



MUKAND LAL NATIONAL COLLEGE

(Affiliated to Kurukshetra University, Kurukshetra) Estd. 1955
YAMUNA NAGAR – 135 001 (Haryana)

Ph : (Off.) 01732-220960, 225560

E-mail : principal@mlncollegeynr.ac.in, principal.mlncynr@gmail.com

•Web : www.mlncollegeynr.ac.in

Criterion 7 – Institutional Values and Best Practices

7.1.3 Quality audits on environment and energy regularly undertaken by the Institution.

Report of the Energy Audit.

Principal

Mukand Lal National College,
YAMUNA NAGAR (Haryana)

Dr. Ritu Kumar

Principal (Offg.)

Ref No: EEPL/2022-23/C93

Date: - 18-01-2023

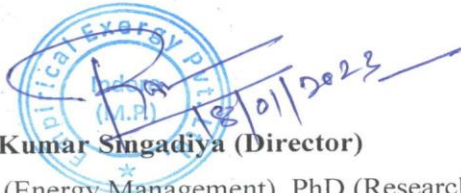
ENERGY AUDIT CERTIFICATE

This is to certify that Empirical Exergy Private Limited (EEPL) has conducted energy audit at Mukand Lal National College Yamuna Nagar, Haryana for the academic Year 2021-22.

The activities and measures carried out by Mukand Lal National College Yamuna Nagar, Haryana has been verified and was found to be acceptable. The positive approach of the management towards saving energy is highly valued and commendable.

This certificate is being issued on the basis of audit carried out by EEPL.

For- Empirical Exergy Private Limited



Rajesh Kumar Singadiya (Director)

M.Tech (Energy Management), PhD (Research Scholar)
Accredited Energy Auditor [AEA-0284]
Certified Energy Auditor [CEA-7271]
(BEE, Ministry of Power, Govt. of India)
Empanelled Energy Auditor with MPUVN, Bhopal M.P.
Lead Auditor ISO50001:2011 [EnMS) from FICCI, Delhi
Certified Water Auditor (NPC, Govt of India)
Chartered Engineer[M-1699118], The Institution of Engineers (India)
Member of ISHRAE [58150]

An ISO 9001: 2015 Certified Company





**Energy Audit Report
Mukand Lal National College
Yamuna Nagar, Haryana
Academic Year 2021-22**



**ENERGY AUDIT REPORT
CONSULTATION**



**Mukand Lal National College
Yamuna Nagar
Haryana, 135001**

PREPARED BY

EMPIRICAL EXERGY PRIVATE LIMITED

Flat No. 201, OM Apartment, 214 Indrapuri Colony,
Bhawarkuan, Indore – 452 001 (M. P.), India

0731-4948831, 7869327256

Email ID: eempirical18@gmail.com

www.eeplgroups.com

(2021-22)



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Yamuna Nagar, Haryana
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ACKNOWLEDGEMENT

Empirical Exergy Private Limited (EEPL), Indore (M.P) takes this opportunity to appreciate & thank the management of **Mukand Lal National College, Yamuna Nagar (H.R.)** for allowing us to conduct an energy audit for the college.


We are indeed touched by the helpful attitude and co-operation of all faculties and technical staff, who rendered their valuable assistance and co-operation during the course of study.

Rajesh Kumar Singadiya

(Director)


M.Tech (Energy Management), PhD (Research Scholar)
Accredited Energy Auditor [AEA-0284]
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Chartered Engineer [M-1699118], The Institution of Engineers (India)
Member of ISHRAE [58150]

Certificate of Accreditation

 **BUREAU OF ENERGY EFFICIENCY**

Examination Registration No.: **EA- 7271**

Accreditation Registration No.: **AEA-284**



Certificate of Accreditation

This is to certify that Mr./Ms. **Shri. Rajesh Kumar Singadiya** having its trade/registered office at has been given accreditation as accredited energy auditor. The certificate shall be effective from **9th** day of **May, 2018**


The certificate is subject to the provisions of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.



This certificate shall be valid until it is cancelled under regulation 9 of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

On cancellation, the certificate of accreditation shall be surrendered to the Bureau within fifteen days from the date of receipt of order of cancellation.

Your name has been entered at AEA No. **284** in the register of list of accredited energy auditors. Your name shall be liable to be struck out on the grounds specified in regulation 8 of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

Given under the seal of the Bureau of Energy Efficiency, Ministry of Power, this **5th** day of **October, 2018**


Secretary,
Bureau of Energy Efficiency
New Delhi

| | | |
|---|--|---|
|  | Energy Audit Report Mukand Lal National College Yamuna Nagar, Haryana Academic Year 2021-22 |  |
|---|--|---|

The Audit Team

The study team constituted of the following senior technical executives from **Empirical Exergy Private Limited,**

- ✚ **Mr. Rajesh Kumar Singadiya** [Director & Accredited Energy Auditor AEA-0284]
- ✚ **Mr. Rakesh Pathak,** [Director & Electrical Expert]
- ✚ **Mrs. Laxmi Raikwar Singadiya** [Chemical Engineer]
- ✚ **Mr. Sachin Kumawat** [Sr. Project Engineer]
- ✚ **Mr. Charchit Pathak** [Asst.Project Engineer]
- ✚ **Mr. Aakash Kumawat** [Junior Engineer]
- ✚ **Mr. Ajay Nahra** [Sr. Accountant & admin]

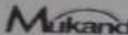


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Green Monitoring Committee

(Pending from college side)


MUKAND LAL NATIONAL COLLEGE
(Affiliated to Kurukshetra University, Kurukshetra)
YAMUNA NAGAR - 135 001 (Haryana) Estd. 1955
Ph. : (Off.) 01732-220960, 225580
E-mail : principal@mlncollegeynr.ac.in, principal.mlncynr@gmail.com • Web : www.mlncollegeynr.ac.in

Ref. No. _____ Date _____

September 21, 2022

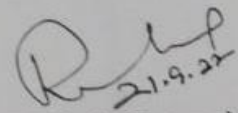
NOTICE

An Energy, Green and Environmental audit committee is formed in the college. It includes the following teachers:

1. Dr. Ritu Kumar *Ritu*
2. Dr. Rachna Aggarwal (IQAC incharge)
3. Mrs. Sunita Sikri *Sunita*
4. Dr. Rahul Singh *Rahul*
5. Dr. Rameshwar Groach
6. Sh. Gurmeet Singh

The following non-teaching staff is also deputed for helping to collect the data:

1. Sh. Ram Pratap
2. Sh. Ajay Kumar
3. Sh. Ajit Kumar
4. Sh. Asha Ram


(Dr. Rahul Khanna)
Offg. Principal

EXECUTIVE SUMMARY

The executive summary of the energy audit report furnished in this section briefly gives the identified energy conservation measures and other recommendations during the project that can be implemented in a phased manner to conserve energy and increase productivity inside the college campus.

ENERGY MANAGEMENT INITIATIVE TAKEN BY COLLEGE

✚ SOLAR SYSTEM

College has installed grid connected solar system with capacity 226 KWp on various building. Total unit generation is 4,93,432 unit from date of solar installation. **Its Appreciable.**

RECOMMENDATION: -

✚ LIGHTING SYSTEM

College has already initiated installation of energy efficient lighting in building and replacement of “conventional tube light by energy efficient LED light. Still there are good potential for replacement of 16 no. of conventional T-8 (40Watt)” tube light by energy efficient 20Watt LED lighting in institute estimated energy saving potential is 640 kWh/Year.

Detailed calculation in chapter-5

✚ Ceiling Fan

Replacement of “conventional ceiling fan (50 Watt)” by energy efficient star rated fan or BLDC based energy efficient fan (28 Watt) in class rooms, laboratories and faculties cabin” have great potential for energy saving. **Detailed calculation in chapter-5**

✚ TIMER CONTROLLED STREET LIGHTS

It is recommended to Installation of “Timer control on street lighting” in college campus

✚ IOT BASED ENERGY MONITORING SYSTEM.

