



Bullitt County Public Schools
Energy Management Program
2012/2013 Year End Report

Summary

Bullitt County Public Schools began an energy conservation program in November 2006 through the Kentucky Energy Efficiency Program for Schools (KEEPS). Through the program, basic steps were taken to establish an energy program by hiring an energy manager, creating an energy plan, promoting energy conservation and making low/no-cost changes to reduce energy consumption. In 2008 the district entered into an energy saving performance contract (ESPC) with Harshaw Trane and began implementing facility improvements such as new HVAC controls, lighting, domestic water heater and boiler replacement.

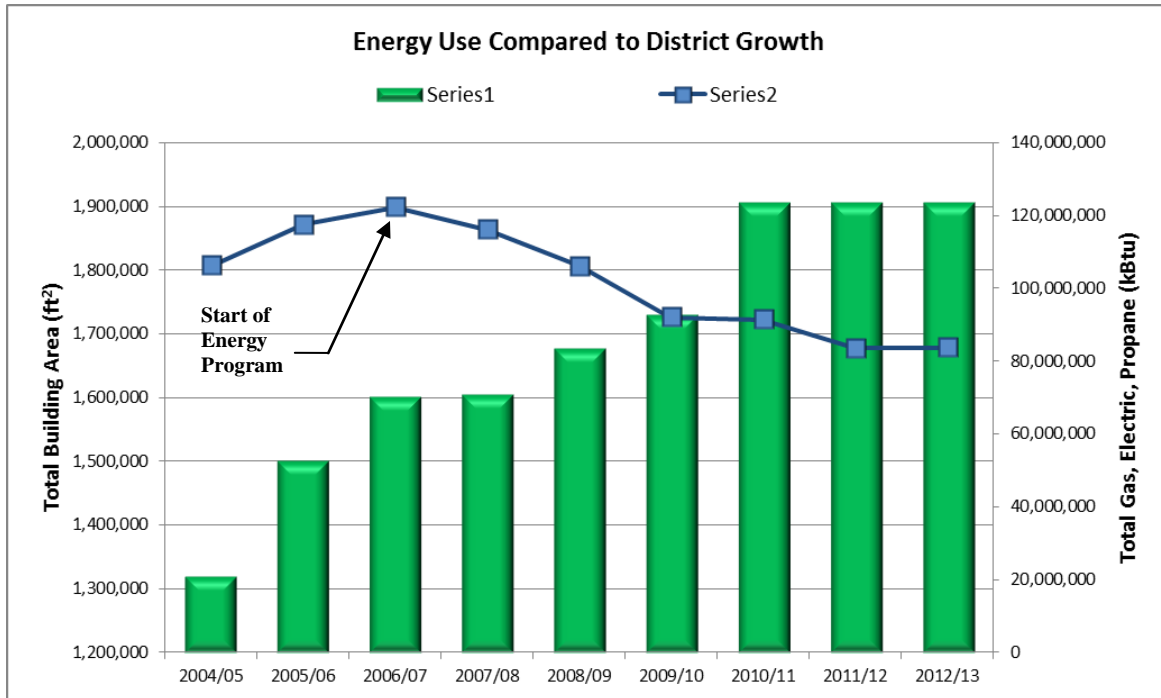
This report summarizes the energy usage for the **2012/2013** fiscal year. Actions used for energy savings are included as well as goals for the upcoming year. Total district electric consumption was **24% less** than the baseline usage resulting in a cost avoidance of approximately **\$445,117**. Natural gas usage was **46% less** resulting in cost avoidance of approximately **\$109,242**. Propane for heating and cooking has been eliminated (replaced with electric or natural gas), resulting in a cost avoidance of approximately **\$78,135**. Had we not reduced our electric, gas and propane usage by these amounts, given today's rates, we would have spent approximately **\$632,494** more on our utility bills.

The cost of the district's energy management program in 2012/2013 was approximately \$75,000 for the energy manager budget and salary, and \$400,000 for the ESPC bond re-payment. This leaves a net savings of **\$157,494**. The district's investment through the ESPC not only provides energy savings, but also improves the learning environment for our students through increased reliability of lighting and HVAC systems and added comfort to our building occupants.

