet including modular classrooms and is one story. It is brick construction with a flat rubber membrane roof. The existing windows are metal frame and single pane.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

Two Weil-McLain 88 gas-fired hot water boilers were installed to provide heating to two (2) RTUs that serve the Gym, thirty-three (33) Unit Ventilators (UV) in the classrooms, and numerous fin tubes throughout the building.

Energy Management Systems

The school has an older DDC Tridium EMS that can be accessed via VPN. All relevant equipment has been added to the system. All actuators on damper and valves are digital, and adjustments to temperature setpoints and schedules can be made remotely. The system is monitored by staff via a PC at the school facility offices at the Fuller Middle School.

Domestic Hot Water Systems

Domestic hot water is provided by a Burnham hot water heater and one storage tank in the boiler room.

Lighting Systems

Classrooms utilize standard T8 wraps, troffers, boxes. Halls employ T5 "biax" indirects, standard T8 indirects, troffers, compact fluorescent drums. Offices employ standard T8 old surface fixtures, wraps, indirects, industrials, compact fluorescent drums. Baths have standard T8 troffers, wraps, compact fluorescent drums. Libraries have standard T8 troffers, wraps. Gyms employ T5 bay fixtures. Mechanical areas utilize LED surface fixtures. Cafeterias have standard T8 wraps. Storage areas use standard T8 old surface fixtures, wraps, LED surface fixtures, compact fluorescent drums. Kitchens use standard T8 old surface fixtures. Auditoriums employ incandescent cans. Perimeters utilize LED exterior fixtures.

Juniper Hill Elementary School

Building Characteristics

Juniper Hill Elementary School was built in 1959. The building has gone through several different uses over the years, including recently as a Jewish Day School. It is a two story building and approximately 44,300 square feet. It is brick construction with a flat rubber membrane roof. It has original single plane windows that have become very drafty in sections.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

Two Weil-McLain 88 gas-fired hot water boilers were installed to provide heating to one (1) RTU, one (1) Heating & Ventilation Unit in the Gym, twenty-four (24) Unit Ventilators (UV) in the classrooms, and numerous fin tubes throughout the building.

Energy Management Systems

The school has a new DDC Tridium EMS that can be accessed via the internet. All relevant equipment has been added to the system. All actuators on damper and valves are digital, and adjustments to temperature setpoints and schedules can be made remotely. The system is monitored by staff via a PC at the school facility offices at the Fuller Middle School.

Domestic Hot Water Systems

Domestic hot water is provided by a Burnham hot water heater and one storage tank in the boiler room.

Lighting Systems

Classrooms utilize standard T8 wraps, troffers. Halls employ compact fluorescent drums, LED cans, standard T8 troffers. Offices use standard T8 old surface fixtures, wraps, troffers. Baths utilize compact fluorescent drums, standard T8 wraps. Cafeterias use standard T8 wraps. Gyms employ T5 bay fixtures. Mechanical areas utilize LED surface fixtures. Storage areas have standard T8 old surface fixtures, wraps, troffers, LED surface fixtures. Kitchens have standard T8 old surface fixtures, wraps. Auditoriums utilize standard T8 wraps. Perimeters have HPS exterior fixtures, squares, standard T8 coves.

King Administration Building

Building Characteristics

The King Administration Building was built in 1957 as the Brook Water School. It has been converted to house school administration services, with classrooms converted to offices and meeting space. It is approximately 50,000 square feet spread over two levels. It is block construction with a flat rubber membrane roof. Windows are operable and single pane.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The building has Two Weil-McLain 88 gas-fired hot water boilers that provide heating to six (6) RTUs, one (1) AHU, two (2) Heating & Ventilation Units that serve the Cafetorium and All-Purpose Room and twenty-five (25) Unit Ventilators (UV) in the former classrooms. The RTUs provide ventilation air to occupied spaces as well as DX cooled air.

Energy Management Systems

The school has a new DDC Tridium EMS that can be accessed via the internet. All relevant equipment has been added to the system. All actuators on damper and valves are digital, and adjustments to temperature setpoints and schedules can be made remotely. The system is monitored by staff via a PC at the school facility offices at the Fuller Middle School.

Domestic Hot Water Systems

Domestic hot water is provided by a Ruud storage hot water heater.

Lighting Systems

Offices have efficient 4' T8 30w troffers, wraps, indirects, standard T8 troffers, incandescent surface fixtures. Halls use standard T8 wraps, indirects, compact fluorescent squares, exits, efficient 4' T8 30w wraps. Auditoriums employ standard T8 indirects. Baths utilize efficient 4' T8 30w wraps, standard T8 indirects, wraps, compact fluorescent squares, LED surface fixtures, incandescent drums. Storage areas employ efficient 4' T8 30w old surface fixtures, troffers, wraps, strips, compact fluorescent squares, surface fixtures, incandescent drums. Gyms use T5 bay fixtures. Mechanical areas employ compact fluorescent surface fixtures. Parking lots utilize MH parking/roadway fixtures, HPS floods. Perimeters utilize HPS exterior fixtures, incandescent squares, MH exterior fixtures, LED floods.

McCarthy Elementary School

Building Characteristics

McCarthy Elementary School was built in 1952 but was largely reconstructed in 1994. It is approximately 94,936 square feet on two levels. It is block construction with a brick façade and a flat rubber membrane roof with gravel ballast. Windows are metal framed and double-paned.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

Two Weil-McLain 88 gas-fired hot water boilers provide heating to air handlers serving the Cafeteria, Administration Area, Gym, Library, Kitchen, and hallway along with forty (40) UVs, and six (6) Variable Air Volume (VAV) boxes. The VAVs modulate heating and cooling air delivered to individual spaces.

Energy Management Systems

The school has a new DDC Tridium EMS that can be accessed via the internet. All relevant equipment has been added to the system. All actuators on damper and valves are digital, and adjustments to temperature setpoints and schedules can be made remotely. The system is monitored by staff via a PC at the school facility offices at the Fuller Middle School.

Domestic Hot Water Systems

Domestic hot water is provided by a Weil-Mclain PFG hot water heater and one storage tank in the boiler room.

