

Energy Conservation during difficult times:

Everyday in the modern developed world, energy is wasted in many different and mostly needless ways. Lamps are so much a common day part of life that people take them for granted and never really look into the cost of keeping a lamp running. In this essay, I will talk about: The types of lamps, how to save energy during these tough economic times, basics of lamp life, and different color types of lamps.

The bulb as we know it today was invented in the early 1900's by Thomas Edison uses a spiral filament through which electricity flows. The high resistance of the filament causes an energy transfer into heat and light. More than 90% of the electricity is converted into heat, with the remainder giving out light, which is the intended purpose. Just try to touch a light bulb after it's been switched on to get an idea how hot it gets (3000 degrees Celsius to make it glow).

So by simply being switched on, the humble light bulb wastes huge amounts of energy. Just think, if you have a 60 Watt light bulb, you may be lucky to have 6 Watts of your electricity turned into light, with the rest heating up the room or even worse; the outside. Most houses have at least a couple of these bulbs in each room. If say we have 5 rooms with 2 bulbs each at 60 Watts, all on at once (this is quite conceivable) then you are using 600 Watts, with around 540 Watts being turned into heat. Note that I'm being rather conservative with the efficiency here - most bulbs are probably worse.

A simple solution is to change these prehistoric relics from the dim (literally) and distant past: install low energy bulbs or Compact Fluorescent Lights (CFLs) as they are known commercially. Although more expensive than a 'normal' bulb, it will last at a great deal longer than the standard incandescent lamp. A compact fluorescent light bulb (CFL) is fluorescent lighting designed to be used in a standard (incandescent) light bulb socket. Fluorescent lighting works by passing a current through a gas-filled tube. Incandescent light works by heating up a metal filament until it is white-hot. Incandescent bulbs produce mostly heat, which is why a fluorescent using only 13 watts of electricity can produce light comparable to an incandescent hogging 60 watts.

Consider how often you replace your incandescent light bulbs and add up the cost over a year and then add it to the cost of electricity you waste using inefficient bulbs. Then, if you're still not convinced, consider that if each of the 20 million households in the US changed just one conventional light bulb to a CFL we could drop power consumption by 75%. Replace all the light bulbs in Europe to CFLs and we could save the emission of 28 million tons of carbon.

So, first steps would be to simply switch off your unused lights - it makes sense. Then, change your existing bulbs into energy saving ones. Sure it might be a little expensive but they'll last for years and save you money as well as cutting the environmental cost. Each 13-watt CFL, over the expected 10,000 hour life of the bulbs, will save 470 kilowatt-hours (kWh) of electricity as compared to 60-watt bulbs. This translates to a global warming-fighting reduction of over 730 pounds of carbon dioxide. It also means a reduction of 1.6 pounds of nitrogen oxides (which contribute to ozone and acid rain) and 4.3 pounds of sulfur dioxide (which contributes to haze and acid rain), and makes significant reductions in other impacts of coal-produced power such as mercury pollution and destruction of forest and stream habitats in mining areas. For larger scale projects besides individual homes like HOA's, Lighting Technology Services, can work with the local utility company to change all the incandescent lamps over to Compact Florescent Lamps and get a rebate back over to the HOA for their efforts to go green and save electricity as a community.

In the end, for most home and/or Communities the bottom line is the cost. Everyone community meeting I have been to has been trying to find ways to cut cost and defer maintenance to save money. However this is not the best way to proceed as the community will only incur larger costs in the long run. No one likes to spend money on projects during times of a recession but based on Lighting Technology Services and that of the local utility provider (Edison, Department of water and Power, SDGE, ect.), survey of the communities can be done to show how much of a return on investment and rebates available for communities to switch from incandescent lamps over to compact florescent. Communities can save

hundreds and even thousands of dollars if they would all convert from their current incandescent lamps to that of a compact florescent lamp. Please view the module below base on converting one incandescent lamp over to compact florescent.

Based on 10,000 hours of light	Compact Florescent Lamps (CFL)	Incandescent
Energy Input (watts)	13	60
Light Output (lumens)	810	830
Useful life (hours)	10000	1500
# Bulbs for 10,000 hour	1	6.7
Bulb Costs	1 @ \$4.00 = \$4.00	6.7 @ \$0.32 = \$2.14
Electricity Used (kilowatt hours)	130	600
Electricity Cost (@ \$.08 per kwh)	\$10.40	\$48.00
Total Cost (Electricity + Bulb)	\$14.40	\$50.14
Cost saving in using a CFL - \$35.74, or 71%!		

Communities that are already active in changing out incandescent lamps may start to ask why some of their lamps die out before their rated life as advertise by the manufacture. To determine the average rated life of a lamp a large quantity of the lamps are operated under controlled conditions for an extended period of time. The life rate is determined by the time in hours that it takes half of the test lamps to stop operating. Because the test is performed under controlled conditions, the average rated life of a lamp does not tell you how long a lamp or a group of lamps will last in a particular application. So a lamp rated at 10,000 hours on the average, half will fail before the rated 10000.

Another issue that generally comes across when changing out incandescent lamps to compact florescent is that they never really look at the color that is given off by the lamps. Many people assume that all lamps emit the same color. However, each compact florescent lamp gives off 3 main types of color. The first type is Soft White (2700 Kelvin) which emits a yellow light. The second is Bright White (4100 Kelvin), which emits white. The 3rd and least known is Day Light (5000 Kelvin), these lamps emits a light bluish color which is the same light as day light. The reason why they have different light setting is due to the amount of florescent gas put into each lamp. The more the florescent the brighter the emitting light becomes. That's why it is imperative that people do not just buy the lamp that is on sale at the local store but rather look closely at the lamp color printed on them so that they can purchase the correct lamp type to fit their home and/or community. If not they will have an assortment of different color lamps all over their home and/or community.

In the future, it is predicted that in 10-15 years time, 90% of lighting will be produced using Light Emitting Diodes (LEDs) and/or Plasma rods (currently under testing). These devices utilize semiconductor technologies that exceed even the CFLs for efficiency and lifetime. You may have noticed car manufacturers using LEDs in the dash cams of all new model cars. As we all push towards the future, we can all hope that what we do today will be for a better tomorrow. The seeds that we plant for the future, we instill in the next generation to follow and will be a better and brighter one as they reap the rewards of what our generation has done for them.

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