



# CY 2018 Energy Report

January 2018 – December 2018

Kim Melander, Energy Manager

One Team. One Mission. One Rock Hill.

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

Energy Type	Base Use Recorded	Units	Avg Unit Cost	Energy Cost
Electric	34,433,341	kWh	0.1037	\$3,571,424
Natural Gas	339,816	Therm	1.2069	\$410,114
<b>Total Energy:</b>	<b>151,502,593</b>	<b>kBtu</b>	<b>Total Cost</b>	<b>\$3,981,538</b>

*Actual Use and Cost With Energy Management Program (1/2018 through 12/2018)*

Energy Type	Current Use Recorded	Units	Avg Unit Cost	Energy Cost
Electric	28,876,598	kWh	0.1309	\$3,779,626
Natural Gas	261,918	Therm	1.1017	\$288,544
<b>Total Energy:</b>	<b>124,747,629</b>	<b>kBtu</b>	<b>Total Cost</b>	<b>\$4,068,170</b>

*Energy Saved 2018 Compared to Base Period*

Energy Type	Base - Current	Units	Percent Saved	Total Cost
Electricity	5,556,743	kWh	16%	(\$208,202)
Natural Gas	77,898	Therm	23%	\$121,570
<b>Total Energy Saved:</b>	<b>26,754,964</b>	<b>kBtu</b>	<b>Gross Savings:</b>	<b>(\$86,632)</b>
<b>Percent Savings:</b>	<b>18%</b>			<b>-2%</b>

**Cost Avoidance - Without Our Energy Program:**



Rates: Base period consumption at current period rates would be an additional: \$899,765  
 "Load Creep": Additional equipment, operating hours and efficiency lost due to age would cost: \$180,278  
 Adjustments for weather, bill period differences & other deviations: \$388,369

**Total Cost Avoidance: \$1,381,780**  
**Adjusted Savings: 26%**

Baseline period (CY2009)

Current period (CY2018)

Difference between baseline and current periods

Adjustments to baseline data using current weather and cost data

# Key Performance Indicators

We are outperforming SC State and National averages according to data from the Energy.SC.GOV and CGCS.ORG websites.

<u>Key Performance Indicator</u>	<u>2018 RHSD</u>	<u>2018 SC State Average (k-12)</u>	<u>2018 CGCS.org Report (2016-2017)</u>
Energy Usage Intensity (kBTU/Sq. Ft.)	35 (+6%)	37 (0%)	46.7 (-9%)
Energy \$/Sq. Ft.	\$1.15 (+1%)	\$1.19 (+2%)	\$1.23 (-5%)
Energy \$/Student	\$228 (+4%)	NA	NA