The total avoided utility cost since BCPS began the energy management program in 2006 is approximately **\$2,402,877**. The cost of the district's energy management program has averaged approximately \$72,000 annually, or \$432,000 since the program began. The bond re-payment for the performance contract project (since 2009/2010) has been a total of \$1,182,756 leaving a net cost avoidance of approximately \$788,121.

Figure 1 shows our district's energy use compared to our increase in square footage since 2004/05.

Figure 1--Energy Use Compared to District Growth



Projects

Energy saving measures that were in place during the 12/13 school year include:

- Energy manager tracking utility usage and costs monthly
- Non-school hour energy conservation HVAC procedures including
 - Shutdowns over long breaks
 - Temperature Setbacks
 - Outside air units only operating during school hours
- Staff education and awareness such as
 - Turning off lighting when leaving a room
 - Turning off computer monitors at the end of the day
- Student energy teams active in 15 schools during the 12/13 school year
- School walkthroughs to monitor energy use behaviors and equipment operation.
- Daily monitoring of HVAC control systems to ensure proper equipment operation and scheduling.
- Utility rate review and evaluations

Other associated activities:

- Monitoring of indoor air quality (IAQ)—temperature, relative humidity, and carbon dioxide.
- The following buildings have had completed upgrades through the performance contract.
 - Bernheim Middle
 - Bullitt East High School
 - Bullitt Lick Middle

- Freedom Elementary
- Mt. Washington Elementary
- Maryville Elementary
- North Bullitt High School
- Pleasant Grove Elementary
- Shepherdsville Elementary
- Mt. Washington Middle
- Nichols Elementary
- Bullitt Central
- Cedar Grove Elementary
- Hebron Middle
- Lebanon Junction Elementary
- Riverview/ Day Treatment Campus
- Central Office
- Maintenance Office (MB-1)

➤ As of 2012/2013, using Energy Star's® benchmarking tool (Portfolio Manager), the district has 15 Energy Star rated buildings.

School	Energy Star Rating
Brooks Elementary	93
Bullitt Lick Middle	86
Cedar Grove Elementary	78
Crossroads Elementary	96
Freedom Elementary	88
Lebanon Junction Elementary	89
Maryville Elementary	91
Mt. Washington Middle	84
Nichols Elementary	83
North Bullitt High School	78
Overdale Elementary	98
Pleasant Grove Elementary	89
Roby Elementary	86
Shepherdsville Elementary	87
Zoneton Middle	93

The EPA's energy performance rating system, based on source energy, accounts for the impact of weather variations as well as changes in key physical and operating characteristics of each building. A rating of 75 means that, from an energy consumption standpoint, the building performs better than 75% of all similar buildings nationwide.

The district also achieved recognition as an Energy Star® Leader during the 2012/2013 school year. This recognition is for organizations that have achieved an overall score of 75 or greater, across the district's entire portfolio of buildings. Bullitt County Public Schools also received recognition as an Energy Star® Top Performer, for reducing our overall energy portfolio by 10% or more from our baseline year. **To date, BCPS has reduced their Energy Star® portfolio by approximately 28.3%.**

Planned Projects

Planned projects for next year (2013/2014) include:

- Continuation of student energy team program. There are 16 schools that have signed up to participate in the program for the 2013/2014 school year.
- Installation of lighting controls (occupancy sensors)
- Energy Star[®] re-certification for eligible buildings
- Add new schools to the Trane EcoRate energy monitoring program
- Continued monitoring of utility bills, utility rates, and building automation systems
- Continuation of building awareness throughout the district about energy savings opportunities

Energy Usage Information

The following table shows the district’s utility use and cost for each year since 2004/2005.

