**JAEI ENVIRONMENTAL CORNER**

***To LED or CFL –that is the question***

Thomas Edison (the man who invented the modern incandescent light bulb as we know it) once said “We will make electricity so cheap that only the rich will burn candles”. While we appreciate the philanthropic nature of his comment, he never would have predicted just how much it costs to power the light bulbs that illuminate our homes more than a century later.

Choosing a light-bulb used to be a fairly simple process. Today however, there are so many factors to take into consideration such as the type of globe, the environment, its lifespan, the quality, the price and the electricity cost. South Africa’s energy policy stipulates that by 2016, *all* conventional (incandescent) light-bulbs must be replaced with energy-efficient ones. . *Incandescent era,* ***RIP****. Like it or not, it’s time to move on! ……..*

That’s the way the world is moving – most recently in the US, where the Energy Independence and Security Act effectively killed off lower-output incandescents from 1 January simply by requiring them to be about 25 per cent more efficient. That efficiency gain is impossible to achieve without decreasing their luminous flux (brightness), so, instead, manufacturers have shifted to more energy-efficient technologies, such as compact fluorescents (CFLs), halogens, and LEDs.

South Africa is not that far down the road, but we’re headed there.

Already in 2011, this country banned the import of incandescents. The fact that, three years later, these lightbulbs are still freely available on your local supermarket shelves suggests that the importers simply rushed out and brought them in by the shipload before the deadline. In the interim, changes are being phased in. New buildings that exceed a certain energy requirement must incorporate energy-efficient lighting right at the design stage.

Of course, not everyone is embracing these next-gen lightbulbs. Some wonder why we need a mandate to use them, if they’re so great. The fact is, after more than a century of incandescents, we’ve become attached to them. They’re cheap, they dim predictably, and they emit a warm and familiar glow. Weaning ourselves off them won’t be easy.

So, what now? According to a survey by switch manufacturer Lutron, two-thirds of American adults are aware of the phase-out, but only one in 10 are “very knowledgeable” about replacement options. Most of us will probably buy halogens without even noticing. They are cheap and they look, feel and function almost exactly like traditional incandescents. But they’re only about 25 per cent more efficient. Meanwhile, CFLs, which are inherently flawed and generally unpopular, are steadily losing market share.

That leaves LEDs, which offer the most sustainable - and exciting - alternative to incandescents. For starters, they’re highly efficient: the average efficacy of an LED bulb is 78 lm/W (lumens per watt), compared with around 13 lm/W for an incandescent and approximately 18 lm/W for a halogen equivalent. Yes, LEDs have their shortcomings: buying an LED bulb doesn’t seem as intuitive as picking up an incandescent from your local convenience store, and the up-front cost is high. But once you get to know the technology and the incomparable versatility that LEDs offer, you’ll see the demise of the incandescent as an opportunity.

**So what to choose – LED or CFL** \*

(\* - Light emitting diode / Compact Fluorescent Light)

|  | **LED (Light Emitting Diodes)** | **CFL (Compact Fluorescent Light)** | **Incandescent** |
| --- | --- | --- | --- |
| **Energy Efficiency & Energy Costs** |
| Average lifespan | 15 000 – 25 000 hours | 8 000 hours | 1 200 hours |
| Watts of electricity used | 3 – 10 watts | 9 – 24 watts | 40 – 100 watts |
| Kilowatts of electricity used (based on 5 hours per day – **home** use) | 5.5 – 18.25 KWh/yr | 16.5 – 44 KWh/yr | 73 – 182.5 KWh/yr |
| Annual operating cost (based on R1.40 per KWh – **home** use) | R 7.70 – R 25.60 per yr per bulb \* | R 23.10 – R 61.60 per yr per bulb \* | R 102 – R 255.50 per yr per bulb \* |
| Kilowatts of electricity used (based on 10 hours per day – **office** use) | 11 – 36.5 KWh/yr | 33 – 88 KWh/yr | 146 – 365 KWh/yr |
| Annual operating cost (based on R1.40 per KWh – **office** use) | R 15.40 – R 51.20 per yr per bulb \* | R 46.20 – R 123.20 per yr per bulb \* | R 204 – R 511 per yr per bulb \* |
| **Important Facts** |
| Sensitivity to low temperatures | Limited | Yes – may not work in extreme temperatures | Some |
| Sensitive to humidity | Limited | Yes | Some |
| On / off cycling | Limited | Yes  – can reduce lifespan drastically | Some |
| Turns on instantly | Yes | No – takes time to warm up | Yes |
| Durability | Mostly durable – LEDs are resistant to rough handling | Not very durable – glass can break easily | Not very durable – glass or filament can break easily |
| **Summary** |
| **LED (Light Emitting Diodes)** | **CFL (Compact Fluorescent Light)** | **Incandescent** |
| * Uses 10% less energy than CFLs
* Contains a negligible amount of mercury
* Long-term lifespan
* Most energy efficient
* Versatile for residential and commercial use
* Rarely needs replacing
* Emit little heat
* Bulb is hardy
* Most sustainable
* Consumes least power
* Widely used in electronic devices
* These bulbs fit in standard light fixtures with no adaptor necessary.
* LED makes very nice lighting for effect and decorative purposes.
 | * Use 60% less energy than incandescents
* Contains mercury
* Not easily recycled
* Medium-term life span
* Energy saving
* Relatively inexpensive
* Fragile
 | * In process of being phased out completely
* Contains no mercury
* Short-term life span
* Cheap
* Dim predictably
* Fragile
 |