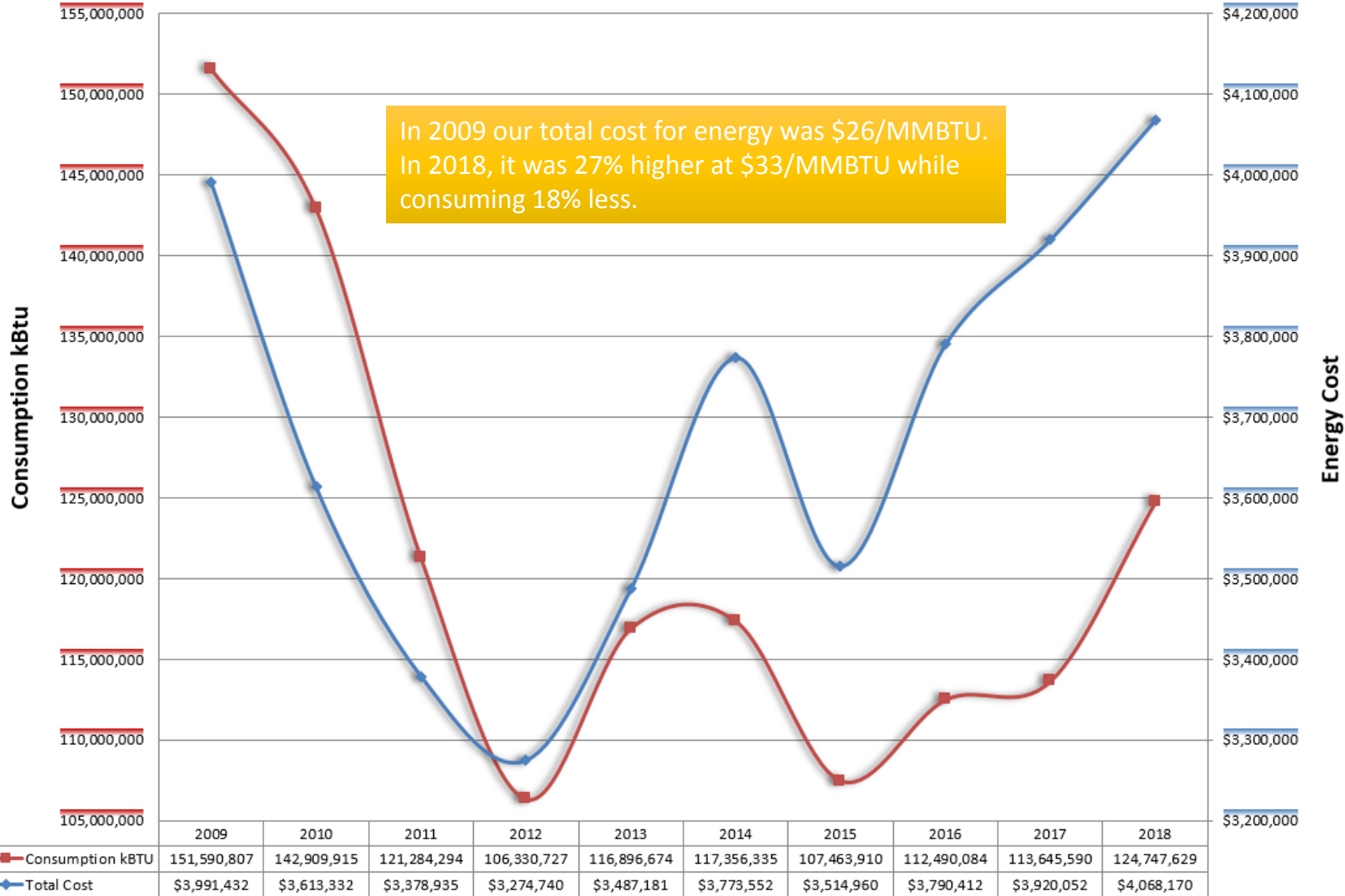
Note: Values in parenthesis are percent change from previous year.

