

Honeywell

and

The Rochester School Department



Phase I & II Energy Retrofit Program Overview

Cost Avoidance Results Summary

Presented by:

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October 2, 2008



Presentation Summary

- ◆ **Phase I & II Energy Retrofit Program Summary**

- ◆ **Energy Cost Avoidance Summary to Date**
 - Phase I & Phase II

- ◆ **Questions**

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Phase I & II- Project Summary

- ◆ **Project Start Dates: Phase I-** March 1994, Phase II August 2005
- ◆ **Project Term:** 10 Years
- ◆ **Project Costs: Phase I-** 1.5 Million, Phase II- 9.5 Million (excluding window replacement work)
- ◆ **Annual Guaranteed Cost Avoidance: \$275,000**
 - ➔ Utility Rebates: Approximately \$75,000
 - ➔ Building Aid: 7.35 Million
- ◆ **Project Improvements:**
 - ➔ Temperature Control Upgrades
 - ➔ Lighting Retrofit
 - ➔ Building Insulation Upgrades
 - ➔ Water Conservation Upgrades
 - ➔ Window Replacements
 - ➔ HVAC Upgrades
 - ➔ Fire Alarm Upgrades
 - ➔ HVAC Preventive Maintenance Services

Phase II Scope of Work Summary

	Allen	Chamberlain	East Rochester Annex	Gonic	Maple Street	McClelland	Middle	East Rochester	School Street	High School	Vocational
Proposed Improvements											
Lighting Improvements	X	X	X	X	X	X	X	X	X	X	X
Building Envelope	X	X	X	X	X	X	X	X	X	X	X
Water & Sewer Conservation Upgrades	X	X	X	X	X	X	X	X	X	X	X
Ventilation Improvements	X	X	X	X	X	X	X	X	X	X	X
Motors & VSD's	X	X	X	X	X	X	X	X	X	X	X
Pipe Insulation										X	
Boiler Modications		X	X					X		X	
Paddle Fans			X				X				
Windows			X	X	X				X	X	

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Phase I & II Cost Avoidance Results

SCHOOLS: PHASE 1

TIME PERIOD		TOTAL COST AVOIDANCE
Year 1	8/95 - 7/96	\$ 268,324
Year 2	8/96 - 7/97	\$ 314,004
Year 3	8/97 - 7/98	\$ 291,258
Year 4	8/98 - 7/99	\$ 310,565
Year 5	8/99 - 7/00	\$ 320,683
Year 6	8/00 - 7/01	\$ 318,313
Year 7	8/01 - 7/02	\$ 300,411
Year 8	8/02 - 7/03	\$ 327,619
Year 9	8/03 - 7/04	\$ 331,852
Year 10	8/04 - 7/05	\$ 368,545
Year 11	8/05 - 7/06	\$ 477,374
Year 12	8/06 - 7/07	\$ 375,136
Year 13	8/06 - 2/08	\$ 235,437
TOTAL		\$ 4,239,521

SCHOOLS: PHASE 2

TIME PERIOD		TOTAL COST AVOIDANCE
Installation	8/05-7/06	\$ 94,153
Installation	8/06-4/07	\$ 166,607
Installation	5/07-2/08	\$ 223,145
TOTAL		\$ 483,905

TOTAL	\$ 4,723,426
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Contracted Energy Units Avoided

Utility Savings	TOTAL SAVED
City Buildings (9 years)	2,250,999
Schools-Phase 1 (10 years)	5,468,284
Schools-Phase 2 (2 years)	1,722,630
Total kWh Saved	9,441,913

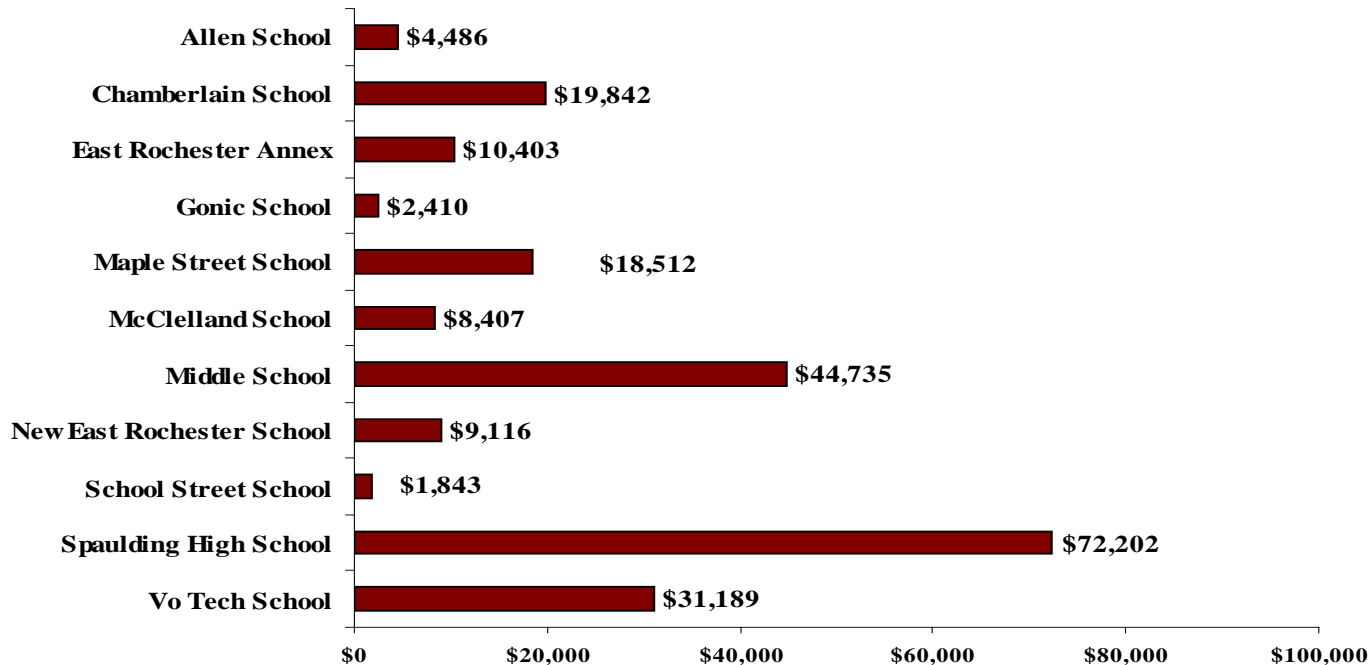
City Buildings (9 years)	250,550
Schools-Phase 1 (10 years)	1,046,622
Schools-Phase 2 (2 years)	324,624
Total Therms gas saved	1,621,796