Lighting Systems

Classrooms use standard T8 valances, indirects, strips, compact fluorescent cans, MH decorative fixtures, T5 "biax" decorative fixtures. Halls have compact fluorescent exterior fixtures, decorative fixtures, cans, exits, sconces, standard T8 coves, boxes, T5 "biax" decorative fixtures. Offices have standard T8 valances, boxes, coves, wraps, compact fluorescent cans, decorative fixtures, exits, drums. Libraries have standard T8 coves, strips, compact fluorescent cans. Cafeterias have LED cans, standard T8 indirects, wallwash, compact fluorescent cans. Baths have standard T8 strips, coves, valances, wraps, compact fluorescent cans. Storage areas employ standard T8 wraps, valances, strips, compact fluorescent drums. Gyms utilize T5 bay fixtures, compact fluorescent exits. Kitchens use standard T8 troffers, coves, wraps. Auditoriums have LED surface fixtures, standard T8 strips. Bedrooms employ standard T8 valances. Walkways utilize HPS parking/roadway fixtures. Perimeters use incandescent squares, HPS exterior fixtures, floods, compact fluorescent exterior fixtures. Parking lots use HPS parking/roadway fixtures.

Potter Road Elementary School

Building Characteristics

The Potter Road Elementary School was built in 1966 and is virtually identical to the Brophy Elementary School. It is two stories and approximately 63,600 square feet. It is standard block construction with a brick exterior and flat rubber membrane roof.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

In the main school, two Weil-McLain 88 gas-fired hot water boilers provide heating to five (5) Air Handling Units (AHU) that serve the Gym, Cafetorium, and Locker Rooms, and twenty-six (26) Unit Ventilators (UV) in the classrooms as well as perimeter heating. Heating hot water is circulated by two ten-horsepower pumps.

Energy Management Systems

The school has an older DDC Tridium EMS that can be accessed via VPN. All relevant equipment has been added to the system. All actuators on damper and valves are digital, and adjustments to temperature setpoints and schedules can be made remotely. The system is monitored by staff via a PC at the school facility offices at the Fuller Middle School.

Domestic Hot Water Systems

Domestic hot water is provided by a Burnham hot water heater in the boiler room along with three (3) storage tanks (two are valved off).

Lighting Systems

Classrooms have standard T8 wraps, LED cans. Halls employ LED cans, standard T8 indirects, wraps, troffers, compact fluorescent decorative fixtures. Offices utilize standard T8 wraps, indirects, incandescent surface fixtures, compact fluorescent squares. Baths have compact fluorescent drums, squares, standard T8 vanities. Gyms use T5 bay fixtures. Libraries employ standard T8 wraps. Storage areas utilize compact fluorescent surface fixtures, squares, standard T8 wraps. Kitchens employ standard T8 wraps, LED cans. Auditoriums have standard T8 strips, incandescent surface fixtures. Cafeterias employ standard T8 wraps. Mechanical areas utilize standard T8 strips, compact fluorescent surface fixtures. Parking lots employ HPS floods, parking/roadway fixtures. Perimeters utilize MH exterior fixtures, incandescent squares.

Stapleton Elementary School

Building Characteristics

Stapleton Elementary School was built in 1922. Additions were built in 1956 and 1972. It is three stories and approximately 59,600 square feet. It is brick construction with most likely little to no insulation in the original section.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

Two Weil-McLain 88 gas-fired steam boilers were installed to provide heating to an AHU that serves the GYM, twenty-four (24) Unit Ventilators in the classrooms, and numerous fin tubes throughout the building.

Energy Management Systems

The school has an older, very limited EMS system that is in the process of getting upgraded. Existing pneumatic actuators are currently controlled by the EMS but that are being replaced by DDC actuators to eliminate the need for a pneumatic compressor.

Domestic Hot Water Systems

Domestic hot water is provided by a Burnham hot water heater in the boiler room and storage tank.

Lighting Systems

Classrooms have standard T8 wraps. Halls use standard T8 old surface fixtures, wraps. Offices utilize standard T8 troffers, old surface fixtures, wraps, strips. Libraries utilize standard T8 wraps, old surface fixtures. Cafeterias use standard T8 boxes, wraps. Storage areas utilize standard T8 wraps, strips, troffers, old surface fixtures, LED surface fixtures, compact fluorescent squares. Baths employ standard T8 wraps, old surface fixtures, compact fluorescent old drums, squares, LED squares. Gyms have T5 bay fixtures. Kitchens use standard T8 wraps. Auditoriums utilize standard T8 strips. Parking lots employ HPS floods. Perimeters utilize HPS exterior fixtures.

Thayer Campus of FHS

Building Characteristics

The Thayer Building was built in 1905. It is approximately 10,800 square feet, with two stories plus a basement. It is brick construction and a shingled roof over the attic. It has previously been used as school and office space and currently houses the alternative high school Windows are wood framed and have been replaced.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

One Weil-McLain 78 gas-fired steam boiler provides heating to floor mounted cast iron radiators throughout the building. All accessible piping is well insulated.

Energy Management Systems

The school has an older DDC Tridium EMS that can be accessed via VPN. The system is monitored by staff via a PC at the school facility offices at the Fuller Middle School.

Domestic Hot Water Systems

Domestic hot water is provided by a Ruud storage hot water heater in the basement.

Lighting Systems

Classrooms have T12 wraps. Offices use T12 wraps, troffers, and standard T8 wraps. Halls have compact fluorescent drums, T12 wraps. Baths have incandescent squares, drums, T12 wraps, compact fluorescent decorative fixtures. Kitchens use T12 wraps. Perimeters employ HPS old exterior fixtures, old surface fixtures.

Walsh Middle School

Building Characteristics

Walsh Middle School was built in 1969. It is approximately 201,000 square feet and two stories. The building features classroom space, administration offices, an auditorium, a gymnasium and a cafeteria. It is standard block construction with a brick façade and has a flat rubber membrane roof.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The building has a hot water heating system with three Weil-McLain 88 gas-fired hot water boilers. These boilers provide hot water Heating & Ventilation units that serve the Cafeteria, Kitchen, Gyms & Locker Rooms, and offices. The classrooms are heated and ventilated by unit ventilators.

Energy Management Systems

The school has a new DDC Tridium EMS that can be accessed via the internet. All relevant equipment has been added to the system. All actuators on damper and valves are digital, and adjustments to temperature setpoints and schedules can be made remotely. The system is monitored by staff via a PC at the school facility offices at the Fuller Middle School.

Domestic Hot Water Systems

Domestic hot water is provided by a Weil-Mclain PFG hot water heater and three storage tanks in the boiler room. A Ruud electric storage tank water heater serves the kitchen.

Lighting Systems

Classrooms employ efficient 4' T8 28w wraps, strips, standard T8 troffers. Halls use efficient 4' T8 28w wraps, compact fluorescent exits. Gyms utilize T5 bay fixtures, efficient 4' T8 28w wraps. Libraries use LED cans, efficient 4' T8 28w wraps. Cafeterias utilize efficient 4' T8 28w wraps, incandescent cans, compact fluorescent exits. Baths employ efficient 4' T8 28w wraps, old surface fixtures. Offices have efficient 4' T8 28w wraps. Storage areas employ LED surface fixtures.

