

BUSINESS REPORT

Executive Summary

The energy sector has recently been characterized by an upward trend when it comes to billing. This situation has raised so many questions since it contradicts to the fact that oil prices have steadily decreased over the past three years. To be on the safe side, however, cutting down your energy consumption is your best move. 35% of energy consumed goes into lighting, hinting, just by reducing your lighting consumption by upgrading to better technologies can significantly reduce your electricity bill. This report collects data from the clients' site and other secondary resource, evaluates several soffit lighting methods and analyses them. The conclusion drawn is that HPS lighting is highly ineffective and our client stands to benefit by upgrading to LED lighting. Additionally, several recommendations are made including settling on a vendor with the best deal.

1. INTRODUCTION

Today successful ventures are characterized by 'efficiency' and the lighting industry is no exception. Since 1960s, many lighting technologies have been faced out and new ones keep cropping up by the day. Surprisingly, Upgrading to a better lighting system is identified as the second stage in a building upgrade process. This is according to a report released by Energy star in 2006. The report further affirms, more than 35% of electricity consumed in commercial buildings across the US goes into lighting. Therefore, improvement on lighting systems significantly reduce energy used, better the visibility and consequently prolong of HVAC and other electrical systems. For sure, everyone not only needs to light that exterior area of their house or office, but also, do it using the best technologies in the market. Our clients expressed interest in upgrading from High Pressure Sodium (HPS) lighting system. In this regard, the report posits the best alternative upgrades and details facts of the current HPS and recommend the best lighting system.

The solemn purpose of this report herein is without a doubt to provide preliminary information on the benefits they stand to gain by upgrading to LED. Secondly, the report aims to present hard facts to our client's management team on the cost benefit analysis done to achieve at the conclusions. Note, this study considers the merits of LED technology if applied in the same context over its ineffective brother HPS. For this reason, facts and figures show how the LED will perform when subdued under the exactly same conditions the HPS were observed to be performing.

During our exploration we incorporated the following methodology. Firstly, our team observed how many soffit lights existed and the number of hours they were in use. Secondly, we compared the data to prevalent facts on LED and HPS lamps.

The report is separated majorly into three sections; facts and findings – presents information on what was collected from the clients lighting system. Next, the analysis section details pros and cons of both systems and assesses the cost versus benefits of upgrading to an LED system.

Lastly, the recommendation section enlists suggestions and benefits of the Kischer LED over HPS.

2. FACTS AND FINDINGS

2.1 Current situation

A total of 66 exterior soffit lamps light were counted at the client's office buildings. Our surveillance further proved that this lamps were functional all week long for 10 to 12 hours a day. This translates to a daily energy consumption rate of up to 11,550 WATS. Simple arithmetic equates this rate to a consumption of this figure to an annual consumption of 4200kWh.

TYPE OF SOFFIT LIGHT	# of lights	Glowing Hours /day	Total Daily Consumption (kWh)	Annual Consumption (kWh)
Present - HPS	66	10 - 12	11.5	4200

The team further noted that the prevailing outdoor lighting codes and ordinances not only is it great in reducing light pollution but also reduces glare and light trespass, hence, encourage quality lighting.

The HPS lights were unveiled in 1968 by General Electric replacing its predecessor, the low pressure lamps. Owing its bright yellow ability, HPS lights are commonly used in street lighting and a wide range of industrial applications. It is efficient, smaller sized and remarkably fits into a wide range of fixture types. However, when compared to other lighting options like metal halides, it has a really bad rendering colour. Making it worse, HPS require ballast which is highly inefficient judging from the current energy standards considerations. Additionally, this component is very costly trading in the market today at \$35.00. As if not enough, the HPS is really slow to ignite and takes a considerable amount of time to reach full brightness. When burning it really gets hot a sign of just how much energy it consumes. Lastly, the HPS is non-recyclable and adds up to the ever increasing list of non-biodegradables.

2.2 ALTERNATIVES

LED lighting have highly developed over the past 4 decades in terms of their light output, power efficacy, life span and colour rendering. According to Grahlighting.eu, LED lighting has by far outdone other lighting solutions in the market today by all technical considerations. Its only disadvantage – A high initial cost – is a nonissue since it quickly achieves returns by significantly cutting down the electricity bills.

Kischer LED lamps are one of a kind. They are designed to withstand wet conditions and can be recycled! This lights are consistent in their output, thus, unlike the HPS you don't have to worry about lagging to reach full potential. Additionally, light output can never be lost since they are designed with current constant driver. This LED lights have the capabilities to spread their beams accommodating a 25% degrees wide spot.

3. ANALYSIS.

We analysed the information gathered from the clients lighting system and compared it with the aforementioned alternatives.

