



## COUNCIL STAFF REPORT

To: **Honorable Mayor and Members of the City Council**  
From: **Virgil Turner**  
CC: **William E. Bell, City Manager**  
Date: **September 5, 2014**  
Subject: **Energy Monitoring Report**  
Attachments: **Staff prepared spreadsheet and graphs and Ameresco Energy Monitoring Report – Year 2**

In April 2010 the City of Montrose entered into an Energy Performance Contract (EPC) with Ameresco (formerly Ennovate Corporation) to install a number of energy conservation measures (ECMs). As a part of this contract Ameresco has continued to monitor our energy usage and on an annual basis has provided a report of its findings. I have attached, for your review, a copy of the Year 2 report.

In addition to the utility monitoring that Ameresco completes, staff of the City of Montrose also monitor energy usage in a system called Portfolio Manager. Through these monitoring efforts we are able to gain a good understanding of how much energy we are consuming at our largest facilities. In addition to the Ameresco report I have included spreadsheets and graphs you may find helpful in understanding how we are using energy.

The City of Montrose has made great progress in reducing energy costs related to operating our facilities. These reductions in costs have come through increased awareness among our staff of the importance of energy efficiency and the implementation of energy conservation measures. Over the past five years the City has realized a combined savings of over \$366,000 through reduced utility bills for our largest facilities. We are consistently saving more than twenty percent each year when compared to the baseline year of 2007-2008.

### **Individual Building Results**

Animal Shelter – Prior to the EPC this facility was heated using propane, since natural gas was not available in this area. With the acquisition on the Milsap property to the north of the shelter, we were able to cost effectively extend natural gas service to the shelter. This was completed in September 2010 as a part of the EPC contract. Several other ECMs were completed at the shelter as well. During our baseline year the City expended over \$21,000 on electricity and propane. During the past twelve months we have spent \$11, 228.92 or 52% less than the baseline. Both changes to operations and the conversion to natural gas fuel for heating are attributed as the greatest factors for this cost reduction.

431 South Second Street - This building has seen limited use in recent years. Since the usage patterns have not been consistent it is difficult to attribute cost savings to specific changes in use. We have been realizing a cost reduction of around 30% annually from the baseline.

City Hall and Annex – Prior to the EPC project much work had been done by staff to increase energy efficiency in these buildings. Conversion from T-12 to T-8 fluorescent lighting was completed as well as installation of programmable thermostats. A change to daytime janitorial service was also implemented, resulting in reduced lighting costs. The results of these efforts as well as staff's commitment to saving energy has resulted in a steady reduction in costs by over 30% compared to the baseline. These buildings, while historic, also rank in the 70<sup>th</sup> percentile of all similarly used buildings in the nation, for energy efficiency.

City Shop – This building was focused on during the EPC. As a result we are now realizing greatly reduced costs for energy at this facility. In the last twelve months alone, we realized a savings of over 47% and saved over \$13,000. Many of the ECMs occurred in the high-bay shop area with the installation new infrared heating, door switches that disable heating when doors are open and improved lighting. Not only is the shop more energy efficient, but staff have commented on the improved working environment.

Elks Civic Building – Completion of the rehabilitation of this building was completed in 2007. The baseline year was the first year of operation for this building. The rehabilitation of this building included many features that were intended to reduce energy cost and attain high levels of efficiency. The building earned an Energy Star rating in 2010 with a ranking above the 75<sup>th</sup> percentile of all similarly used buildings in the nation. (You can view the Energy Star profile at [http://www.energystar.gov/index.cfm?fuseaction=labeled\\_buildings.showProfile&profile\\_id=1011024](http://www.energystar.gov/index.cfm?fuseaction=labeled_buildings.showProfile&profile_id=1011024).) As a part of the EPC we fine-tuned the building controls and installed additional controls aimed at efficiency. We are continuing to see increases in efficiency due to these measures.

Lions Community Clubhouse – This is the only building of those that are actively monitored that we have not seen a decrease in costs. During our baseline year we spent \$1305.72 on utilities and during the last twelve months we have spent \$1705.72. During the EPC, lighting was changed to more efficient fixtures and a programmable thermostat was installed. We also reduced the thermostat set-point to 70 degrees during occupied periods. This change was met with much resistance by the regular users of the building and after receiving complaints that the building was too cold for many months, staff relented and increased the heating set-point. The cold temperatures in January of this year coupled with the increased set-point have resulted in an increase from the baseline as well as previous years.

Montrose Pavilion – A lighting retrofit for the Pavilion was completed in 2008 and this set the stage for ongoing energy cost savings. The Pavilion has made improvements in the use of their building control system to reduce costs by setting back temperatures in unoccupied areas. In the past twelve months they have achieved a 17% reduction in costs over the baseline period in a year with substantial increase in usage.

Montrose Police Department – Several ECMs were implemented in the Police Department over the last few years. Changes to the building control system and the plumbing of the HVAC have improved occupant comfort and reduced costs.

Wastewater Treatment Plant – Annual costs for energy at the Wastewater Treatment Plant commonly approached \$250,000 six to eight years ago. Energy costs in the last twelve months were just over \$185,000. This reduction in costs is due to many factors. Changes to the operations in the plant and reductions of influent are factors. The installation of variable frequency drives (VFD) is undoubtedly one of the largest factors. Prior to the installation of VFDs, large electric motors in use at the plant either ran at full speed or were off. VFDs now allow a motor to be run at a variable range of between 0% and 100% based on the need at the time. This level of control provides for much more flexibility for the operators. It also saves a lot in energy costs. This year the Wastewater Treatment Plant installed a 23 KW solar array. This system will continue provide reductions in the amount of grid-purchased power needed to operate the plant.

### **Future Efforts for Energy Efficiency**

During the past five years our efforts have primarily focused on our largest facilities. We have proven that this focus has driven down costs and increased efficiency. While we will continue our efforts on these larger facilities, we will now begin to more closely monitor all of our energy meters. Starting in 2014, through the use of utility management software we will track monthly bills and look for ways to reduce costs where possible throughout all of our energy uses. We will also begin to actively monitor our water usage to ensure that we are using this resource wisely. In the past it has required a substantial amount of staff time to input this usage data. We are now in a position with our utilities that we should be able to obtain and update these records in batches.

Staff has been considering the possibility of another EPC that would be focused on a couple of key areas. One area being considered is street lighting. We currently expend over a quarter million dollars annually on energy for street lighting. We have made good progress working with Delta Montrose Electric to accurately inventory all of our tariffed lights. It is now time to analyze whether we have the right lights in the right areas. It could be that we have areas that have too much light. We may also have an opportunity to bring cost down by retrofitting existing luminaires with LEDs.

The Wastewater Treatment Plant is another area that we may want to explore the benefits of an EPC. We have made great strides in the past few years, but more can be done. One area that could be explored is the possibility of heating and cooling the buildings using geo-thermal energy that could be harvested from the effluent at the plant. This would require retrofitting existing HVAC equipment, but much of this equipment is at or beyond end of life.

The Pavilion is another facility where we may benefit from an EPC. Most of the HVAC components are at the end of life. This facility may be a good candidate for a geothermal system. Increasing the energy efficiency further in this facility will improve occupant comfort and offer opportunities to market it as a "green" venue.

The first step in considering whether we could benefit from an EPC is to complete a feasibility study. We have had discussions with an energy services company that has stated they will complete a "free" feasibility study for us. To ensure a competitive process, staff recommends this study be completed by an independent party, who is not expected to compete for any future contracts. In our initial EPC process we were able to obtain the assistance from the state energy office in completing an independent feasibility study. We will be in contact with the Colorado Energy Office to determine if this option is available to us once more.

## Comparison of Actual Energy Cost to Baseline

Report prepared by: Virgil Turner 9-5-2013

	Baseline 2007-2008	2008-2009			2009-2010			2010-2011			2011-2012			2012-2013		
Building	Current Annual Energy Cost (2008/2009)**	Total Increase/ Decrease Cost****	Percent Change	Current Annual Energy Cost (2009/2010)**	Total Increase/ Decrease Cost ****	Percent Change	Current Annual Energy Cost (2010/2011)**	Total Increase/ Decrease Cost ****	Percent Change	Current Annual Energy Cost (2011/2012)**	Total Increase/ Decrease Cost ****	Percent Change	Current Annual Energy Cost (2012/2013)**	Total Increase/ Decrease Cost ****	Percent Change	
Animal Shelter	21,050.99	16,301.67	\$ (4,958.47)	-24%	18,199.78	\$ (3,274.81)	-16%	10,392.51	\$ (11,300.36)	-54%	10,988.39	\$ (10,919.07)	-52%	11,228.92	\$ (10,893.34)	-52%
431 South Second	2,157.80	1,776.34	\$ (402.90)	-19%	2,268.04	\$ 66.82	3%	1,351.66	\$ (871.93)	-40%	1,793.93	\$ (451.66)	-21%	1,576.98	\$ (690.63)	-32%
City Hall & Annex	28,394.83	25,990.64	\$ (2,686.31)	-9%	22,839.96	\$ (6,126.24)	-22%	19,709.19	\$ (9,551.44)	-34%	19,556.74	\$ (9,993.35)	-35%	21,854.56	\$ (7,985.27)	-28%
City Shop	29,211.43	27,515.31	\$ (1,986.35)	-7%	27,791.71	\$ (2,007.52)	-7%	20,205.12	\$ (9,897.01)	-34%	17,620.69	\$ (12,779.23)	-44%	17,009.34	\$ (13,688.64)	-47%
Elks Civic Building	15,134.78	14,986.64	\$ (298.51)	-2%	12,615.46	\$ (2,823.87)	-19%	12,524.08	\$ (3,072.18)	-20%	12,653.99	\$ (3,096.56)	-20%	13,498.12	\$ (2,406.86)	-16%
Lions Community Clubhouse	1,305.72	1,549.25	\$ 230.56	18%	1,684.57	\$ 352.58	27%	1,492.70	\$ 147.17	11%	1,528.99	\$ 170.14	13%	1,705.72	\$ 333.55	26%
Montrose Pavilion	77,303.67	78,692.55	\$ 620.84	1%	76,866.21	\$ (1,992.99)	-3%	70,700.52	\$ (8,960.25)	-12%	66,566.33	\$ (13,882.50)	-18%	67,967.25	\$ (13,270.36)	-17%
Montrose Police Department	19,147.82	20,646.84	\$ 1,308.78	7%	18,790.28	\$ (742.84)	-4%	17,024.70	\$ (2,706.97)	-14%	16,717.15	\$ (3,209.72)	-17%	17,879.96	\$ (2,242.28)	-12%
Wastewater Treatment Plant	213,213.00	197,710.20	\$ (17,621.17)	-8%	188,785.53	\$ (28,717.82)	-13%	187,515.32	\$ (32,198.86)	-15%	178,792.71	\$ (43,095.03)	-20%	185,067.97	\$ (38,995.33)	-18%
<b>Total Increase/Decrease for All Listed Facilities</b>	<b>406,920.04</b>	<b>385,169.44</b>	<b>\$ (25,793.53)</b>	<b>-6%</b>	<b>369,841.55</b>	<b>\$ (45,266.70)</b>	<b>-11%</b>	<b>340,915.80</b>	<b>\$ (78,411.83)</b>	<b>-19%</b>	<b>326,218.92</b>	<b>\$ (97,256.98)</b>	<b>-24%</b>	<b>337,788.82</b>	<b>\$ (89,839.16)</b>	<b>-22%</b>

\* Baseline Period typically covers 5-1-2007 to 4-30-2008

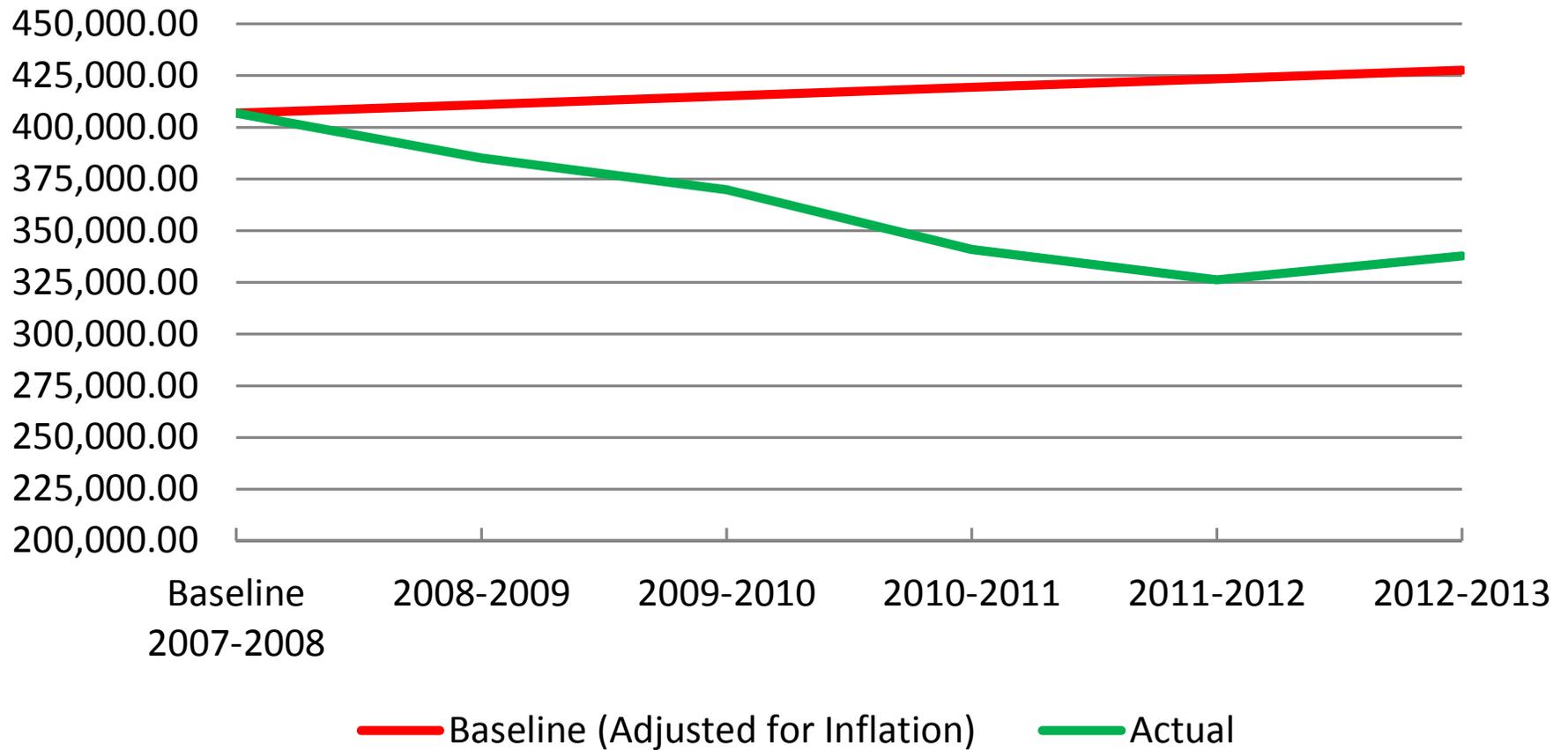
\*\* Twelve Month Period from July 1 to June 30

\*\*\* Conversion to Natural Gas from Propane Occurred in September 2010

\*\*\*\* Comparison of actual to inflation adjusted baseline using Denver, Boulder and Greeley CPI

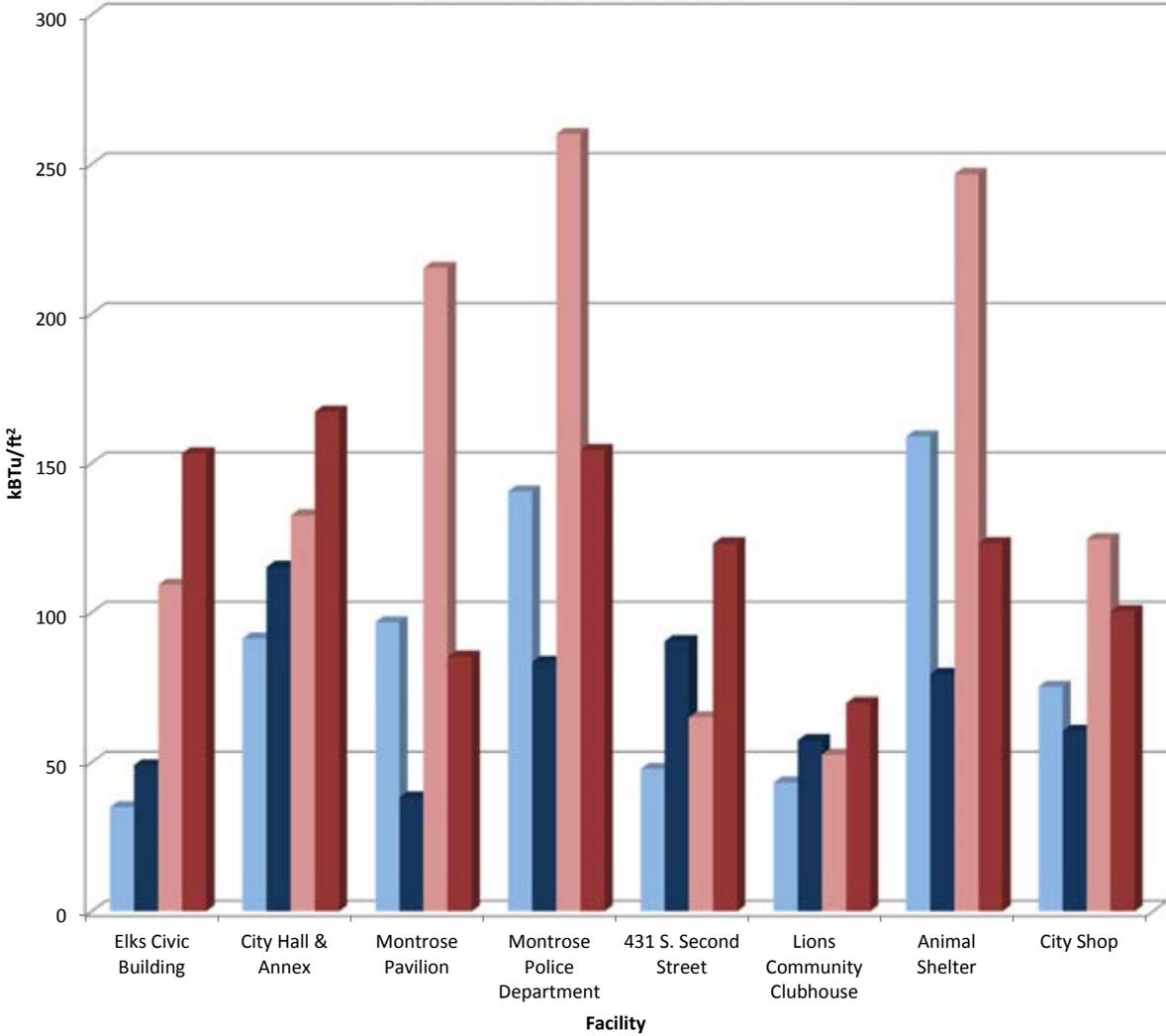
<b>Net Energy Cost Change Since Baseline****</b>	<b>\$ (336,568.21)</b>
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# Comparison of Actual Energy Costs to Baseline



# Annual Energy Performance

(12 months ending June 30, 2013)



**Key Terms:**

**EUI** - Energy Use Intensity

**ft<sup>2</sup>** - Square foot (building area)

**kBTu** - 1000 BTU (common metric of energy consumption)

**Site EUI** - the total site energy use per unit of gross building area

**Source EUI** - the total energy that was required to be generated in order to supply the energy to the site. This accounts for losses and inefficiencies in transmission.

- Site EUI (kBTu/ft<sup>2</sup>)
- National Median Site EUI (kBTu/ft<sup>2</sup>)
- Source EUI (kBTu/ft<sup>2</sup>)
- National Median Source EUI (kBTu/ft<sup>2</sup>)

## City of Montrose

## Energy Monitoring Report - Year 2

March 1 2012 – February 28 2013



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## Executive Summary

### Project Background

In April of 2010 the City of Montrose entered into an Energy Performance Contract (EPC) with Ameresco to install a number of energy conservation measures designed to improve **the energy efficiency of the City's buildings**. The EPC guaranteed \$38,027 in annual energy cost savings and \$1,558 in water savings in 9 of the City's facilities. Savings for the project were verified by retrofit isolation techniques or stipulated as documented in the Measurement and Verification (M&V) report submitted to the City upon project completion.

The M&V report documented a verified energy cost savings of \$41,557 and a verified water savings of \$1,694 for the first year following project completion.

As part of the EPC Ameresco is to monitor and report annually on energy consumption and cost for 7 of the 9 facilities. These 7 facilities are the; Animal Shelter, Wastewater Treatment Plant, Police Department, Pavilion, City Municipal Shops, Lions Clubhouse and the Elks Civic Building. No water usage data is included in this report. This is the second of such reports. The energy and cost figures stated in this report are for the period from March 2012 through February 2013.

