Energy Audit Summary Report

Town of Sudbury

Sudbury, MA 01776

- Sudbury Town Hall
- Sudbury Flynn building
- Sudbury Fairbanks Center
- Sudbury DPW

Massachusetts Department of Energy Resources Energy Audit Program

June 2009

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FEC Project No.:F09-016-01

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1 Executive Summary

A total of four buildings were evaluated based on data gathered during site visits, a review of the utility bills and discussions with administration officials. The Energy Performance Summary for the four buildings that were audited is provided below. The total energy index is a measure of energy intensity, or annual energy usage per square foot of building area. Similarly, the energy cost index is a measure of annual energy costs per square foot of building area.

Facility	Square footage	Energy Intensity (kBTU/sqft/yr)	Energy Star Rating	Annual Energy Cost	Energy Cost ($/sqft/yr)
Town Hall	12,798	117	33	$ 30,505	$ 2.39
Flynn Building	15,916	77	63	$ 39,659	$ 2.49
Fairbanks Center and Pool	39,076	183	NA	$ 148,374	$ 3.90
DPW Offices and Highway Building	32,000	107	NA	$ 83,320	$ 2.54
Total:	**99,790**			**$ 301,858**	**$ 3.02**

Based on the initial benchmarking of these facilities, it was determined that energy audits were warranted.

2 ECM Summary

Specific Energy Conservation Measures (ECMs) were identified at each of the facilities where audits were performed. A summary of each of these ECMs and their impacts on energy consumption if implemented is on the following page.

Proposed ECMs				Annual Energy Usage					Annual Reduction in Greenhouse Gas (CO_2) Emissions	Annual Savings	Simple Payback
#	Description	Installed Cost		Existing		Savings with ECM		% Reduction			
		Town	Other	kWh/yr	MMBTU/yr	kWh/yr	MMBTU/yr				
Sudbury Town Hall											
1	Install Attic Insulation	$3,500		0	1349	0	154	11.4%	8.17	$2,312	1.5
2	Insulate Steam Pipes	$3,800		0	1349	0	69	5.1%	3.65	$1,032	3.7
3	Increase Radiator Output	$1,350		1800	1349	1800	-8	-0.1%	0.35	$171	7.9
	Building Total:	**$8,650**		**42572**	**1349**	**1800**	**215**	**14.8%**	**12.16**	**$3,515**	**2.5**
Sudbury Flynn Building											
1	On-Demand Water Heaters	$1,400		170755	4	-616	4	0.3%	-0.06	$189	7.4
2	Insulate Water Pipes	$900		0	635	0	16	2.5%	0.83	$236	3.8
3	Increase Radiator Output	$4,050		170755	635	4320	-19	-0.3%	0.84	$410	9.9
4	Replace Refrigerators	$1,500		2200	0	1228	0	55.8%	0.52	$196	7.6
	Building Total:	**$7,850**		**170,755**	**635**	**4932**	**1**	**1.4%**	**2.13**	**$1,032**	**7.6**
Sudbury Fairbanks Center											
1	Vending Machine Timer	$875		6570	0	1971	0	30.0%	0.84	$369	2.4
2	Replace Refrigerator	$1,950		4620	0	3555	0	76.9%	1.51	$665	2.9
3	Replace Water Heater	$1,000		2157	0	2157	0	100.0%	0.91	$278	3.6
4	HVAC Pump VFDs	$5,600		16785	0	4096	0	24.4%	1.74	$766	7.3
5	DCV in Gym	$1,500		0	93	0	15	15.9%	0.78	$222	6.8
6	VFDs on Gym AHU	$5,600		8206	0	5391	0	65.7%	2.29	$1,008	5.6
7	Relocate A/C Unit	$800		3500	0	1700	0	48.6%	0.72	$318	2.5
8	Pool Lightning	$8,400		36720	0	15912	0	43.3%	6.75	$2,976	2.8
9	Pump Motors	$2,000		47314	0	4997	0	10.6%	2.12	$935	2.1
10	Pool Pump VFDs	$8,000		64902	0	7405	0	11.4%	3.14	$1,385	5.8
11	Economizer	$140,000		130646	6402	13065	2087	31.1%	116.17	$33,754	4.1
	Building Total:	**$175,725**		**321420**	**6402**	**60249**	**2102**	**30.8%**	**136.96**	**$42,674**	**4.1**
Sudbury DPW Office and Highway Building											
1	Lighting DPW Office Building	$12,000.00		27300	0	13260	0	48.6%	5.62	$2,652.00	4.5
2	Low Velocity Fans for Destratification	$22,000.00		0	900	-1056	270	29.6%	13.86	$2,515.20	8.7
3	Lighting DPW Highway Building	$3,000.00		6825	0	3315	0	48.6%	1.41	$663.00	4.5
4	Replace Refrigerator	$650.00		1100	0	658	0	59.8%	0.28	$115.15	5.6
5	Reflectors	$1,000.00		0	992	0	45	4.5%	2.39	$787.50	1.3
6	Control Air Leakage	$800.00		0	992	0	38	3.9%	2.04	$672.28	1.2
	Building Total:	**$39,450.00**		**203,840**	**2742**	**16177**	**353**	**11.9%**	**25.59**	**$7,405.13**	**5.3**
Sudbury Town Buildings		**$231,675**		**738,587**	**11,128**	**83,158**	**2,672**	**21.7%**	**176.85**	**$54,626**	**4.2**

