



Student Assignment #2

CFL Replacement Worksheet: Cost-Benefit Analysis

Five most used bulbs: Incandescent vs. Compact Fluorescent

Table 1 – Calculate the total kWh for the 5 most used incandescent bulbs and the amount of kWh that would be use if these bulbs were replaced with 5 reduced wattage compact fluorescent light bulbs.

Watts x hours = watt hours (Wh) Wh x 365 = Wh/year Wh/year ÷1000 = kWh/year

		Existing incandescent light bulbs				Replacement compact fluorescent				
	Wattage (W)	$\frac{\text{Hours}}{\text{day}}$	$\frac{\text{Wh}}{\text{day}}$	Wh/year	kWh	Reduced Wattage	$\frac{\text{Hour}}{\text{day}}$	$\frac{\text{Wh}}{\text{day}}$	Wh/year	kWh
1										
2										
3										
4										
5										
Total kWh for 5 incandescent light bulbs						Total kWh for 5 CFL bulbs				

Table 2 – Compare the amount of carbon dioxide (CO₂) and nitrogen dioxide (NO₂) emitted by the 5 incandescent and compact fluorescent light bulbs

5 BULB REPLACEMENT EMISSION COMPARISON INCANDESCENT vs. COMPACT FLUORESCENT		
	Incandescent	Compact Fluorescent
5 bulb total (kWh)		
CO ₂ produced @ 0.94 lbs/kWh		
CO ₂ not emitted by switching 5 bulbs		
NO ₂ produced @ 0.0120 lbs/kWh		
NO ₂ not emitted by switching 5 bulbs		

Five most used Incandescent vs. Compact Fluorescent Light Bulbs

Table 3 – Compare the total price paid for the incandescent light bulbs and the compact fluorescent light bulbs. Note: Incandescent light bulbs last approximately 1000 hours and compact fluorescent bulbs last approximately 10,000 hours

5 BULB REPLACEMENT COST COMPARISON INCANDESCENT vs. COMPACT FLUORESCENT		
	Incandescent	Compact Fluorescent
Number of Bulbs / 10,000 hours	50	5
Price of each light bulbs	\$0.75	\$6.00
Total Cost of Bulbs	\$37.50	\$30.00
Total kWh for the 5 bulbs (Table 1)		
Total Cost of Electricity (\$0.15/kilowatt-hour)		
Total Cost over 10,000 hours (bulbs +electricity)		
Total potential savings from changing my 5 most used bulbs		