



Bullitt County Public Schools
Energy Management Program
2009/2010 Year End Report

Summary

Bullitt County Public Schools began our energy conservation program officially 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 a performance contract with Harshaw Trane and began implementing energy conservation measures such as new controls, lighting, domestic water heater replacement and boiler replacement.

This report summarizes the energy usage for the 2009/2010 fiscal year. Actions used for energy savings are included as well as goals for the upcoming year. District wide, electric consumption has been **reduced by 22%** compared to the baseline usage resulting in a cost avoidance of approximately **\$235,000**. Natural gas usage has been **reduced by 36%** resulting in cost avoidance of approximately **\$87,700**. Propane usage **decreased by 97%** resulting in a cost avoidance of approximately **\$43,500**. (The majority of the district's propane using equipment has been replaced with electric or natural gas through the recent renovation projects.) Had we not reduced our electric, gas and propane usage by these amounts, given today's rates, we would have spent approximately \$366,200 more on our utility bills.

The total avoided utility cost since BCPS began the energy management program is approximately \$802,200. The cost of the district's energy management program has averaged approximately \$73,000 annually, or \$255,500 since the program began, leaving a net cost avoidance of approximately \$547,000.

We were able to accomplish these savings in spite of the fact that we increased the square footage of board owned property with the construction of the new Roby and Overdale Elementary Schools. The majority of the savings are due to renovations and upgrades through the district's investment in the energy savings

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

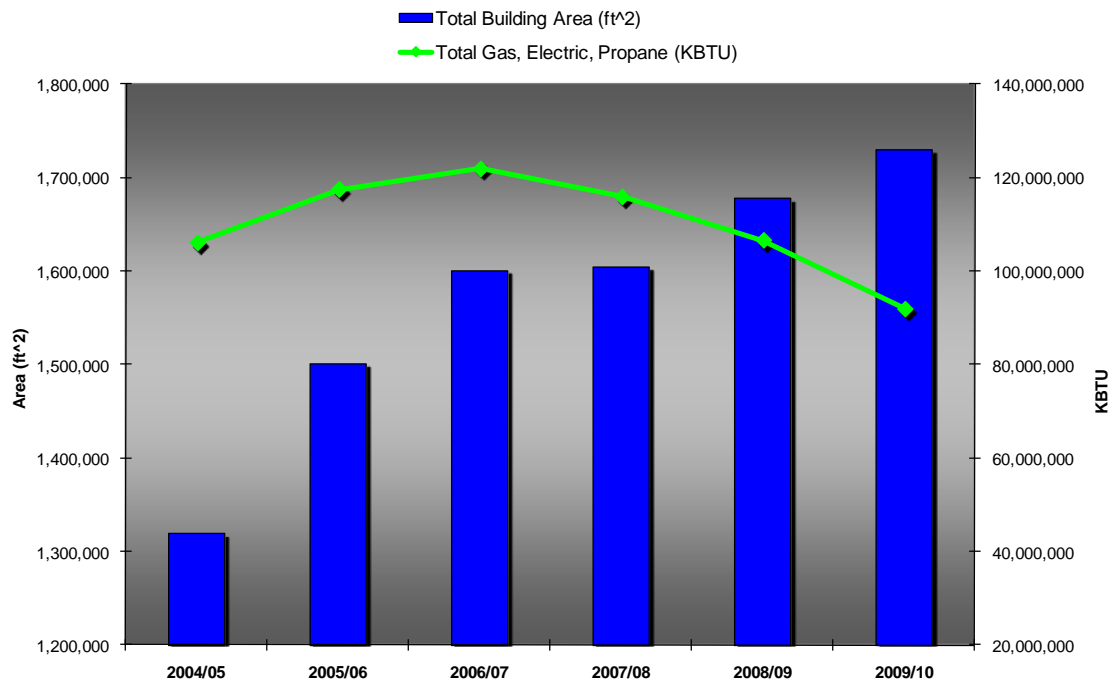


Figure 1--Energy Use Compared to District Growth

Projects

Energy saving measures that were in place during the 09/10 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 10 schools during the 09/10 school year.
 - Bullitt Lick Middle School's team won the National Middle School of the Year Award from NEED.
- School walkthroughs to monitor energy use behaviors and equipment operation.
- Daily monitoring of HVAC control systems to ensure proper equipment operation and scheduling.