# Combined program cost and energy avoided

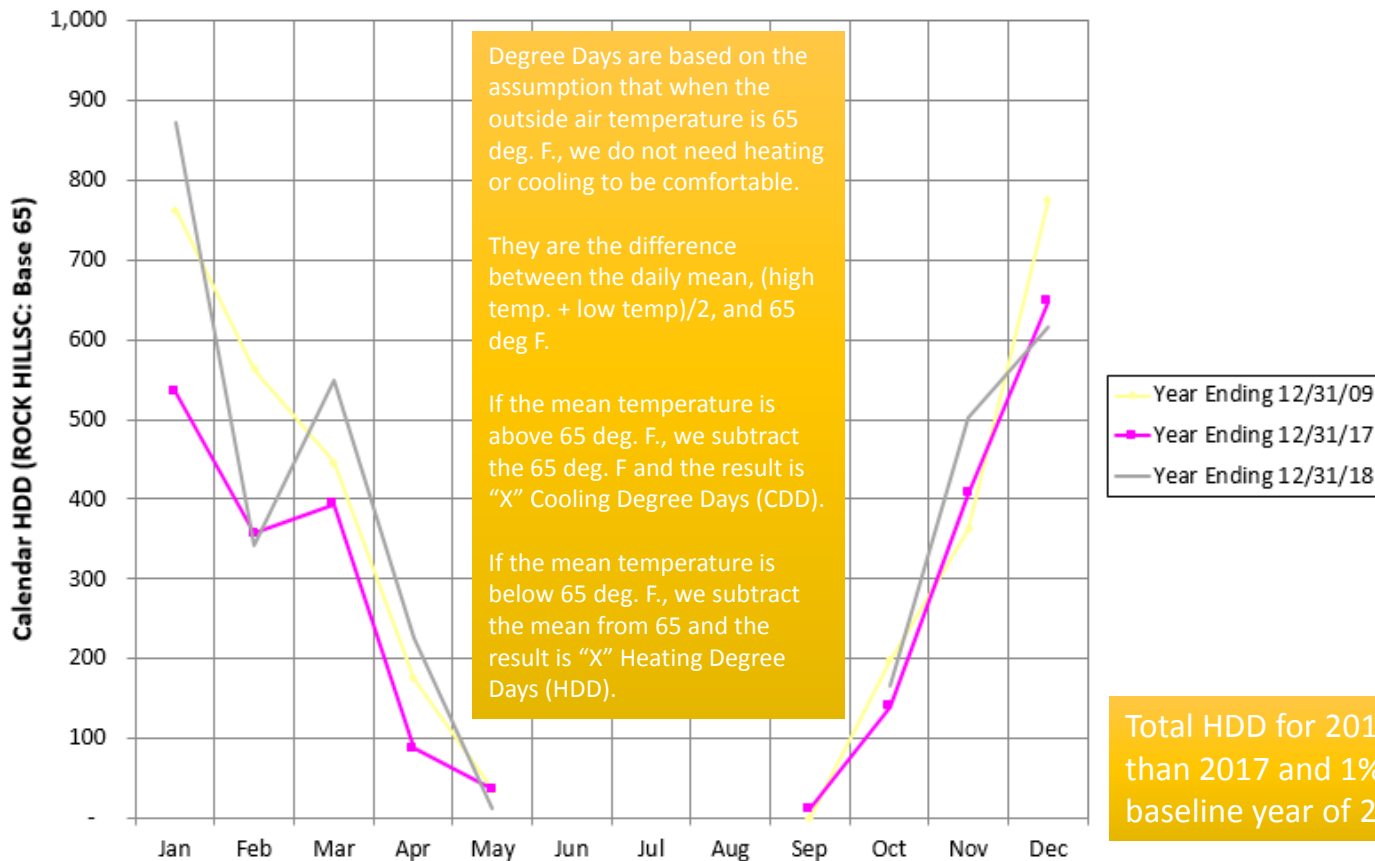
<i>Year</i>	<i>Energy Saved kBTU</i>	<i>Energy Cost Avoided \$</i>
2011	32,068,070	\$1,174,213
2012	49,514,735	\$1,251,370
2013	36,922,222	\$1,217,002
2014	34,231,845	\$1,629,316
2015	44,038,683	\$2,048,188
2016	39,012,508	\$2,202,829
2017	37,830,566	\$1,675,056
2018	26,754,964	\$1,381,780
<b>Total</b>	<b>300,373,593</b>	<b>\$12,579,754</b>

According to the U.S. Energy Information Administration, Rock Hill Schools has saved enough energy since 2011 to power 3,337 homes for 1 year. In 2018 alone, enough for 297 homes. The average household consumes 90 MMBTU/year.

