

PROPOSAL OF USING LED LIGHT FOR KHAZANAH NASIONAL BERHAD

1.0 INTRODUCTION ABOUT LED LIGHT

LED lighting is truly the next generation technology which features numerous benefits to not only consumers for Home LED Lighting, but businesses alike, with LED Down lighting products and LED Tubes which can replace out-dated, buzzing fluorescent lighting. LED lighting offers such benefits as higher energy efficiency than CFLs and fluorescents, lower power consumption, lower maintenance costs, longer lifetime (**50,000 hours compared to less than 10,000**), durability and brighter light output than conventional fluorescent lighting. LED lighting is slowly filling the Home Lighting and Business Lighting market place with such innovative products as LED T5 and LED T8 Tubes, Flexible LED Lighting, and LED down Lighting.



2.0 NORMAL FLUORESCENT LIGHT

Fluorescent lighting contains toxic materials such as mercury which is harmful to environment and human body. Did you know that if you drop or break a fluorescent bulb you must leave the room for 4 hours, due to the toxic materials floating in the air, which could cause respiratory damage or Asthma in the long run for workers who have to deal with these fixtures daily?

3.0 DIFFERENT POWER CONSUMPTION

Although fluorescent lighting is more energy efficient than incandescent lighting, it is still an energy wasting monster when compared with LED lighting. For businesses that have a large electric bill, switching to **LEDs could cut your energy bill in half**, while still keeping all of the brightness, and no fluorescent flickering! Even with the most advanced state of the art CFLs, fluorescent lighting accounts for a high percentage in existing lighting all over the world, switching from fluorescent lighting into LED lighting can greatly reduce the global lighting power consumption and greenhouse gas emissions.

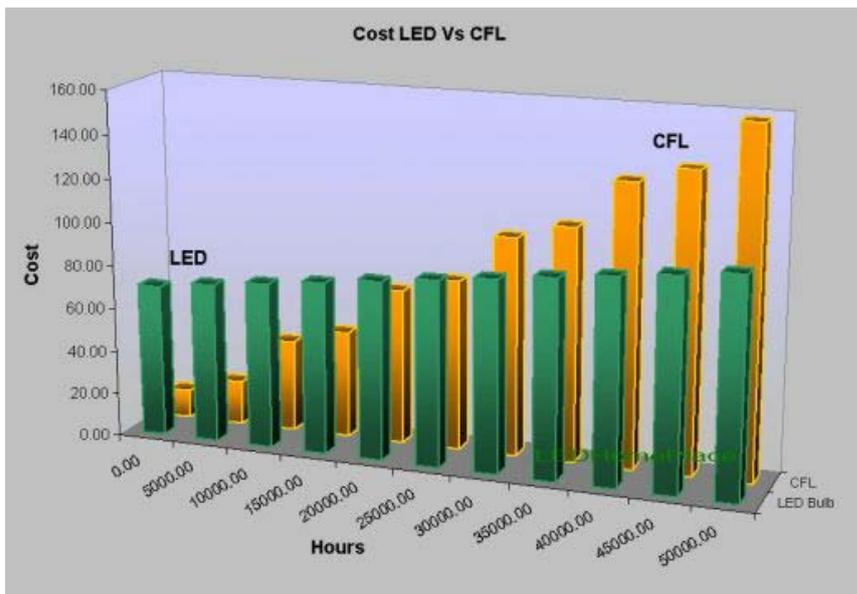
4.0 LED LIGHT ENERGY EFFICIENTCY

First of all, LED lighting is more energy efficient than fluorescent lighting due to the high efficacy of LEDs. LEDs for interior lighting have already broken the efficacy record of 100 lumen per watt, while fluorescent lighting only has an efficacy of around 60 lumen per watt. LED has a power factor of 0.9, which means most of the power is converted into light, but when fluorescent lighting works, a huge amount of power is converted into heat which will be dispersed finally. LED lighting consumes only 30% energy as fluorescent lighting to deliver the same lumen output.

Secondly, Flexible LED lighting has a much longer lifetime than fluorescent lighting since LED lighting is solid state lighting which more stable and reliable. **LEDs can last over 50,000 hours which means 17 years under normal use. Whereas fluorescent lighting only has a lifetime of around 5,000 hours, which means you have to replace them as often.** Using LED lighting can greatly save your expenses which are used to buy new light bulbs and pay for the labour.