**A little info about LEDs & CFLs**

**LEDs**

LEDs are the most energy efficient lighting on the market. They may cost more upfront, but have a longer lifespan (between 20 & 30 thousand hours) and are far lighter on electricity (compared to conventional (incandescent) lighting. This makes LEDs a better overall investment. As they increase in popularity the prices should stabilise. It is wise to always use a credible and reputable brand which offers a warranty on their products.

LEDs are generally excellent for lights under cabinetry, but not as suitable to table lamps.

**CFLs**

CFL, or compact fluorescent, is simply a mini version of a standard fluorescent light bulb. However, these bulbs fit in standard light sockets without any adaptor. The light appears much like the incandescent light we’re used to, and looks nothing like the harsh lighting we associate with offices or school buildings.

The primary disadvantage to CFL lights is the mercury contained in the bulb. This is ordinarily not a problem, but if the bulb breaks clean-up is a hassle. Mercury is a dangerous heavy metal, and proper clean-up and disposal of CFL bulbs is critical. CFLs cannot be disposed of with normal household rubbish.

**You need to factor in the purchase price of the bulbs to get a true reflection and these guidelines will help:**

1. The average price for **LED bulbs** is around R100.00 and, using the above averages, a bulb will last 10 years or cost you a total between R17.70 and R35.00 per year
2. The average **CFL** price is around R20.00 and, using the above averages, a bulb will last 4 years or cost you a total between R28.10 and R65.60 per year
3. The **Incandescent** bulb average price is around R10.00 and, using the above averages, a bulb will last 8 months or cost you a total between R102.80 and R256.30 per year

*(All based on 5 hours daily home use at R1.40 per KWH).*

### **Remember to use the lowest-wattage bulbs for lights that are always on. The efficiency is simple – Higher lumen output at lowest wattage = MOST EFFICIENT**

**Of course the expected savings will fluctuate wildly if:**

1. You purchase cheaper bulbs that last for less time
2. You stay in an area where the electricity charges are different

*By the way* - The idea that lights use extra electricity to start up is a myth. You’ll save electricity every time you turn the lights off.

**Aren’t LEDs expensive?**

The days of the R400 LED bulb are over. As demand has increased and manufacturing processes have become more streamlined, costs have plummeted. LED bulbs consume one-sixth the energy of incandescents and last up to 25 times longer. Replacing a 60-watt incandescent with an LED equivalent will save you a fortune in energy costs over the new bulb’s lifetime.

Even at current prices, though, here’s a statistic to make you sit up and think: “By switching to LED you could amortise your costs within 13 to 14 months. Even less if energy costs continue rising as they are.”

Lightbulb packaging should allow easy comparisons between similar bulbs without relying on watts as the sole indicator of performance. It gives information about the bulb’s brightness (in lumens); yearly cost (based on 3 hours of daily use); life expectancy (in years); light appearance, or colour temperature, measured in Kelvins (K); and energy consumed (in watts). Remember - an LED bulb’s wattage rating doesn’t indicate its brightness; its lumens rating does.

B***OTTOM LINE – LEDs ROCK!!!! – That’s the way to go!***

**Here’s some good news! …….**

***Ongoing Lighting***

*Ongoing Lighting* is a local company (in Kempton Park) manufacturing cost effective LED light bulbs. The company is owned by 5% women with disabilities, 5% by women living with HIV and the balance by a family trust.

*Ongoing Lighting’s* prices are marginally lower than those bought in stores and hold a 30000 hour guarantee. A percentage of sales of their products bought directly through *Ongoing Lighting* by any Parish or members of congregations within the Johannesburg Diocese will be donated to **JAEI**.

* Do contact them via Connie Nkosi at lydia.nkosi@ongoing.co.za / 082 069 7440 for their catalogue and price list.