

CHAPTER-V STUDY OF LIGHTING

Terminology:

- Lumen** is a unit of light flow or luminous flux. The lumen rating of a lamp is a measure of the total light output of the lamp. The most common measurement of light output (or luminous flux) is the lumen. Light sources are labeled with an output rating in lumens.
- Lux** is the metric unit of measure for illuminance of a surface. One lux is equal to one lumen per square meter.
- Circuit Watts** is the total power drawn by lamps and ballasts in a lighting circuit under assessment.
- Installed Load Efficacy** is the average maintained illuminance provided on a horizontal working plane per circuit watt with general lighting of an interior. Unit: lux per watt per square metre (lux/W/m²)
- Lamp Circuit Efficacy** is the amount of light (lumens) emitted by a lamp for each watt of power consumed by the lamp circuit, i.e. including control gear losses. This is a more meaningful measure for those lamps that require control gear. Unit: lumens per circuit watt (lm/W)
- Lighting Power Density:** It is defined as Total Lighting Load in a room divided by the Area of that Room in square meters.

In this Chapter we compute the Lighting Power density and the percentage usage of LED Lighting to total Lighting Load of the College.

Table No 4: Computation of Lighting Power Density: IQAC Room:

No	Particulars	Value	Unit
1	Qty of 40 W Fittings in IQAC Room	2	Nos
2	Load of 40 W Fitting	40	W/unit
3	Total Load of 2 Nos, 40 W Fittings	80	W
4	Built up area of IQAC Room	26.76	m ²
5	Lighting Power Density = (3)/(4)	2.99	W/m ²

Table No 5: Percentage Usage of LED Lighting to Total Lighting Load:

No	Particulars	Value	Unit
1	No of 40 W FTL Fittings	240	Nos

2	Load per unit of 40 W FTL Fitting	40	W
3	Total Load of 40 W FTL Fittings	9.6	kW
4	No of 20 W LED Fittings	15	Nos
5	Load per unit of 20 W LED Fitting	20	W
6	Total Load of 20 W LED Fittings	0.3	kW
7	Total LED Lighting Load= 6	0.3	kW
8	Total Lighting Load= 3+6	9.9	kW
9	% of Usage of LEDs to Total Lighting Load= $7 \times 100 / 8$	3.03	%

EXECUTIVE SUMMARY

1. Prabhakar Patil Education Society's, Arts, Commerce and Science College, Veshvi, Tal: Alibag, District: Raigad consumes Energy in the form of Electrical Energy; used for various gadgets, Office & other facilities.

2. Present Energy Consumption & CO₂ Emission:

No	Particulars	Value	Unit
1	Annual Energy Consumed	34321	kWh
2	Annual CO ₂ Emissions	30.89	MT

3. Usage of Renewable Energy:

- The College has yet to install Roof Top Solar PV Plant

4. Waste Management:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source
2	Organic Waste	Provision of Bio Composting Bed
3	Sanitary Waste	Provision of Sanitary Waste Incinerator
4	Lab Liquid Waste	Provision of Soak Pit

5. Rain Water Management:

The College has installed Rainwater Management Project. The rain water falling on the terrace is collected through pipe and is stored in an underground Water Tank and further used for domestic purpose.

6. Green & Sustainable Practices:

- Maintenance of good Internal Road
- Tree Plantation in the campus.
- Provision of Ramp for Divyangajan
- Creation of awareness on Energy Conservation Display of Posters

7. Assumption:

1. 1 kWh of Electrical Energy releases 0.9 Kg of CO₂ into atmosphere

8. Reference:

- For CO₂ Emissions: www.tatapower.com