For workers and personnel who replace fluorescent tubes at work such as electricians are the most impressed by LED tubes, since they are not only easier to install, requiring no ballast, but they are worry-free, as they can last upwards of 10 years, on for 24 hours a day, and do not contain any toxic materials like mercury dust that fluorescents do. For quick installation, LED tube lighting can be placed and installed directly into existing fluorescent T5 and T8 sized sockets, you only need to remove the ballast, plug the LED bulbs in, and you're done! Contrary to popular belief, LEDs are very easy to install in this day and age, and the bulk of LED products are now "plug-and-play" while still offering a slick look with unmatched energy savings.

Cost of LED Light versus Comparable CFL



Cost versus Hours: When compared to CFL lights the cost of LED lighting is less after about 25,000 hours. Assumptions: LED Bulb: \$70.00, 6 Watts, 50,000 hours, CFL Bulb: \$13.00, 14 Watts, 10,000 hours, maintenance on replacement \$2.00



5.0 ADVANTAGE OF THE LED LIGHT

In addition, the light quality of LED down lighting is much better than that of fluorescent lighting. Fluorescent lighting is always flickering when start up, while LED lighting is quick to start up without any flickering. We all know and have seen or live with flickering fluorescent tubes on a daily basis. They've actually been proven to cause headaches, due to the micro-pulse wavelength they emit. ***Using LEDs can reduce workplace strain, headaches, and increase efficiency, with workers at top performance,*** minus the migraines from CFLs!

When on for hours a day, for a long period of time, fluorescent lighting may have some hot spots due to heat it generates, which does not happen to LED lighting. These hotspots cause the rest of the light to become dimmer, and quickly results in a dead CFL tube, a perfect reason to switch to LED T8 Tubes or T5 tubes, depending on the socket size. Fluorescent lighting / CFL pigtailed can cause eyestrain, but LED lighting does not as a result of its uniform and unparalleled balanced light output, and does not flicker or emit a low pitched humming like the earlier fluorescent technology. Today, Flexible LED Lighting, Home LEDs, and down lights / ***LED Tubes are more eco-friendly than ever, beating fluorescent lighting by upwards of 500%*** - Translation: Savings on your energy bill for both your home and office lighting fixtures. And of course, Fluorescent lighting contains toxic materials such as mercury which can cause air pollution if broken and when thrown out and can cause permanent damage to the lungs and throat / skin if contact is frequent, or daily.

In contrast, LED lighting is solid state lighting which does not contain any filaments that could break (like incandescent) or hazardous materials like CFLs. Someone may say that the upfront costs of LED lighting is too high, due to the technology used to achieve such a high lumens per watt (efficacy) rating, it is true. ***However, think about the long term energy savings, and savings you will get from not needing to replace the lights, for up to 5 or 10 times as long, depending if the light replaced was incandescent or fluorescent. Either way, the more high energy halogen, incandescent, or fluorescent lights you replace, the more money you will save every month.***

Over the full life of the LED fixture / tube or bulb, the money saved by using LED lighting will be enormous? Why's that? When factoring in the true price of lighting, you must include all 3 variables: Upfront costs, maintenance costs, and maintenance man to routinely replace your lights. That is of course, if you aren't using LEDs!

The benefits of LED Lighting are endless. LED Lights are energy efficient, cost effective, durable and more. They are the latest technology in lighting and offer a great alternative in replacing your current halogen or standard lights. Below is a detailed list of some of the many benefits of LED Lighting.



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Energy Efficient

A standard 50W halogen lamp turns 90% of electricity used into heat with only 10% into light. The benefit of LED Lights are that they use only 15% of the energy a standard halogen uses, provide up to 85% of the light output and create less heat making them so cool to touch. This makes LED Lights not only energy efficient but extremely cost effective as air conditioning use can be lowered. Some LED Lights can be operated by mains power, but when used with a Low Voltage LED Driver, LED Lights will produce more light output per watt.

Long Life Span

LED Lights have the benefit of a super long life span of up to 40,000 hours which means you can ***cut maintenance costs as the lamps last up to 8-10 times longer than standard halogen lamps*** making them an ideal replacement.

Improved Durability

LED's have no filaments so can withstand a greater intensity of vibration and shock than standard lights making them durable with less risk of breaking and need to replace.

Compact Size

LED Light bulbs can be as small as 2mm making them ideal for fitting into hard to reach and compact areas.

