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LIGHTING FOR LESS



A Guide to Efficient Lighting

Household lighting can consume up to 20% of the total household energy in Abu Dhabi. After cooling, lighting accounts for the next most significant portion of a residence’s electricity use and its effective use can produce energy savings for a residence quickly and easily. Understanding how lighting impacts your electricity bill is important. This guide will help you learn how to implement lighting in your residence efficiently and also how you can reduce your monthly bill.

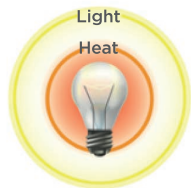
Lighting Types

Lighting options typically range between incandescent light bulbs (the original form of the light bulb and a highly inefficient option), light emitting diodes (LEDs) or compact fluorescent lamps (CFLs). **Figure 1** provides a description of how each incandescent, LED, and CFL fixture generates light from the electric source.

Figure 2 provides a side-by-side comparison of the electricity use and the lifetime for the three different lamps. LEDs and CFLs are the popular options worldwide to replace existing inefficient incandescent lamps. LEDs are becoming

increasingly more popular due to their long fixture life (LEDs can last up to 10 times longer than CFLs) and low operating costs, and new technologies have led to a decrease in their purchase price in the market. Although CFLs have been criticized over the years due to mercury content in the lamps that can lead to environmental damage, however, they can be considered as an alternative to incandescent lamps provided they are disposed of properly.

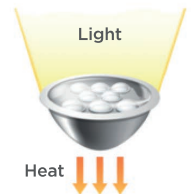
Figure 1. Descriptions of how electricity is generated into light for each fixture



Incandescent bulbs create light by passing electricity through a metal filament until it becomes so hot that it glows. Incandescent bulbs release 90% of their energy as heat.



In a CFL, an electric current is driven through a tube containing gasses. This reaction produces ultraviolet light that gets transformed into visible light by the fluorescent coating (called phosphor) on the inside of the tube.



LED lighting products use light emitting diodes to produce light very efficiently. The movement of electrons through a semiconductor material illuminates the tiny light sources we call LEDs. A small amount of heat is released backwards into a heat sink. In a well-designed product, LEDs are basically cool to the touch.

When lighting a space, it is important to choose the lamp with the highest efficiency as well as providing the proper illumination for the space or task. Using a CFL or LED will significantly slash your energy bill. Although initially more expensive the incandescent lamp, the payback period of the efficient lighting is quite fast, and the bulbs have a longer lifetime. It is important to assess each room and choose the lighting that is most efficient, in terms of illumination, brightness, and lifetime for each room.

Figure 2. Comparison of incandescent, CFL, and LED electricity use and lifetime



Common 60W Incandescent Bulb
uses 60W per bulb for 800 lumens
1 bulb lasts 1,200 hrs
20 years = 21 bulbs



Common 14W CFL Bulb
uses 14W per bulb for 800 lumens
1 bulb lasts 10,000 hrs
20 years = 3 CFL bulbs



12.5W Ambient LED Bulb
uses 12.5W per bulb for 800 lumens
1 bulb lasts 25,000 hrs
20 years = 1 LED bulb

Lighting Recommendations

Lighting illumination is an important factor to consider for efficiency and comfort. Depending on the space, illumination and brightness can vary significantly for comfort. To create the right ambience for a room, lumens (the total amount of visible light emitted by the fixture) should be considered, not the power wattage of the lamp. For lightly lit areas, purchase an energy efficient bulb with lower lumen ratings, and for brighter light, purchase an energy efficient bulb with higher lumen ratings. For example, in a television room, when the TV is on - most lights can be switched off in order to utilize the brightness from the television. Switching off most of the lights when watching television is both more comfortable for the eyes and helps reduce electricity consumption from lighting. Therefore, the artificial light in a television room can be LEDs with low lumen ratings, to be switched on if more light is needed.

Utilizing the natural sunlight from Abu Dhabi is an important factor. It should be a goal to not use artificial lighting during daylight hours as long as cooling is optimized as well. Keeping the drapes closed optimizes cooling in the room, as the strong heat associated with Abu Dhabi's sunlight can increase the temperature of a room naturally. Therefore, it is important to switch off the lights when leaving a room as well as keeping the drapes shut in order to minimize electricity usage from both lighting and cooling.

If the room is occupied, natural sunlight can be used rather than artificial lights as long as excessive cooling demands are not required. Abu Dhabi residents tend to over light spaces in their household, consuming unnecessary energy levels - it is important to assess how much lighting you really need in each room and switch off any unusable lights. Keeping the drapes open during the day and switching off the artificial lights can help reduce your electricity bill - this is easily applicable in living rooms, as most living rooms have sufficient natural light.

In addition, task lights can be used to reduce the usage of the main electricity light. Next to your reading quarters, for example, a task light, such as a table lamp, can be utilized for direct reading light, while minimizing the usage of the main lights. This is both more comfortable for the reader and more efficient in terms of electricity consumption. Kitchen cabinet and oven lighting is another example of task lighting. The concept involves reducing the overall energy demand via concentrated bright lighting in a specific area. Lastly, keeping light fixtures clean and avoiding the accumulation of dust on the lamps will allow the lights to work more efficiently, reducing your demand for more lighting in a single space.