Wilson Elementary School

Building Characteristics

Wilson Elementary School was built in 1998. It is approximately 100,695 square feet and two stories. It is block construction with brick façade and has a flat rubber membrane roof. Windows are double pane with metal frames and operable sections in the classrooms. This building is one of the newest of the Town and School buildings.

Heating, Ventilating, and Air Conditioning Systems (HVAC)

The building is heated by two Smith 28A gas-fired hot water boilers and cooled by a Trane RTHB 255-ton chiller. Hot and chilled water is fed to seven (7) Air Handling Units (AHU) that serve Library, Kitchen, Gym, and Classroom space and numerous Variable Air Volume (VAV) Boxes which provide heating, cooling, and ventilation air to the occupied spaces. There are also fin tubes throughout the building.

Energy Management Systems

The school has an older DDC Tridium EMS that can be accessed via VPN. All relevant equipment has been added to the system. All actuators on damper and valves are digital, and adjustments to temperature setpoints and schedules can be made remotely. The system is monitored by staff via a PC at the school facility offices at the Fuller Middle School.

Domestic Hot Water Systems

Domestic hot water is provided by a Patterson-Kelly hot water heater in the boiler room along with one storage tank.

Lighting Systems

Classrooms utilize standard T8 indirects, coves, troffers, compact fluorescent cans, and drums. Halls have compact fluorescent sconces, cans, drums, exterior fixtures, standard T8 boxes, troffers, coves, T5 "biax" decorative fixtures. Offices have standard T8 troffers, indirects, valances, coves, compact fluorescent cans, sconces, T5 "biax" decorative fixtures. Libraries have compact fluorescent cans, standard T8 indirects, valances, T5 "biax" decorative fixtures. Baths have compact fluorescent cans, drums, exterior fixtures, sconces, standard T8 strips, troffers. Storage areas employ standard T8 troffers, valances, compact fluorescent cans, and incandescent cans. Cafeterias employ MH cans, incandescent cans, and compact fluorescent sconces. Kitchens employ standard T8 troffers, boxes, compact fluorescent cans. Mechanical areas have standard T8 industrials, strips. Gyms employ T5 bay fixtures, compact fluorescent exterior fixtures. Auditoriums have MH cans. Driveways use MH decorative fixtures. Parking lots employ MH decorative fixtures, floods. Walkways have MH decorative fixtures. Perimeters use MH exterior fixtures, cans, floods.

