Use Compact Fluorescent Lights to save money

Introduction

Many building and home owners in Michigan use incandescent light bulbs. For the most part they are unaware that there is an alternative which will provide the same light levels at a much cheaper operating and maintenance cost. They are unaware that large savings on their electrical bill are as easy as changing a light bulb.

A Compact Fluorescent Lamp (CFL) is a fluorescent light bulb made to be used in the same manner that incandescent light bulbs have been used traditionally. A CFL provides the same light output as an incandescent bulb, but typically uses only a quarter of the energy that an incandescent would. CFLs also put out only a fraction of the heat that incandescent bulbs put out. This saves even more on electric bills in buildings with air conditioning and makes buildings without air conditioning more comfortable in the summer. Besides saving so much energy, a CFL lasts about 5 to 15 times longer than a standard incandescent bulb. Therefore, by using CFLs a building or home owner can save money in heating and cooling costs and on the amount spent on purchasing light bulbs.

This handout will show you how to use CFLs to reduce your electric bills, cut down on light bulb costs, and cut down on the number of times you have to change your bulbs each year. There may be some variance in the costs included in this handout. This is due to price differences in different areas of the state and the availability of the products to suppliers in each area. Also, the actual savings achieved will depend on many variables, such as changes in building structure and usage, variations in electricity prices, and weather conditions.

Description of CFLs

CFLs come in three basic types: Self-ballasted, Adapter kits, and new fixtures. Following is a brief description of each type of bulb and in what situations it is best used.

Self-ballasted (Screw-in) CFL

This CFL is a one piece fluorescent bulb and ballast combination. The ballast end of the unit screws directly into an ordinary incandescent light socket just like an incandescent bulb. Because the bulb is not separable from the unit, when the bulb burns out the entire unit is disposed of and replaced. This CFL is the easiest to install and replace. It is very well suited to retrofits in buildings where there are no addition or extensive remodeling plans. These bulbs are available in many different shapes to make them more visually appealing and to give them a wider variety of applications.

Adapter Kit CFLs

This CFL involves two pieces. One piece is a ballast which screws directly into an ordinary incandescent light socket just like an incandescent bulb. This piece is called the adapter. The second piece is the fluorescent bulb which plugs into the ballast. This allows the ballast to be used through the life span of more than one bulb. This CFL is also very good for most retrofits. It is especially useful for retrofits in buildings where some dedicated ballast CFLs are already being used, or in building which may have dedicated ballast CFLs in an upcoming addition or remodeling. It combines the convenience of using current like sockets with the practicality of being able to change just a bulb and not the ballast every time. The draw back is that the lamp and adapter combination is long and will not fit in short enclosed fixtures.

New fixtures

This CFL requires a new fixture which includes a CFL ballast. The bulbs are separable from the fixture and plug in making bulb changes easy. These lights use the same type of bulbs as the adapter kits. This CFL is an excellent choice for new construction, building additions, and extensive remodeling because the fixture requires installation by an electrician. It is the most visually appealing because the ballast is usually more hidden than with the other two types of CFLs.

Information Sheet

This page will assist you with gathering the information needed to perform the calculations on the worksheet.

Given Information:

- For existing 100, 95, & 90 Watt incandescent bulbs, use a 25 Watt CFL.
- For existing 75 & 65 Watt incandescent bulbs, use a 20 Watt CFL.
- For existing 60, 55, 52, & 50 Watt incandescent bulbs, use a 15 Watt CFL.
- For bulbs which are higher or lower in Wattage than those listed, bulbs that are used with dimmer switches, and flood or spot light bulbs contact a lighting supplier or call your State of Michigan Energy Engineer at (517) 241-6154.
- Use a cost of $10 per bulb for 25, 20, & 15 Watt CFL bulbs.

Information you must find:

- Make a list of the incandescent bulbs in your building. Include the location and wattage of each bulb.
- Figure out how many hours each bulb is on per year. It may be easiest to determine the hours per week and multiply by 52 weeks. A rough estimate will usually be good enough.

  Example: 100 Watt light in entryway: on approximately 2 hours each day, 5 days each week

  (2 hrs/day) X (5 days/week) X (52 weeks/year) = 520 hrs/year
- Find out your price for electricity. This can be found from your electricity bills by dividing the cost of a month by the number of kiloWatt-hours (kWh) used that month

  Example: Your bill might look like this:

ELECTRIC USE **1351** KWH	$138.12	
MICHIGAN SALES TAX	$8.29	
CURRENT UTILITY CHARGES		**146.41**

Your electricity price, in this case, is: ($146.51) / (1351 kWh) = $0.108/kWh

You may want to add up the total uses and costs of all your bills for one year and divide the total cost by the total use to get a more accurate number.

If no bills are available use $0.10/kWh as your electricity price.

CFL Worksheet

This worksheet will show you how to use self-ballasted CFLs to reduce your electric bills, cut down on light bulb costs, and cut down on the number of times you have to change your bulbs each year.

1. Multiply the wattage of the current bulb by the number of hours it's used each year and divide by 1000 to get the kilowatt-hour usage per year.

   _____Watts **X** _____ hours/year **/** 1000 **=** _____ kWh/year

2. Multiply the answer from 1. by the electricity price from the information sheet. This will give you the operating cost of that light for one year.

   _____ kWh/year **X** $_____/kWh **=** $_____/year

3. Repeat 1. & 2. using the correct CFL wattage from the information sheet. Use the same hours/year and the same electricity cost as you did in 1. & 2. This will give the usage per year and operating cost for one year of using a CFL for that light.

   a) _____Watts **X** _____ hours/year **=** _____ kWh/year

   b) _____ kWh/year **X** $_____/kWh **=** $_____/year

4. Subtract the answer of 3. b) from the answer of 2. to get the difference in operating cost of a CFL versus an incandescent. This will be the amount of money you should save each year by operating that light with a CFL instead of an incandescent.

   $_____/year (2.) **-** $_____/year (3. b)) **=** $_____/year (savings)

5. Divide the cost of the CFL ($10) by the savings. This will tell you how long, in years, it will take for the CFL to save as much money as it cost. This is called simple payback. ($10) **/** ($_____/year (savings)) **=** _____ years

6. Divide 1,000 by the hours/year to find how long an incandescent bulb will last in your light. Divide 10,000 by the hours/year to find how long a CFL bulb will last in your light.

   a) (1,000) **/** (_____ hours/year) **=** _____ years (incandescent)

   b) (10,000) **/** (_____ hours/year) **=** _____ years (CFL)