Installation of “Cloud based (IoT based) energy monitoring system” on electrical feeder as well as energy monitoring on individual building will be good initiate for energy monitoring as well as student demo project for student and management



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ENERGY CONSERVATION MEASURES FOR ELECTRICAL SYSTEM

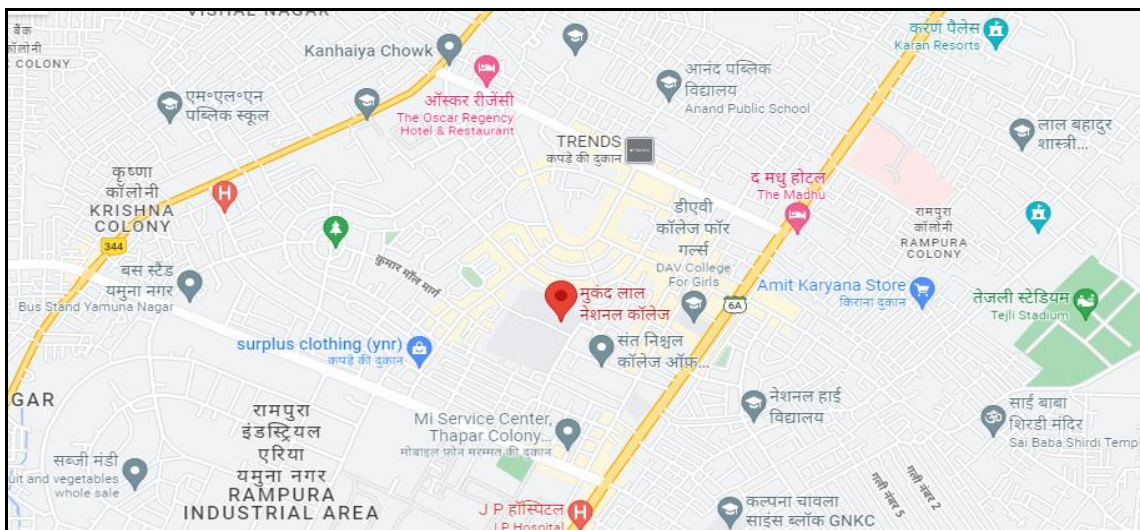
| Case Study | Section | Identification | Observation | Recommendation | Annual energy saving (kWh) | Annual cost saving (Rs.) | Investment (Rs.) | Simple payback Period |
|-------------------|-----------------|---|---|--|-----------------------------------|---------------------------------|-------------------------|------------------------------|
| 1 | Celling Fan | 578 No celling fan working with 50 Watt | Power consumption by exesting ceiling fan (50 Watt) | Replacement of 50W conventional ceiling fan by 28W BLDC energy efficient ceiling fan | 25,476 | 1,28,399 | 9,72,720 | 7.6 year |
| 2 | Lighting System | 16 No. FTL tubelight | Power consumption by T-8 FTL | Replacement of conventional (T-8) with (T-5 Watt) | 640 | 3,225 | 3,360 | 13 month |

CHAPTER-1 INTRODUCTION

1.1 About College **(Pending from college side)**

Mukand Lal National College was established in 1955 by a great visionary and educationist Seth Jai Prakash Ji in the cherished memory of his illustrious father Seth Mukand Lal Ji, who was a renowned Gandhian and philanthropist. **From the founder Principal Mr. R.N. Rihan, Prof. Tilak Raj Chadha took over the charge. He and his successors, Dr. B.K. Chanan, Dr. K.L. Johar, Dr. Ramesh Kumar and Dr. Shailesh Kapoor with the able support and magnanimity** of Chairman, Seth Ashok Kumar Ji coupled with unstinted support of faculty members have succeeded in carving a niche for the college as a premier institute of higher education in Northern India. The present incumbent, has taken the baton from his illustrious predecessors with the mission of carrying the College to still greater heights with the blessings and guidance of Sh. Ashok Kumar, Chairman, and day to day active support from Dr. Ramesh Kumar, General Secretary, College Managing Committee coupled with full support from the experienced and dedicated faculty. During the course of its long journey, the College has scaled towering heights in academics, sports, co-curricular activities and social service and its alumni has made a mark in different fields of public service and public life.

The college has been declared as College with Potential for Excellence (CPE) by the University Grants Commission of India, New Delhi.



Source : **Satellite Image of MLN College from Google map**



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Vision

To impart Quality Education through Time-tested Traditions blended with latest Innovations to transform Youth into Human Resource that is Responsive to Societal, Environmental and Cultural Responsibilities.

Mission

To build State-of-the-art Infrastructure, engage Dynamic and Dedicated Faculty and inculcate Scholarly Pursuits and Human Values in the Young Minds and imbibe them with Qualities, both of Head and Heart, so that they emerge as assets to National Pride and challenge to International benchmarks.

Objective

To remain committed to excellence in imparting Quality Education, promoting Research Culture, ensuring Transparent Governance and focusing on the dimensions of Studies, Sports, Stage and Social Service, for the Holistic Development of Student's Personality.



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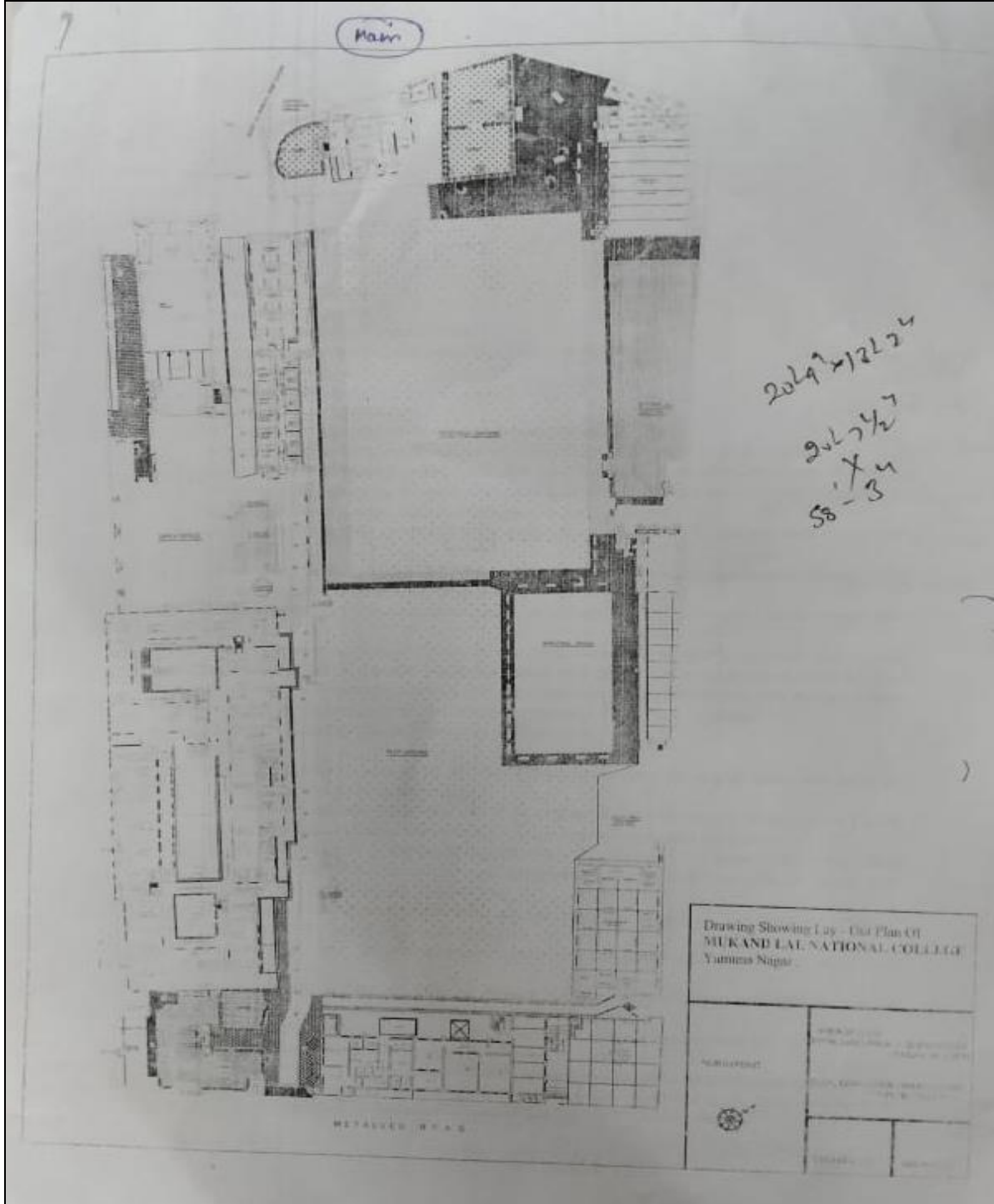