### Total Annual Energy Comparison



Actual Calendar HDD (ROCK HILLSC: Base 65) for Rock Hill Schools Project

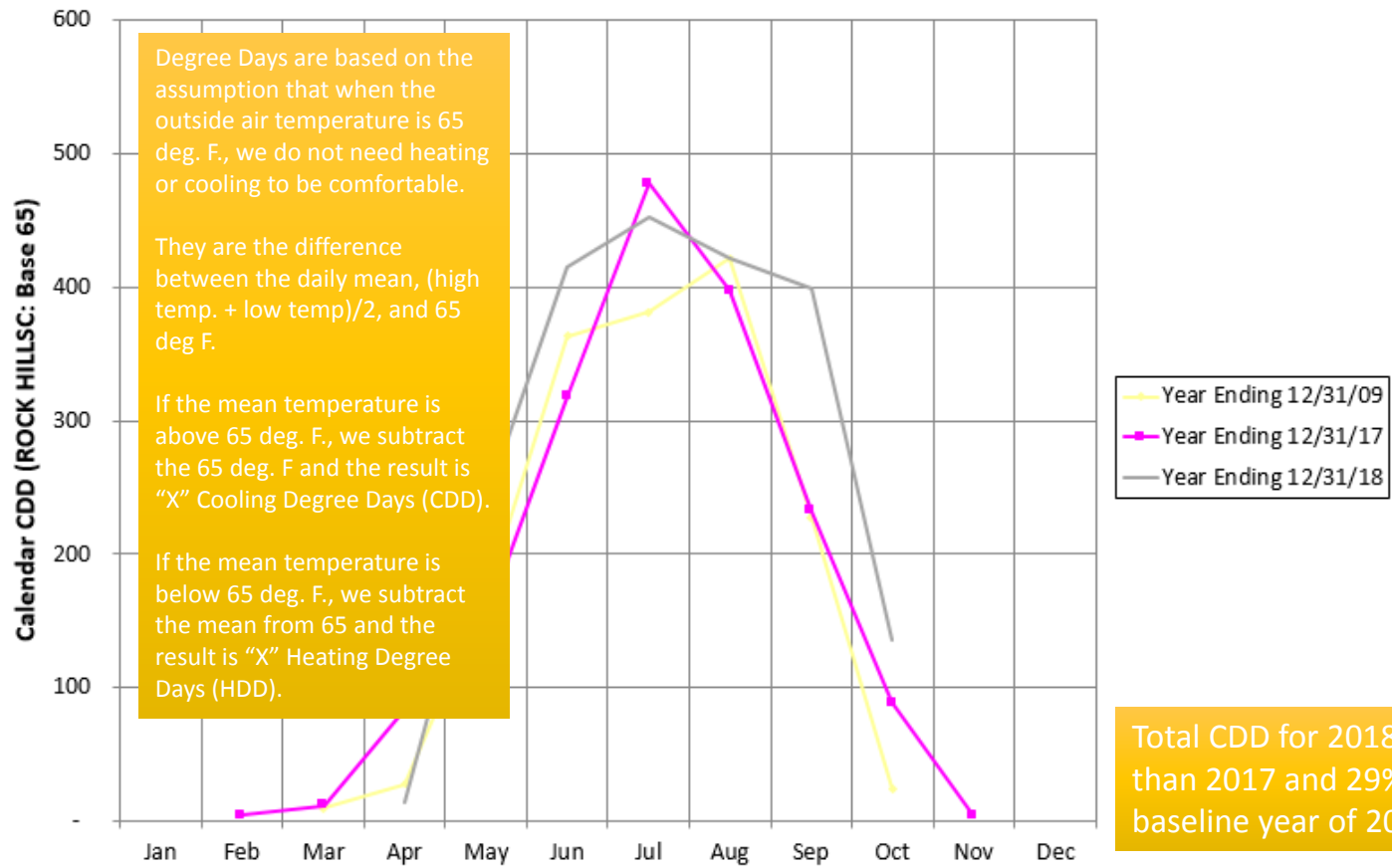


Total HDD for 2018 were 26% higher than 2017 and 1% less than our baseline year of 2009.

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Year Ending 12/31/09	762	564	446	176	37				1	198	362	775	3,319
Year Ending 12/31/17	534	357	394	88	36					12	407	648	2,615
Year Ending 12/31/18	872	342	548	227	13						167	502	3,287

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Actual Calendar CDD (ROCK HILLSC: Base 65) for Rock Hill Schools Project



Total CDD for 2018 were 19% higher than 2017 and 29% higher than our baseline year of 2009.