3 Financial Summary

This Financial Summary includes all buildings that received an audit:

Facility	ECM Cost	Annual Energy Cost	Annual Energy Savings			Simple Payback
			Electric	Fuels	Total	
Town Hall	$ 8,650	$ 30,505	$ 171	$ 3,344	$ 3,515	2.5
Flynn Building	$ 7,850	$ 39,659	$ 607	$ 425	$ 1,032	7.6
Fairbanks Center and Pool	$175,725	$ 148,374	$42,452	$10,863	$31,811	4.1
DPW Offices and Highway Building	$ 39,450	$ 83,320	$ 3,235	$ 4,170	$ 7,405	5.3
Total:	**$231,675**	**$ 301,858**	**$14,877**	**$39,749**	**$54,626**	**4.2**

4 Clean Energy:

The Commonwealth of Massachusetts is dedicated to promoting clean energy as an alternative to traditional sources of energy. As such, the DOER and other agencies have developed a number of programs to promote the use of clean energy sources by potentially providing technical assistance and/or financial incentives based on project feasibility. A table is also provided which lists the specific projects that may be appropriate for various clean energy technologies.

Clean Energy Opportunities	
Building	**Opportunity Description**
Town Hall	No opportunities identified
Flynn Building	No opportunities identified
Fairbanks Center and Pool	Hot water heating demanded by the pool and showers associated with the pool use is substantial. Furthermore, the roof of the pool has a clear view of the southern sky and is ballasted. As the roof is nearing replacement, it will be possible to replace the roof with a membrane that does not require ballast. The structural load capacity relieved from the removal of the ballast could potentially be used to support a solar array. Based on this audit, and due to its location, Fairbanks Center appears to be a good candidate for a potential solar hot water system. The Massachusetts Department of Energy Resources has approved a solar hot water feasibility study for this location.
DPW Offices and Highway Building	No opportunities identified

5 Other Considerations

Benchmarking and building walkthroughs were used to prioritize Sudbury's buildings to determine which would most benefit from these audits. Due to budget limits, not all of the buildings for which applications were received were awarded audits.

One of the buildings that did not receive an audit was Sudbury's Library. Based on the initial walk-thought of the building, it is FEC's opinion that the library may be better served with a HVAC retro-commissioning study and/or an HVAC balancing service as most of the energy issues in the library seem to be associated with building comfort.