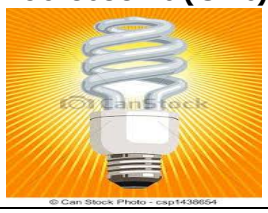
B.E.S. & T. UNDERTAKING
TRAINING & INDUSTRIAL ENGINEERING DEPARTMENT

SWITCH TO LED (Light Emitting Diode) LIGHTING :

Refer below comparison Chart for Knowing Advantages/ Benefits.

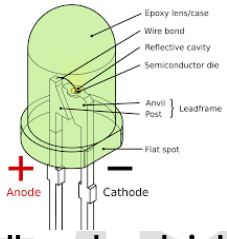
SR. NO.	LIST OF COMPARATIVE ADVANTAGES OF LEDS	Incandescent Light Bulbs 	Compact Fluorescents (CFLs) 	Light Emitting Diodes (LEDs) 
1	**LOWER ENERGY BILLS.** LEDs use less power for same light output. Lower energy consumption also decreases: CO2 emissions, sulfur oxide, and high-level nuclear waste	60 watts	13-15 watts	**6-8 watts**
2	**LIFE SPAN HOURS**	1500 hrs	10000 hrs	**50000 hrs***
3	**SAVING PER YEAR** Considering 5 lamps,7 hrs per day usage and Rs 5 per unit cost	**-**	Compared to incandescent lamp Rs 2875/-	Compared to incandescent lamp Rs **3385/-** Compared to CFL Rs **511**
4	**PURCHASE COST** for *50000 hrs use	Thirty three lamps replacement will be required. cost of 33 lamps Rs 20*33=660/-	Five lamps replacement will be required. cost of 5 lamps Rs 125*5=625/-	**One lamp will be required cost Rs 350/-**
5	**ENVIRONMENT FRIENDLY**	**Contains no toxic mercury so breakage and disposal is not risky**	Contains toxic mercury so breakage and disposal is risky to health and environment	**Contains no toxic mercury so breakage and disposal is not risky**
6	**MORE DURABLE**	Not Very Durable - glass or filament can break easily	Not Very Durable - glass can break easily	**Very Durable - LEDs can handle jarring and bumping**
7	**IS NOT SENSITIVE TO SURROUNDING TEMPERATURE AND HUMIDITY**	Somewhat Sensitive	Sensitive. Also May not work in under negative 10 degrees Fahrenheit or over 120 degrees Fahrenheit	**Not Sensitive**

Although LEDs are initially expensive, the cost is recouped over time.
Further Light for remote areas is possible because of the low power requirement for LEDs. Using solar panels becomes more practical and less expensive than running an electric line or using a generator for lighting in remote or off-grid areas. LED light bulbs are also ideal for use with small portable generators which homeowners use for backup power in emergencies

How do LED lights work?

The structure of the LED light is completely different than that of the conventional light bulb. Amazingly, the LED has a simple and strong structure. The beauty of the structure is that it is designed to be versatile, allowing for assembly into many different shapes. The **light-emitting semiconductor material** is what determines the LED's color.

As indicated by its name, the LED is a diode that emits light. A diode is a device that allows current to flow in only one direction. Almost any two conductive materials will form a diode when placed in contact with each other. When electricity is passed through the diode the atoms in one material (within the semiconductor chip) are excited to a higher energy level. The atoms in that first material have too much energy and need to release that energy. The energy is then released as the atoms shed electrons to the other material within the chip. During this energy release light is created. The color of the light from the LED is a function of the ingredients (materials) and recipes (processes) that make up the chip.



Did you know watts don't tell you how bright a light will be?

To compare different light bulbs, you need to know about lumens. Lumens, not watts, tell you how bright a light bulb is, no matter the type of bulb. The more lumens the brighter the light. Beginning in 2012, labels on the front of light bulb packages now state a bulb's brightness in lumens, instead of the bulb's energy usage in watts.

While lumen is the best measurement of comparative lighting among the various bulbs, it is not always a perfect measure. Some floodlights in can lighting use an internal reflector in the bulb to send the light facing downward. When shopping for light bulbs, note that bulbs equipped with reflectors will deliver increased directional light.
The chart below shows the amount of brightness in lumens you can expect from different wattage light bulbs. The LED bulbs require much less wattage than the CFL or Incandescent light bulbs, which is why LED bulbs are more energy-efficient and long lasting than the other types of bulb.

Incandescent Light Bulbs	Compact Fluorescents (CFLs)	Light Emitting Diodes (LEDs)	Lumens (Brightness)
40	8-12	6-9	400-500
60	13-18	8-12.5	650 - 900
75-100	18-22	13+1	1100 - 1750
100	23-30	16-20	1800+
150	30-55	25-28	2780