April 27, 2015

ROCK HILL SCHOOLS

District Energy Update
For the period of January, 2014 – December, 2014

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How can we measure the effectiveness 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. RHSD baseline is 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 in dollars.
   - Measureable variables that affect energy consumption – typically weather and occupancy.

How can we measure the effectiveness 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

How can we measure the effectiveness of an energy conservation program?

3. Periodic comparisons of historical and current data

- Baseline
- KPI
- Total consumption and cost.

Section 1

Section 2

Section 3

Section 4

Rock Hill Schools Energy Management Department
Energy Savings and Avoidance Report
For the period of January 1, 2014 through December 31, 2014

Actual Use and Cost for Base Period (1/2009 through 12/2009)

Energy Type	Base Use Recorded	Units	Avg Unit Cost	Energy Cost
Electric	34,508,427	kWh	0.1038	$3,581,022
Natural Gas	338,109	Therm	1.2145	$410,645
Total Energy:	151,588,161	kBtu	Total Cost	***$3,991,667***

Actual Use and Cost With Energy Management Program (1/2014 through 12/2014)

Energy Type	Current Use Recorded	Units	Avg Unit Cost	
Electric	25,908,912	kWh	0.1340	$3,471,443
Natural Gas	289,292	Therm	1.0443	$302,109
Total Energy:	117,356,317	kBtu	Total Cost	***$3,773,552***

Energy Saved 2014 Compared to Base Period

Energy Type	Base - Current	Units	Percent Saved	Total Cost
Electricity	8,599,515	kWh	**25%**	$109,579
Natural Gas	48,817	Therm	**14%**	$108,536
Total EnergySaved:	34,231,845	kBtu	Gross Savings:	***$218,115***
Percent Savings:	**23%**			***5%***

Cost Avoidance - Without Our Energy Program:

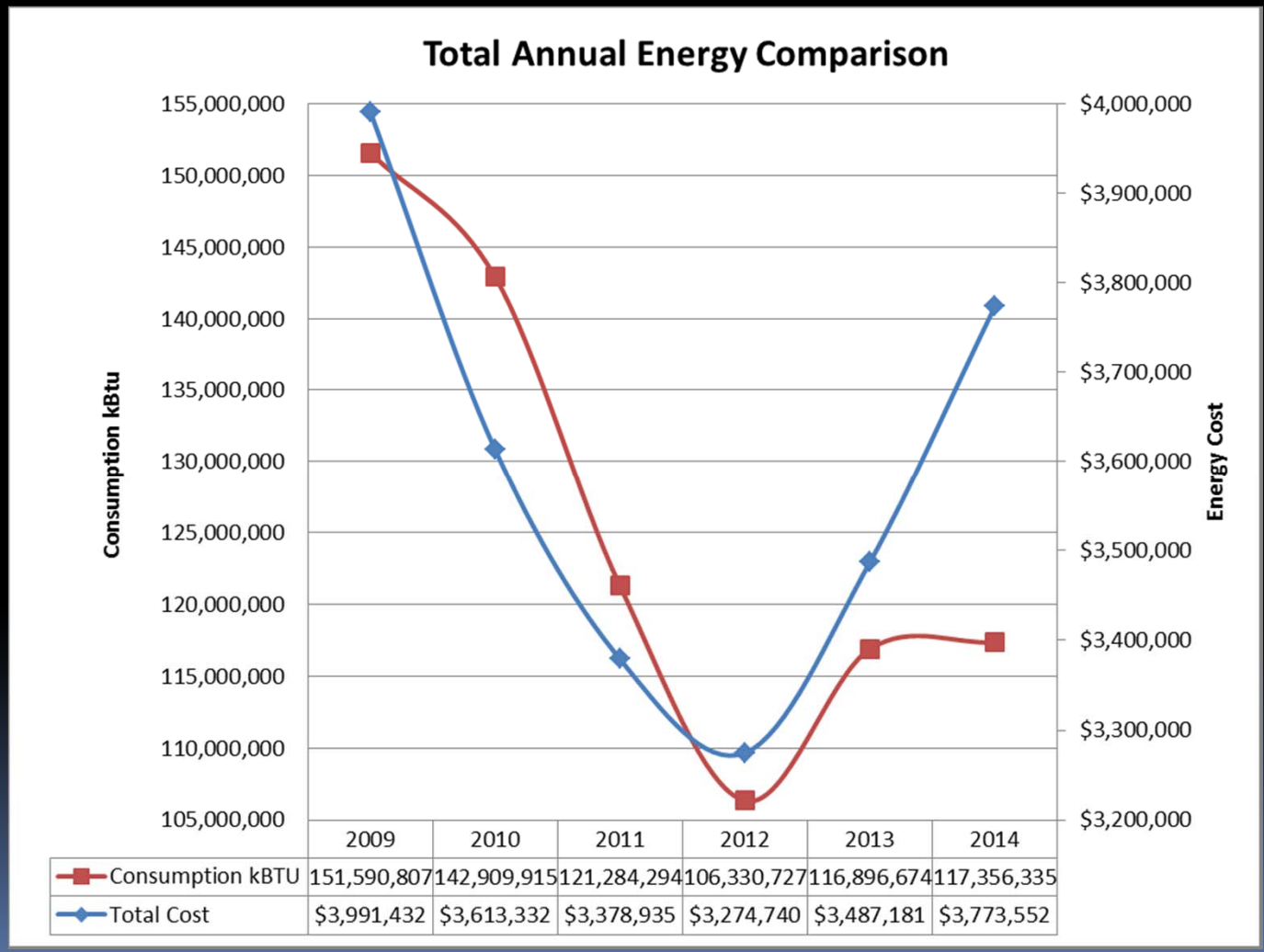
Rates: Base period consumption at current period rates would be an additional:	$985,083
"Load Creep": Additional equipment, operating hours and efficiency lost due to age would cost:	$184,946
Adjustments for weather, bill period differences & other deviations.	$241,172
Total Cost Avoidance:	***$1,629,316***
Adjusted Savings:	***31%***

