



Your Partner for Green Facilities, Sustainability and Clean Technologies

---

## ENERGY EXPENDITURE PLAN

---



**Edison Language Academy**

Together in Two Languages/Juntos a traves de dos idiomas

### ***Edison Language Academy***

2402 Virginia Avenue

Santa Monica, CA 90404

P: (310) 828-0335

---

### PREPARED FOR:

---

California Energy Commission  
Energy Division  
Local Assistance and Financing Office, MS-23  
1516 Ninth Street  
Sacramento, Ca 95814



PREPARED ON:  
5/16/2017

## Table of Contents

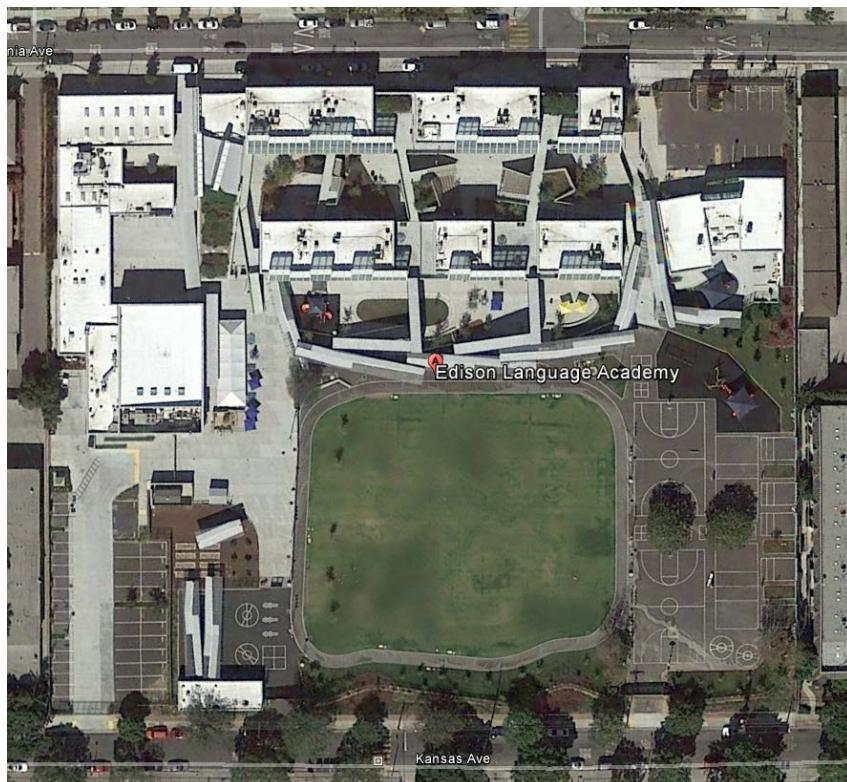
|  |    |
|--|----|
| Section 1: Facility Background.....                      | 3  |
| Edison Language Academy .....                            | 3  |
| Utility Costs and Rate Schedules .....                   | 4  |
| Benchmarking.....  | 5  |
| Section 2: Energy Efficiency Measures (EEM) Summary..... | 6  |
| Lighting Systems Retrofit.....                           | 7  |
| Appendix – A.....  | 8  |
| School Schedules and Maps .....                          | 8  |
| Daily Bell Schedule and Academic Calendar .....          | 9  |
| Edison Language Academy Map.....                         | 11 |
| Appendix – B.....  | 13 |
| Energy Utilization Analysis .....                        | 13 |
| Appendix – C .....                                       | 16 |
| Lighting Systems Audit.....                              | 16 |

## Section 1: Facility Background

### Edison Language Academy

Edison Language Academy is located at 2402 Virginia Avenue in Santa Monica, CA 90404. It is an elementary school serving approximately 450 students ranging from grades P-5 and provides instruction using 6 permanent buildings. The total amount of occupied space is 72,597 SF. For a complete map of the campus, see Appendix A.

The campus operates on an academic calendar that begins in late August and ends in late June. Winter Break is a two week break that begins at the end of December and goes to the first week of January. Spring Break is a one week break that begins in early-April. School is in session beginning at 8:15 a.m. and continuing until 2:45 p.m., Monday through Friday. For a complete academic calendar and bell schedule, refer to Appendix A.