College build-up area

Details are the total build-up area given in the table:-

| | | | |
|---------------------------|------------------|---------------------------------------|--------------------------------------|
| Total covered area | | 33070.91 SQ.MT | |
| Total build area | | 17215.52 SQ.MT | |
| Sr. No. | BLOCK | BUILT AREA | |
| | | GROUND FLOOR AREA IN SQ.MT | FIRST FLOOR AREA IN SQ.MT |
| 1 | Cafeteria | 3873.35 | NA |
| 2 | Commerce Block | 3561.41 | 2976.63 |
| 3 | Admin Block | 1440.93 | 1389.15 |
| 4 | Arts Block | 353.15 | NA |
| 5 | Gymnasium | 755.64 | 567.73 |
| 6 | Sub Station Room | 171.96 | NA |
| 7 | Stadium Block | 504.51 | 524.88 |
| 8 | PG Block | 728.01 | 368.17 |

Layout of college campus





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1.2 About Energy Audit

An energy audit helps to understand more about the ways energy is used in any college and helps in identifying areas where waste may occur and scope for improvement exists. The overall energy efficiency from generation to the final consumer becomes 50%. Hence one unit saved in the end user is equivalent to two units generated in the power plant.

An energy audit is the most efficient way to identify the strength and weaknesses of energy management practices and to find a way to solve problems. An energy audit is a professional approach to utilizing economic, financial, social, and natural resources responsibly. Energy audits “adds value” to management control and are a way of evaluating the system.

Empirical Exergy Private Limited (EEPL), Indore M.P. carried out the “Energy Audit” at the site to find gaps in the energy consumption pattern for **Mukand Lal National College, Yamuna Nagar (H.R.)** A technical report is prepared as per the need and the requirement of the project.

1.3 Objectives of Energy Auditing

An energy audit provides a vital information base for an overall energy conservation program covering essentially energy utilization analysis and evaluation of energy conservation measures. It aims at:

- Identifying the quality and cost of various energy inputs.
- Assessing the present pattern of energy consumption in different cost centers of operations.
- Relating energy inputs and production output.
- Identifying potential areas of the thermal and electrical energy economy.
- Highlighting wastage in major areas.
- Fixing of energy-saving potential targets for individual cost centers.
- Implementation of measures for energy conservation & realization of savings.

1.4 Methodology:

The methodology adopted for achieving the desired objectives viz.: Assessment of the current operational status and energy savings includes the following:

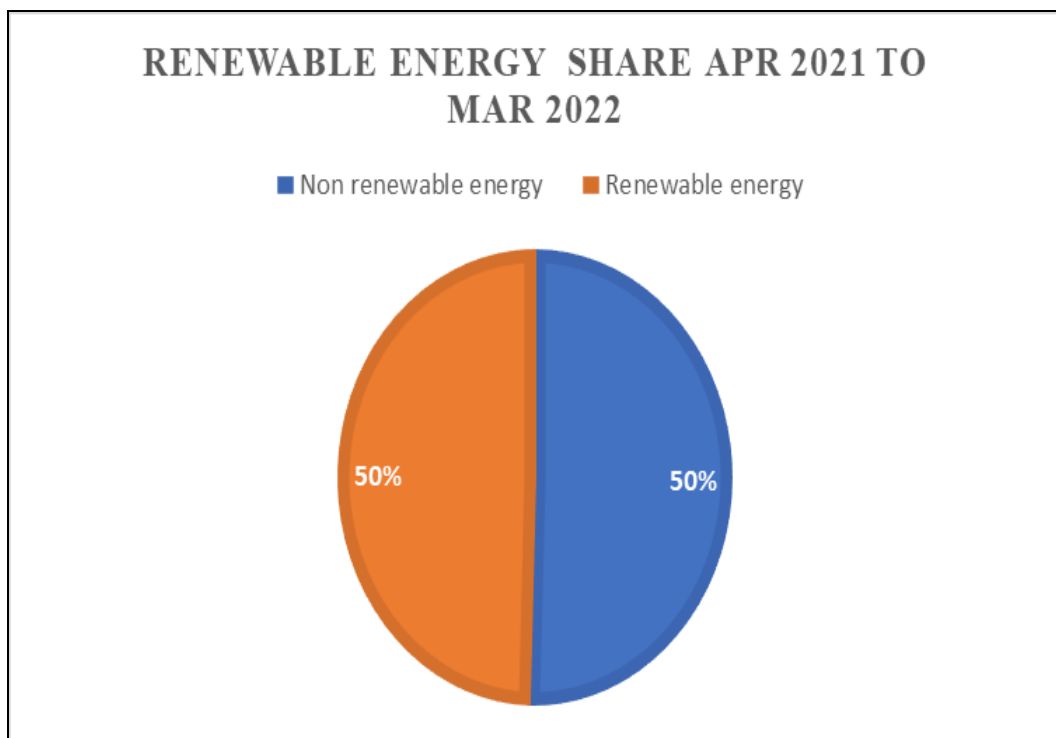
- ✚ Discussions with the concerned officials for identification of major areas of focus and other related systems.
- ✚ A team of engineers visited the site and had discussions with the concerned officials/supervisors to collect data/information on the operations and load distribution within the plant and the same for the overall premises. The data were analyzed to arrive at a baseline energy consumption pattern.
- ✚ Measurements and monitoring with the help of appropriate instruments including continuous and/or time-lapse recording, as appropriate and visual observations were made to identify the energy usage pattern and losses in the system.
- ✚ Trend analysis of costs and consumptions.
- ✚ Capacity and efficiency test of major utility equipments, wherever applicable.
- ✚ Estimation of various losses
- ✚ Computation and **in-depth analysis** of the collected data, including utilization of computerized analysis and other techniques as appropriate, were done to draw inferences and to evolve suitable energy conservation plan's for improvements/reduction in specific energy consumption.

1.5 College Present Energy Scenario:

- ✚ College uses energy in the form of electricity purchased from the grid and a 226 KWp solar grid-connected system for the college campus. There is single feeders for college. The annual energy consumption of the campus is about 2,14,207 units period from April - 2021 to March - 2022.
- ✚ It was observe that college has installed on grid solar system with capacity 226 KWp on various building . Total unit generation is 2,18,160 units as per electricity bill period April - 2021 to March - 2022. **Its Appriciable**

1.6 Renewable Energy Share in Apri-2021 to March-2022.

College has installed 226 KWp solar system and it is observe that it is 50% share of the total energy of the college . **It is Very Appriciable.**



CHAPTER- 2

POWER SUPPLY SYSTEM

2.1 Transformer Details.

The power supply for **Mukand Lal National College, Yamuna Nagar (H.R.)** is from Uttar Haryana Bijli Vitran Nigam Limited with sanctioned load of 299.90 kW. There is a transformer having capacity of 400 kVA. The details are given in following table 2.1

Table: 2.1 Technical details of transformer.

| Sr. No. | Items | Technical Specification |
|---------|---------------------------|-------------------------|
| 1 | Make | NUCON |
| 2 | Year | 2005 |
| 3 | Rating (kVA) | 400 |
| 4 | Volts at No load (HV/ LV) | 11000/433 |
| 5 | Current Rating (HV/ LV) | 20.99 / 533.34 |
| 6 | Frequency (Hz) | 50 |
| 7 | Impedance | 4.5 % |
| 8 | Vector group | DY-11 |
| 9 | Type of cooling | ONAN |



Figure 2.1:- 400 kVA Transformer

Power Measurement and Loading of the Transformer.

| Sr.No. | Voltage | Current | Power Factor | KW | KVA | TR Loading |
|--------|---------|---------|--------------|----|-----|------------|
| 1 | 423 | 51 | 0.9 | 34 | 37 | 9.3 |



Observation :-

- ✚ It is observe that during the energy audit transformer are working condition .
- ✚ Transformer loading is 9.3% Its is acceptable.