Appendix C2: Peregrine Building Assessment -

Priority (1, 2, 3)	Bldg	ECM No.	ECM No. and Description	Technology Group	Approximate Implementation Cost	Utility Incentive Available[1]	Potential Utility Savings				Annual Cost Avoidance	Reduces O&M Liability	Addresses End Of Life Equipment	Visual and/or Comfort Improvement	Simple Payback Yr
							Demand kW	Electric kWh/yr	Gas Therm/yr	Water MCF					
1	Barbieri ES	5	Replace CRT Computer Screens	O&M	$6,100	$0	24	4,000	(70)	-	$900	-	X	X	6.8
1	Barbieri ES	7	Lighting Update	LIGHTING	$84,300	$23,600	196	64,000	(560)	-	$11,500	-	-	-	5.3
2	Barbieri ES	9	Lighting Controls	LIGHTING	$40,000	$6,000	-	9,000	(100)	-	$1,000	-	-	-	34.0
2	Barbieri ES	10	Recommission / Adjust Control Systems	CONTROLS	$24,500	$0	-	12,000	1,000	-	$2,600	-	-	-	9.4
1	Barbieri ES	17	Schedule Domestic Hot Water	CONTROLS	$3,000	$0	-	300	300	-	$400	-	-	-	7.5
2	Barbieri ES	18	Install Fan VFD	CONTROLS	$30,000	$8,000	-	9,600	-	-	$1,200	-	-	-	18.3
2	Barbieri ES	22	Walk-in Evaporator Control & ECM Motors	CONTROLS	$6,000	$0	4	3,000	-	-	$500	-	-	-	12.0
1	Barbieri ES	25	Reduce Airflow (Resheave and/or New Motor)	HVAC	$5,000	$0	-	900	600	-	$800	-	-	-	6.3
1	Barbieri ES	35	Add / Replace Door Seals & Align Doors	ENVELOPE	$9,000	$0	-	-	900	-	$1,000	-	-	X	9.0
1	Brophy ES	5	Replace CRT Computer Screens	O&M	$900	$0	-	600	(10)	-	$100	-	-	-	9.0
1	Brophy ES	6	Replace Refrigerator(s)	O&M	$1,000	$0	1	800	-	-	$100	-	X	-	10.0
2	Brophy ES	8	Exterior Lighting Update	LIGHTING	$32,000	$3,200	-	22,000	-	-	$2,700	-	-	-	10.7
2	Brophy ES	9	Lighting Controls	LIGHTING	$30,000	$4,500	-	7,000	(100)	-	$800	-	-	-	31.9
2	Brophy ES	10	Recommission / Adjust Control Systems	CONTROLS	$25,000	$0	-	3,000	900	-	$1,400	-	-	-	17.9
2	Brophy ES	12	Expand Central DDC Controls	CONTROLS	$55,000	$0	-	1,000	300	-	$500	X	X	X	110.0
2	Brophy ES	13	Add Demand Control Ventilation	CONTROLS	$12,000	$700	-	2,000	600	-	$900	-	-	-	12.6
1	Brophy ES	17	Schedule Domestic Hot Water	CONTROLS	$3,000	$0	-	300	200	-	$300	-	-	-	10.0
2	Brophy ES	20	Interlock Dishwasher EF	CONTROLS	$5,000	$0	-	300	400	-	$500	-	-	-	10.0
2	Brophy ES	23	Update Pipe Insulation	HVAC	$5,000	$0	-	-	300	-	$300	-	-	X	16.7
2	Brophy ES	24	Replace Motor	HVAC	$750	$0	1	400	-	-	$70	-	-	-	10.7
2	Brophy ES	26	Install 2-Way Valves	HVAC	$8,000	$0	-	2,700	-	-	$300	-	-	-	26.7
3	Brophy ES	29	Convert Electric Heating to Gas	HVAC	$150,000	$0	40	24,000	(1,000)	-	$2,700	-	-	-	55.6
1	Brophy ES	35	Add / Replace Door Seals & Align Doors	ENVELOPE	$22,000	$0	-	-	1,700	-	$1,900	-	-	X	11.6
3	Brophy ES	40	Replace Windows	ENVELOPE	$800,000	$0	-	2,000	1,400	-	$1,800	X	X	X	444.4
1	Cameron MS	5	Replace CRT Computer Screens	O&M	$3,500	$0	8	2,000	(30)	-	$400	-	X	X	8.8
1	Cameron MS	7	Lighting Update	LIGHTING	$124,500	$10,300	144	44,000	(350)	-	$8,100	-	-	-	14.1
2	Cameron MS	9	Lighting Controls	LIGHTING	$40,000	$6,000	-	11,000	(200)	-	$1,100	-	-	-	30.9
2	Cameron MS	10	Recommission / Adjust Control Systems	CONTROLS	$25,000	$0	-	2,000	140	-	$400	X	-	-	62.5
2	Cameron MS	11	Integrate Controls to Web-Based Front End	CONTROLS	$121,600	$0	-	1,000	100	-	$200	X	-	-	608.0
1	Cameron MS	17	Schedule Domestic Hot Water	CONTROLS	$3,000	$0	-	300	300	-	$400	-	-	-	7.5
2	Cameron MS	19	Install Pump VFD	CONTROLS	$42,400	$16,200	-	22,000	-	-	$2,700	-	-	-	9.7
2	Cameron MS	22	Walk-in Evaporator Control & ECM Motors	CONTROLS	$6,000	$0	4	3,000	-	-	$500	-	-	-	12.0
1	Cameron MS	35	Add / Replace Door Seals & Align Doors	ENVELOPE	$3,300	$0	-	-	320	-	$400	-	-	X	8.3
2	Dunning ES	8	Exterior Lighting Update	LIGHTING	$0	$0	-	-	-	-	$0	-	-	-	#DIV/0!
2	Dunning ES	9	Lighting Controls	LIGHTING	$40,000	$6,000	-	7,000	(100)	-	$800	-	-	-	42.5
2	Dunning ES	10	Recommission / Adjust Control Systems	CONTROLS	$20,000	$0	-	1,000	2,000	-	$2,300	X	-	-	8.7
2	Dunning ES	11	Integrate Controls to Web-Based Front End	CONTROLS	$55,200	$0	-	500	400	-	$500	X	-	-	None
2	Dunning ES	13	Add Demand Control Ventilation	CONTROLS	$8,200	$450	-	500	300	-	$400	-	-	-	19.4