City Buildings (9 years)	89,050
Schools-Phase 1 (10 years)	229,657
Schools-Phase 2 (2 years)	147,816
Total gallons oil Saved	466,523

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Installation Period (May 2007-February 2008)

	Actual Savings	Projected Savings
Allen School	\$ 4,486	-\$974
Chamberlain School	\$ 19,842	\$100
East Rochester Annex	\$ 10,403	-\$2,249
Gonic School	\$ 2,410	\$1,678
Maple Street School	\$ 18,512	-\$1,723
McClelland School	\$ 8,407	-\$8,939
Middle School	\$ 44,735	\$20,228
New East Rochester School	\$ 9,116	-\$3,565
School Street School	\$ 1,843	-\$1,931
Spaulding High School	\$ 72,202	\$14,395
Vo Tech School	\$ 31,189	\$4,710
		<u>\$21,730</u>



Installation Period: Phase 2 – Electrical Savings

Electrical Savings

	Installation Savings 10 months 5/07-2/08	Projected Annual Savings	Variance
Allen School	\$ (356)	\$ 149	\$ (505)
Chamberlain School	1,662	2,472	\$ (810)
East Rochester Annex	(2,387)	(2,632)	\$ 245
Gonic School	(1,774)	(20)	\$ (1,754)
Maple Street School	(3,041)	(2,885)	\$ (156)
McClelland School	1,836	1,084	\$ 752
Middle School	18,538	9,954	\$ 8,584
New East Rochester School	5,183	122	\$ 5,061
School Street School	(1,580)	(2,744)	\$ 1,164
Spaulding High School	19,348	8,349	\$ 10,999
Vo Tech School	3,322	1,058	\$ 2,264
	<u>\$ 40,751</u>	<u>\$ 14,908</u>	<u>\$ 25,844</u>



Installation Period: Phase 2 – Natural Gas ECM

Natural Gas ECM Results

	Installation Savings 10 months 5/07-2/08	Projected Annual Savings		Variance
Allen School	\$ -	\$ -	\$	-
Chamberlain School	-	-	\$	-
East Rochester Annex	-	-	\$	-
Gonic School	-	-	\$	-
Maple Street School	-	-	\$	-
McClelland School	4,297	(12,339)	\$	16,636
Middle School	21,285	5,643	\$	15,642
New East Rochester School	-	-	\$	-
School Street School	-	-	\$	-
Spaulding High School	33,272	-	\$	33,272
Vo Tech School	26,311	2,085	\$	24,226
	<u>\$ 85,165</u>	<u>\$ (4,611)</u>	<u>\$</u>	<u>89,776</u>

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Installation Period: Phase 2 – Fuel Oil ECM

Fuel Oil ECM Results

	Installation Savings 10 months 5/07-2/08	Projected Annual Savings		Variance
Allen School	\$ (237)	\$ (2,621)	\$	2,384
Chamberlain School	17,063	(3,803)	\$	20,866
East Rochester Annex	11,575	(94)	\$	11,669
Gonic School	2,497	745	\$	1,752
Maple Street School	19,821	344	\$	19,477
McClelland School	-	-	\$	-
Middle School	-	-	\$	-
New East Rochester School	2,458	(4,709)	\$	7,167
School Street School	2,806	200	\$	2,606
Spaulding High School	11,124	2,301	\$	8,823
Vo Tech School	-	-	\$	-
	<u>\$ 67,107</u>	<u>\$ (7,636)</u>	<u>\$</u>	<u>74,743</u>

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Contracted Energy Units Avoided