2.2 DG Set:-

There are three DG set in the college campus. Details of the DG Set is given table. 2.2

Table 2.2 Technical specifications of DG set

| Sr.No. | Parameter | Technical Specification DG Set-01 | Technical Specification DG Set-02 | Technical Specification DG Set-03 |
|--------|----------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 1 | Make | Kirloskar | Kirloskar | Kirloskar |
| 2 | M/C No | 22S3L205F10820 | ES3H008B37292 | NL34500-204 |
| 3 | Capacity (KVA) | 125 | 125 | 45 |
| 4 | Rated Voltage | 415 | 415 | 415 |
| 5 | Frequency(HZ) | 50 | 50 | 50 |
| 6 | Power factor | 0.8 | 0.8 | 0.8 |
| 7 | RPM | 1500 | 1500 | 1500 |
| 8 | Phase | 3 | 3 | 3 |

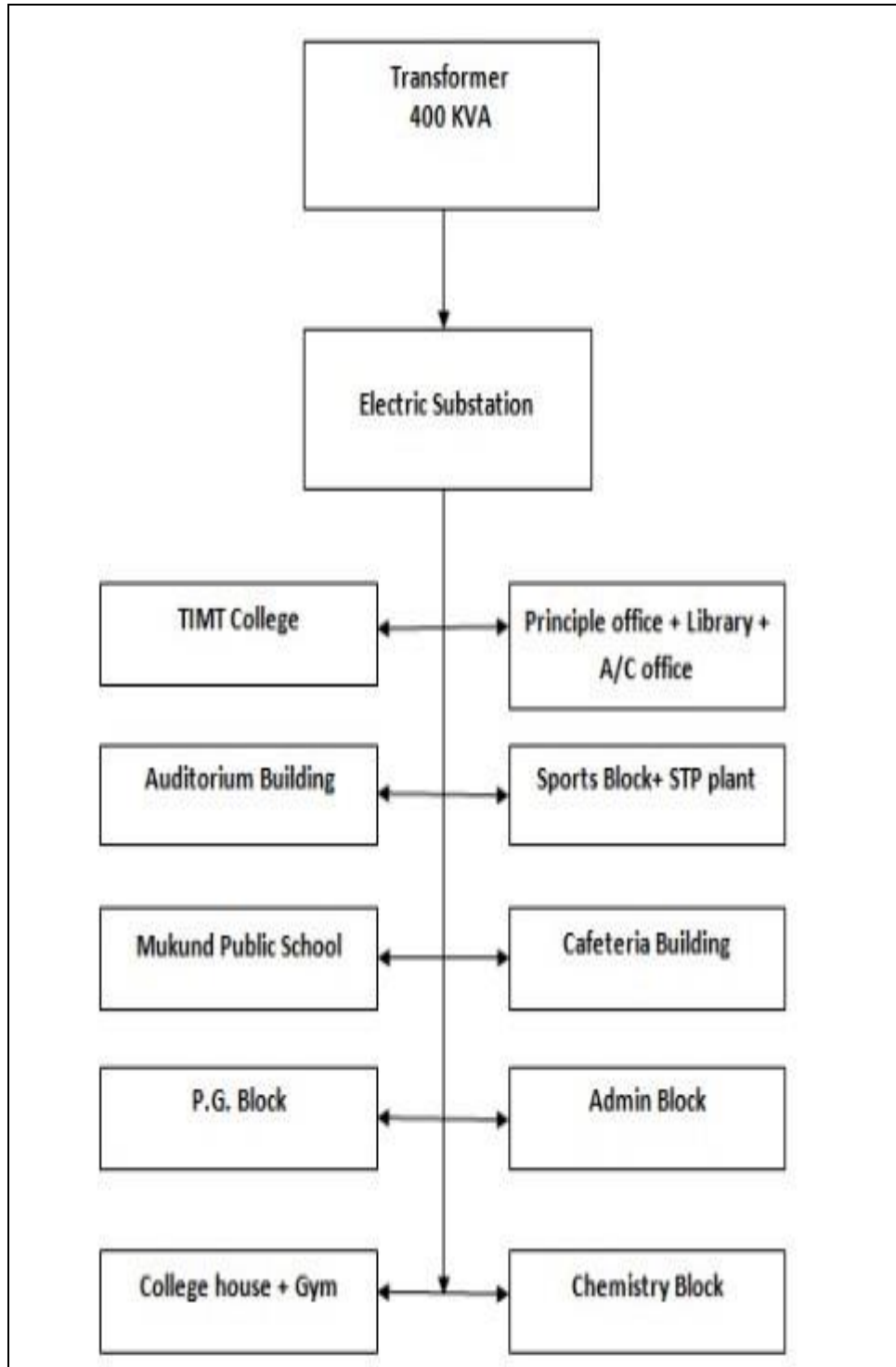


Figure 2.3:- DG set in Power House

Observation

- ✚ DG set is used only in case of power failure.
- ✚ There are requirement of energy meter to monitoring total unit generation .

Single Line Diagram(SLD)



2.3 Capacitor Bank

The energy audit team examine of existing capacitor bank at the power house. Details of the capacitor are given in table 2.5

Table: 2.5 Details of Capacitor bank

| Sr. No. | Loaction No. | Capacity KVAr | Phase | Measured Current | Rated Current | Output KVAr | % Derating | Remarks |
|---------|--------------|---------------|-------|------------------|---------------|-------------|------------|---------|
| 1 | Capacitor-1 | 30 | R | 36.6 | 39 | 27.4 | 8.6 | NA |
| | | | y | 36.1 | | | | |
| | | | B | 34.2 | | | | |
| | | | Avg. | 35.6 | | | | |
| 2 | Capacitor-2 | 30 | R | 36.6 | 39 | 27.7 | 7.8 | NA |
| | | | y | 36 | | | | |
| | | | B | 35.3 | | | | |
| | | | Avg. | 36 | | | | |
| 3 | Capacitor-3 | 30 | R | 36 | 39 | 27.4 | 8.7 | NA |
| | | | y | 36 | | | | |
| | | | B | 34.8 | | | | |
| | | | Avg. | 35.6 | | | | |
| 4 | Capacitor-4 | 15 | R | 21.1 | 23 | 13.3 | 11.3 | NA |
| | | | y | 20.8 | | | | |
| | | | B | 19.3 | | | | |
| | | | Avg. | 20.4 | | | | |
| 5 | Capacitor-5 | 10 | R | 13.5 | 14 | 9.5 | 5.5 | NA |
| | | | Y | 14.8 | | | | |
| | | | B | 11.4 | | | | |
| | | | Avg. | 13.2 | | | | |

| Sr.No. | Loaction | Capacity | Phase | Measured Current | Rated Current | Output KVAR | % Derating | Remarks |
|--------|-------------|----------|-------|------------------|---------------|-------------|------------|---------|
| 6 | Capacitor-6 | 5 | R | 7 | 6.1 | 4.9 | 1.6 | NA |
| | | | Y | 6.1 | | | | |
| | | | B | 4.9 | | | | |
| | | | Avg. | 6 | | | | |

Observation :-

- ✚ It is observe that college has 150 KVAR capacitor bank installed for maintain the power factor.
- ✚ Energy audit team taken helth check up 6 capacitor bank and find out capacitor are working condition.
- ✚ Total capacitor output is 110.2 KVAR it is acceptable.



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2.4 Grid Connected Solar Photovoltaic System (226KWp)

There is a 226 KWp solar photovoltaic rooftop grid-connected system on various building.