## Utility Costs and Rate Schedules

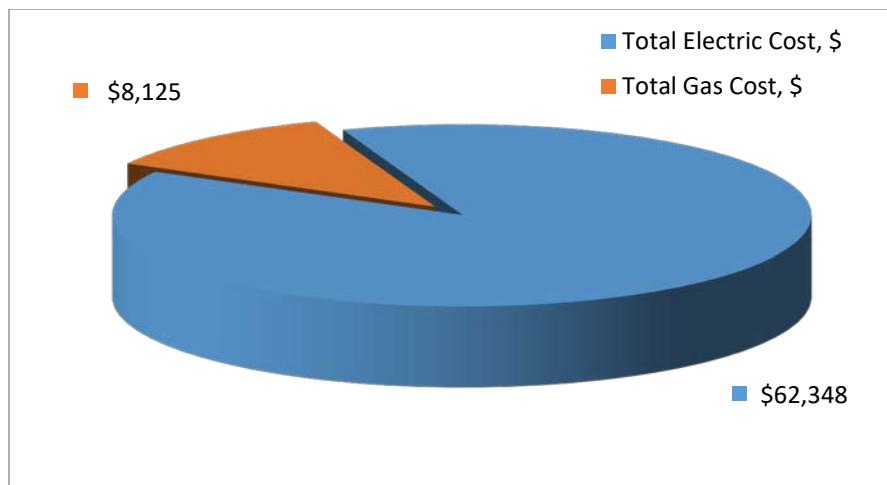
The Edison Language Academy facilities receive electricity services from Southern California Edison (SCE) and gas services from SoCalGas (SCG). Monthly utility data is considered separately for each utility meter and each energy type (electricity, natural gas, propane, diesel, and water).

The following is a list of the meters associated with each energy type utilized at Edison Language Academy:

| <b>Table 1: Electric Meter Numbers and Rate Schedules</b> |               |                |
|---|---------------|----------------|
| Account Number  | Meter Number  | Rate Schedule  |
| 3-041-4672-92   | 223000-012525 | TOU-GS-2-A     |
| 3-040-5164-57   | V349N-005220  | TOU-GS-2-B-CPP |

| <b>Table 2: Gas or Propane Meter Numbers and Rate Schedules</b> |              |               |
|---|--------------|---------------|
| Account Number  | Meter Number | Rate Schedule |
| 1444770742  | 13983325     | GN-10         |

The utility data provided uses the data recovered from each of these meters during the period of July, 2015 to June, 2016. The cost comparison of Edison Language Academy's gas and electricity costs can be seen in the table below:



## Benchmarking

As part of the site evaluation we determined the Energy Utilization Analysis (EUA) to provide important information about the energy usage of the school. Listed in the table below is the Benchmarking Report for Edison Language Academy:

| Energy Use Intensity Calculator |         |             |                          |             |         |
|---------------------------------|---------|-------------|--------------------------|-------------|---------|
| Electricity                     |         | Natural Gas |                          | Other Fuels |         |
| 1.54                            | W/SF    | 0.14        | Therms/SF                | 0.00        | Gals/SF |
| 5.28                            | kWh/SF  | \$ 0.11     | Cost/SF                  | \$ 0.00     | Cost/SF |
| \$ 0.86                         | Cost/SF |             |                          |             |         |
| Energy Costs/SF/Year            |         | \$ 0.97     | Energy Use(Kbtu)/SF/Year |             | 71.03   |

The main purpose of this report is to assess the current energy usage of Edison Language Academy. Energy consumption is analyzed compared to the site's actual weather data expressed in Cooling Degree Days (CDD) & Heating Degree Days (HDD). Graphs comparing the energy consumption to the CDD and HDD can be found in Appendix B.

The Baseline Energy Utilization Analysis (EUA) report compiles the monthly energy data from all meters on site. The EUA is useful in identifying critical energy consuming benchmarks like kWh/SF, kBtu/SF, and Cost/SF for each fuel type and individual school site. This report is a great resource to have for identifying the lowest energy performing schools. The report ranking will present the schools that consume the most energy when compared to others within the district or other comparable districts. The considered school is rated at 5.28 kWh/SF/yr.

The baseline EUA summary of all the meters for Edison Language Academy can be found in Appendix B.