The table below summarises the main several factors between the LED and HPS lights;

Comparison Factor	High Pressure Sodium Lights	Light Emitting Diodes Lights
Ignition time	Slow - can take up to 10 mins	Instant - 2 seconds
Life Span	<15000 Hours	>50,000 hours
Power Consumption	High, up to 175 Watts	low, 17 Watts
Startup to full glow time	Easy - High Voltage	Safe to handle - low Voltage
Optical Efficiency	LOW	HIGH
Heat Generation	Over 300 ⁰ C	Less than 60 ⁰ C
Glare	Strong - Dazzle	Safe
Maintenance cost	High - due to ballast	Quite low - no ballast & lasts long
Environmental Pollution	Non-recyclable & Contains heavy metal i.e. Lead	Safe , recyclable
Beam	Focused and not uniformly distributed	wide spread and distributed uniformly from the center to edge
Energy Saver	Not efficient	Efficient Saves Up to 80%

Initial Cost	Low	Comparatively high. \$58.35 each. The initial investment is also higher
Lumens Per Watt	45 - 130	70 - 150
Color Temperature	2.000K	3.200 - 6.400K

3.1 Life span, maintenance costs and Recycling.

Loa, mentions in his works that the LED lights have a lifespan of about 3 times more than the HPS lights. This is attributed to the different technology behind the two lights. A HPS bulb burns sodium under high temperatures with time, an average of 15000 hours it gets depleted and the bulb 'dies'. On the flip side, some LED are rated to a high of 80000 hours. That means you could use it for approximately 12 years. At this rate you might need to replace its plastic housing before you even think about replacing the lights. For this reason maintaining LED lights are seriously cheap.

Additionally, this lights can be recycled. Thus, after serving you for almost forever you don't throw it away. You can trade them in with new ones.

3.2 Energy saving and its initial cost.

Although very expensive, LED saves up to 80% of your lighting consumption thus guaranteeing you of returns on investment.

3.3 Environmental Pollution

LED are not made from any heavy metal or harmful materials making it safe to dispose and handle. On the contrary, SHP have Lead metal and sodium which threaten human health.

3.4 Glare.

HPS lights emit a bright arc resulting into a strong glare. Thus, seeing through when this type of lamps are very bright is really hard. On the flip end, LED emits a soft luminous glow that is not coloured. This kind of light is usually free of glare and even if bright people can comfortably see through.

3.5 Commercial rebates and incentives.

To help reduce the pinch of initial costs in upgrading to LED, numerous utility companies inject millions of dollars in the energy sector yearly. One such company is Tampa Electric which guarantees a rebate pay of between 20-30% of the initial upgrade cost. This funds help eligible companies quickly upgrade without overstressing their resources.

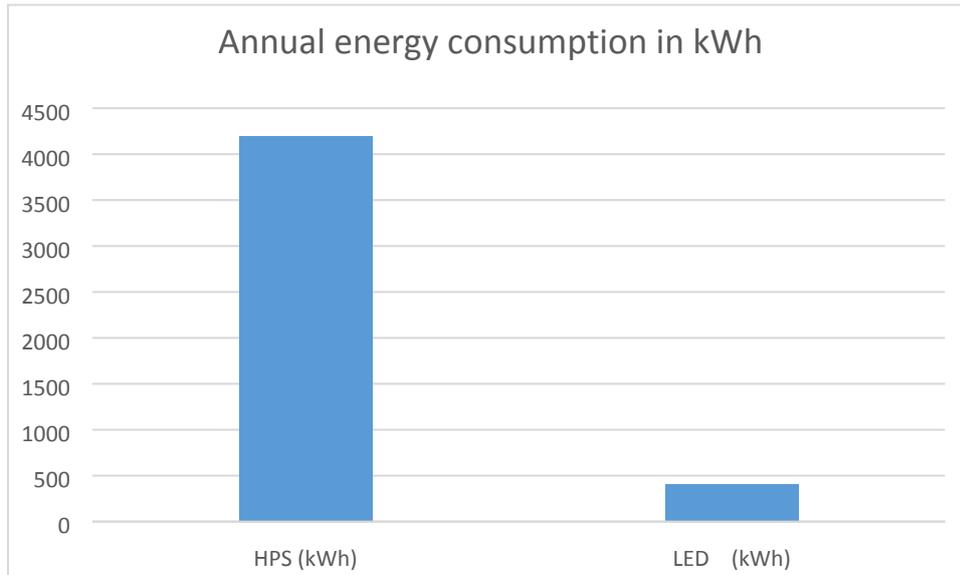
3.6 Projected Benefits to the client.

The reports main objectives include:

3.6.1 Reduce energy consumption.

The team is dedicated to come up with a better lighting solutions for our clients. A solution that will lower energy consumption by 60%. Furthermore a cut on energy costs reduces overall expenditure and increases profits with the same margin.