Table 1--Yearly Utility Use and Cost

Utility Type	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013
Electric (kWh)	20,238,383	23,968,514	25,286,477	23,731,788	21,368,945	20,188,729	21,702,211	20,684,107	20,056,854
Natural Gas (ccf)	344,412	324,933	328,762	317,432	301,614	223,715	168,058	124,929	148,647
Propane	18,307	24,547	24,321	26,067	22,637	738	726	264	0
Total Energy (kBtu)	106,193,736	117,482,446	122,353,157	116,040,454	106,037,049	91,993,746	91,423,984	83,466,042	83,744,627
Water/Sewer (Gal)	31,983,000	30,180,000	28,696,410	27,645,360	22,885,080	18,335,600	19,310,020	19,069,729	19,650,014
Utility Type	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013
Electric Cost	\$ 1,347,257	\$ 1,731,618	\$ 1,878,962	\$ 1,874,410	\$ 1,888,880	\$ 1,841,316	\$ 2,052,474	\$ 2,116,981	\$ 2,125,721
Natural Gas Cost	\$ 361,814	\$ 500,245	\$ 326,271	\$ 359,626	\$ 413,207	\$ 182,260	\$ 155,724	\$ 124,768	\$ 131,426
Propane Cost	\$ 22,543	\$ 36,697	\$ 40,337	\$ 63,841	\$ 52,343	\$ 1,497	\$ 1,405	\$ 764	\$ 0
Total Energy Cost	\$ 1,731,614	\$ 2,268,560	\$ 2,245,570	\$ 2,297,877	\$ 2,354,430	\$ 2,025,073	\$ 2,209,602	\$ 2,242,513	\$ 2,257,147
Water/Sewer Cost	\$ 174,520	\$ 161,663	\$ 166,568	\$ 177,149	\$ 159,270	\$ 131,292	\$ 159,127	\$ 185,462	\$ 198,366
Total Building Area (ft²)	1,319,733	1,501,305	1,600,859	1,604,359	1,677,440	1,729,599	1,906,093	1,906,093	1,906,093

*The only Propane purchases that Bullitt County Public Schools continues to make are for the generator at Hebron Middle School.

Tables 2 and 3 show the energy usage per school compared to their respective baseline. Energy savings and cost avoidance calculations account for changes in the number of days in the billing period, current costs, and heating degree days and/or cooling degree days (weather corrections). Figure 2 shows how the districts’ buildings compare by energy use intensity (kBtu per square foot). Figures 3 through 5 show the district’s non-adjusted energy profile per month as compared to weather trends.