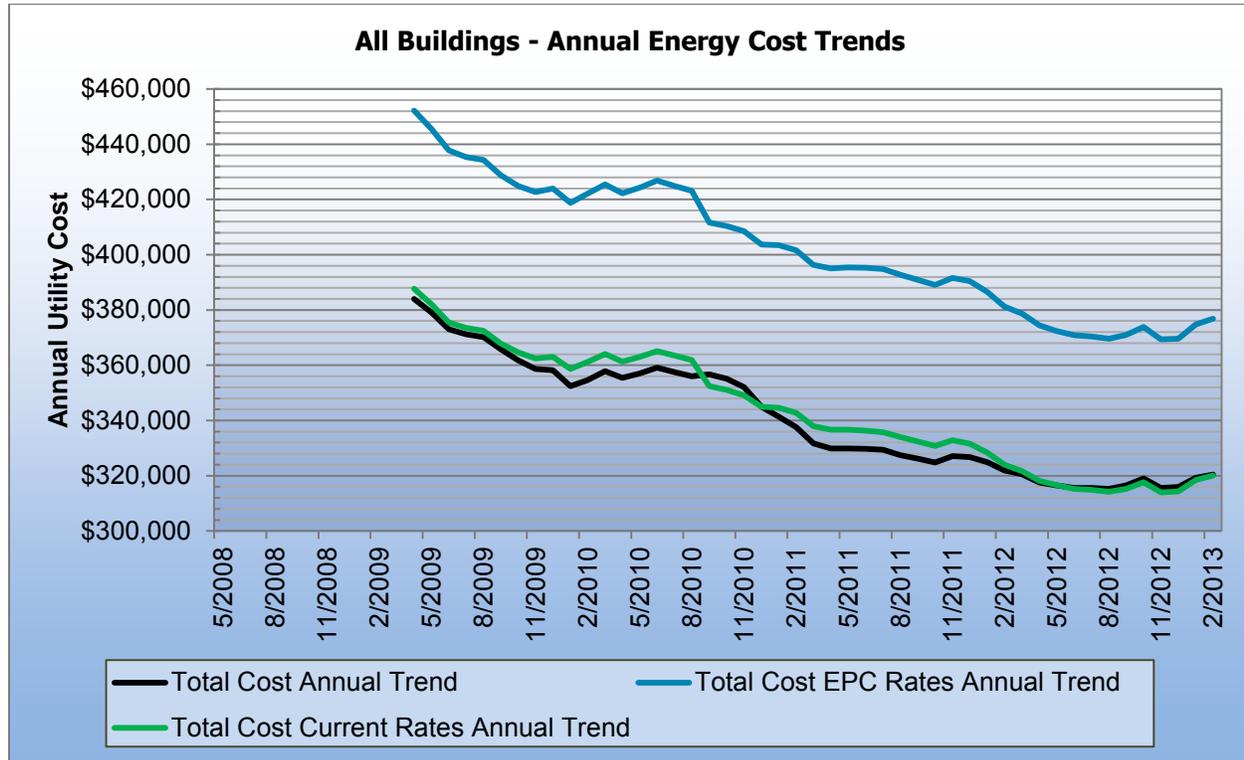
### Total Energy Use and Benchmarks

Below are the total annual energy use and benchmarks for the 7 buildings included in this report.

Audit Year Energy Summary							
Facility	Facility Square Footage	Audit Year Energy Cost	Audit Year Energy Cost Intensity (\$/SF/Yr)	Audit Year Energy Use Intensity (kBtu/SF/Yr)	Audit Year Natural Gas Usage (Therms)	Audit Year Electric Usage (kWh)	Audit Year Electric Demand (kW)
<b>Animal Shelter</b>	5,000	\$10,976	\$2.20	154	5,833	54,426	-
<b>Wastewater Treatment Plant</b>	22,048	\$183,561	\$8.33	335	-	2,166,340	4,960
<b>Police Department</b>	7,850	\$17,366	\$2.21	123	5,476	123,040	-
<b>Pavilion</b>	33,155	\$69,498	\$2.10	96	13,532	537,458	2,095
<b>City Municipal Shops</b>	13,700	\$23,766	\$1.73	92	7,165	158,778	-
<b>Lions Clubhouse</b>	2,500	\$2,135	\$0.85	47	927	7,568	-
<b>Elks Civic Building</b>	13,103	\$13,154	\$1.00	34	25	127,920	-
<b>Totals:</b>	97,356	\$320,457	\$3.29	145	32,958	3,175,530	7,056

**Total Energy Use History Charts**

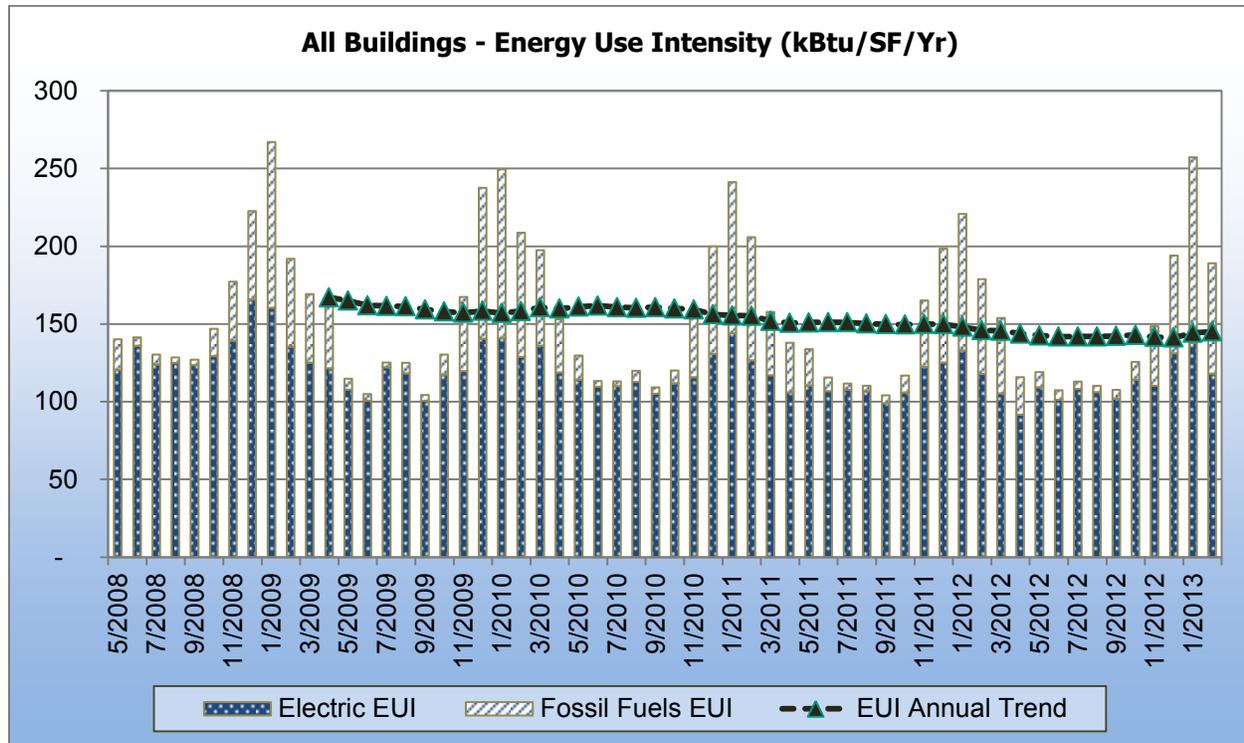
**Annual Energy Cost Trends**



The chart above shows the annual energy costs in three ways;

- Total Cost Annual Trend: This is a 12-month moving average of the actual utility costs as reported on the utility bills.
- Total Cost EPC Rates Annual Trend: This is a 12-month moving average of the energy costs normalized to current EPC utility rates.
  - Energy consumption is normalized to the utility rates that were forecast in the EPC for the current period.
- Total Cost Current Rates Annual Trend: This is a 12-month moving average of the energy costs normalized to the current actual utility rates.
  - Energy consumption is normalized to the actual utility rates experienced over the past 12 months.

## Energy Use Intensity



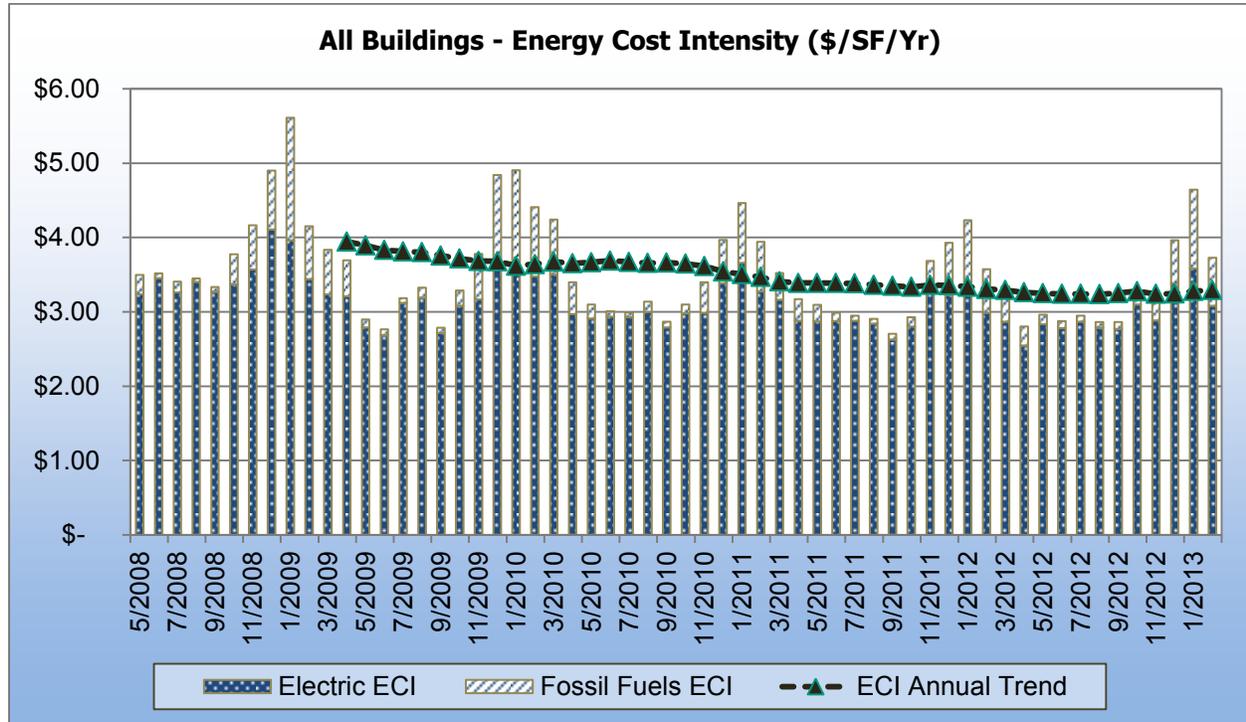
This is an industry standard benchmark for building energy use. The units are thousands of BTUs per square foot of floor area per year. The chart above shows energy use intensity in three ways:

- Electric EUI: This shows the portion of the EUI that results from electric usage.
- Fossil Fuels EUI: This shows the portion of the EUI that results from fossil fuel usage.

The electricity EUI and fossil fuels EUI are stacked to show the total EUI.

- EUI Annual Trend: This is a 12-month moving average of the total EUI.

## Energy Cost Intensity



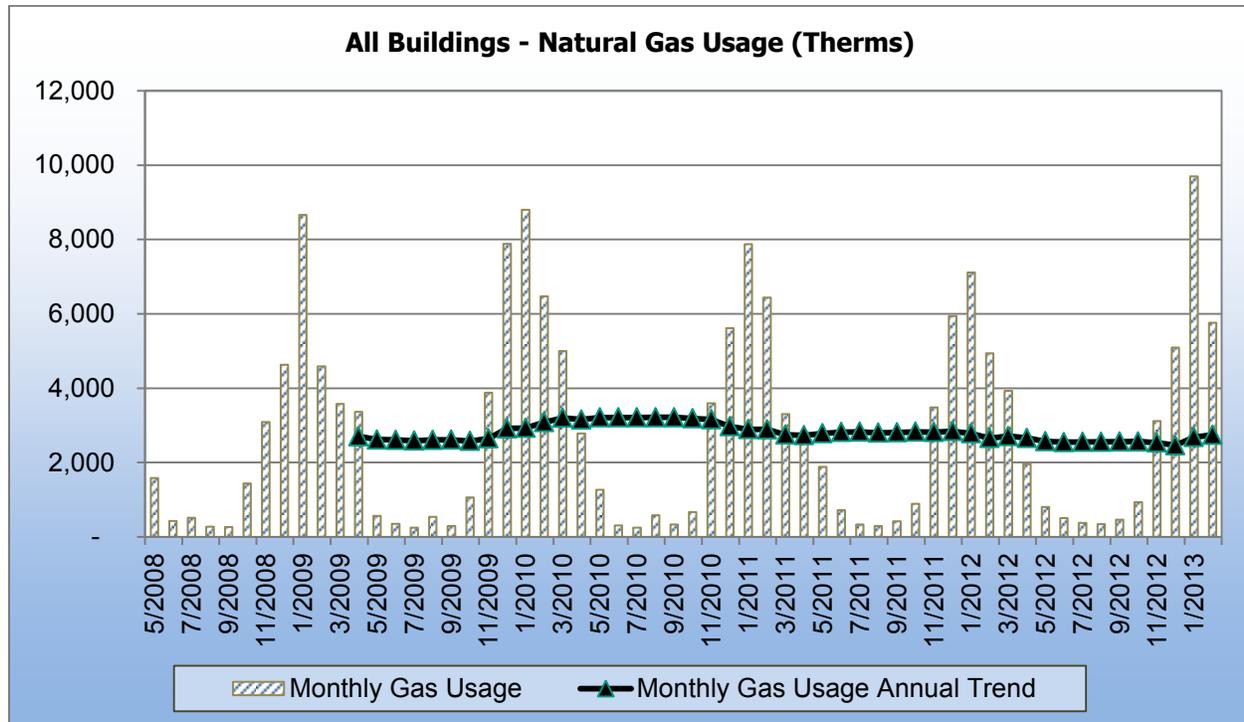
This is an industry standard benchmark for building energy cost. The units are dollars per square foot of floor area per year. The chart above shows energy cost intensity in three ways;

- Electric ECI: This shows the portion of the ECI that results from electric usage.
- Fossil Fuels ECI: This shows the portion of the ECI that results from fossil fuel usage.

The electricity ECI and fossil fuels ECI are stacked to show the total ECI.

- ECI Annual Trend: This is a 12-month moving average of the total ECI.

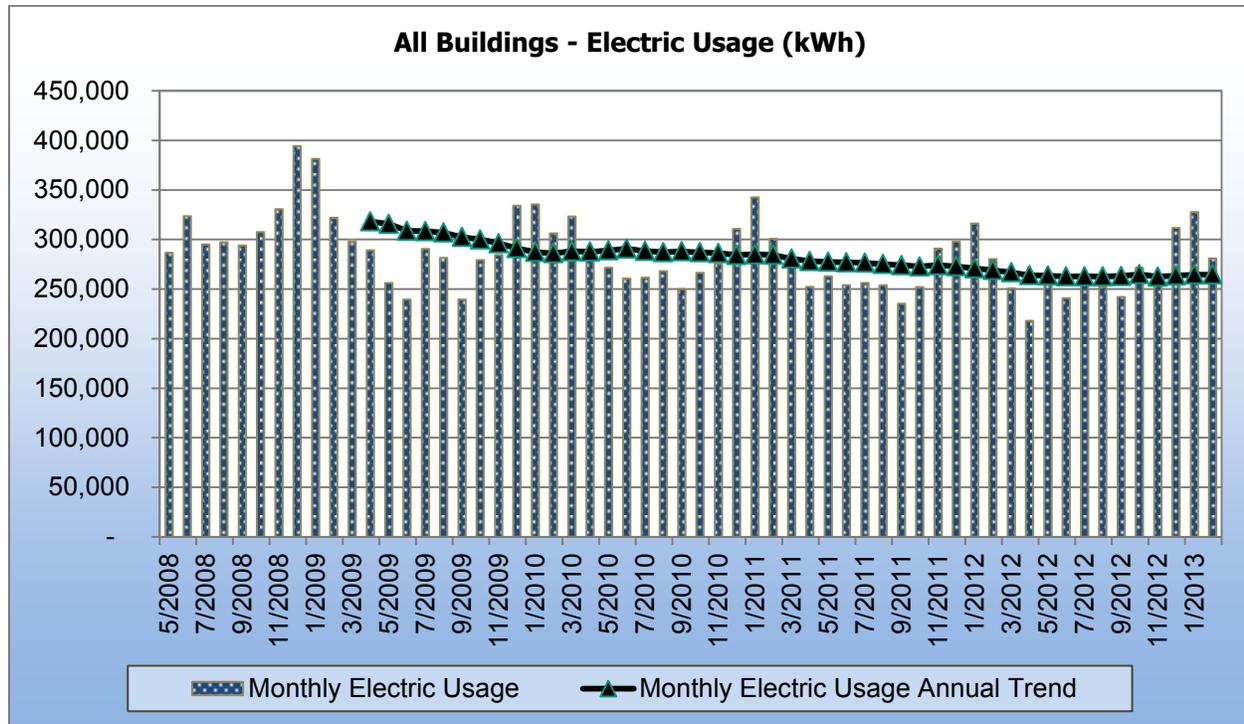
## Natural Gas Consumption History



This is the natural gas consumption history reported in two ways:

- Monthly Gas Usage: This is the actual monthly natural gas consumption reported on the utility bills. The units are therms per month.
- Monthly Gas Usage Annual Trend: This is a 12-month moving average of the actual natural gas consumption reported on the utility bills. The units are therms per month.

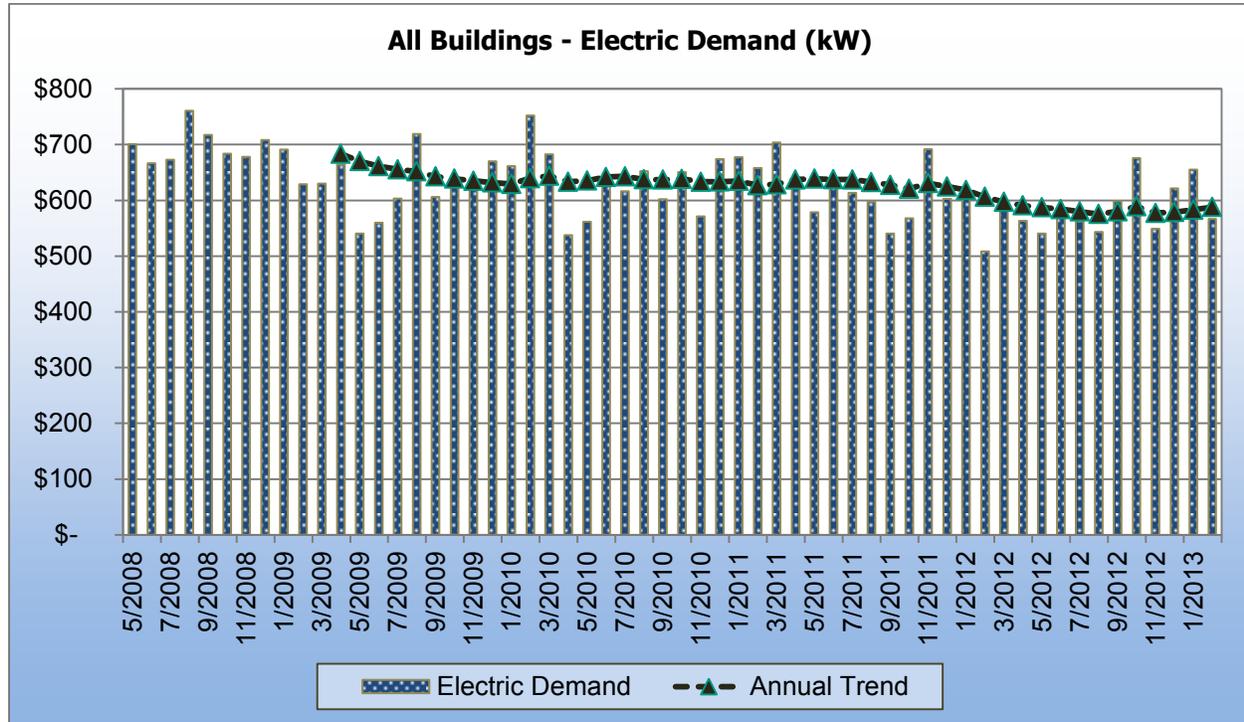
## Electric Consumption History



This is the electric consumption history reported in two ways:

- Monthly Electric Usage: This is the actual monthly electric consumption reported on the utility bills. The units are kWh per month.
- Monthly Electric Usage Annual Trend: This is a 12-month moving average of the actual electric consumption reported on the utility bills. The units are kWh per month.

## Electric Demand History



This is the electric consumption history reported in two ways:

- Monthly Electric Demand: This is the actual monthly electric demand reported on the utility bills. The units are peak kW per month.
- Monthly Electric Demand Annual Trend: This is a 12-month moving average of the actual peak electric demand reported on the utility bills. The units are peak kW per month.

## Buildings

### *Animal Shelter*

#### Overview of Energy Consumption

The annual energy metrics for the facility are summarized in the following table.