## Section 2: Energy Efficiency Measures (EEM) Summary

Energy savings are based on the difference between annual energy use under existing conditions and annual energy use under proposed conditions. These annual energy savings, and the corresponding annual energy cost savings, are used to determine the cost-effectiveness of the projects. Demand savings are calculated as the difference between the electricity demand of the existing equipment and electricity demand of proposed equipment. The table below shows the Energy Efficiency Measures proposed and the corresponding savings associated with them.

| EEM Number | Energy Efficiency Measure            | Demand Savings (kW) | Electricity Savings (kWH/yr) | Natural Gas or Fuel Savings (therms or gal/yr) | Annual Cost Savings (\$) | Rebates and Grants (\$) | Installed Measure Cost (\$) |
|------------|--------------------------------------|---------------------|------------------------------|--|--------------------------|-------------------------|-----------------------------|
| Lighting   | Lighting – Interior Fixture Retrofit | 25                  | 46,351                       |  | \$7,555.00               | \$65,000.00             | \$130,524.00                |
| Lighting   | Lighting – Exterior Fixture Retrofit | 10                  | 36,584                       |  | \$5,963.00               | \$62,000.00             | \$124,181.00                |
|            | <b>Totals</b>                        | 35                  | 82,935                       |  | \$13,518.00              | \$127,000.00            | \$254,705.00                |

## Lighting Systems Retrofit

A significant portion of a facilities electrical costs comes from lighting, making lighting retrofits one of the quickest and simplest methods for reducing utility costs. In most cases the retrofits will result in improved light quality and reduced maintenance costs in addition to the estimated energy savings.

The method used for calculating energy savings is outlined below:

$$\text{Annual Saving, } \$ = (\text{Existing Watts} - \text{New Watts}) / 1000 \times \text{Hours/Year} \times \text{Utility Rate} \times N$$

Where,

*Existing Watts* – Wattage rating for the existing (Baseline) light fixture

*New Watts* – New wattage rating for the existing light fixture

*Hours/Year* – Annual number of “burn-hours” (run hours for different areas; see detailed audit in Appendix C)

*Utility Rate* – Actual weighted composite utility rate, \$/kWh

*N* – Number of light fixtures of the particular type (see below & in Appendix C for the actual quantities).

The current interior lighting systems in the Edison Language Academy buildings consist of a combination of 1<sup>st</sup> generation T-8 and compact fluorescent lamps and fixtures. Following examination of the data collected, a full retrofit of the lighting system with LED lamps and fixtures is recommended.

The current exterior lighting systems in the Edison Language Academy buildings consist of metal halide, T-5 and high pressure sodium lamps and fixtures. Following examination of the data collected, a full retrofit of the lighting system with LED lamps and fixtures is recommended.

This retrofit will generate more saving, electrical demand reduction and better payback than other Energy Conservation Measures such as HVAC replacements. Upon installment of the new system, the campus will conserve 35.39 kW and 82,935 kWh per year. The cost savings per year will be approximately \$13,518.34. A full detailed audit of the current lighting system implemented in the entire campus can be found in Appendix C.