Table 2—Electricity Cost Avoidance Report

Cost Avoidance Report								
Electric Consumption: 2012/2013 Compared to Baseline								
Building	Base Year Actual (kWh)	Base Year Weather Adjusted (kWh)	Evaluation Year Actual (kWh)	Use Avoidance Non-Adjusted (kWh)	Use Avoidance Weather Adjusted (kWh)	Change Non-Adjusted %	Change Weather Adjusted %	Cost Avoidance Weather Adjusted \$
Bernheim	968,378	989,671	615,200	-353,178	-374,471	-36%	-38%	\$ (23,071)
Brooks	840,640	859,157	789,120	-51,520	-70,037	-6%	-8%	\$ (4,315)
Bullitt Central	1,749,023	1,785,789	1,512,439	-236,584	-273,350	-14%	-15%	\$ (16,841)
Bullitt East	2,058,205	2,104,185	1,677,916	-380,289	-426,269	-18%	-20%	\$ (26,262)
Bullitt Lick	1,199,102	1,222,538	629,040	-570,062	-593,498	-48%	-49%	\$ (30,885)
Cedar Grove	862,445	876,149	886,800	24,355	10,651	3%	1%	\$ (3,314)
Central Office	438,922	448,530	393,040	-45,882	-55,490	-10%	-12%	\$ (3,630)
Crossroads	828,036	843,983	675,300	-152,736	-168,683	-18%	-20%	\$ (5,870)
Eastside	1,678,209	1,719,453	1,317,696	-360,513	-401,757	-21%	-23%	\$ (24,752)
Freedom	1,196,862	1,220,894	689,600	-507,262	-531,294	-42%	-44%	\$ (18,529)
Hebron	1,364,982	1,394,858	851,366	-513,616	-543,492	-38%	-39%	\$ (18,927)
Lebanon Junction	474,697	485,930	592,440	117,743	106,510	25%	22%	\$ 6,967
Maintenance	70,569	72,401	80,317	9,748	7,916	14%	11%	\$ 680
Maryville	847,754	869,875	492,720	-355,034	-377,155	-42%	-43%	\$ (31,554)
MW Elementary	1,293,255	1,321,233	650,496	-642,759	-670,737	-50%	-51%	\$ (41,324)
MW Middle	1,357,261	1,387,438	817,600	-539,661	-569,838	-40%	-41%	\$ (19,858)
Nichols	212,232	216,312	424,440	212,208	208,128	100%	96%	\$ 17,924
North Bullitt	2,494,791	2,552,795	1,768,351	-726,440	-784,444	-29%	-31%	\$ (82,436)
Old Mill	625,863	638,721	578,400	-47,463	-60,321	-8%	-9%	\$ (3,716)
Overdale	616,080	627,795	620,880	4,800	-6,915	1%	-1%	\$ (247)
Pleasant Grove	1,173,670	1,197,944	713,664	-460,006	-484,280	-39%	-40%	\$ (31,677)
Riverview/DT	391,633	400,103	345,600	-46,033	-54,503	-12%	-14%	\$ (3,358)
Roby	877,360	895,672	817,760	-59,600	-77,912	-7%	-9%	\$ (5,096)
Shepherdsville	1,067,200	1,088,434	755,036	-312,164	-333,398	-29%	-31%	\$ (11,601)
Transportation	197,383	201,685	209,280	11,897	7,595	6%	4%	\$ 497
Zoneton	1,678,209	1,719,453	931,600	-746,609	-787,853	-44%	-46%	\$ (64,919)
TOTAL	26,562,761	27,140,998	19,836,101	-6,726,660	-7,304,897	-25%	-27%	\$ (445,117)

Table 3--Natural Gas and Propane Cost Avoidance Report

Natural Gas Consumption								
2012/2013 Compared to Baseline								
Building	Base Year Actual (ccf)	Base Year Weather Adjusted (ccf)	Evaluation Year Actual (ccf)	Use Avoidance Non-Adjusted (ccf)	Use Avoidance Weather Adjusted (ccf)	Change Non-Adjusted %	Change Weather Adjusted %	Cost Avoidance Weather Adjusted \$
Bernheim	19,203	19,998	4,756	-14,447	-15,242	-75%	-76%	\$ (9,219)
Brooks	17,874	18,861	0	-17,874	-18,861	-100%	-100%	\$ (11,799)
Bullitt Central	41,767	43,078	31,478	-10,289	-11,600	-25%	-27%	\$ (7,140)
Bullitt East	35,419	37,913	14,154	-21,265	-23,759	-60%	-63%	\$ (13,116)
Bullitt Lick	9,001	9,402	6,609	-2,392	-2,793	-27%	-30%	\$ (1,781)
Cedar Grove	22,476	23,784	5,624	-16,852	-18,160	-75%	-76%	\$ (11,293)
Central Office	501	360	-59	-560	-419	-112%	-116%	\$ (101)
Crossroads								
Eastside								
Freedom	11,448	12,554	5,122	-6,326	-7,432	-55%	-59%	\$ (4,738)
Hebron	20,975	6,578	-14,622	-35,597	-21,200	-170%	-322%	\$ (12,842)
Lebanon Junction	25,234	26,668	4,422	-20,812	-22,246	-82%	-83%	\$ (13,845)
Maintenance	1,567	2,665	2,305	738	-360	47%	-14%	\$ (230)
Maryville	-3,894	-4,217	-2,544	1,350	1,673	-35%	-40%	\$ (1,049)
MW Elementary	7,831	8,049	4,877	-2,954	-3,172	-38%	-39%	\$ (1,837)
MW Middle	13,549	14,667	12,728	-821	-1,939	-6%	-13%	\$ (1,145)
Nichols								
North Bullitt	12,371	12,717	15,245	2,874	2,528	23%	20%	\$ 1,574
Old Mill	10,468	11,162	9,198	-1,270	-1,964	-12%	-18%	\$ (789)
Overdale	23,174	24,156	2,756	-20,418	-21,400	-88%	-89%	\$ (13,417)
Pleasant Grove	8,412	8,838	7,141	-1,271	-1,697	-15%	-19%	\$ (795)
Riverview/DT	8,784	9,288	8,961	177	-327	2%	-4%	\$ 102
Roby	8,463	8,891	37	-8,426	-8,854	-100%	-100%	\$ (5,253)
Shepherdsville	3,201	3,452	2,250	-951	-1,202	-30%	-35%	\$ (743)
Transportation	3,159	3,348	3,505	346	157	11%	5%	\$ 214
Zoneton								
TOTAL	300,982	302,211	123,943	-177,039	-178,268	-59%	-59%	\$ (109,242)