Audit Year Energy Summary	
<b>Facility Square Footage</b>	5,000
<b>Audit Year Energy Cost (\$/Yr)</b>	\$10,976
<b>Audit Year Energy Cost Intensity (\$/SF/Yr)</b>	\$2.20
<b>Audit Year Energy Use Intensity (kBtu/SF/Yr)</b>	154
<b>Audit Year Natural Gas Usage (Therms/Yr)</b>	5,833
<b>Audit Year Electric Usage (kWh/Yr)</b>	54,426
<b>Audit Year Electric Demand (Peak kW-Months/Yr)</b>	-

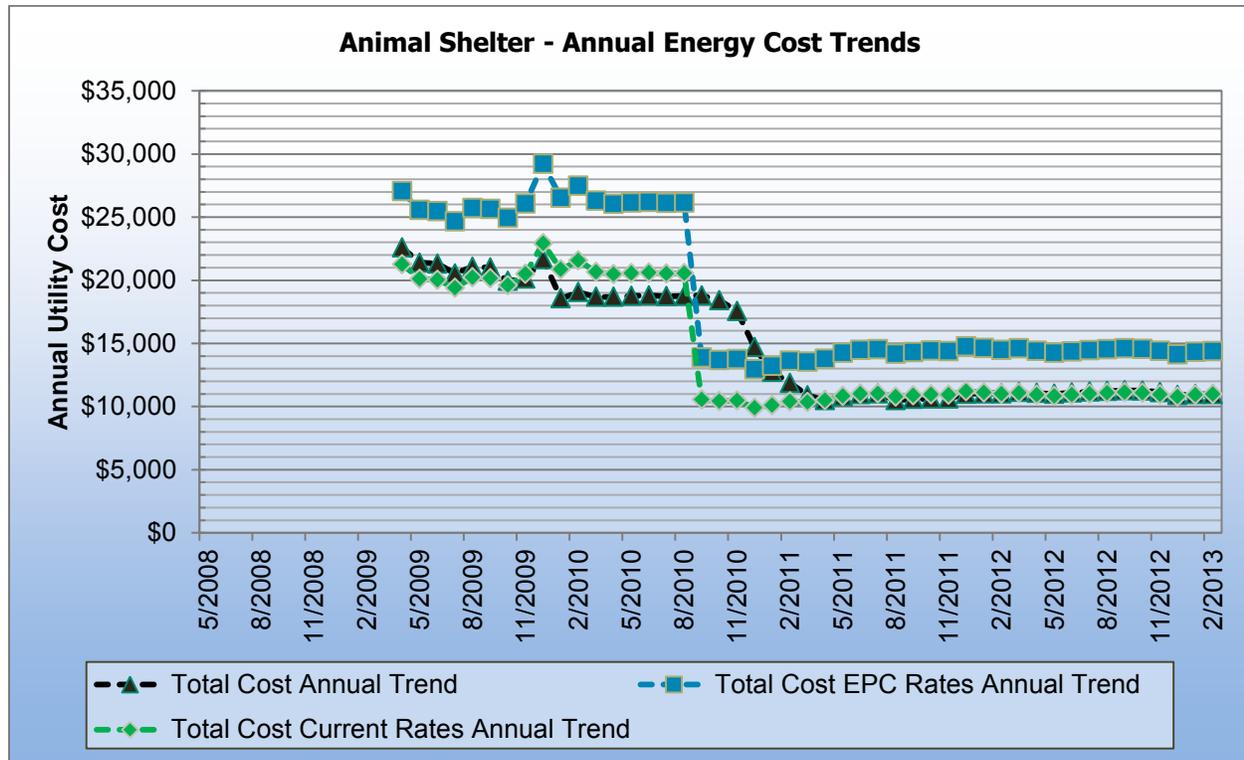
These metrics are described below;

- Facility Square Footage – The facility square footage
- Audit Year Energy Cost – The annual energy cost for this audit year as reported on the bills
- Audit Year Energy Cost Intensity – The total audit year energy cost in dollars per square foot
- Audit Year Energy Use Intensity – The total audit year energy use in thousands of BTUs per square foot
- Audit Year Natural Gas Usage – The number of therms of natural gas consumed during the audit year
- Audit Year Electric Usage – The number of kilo-watt-hours of electricity consumed during the audit year
- Audit Year Electric Demand – The sum of the 12 monthly demand peaks during the audit year.

Notes:

The Animal Shelter was previously heated by propane and is now heated with natural gas. Propane usage from the early periods was converted to its equivalent therms of natural gas for ease of comparison in this report.

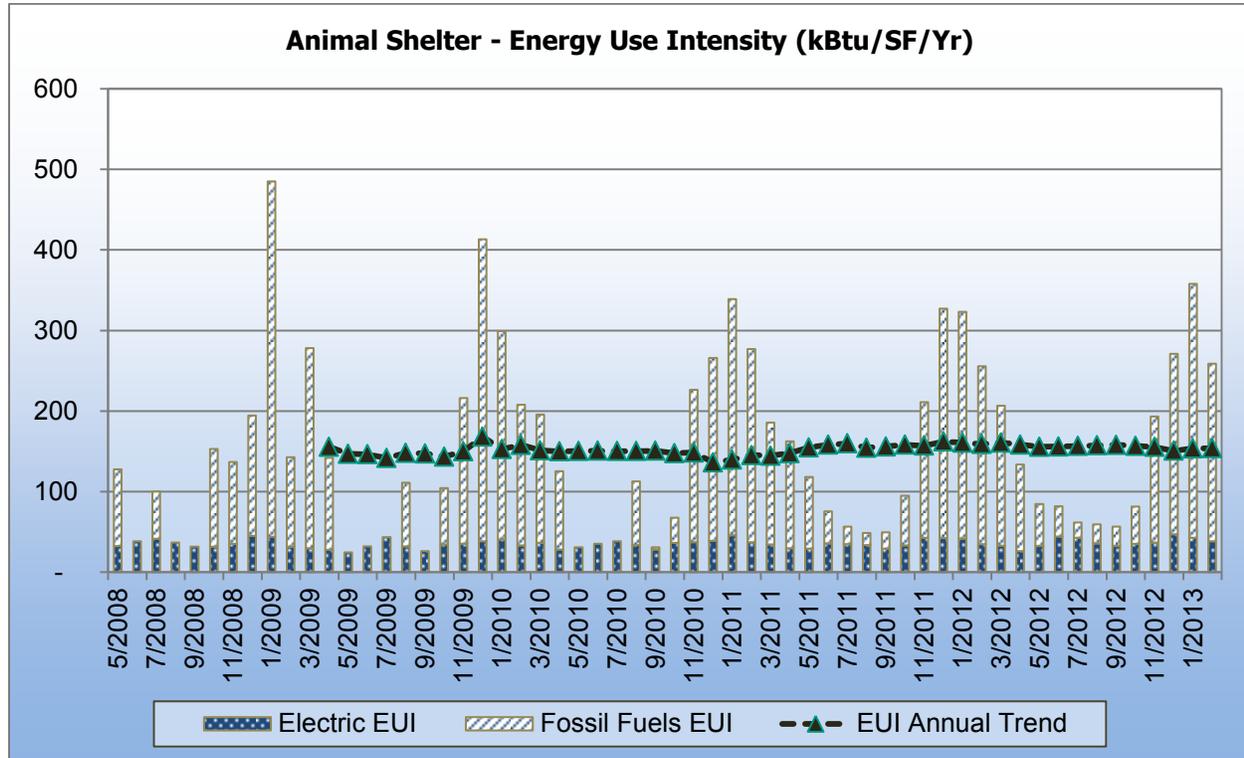
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  - Energy consumption is normalized to the utility rates that were forecast in the EPC for the current period.
- Total Cost Current Rates Annual Trend: This is a 12-month moving average of the energy costs normalized to the current actual utility rates.
  - Energy consumption is normalized to the actual utility rates experienced over the past 12 months.

## Energy Use Intensity



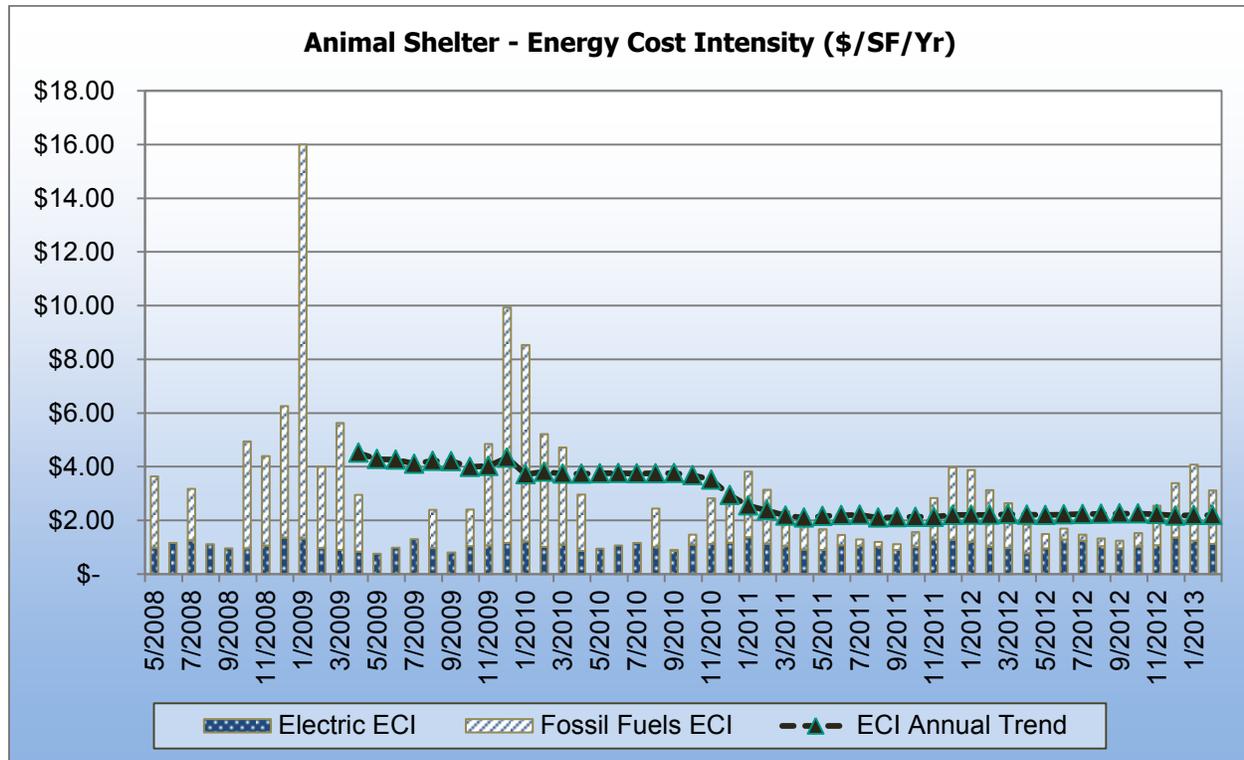
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## Energy Cost Intensity



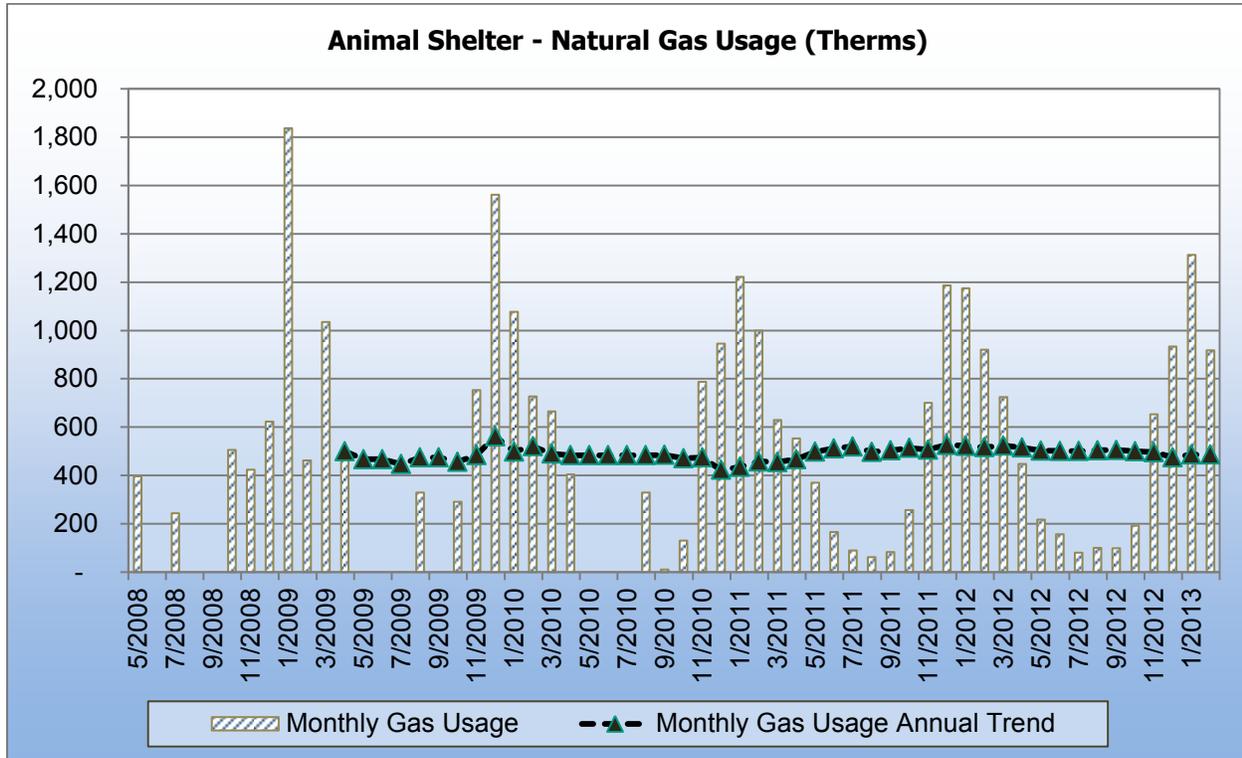
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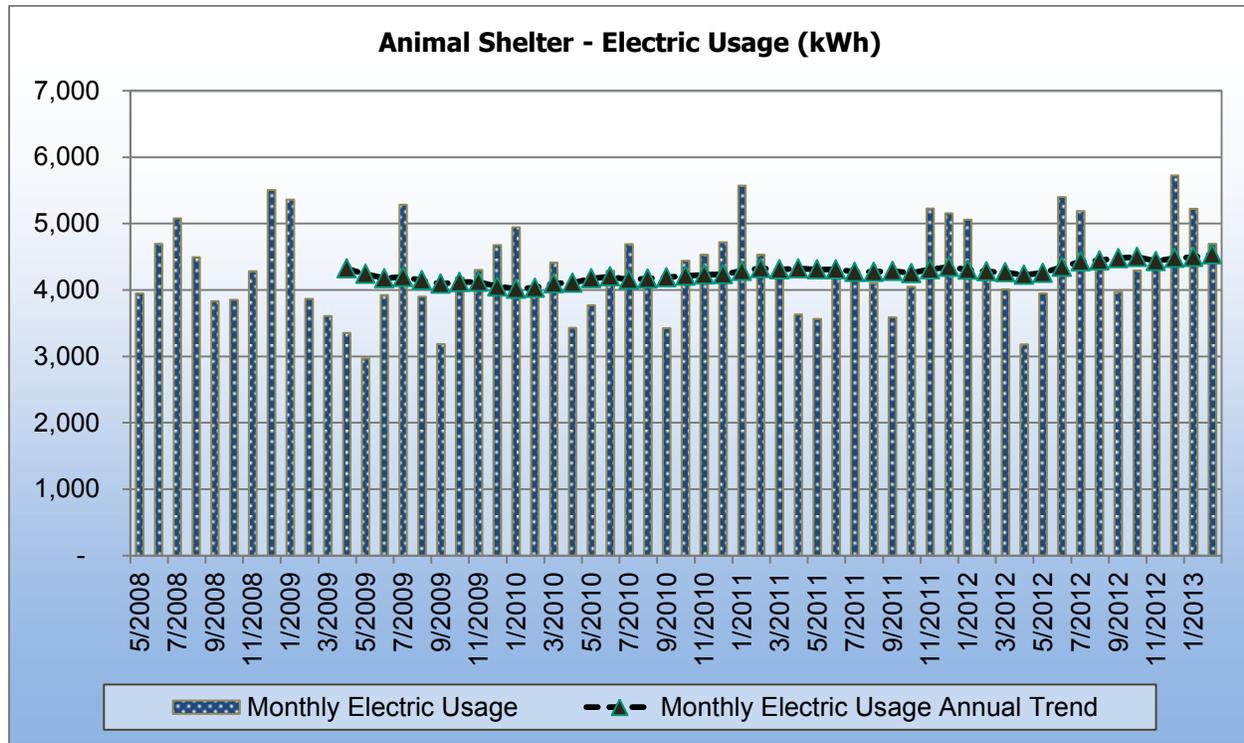
## Natural Gas Consumption History



This is the natural gas consumption history reported in two ways:

- Monthly Gas Usage: This is the actual monthly natural gas consumption reported on the utility bills. The units are therms per month.
- Monthly Gas Usage Annual Trend: This is a 12-month moving average of the actual natural gas consumption reported on the utility bills. The units are therms per month.

## Electric Consumption History



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- Monthly Electric Usage Annual Trend: This is a 12-month moving average of the actual electric consumption reported on the utility bills. The units are kWh per month.

**Wastewater Treatment Plant**

**Overview of Energy Consumption**

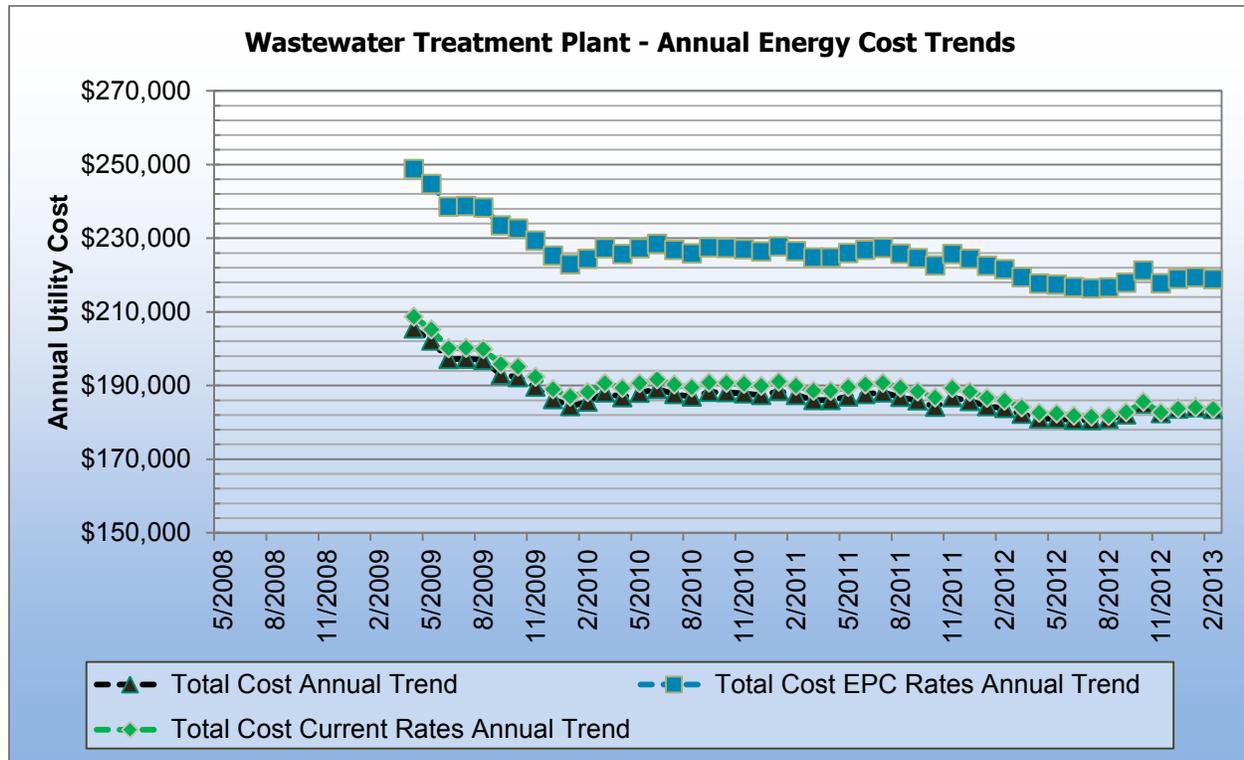
The annual energy metrics for the facility are summarized in the following table.

<b>Audit Year Energy Summary</b>	
<b>Facility Square Footage</b>	22,048
<b>Audit Year Energy Cost (\$/Yr)</b>	\$183,561
<b>Audit Year Energy Cost Intensity (\$/SF/Yr)</b>	\$8.33
<b>Audit Year Energy Use Intensity (kBtu/SF/Yr)</b>	335
<b>Audit Year Natural Gas Usage (Therms/Yr)</b>	-
<b>Audit Year Electric Usage (kWh/Yr)</b>	2,166,340
<b>Audit Year Electric Demand (Peak kW-Months/Yr)</b>	4,960

These metrics are described below;

- Facility Square Footage – The facility square footage
- Audit Year Energy Cost – The annual energy cost for this audit year as reported on the bills
- Audit Year Energy Cost Intensity – The total audit year energy cost in dollars per square foot
- Audit Year Energy Use Intensity – The total audit year energy use in thousands of BTUs per square foot
- Audit Year Natural Gas Usage – The number of therms of natural gas consumed during the audit year
- Audit Year Electric Usage – The number of kilo-watt-hours of electricity consumed during the audit year
- Audit Year Electric Demand – The sum of the 12 monthly demand peaks during the audit year.

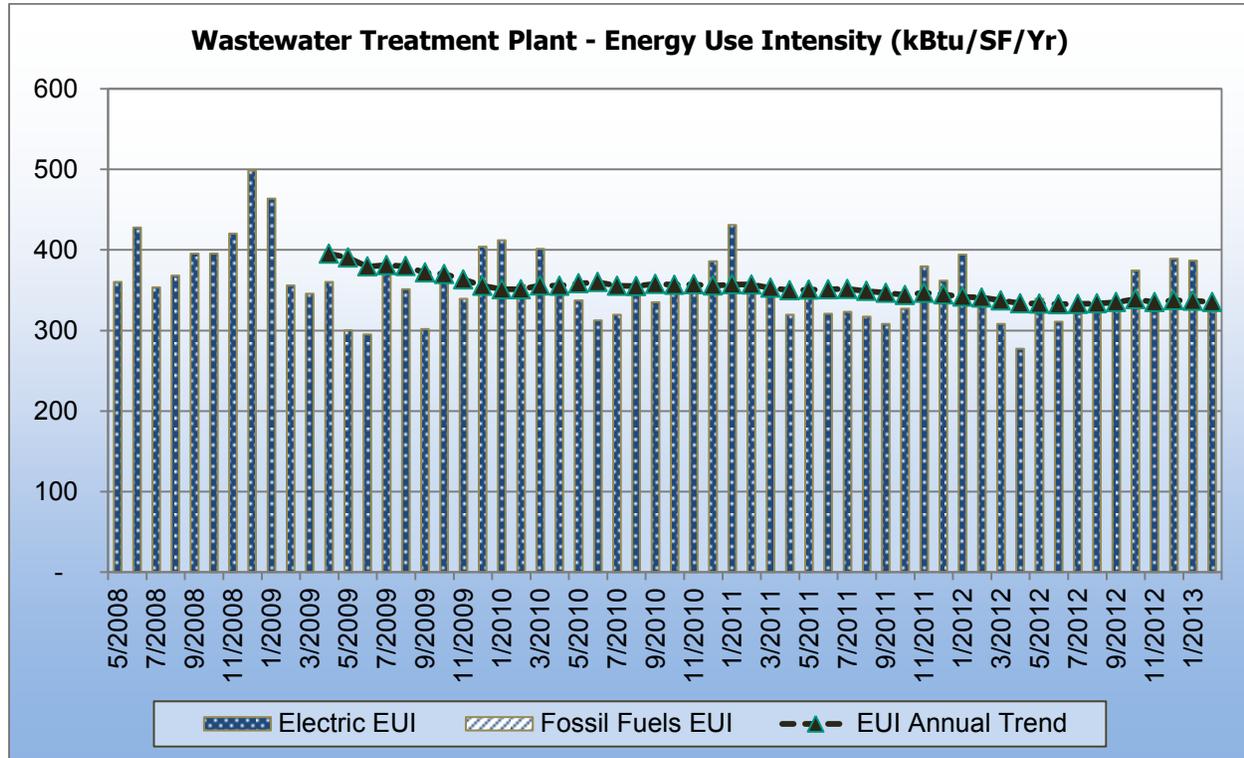
## Annual Energy Cost Trends



The chart above shows the annual energy costs in three ways;

- Total Cost Annual Trend: This is a 12-month moving average of the actual utility costs as reported on the utility bills.
- Total Cost EPC Rates Annual Trend: This is a 12-month moving average of the energy costs normalized to current EPC utility rates.
  - Energy consumption is normalized to the utility rates that were forecast in the EPC for the current period.
- Total Cost Current Rates Annual Trend: This is a 12-month moving average of the energy costs normalized to the current actual utility rates.
  - Energy consumption is normalized to the actual utility rates experienced over the past 12 months.