## Appendix – A

School Schedules and Maps

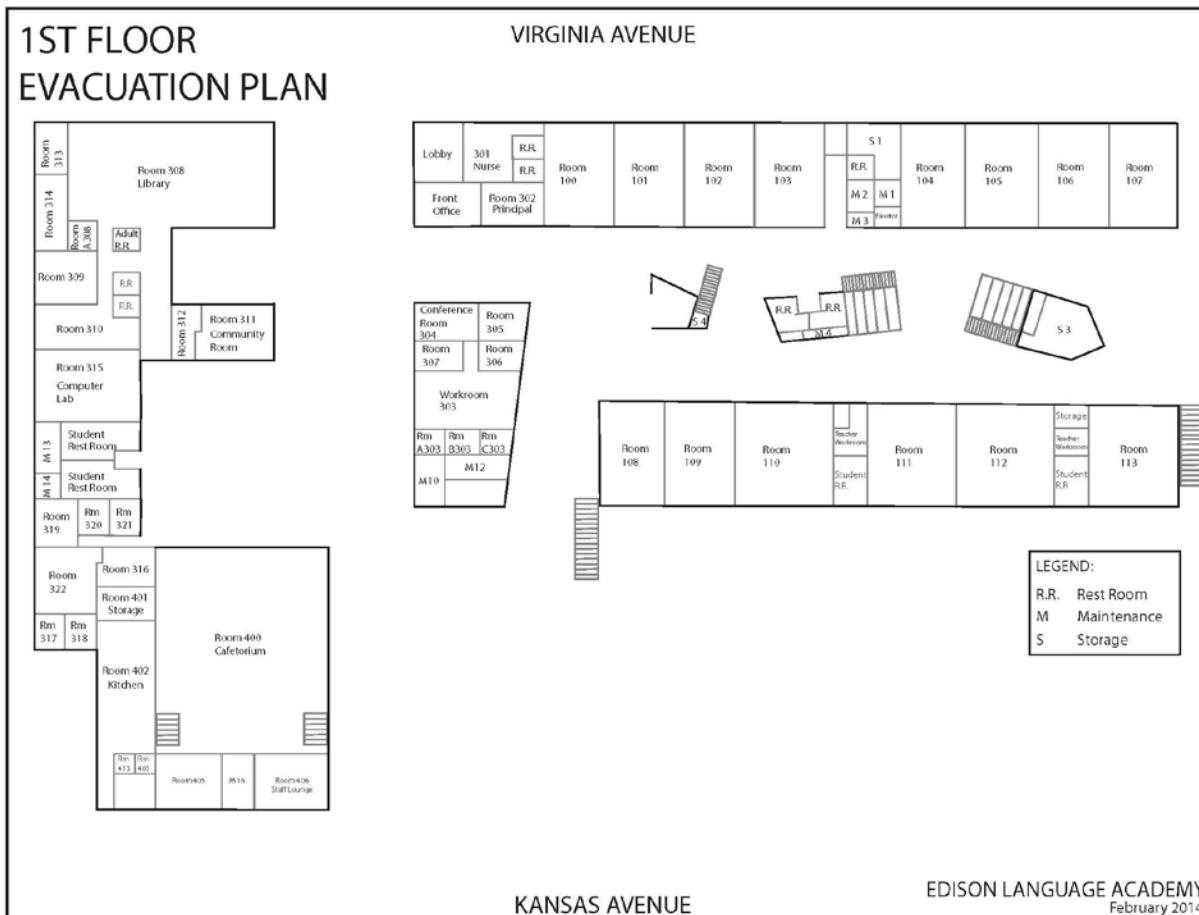
## Daily Bell Schedule and Academic Calendar

*Office Hours are 8:00 am - 4:00 pm Monday through Friday.*

| <i>Grade Level</i> | <i>Regular Days</i> | <i>Wednesday Schedule</i> | <i>Minimum Day</i> |
|--------------------|---------------------|---------------------------|--------------------|
| Preschool          | 9:00am - 3:00pm     | 9:00am - 3:00pm           | 9:00am - 12:25pm   |
| TK                 | 8:15am - 1:35pm     | 8:15am - 1:35pm           | 8:15am - 12:25pm   |
| Kindergarten       | 8:15am - 1:35pm     | 8:15am - 1:35pm           | 8:15am - 12:25pm   |
| Grade 1 & 2        | 8:15am - 2:45pm     | 8:15am - 1:35pm           | 8:15am - 1:35pm    |
| Grades 3 to 5      | 8:30am - 3:00pm     | 8:30am - 1:50pm           | 8:30am - 1:50pm    |