Propane Consumption								
2012/2013 Compared to Baseline								
Building	Base Year Actual (gal)	Base Year Weather Adjusted (gal)	Evaluation Year Actual (gal)	Use Avoidance Non-Adjusted (gal)	Use Avoidance Weather Adjusted (gal)	Change Non-Adjusted %	Change Weather Adjusted %	Cost Avoidance Weather Adjusted \$
Cedar Grove	22,476	12,450	0	-22,476	-12,450	-100%	-100%	\$ (23,655)
Lebanon Junction	841	841	0	-841	-841	-100%	-100%	\$ (1,597)
Nichols	19,421	19,808	0	-19,421	-19,808	-100%	-100%	\$ (36,900)
Roby	8,412	8,412	0	-8,412	-8,412	-100%	-100%	\$ (15,982)
TOTAL	51,150	41,510	0	-51,150	-41,510	-100%	-100%	\$ (78,135)

BASELINE EXPLANATION

The baseline for the majority of facilities is the average use of fiscal years 2004/05 and 2005/06 which are the two years just prior to the start of the program. Schools such as Eastside Middle, Zoneton Middle and Shepherdsville Elementary were constructed mid 2005, therefore 2006/07 is the only year used for their baseline. Maryville Elementary had roof top heat pump replacements in 2005; therefore 2006/07 was also used as their baseline. Old Mill Elementary had a building addition in 2005 so 2005/06 was used for their baseline. The Central Office added numerous computer servers added as well as a new air conditioning unit installed for their server room prior to 2006; therefore, 2006/2007 is used for their baseline. With newly constructed buildings such as Brooks and Overdale, their respective baselines have now been set as their first full year of energy use.

Figure 2 - BCPS Building Energy Use Profile (kBtu/sq²)