The date of first solar project installation 14/12/2017 . System details are given below:

Table: - 2.6 Solar plant detailed

Solar system on the commerce block -35 KWp

| PV Panel | |
|----------------------|------------------|
| Make | Adani |
| Panel Type | Poly-crystalline |
| Panel Wattage | 340.79 |
| Make | Satvik |
| Panel Type | Poly-crystalline |
| Panel Wattage | 325 |
| Invertor Information | |
| Make | Delta |
| Model | RPIM30A_121 |

Solar System on the Rooftop of Applied Physics, Botany, Zoology(75KWp)

| PV Panel | |
|----------------------|------------------|
| Make | Himalayan |
| Panel Type | Poly-crystalline |
| Panel Wattage | 330 |
| Invertor Information | |
| Make | Ethospower |
| Model | 15KW |

Solar System on the Rooftop of Arts Block (50KWp)

| PV Panel | |
|----------------------|------------------|
| Make | Havells |
| Panel Type | Poly-crystalline |
| Panel Wattage | 330 |
| Make | Adani |
| Panel Type | Poly-crystalline |
| Panel Wattage | 340.79 |
| Invertor Information | |
| Make | Havells |
| Model | - |
| Make | Delta |
| Model | RPIM30A_121 |



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On the Rooftop of Basket Ball court (30KWp)

| PV Panel Detail | |
|----------------------|------------------|
| Make | Satvik |
| Panel Type | Poly-crystalline |
| Panel Wattage | 325 |
| Inverter Information | |
| Make | Delta |
| Model | RPIM30A_121 |

Photographs of Solar Plant:-



Figure 2.3:- Solar Plant and Inverter

Total Solar unit generation from installation.

Table 2.7:- Total solar unit generation Year-2017 to 2022

| Sr.No. | Year | Total Unit Generation |
|--------|-----------|-----------------------|
| 1 | 2017-2018 | 10,612.94 |
| 2 | 2018-2019 | 32,631.7 |
| 3 | 2019-2020 | 52,921.64 |
| 4 | 2020-2021 | 1,64,655.55 |
| 5 | 2021-2022 | 2,32,610.05 |
| Total | | 4,93,431.88 |

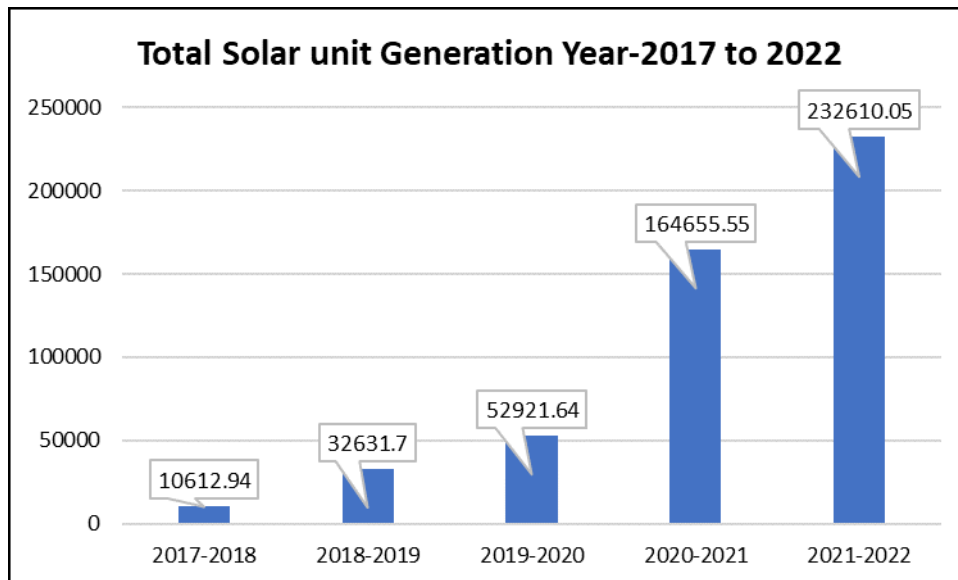


Figure: - 2.7 Graphical presentation of Solar unit generation

Observation: -

College has installed on grid solar system with capacity 226 KWp on various building. Total unit generation is 4,93,432 units. **Its Appreciable.**



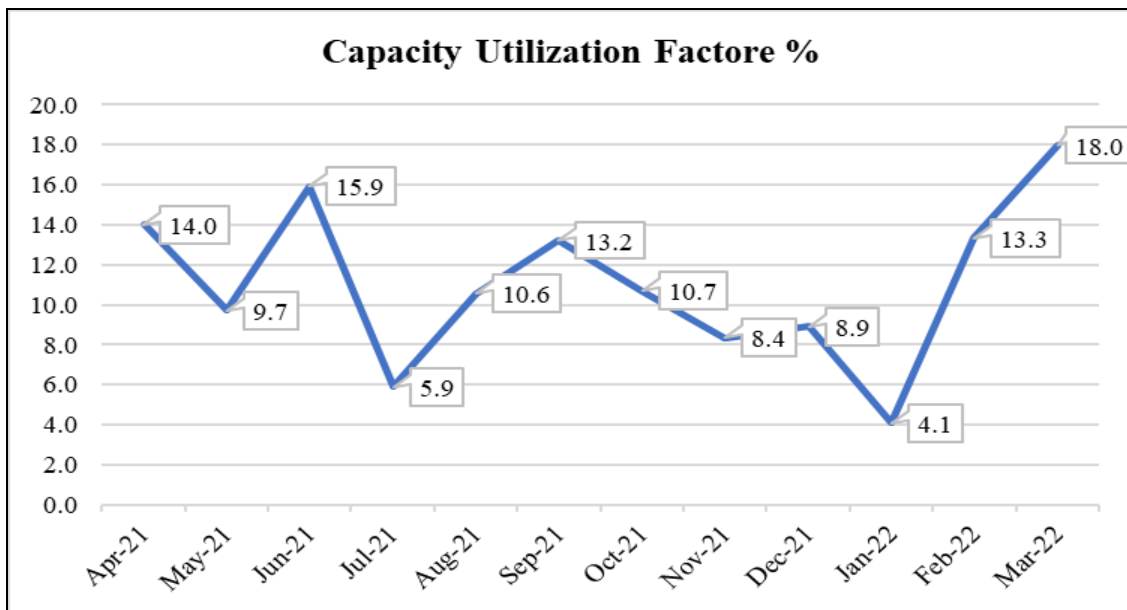
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Solar unit generation Year-2021-22 :-

Table 2.8:- Monthly Solar unit generation

| Sr.No. | Month & Year | Solar Unit Generation | No. of Days | CUF % |
|--------|--------------|-----------------------|-------------|-------------|
| 1 | Apr-21 | 22,800 | 30 | 14.0 |
| 2 | May-21 | 16,320 | 31 | 9.7 |
| 3 | Jun-21 | 25,920 | 30 | 15.9 |
| 4 | Jul-21 | 9,920 | 31 | 5.9 |
| 5 | Aug-21 | 17,760 | 31 | 10.6 |
| 6 | Sep-21 | 21,520 | 30 | 13.2 |
| 7 | Oct-21 | 18,000 | 31 | 10.7 |
| 8 | Nov-21 | 13,600 | 30 | 8.4 |
| 9 | Dec-21 | 14,960 | 31 | 8.9 |
| 10 | Jan-22 | 6,880 | 31 | 4.1 |
| 11 | Feb-22 | 20,240 | 28 | 13.3 |
| 12 | Mar-22 | 30,240 | 31 | 18.0 |
| | Total | 2,18,160 | 365 | 11.1 |



Observation :-

- ✚ It is observe that total solar unit generation is 2,18,160 units April-2021 to March-2022.
- ✚ Average Capacity utilization factor is 11.1 % it is low . It will be increased frequently to cleaning of the solar panel.