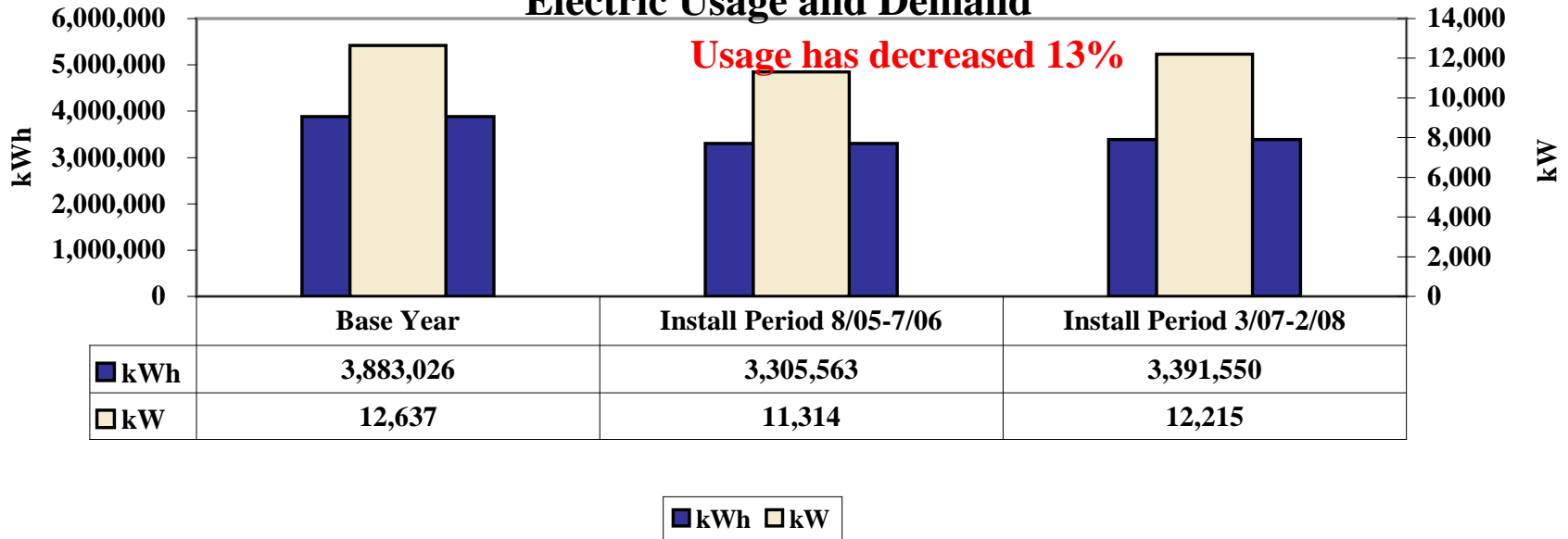
Water ECM Results

	Installation Savings 10 months 5/07-2/08	Projected Annual Savings	Variance
Allen School	\$ 5,079	\$ 1,498	\$ 3,581
Chamberlain School	1,117	1,430	\$ (313)
East Rochester Annex	1,215	477	\$ 738
Gonic School	1,687	953	\$ 734
Maple Street School	1,732	817	\$ 915
McClelland School	2,274	2,316	\$ (42)
Middle School	4,912	4,631	\$ 281
New East Rochester School	1,475	1,022	\$ 453
School Street School	617	613	\$ 4
Spaulding High School	8,458	3,746	\$ 4,712
Vo Tech School	1,555	1,566	\$ (11)
	<u>\$ 30,121</u>	<u>\$ 19,070</u>	<u>\$ 11,052</u>

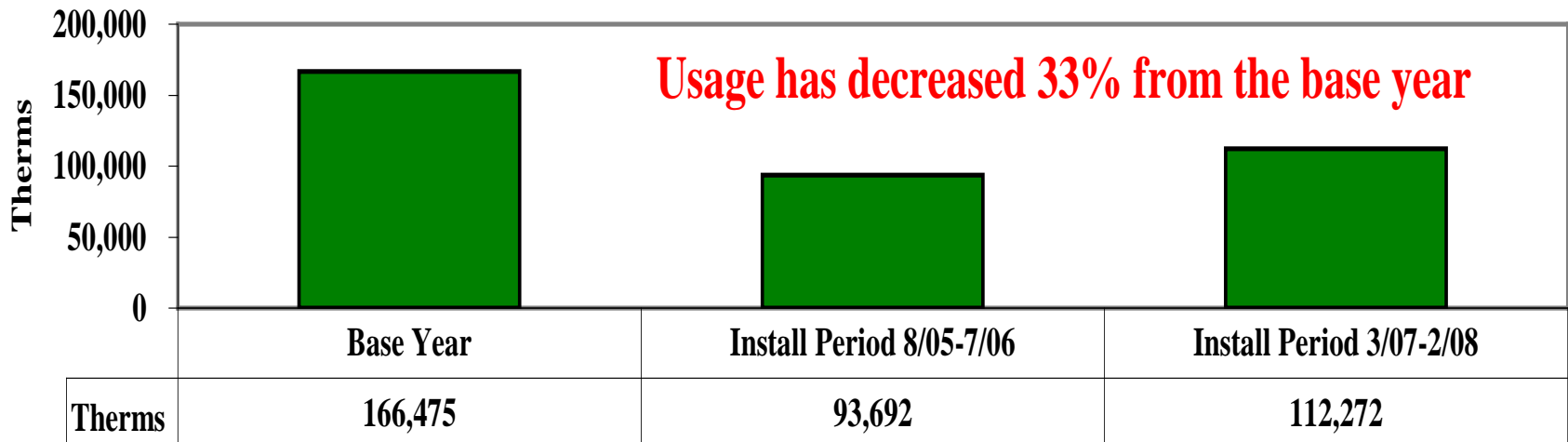
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Historical Energy Usage Comparisons