## Energy Use Intensity



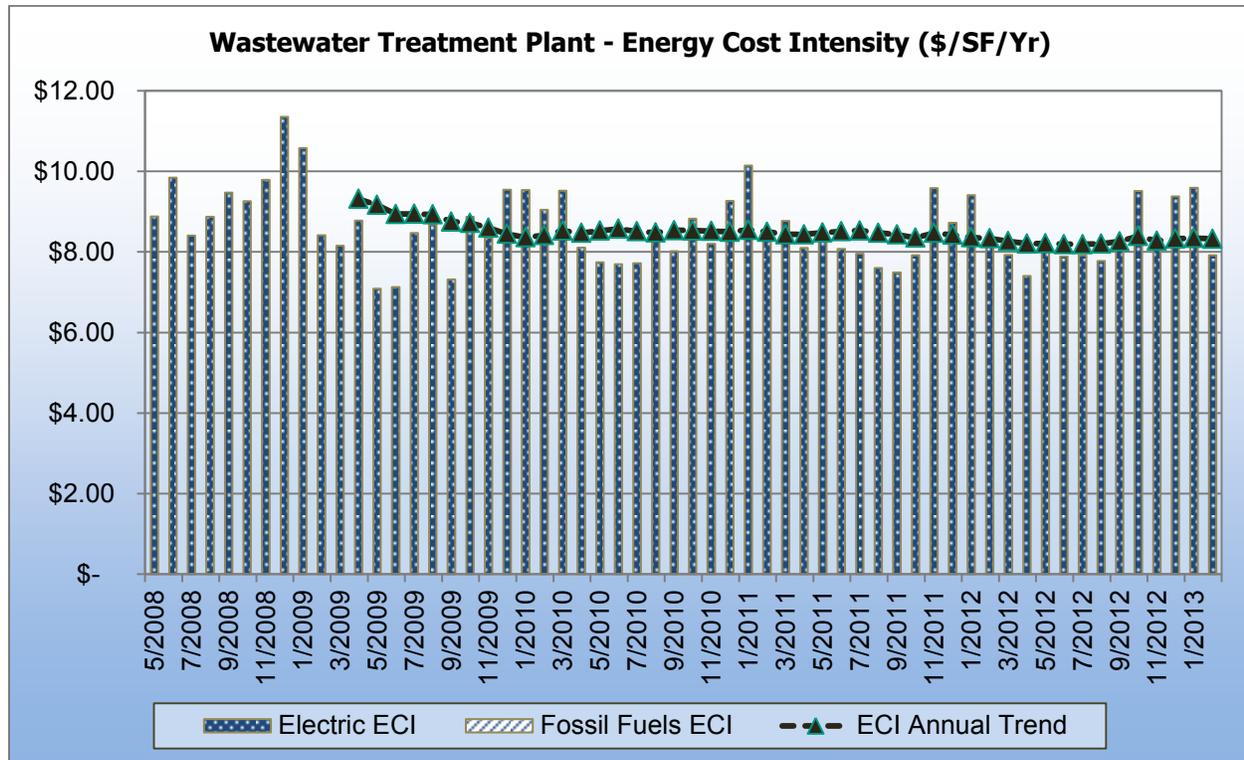
This is an industry standard benchmark for building energy use. The units are thousands of BTUs per square foot of floor area per year. The chart above shows energy use intensity in three ways;

- Electric EUI: This shows the portion of the EUI that results from electric usage.
- Fossil Fuels EUI: This shows the portion of the EUI that results from fossil fuel usage.

The electricity EUI and fossil fuels EUI are stacked to show the total EUI.

- EUI Annual Trend: This is a 12-month moving average of the total EUI.

## Energy Cost Intensity



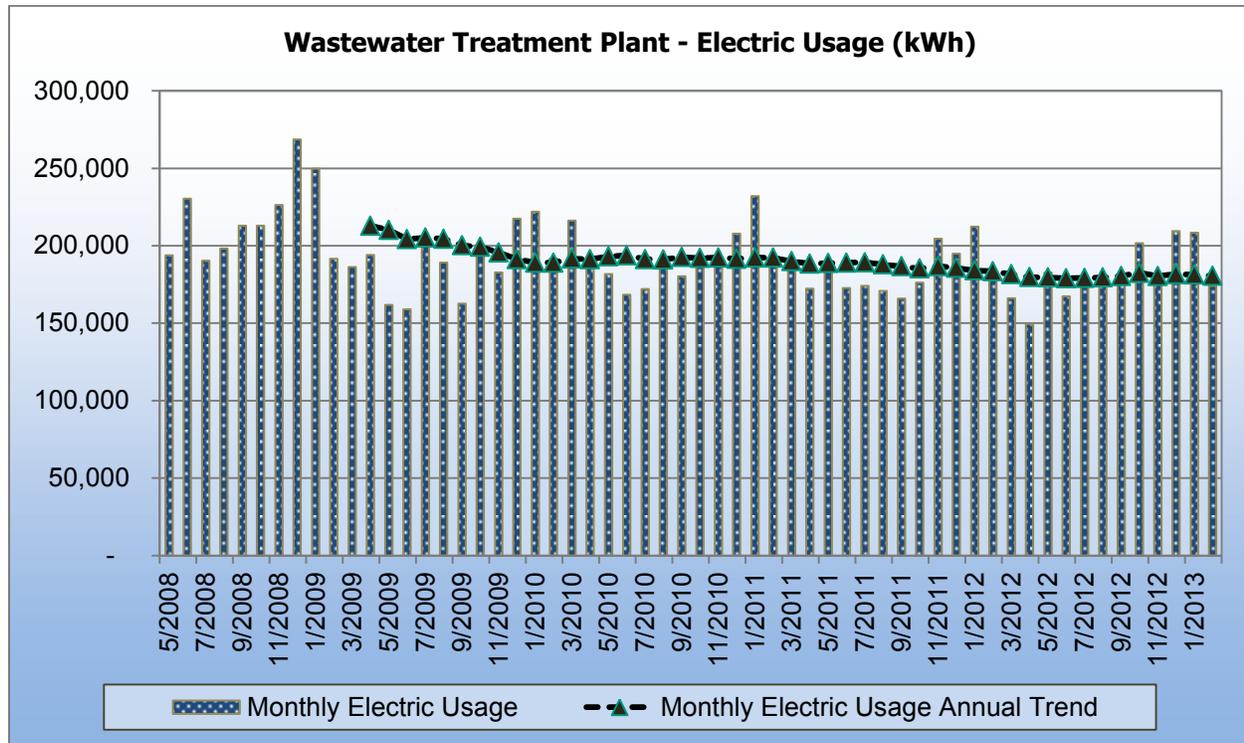
This is an industry standard benchmark for building energy cost. The units are dollars per square foot of floor area per year. The chart above shows energy cost intensity in three ways;

- Electric ECI: This shows the portion of the ECI that results from electric usage.
- Fossil Fuels ECI: This shows the portion of the ECI that results from fossil fuel usage.

The electricity ECI and fossil fuels ECI are stacked to show the total ECI.

- ECI Annual Trend: This is a 12-month moving average of the total ECI.

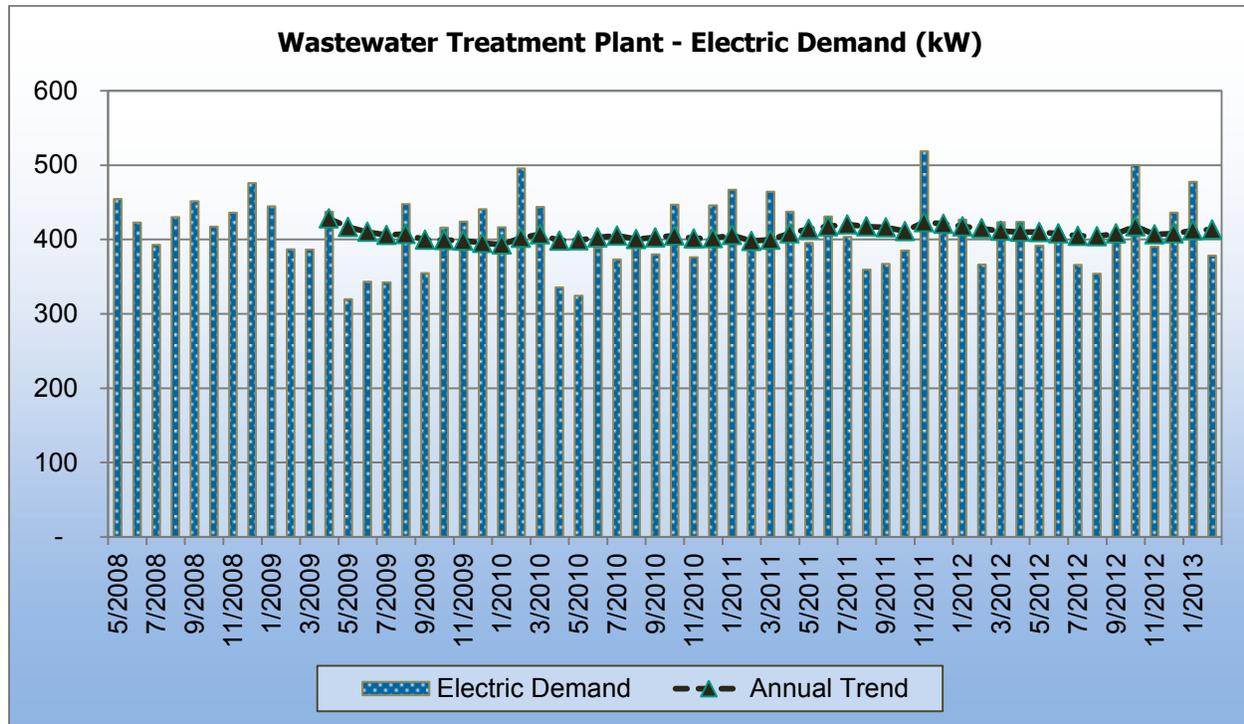
## Electric Consumption History



This is the electric consumption history reported in two ways:

- Monthly Electric Usage: This is the actual monthly electric consumption reported on the utility bills. The units are kWh per month.
- Monthly Electric Usage Annual Trend: This is a 12-month moving average of the actual electric consumption reported on the utility bills. The units are kWh per month.

## Electric Demand History



This is the electric consumption history reported in two ways:

- Monthly Electric Demand: This is the actual monthly electric demand reported on the utility bills. The units are peak kW per month.
- Monthly Electric Demand Annual Trend: This is a 12-month moving average of the actual peak electric demand reported on the utility bills. The units are peak kW per month.

***Police Department***

**Overview of Energy Consumption**

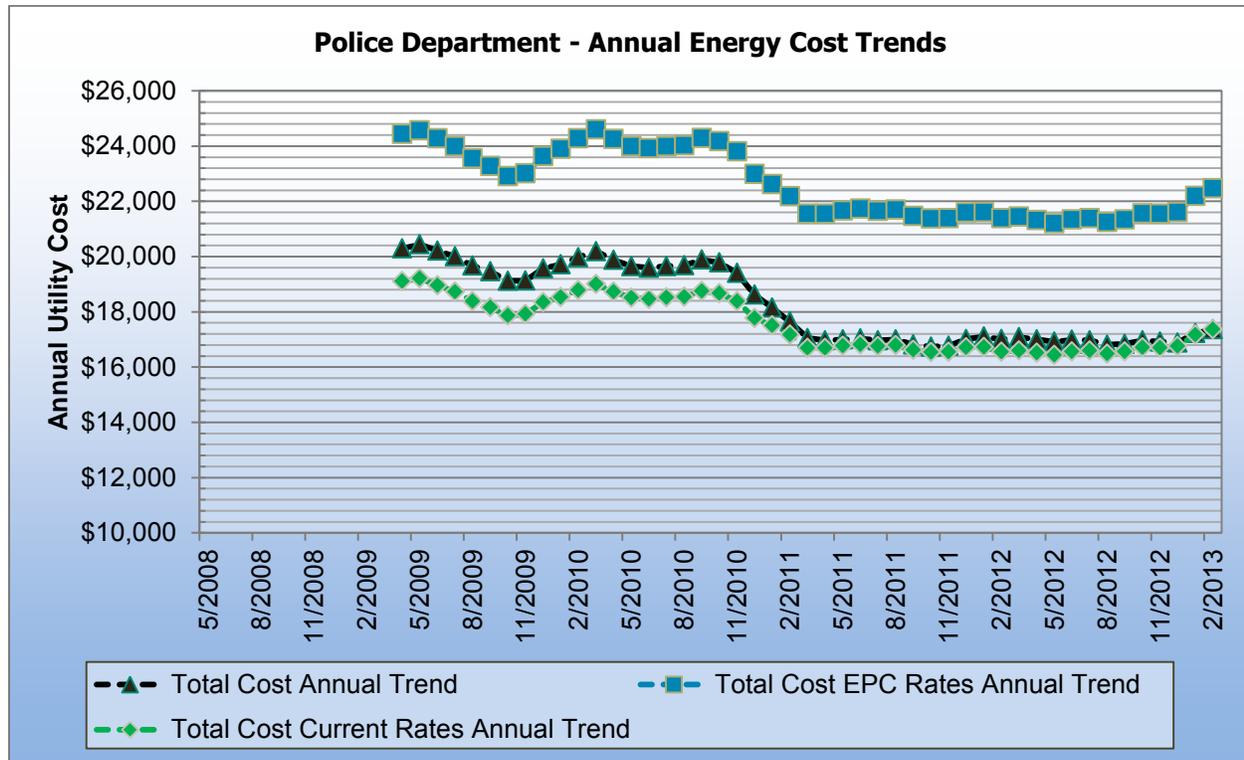
The annual energy metrics for the facility are summarized in the following table.

<b>Audit Year Energy Summary</b>	
<b>Facility Square Footage</b>	7,850
<b>Audit Year Energy Cost (\$/Yr)</b>	\$17,366
<b>Audit Year Energy Cost Intensity (\$/SF/Yr)</b>	\$2.21
<b>Audit Year Energy Use Intensity (kBtu/SF/Yr)</b>	123
<b>Audit Year Natural Gas Usage (Therms/Yr)</b>	5,476
<b>Audit Year Electric Usage (kWh/Yr)</b>	123,040
<b>Audit Year Electric Demand (Peak kW-Months/Yr)</b>	-

These metrics are described below;

- Facility Square Footage – The facility square footage
- Audit Year Energy Cost – The annual energy cost for this audit year as reported on the bills
- Audit Year Energy Cost Intensity – The total audit year energy cost in dollars per square foot
- Audit Year Energy Use Intensity – The total audit year energy use in thousands of BTUs per square foot
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- Audit Year Electric Usage – The number of kilo-watt-hours of electricity consumed during the audit year
- Audit Year Electric Demand – The sum of the 12 monthly demand peaks during the audit year.

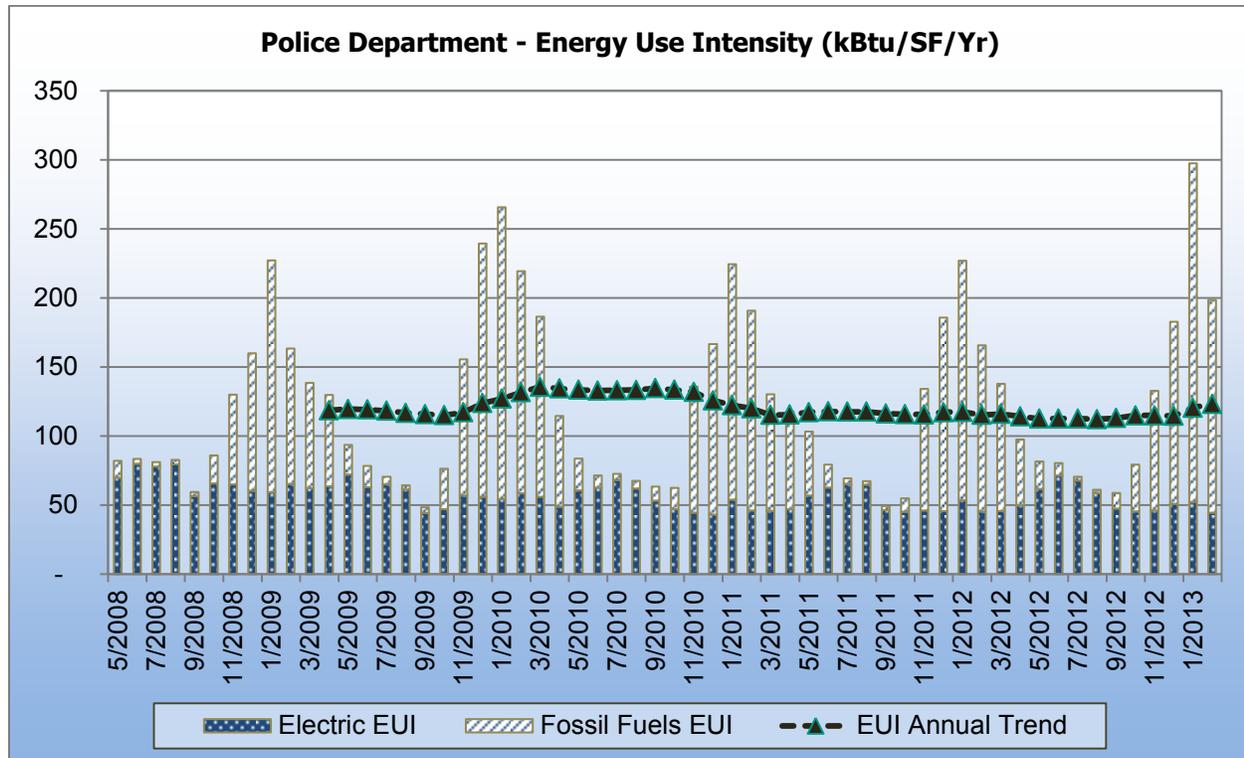
## Annual Energy Cost Trends



The chart above shows the annual energy costs in three ways;

- Total Cost Annual Trend: This is a 12-month moving average of the actual utility costs as reported on the utility bills.
- Total Cost EPC Rates Annual Trend: This is a 12-month moving average of the energy costs normalized to current EPC utility rates.
  - Energy consumption is normalized to the utility rates that were forecast in the EPC for the current period.
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## Energy Use Intensity



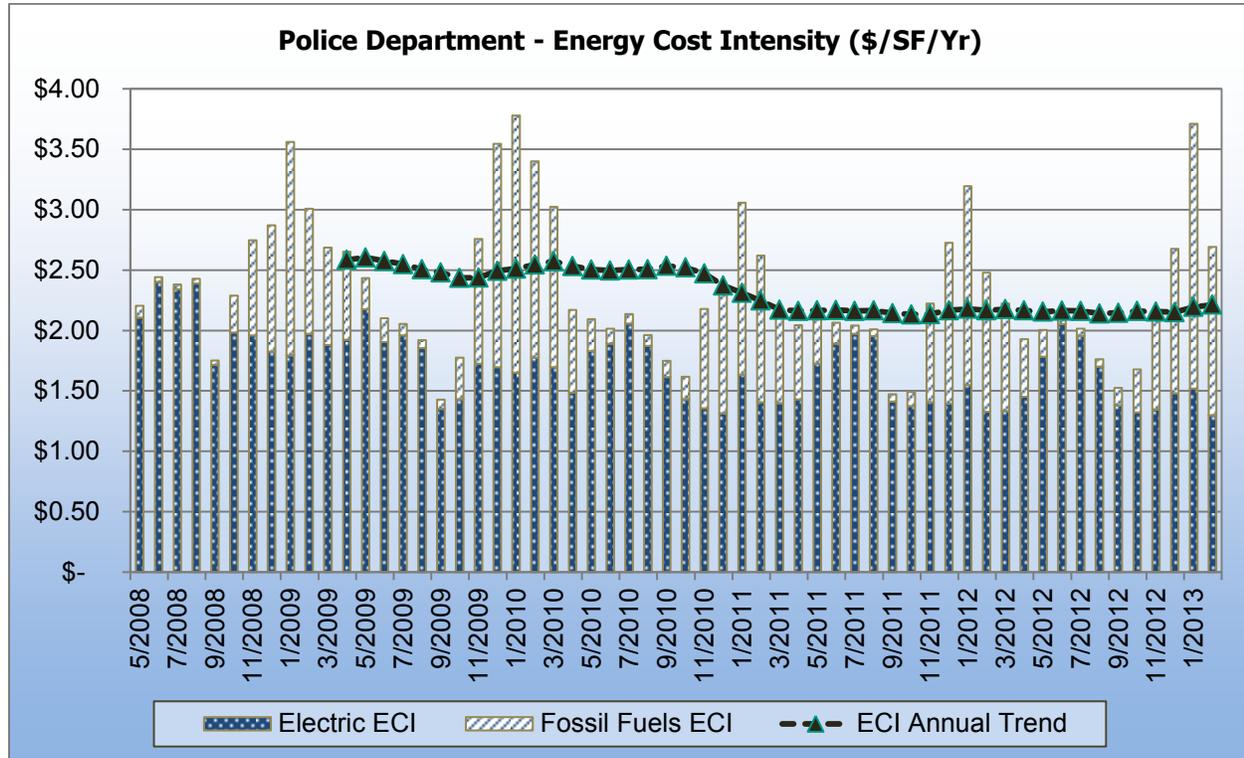
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- EUI Annual Trend: This is a 12-month moving average of the total EUI.