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CHAPTER- 3

ELECTRICITY BILL ANALYSIS

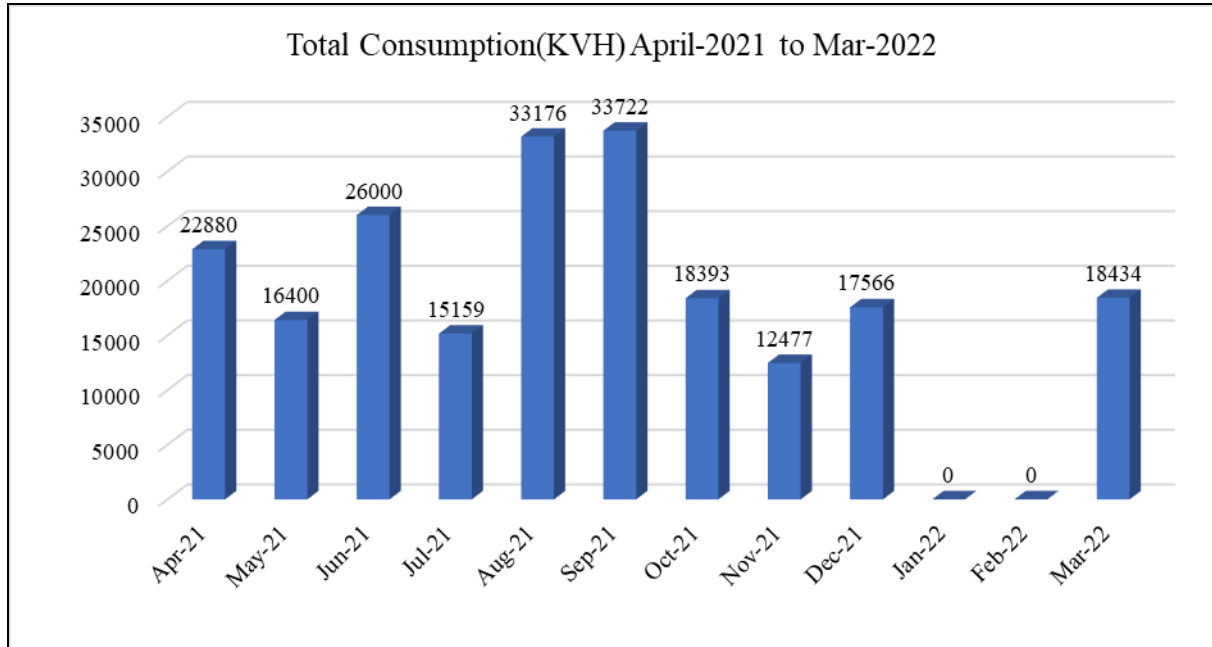
3.1 Monthly Electrical Energy & Solar Consumption 2021-22

The monthly electrical consumption for the college is given in the table.

Table 3.2 Energy consumption and billing amount (the year 2021-22)

| Sr. No. | Month & Year | Sanctioned Load | Net Bill Unit | Total Consumption(KVH) | Solar Unit Genration | Amount | Surcharge | Overall Unit charges |
|---------|--------------|-----------------|---------------|------------------------|----------------------|------------|-----------|----------------------|
| 1 | Apr-21 | 299.9 | 0 | 22,880 | 22,800 | 48,290/- | 710/- | 2.11/- |
| 2 | May-21 | 299.9 | 0 | 16,400 | 16,320 | 49,899/- | 734/- | 3.04/- |
| 3 | Jun-21 | 299.9 | 0 | 26,000 | 25,920 | 48,289/- | 710/- | 1.86/- |
| 4 | Jul-21 | 299.9 | 5159 | 15,159 | 9,920 | 74,149/- | 1,087/- | 4.89/- |
| 5 | Aug-21 | 299.9 | 15336 | 33,176 | 17,760 | 1,56,803/- | 2,287/- | 4.73/- |
| 6 | Sep-21 | 299.9 | 12042 | 33,722 | 21,520 | 1,32,524/- | 1,934/- | 3.93/- |
| 7 | Oct-21 | 299.9 | 393 | 18,393 | 18,000 | 5,4124/- | 796/- | 2.94/- |
| 8 | Nov-21 | 299.9 | 0 | 12,477 | 13,600 | 55,331/- | 814/- | 4.43/- |
| 9 | Dec-21 | 299.9 | 1323 | 17,566 | 14,960 | 66,148/- | 973/- | 3.77/- |
| 10 | Jan-22 | 299.9 | 8178 | 0 | 6,880 | 1,13,149/- | 1,657/- | 0.00/- |
| 11 | Feb-22 | 299.9 | 0 | 0 | 20,240 | 155/- | 2/- | 0/- |
| 12 | Mar-22 | 299.9 | 0 | 18,434 | 30,240 | 57,290/- | 842/- | 3.11/- |
| | | Total | | 2,14,207 | 2,18,160 | 8,56,151/- | 11,706/- | 2.90/- |

Graphical Presentation of Unit Consumption year April-2021 to March-2022.



Observation :-

- ✚ Energy Audit team was analysed 01 Year electricity bill and find out yearly unit consumption is 2,14,207unit. And total amount pay Rs 8,56,151/-
- ✚ Overall energy charges is Rs 2.90. It is Low due to installation of solar system. **Its Appreciable .**

3.2 ON Site power measurement in College

| Sr.No. | Location | Measurd Voltage | Measurd Current | Measurd Power Factor | K. W. |
|--------|--|-----------------|-----------------|----------------------|-------|
| 1 | Principal Office | 430 | 6.6 | 0.86 | 4.22 |
| 2 | Chemistry Block | 420 | 16.52 | 0.87 | 10.45 |
| 3 | NCC office(Cafeteria,Conference hall, Boys Hostal) | 429 | 33.5 | 0.88 | 21.90 |
| 4 | Mukand Public Room | 426 | 23.1 | 0.88 | 15.00 |
| 5 | College House | 421 | 14.6 | 0.85 | 9.05 |
| 6 | Sports Block | 415 | 18.6 | 0.89 | 11.90 |
| 7 | Transformer | 423 | 51 | 0.9 | 33.62 |
| 8 | DG SET 125KVA | 413 | 42 | 0.86 | 25.84 |
| 9 | DG SET 125KVA | 423 | 52 | 0.86 | 32.76 |
| 10 | DG SET 45KVA | 420 | 52 | 0.86 | 15 |



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Chapter-4
CONNECTED LOAD

4.1 Connected Load detail of College

| Sr. No. | Location | Fan (50W) | Wallfan (50W) | LED Light Panel (36W) | LED Tubelight (22W) | Exhaust fan (40W) | AC | Refrigerator (500W) | Flycatcher (1500W) | Microwave (2000W) | LED Bulb (8W) | LED 15W |
|---------|-------------------------------------|-----------|---------------|-----------------------|---------------------|-------------------|----|---------------------|--------------------|-------------------|---------------|---------|
| 1 | Principal Office | 4 | 0 | 4 | 2 | 1 | 2 | 0 | 1 | 0 | 0 | 0 |
| 2 | Principal Office Peon room | 4 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | Pantry | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 4 | Administration Branch-I | 4 | 0 | 4 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 5 | Administration Branch-II | | 1 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 6 | Administration Branch-III near bank | 2 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 7 | Account Office | 9 | 0 | 6 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 8 | Account Office Store | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | Confrence Hall | 0 | 2 | 24 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| 10 | Confrence Hall II small | 4 | 0 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 11 | Cafeteria | 19 | 0 | 0 | 17 | 3 | 0 | 0 | 2 | 0 | 0 | 0 |
| 12 | Boys Common Room | 20 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | Cycle stand | 2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 30 | 0 |
| 14 | Girls Common room | 12 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| 15 | Library | 23 | 8 | 18 | 43 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | Recording Room | 4 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |



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| Sr. No. | Location | Fan (50W) | Wallfan (50W) | LED Light Panel (36W) | LED Tubelight (22W) | Exhaust fan (40W) | AC | Refrigerator (500W) | Flycatcher (1500W) | Microwave (2000W) | LED Bulb (8W) | LED 15W |
|---------|--------------------------|-----------|---------------|-----------------------|---------------------|-------------------|----|---------------------|--------------------|-------------------|---------------|---------|
| 17 | Syndicate room | 4 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 | Burser room | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 19 | State office | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 20 | Reception | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Confrence hall office | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 22 | NCC office boys | 2 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | NCC office girls | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | Music room | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 | paper marking centre | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 | Staff room | 5 | 0 | 4 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 27 | Applied Physics office-1 | 2 | 0 | 8 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 |
| 28 | Applied Physics office-1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 29 | Applied Physics store | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | Applied Physics lab-1 | 6 | 0 | 6 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 31 | Applied Physics lab-2 | 6 | 0 | 6 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 32 | Applied Physics lab-3 | 9 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33 | Dark room | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