Other associated activities:

- Rate schedule evaluations.
- Using Energy Star Benchmarking tool (Portfolio Manager)
- Application for the E.ON Rebate Program has been approved.
- Monitoring of indoor air quality (IAQ)—temperature, relative humidity, and carbon dioxide.

The following schools 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

The schools that are currently under renovation or were just recently completed include:

- Bullitt Central
- Cedar Grove Elementary
- Hebron Middle
- Lebanon Junction Elementary
- Riverview/ Day Treatment Campus

Savings from these renovations will be realized in the 10/11 fiscal year.

One of BCPS' goals was for our facilities to earn the EPA's Energy Star Award.

This year we have had six of our schools earn the award:

- Bullitt Lick (Energy Star Ranking-82)
- Eastside Middle School (Energy Star Ranking-80)
- Freedom Elementary (Energy Star Ranking-80)
- Maryville Elementary (Energy Star Ranking-78)
- Shepherdsville Elementary (Energy Star Ranking-79)
- Zoneton Middle School (Energy Star Ranking-78)

The new Overdale, Brooks and Crossroads Elementary Schools have earned the "Designed to Earn the Energy Star" designation. After one year of operation, if the facilities earn a rating of 75 points or higher we will be able to apply for the Energy Star Award.

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.

Planned Projects

Planned projects for next year (2010/11) include:

- Continuation of student energy team program. There are 17 schools that have signed up to participate in the program for the 2010/11 school year.
- Monthly newsletters to student energy teams.
- Completion of Phase II and III of the Performance Contract.
- Installation of Lighting Controls (occupancy sensors).
- Apply for the Energy Star Leader's award.
- Apply for Energy Star Award for additional schools that meet criteria.

BCPS has been awarded a grant through KSBA. With these funds we will be able to:

- Provide energy related training for facilities staff.
- Purchase energy conservation related signs and posters.
- Purchase an infrared camera.
- Begin an incentive program for school energy teams.
- Provide energy related professional development for teachers.

Energy Usage Information

Tables 1 and 2 show the energy usage per school compared to their respective baseline. Energy savings 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). Figures 2 through 5 show the district's non-adjusted energy profile per month as compared to weather trends.

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.