## Energy Cost Intensity



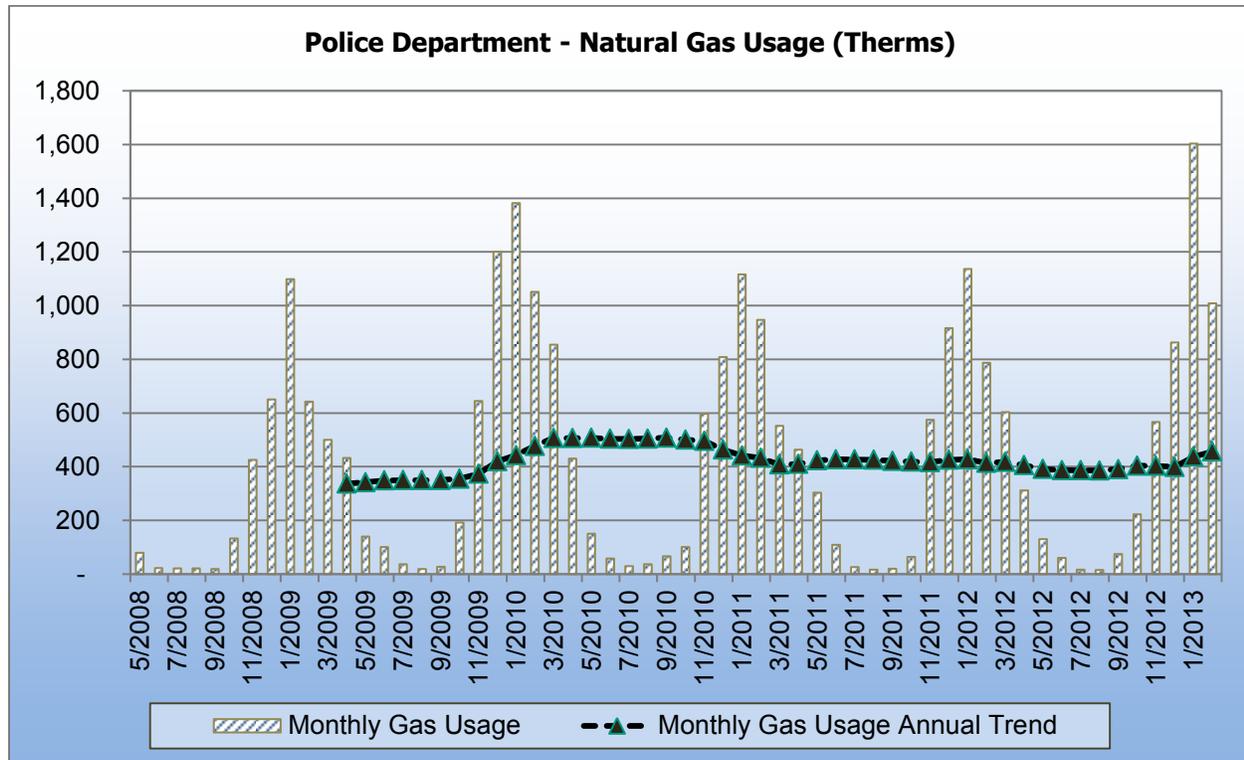
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- Electric ECI: This shows the portion of the ECI that results from electric usage.
- Fossil Fuels ECI: This shows the portion of the ECI that results from fossil fuel usage.

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- ECI Annual Trend: This is a 12-month moving average of the total ECI.

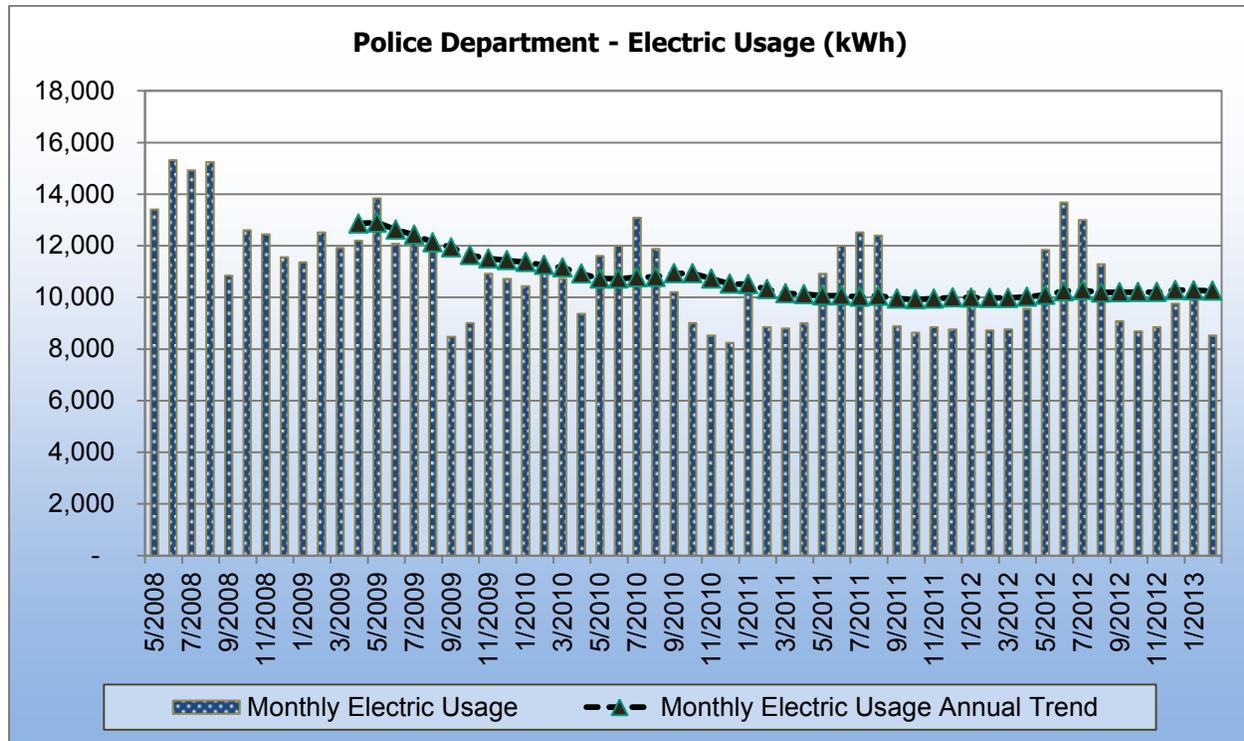
## Natural Gas Consumption History



This is the natural gas consumption history reported in two ways:

- Monthly Gas Usage: This is the actual monthly natural gas consumption reported on the utility bills. The units are therms per month.
- Monthly Gas Usage Annual Trend: This is a 12-month moving average of the actual natural gas consumption reported on the utility bills. The units are therms per month.

## Electric Consumption History



This is the electric consumption history reported in two ways:

- Monthly Electric Usage: This is the actual monthly electric consumption reported on the utility bills. The units are kWh per month.
- Monthly Electric Usage Annual Trend: This is a 12-month moving average of the actual electric consumption reported on the utility bills. The units are kWh per month.

***Pavilion***

**Overview of Energy Consumption**

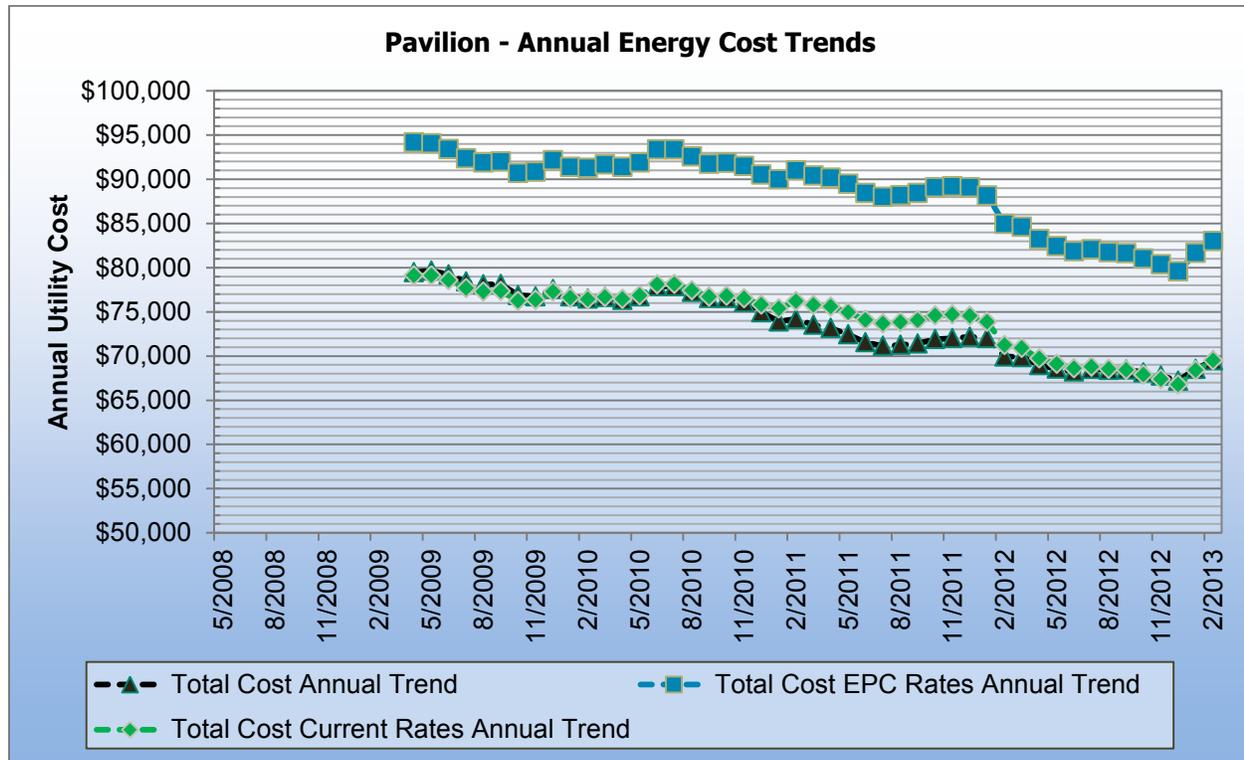
The annual energy metrics for the facility are summarized in the following table.

<b>Audit Year Energy Summary</b>	
<b>Facility Square Footage</b>	33,155
<b>Audit Year Energy Cost (\$/Yr)</b>	\$69,498
<b>Audit Year Energy Cost Intensity (\$/SF/Yr)</b>	\$2.10
<b>Audit Year Energy Use Intensity (kBtu/SF/Yr)</b>	96
<b>Audit Year Natural Gas Usage (Therms/Yr)</b>	13,532
<b>Audit Year Electric Usage (kWh/Yr)</b>	537,458
<b>Audit Year Electric Demand (Peak kW-Months/Yr)</b>	2,095

These metrics are described below;

- Facility Square Footage – The facility square footage
- Audit Year Energy Cost – The annual energy cost for this audit year as reported on the bills
- Audit Year Energy Cost Intensity – The total audit year energy cost in dollars per square foot
- Audit Year Energy Use Intensity – The total audit year energy use in thousands of BTUs per square foot
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- Audit Year Electric Usage – The number of kilo-watt-hours of electricity consumed during the audit year
- Audit Year Electric Demand – The sum of the 12 monthly demand peaks during the audit year.

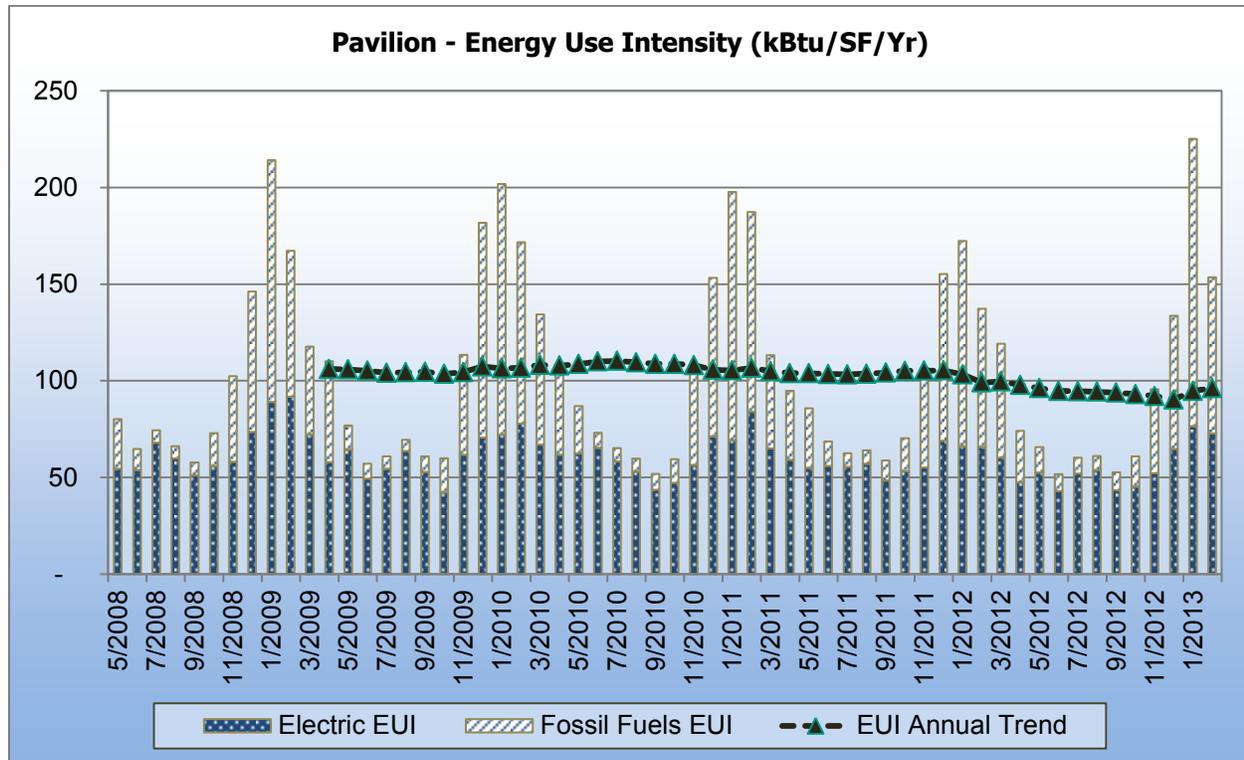
## Annual Energy Cost Trends



The chart above shows the annual energy costs in three ways;

- Total Cost Annual Trend: This is a 12-month moving average of the actual utility costs as reported on the utility bills.
- Total Cost EPC Rates Annual Trend: This is a 12-month moving average of the energy costs normalized to current EPC utility rates.
  - Energy consumption is normalized to the utility rates that were forecast in the EPC for the current period.
- Total Cost Current Rates Annual Trend: This is a 12-month moving average of the energy costs normalized to the current actual utility rates.
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## Energy Use Intensity



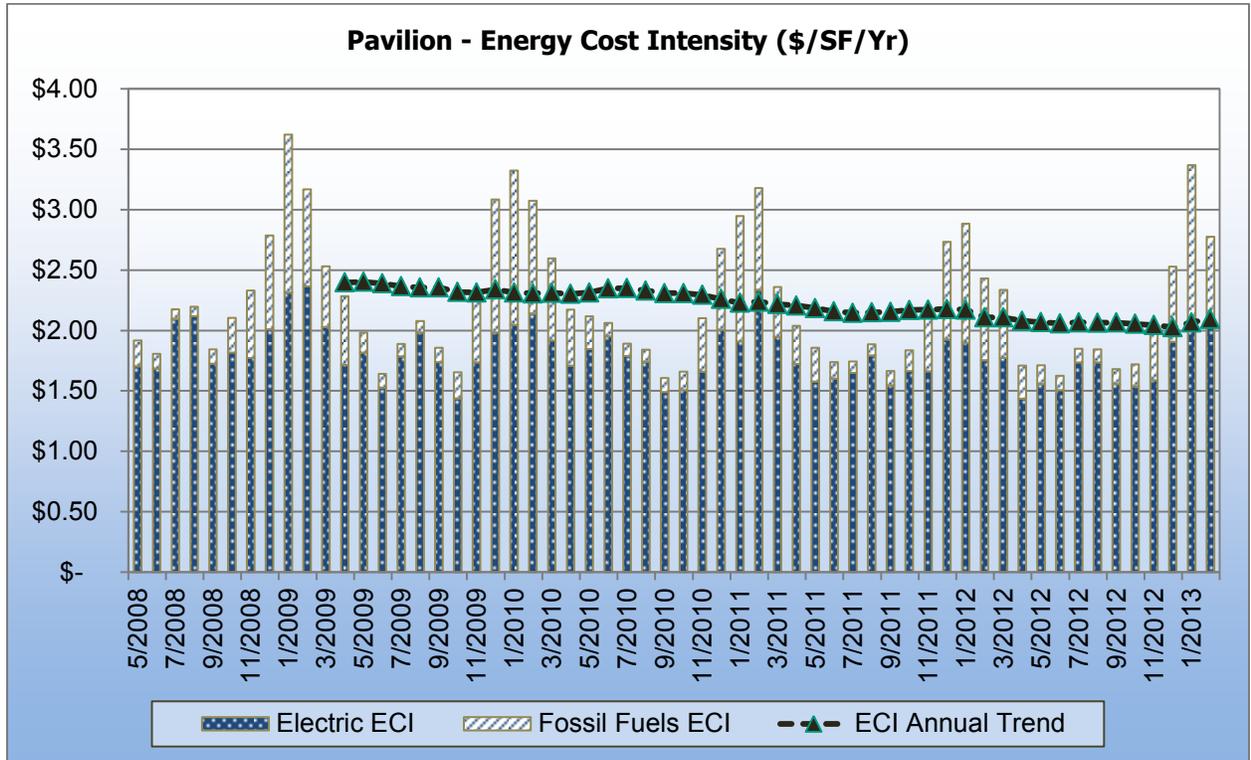
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## Energy Cost Intensity



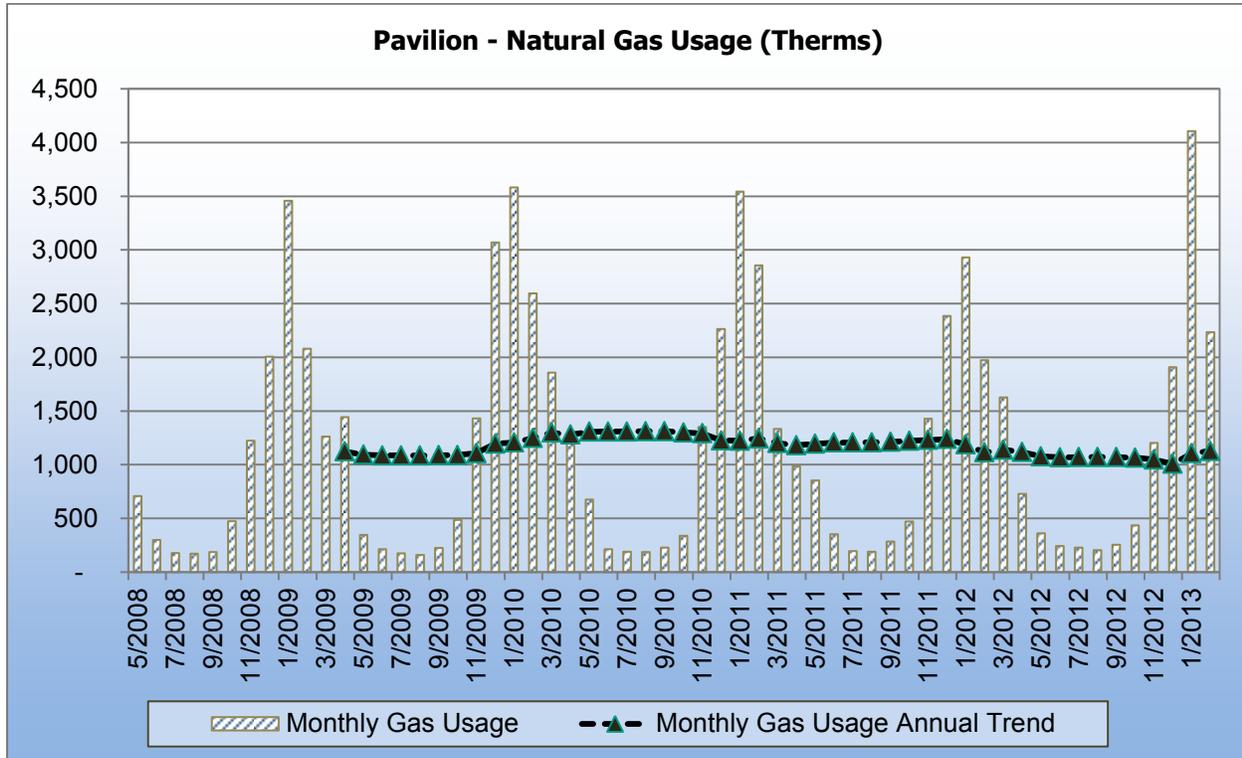
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- ECI Annual Trend: This is a 12-month moving average of the total ECI.