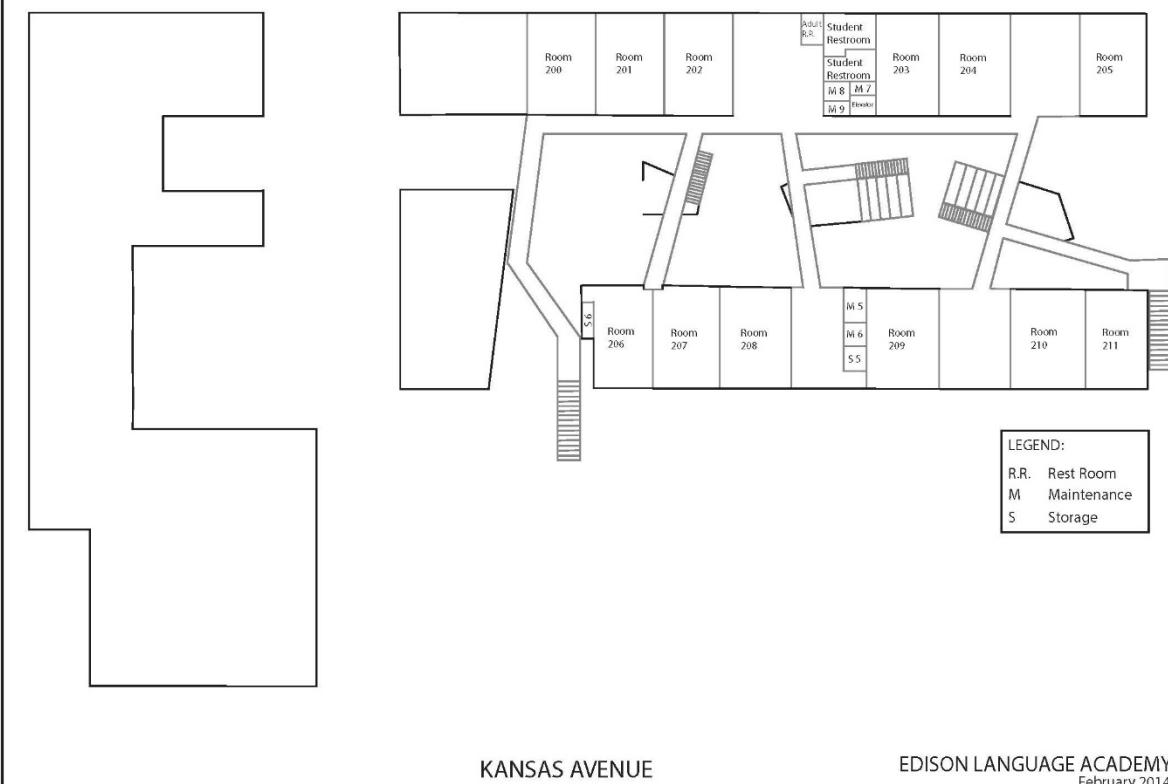


## Edison Language Academy Map



**2ND FLOOR  
EVACUATION PLAN**

VIRGINIA AVENUE



## Appendix – B

### Energy Utilization Analysis

Customer Name: **Santa Monica-Malibu USD**Facility Name: **Edison Elementary**

Facility Location: 2425 Kansas Avenue, Santa Monica, CA  
 Sq. Ft. (conditioned space): 72,597  
 Billing Period  
 FROM: Jul-15  
 TO: Jun-16

Elec Utility Name: **SCE** Natural Gas Utility Name: **SCG**

| Account #     | Meter #       | Rate Schedule  | Account #  | Meter #  | Rate Schedule         |
|---------------|---------------|----------------|------------|----------|-----------------------|
| 2-07-030-4431 | 223000-012525 | TOU-GS-2-A     | 6307342052 | 13983325 | GN-10-NON-RESIDENTIAL |
| 2-35-679-1350 | V349N-005220  | TOU-GS-2-B CPP | 0          | 0        | 0                     |
| 0             | 0             | 0              | 0          | 0        | 0                     |
| 0             | 0             | 0              | 0          | 0        | 0                     |