Electric Usage and Demand



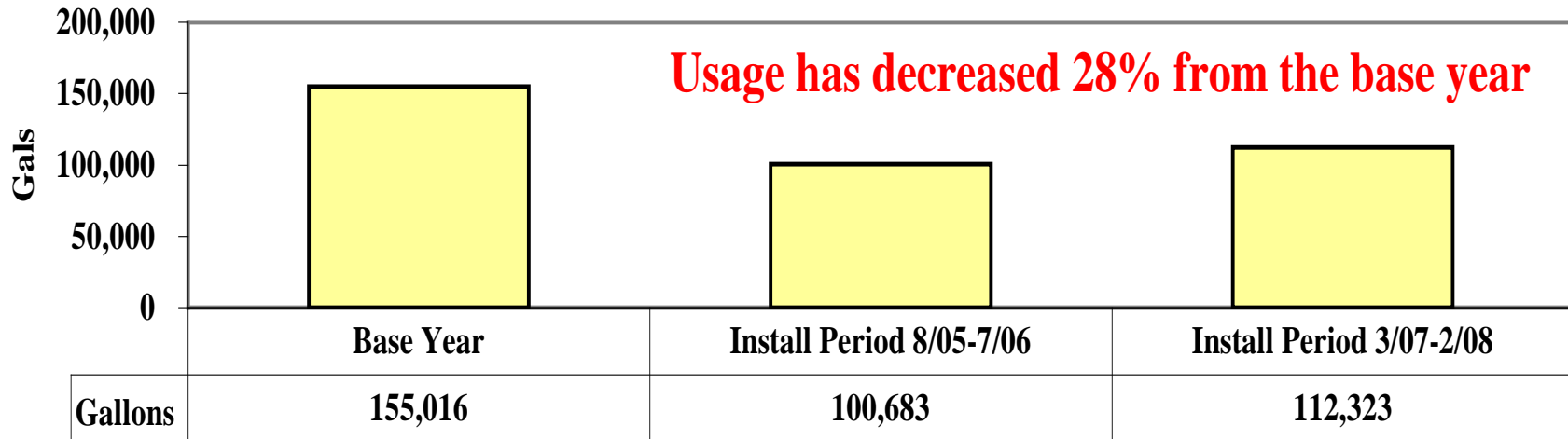
Natural Gas Usage



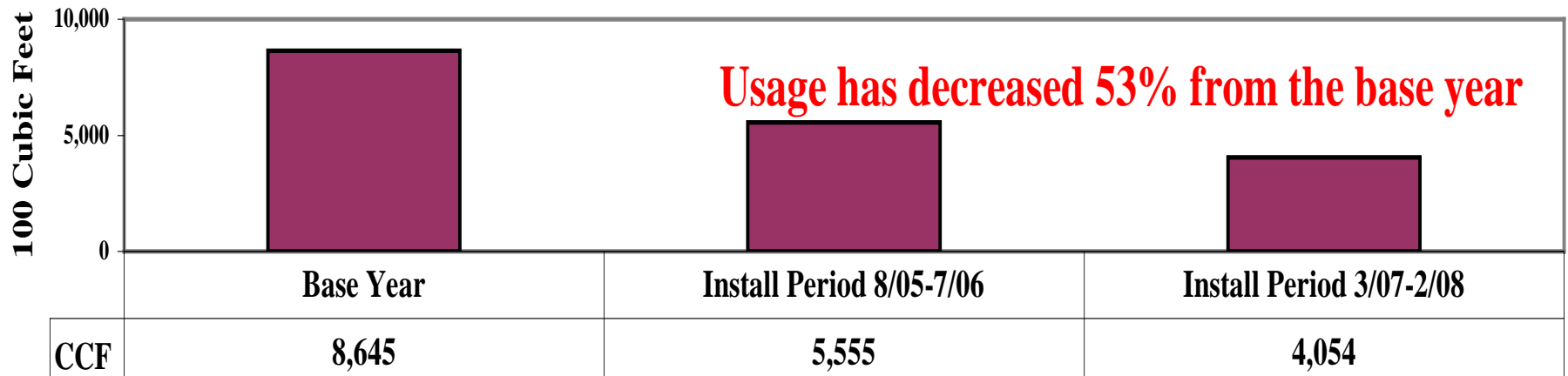
Base Year Period August 2003 to July 2004