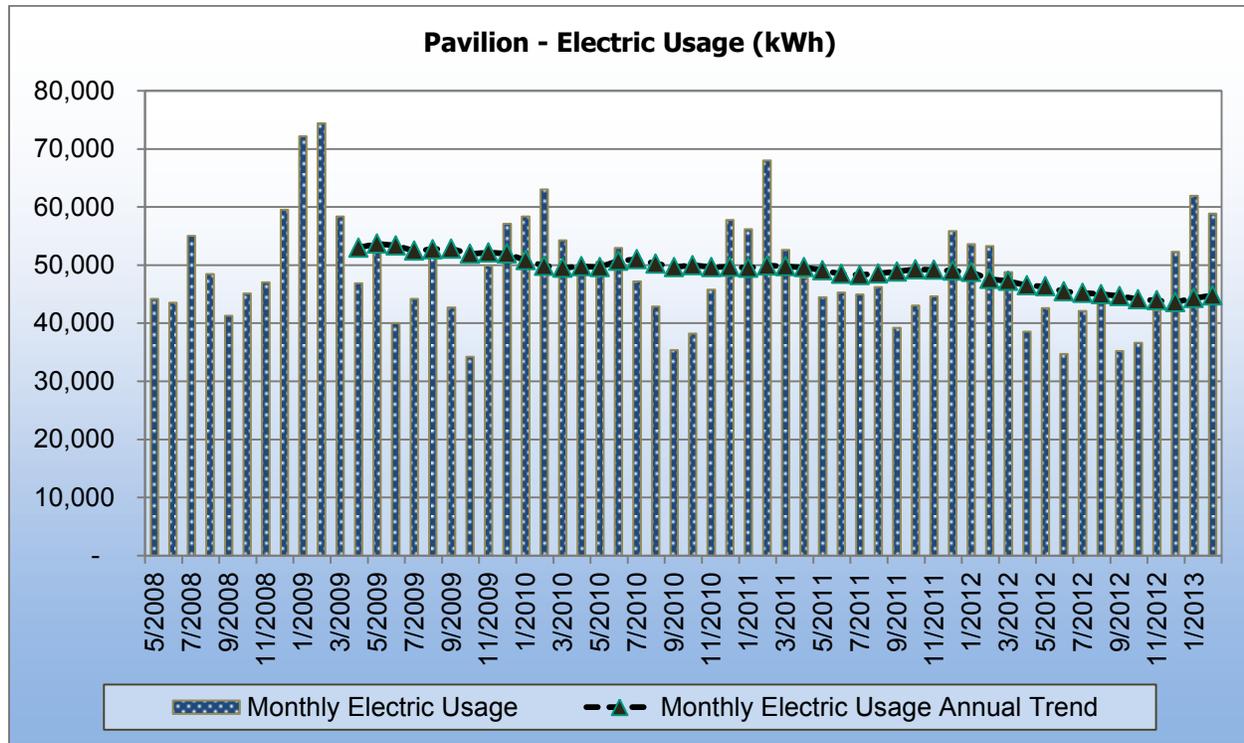
## Natural Gas Consumption History



This is the natural gas consumption history reported in two ways:

- Monthly Gas Usage: This is the actual monthly natural gas consumption reported on the utility bills. The units are therms per month.
- Monthly Gas Usage Annual Trend: This is a 12-month moving average of the actual natural gas consumption reported on the utility bills. The units are therms per month.

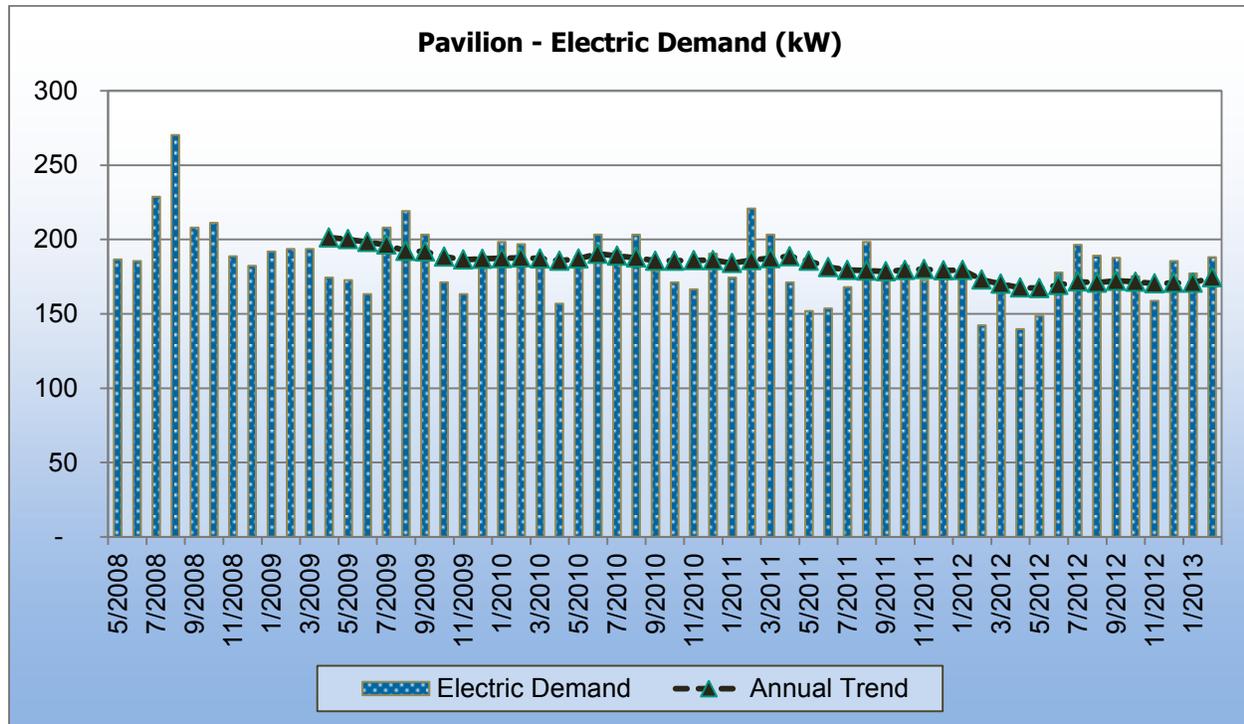
## Electric Consumption History



This is the electric consumption history reported in two ways:

- Monthly Electric Usage: This is the actual monthly electric consumption reported on the utility bills. The units are kWh per month.
- Monthly Electric Usage Annual Trend: This is a 12-month moving average of the actual electric consumption reported on the utility bills. The units are kWh per month.

## Electric Demand History



This is the electric consumption history reported in two ways:

- Monthly Electric Demand: This is the actual monthly electric demand reported on the utility bills. The units are peak kW per month.
- Monthly Electric Demand Annual Trend: This is a 12-month moving average of the actual peak electric demand reported on the utility bills. The units are peak kW per month.

**City Municipal Shops**

**Overview of Energy Consumption**

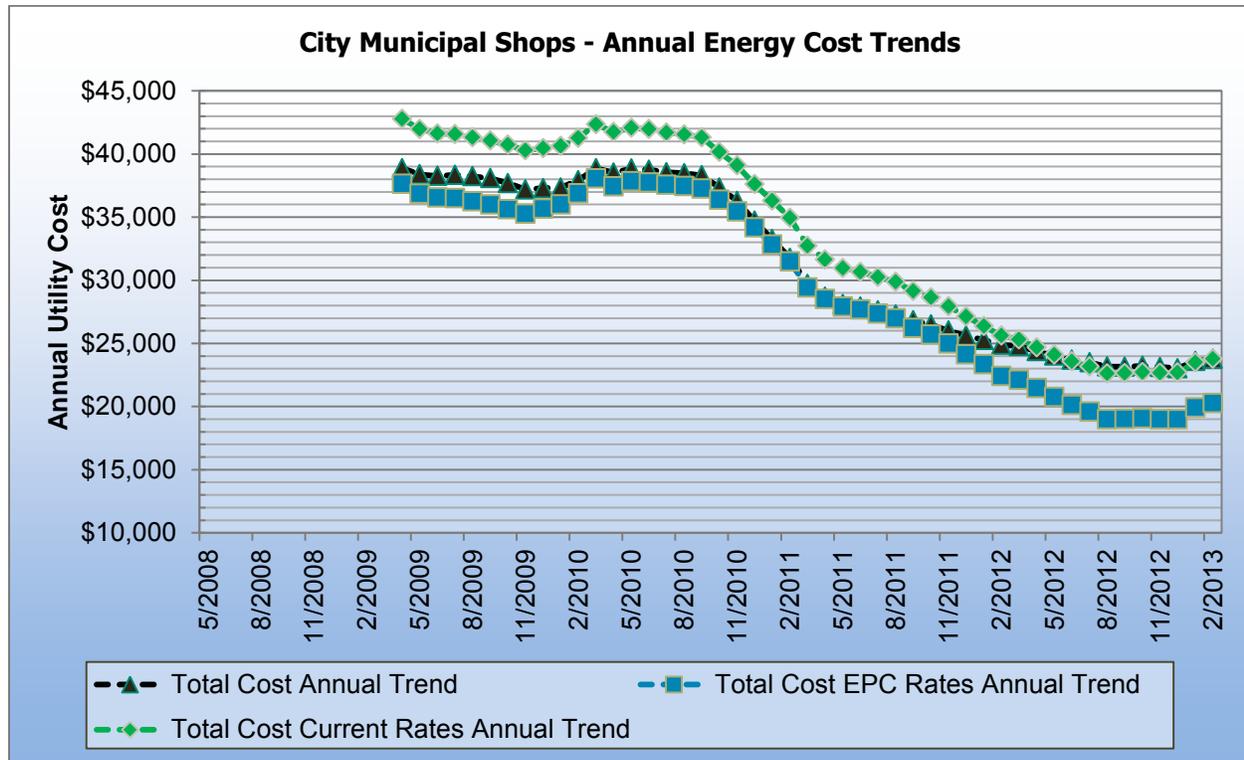
The annual energy metrics for the facility are summarized in the following table.

<b>Audit Year Energy Summary</b>	
<b>Facility Square Footage</b>	13,700
<b>Audit Year Energy Cost (\$/Yr)</b>	\$23,766
<b>Audit Year Energy Cost Intensity (\$/SF/Yr)</b>	\$1.73
<b>Audit Year Energy Use Intensity (kBtu/SF/Yr)</b>	92
<b>Audit Year Natural Gas Usage (Therms/Yr)</b>	7,165
<b>Audit Year Electric Usage (kWh/Yr)</b>	158,778
<b>Audit Year Electric Demand (Peak kW-Months/Yr)</b>	-

These metrics are described below;

- Facility Square Footage – The facility square footage
- Audit Year Energy Cost – The annual energy cost for this audit year as reported on the bills
- Audit Year Energy Cost Intensity – The total audit year energy cost in dollars per square foot
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- Audit Year Electric Usage – The number of kilo-watt-hours of electricity consumed during the audit year
- Audit Year Electric Demand – The sum of the 12 monthly demand peaks during the audit year.

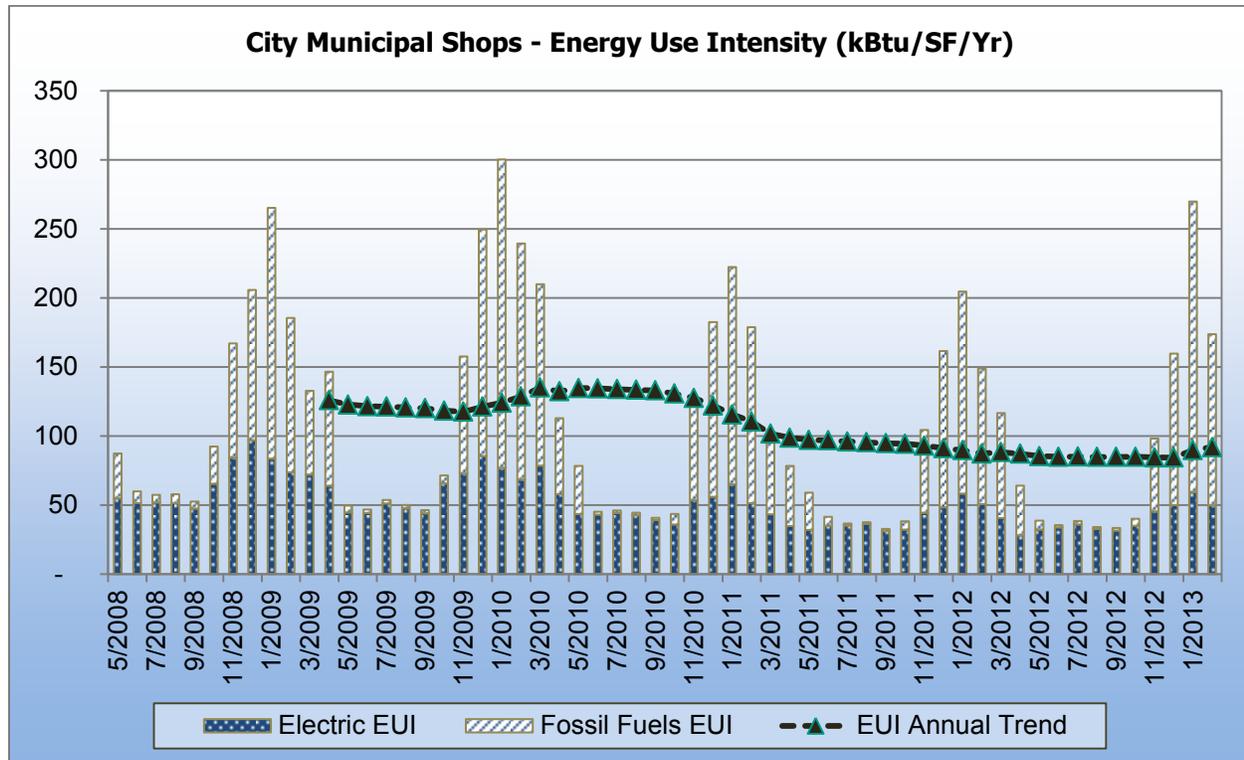
## Annual Energy Cost Trends



The chart above shows the annual energy costs in three ways;

- Total Cost Annual Trend: This is a 12-month moving average of the actual utility costs as reported on the utility bills.
- Total Cost EPC Rates Annual Trend: This is a 12-month moving average of the energy costs normalized to current EPC utility rates.
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## Energy Use Intensity



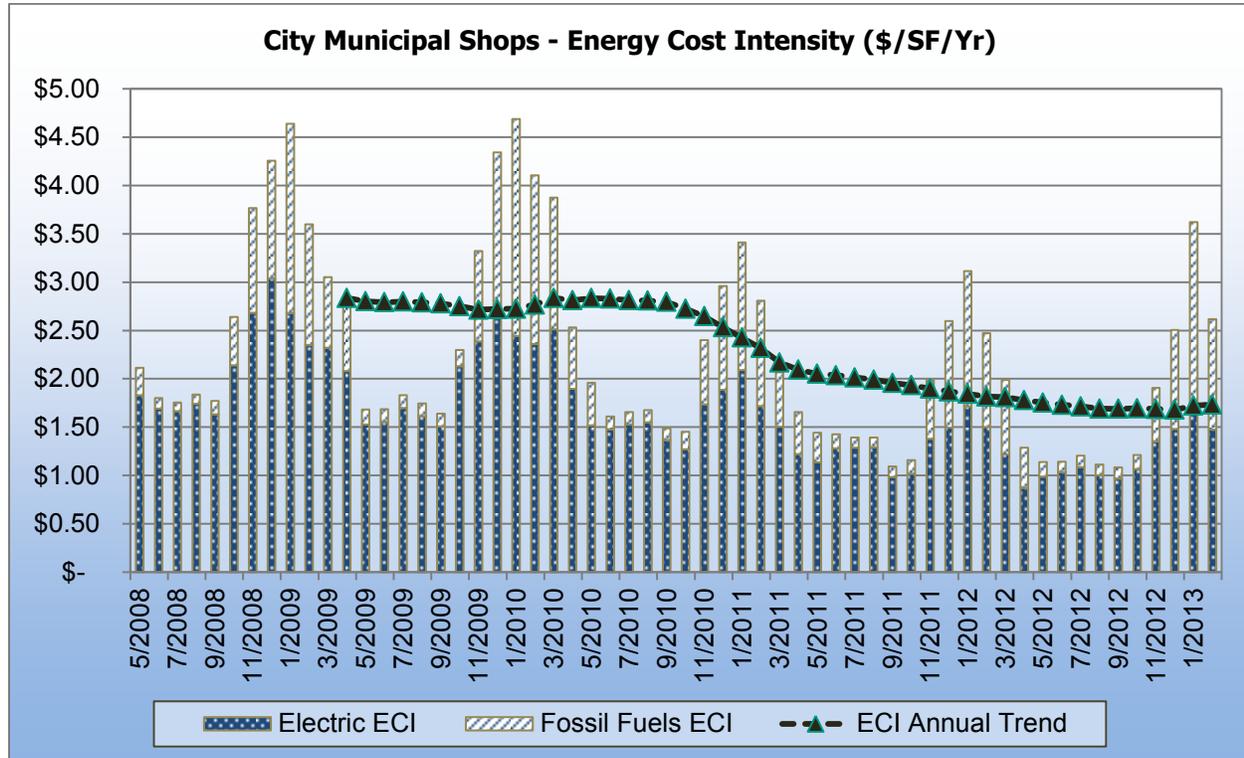
This is an industry standard benchmark for building energy use. The units are thousands of BTUs per square foot of floor area per year. The chart above shows energy use intensity in three ways;

- Electric EUI: This shows the portion of the EUI that results from electric usage.
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The electricity EUI and fossil fuels EUI are stacked to show the total EUI.

- EUI Annual Trend: This is a 12-month moving average of the total EUI.

## Energy Cost Intensity



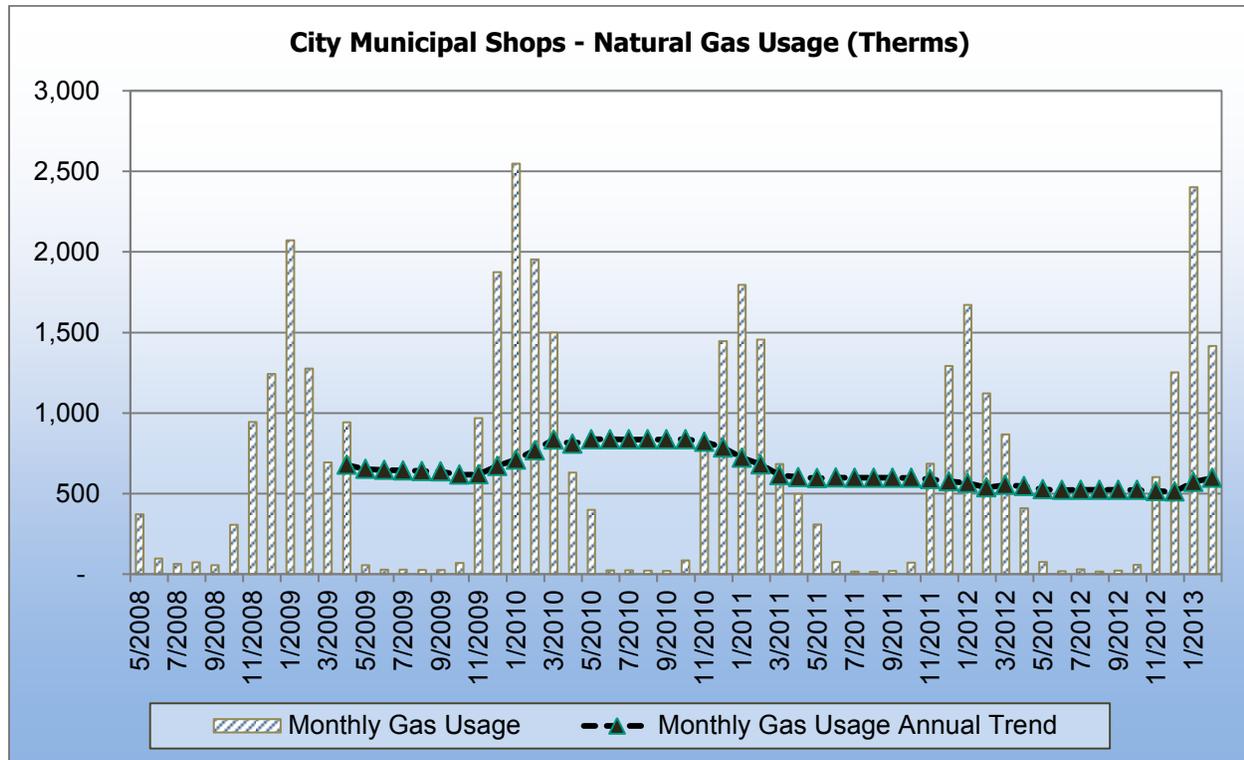
This is an industry standard benchmark for building energy cost. The units are dollars per square foot of floor area per year. The chart above shows energy cost intensity in three ways;

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The electricity ECI and fossil fuels ECI are stacked to show the total ECI.

- ECI Annual Trend: This is a 12-month moving average of the total ECI.