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| Sr. No. | Location | Fan (50W) | Wallfan (50W) | LED Light Panel (36W) | LED Tubelight (22W) | Exhaust fan (40W) | AC | Refrigerator (500W) | Flycatcher (1500W) | Microwave (2000W) | LED Bulb (8W) | LED 15W |
|---------|---------------------------|-----------|---------------|-----------------------|---------------------|-------------------|----|---------------------|--------------------|-------------------|---------------|---------|
| 35 | Chemistry lab Office No.1 | 2 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 36 | Chemistry lab Office No.2 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 37 | Chemistry lab | 18 | 0 | 0 | 30 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 38 | Physics lab office | 1 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 39 | Physics la-1 | 12 | 0 | 0 | 15 | 1 | 3 | 0 | 0 | 0 | 0 | 0 |
| 40 | Physics la-2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41 | IQAC | 2 | 0 | 0 | 4 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 42 | Exam room | 1 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 43 | Computer lab office | 2 | 0 | 0 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 44 | Computer lab -1 | 7 | 0 | 0 | 20 | 2 | 3 | 0 | 0 | 0 | 0 | 0 |
| 45 | Computer lab -2 | 4 | 0 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 46 | Computer lab -3 | 5 | 0 | 6 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| 47 | Computer lab -4 | 6 | 0 | 6 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| 48 | Computer lab -5 | 6 | 0 | 5 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 49 | Computer lab -6 | 6 | 0 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 50 | Language Lab-1 | 4 | 0 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 51 | Language Lab-2 | 4 | 0 | 4 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 52 | Language Lab-3 | 5 | 0 | 3 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 53 | Language Lab-4 | 6 | 0 | 5 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |



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| Sr. No. | Location | Fan (50W) | Wallfan (50W) | LED Light Panel (36W) | LED Tubelight (22W) | Exhaust fan (40W) | AC | Refrigerator (500W) | Flycatcher (1500W) | Microwave (2000W) | LED Bulb (8W) | LED 15W |
|---------|-------------------------|-----------|---------------|-----------------------|---------------------|-------------------|----|---------------------|--------------------|-------------------|---------------|---------|
| 54 | Statics lab | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 55 | New lab | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 56 | Despencery | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57 | Commerce block office | 2 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 58 | Science block offfoce | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 59 | Arts block office-1 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60 | Arts block office-2 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 61 | Punjabi dept. | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 62 | Hindi dept. | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 63 | NSS room | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 64 | NSS store | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65 | Auditorium | 10 | 10 | 32 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 36 |
| 66 | PG block office | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 67 | Sport block office no.1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 68 | Sport block office no.2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 69 | Security room-1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 70 | Security room-2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



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| Sr. No. | Location | Fan (50W) | Wallfan (50W) | LED Light Panel (36W) | LED Tubelight (22W) | Exhaust fan (40W) | AC | Refrigerator (500W) | Flycatcher (1500W) | Microwave (2000W) | LED Bulb (8W) | LED 15W |
|---------|---------------------------------|-----------|---------------|-----------------------|---------------------|-------------------|----|---------------------|--------------------|-------------------|---------------|---------|
| 71 | College house | 16 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 1 | 0 | 6 |
| 72 | College campus labour quarter-1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 6 | 0 |
| 73 | College campus labour quarter-2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 74 | College campus labour quarter-3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 75 | College campus labour quarter-4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 76 | Gymnasium hub | 8 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 77 | Geology lab office | 3 | 0 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 78 | Geology lab | 13 | 0 | 0 | 16 | 3 | 2 | 0 | 0 | 0 | 0 | 0 |
| 79 | Bioteclab | 8 | 0 | 0 | 10 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80 | Botany lab | 15 | 0 | 0 | 19 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81 | Timetable office | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 82 | Store | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 83 | TTM | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 84 | Woman study self | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 85 | Bathroom | | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 16 | 0 |
| 86 | Mechanical Workshop | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 87 | Parabola | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



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| Sr. No. | Location | Fan (50W) | Wallfan (50W) | LED Light Panel (36W) | LED Tubelight (22W) | Exhaust fan (40W) | AC | Refrigerator (500W) | Flycatcher (1500W) | Microwave (2000W) | LED Bulb (8W) | LED 15W |
|---------|-----------------------|-----------|---------------|-----------------------|---------------------|-------------------|----|---------------------|--------------------|-------------------|---------------|---------|
| 88 | Electronic lab office | 1 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 89 | Electronic lab | 3 | 0 | 7 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 90 | IT lab | 3 | 0 | 7 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| | | 377 | 22 | 211 | 317 | 42 | 84 | 2 | 3 | 2 | 52 | 72 |



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Continues

| Sr.No. | Location | Fan (36W) | Ducting plant | Tubelight (40W) | LED tubelight (18W) | Floodlight (30W) | LED(6W) | Floodlight (50W) | Street light(50W) |
|--------|------------------------------------|--------------|------------------|--------------------|------------------------|---------------------|---------|---------------------|----------------------|
| 15 | Library | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 37 | Chemistry lab | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40 | Physics la-2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| 41 | IQAC | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 57 | Commerce block office | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 58 | Science block offoce | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 61 | Punjabi dept. | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 62 | Hindi dept. | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 65 | Auditorium | 0 | 0 | 0 | 15 | 4 | 0 | 0 | 0 |
| 71 | College house | 0 | 0 | 0 | 26 | 0 | 12 | 6 | 0 |
| 72 | College campus labour quarter-1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 73 | College campus labour quarter-2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 74 | College campus labour quarter-3 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 75 | College campus labour quarter-4 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 76 | Gymnasium hub | 0 | 0 | 0 | 0 | 0 | 16 | 2 | 0 |
| 87 | Parabola | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 |
| | Total | 7 | 1 | 16 | 41 | 4 | 36 | 1 | 1 |



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| Sr.No. | Arts Block | Fan | LED Tubelight (22W) |
|--------|------------|-----|---------------------|
| 1 | Room No.1 | 4 | 2 |
| 2 | Room No.2 | 4 | 2 |
| 3 | Room No.3 | 4 | 2 |
| 4 | Room No.4 | 4 | 2 |
| 5 | Room No.5 | 5 | 2 |
| 6 | Room No.6 | 5 | 2 |
| 7 | Room No.7 | 5 | 2 |
| 8 | Room No.8 | 5 | 2 |
| 9 | Room No.9 | 5 | 2 |
| 10 | Room No.10 | 5 | 2 |
| Total | | 46 | 20 |

| Sr.No. | Science Block | Fan | LED Tubelight (22W) | Exhaust Fan |
|--------|---------------|-----|---------------------|-------------|
| 1 | Room No.11 | 5 | 4 | 0 |
| 2 | Room No.12 | 5 | 4 | 1 |
| 3 | Room No.13 | 3 | 2 | 1 |
| 4 | Room No.14 | 3 | 2 | 0 |
| 5 | Room No.15 | 5 | 2 | 0 |
| 6 | Room No.16 | 6 | 2 | 1 |
| 7 | Room No.17 | 5 | 2 | 0 |
| 8 | Room No.18 | 5 | 2 | 0 |
| 9 | Room No.19 | 5 | 2 | 0 |
| Total | | 42 | 22 | 2 |

| Sr.No. | Commerce Block | Fan | LED Tubelight (22W) | A.C. |
|--------|----------------|-----|---------------------|------|
| 1 | Room No.20 | 5 | 2 | 0 |
| 2 | Room No.21 | 5 | 2 | 0 |
| 3 | Room No.22 | 5 | 2 | 0 |
| 4 | Room No.23 | 5 | 2 | 0 |
| 5 | Room No.24 | 5 | 2 | 0 |
| 6 | Room No.25 | 7 | 2 | 2 |
| 7 | Room No.26 | 7 | 2 | 0 |
| 8 | Room No.26 | 5 | 2 | 0 |
| 9 | Room No.27 | 5 | 2 | 0 |
| 10 | Room No.28 | 5 | 2 | 0 |
| 11 | Room No.29 | 5 | 2 | 0 |
| Total | | 59 | 22 | 2 |