Historical Energy Usage Comparisons

Fuel Oil Usage



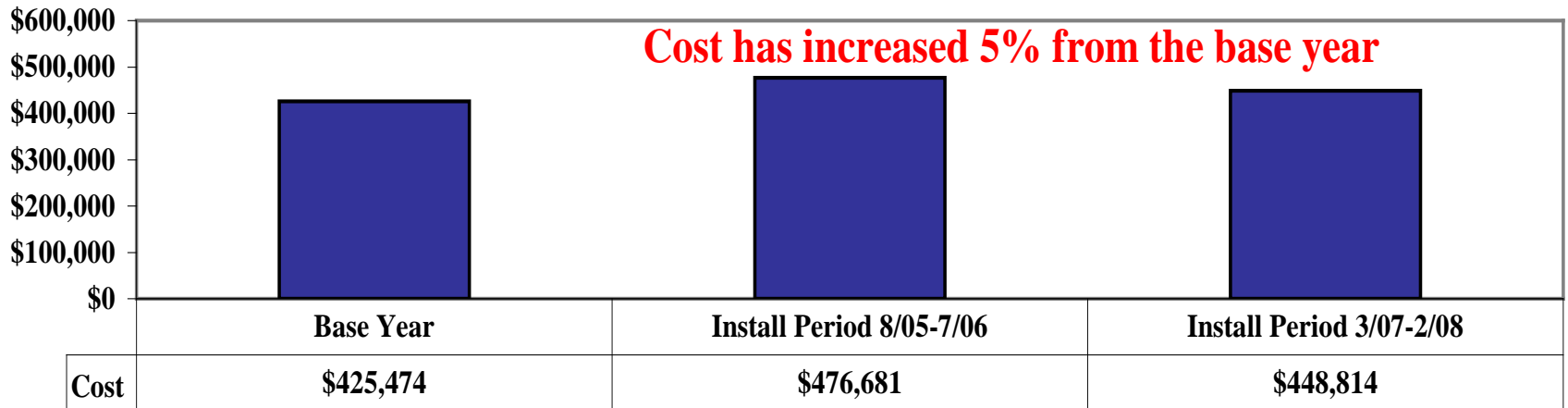
Water and Sewer Usage



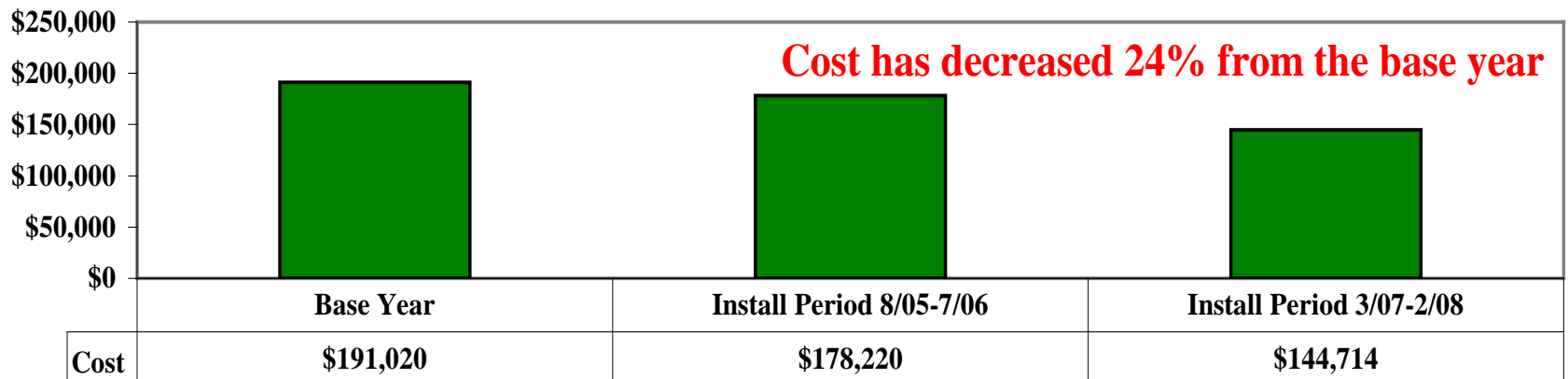
Base Year Period August 2003 to July 2004