Table 1--Electricity Cost Avoidance Report

Electric Consumption 2009/10 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	970,597	1,032,023	625,600	-344,997	-406,423	-36%	-39%	\$ (26,300)
Brooks	468,494	491,340	502,160	33,666	10,820	7%	2%	\$ 715
Bullitt Central	1,742,601	1,819,191	1,706,074	-36,527	-113,117	-2%	-6%	\$ (7,370)
Bullitt East	2,029,087	2,153,304	1,670,486	-358,601	-482,818	-18%	-22%	\$ (22,944)
Bullitt Lick	1,218,465	1,243,815	635,000	-583,465	-608,815	-48%	-49%	\$ (25,181)
Cedar Grove	603,041	631,664	707,350	104,309	75,686	17%	12%	\$ 4,966
Central Office	440,184	448,427	414,960	-25,224	-33,467	-6%	-7%	\$ (2,373)
Eastside	1,683,321	1,718,174	1,244,928	-438,393	-473,246	-26%	-28%	\$ (30,497)
Freedom	1,213,886	1,285,862	744,400	-469,486	-541,462	-39%	-42%	\$ (15,000)
Hebron	1,383,511	1,442,602	1,005,120	-378,391	-437,482	-27%	-30%	\$ (12,162)
Lebanon Junction	475,777	494,563	581,160	105,383	86,597	22%	18%	\$ 6,137
Maryville	861,273	875,761	622,560	-238,713	-253,201	-28%	-29%	\$ (18,482)
MW Elementary	1,296,026	1,353,334	678,912	-617,114	-674,422	-48%	-50%	\$ (43,411)
MW Middle	1,372,766	1,464,400	896,000	-476,766	-568,400	-35%	-39%	\$ (15,751)
Nichols	212,232	219,855	484,600	272,368	264,745	128%	120%	\$ 23,586
North Bullitt	2,459,655	2,570,540	1,710,000	-749,655	-860,540	-30%	-33%	\$ (22,552)
Old Mill	627,184	660,322	558,600	-68,584	-101,722	-11%	-15%	\$ (7,045)
Overdale	218,163	242,645	395,040	176,877	152,395	81%	63%	\$ 11,261
Pleasant Grove	1,176,169	1,249,407	747,648	-428,521	-501,759	-36%	-40%	\$ (34,398)
Riverview/DT	392,679	407,525	336,320	-56,359	-71,205	-14%	-17%	\$ (4,591)
Roby	448,841	466,346	877,360	428,519	411,014	95%	88%	\$ 28,217
Shepherdsville	1,082,999	1,145,109	858,400	-224,599	-286,709	-21%	-25%	\$ (8,024)
Transportation	197,940	205,561	250,670	52,730	45,110	27%	22%	\$ 3,123
Zoneton	1,468,164	1,498,771	1,267,000	-201,164	-231,771	-14%	-15%	\$ (16,992)
Total	24,043,056	25,120,539	19,520,348	-4,522,708	-5,600,190	-19%	-22%	\$ (235,068)

Table 2--Natural Gas and Propane Cost Avoidance Report

Natural Gas Consumption 2009/10 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	19,785	20,475	5,920	-13,865	-14,555	-70%	-71%	\$ (9,167)
Brooks	18,082	19,146	21,714	-3,632	2,568	20%	13%	\$ 1,995
Bullitt Central	42,255	45,958	49,721	7,466	3,763	18%	8%	\$ 2,661
Bullitt East	35,646	37,153	15,491	-20,155	-21,662	-57%	-58%	\$ (17,440)
Bullitt Lick	9,213	9,825	7,321	-1,892	-2,504	-21%	-25%	\$ (1,736)
Cedar Grove	22,879	24,294	15,955	-6,924	-8,339	-30%	-34%	\$ (5,741)
Central Office	250	283	578	328	295	131%	104%	\$ 198
Eastside								
Freedom	11,761	12,454	4,474	-7,287	-7,980	-62%	-64%	\$ (5,228)
Hebron	20,271	21,203	4,972	-15,299	-16,231	-75%	-77%	\$ (11,902)
Lebanon Junction	25,489	27,015	15,286	-10,203	-11,729	-40%	-43%	\$ (8,286)
Maryville	3,912	3,912	2,445	-1,467	-1,467	-37%	-37%	\$ (1,017)
Mt. Washington ES	7,779	8,204	6,499	-1,280	-1,705	-16%	-21%	\$ (1,183)
Mt. Washington MS	13,744	15,573	15,128	1,384	-445	10%	-3%	\$ (1,221)
Nichols								
North Bullitt	12,304	13,222	18,117	5,813	4,895	47%	37%	\$ 3,565
Old Mill	10,530	11,451	8,847	-1,683	-2,604	-16%	-23%	\$ (2,051)
Overdale	20,086	22,082	1,184	-18,902	-20,898	-94%	-95%	\$ (13,839)
Pleasant Grove	8,326	8,928	8,123	-203	-805	-2%	-9%	\$ (649)
Riverview/DT	8,765	9,235	11,072	2,307	1,837	26%	20%	\$ 950
Roby	24,107	25,586	51	-24,056	-25,535	-100%	-100%	\$ (17,833)
Shepherdsville	3,058	3,096	3,464	406	368	13%	12%	\$ 411
Transportation	3,152	3,554	3,332	180	-222	6%	-6%	\$ (179)
Zoneton								
Total	321,393	342,648	219,694	-101,699	-122,954	-32%	-36%	\$ (87,691)
Propane Consumption 2009/10 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 \$
Roby*	0	0	0	0	0	#DIV/0!	#DIV/0!	\$ -
Cedar Grove	1,180	1,180	738	-442	-442	-37%	-37%	\$ (1,106)
Nichols	19,421	20,162	0	-19,421	-20,162	-100%	-100%	\$ (40,235)
Lebanon Junction	841	841	0	-841	-841	-100%	-100%	\$ (2,164)
Total	21,442	22,183	738	-20,704	-21,445	-97%	-97%	\$ (43,505)