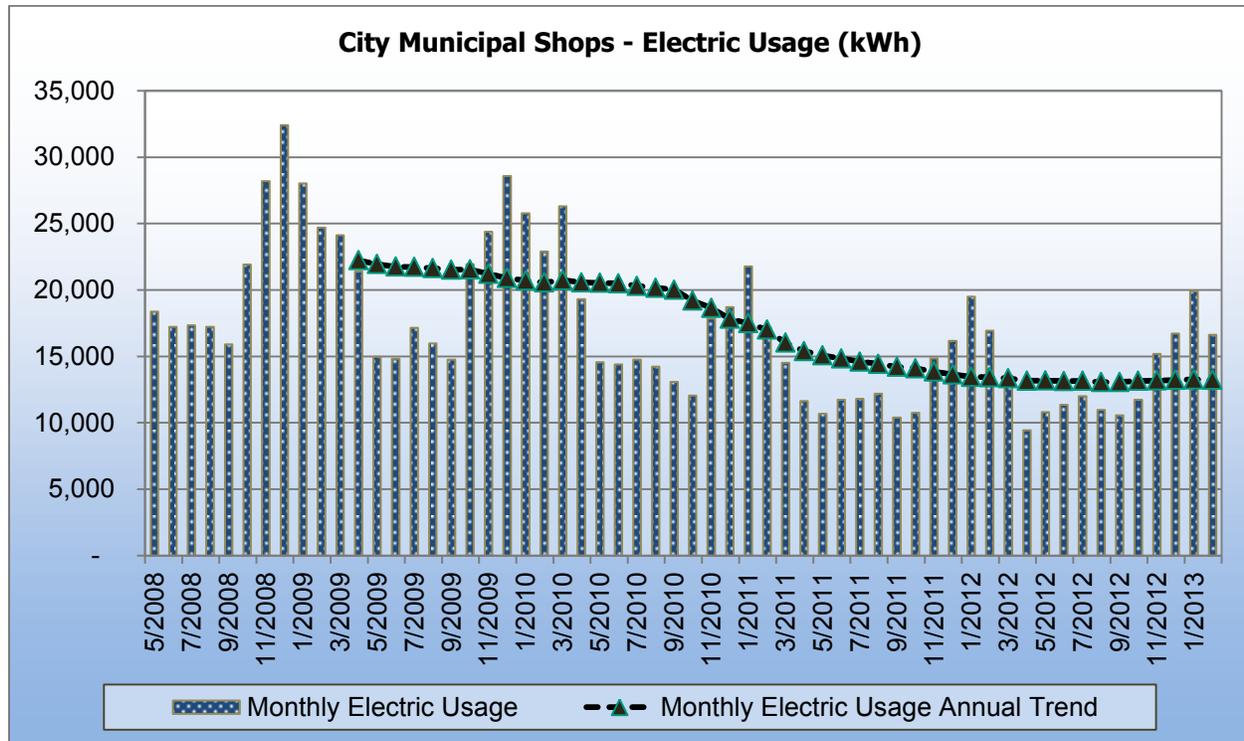
## Natural Gas Consumption History



This is the natural gas consumption history reported in two ways:

- Monthly Gas Usage: This is the actual monthly natural gas consumption reported on the utility bills. The units are therms per month.
- Monthly Gas Usage Annual Trend: This is a 12-month moving average of the actual natural gas consumption reported on the utility bills. The units are therms per month.

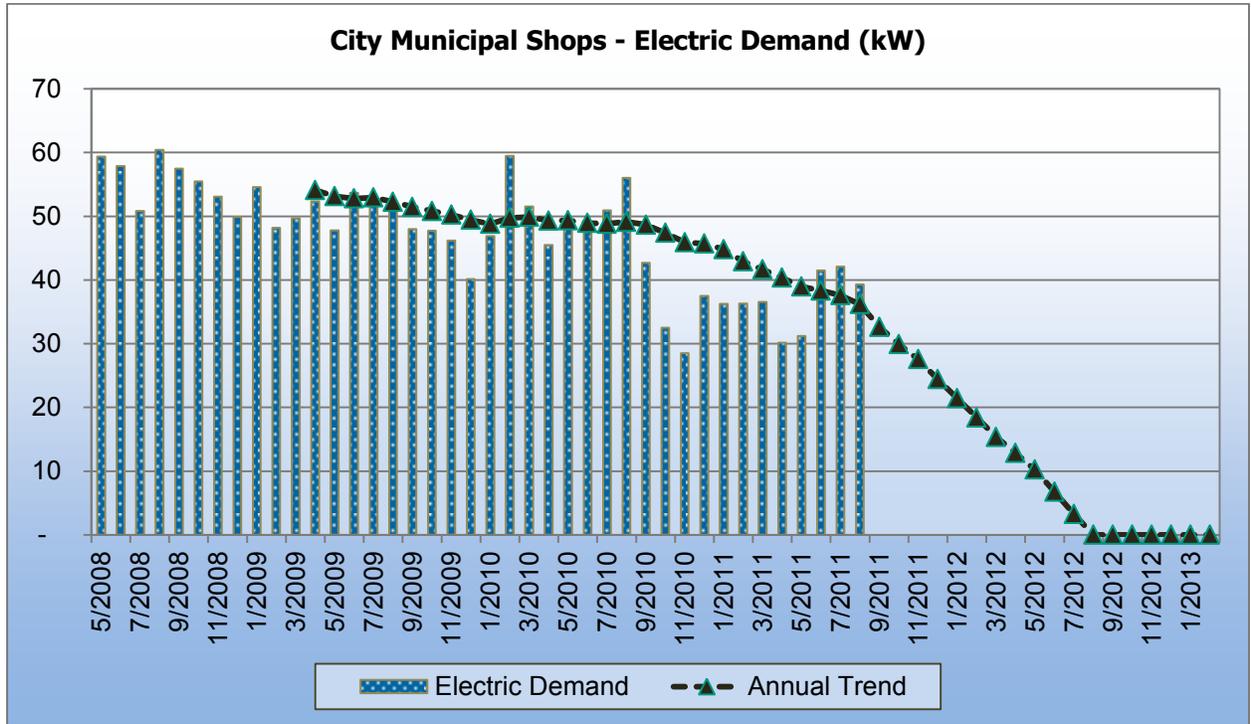
## Electric Consumption History



This is the electric consumption history reported in two ways:

- Monthly Electric Usage: This is the actual monthly electric consumption reported on the utility bills. The units are kWh per month.
- Monthly Electric Usage Annual Trend: This is a 12-month moving average of the actual electric consumption reported on the utility bills. The units are kWh per month.

## Electric Demand History



This is the electric consumption history reported in two ways:

- Monthly Electric Demand: This is the actual monthly electric demand reported on the utility bills. The units are peak kW per month.
- Monthly Electric Demand Annual Trend: This is a 12-month moving average of the actual peak electric demand reported on the utility bills. The units are peak kW per month.

**Note:** The main electric service’s rate schedule was changed in August of 2011 for the City Municipal Shops, electrical demand is no longer billed.

**Lions Clubhouse**

**Overview of Energy Consumption**

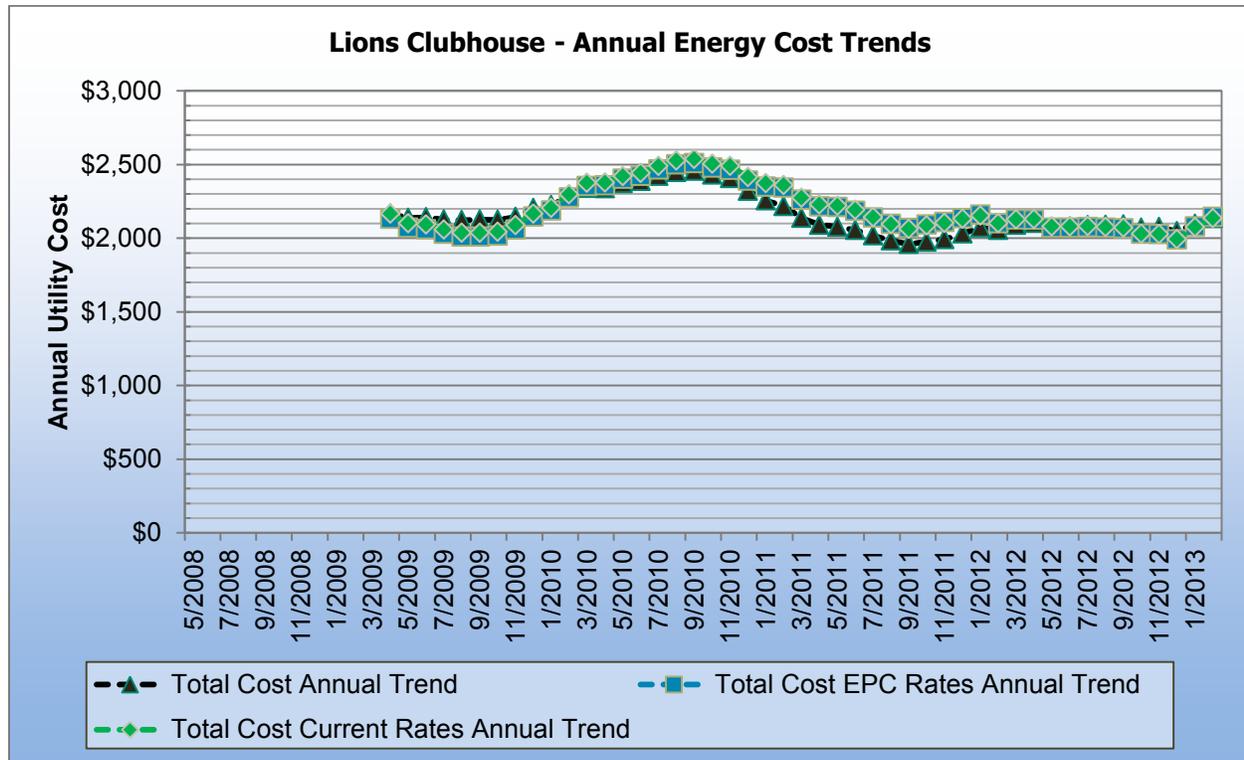
The annual energy metrics for the facility are summarized in the following table.

<b>Audit Year Energy Summary</b>	
<b>Facility Square Footage</b>	2,500
<b>Audit Year Energy Cost (\$/Yr)</b>	\$2,135
<b>Audit Year Energy Cost Intensity (\$/SF/Yr)</b>	\$0.85
<b>Audit Year Energy Use Intensity (kBtu/SF/Yr)</b>	47
<b>Audit Year Natural Gas Usage (Therms/Yr)</b>	927
<b>Audit Year Electric Usage (kWh/Yr)</b>	7,568
<b>Audit Year Electric Demand (Peak kW-Months/Yr)</b>	-

These metrics are described below;

- Facility Square Footage – The facility square footage
- Audit Year Energy Cost – The annual energy cost for this audit year as reported on the bills
- Audit Year Energy Cost Intensity – The total audit year energy cost in dollars per square foot
- Audit Year Energy Use Intensity – The total audit year energy use in thousands of BTUs per square foot
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- Audit Year Electric Usage – The number of kilo-watt-hours of electricity consumed during the audit year
- Audit Year Electric Demand – The sum of the 12 monthly demand peaks during the audit year.

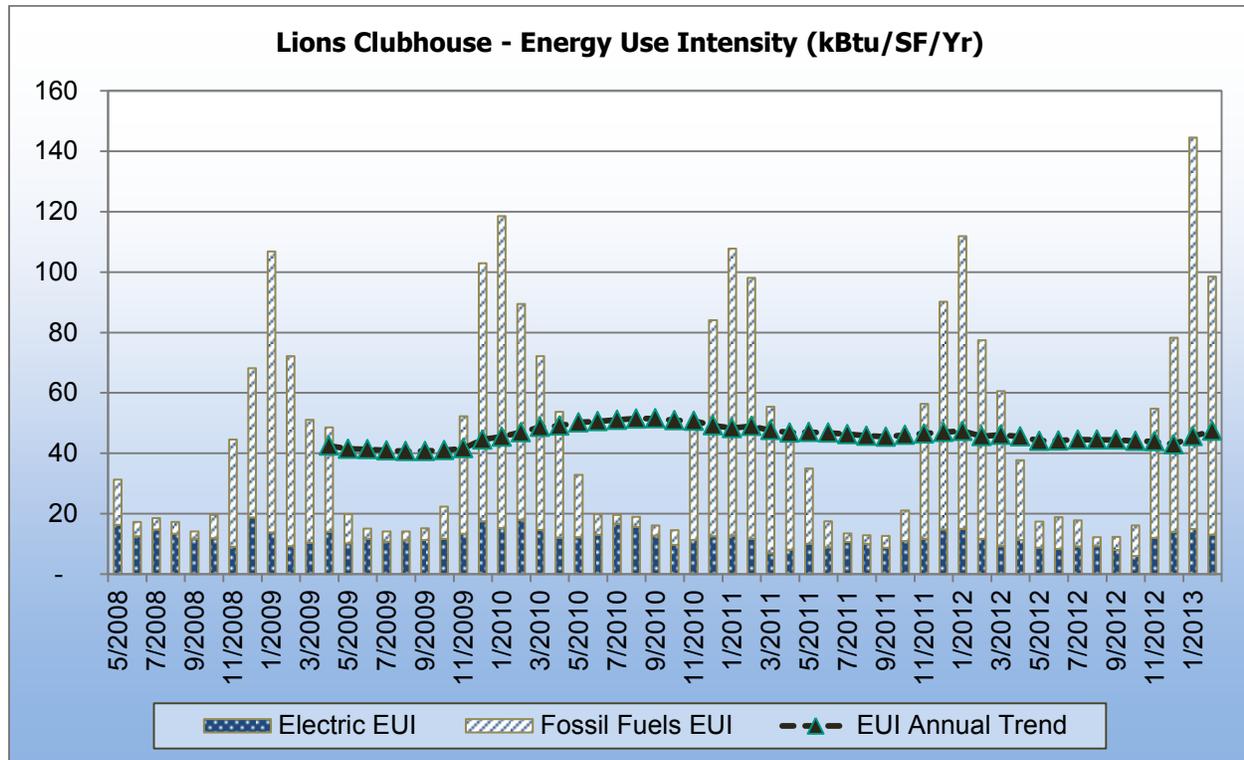
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## Energy Use Intensity



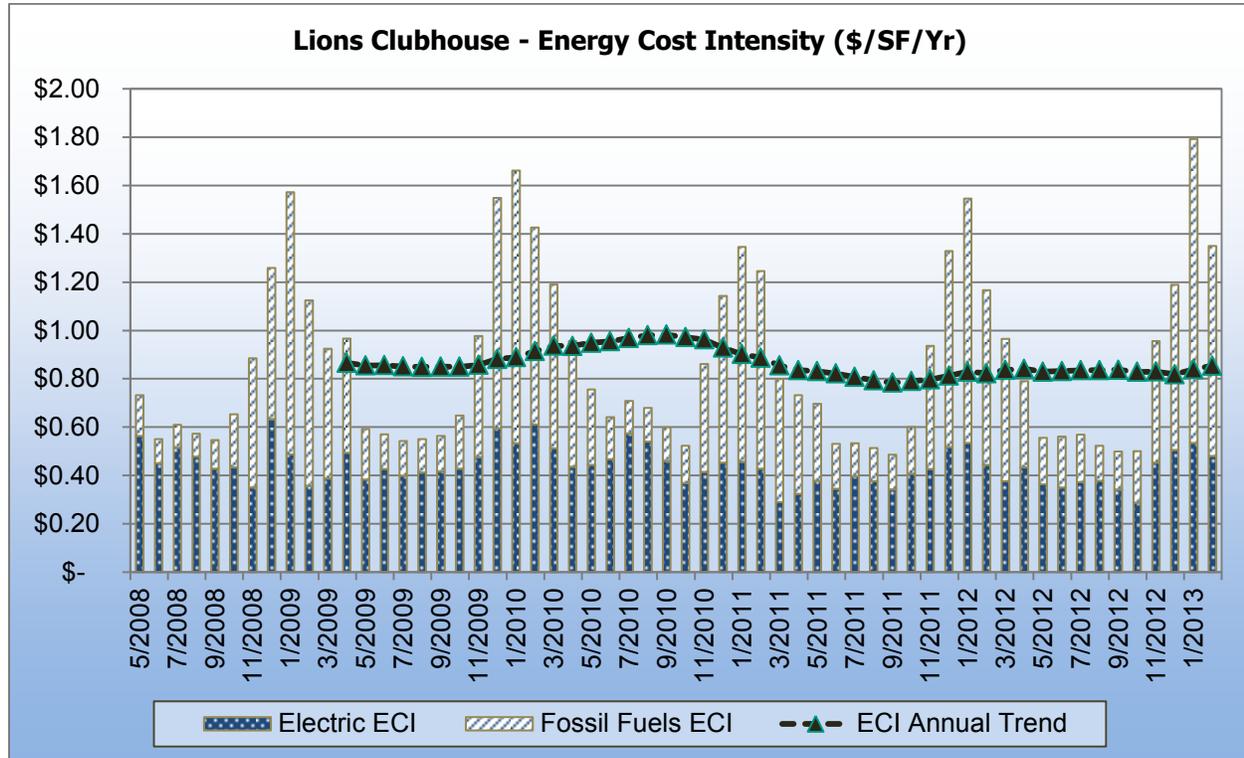
This is an industry standard benchmark for building energy use. The units are thousands of BTUs per square foot of floor area per year. The chart above shows energy use intensity in three ways;

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- EUI Annual Trend: This is a 12-month moving average of the total EUI.

## Energy Cost Intensity



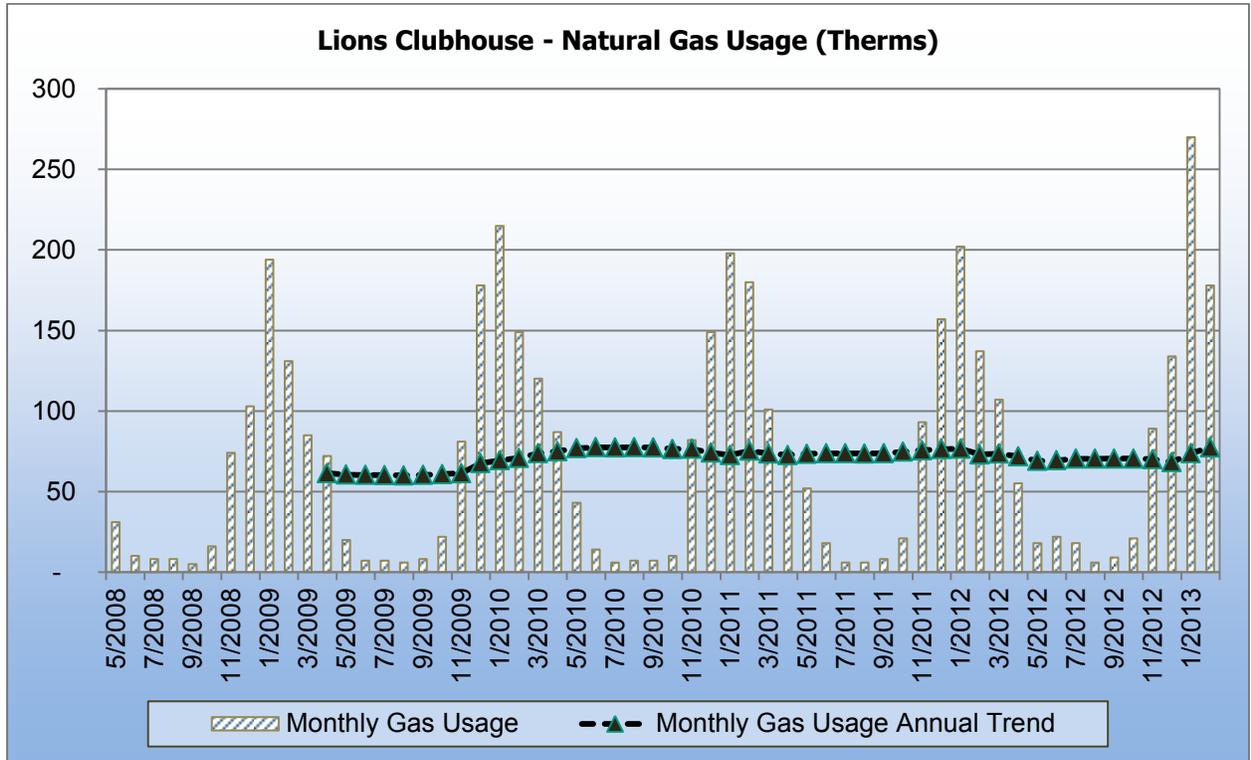
This is an industry standard benchmark for building energy cost. The units are dollars per square foot of floor area per year. The chart above shows energy cost intensity in three ways:

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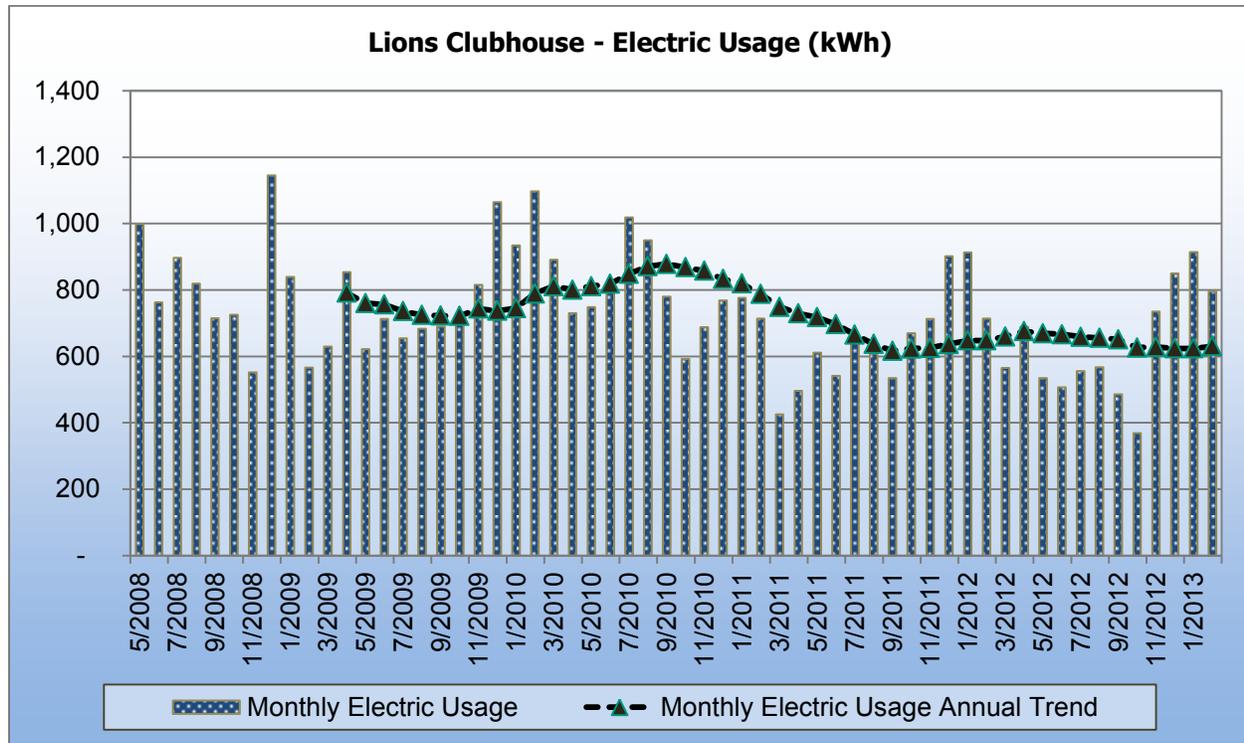
## Natural Gas Consumption History



This is the natural gas consumption history reported in two ways:

- Monthly Gas Usage: This is the actual monthly natural gas consumption reported on the utility bills. The units are therms per month.
- Monthly Gas Usage Annual Trend: This is a 12-month moving average of the actual natural gas consumption reported on the utility bills. The units are therms per month.