66 LED lights will consume an estimated 1100 WATS daily and 420kWh annually compared to 4200kWh consumed by HPS.

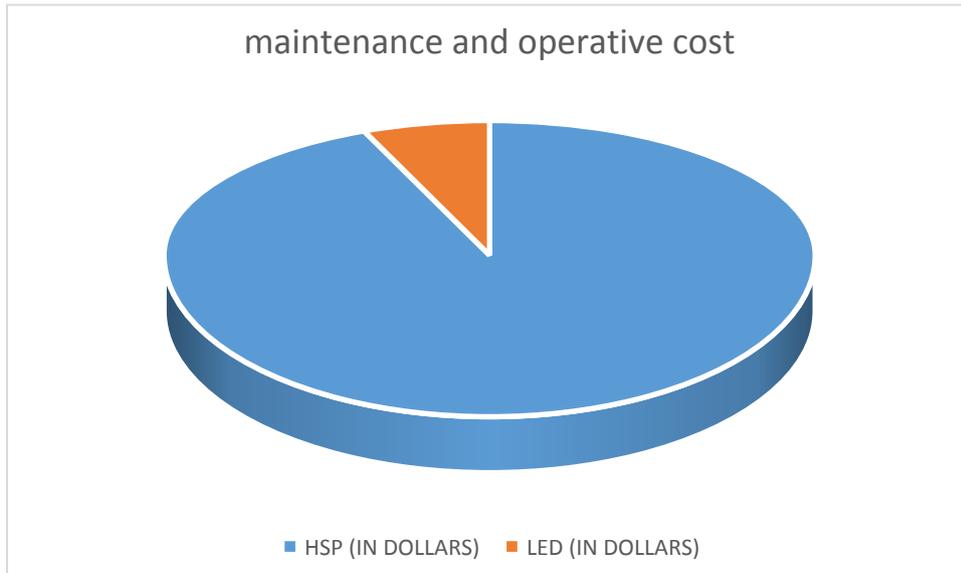


3.6.2 Improve the building appearance.

Tampa electric prides itself in leaving a client's building looking magnificent through installation of unique and beautiful lights that are appealing.

3.6.3 Minimize on maintenance and operative cost.

The report analyses alternatives and recommends an option that will ensure our clients' future expenditure on maintenance is cut. Firstly, by doing away with HPS, the ballast problem will henceforth be a non-issue. Secondly, the report purposes in endorsing a product with longer life span automatically ensuring repair and replace costs are brought down.



3.6.4 Guaranteed return in investment.

Coming up with a system that will ensure the initial capital invested is realised back within the shortest time frame.

4. CONCLUSIONS AND RECOMMENDATIONS

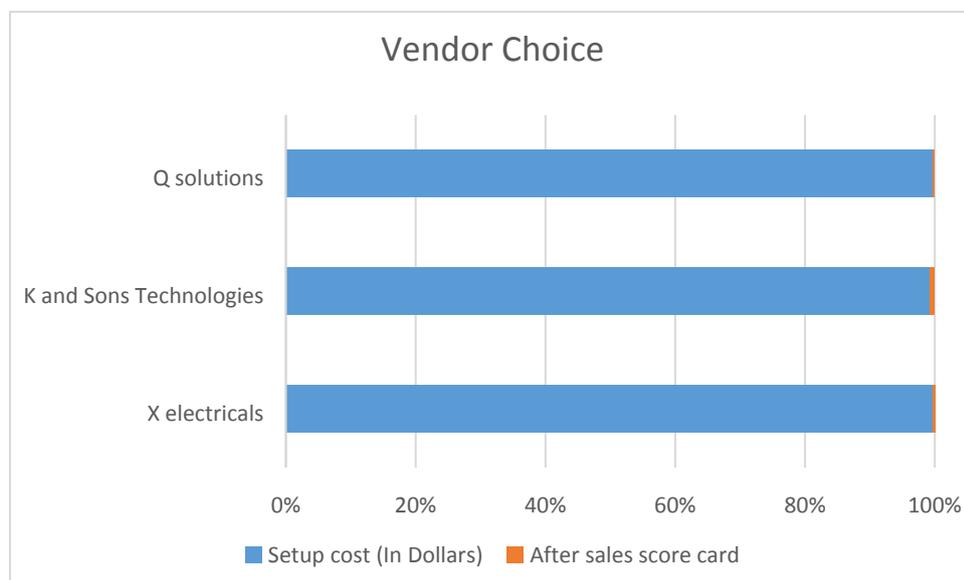
4.1 Conclusion

The analysis clearly point out how inefficient High Pressure Sodium lighting are; they consumes a lot of energy, they are expensive to maintain and have a short lifespan. Our research also ascertained a good lighting ordinance and codes at the clients site that encouraged quality lighting. The HSP lamps consume 4200kWh annually which consequently translates to fat electricity bills.

4.2 Recommendations

We therefore would like to recommend the following measures for your consideration:

Install the LED lighting whose only disadvantages we ran into is a high initial setup cost. We evaluated three different contractors and settled on a 'K and Sons Technologies'. Their offer on the total cost is \$10500, including labour and materials. Notably, they were not the lowest priced vendor, however, they had the best warranty. Their package comes bundled with a 3 year free replacement and labour warranties.



Lastly, According to The Energy and Cost Saving Council, institutions and commercial facilities lighting upgrades attract an average payback time of slightly more than two years with a 45% return on Investment.