Historical Energy Cost Comparisons

Electric

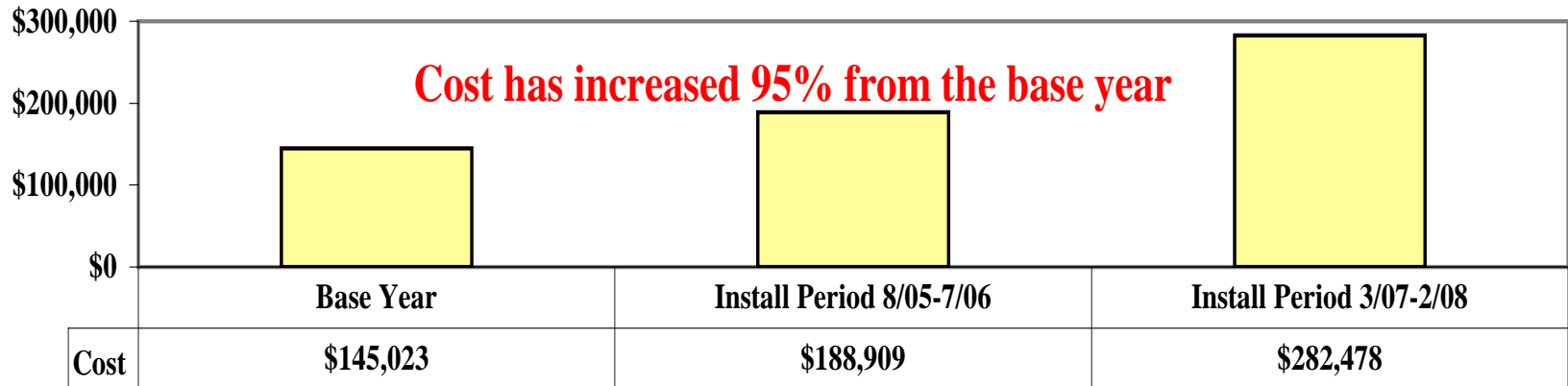


Natural Gas

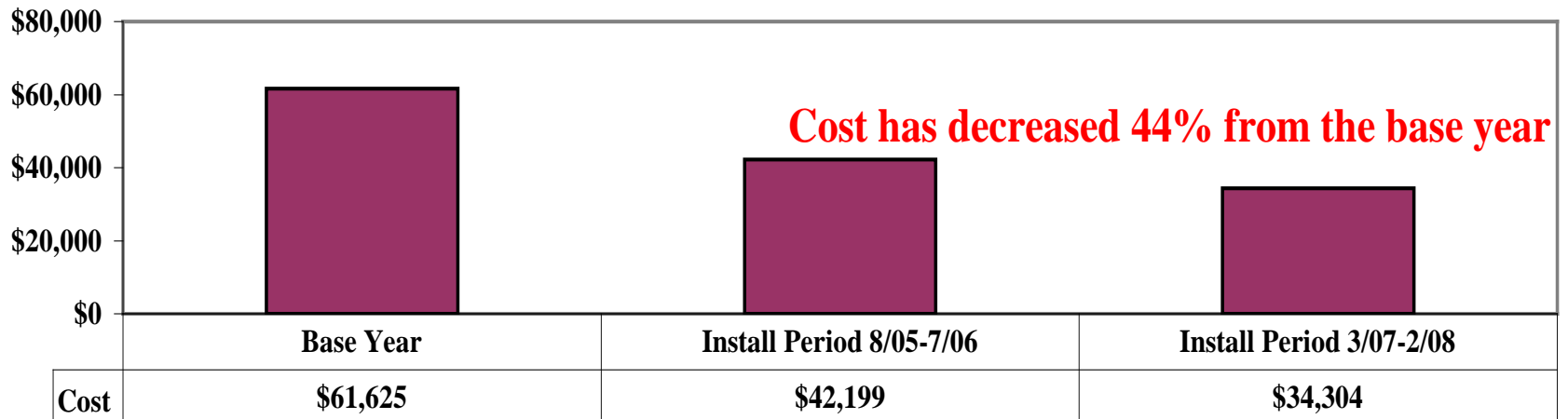


Historical Energy Cost Comparisons