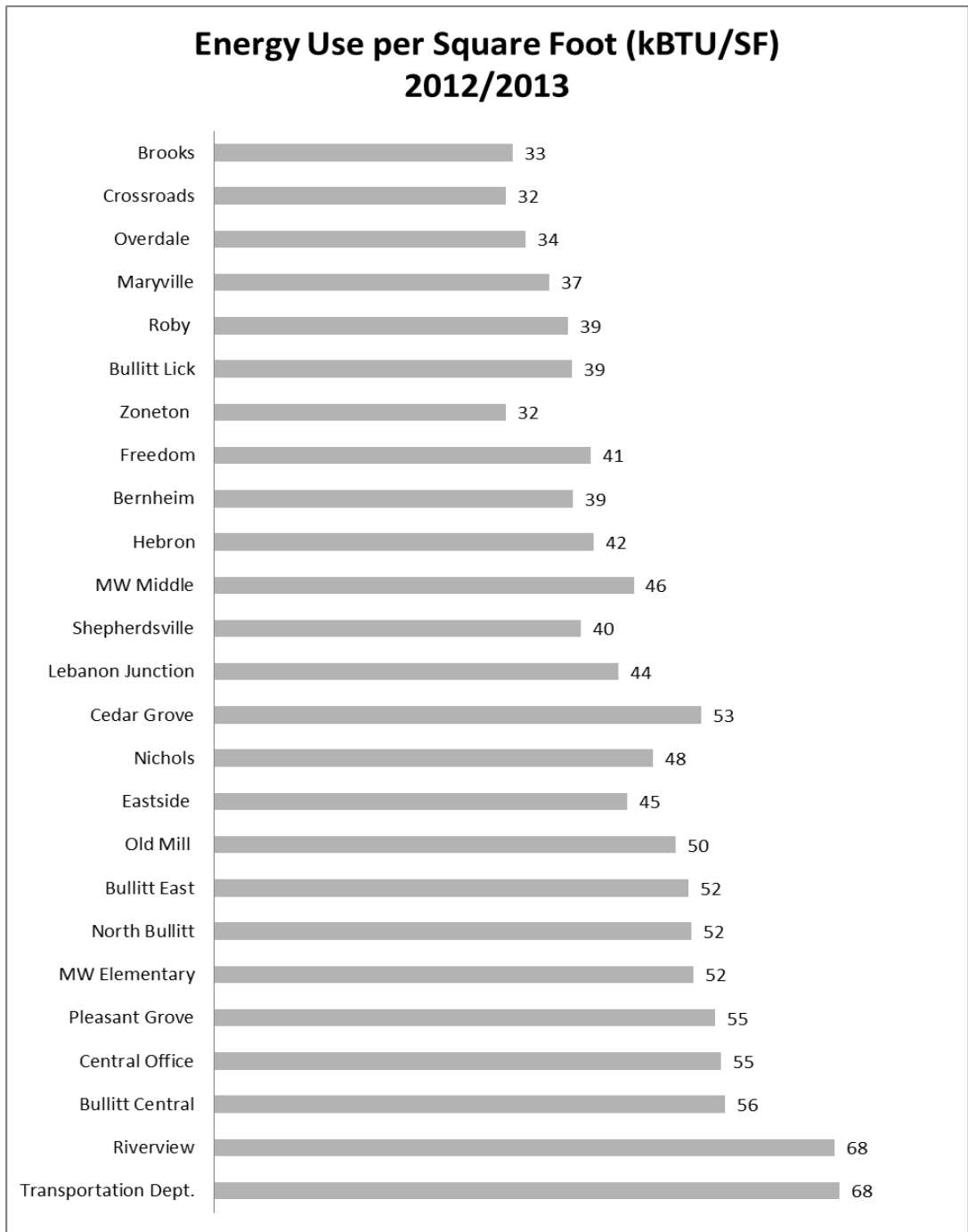


Figure 3—Total, Non-Adjusted Energy Use (Electric, Gas and Propane)

Month	Total Energy Use (kBtu)				Weather Data			
	2011/2012	2012/2013	Baseline	% Change from Baseline	2012/2013		Baseline	
					CDD	HDD	CDD	HDD
July	5,549,307	5,647,112	8,005,849	-29%	581	0	429	0
Aug	8,041,060	7,973,359	9,272,785	-14%	408	4	389	5
Sept	7,394,509	7,086,115	10,158,670	-30%	192	56	218	17
Oct	6,418,903	6,264,247	8,553,459	-27%	48	295	47	167
Nov	6,756,248	6,735,121	9,765,787	-31%	3	580	4	436
Dec	7,743,161	7,167,938	12,996,422	-45%	3	638	0	910
Jan	9,018,523	8,922,920	12,105,100	-26%	3	835	0	725
Feb	8,491,536	8,452,170	11,871,489	-29%	0	768	0	702
March	6,870,887	7,742,812	10,630,920	-27%	2	747	0	595
April	5,500,045	5,813,102	8,206,387	-29%	68	270	45	171
May	6,114,046	5,619,748	8,539,969	-34%	80	188	93	97
June	4,424,944	4,506,532	7,989,551	-44%	321	3	317	0
Total YTD	82,323,169	81,931,177	118,096,386	-31%	1709	4384	1540	3824