# Budget Performance

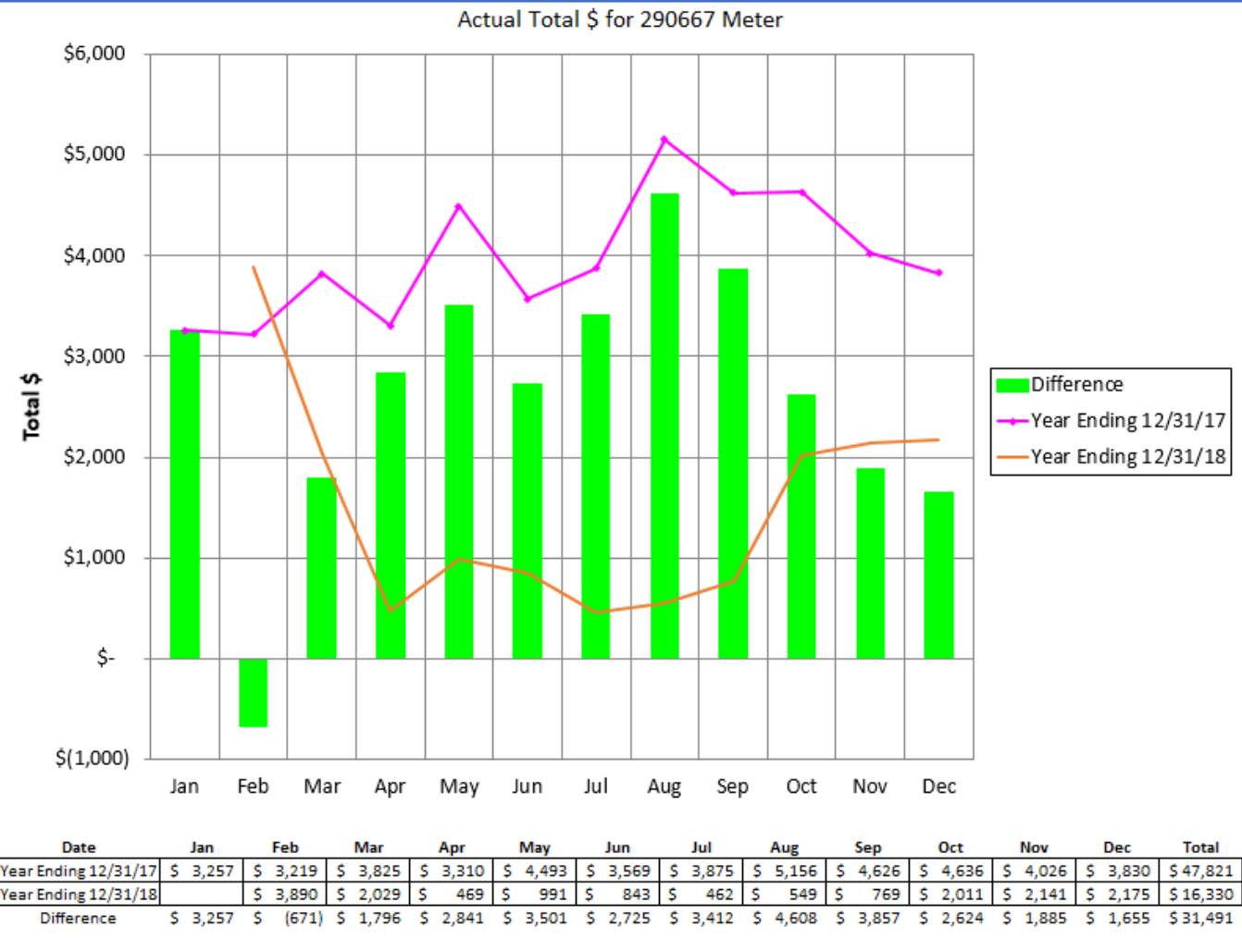
- Electric/Natural Gas

- \$4.29M budgeted for 2018-2019 SY
- \$3.2M spent through March 2019
- \$1.09M remaining
- \$350k/month \* 3 month = \$1.05M

## 2019-2020 SY Planning

- Electric/Natural Gas = \$4.39M (2.3% increase)