Fuel Oil

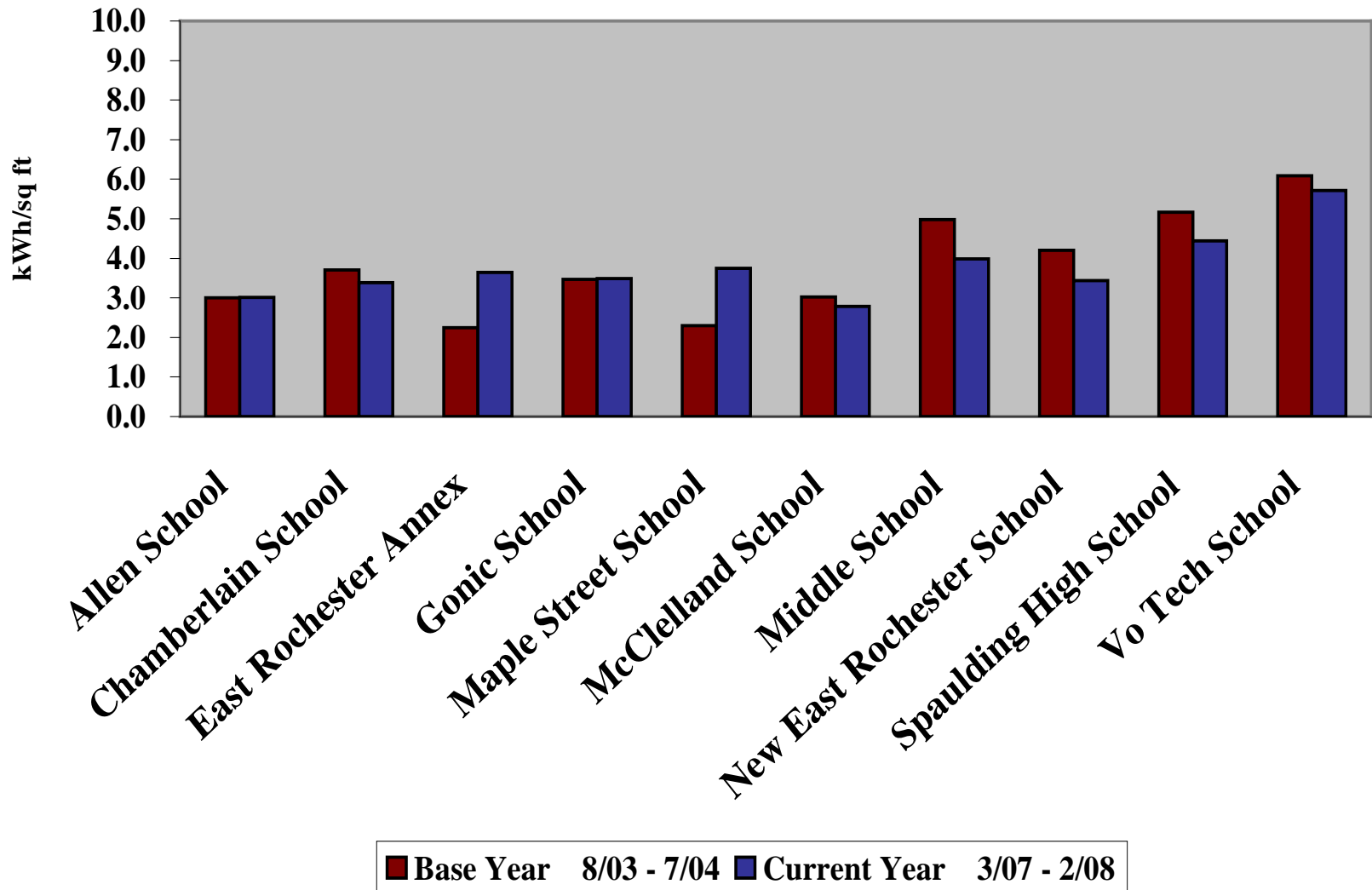


Water and Sewer

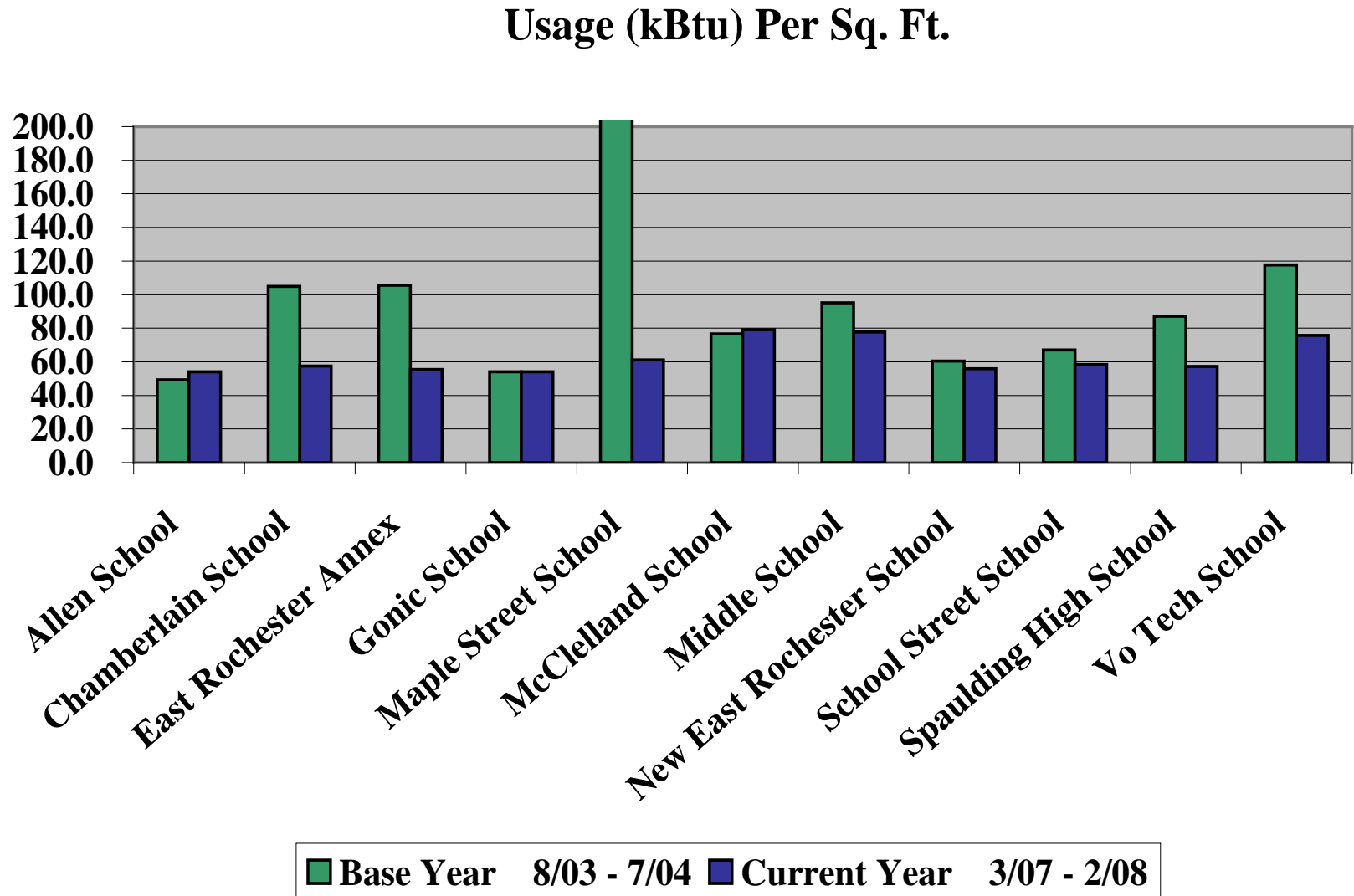


Electric Usage Per Square Foot

Usage (kWh) per Sq. Ft.

