

## **Replacing Incandescent and Florescent lights with LEDs: A No-Brainer**

One of the least expensive and most cost-efficient ways of reducing energy consumption is replacing incandescent and florescent light bulbs with LEDs. For the same amount of light, LEDs consume about one-sixth as much power as an incandescent bulb and about one half as much as a florescent bulb. Not only that, but florescent bulbs, in particular, contain mercury (which means that they have to be disposed of carefully) and take several minutes to reach full brightness.

LEDs are now available in the full range of nominally-white shades, from the warm yellowish light associated with incandescent bulbs to bright, bluish lights suitable for high-intensity lighting in shops, as well as various colors (e.g. Christmas tree lights). They are also available in nearly all sizes shapes, and bases, and also in various specialty shapes, such as strip lights. Tube lights are available that can directly replace florescent tubes in existing fixtures. Both dimmable and non-dimmable types can be purchased.

The cost of LEDs has also declined rapidly, so that the decision to upgrade to LEDs is now easier than ever. For example, (and based on current prices at a local hardware store) packs of four “60-watt equivalent” dimmable LED lamps were on sale for \$7.88. These bulbs had a manufacturer-estimated lifetime of 13.7 years, based on three hours per day usage, and consume 9 watts of power.

Packs of four “high efficiency” incandescent “60-watt equivalent” bulbs were selling for \$4.67. These bulbs had a manufacturer-estimated lifetime of 0.9 years, also based on three hours per day usage, and consume 43 watts of power for the same amount of light.

Based on the above, the cost difference per bulb, including sales tax, is \$0.87. The difference in electrical power consumed is 34 watts. Using the manufacturer’s estimate of 3 hours per day usage, the annual difference in energy consumption will then be 37.23 kWh. At our local power rate of about \$0.07/kWh (Clallam PUD – other areas’ rates will differ slightly), the annual power cost savings will be \$2.61 when using the LED bulbs. Otherwise stated, the higher initial cost for the lamps will be repaid in just the first four months of electricity cost reduction.

In addition to energy usage, there is an addition savings in replacement cost. The annualized replacement cost for the LED bulbs is \$2.14 (the initial cost including tax) divided by their predicted 13.7 year lifetime, or \$.16, while the annualized replacement cost for the incandescent bulbs is \$1.27 initial cost divided by their 0.9 year lifetime or \$1.41, for an additional savings resulting from the use of the longer-life LEDs of \$1.26.

**Adding the annual energy cost savings and the replacement cost savings, the total savings through use of LED lights is \$3.87, meaning that the higher additional cost for the LEDs is repaid in under three months.**

While the savings will be different for various sizes and types of bulbs, there are few applications where it is not a no-brainer to replace incandescent bulbs with LEDs (except in high-temperature applications such as ovens and clothes dryers).