1	Dunning ES	17	Schedule Domestic Hot Water	CONTROLS	$3,000	$0	-	300	300	-	$400	-	-	-	7.5
2	Dunning ES	23	Update Pipe Insulation	HVAC	$2,500	$0	-	-	150	-	$170	-	-	X	14.7
3	Dunning ES	29	Convert Electric Heating to Gas	HVAC	$150,000	$0	36	22,000	(900)	-	$2,500	-	-	X	60.0
1	Dunning ES	35	Add / Replace Door Seals & Align Doors	ENVELOPE	$7,800	$0	-	-	1,300	-	$1,400	-	-	X	5.6
3	Dunning ES	40	Replace Windows	ENVELOPE	$1,000,000	$0	-	2,000	2,400	-	$2,900	X	X	X	344.8
1	Framingham HS	1	Change Operating Policy for Fume Hoods	O&M	$0	$0	29	15,000	3,200	-	$6,000	-	-	-	-
1	Framingham HS	2	Close Doors to Conditioned Space	O&M	$0	$0	31	4,000	-	-	$1,200	-	-	-	-
1	Framingham HS	5	Replace CRT Computer Screens	O&M	$4,500	$0	18	2,000	-	-	$600	-	X	X	7.5
1	Framingham HS	7	Lighting Update	LIGHTING	$194,000	$50,000	578	109,000	(1,200)	-	$24,600	-	-	-	5.9
2	Framingham HS	9	Lighting Controls	LIGHTING	$100,000	$15,000	-	24,000	(400)	-	$2,500	-	-	-	34.0
2	Framingham HS	10	Recommission / Adjust Control Systems	CONTROLS	$75,000	$0	72	18,000	3,500	-	$7,600	-	-	-	9.9
2	Framingham HS	11	Integrate Controls to Web-Based Front End	CONTROLS	$329,000	$0	-	5,000	500	-	$1,200	X	-	-	None
2	Framingham HS	13	Add Demand Control Ventilation	CONTROLS	$16,500	$900	-	-	1,500	-	$1,700	-	-	-	9.2
1	Framingham HS	15	Add HHW Reset	CONTROLS	$15,000	$0	-	-	1,100	-	$1,200	-	-	-	12.5
2	Framingham HS	16	Add Kitchen Exhaust Fan Control	CONTROLS	$20,000	$0	1	300	1,100	-	$1,300	-	-	-	15.4
1	Framingham HS	17	Schedule Domestic Hot Water	CONTROLS	$5,000	$0	-	300	400	-	$500	-	-	-	10.0
2	Framingham HS	18	Install Fan VFD	CONTROLS	$30,000	$2,000	48	11,000	-	-	$2,400	-	-	-	11.7
1	Framingham HS	21	Vending Machine Controller	CONTROLS	$2,000	$0	6	2,800	-	-	$500	-	-	-	4.0
2	Framingham HS	22	Walk-in Evaporator Control & ECM Motors	CONTROLS	$6,000	$0	4	3,000	-	-	$500	-	-	-	12.0
1	Framingham HS	35	Add / Replace Door Seals & Align Doors	ENVELOPE	$63,000	$0	-	-	3,000	-	$3,300	-	-	X	19.1
1	Hemenway ES	4	PC Load Management	O&M	$4,500	$0	-	3,000	(30)	-	$300	-	-	-	15.0
1	Hemenway ES	7	Lighting Update	LIGHTING	$36,700	$7,100	88	20,000	(200)	-	$4,100	-	-	-	7.2
2	Hemenway ES	9	Lighting Controls	LIGHTING	$40,000	$6,000	-	6,000	(100)	-	$600	-	-	-	56.7
2	Hemenway ES	10	Recommission / Adjust Control Systems	CONTROLS	$21,100	$0	-	4,000	1,600	-	$2,300	X	-	-	9.2
2	Hemenway ES	13	Add Demand Control Ventilation	CONTROLS	$8,200	$450	-	900	440	-	$600	-	-	-	12.9
1	Hemenway ES	17	Schedule Domestic Hot Water	CONTROLS	$3,000	$0	-	300	300	-	$400	-	-	-	7.5
2	Hemenway ES	23	Update Pipe Insulation	HVAC	$2,500	$0	-	-	150	-	$200	-	-	-	12.5
2	Hemenway ES	29	Convert Electric Heating to Gas	HVAC	$150,000	$0	36	22,000	(900)	-	$2,500	-	-	-	60.0
1	Hemenway ES	35	Add / Replace Door Seals & Align Doors	ENVELOPE	$9,200	$0	-	-	1,300	-	$1,400	-	-	-	6.6
3	Hemenway ES	40	Replace Windows	ENVELOPE	$1,000,000	$0	-	2,500	2,400	-	$2,900	-	-	-	344.8
1	Juniper ES	6	Replace Refrigerator(s)	O&M	$3,000	$0	3	2,400	-	-	$360	-	X	-	8.3
1	Juniper ES	7	Lighting Update	LIGHTING	$50,700	$6,100	58	32,000	(200)	-	$5,000	-	-	-	8.9
2	Juniper ES	9	Lighting Controls	LIGHTING	$35,000	$5,300	-	6,000	(100)	-	$600	-	-	-	49.5
2	Juniper ES	10	Recommission / Adjust Control Systems	CONTROLS	$21,100	$0	-	500	2,400	-	$2,700	X	-	-	7.8
2	Juniper ES	13	Add Demand Control Ventilation	CONTROLS	$4,100	$200	-	700	200	-	$300	-	-	-	13.0
1	Juniper ES	17	Schedule Domestic Hot Water	CONTROLS	$3,000	$0	-	300	400	-	$500	-	-	-	6.0
2	Juniper ES	23	Update Pipe Insulation	HVAC	$5,000	$0	-	-	300	-	$300	-	-	-	16.7
1	Juniper ES	27	Install Boiler Isolation Valves	HVAC	$5,000	$0	-	-	400	-	$400	X	-	-	12.5
3	Juniper ES	29	Convert Electric Heating to Gas	HVAC	$80,000	$0	16	11,000	(500)	-	$1,200	-	-	-	66.7
1	Juniper ES	35	Add / Replace Door Seals & Align Doors	ENVELOPE	$2,500	$0	-	-	400	-	$400	-	-	X	6.3
3	Juniper ES	40	Replace Windows	ENVELOPE	$750,000	$0	-	1,000	1,200	-	$1,400	X	X	X	535.7