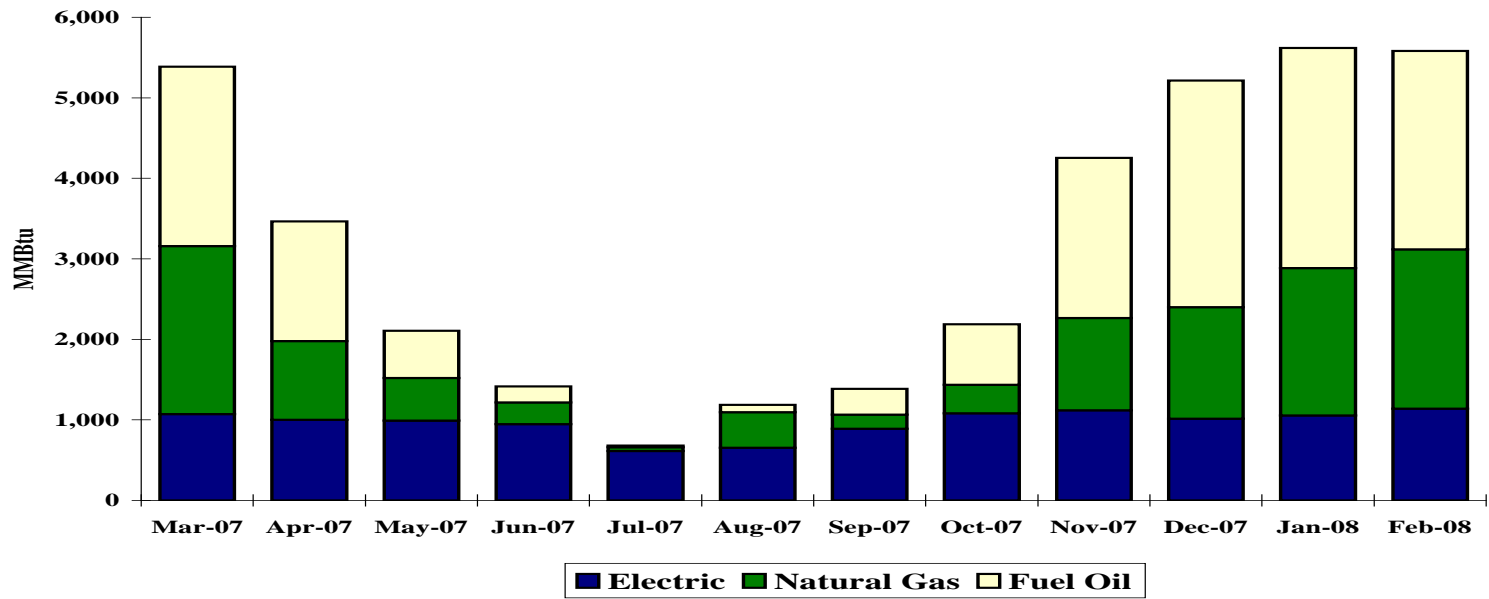


BTU's Per Square Foot

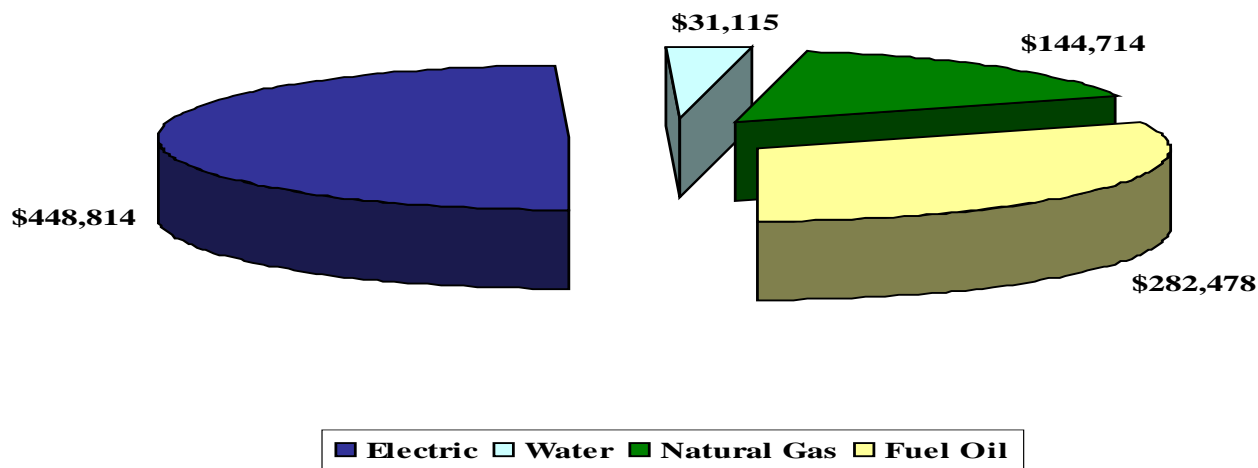


Total Energy Costs March 07 to February 08- \$907,121

Annual Energy Consumption



Actual Cost by Utility (March 2007 to February 2008)



Additional Energy Conservation Considerations

- ◆ **Convert Existing Fuel Oil Buildings to Natural Gas (Dual Fuel)**
 - ⦿ Allen, Gonic, Maple Street, East Rochester, East Rochester Annex, Chamberlain & School Street

- ◆ **Evaluate the Feasibility of Renewable Energy Solutions**
 - ⦿ Biomass Heating
 - ⦿ Solar Thermal

- ◆ **Computer Power Management for Desktop PC's**

- ◆ **Install a Real Time Energy Metering and Information System**

- ◆ **Energy Education/ Awareness Program**

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