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Rock Hill Schools

DISTRICT ENERGY UPDATE

FOR THE PERIOD OF JANUARY, 2015 – DECEMBER, 2015

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Performance measures of an energy conservation program

1. Establish a baseline period and data set. This is historic information about consumption and costs prior to the implementation of any programs.
 - Fixed period of time – typically 1 year. Our baseline is CY 2009.
 - Total energy consumption – standardized unit of measure is typically kBTU which abbreviates kilo British thermal unit. Electrical kWh and NG therm units are converted.
 - Total energy cost.
 - Measureable variables that affect energy consumption – weather and occupancy.

1 kBTU = 1000 BTU

1 Therm = 100,000 BTU

1kWh = 3,412 BTU

Performance measures of an energy conservation program

2. **Benchmarking – compare common performance measurements to similar, competing facilities - National and State K-12 public school districts.**
 - **Common performance measurements are referred to as “Key Performance Indicators” abbreviated as KPI.**
 - **Consumption per square foot of conditioned floor area – units are kBTU/sq.ft. This value is also known as the “Energy Usage Intensity” abbreviated as EUI.**
 - **Energy cost per square foot of conditioned floor area – units are \$/sq.ft.**
 - **Consumption and cost per student. – kBTU/student and \$/student**

Performance measures of an energy conservation program



3. Periodic comparisons of historical and current data

- **Baseline**
- **KPI**
- **Total consumption and cost.**

Section 1

<i>Actual Use and Cost for Base Period (1/2009 through 12/2009)</i>				
<u>Energy Type</u>	<u>Base Use Recorded</u>	<u>Units</u>	<u>Avg Unit Cost</u>	<u>Energy Cost</u>
Electric	34,433,341	kWh	0.1037	\$3,571,424
Natural Gas	339,816	Therm	1.2069	\$410,114
Total Energy:	151,502,593	kBtu	Total Cost	\$3,981,538

Section 2

<i>Actual Use and Cost With Energy Management Program (1/2015 through 12/2015)</i>				
<u>Energy Type</u>	<u>Current Use Recorded</u>	<u>Units</u>	<u>Avg Unit Cost</u>	
Electric	24,578,204	kWh	0.1333	\$3,276,744
Natural Gas	235,785	Therm	1.0103	\$238,216
Total Energy:	107,463,910	kBtu	Total Cost	\$3,514,960

Section 3

<i>Energy Saved 2014 Compared to Base Period</i>				
<u>Energy Type</u>	<u>Base - Current</u>	<u>Units</u>	<u>Percent Saved</u>	<u>Total Cost</u>
Electricity	9,855,137	kWh	29%	\$294,680
Natural Gas	104,031	Therm	31%	\$171,898
Total Energy Saved:	44,038,683	kBtu	Gross Savings:	\$466,578
Percent Savings:	29%			12%

Cost Avoidance - Without Our Energy Program:



Rates: Base period consumption at current period rates would be an additional: \$952,404

"Load Creep": Additional equipment, operating hours and efficiency lost due to age would cost: \$229,531

Adjustments for weather, bill period differences & other deviations: \$399,675

Total Cost Avoidance: \$2,048,188

Adjusted Savings: 38%

Section 4

5 Year Total Savings

<i>Year</i>	<i>Energy Saved kBTU</i>	<i>Energy Cost Avoided \$</i>
2011	32,068,070	\$1,174,213
2012	49,514,735	\$1,251,370
2013	36,922,222	\$1,217,002
2014	34,231,845	\$1,629,316
2015	44,038,683	\$2,048,188
Total	196,775,555	\$7,320,089

Values represent yearly savings compared to baseline (2009) period.