1	King Adminatration	6	Replace Refrigerator(s)	O&M	$1,000	$0	1	800	-	-	$100		-	X			-	10.0
2	King Adminatration	8	Exterior Lighting Update	LIGHTING	$22,500	$700	-	9,000	-	-	$1,100		-	X			-	19.8
2	King Adminatration	9	Lighting Controls	LIGHTING	$35,000	$5,300	-	6,000	(100)	-	$600		-		-		-	49.5
2	King Adminatration	10	Recommission / Adjust Control Systems	CONTROLS	$21,200	$0	-	11,000	1,200	-	$2,700	X			-		-	7.9
2	King Adminatration	13	Add Demand Control Ventilation	CONTROLS	$8,200	$450	-	1,200	600	-	$800		-		-		-	9.7
1	King Adminatration	17	Schedule Domestic Hot Water	CONTROLS	$3,000	$0	-	300	300	-	$400		-		-		-	7.5
2	King Adminatration	23	Update Pipe Insulation	HVAC	$500	$0	-	-	30	-	$30		-		-		X	16.7
1	King Adminatration	27	Install Boiler Isolation Valves	HVAC	$5,000	$0	-	-	400	-	$440	X			-		-	11.4
1	King Adminatration	35	Add / Replace Door Seals & Align Doors	ENVELOPE	$1,900	$0	-	-	200	-	$200		-		-		-	9.5
3	King Adminatration	40	Replace Windows	ENVELOPE	$900,000	$0	6	3,000	1,500	-	$2,100	X		X			X	428.6
1	McCarthy ES	7	Lighting Update	LIGHTING	$81,100	$1,200	175	55,000	(500)	-	$10,000		-		-		-	8.0
2	McCarthy ES	8	Exterior Lighting Update	LIGHTING	$0	$0	-	-	-	-	$0	X			-		-	#DIV/0!
2	McCarthy ES	9	Lighting Controls	LIGHTING	$60,000	$9,000	-	10,000	(200)	-	$1,000		-		-		-	51.0
2	McCarthy ES	10	Recommission / Adjust Control Systems	CONTROLS	$40,900	$0	-	32,000	(40)	-	$3,900		-		-		-	10.5
2	McCarthy ES	13	Add Demand Control Ventilation	CONTROLS	$8,100	$450	-	1,300	1,300	-	$1,600		-		-		-	4.8
1	McCarthy ES	17	Schedule Domestic Hot Water	CONTROLS	$3,000	$0	-	300	300	-	$400		-		-		-	7.5
2	McCarthy ES	19	Install Pump VFD	CONTROLS	$17,900	$6,300	-	11,400	-	-	$1,400		-		-		-	8.3
2	McCarthy ES	23	Update Pipe Insulation	HVAC	$5,000	$0	-	-	300	-	$300		-		-		X	16.7
1	McCarthy ES	35	Add / Replace Door Seals & Align Doors	ENVELOPE	$18,700	$0	-	300	2,900	-	$3,200		-		-		X	5.8
1	Walsh MS	3	Shutdown Boiler Plant at Night	O&M	$0	$0	-	-	1,300	-	$1,400		-		-		-	-
2	Walsh MS	8	Exterior Lighting Update	LIGHTING	$43,500	$0	-	22,300	-	-	$2,800	X			-		-	15.5
2	Walsh MS	9	Lighting Controls	LIGHTING	$39,300	$0	-	7,000	(120)	-	$700		-		-		-	56.1
2	Walsh MS	10	Recommission / Adjust Control Systems	CONTROLS	$51,000	$0	-	6,000	2,300	-	$3,300		-		-		-	15.5
2	Walsh MS	13	Add Demand Control Ventilation	CONTROLS	$29,000	$900	-	5,600	1,600	-	$2,500		-		-		-	11.2
2	Walsh MS	16	Add Kitchen Exhaust Fan Control	CONTROLS	$20,000	$0	1	200	800	-	$900		-		-		-	22.2
1	Walsh MS	17	Schedule Domestic Hot Water	CONTROLS	$3,000	$0	-	300	300	-	$400		-		-		-	7.5
2	Walsh MS	23	Update Pipe Insulation	HVAC	$500	$0	-	-	75	-	$80		-		-		-	6.3
2	Walsh MS	24	Replace Motor	HVAC	$2,500	$0	-	1,600	-	-	$200		-		-		-	12.5
2	Walsh MS	28	Add Heating Capcity Where Limited	HVAC	$15,000	$0	-	-	-	-	$0	X			-		X	#DIV/0!
2	Walsh MS	33	Replace Domestic Hot Water System	HVAC	$35,000	$0	-	-	600	-	$700	X			-		-	50.0
1	Walsh MS	35	Add / Replace Door Seals & Align Doors	ENVELOPE	$0	$0	-	-	-	-	$0		-		-		X	#DIV/0!
2	Walsh MS	39	Seal Windows	ENVELOPE	$10,000	$0	-	-	500	-	$600	X			-		X	16.7
3	Walsh MS	40	Replace Windows	ENVELOPE	869,000.0	-	-	-	1,000.0	-	1,100.0	X		X		X		790.0
1	Wilson ES	7	Lighting Update	LIGHTING	$99,000	$16,100	267	72,000	(700)	-	$13,900		-		-		-	6.0
2	Wilson ES	9	Lighting Controls	LIGHTING	$35,000	$5,000	-	7,000	(120)	-	$700		-		-		-	42.9
2	Wilson ES	10	Recommission / Adjust Control Systems	CONTROLS	$25,000	$0	-	3,700	400	-	$900	X			-		-	27.8
2	Wilson ES	11	Integrate Controls to Web-Based Front End	CONTROLS	$121,600	$0	-	1,000	200	-	$300	X			-		-	None
2	Wilson ES	13	Add Demand Control Ventilation	CONTROLS	$12,300	$700	-	1,200	500	-	$700		-		-		-	16.6
1	Wilson ES	17	Schedule Domestic Hot Water	CONTROLS	$5,000	$0	-	300	400	-	$500		-		-		-	10.0
2	Wilson ES	19	Install Pump VFD	CONTROLS	$40,700	$15,000	-	4,800	-	-	$600		-		-		-	42.8
1	Wilson ES	35	Add / Replace Door Seals & Align Doors	ENVELOPE	15,700.0	-	-	200.0	800.0	-	900.0		-		-	X		17.4
1	Fire Headquarters	4	PC Load Management	O&M	$300	$0	-	1,000	(20)	-	$100		-		-		-	3.0
1	Fire Headquarters	7	Lighting Update	LIGHTING	$54,000	$8,800	64	32,000	(160)	-	$5,200		-		-		-	8.7
2	Fire Headquarters	9	Lighting Controls	LIGHTING	$15,000	$2,000	-	4,700	(60)	-	$500		-		-		-	26.0
2	Fire Headquarters	11	Integrate Controls to Web-Based Front End	CONTROLS	$71,100	$2,700	-	27,000	3,400	-	$7,100		-		-		-	9.6
2	Fire Headquarters	19	Install Pump VFD	CONTROLS	$16,600	$1,200	-	2,700	-	-	$300		-		-		-	51.3
1	Fire Headquarters	21	Vending Machine Controller	CONTROLS	$500	$0	-	2,000	(40)	-	$200		-		-		-	2.5
3	Fire Headquarters	31	Redesign/Replace HVAC System	HVAC	$1,000,000	$0	-	7,000	600	-	$1,500	X			-		X	666.7
1	Fire Headquarters	35	Add / Replace Door Seals & Align Doors	ENVELOPE	$8,600	$0	-	200	600	-	$700		-		-		X	12.3
1	Fire Headquarters	36	Attention to Overhead Door Seals	ENVELOPE	3,000.0	-	-	-	200.0	-	220.0		-		-	X		13.6
1	Library	4	PC Load Management	O&M	$2,400	$0	-	4,800	(100)	-	$500		-		-		-	4.8
1	Library	7	Lighting Update	LIGHTING	$26,800	$400	52	19,900	(180)	-	$3,400		-		-		-	7.8
2	Library	9	Lighting Controls	LIGHTING	$15,000	$2,000	-	4,600	(80)	-	$500		-		-		-	26.0
2	Library	11	Integrate Controls to Web-Based Front End	CONTROLS	$353,200	$13,500	-	67,000	3,100	-	$11,700		-		-		-	29.0
1	Library	17	Schedule Domestic Hot Water	CONTROLS	$5,000	$0	-	300	400	-	$500		-		-		-	10.0
2	Library	19	Install Pump VFD	CONTROLS	$23,000	$6,900	-	5,000	-	-	$600		-		-		-	26.8
2	Library	23	Update Pipe Insulation	HVAC	$500	$0	-	-	50	-	$60		-		-		X	8.3
2	Library	24	Replace Motor	HVAC	$4,500	$0	2	700	-	-	$130		-	X			-	34.6
3	Library	32	Replace Boiler Plant	HVAC	253,300.0	15,000.0	-	-	2,100.0	-	2,300.0	X		X			-	103.6
1	Library	35	Add / Replace Door Seals & Align Doors	ENVELOPE	2,900.0	-	-	100.0	300.0	-	300.0		-		-	X		9.7
1	Memorial Hall	4	PC Load Management	O&M	$3,600	$0	-	7,700	(160)	-	$800		-		-		-	4.5
1	Memorial Hall	7	Lighting Update	LIGHTING	$0	$0	-	-	-	-	$0		-		-		-	#DIV/0!
2	Memorial Hall	11	Integrate Controls to Web-Based Front End	CONTROLS	$53,000	$2,250	-	6,000	4,100	-	$5,300		-		-		-	9.6
1	Memorial Hall	17	Schedule Domestic Hot Water	CONTROLS	$5,000	$0	-	300	400	-	$500		-		-		-	10.0
1	Memorial Hall	21	Vending Machine Controller	CONTROLS	$1,300	$390	-	7,800	(170)	-	$800		-		-		-	1.1
2	Memorial Hall	23	Update Pipe Insulation	HVAC	$5,000	$0	-	-	150	-	$170	X			-		-	29.4
7	Memorial Hall	34	Convert to Hot Water Heating System	HVAC	$750,000	$0	-	(5,000)	2,200	-	$1,800	X			-		X	416.7
1	Memorial Hall	35	Add / Replace Door Seals & Align Doors	ENVELOPE	$1,200	$0	-	-	120	-	$130		-		-		-	9.2
2	Memorial Hall	41	Seal Shaft / Fireplace	ENVELOPE	$500	$0	-	-	50	-	$60		-		-		-	8.3
2	Memorial Hall	42	Attention to Airseal Details	ENVELOPE	$10,000	$0	-	-	250	-	$300		-		-		-	33.3
3	Memorial Hall	43	Insulate Attic, Misc	ENVELOPE	$20,000	$0	-	-	300	-	$300		-		-		-	66.7
1	Police Station	4	PC Load Management	O&M	$1,600	$0	-	4,200	(90)	-	$400		-		-		-	4.0
1	Police Station	7	Lighting Update	LIGHTING	$71,000	$8,000	160	72,200	(700)	-	$11,600		-		-		-	5.4
2	Police Station	9	Lighting Controls	LIGHTING	$15,000	$2,000	-	6,500	(110)	-	$700		-		-		-	18.6
2	Police Station	11	Integrate Controls to Web-Based Front End	CONTROLS	$196,900	$0	-	59,000	1,800	-	$9,300		-		-		-	21.2
2	Police Station	14	Add Occupancy Based HVAC Control	CONTROLS	$10,000	$0	-	5,000	500	-	$1,200		-		-		-	8.3
2	Police Station	18	Install Fan VFD	CONTROLS	$10,000	$0	-	40,000	-	-	$4,900		-		-		-	2.0
2	Police Station	19	Install Pump VFD	CONTROLS	$48,000	$9,300	-	9,000	-	-	$1,100		-		-		-	35.2
1	Police Station	21	Vending Machine Controller	CONTROLS	$450	$0	-	600	(10)	-	$60		-		-		-	7.5
2	Police Station	24	Replace Motor	HVAC	$2,500	$0	1	800	-	-	$120		-		-		-	20.8
3	Police Station	30	New HVAC Systems	HVAC	$49,000	$0	-	700	50	-	$140		-		-		-	350.0
1	Police Station	35	Add / Replace Door Seals & Align Doors	ENVELOPE	$1,500	$0	-	50	100	-	$120		-		-		-	12.5
1	Police Station	36	Attention to Overhead Door Seals	ENVELOPE	$500	$0	-	-	100	-	$110		-		-		-	4.5
3	Police Station	43	Insulate Attic, Misc	ENVELOPE	$8,000	$0	-	170	260	-	$300		-		-		-	26.7