## Electric Consumption History



This is the electric consumption history reported in two ways:

- Monthly Electric Usage: This is the actual monthly electric consumption reported on the utility bills. The units are kWh per month.
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***Elks Civic Building***

**Overview of Energy Consumption**

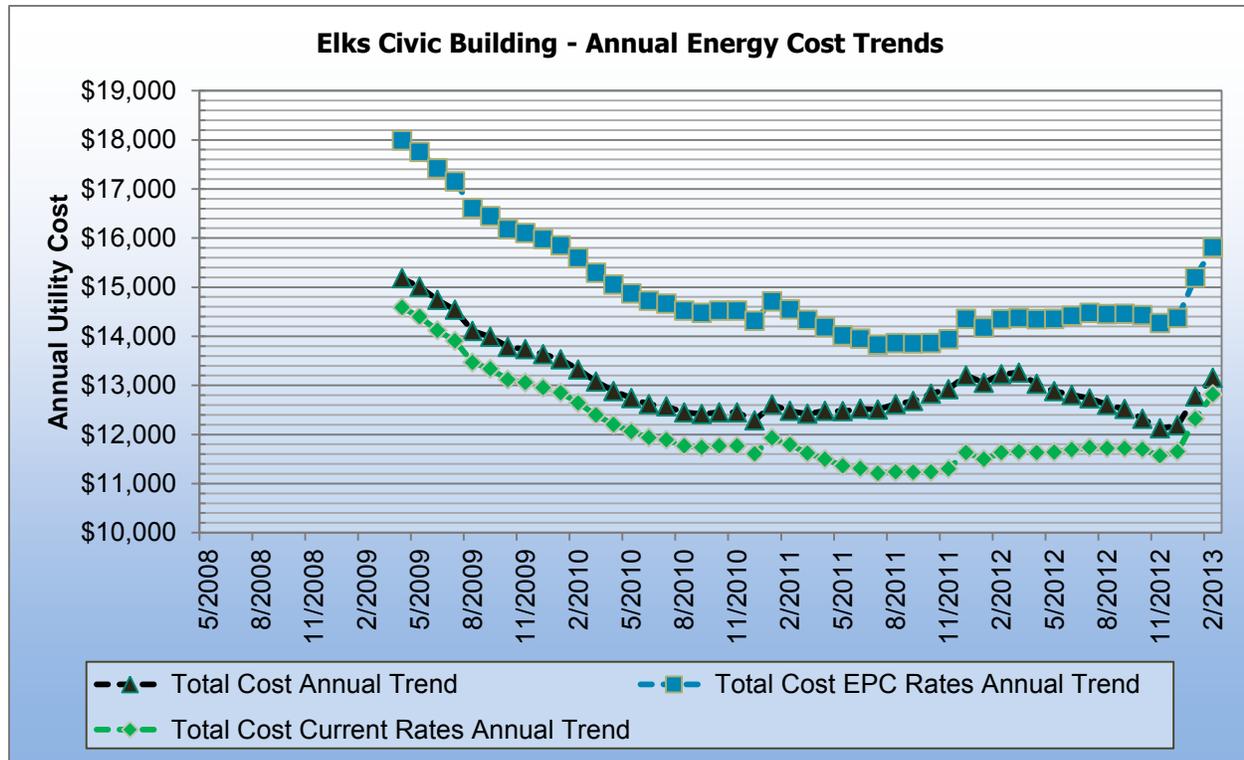
The annual energy metrics for the facility are summarized in the following table.

<b>Audit Year Energy Summary</b>	
<b>Facility Square Footage</b>	13,103
<b>Audit Year Energy Cost (\$/Yr)</b>	\$13,154
<b>Audit Year Energy Cost Intensity (\$/SF/Yr)</b>	\$1.00
<b>Audit Year Energy Use Intensity (kBtu/SF/Yr)</b>	34
<b>Audit Year Natural Gas Usage (Therms/Yr)</b>	25
<b>Audit Year Electric Usage (kWh/Yr)</b>	127,920
<b>Audit Year Electric Demand (Peak kW-Months/Yr)</b>	-

These metrics are described below;

- Facility Square Footage – The facility square footage
- Audit Year Energy Cost – The annual energy cost for this audit year as reported on the bills
- Audit Year Energy Cost Intensity – The total audit year energy cost in dollars per square foot
- Audit Year Energy Use Intensity – The total audit year energy use in thousands of BTUs per square foot
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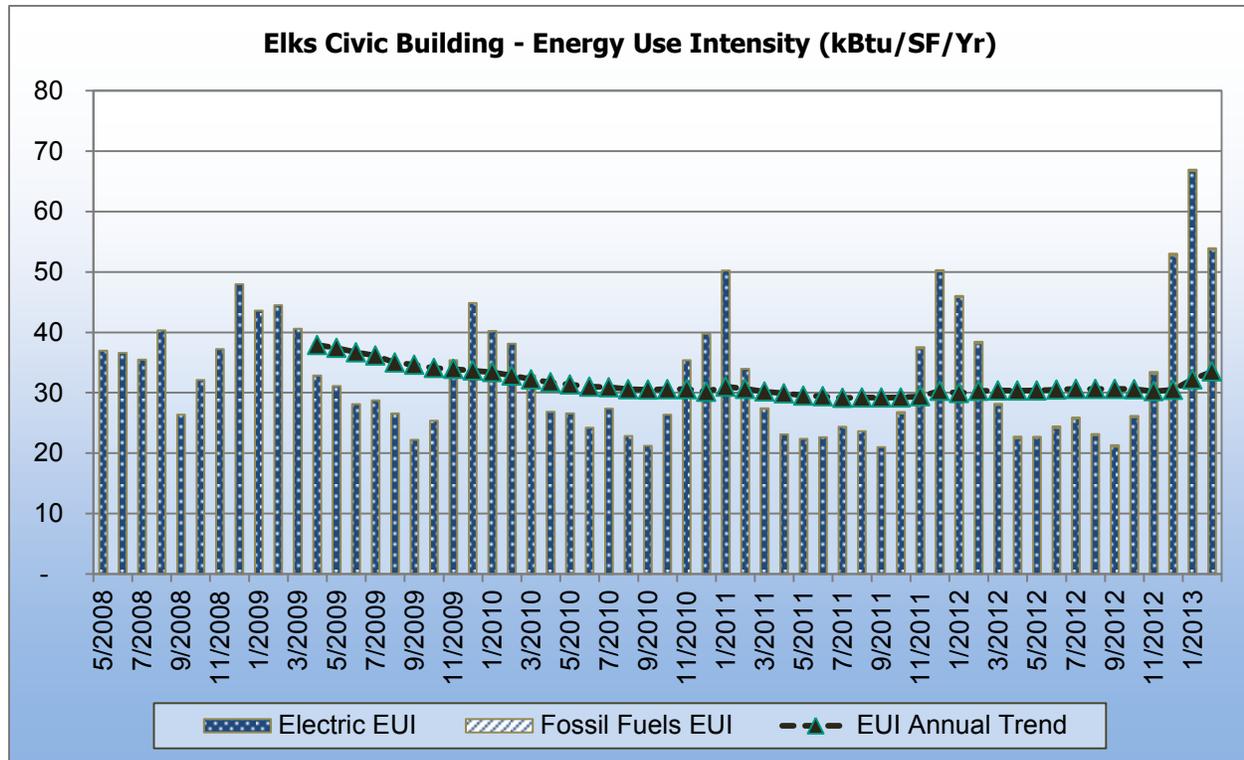
## Annual Energy Cost Trends



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## Energy Use Intensity



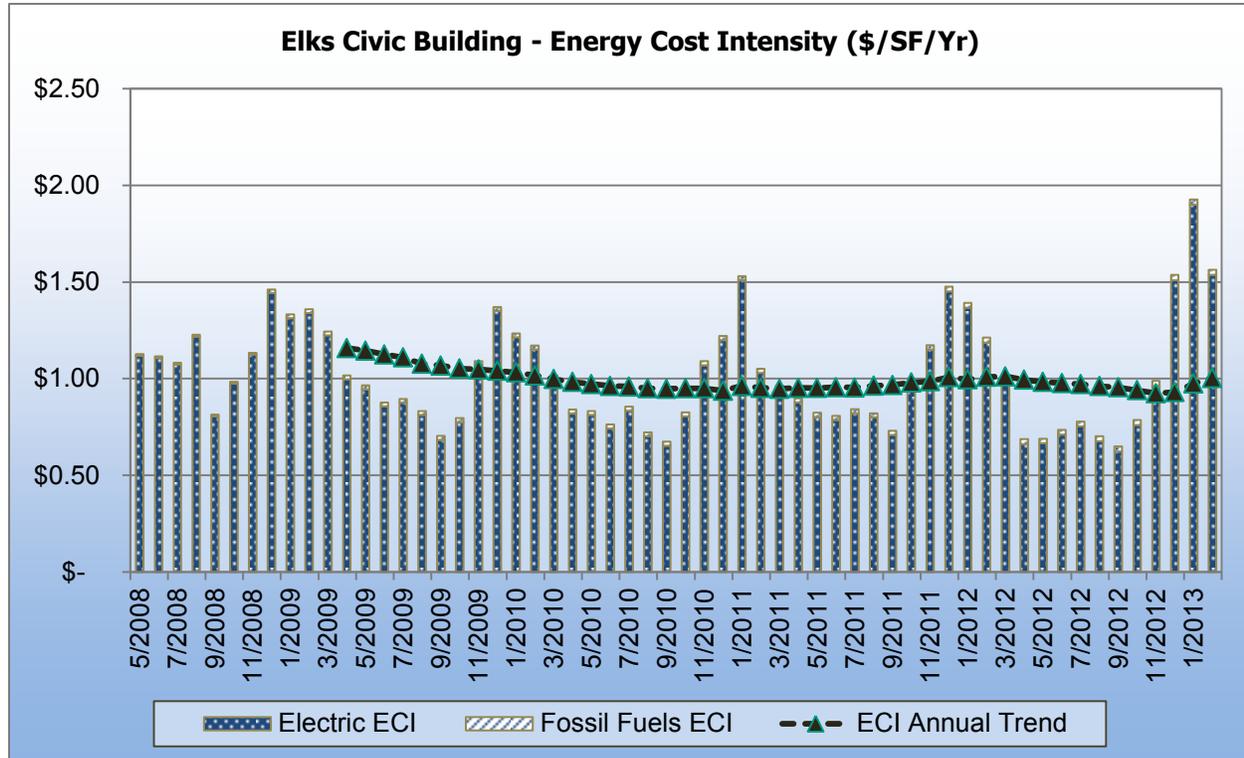
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## Energy Cost Intensity



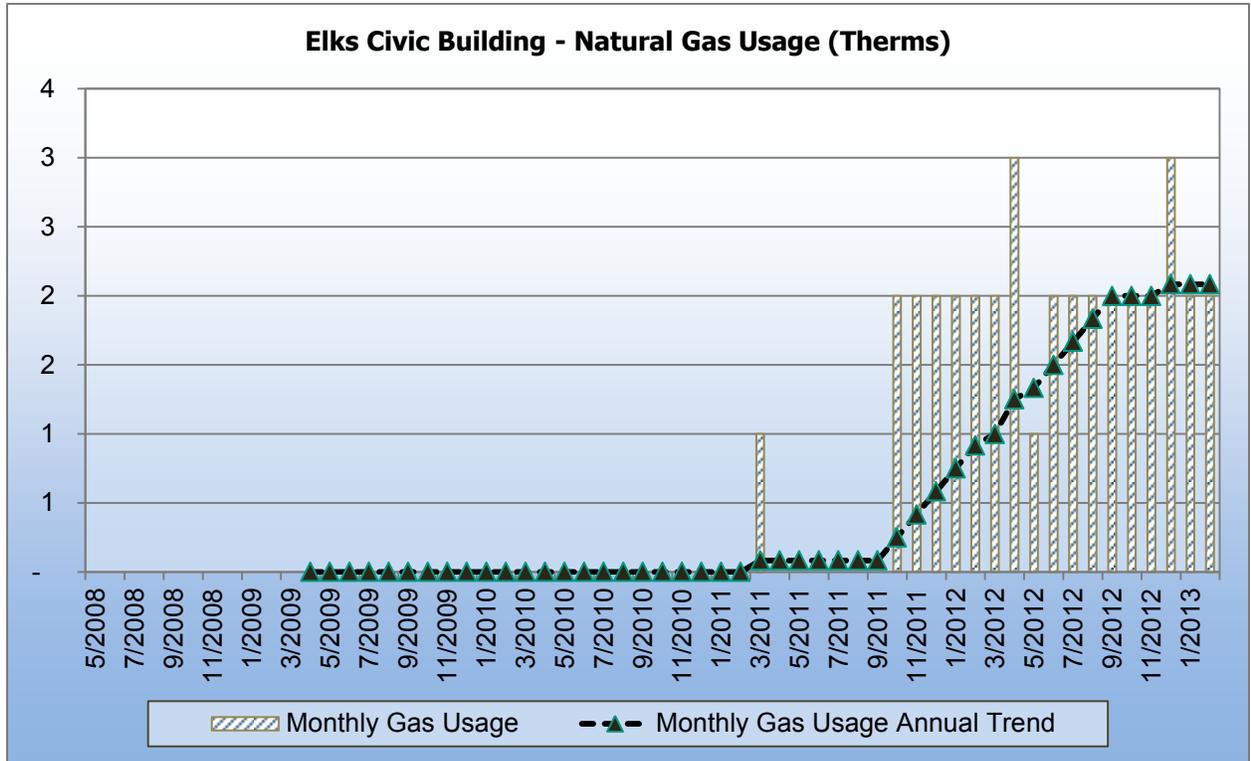
This is an industry standard benchmark for building energy cost. The units are dollars per square foot of floor area per year. The chart above shows energy cost intensity in three ways:

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- ECI Annual Trend: This is a 12-month moving average of the total ECI.

## Natural Gas Consumption History

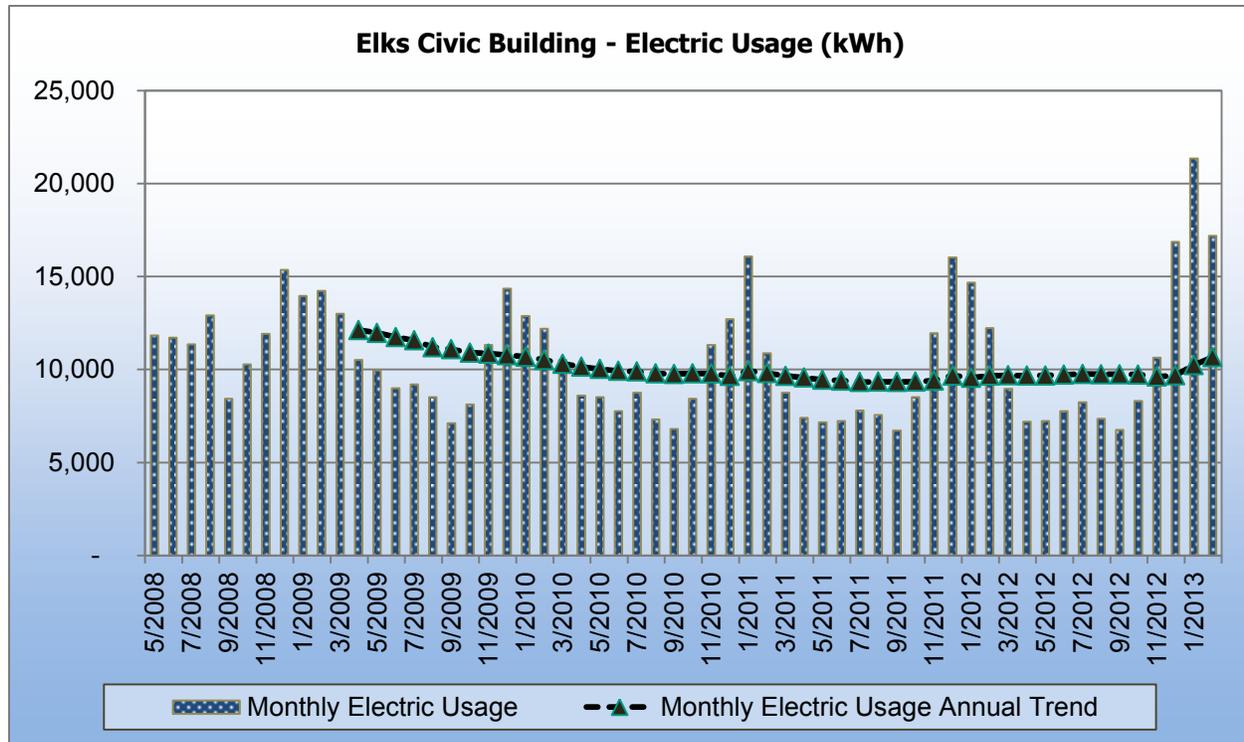


This is the natural gas consumption history reported in two ways;

- Monthly Gas Usage: This is the actual monthly natural gas consumption reported on the utility bills. The units are therms per month.
- Monthly Gas Usage Annual Trend: This is a 12-month moving average of the actual natural gas consumption reported on the utility bills. The units are therms per month.

Note: The Elks Civic Building is heated with a heat pump system. There is one very low usage gas meter still remaining in the building as seen above.

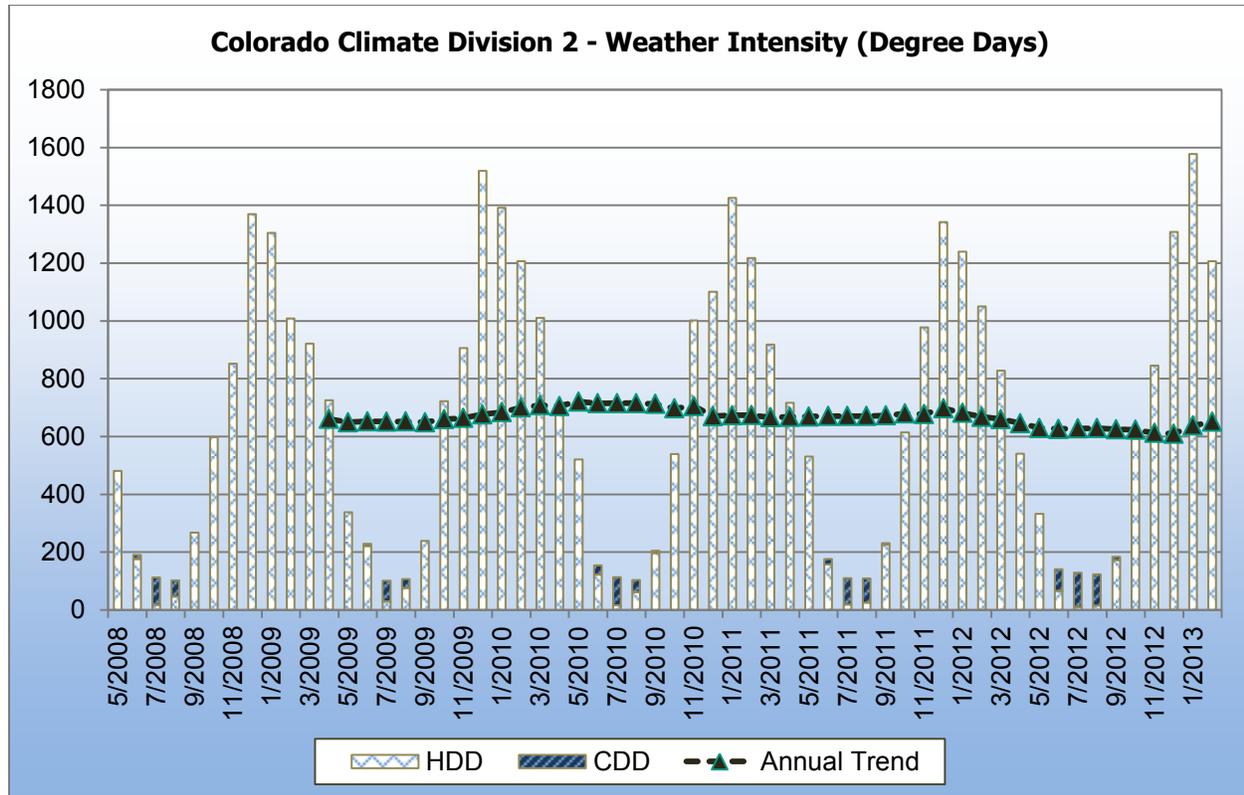
## Electric Consumption History



This is the electric consumption history reported in two ways:

- Monthly Electric Usage: This is the actual monthly electric consumption reported on the utility bills. The units are kWh per month.
- Monthly Electric Usage Annual Trend: This is a 12-month moving average of the actual electric consumption reported on the utility bills. The units are kWh per month.

## Weather History



This is the weather intensity for the National Climatic Data Center climate division in which City of Montrose resides. Three values are shown here;

- Heating Degree Days are a measure of how cold the climate has been and affect the heating use in a building.
- Cooling Degree Days are a measure of how hot the climate has been and affect the air conditioning use in a building.
- The Annual Trend is a 12-month moving average of the sum of both heating and cooling degree days.