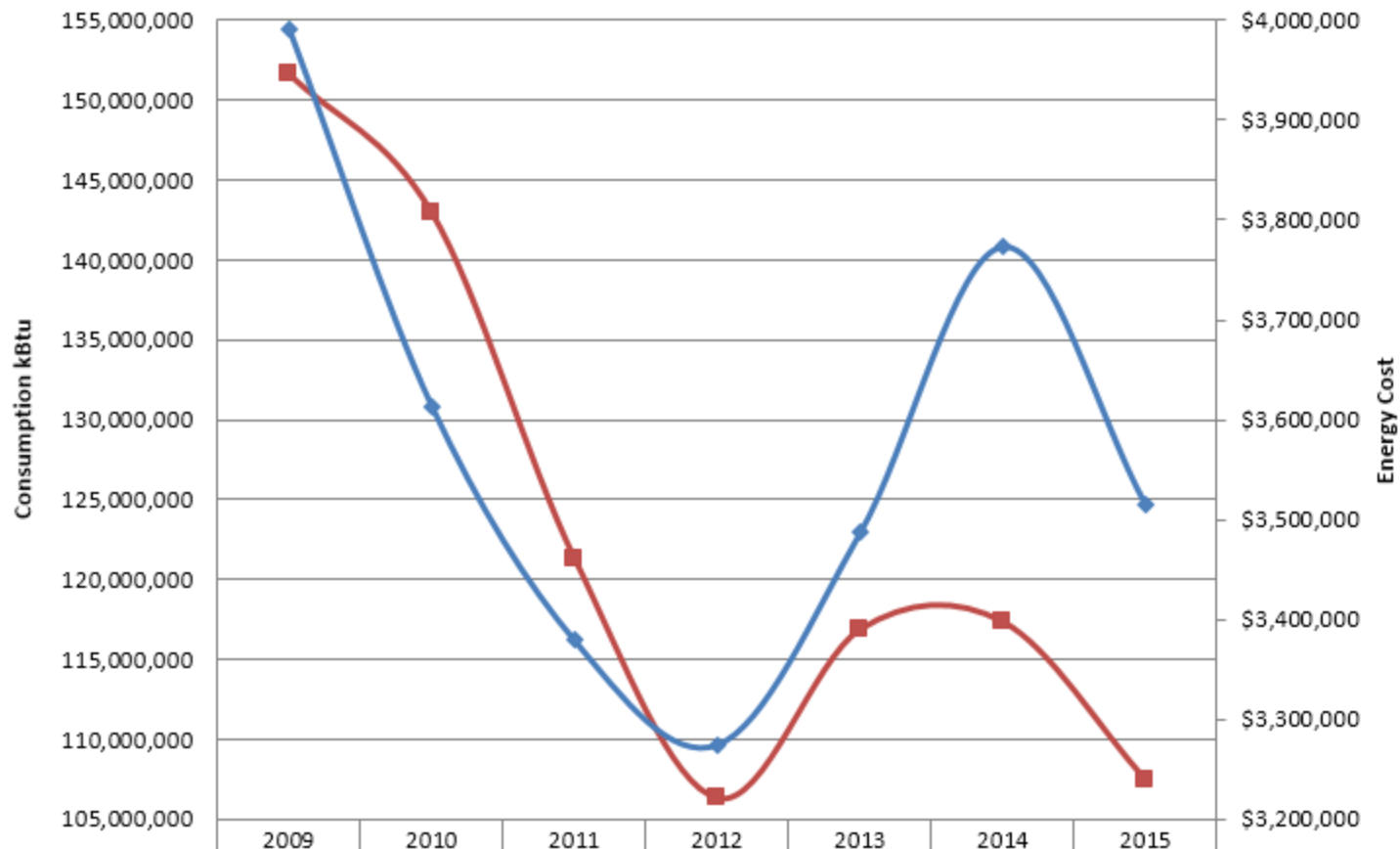
Key Performance Indicator Comparisons

- 17,795 students (as of 11/20/2014)
- 3,404,323 Square Feet

<u>Key Performance Indicator</u>	<u>2015 RHSD</u>	<u>2014 RHSD</u>	<u>2015 National Average (K-12 PS)</u>	<u>2015 State Average (k-12 PS)</u>
Energy Usage Intensity (kBTU/Sq. Ft.)	31.6 (-8.4%)	34.5 (+2.4%)	58.2 2015 data	39 (-2.5%)
Energy \$/Sq. Ft.	1.03 (-7.2%)	1.11 (+4%)	1.30 School Dude Data	1.21 (+2.5%)
Energy \$/Student	198 (-7%)	212 (+7%)	244 School Dude Data	NA

Note: Values in parenthesis are percent change from previous period.

Total Annual Energy Comparison



—■— Consumption kBTU	151,590,807	142,909,915	121,284,294	106,330,727	116,896,674	117,356,335	107,463,910
—◆— Total Cost	\$3,991,432	\$3,613,332	\$3,378,935	\$3,274,740	\$3,487,181	\$3,773,552	\$3,514,960

Ongoing and Future items

Energy Star Certifications:

- Richmond Drive ES
- Castle Heights MS
- Rawlinson Road MS

- 24 of 27 buildings = 89%
- 3 remaining.



Ongoing and Future items



Green Apple Energy Conservation Program.

- 85% complete with our second round of visits for the 2014-2015 School year.
- We have added more chances to win by completing the electronic shutdown forms.
- Positive feedback from comments



Ongoing and Future items



Electronic Shutdown Forms – Comments:

- **“Thank you for all your reminders to conserve energy. Using this survey is a good way to get the information quicker.”**
- **“Great process and easy to follow”**
- **“I love this process. It makes me really think about what I need to do in my room.”**
- **“I love getting my students to contribute. Helps them to grow up as green responsible citizens”**



Ongoing and Future items



Efficiency upgrade projects:

- RRMS – Central Plant Renovation.
 - Converting “A” building from electric heat to Natural Gas heat.
- LED Lighting Upgrades and replacements.
 - Targeted replacement projects
 - Maintenance replacements

Ongoing and Future items

Renewable Energy – Solar Development

- Saluda Trail Middle School – Solar Schools Project.



Ongoing and Future items

Renewable Energy – Solar Development

- Oakdale ES PV Solar Panel Awnings for educational purposes.



Ongoing and Future items

Renewable Energy – Solar Development

- Independence ES 350 kW Rooftop arrays
- Oakdale ES rooftop solar array – Zero Net Energy.





End of Presentation

Thank you!

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