Priority 1 - Building Summary

Building	Approximate Implementation Cost	Utility Incentive Available	Potential Utility Savings				Annual Cost Avoidance	2013 EUI kBtu/sf	Projected EUI kBtu/sf	Overall Savings	Simple Payback Yr
			Demand kW	Electric kWh/yr	Gas Therm/yr	Water MCF/yr					
Barbieri ES	$107,400	$23,600	220	69,200	1,170	-	$14,600	54	51	5.9%	5.7
Brophy ES	$26,900	$0	1	1,700	1,890	-	$2,400	50	48	5.7%	11.2
Cameron MS	$134,300	$10,300	152	46,300	240	-	$9,300	49	47	3.3%	13.3
Dunning ES	$10,800	$0	-	300	1,600	-	$1,800	57	55	4.6%	6.0
Framingham HS	$283,500	$50,000	663	133,100	6,500	-	$37,900	48	45	5.8%	6.2
Hemenway ES	$53,400	$7,100	88	23,300	1,370	-	$6,200	62	59	5.7%	7.5
Juniper ES	$64,200	$6,100	61	34,700	1,000	-	$6,660	62	57	7.9%	8.7
King Adminatration	$10,900	$0	1	1,100	900	-	$1,140	73	71	2.6%	9.6
McCarthy ES	$102,800	$1,200	175	55,600	2,700	-	$13,600	55	50	8.7%	7.5
Walsh MS	$3,000	$0	-	300	1,600	-	$1,800	45	44	1.8%	1.7
Wilson ES	$119,700	$16,100	267	72,500	500	-	$15,300	36	34	5.9%	6.8
Fire Headquarters	$66,400	$8,800	64	35,200	580	-	$6,420	97	90	7.4%	9.0
Library	$37,100	$400	52	25,100	420	-	$4,700	72	70	3.3%	7.8
Memorial Hall	$11,100	$390	-	15,800	190	-	$2,230	58	57	1.6%	4.8
Police Station	$75,050	$8,000	160	77,050	(600)	-	$12,290	92	87	5.2%	5.5
Total	***$1,106,550***	***$131,990***	***1,904***	***591,250***	***20,060***	***-***	***$136,340***	***53***	***50***	***4.9%***	***7.1***

Priority 2 - Building Summary

Building	Approximate Implementation Cost	Utility Incentive Available	Potential Utility Savings				Annual Cost Avoidance	2013 EUI kBtu/sf	Projected EUI kBtu/sf	Overall Savings	Simple Payback Yr
			Demand kW	Electric kWh/yr	Gas Therm/yr	Water MCF/yr					
Barbieri ES	$100,500	$14,000	4	33,600	900	-	$5,300	51	49	3.6%	16.3
Brophy ES	$172,750	$8,400	1	38,400	2,400	-	$7,470	48	42	11.5%	22.0
Cameron MS	$235,000	$22,200	4	39,000	40	-	$4,900	47	46	2.6%	43.4
Dunning ES	$125,900	$6,450	-	9,000	2,750	-	$4,170	55	50	9.1%	28.6
Framingham HS	$576,500	$17,900	125	61,300	6,200	-	$17,200	45	43	4.7%	32.5
Hemenway ES	$221,800	$6,450	36	32,900	1,190	-	$6,200	59	55	6.4%	34.7
Juniper ES	$65,200	$5,500	-	7,200	2,800	-	$3,900	57	50	12.0%	15.3
King Adminatration	$87,400	$6,450	-	27,200	1,730	-	$5,230	71	66	7.5%	15.5
McCarthy ES	$131,900	$15,750	-	54,700	1,360	-	$8,200	50	47	6.7%	14.2
Walsh MS	$245,800	$900	1	42,700	5,755	-	$11,780	44	41	8.1%	20.8
Wilson ES	$234,600	$20,700	-	17,700	980	-	$3,200	34	32	3.4%	66.8
Fire Headquarters	$102,700	$5,900	-	34,400	3,340	-	$7,900	90	71	20.3%	12.3
Library	$396,200	$22,400	2	77,300	3,070	-	$12,990	70	59	15.4%	28.8
Memorial Hall	$68,500	$2,250	-	6,000	4,550	-	$5,830	57	51	10.9%	11.4
Police Station	$282,400	$11,300	1	120,300	2,190	-	$17,320	87	72	NA	15.7
Total	***$3,047,150***	***$166,550***	***174***	***601,700***	***39,255***	***-***	***$121,590***	***50***	***46***	***7.3%***	***23.7***