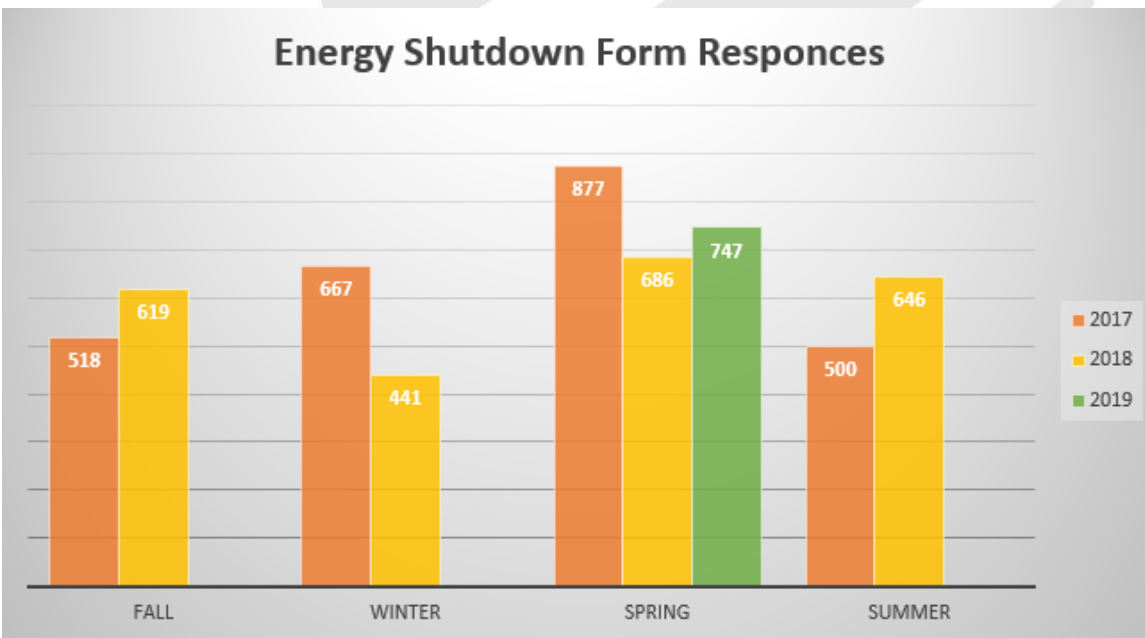




Independence ES Solar update:  
\$31,491 less spent in 2018 compared to  
2017 on electricity.

# Green Apple Energy Conservation Program

Energy Shutdown Form Responses



Based on feedback from previous winners, we ordered larger thermal mugs to award for the 2018-2019 school year.

Our winter shutdown responses were about 27% less than our goal of 600. We believe this was due to communications challenges leading up to the shutdown. We adjusted for the spring shutdown and were very happy to see positive results.

Big Thank You to Dr. Cook and Mychal Frost for helping us "dial in our comms".



# EPA Energy Star Building Certifications

- No new certifications added in 2018-2019
  - Rock Hill HS
  - Richmond Drive ES
- Added 4 buildings to the list
  - Central Child Development Center
  - Central Office
  - Facilities Services
  - Flex Learning Center

1. We use the industry accepted standard for energy measurement and verification (M&V) known as the International Performance Measurement and Verification Protocol (IPMVP). The first step is to establish a baseline period of time and energy data set. This will be historic information about energy consumption and costs prior to the implementation of any conservation programs. This information is entered into a special utility accounting software package.
  - The baseline is a fixed period of time – typically 1 year. Ours is CY 2009. We then:
    - Record all energy consumption – standardized unit of measure is typically kBTU which abbreviates kilo British thermal unit. Electrical kWh and Natural Gas (NG) therm units are converted.
    - Record all energy costs.
    - Record measureable variables that affect energy consumption such as weather and occupancy.
  - Our baseline comparisons are expressed as “Cost Avoidance” because the savings figures are calculated or “normalized” to account for differences in weather conditions, utility rates, billing cycles and changes in construction.

1 kBTU = 1,000 BTU

1 MMBTU = 1,000,000 BTU

1 Therm NG = 100,000 BTU

1 kWh = 3,412 BTU

1 MWh = 1,000,000 kWh

2. Benchmarking is comparing common performance measurements to similar, “competing” facilities. For example, we benchmark against other National and State K-12 public school districts.
- Common and universally accepted benchmark 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.**

3. Periodic comparisons of historical and current data are done through regular reporting.
  - Our baseline report will always compare the current year to the baseline year.
  - KPI reporting will typically compare the current period to the previous reporting period or may cover several reporting periods.
  - Total consumption and cost reports are usually compared to the previous period as well as several periods prior to that. This will give the energy manager a better picture of energy long term trends.