Key Performance Indicator Comparisons

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

Key Performance Indicator	2014 RHSD	2013 RHSD	2014 National Average (K-12 PS)	2014 State Average (k-12 PS)
EUI or Energy Usage Intensity (kBTU/Sq. Ft.)	34.5 (+2.4%)	33.7 (+13%)	58 2012 data	40 (+5%)
Energy $/Sq. Ft.	1.11 (+4%)	1.01 (+9%)	1.24 2012 data	1.18 (+9%)
Energy $/Student	212 (+7%)	197 (+9%)	181 2012 data	NA SD = 245

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


Total Annual Energy Comparison
Consumption kBtu
Energy Cost
155,000,000
150,000,000
145,000,000
140,000,000
135,000,000
130,000,000
125,000,000
120,000,000
115,000,000
110,000,000
105,000,000
$4,000,000
$3,900,000
$3,800,000
$3,700,000
$3,600,000
$3,500,000
$3,400,000
$3,300,000
$3,200,000
2009 2010 2011 2012 2013 2014
Consumption kBTU 151,590,807 142,909,915 121,284,294 106,330,727 116,896,674 117,356,335
Total Cost $3,991,432 $3,613,332 $3,378,935 $3,274,740 $3,487,181 $3,773,552

Notable Accomplishments

Energy Stars awarded to Independence ES.

- 22 of 27 (81%) possible buildings labled
- 1 awarded in 2015 so far…5 more to go.

Green Apple Energy Conservation Program.

- 65% complete with our second round of visits for the 2014-2015 School year.
- Winners will be drawn and announced in late MAY.
- Prizes will be distributed at the Back to School Event where we will have a display booth.

Goals

- Energy Star labels for remaining buildings
- Summer Efficiency upgrade projects
  - Lighting controls and Demand Limiting.
  - HID Lighting Upgrades for Gyms and Parking
  - Lighting upgrades – replace blown bulbs with LED

End of Presentation

Thank you for your time. Are there any questions?

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