Fast Switching

LED Lights will start at full brightness, instantly, every time; therefore there is no need for backup lighting. LED Lights are a benefit because they switch on and off instantly making them ideal for flashing signs, traffic signalling and automotive lights, compared to standard compact fluorescent lights which fade in and out or flicker.

Safety

Most LED lights operate at low voltage so are cool to touch and much safer to handle during installation and maintenance and can be exposed to rain and snow.

Environmentally Friendly

The benefit of LED Lights is that they are an eco-friendly form of lighting as they do not contain mercury or other harmful gasses or emit any harmful UV rays. For example, a 13w LED light emits 68% less CO₂ than a standard 40w incandescent bulb running 10 hours per day.

6.0 CONCLUSION

In my opinion, LED lighting will replace fluorescent lighting since it meets the requirements of sustainable development, incandescent lighting, due to energy savings and durability, and halogen lighting due to the heat, safety factor, and of course energy usage! Replace your money hungry lights at the office! ***Go green and truly be eco-friendly with LED lighting***, and don't forget to PROPERLY dispose of CFL lights in a sealed garbage bag (or two or your garbage mans health).



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Information and different between LED, CFL & INCANDESCENT light.

Description	LED	CFL	INCANDESCENT
Ecology and Environment	Very Friendly/Min. Issue	Damaging-Mercury/Argon	Damaging
Heat Issue	Least	Ballast Heat	Largest
Light Control	Most Control	Least Control	Variable Control
Maintenance	Zero	Ballast Issue	Replacement
Weather Temperature Changes	Not Sensitive	Sensitive	Some Sensitive
Effective Lumens	Equivalent	Equivalent	Equivalent



Pengiraan Perbezaan Antara Lampu Kalimantan Biasa Dengan LED

LAMPU KALIMANTANG	LAMPU LED
<p>Setiap seunit terdapat 4 batang lampu berkuasa 72watt. [Setiap unit lampu berkuasa 18watt]</p> <p>Pertama, kira jumlah penggunaan tenaga dalam unit kWj untuk sebulan :</p> <p>(anggaran hari adalah 30 hari);</p> <p>12 jam x 30 hari = 360 jam</p> <p>Penggunaan tenaga dalam sebulan dalam unit kWj:</p> $\frac{72 \text{ W} \times 360\text{h}}{1000} = 25.92\text{kWh}$ <p>Maka kos penggunaan lampu kalimantang untuk sebulan ialah;</p> <p>25.92 kWj x RM 0.28 = RM 7.25</p> <p>RM 7.25 kos untuk 1 unit lampu kalimantang yang beroperasi selama 12 jam untuk tempoh sebulan.</p> <p>RM 7.25 x 12 bulan = RM 87.00 [kos setahun]</p>	<p>Setiap seunit terdapat 4 batang lampu berkuasa 24watt. [Setiap unit lampu berkuasa 6watt]</p> <p>Pertama, kira jumlah penggunaan tenaga dalam unit kWj untuk sebulan :</p> <p>(anggaran hari adalah 30 hari);</p> <p>12 jam x 30 hari = 360 jam</p> <p>Penggunaan tenaga dalam sebulan dalam unit kWj:</p> $\frac{24 \text{ W} \times 360\text{h}}{1000} = 8.64\text{kWh}$ <p>Maka kos penggunaan lampu kalimantang untuk sebulan ialah;</p> <p>8.64 kWj x RM 0.28 = RM 2.41</p> <p>RM 2.41 kos untuk 1 unit lampu kalimantang yang beroperasi selama 12 jam untuk tempoh sebulan.</p> <p>RM 2.41 x 12 bulan = RM28.92 [kos setahun].</p> <p>Penjimatan sebanyak = 66% dari lampu kalimantang biasa.</p>

Formula untuk menentukan kos penggunaan peralatan elektrik:

Pertama, kira jumlah penggunaan tenaga dalam unit kWj;

$$\text{kWj} = \frac{\text{Kuasa (unit Watt)} \times \text{Bilangan jam penggunaan (unit jam)}}{1000}$$

kWj – unit pengukuran penggunaan elektrik

k – 1000W = 1kW

W – watt, iaitu unit bagi pengukuran kuasa

j – bilangan jam

Rujukan.*formula diambil dari Suruhanjaya Tenaga Malaysia.