Priority 3 - Building Summary

Building	Approximate Implementation Cost	Utility Incentive Available	Potential Utility Savings				Annual Cost Avoidance	2013 EUI kBtu/sf	Projected EUI kBtu/sf	Overall Savings	Simple Payback Yr
			Demand kW	Electric kWh/yr	Gas Therm/yr	Water MCF/yr					
Barbieri ES	$0	$0	-	-	-	-	$0	49	49	0.0%	NA
Brophy ES	$950,000	$0	40	26,000	400	-	$4,500	42	40	4.5%	211.1
Cameron MS	$0	$0	-	-	-	-	$0	46	46	0.0%	NA
Dunning ES	$1,150,000	$0	36	24,000	1,500	-	$5,400	50	46	7.6%	213.0
Framingham HS	$0	$0	-	-	-	-	$0	43	43	0.0%	NA
Hemenway ES	$1,000,000	$0	-	2,500	2,400	-	$2,900	55	51	7.4%	344.8
Juniper ES	$830,000	$0	16	12,000	700	-	$2,600	50	48	5.0%	319.2
King Adminatration	$900,000	$0	6	3,000	1,500	-	$2,100	66	63	4.9%	428.6
McCarthy ES	$0	$0	-	-	-	-	$0	47	47	0.0%	NA
Walsh MS	$869,000	$0	-	-	1,000	-	$1,100	41	40	1.2%	790.0
Wilson ES	$0	$0	-	-	-	-	$0	32	32	0.0%	NA
Fire Headquarters	$1,000,000	$0	-	7,000	600	-	$1,500	71	68	4.7%	666.7
Library	$253,300	$15,000	-	-	2,100	-	$2,300	59	55	6.7%	103.6
Memorial Hall	$20,000	$0	-	-	300	-	$300	51	51	0.8%	66.7
Police Station	$57,000	$0	-	870	310	-	$440	72	71	1.1%	129.5
Total	***$7,029,300***	***$15,000***	***98***	***75,370***	***10,810***	***-***	***$23,140***	***46***	***46***	***1.6%***	***303.1***

Priority 1, 2 and 3 - Building Summary

Building	Approximate Implementation Cost	Utility Incentive Available	Potential Utility Savings				Annual Cost Avoidance	2013 EUI kBtu/sf	Projected EUI kBtu/sf	Overall Savings	Simple Payback Yr
			Demand kW	Electric kWh/yr	Gas Therm/yr	Water MCF/yr					
Barbieri ES	$207,900	$37,600	224	102,800	2,070	-	$19,900	54	49	9.2%	8.6
Brophy ES	$1,149,650	$8,400	42	66,100	4,690	-	$14,370	50	40	20.3%	79.4
Cameron MS	$369,300	$32,500	156	85,300	280	-	$14,200	49	46	5.7%	23.7
Dunning ES	$1,286,700	$6,450	36	33,300	5,850	-	$11,370	57	46	19.8%	112.6
Framingham HS	$860,000	$67,900	788	194,400	12,700	-	$55,100	48	43	10.2%	14.4
Hemenway ES	$1,275,200	$13,550	124	58,700	4,960	-	$15,300	62	51	18.2%	82.5
Juniper ES	$959,400	$11,600	77	53,900	4,500	-	$13,160	62	48	23.0%	72.0
King Adminatration	$998,300	$6,450	7	31,300	4,130	-	$8,470	73	63	14.2%	117.1
McCarthy ES	$234,700	$16,950	175	110,300	4,060	-	$21,800	55	47	14.8%	10.0
Walsh MS	$1,117,800	$900	1	43,000	8,355	-	$14,680	45	40	10.9%	76.1
Wilson ES	$354,300	$36,800	267	90,200	1,480	-	$18,500	36	32	9.1%	17.2
Fire Headquarters	$1,169,100	$14,700	64	76,600	4,520	-	$15,820	97	68	29.7%	73.0
Library	$686,600	$37,800	54	102,400	5,590	-	$19,990	72	55	23.6%	32.5
Memorial Hall	$99,600	$2,640	-	21,800	5,040	-	$8,360	58	51	13.0%	11.6
Police Station	$414,450	$19,300	161	198,220	1,900	-	$30,050	92	71	22.4%	13.1
Total	***$11,183,000***	***$313,540***	***2,176***	***1,268,320***	***70,125***	***-***	***$281,070***	***53***	***46***	***13.9%***	***38.7***

Appendix C3: Siemens Streetlight Analysis -

Framingham's Streetlights in 2013

SIEMENS

- 4,871 "cobra head" type lights
  - 100% are high pressure sodium lamps (orange color) and
  - 86% are </= 50 watts (4,171 fixtures) 14% are >/= 100 watts (700 fixtures)
- Existing Cost and Energy Use
  - Annual cost of electricity= $265,000
  - Annual kilowatt hours of electricity= 1,680,000
- Conversion to LED would…
  - Reduce annual energy use by 55-65%
  - Save the Town approximately $151,000 per year
  - Pay for itself in ~10 years and could be funded from existing budget
  - Make the Town eligible for ~$240,000 in grant money from NSTAR

Streetlight comparison

SIEMENS

	High Pressure Sodium (existing)	Light Emitting Diode (LED)
Color	Orange	White
Life expectancy	24,000 hours (~6 years)	100,000 hours (~20 years)
Energy use	-	50-75% less
Payback	-	4-12 years
NSTAR accepts?	Yes	Yes

SIEMENS

Existing vs. Proposed Lights

Streetlight Type	Watts per Fixture	Number of Lights	LED Watts per Fixture	LED Watts Assumed
35 watt HPS	41	7	15-26	26
50 watt HPS	58	4,164	15-26	26
100 watt HPS	117	73	43-53	51
150 watt HPS	175	387	55-67	67
250 watt HPS*	295	180	123-140	140
400 watt HPS*	464	60	123-213	140
TOTAL		4,871		

* May be more light than necessary, depending on area & spacing of lights.

Conversion to LED Streetlights: Opportunities for Savings

SIEMENS

	Annual operating cost	Net Project Cost	Annual Savings	Payback (years)
Existing HPS	$265,000	n/a	n/a	n/a
Proposed LED Conversion (Town-wide)	$114,000	$1,600,000	$151,000	10.6
Proposed LED Conversion (High Wattage Fixtures Only- 14%)	$202,000	$220,000	$63,000	3.5

Status of LED Streetlight Conversions in Massachusetts

SIEMENS

- Communities with 1,000+ LED streetlights installed by end of 2012:
  - Arlington
  - Boston
  - Watertown

- Communities installing 1,000+ LED streetlights in early 2013:
  - Arlington
  - Chelsea
  - Natick
  - Woburn

  - Nearly all NSTAR communities are considering installing LED streetlights on a community-wide basis or as a pilot project in the next 6-12 months

Benefits of Performance Contracting Programs

1. • ***Guaranteed Project Performance***
2. • ***No Change Orders or Added Cost***
3. • ***Design Build Accountability***
4. • ***Improved Facilities and Infrastructure***
5. • ***Single Source Solution***
6. • ***Local Support, Services and Training***

SIEMENS

Framingham's Streetlights in 2013

SIEMENS

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