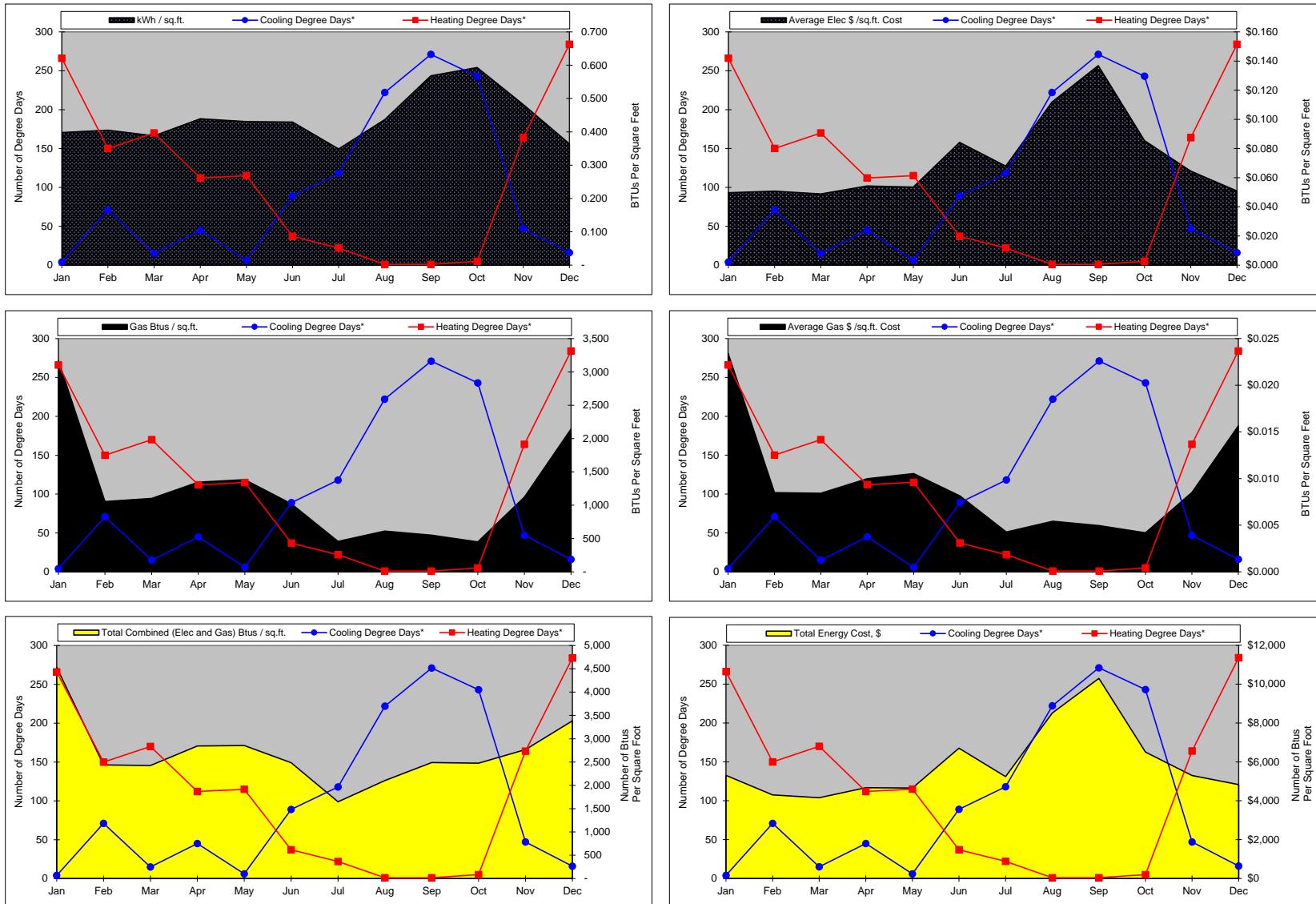
|                                       | Jan     | Feb     | Mar     | Apr     | May     | Jun     | Jul     | Aug     | Sep      | Oct     | Nov     | Dec     | TOTAL ANNUAL |
|---------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|---------|--------------|
| Cooling Degree Days*                  | 4       | 71      | 15      | 45      | 6       | 89      | 118     | 222     | 271      | 243     | 47      | 16      | 1,147        |
| Heating Degree Days*                  | 266     | 150     | 170     | 112     | 115     | 37      | 22      | 1       | 1        | 5       | 164     | 284     | 1,327        |
| Days in Billing Period                |         |         |         |         |         |         |         |         |          |         |         |         |              |
| electric                              | 42      | 0       | 0       | 0       | 0       | 0       | 30      | 31      | 30       | 30      | 32      | 30      | 225          |
| natural gas                           | 35      | 30      | 29      | 31      | 30      | 30      | 30      | 31      | 30       | 28      | 30      | 32      | 366          |
| Electric Usage                        |         |         |         |         |         |         |         |         |          |         |         |         |              |
| kWh per Billing Cycle                 | 28,904  | 29,416  | 28,179  | 31,894  | 31,275  | 31,167  | 25,319  | 31,730  | 41,267   | 43,051  | 35,002  | 26,433  | 383,637      |
| \$ for kWh Billed                     | \$2,260 | \$3,687 | \$2,094 | \$2,374 | \$2,327 | \$6,116 | \$3,161 | \$4,683 | \$5,857  | \$4,124 | \$3,284 | \$2,597 | \$42,564     |
| Max kW Billed                         | 95      | 98      | 96      | 104     | 102     | 115     | 74      | 140     | 166      | 157     | 106     | 88      | 112          |
| \$ for kW Billed                      | \$1,345 | \$0     | \$1,451 | \$1,571 | \$1,563 | \$0     | \$1,768 | \$3,440 | \$4,078  | \$2,072 | \$1,399 | \$1,097 | \$19,784     |
| Total Electric Cost, \$               | \$3,605 | \$3,687 | \$3,545 | \$3,945 | \$3,890 | \$6,116 | \$4,929 | \$8,123 | \$9,935  | \$6,196 | \$4,683 | \$3,694 | \$62,348     |
| Ave. Daily Electric Cost, \$          | \$86    | #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! | \$164   | \$262   | \$331    | \$207   | \$146   | \$123   | #DIV/0!      |
| Average \$/kWh Cost                   | \$0.125 | \$0.125 | \$0.126 | \$0.124 | \$0.124 | \$0.196 | \$0.195 | \$0.256 | \$0.241  | \$0.144 | \$0.134 | \$0.140 | \$0.163      |
