LIFE CYCLE COST ANALYSIS

Performing a life-cycle cost analysis (LCC) gives the total cost of a lighting system—including all expenses incurred over the life of the system. This analysis can be applied not only to lighting but for most of the appliances, automobiles, heating systems, and so on, when two systems are compared to determine the most cost effective options.

There are two reasons to do an LCC analysis:

1. To compare different systems or bulbs in this case
2. To determine the most cost-effective system or a bulb

For some lighting systems, one of two situations may exist:

1. The initial cost may be high but the energy costs will be low over its life time.
2. The initial cost to buy a bulb or a system and the energy or the maintenance costs may be low, but the useful life of such an bulb or system may be short. (In this case, we may have to replace the appliance several times to get the same useful life as the other option.)

Therefore, a life-cycle cost (LCC) analysis can be helpful for comparing the total costs incurred over the lifetime of a lighting system. It is, in essence, calculating all the costs incurred to buy, maintain, and run the system over its lifetime.

In the formula above,

- **Cost to buy** is the purchase price of the bulb or the system.
- **Cost to maintain** is the cost incurred to maintain it in good operating condition. (For example in the case of a car, engine oil change every 3,000 miles is part of maintenance costs.)
- **Cost of energy** is the energy or the fuel it takes to run the appliance or bulb for its life time.
- **Replacement cost** is the cost to replace the bulb. If bulb A has a life of 1000 hrs and bulb B has a life of 10,000 hours, then Bulb A needs to be replaced 10 times to get the same useful life period as that of bulb A. Therefore, 10 A bulbs need to be purchased for each of Bulb B.

The table below shows a life cycle cost analysis in comparing an incandescent bulb and a CFL.

Life Cycle Cost Analysis, Incandescent bulb vs CFL bulb		
	Incandescent	**Compact Fluorescent Light (CFL)**
Rating	60 Watts	15 Watts
Lumen output	865 Lumens	900 Lumens
Cost to buy the bulb ($)	$0.60	$5.00
Life of each bulb	1,000 h	10,000 h
Bulbs needed for same life	10 bulbs - $6.00	1 bulb - $5.00
Energy Consumption	60 Watts x 10,000 h 600,000 Wh = 600 kWh	15 Watts x 10,000 h 150,000 Wh = 150 kWh
Price of electricity	$0.085	$0.085
Cost of Electricity needed for 10,000 h	600 kWh X 0.085/kWh = $51.00	150 kWh X 0.085/kWh = $12.75
Total Cost (Life Cycle costs) to own and operate the bulbs for 10,000 h	51.00+6.00 $57.00	12.75+5.00 $17.75

This analysis shows clearly that each incandescent bulb replaced with a CFL which would fit into a regular incandescent bulb fixture would save about $29.25 over 10,000 hours of operation. Imagine the number of bulbs that you have at home. Living room, kitchen, bath rooms, bed rooms, table lights, floor lamps, ceiling lights, closets, garage, basement, and so on. There are energy saving options all over the home.

Although they save energy, there are some disadvantages with CFLs:

- They are often physically larger than the incandescent bulbs they replace and simply may not fit the lamp.
- The light is generally cooler—less yellow—than incandescent light bulbs. This may result in less than pleasing contrast with ordinary lamps and ceiling fixtures. Newer models have been addressing this issue.
- Some types (usually iron ballasts) may produce an annoying flicker.
- Ordinary dimmers cannot be used with compact fluorescents.
- Like other fluorescents, operation at cold temperatures (under around 50–60 degrees F) may result in reduced light output.
- There may be an audible buzz from the ballast.

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