*Service removed when PE building was demo'd

Note: Cedar Grove, Roby, and Lebanon Junction use propane for cafeteria equipment and some water heating and is not affected by weather.

Figure 2—Total, Non-Adjusted Energy Use (Electric, Gas and Propane)

Month	Total Energy Use (kBtu)			Weather Data			
	2009/2010	Baseline	% Change	2009/2010		Baseline	
				CDD	HDD	CDD	HDD
July	4,641,086	7,571,838	-39%	264	1	429	0
Aug	6,718,781	8,291,307	-19%	339	0	389	5
Sept	6,881,506	9,524,083	-28%	206	18	218	17
Oct	6,283,816	7,970,835	-21%	4	304	47	167
Nov	6,550,322	9,574,602	-32%	0	407	4	436
Dec	10,064,924	13,886,299	-28%	0	873	0	910
Jan	11,284,474	12,715,490	-11%	0	1083	0	725
Feb	10,717,330	12,572,341	-15%	0	949	0	702
March	8,474,916	10,941,278	-23%	0	489	0	595
April	5,599,148	7,984,950	-30%	70	131	45	171
May	6,524,735	8,229,405	-21%	218	39	93	97
June	5,593,211	7,808,685	-28%	492	0	317	0
Total	89,334,250	117,071,112	-24%				

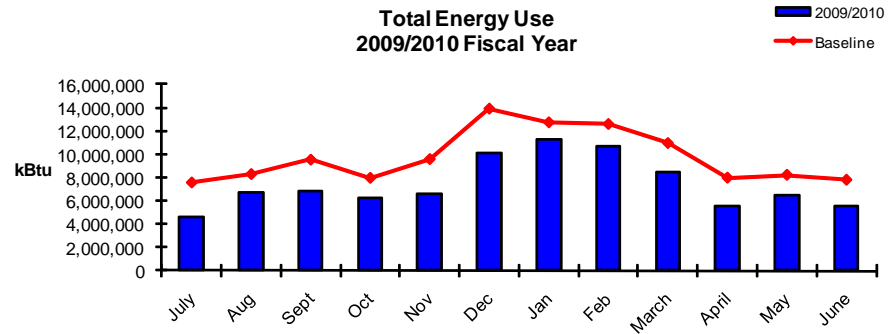


Figure 3--Non-Adjusted Electricity Use

Month	Total Electricity (kWh)			Weather Data			
	2009/2010	Baseline	% Change	2009/2010		Baseline	
				CDD	HDD	CDD	HDD
July	1,264,560	2,066,817	-39%	264	1	429	0
Aug	1,858,253	2,223,721	-16%	339	0	389	5
Sept	1,849,516	2,526,644	-27%	206	18	218	17
Oct	1,554,026	1,962,128	-21%	4	304	47	167
Nov	1,362,082	1,908,036	-29%	0	407	4	436
Dec	1,678,174	1,861,835	-10%	0	873	0	910
Jan	1,850,753	1,903,001	-3%	0	1083	0	725
Feb	1,699,784	1,883,398	-10%	0	949	0	702
March	1,710,415	1,827,217	-6%	0	489	0	595
April	1,397,920	1,792,312	-22%	70	131	45	171
May	1,745,137	2,017,009	-13%	218	39	93	97
June	1,560,034	2,078,262	-25%	492	0	317	0
Total	19,530,654	24,050,378	-19%				