| Average Elec \$ /sq.ft. Cost          | \$0.050 | \$0.051 | \$0.049 | \$0.054 | \$0.054 | \$0.084 | \$0.068 | \$0.112 | \$0.137  | \$0.085 | \$0.065 | \$0.051 | \$0.059      |
| kWh / sq.ft.                          | 0.398   | 0.405   | 0.388   | 0.439   | 0.431   | 0.429   | 0.349   | 0.437   | 0.568    | 0.593   | 0.482   | 0.364   | 5.28         |
| Natural Gas Usage                     |         |         |         |         |         |         |         |         |          |         |         |         |              |
| Therms per Billing Cycle              | 2,301   | 765     | 799     | 977     | 1,004   | 740     | 332     | 444     | 399      | 327     | 813     | 1,555   | 10,456       |
| Total Gas Cost, \$                    | \$1,701 | \$616   | \$611   | \$724   | \$764   | \$590   | \$310   | \$394   | \$359    | \$304   | \$617   | \$1,135 | \$8,125      |
| Ave. Daily Gas Cost, \$               | \$49    | \$21    | \$21    | \$23    | \$25    | \$20    | \$10    | \$13    | \$12     | \$11    | \$21    | \$35    | 22           |
| Average \$/therm Cost                 | \$0.739 | \$0.805 | \$0.765 | \$0.741 | \$0.761 | \$0.797 | \$0.934 | \$0.887 | \$0.900  | \$0.930 | \$0.759 | \$0.730 | 0.777        |
| Average Gas \$ /sq.ft. Cost           | \$0.023 | \$0.008 | \$0.008 | \$0.010 | \$0.011 | \$0.008 | \$0.004 | \$0.005 | \$0.005  | \$0.004 | \$0.008 | \$0.016 | \$0.112      |
| Gas Btus / sq.ft.                     | 3,170   | 1,054   | 1,101   | 1,346   | 1,383   | 1,019   | 457     | 612     | 550      | 450     | 1,120   | 2,142   | 14,403       |
| Total Energy Usage                    |         |         |         |         |         |         |         |         |          |         |         |         |              |
| Combined (Elec and Gas) Btus / sq.ft. | 4,528   | 2,437   | 2,425   | 2,845   | 2,853   | 2,485   | 1,648   | 2,103   | 2,490    | 2,474   | 2,765   | 3,385   | 32,439       |
| Total Energy Cost, \$                 | \$5,306 | \$4,303 | \$4,156 | \$4,669 | \$4,654 | \$6,706 | \$5,239 | \$8,517 | \$10,294 | \$6,500 | \$5,300 | \$4,829 | \$70,473     |
| Ave. Energy \$/sq.ft./period          | \$0.07  | \$0.06  | \$0.06  | \$0.06  | \$0.06  | \$0.09  | \$0.07  | \$0.12  | \$0.14   | \$0.09  | \$0.07  | \$0.07  | \$0.097      |

\* Notes:

1) Heating degree days and cooling degree days are based on 65 F.

**Customer:** Santa Monica-Malibu USD  
**Building:** Edison Elementary

**Energy Used from:** Jul-15  
**to:** Jun-16



## Appendix – C

### Lighting Systems Audit

Page | 16



SANTA MONICA-MALIBU  
EDISON LANGUAGE ACADEMY  
ENERGY AUDIT REPORT