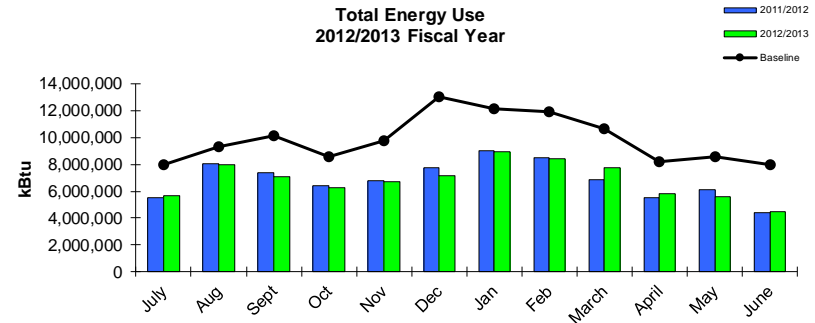


Figure 42--Non-Adjusted Electricity Use

Month	Total Electricity (kWh)				Weather Data			
	2011/2012	2012/2013	Baseline	% Change from Baseline	2012/2013		Baseline	
					CDD	HDD	CDD	HDD
July	1,567,060	1,606,653	2,196,237	-27%	581	0	429	0
Aug	2,255,632	2,239,201	2,519,798	-11%	408	4	389	5
Sept	2,027,076	1,962,290	2,734,260	-28%	192	56	218	17
Oct	1,699,755	1,661,371	2,172,748	-24%	48	295	47	167
Nov	1,619,492	1,535,688	2,074,133	-26%	3	580	4	436
Dec	1,585,642	1,528,899	2,031,215	-25%	3	638	0	910
Jan	1,837,532	1,734,768	2,094,100	-17%	3	835	0	725
Feb	1,779,500	1,665,053	2,045,735	-19%	0	768	0	702
March	1,711,866	1,622,429	2,008,397	-19%	2	747	0	595
April	1,462,784	1,422,465	1,942,129	-27%	68	270	45	171
May	1,680,351	1,526,364	2,161,402	-29%	80	188	93	97
June	1,235,717	1,256,731	2,150,742	-42%	321	3	317	0
Total YTD	20,462,407	19,761,912	26,130,894	-24%				

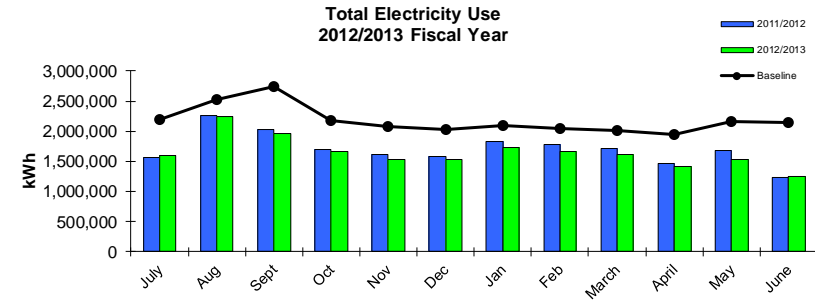


Figure 5--Non-Adjusted Natural Gas Use

Month	Total Natural Gas Use (ccf)				Weather Data			
	2011/2012	2012/2013	Baseline	% Change from Baseline	2012/2013		Baseline	
					CDD	HDD	CDD	HDD
July	1,966	1,604	4,881	-67%	581	0	429	0
Aug	3,348	3,235	6,138	-47%	408	4	389	5
Sept	4,642	3,794	6,872	-45%	192	56	218	17
Oct	6,013	5,783	10,210	-43%	48	295	47	167
Nov	11,947	14,518	23,829	-39%	3	580	4	436
Dec	22,650	18,945	54,793	-65%	3	638	0	910
Jan	26,688	29,164	44,735	-35%	3	835	0	725
Feb	23,494	26,903	44,925	-40%	0	768	0	702
March	10,000	21,428	33,613	-36%	2	747	0	595
April	4,942	9,317	13,540	-31%	68	270	45	171
May	3,696	3,998	10,162	-61%	80	188	93	97
June	2,026	2,122	6,069	-65%	321	3	317	0
Total YTD	121,412	140,811	259,765	-46%				