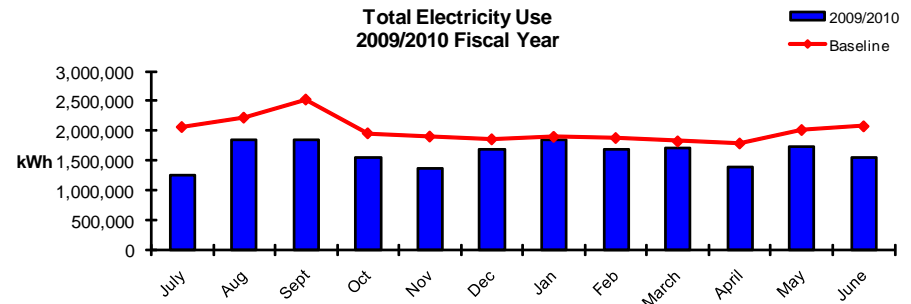


Figure 4--Non-Adjusted Natural Gas Use

Month	Total Natural Gas Use (ccf)			Weather Data			
	2009/2010	Baseline	% Change	2009/2010		Baseline	
				CDD	HDD	CDD	HDD
July	3,169	5,105	-38%	264	1	429	0
Aug	3,674	6,639	-45%	339	0	389	5
Sept	5,424	8,413	-36%	206	18	218	17
Oct	9,448	12,230	-23%	4	304	47	167
Nov	18,406	29,592	-38%	0	407	4	436
Dec	42,069	72,929	-42%	0	873	0	910
Jan	48,202	60,250	-20%	0	1083	0	725
Feb	47,664	59,509	-20%	0	949	0	702
March	25,561	45,616	-44%	0	489	0	595
April	7,973	18,071	-56%	70	131	45	171
May	5,480	12,900	-58%	218	39	93	97
June	2,625	6,899	-62%	492	0	317	0
Total	219,694	338,151	-35%				

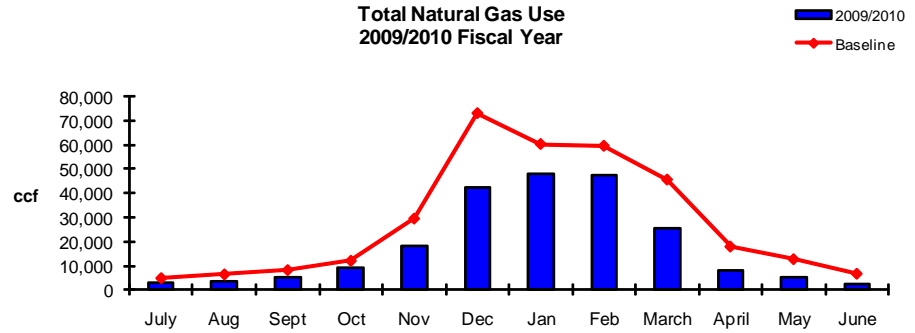


Figure 5--Non-Adjusted Propane Use

Month	Total Propane Use (Gallons)			Weather Data			
	2009/2010	Baseline	% Change	2009/2010		Baseline	
				CDD	HDD	CDD	HDD
July	0	170	-100%	264	1	429	0
Aug	0	443	-100%	339	0	389	5
Sept	135	1,228	-89%	206	18	218	17
Oct	92	879	-90%	4	304	47	167
Nov	78	2,298	-97%	0	407	4	436
Dec	65	4,128	-98%	0	873	0	910
Jan	54	3,443	-98%	0	1083	0	725
Feb	92	2,587	-96%	0	949	0	702
March	68	3,080	-98%	0	489	0	595
April	90	1,809	-95%	70	131	45	171
May	65	1,175	-94%	218	39	93	97
June	0	263	-100%	492	0	317	0
Total	738	21,502	-97%				