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| Sr.No. | PG Block | Fan | LED Tubelight (22W) |
|--------|------------|-----|---------------------|
| 1 | Room No.30 | 5 | 5 |
| 2 | Room No.31 | 5 | 5 |
| 3 | Room No.32 | 5 | 5 |
| 4 | Room No.33 | 5 | 2 |
| 5 | Room No.34 | 5 | 2 |
| 6 | Room No.35 | 5 | 2 |
| 7 | Room No.36 | 5 | 2 |
| 8 | Room No.37 | 5 | 2 |
| 9 | Room No.38 | 5 | 2 |
| 10 | Room No.39 | 5 | 2 |
| 11 | Room No.39 | 5 | 2 |
| Total | | 55 | 31 |

| Sr. no | Location | Electrical Equipment | Quantity |
|--------|----------------------------|----------------------|----------|
| 1 | Corridor | LED Tubelight | 16 |
| 2 | Street light | LED Light | 10 |
| 3 | Flood light | LED Light | 8 |
| 4 | Near college ground (15HP) | Pump | 1 |
| 5 | Near college ground (5HP) | Pump | 1 |
| 6 | STP Plant(7.5HP) | Pump | 1 |
| 7 | STP Plant(5HP) | Pump | 1 |
| 8 | STP Plant(2HP) | Pump | 1 |
| 9 | STP Plant(2HP) | Pump | 1 |
| 10 | Water Cooler | - | 8 |



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4.2 Connected Load sharing Electrical Equipment

Total load share of electrical equipment in college.

| Sr.No. | Equipment | Unit Power(Watt) | Quantity | Total Power (Watt) | Load share% |
|--------|------------------|------------------|----------|--------------------|-------------|
| 1 | Fan | 50 | 579 | 28950 | 12.99 |
| 2 | Wall fan | 50 | 22 | 1100 | 0.49 |
| 3 | LED Light Panel | 36 | 211 | 7596 | 3.41 |
| 4 | LED tubelight | 22 | 317 | 6974 | 3.13 |
| 5 | Exhaust fan | 40 | 44 | 1760 | 0.79 |
| 6 | AC | 1500 | 86 | 129000 | 57.88 |
| 7 | Refrigerator | 500 | 2 | 1000 | 0.45 |
| 8 | Flycatcher | 1500 | 3 | 4500 | 2.02 |
| 9 | Microwave | 2000 | 2 | 4000 | 1.79 |
| 10 | LED Bulb | 8 | 52 | 416 | 0.19 |
| 11 | LED light | 15 | 88 | 1320 | 0.59 |
| 12 | Fan | 36 | 7 | 252 | 0.11 |
| 13 | Ducting Plant | 3677 | 1 | 3677 | 1.65 |
| 14 | Tubelight | 40 | 16 | 640 | 0.29 |
| 15 | LED light | 18 | 41 | 738 | 0.33 |
| 16 | Floodlight | 30 | 12 | 360 | 0.16 |
| 17 | LED | 6 | 36 | 216 | 0.10 |
| 18 | LED Street light | 50 | 11 | 550 | 0.25 |
| 19 | Tubewell Pump | 1185 | 1 | 1185 | 0.53 |
| 20 | Tubewell Pump | 3728 | 1 | 3728 | 1.67 |
| 21 | STP Pump | 5592 | 1 | 5592 | 2.51 |

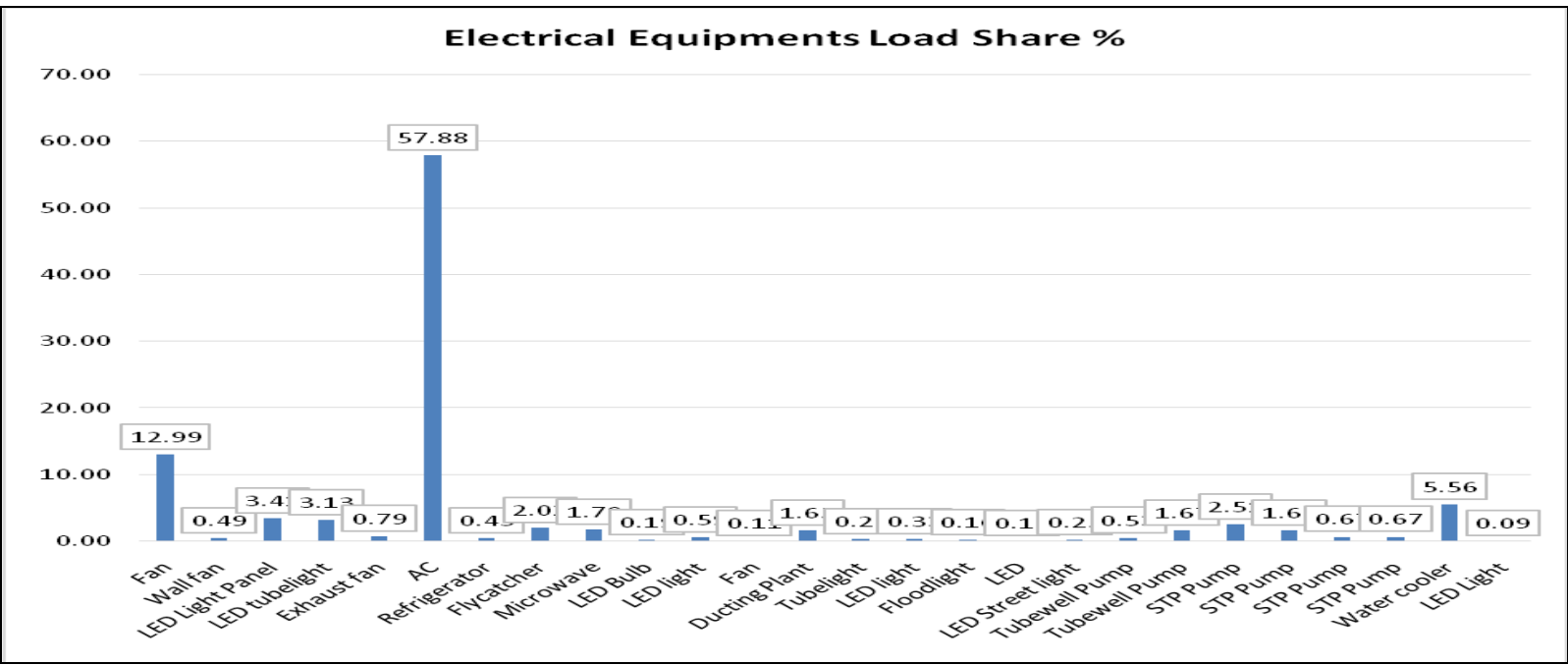


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| Sr.No. | Equipment | Unit Power(Watt) | Quantity | Total Power (Watt) | Load share% |
|--------|--------------|------------------|----------|--------------------|-------------|
| 22 | STP Pump | 3728 | 1 | 3728 | 1.67 |
| 23 | STP Pump | 1491 | 1 | 1491 | 0.67 |
| 24 | STP Pump | 1491 | 1 | 1491 | 0.67 |
| 25 | Water cooler | 1550 | 8 | 12400 | 5.56 |
| 25 | LED Light | 10 | 20 | 200 | 0.09 |
| | Total | | | 222864 | 100.00 |

Graphical representation of electrical equipment load share





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4.3 Some Photograph of Electrical Equipment's





CHAPTER- 5 ENERGY CONSERVATION MEASURES

4.1 Case Study

Replacement of 50W conventional ceiling fan by 28W BLDC Energy efficient ceiling fan in college: -

| Sr. No | Item | Parameter | Unit |
|--------|---------------------------------------|-----------|-----------|
| 1 | Rated Power of Ceiling Fan | 50 | W |
| 2 | No. of Fan | 579 | Nos |
| 3 | Working Hrs./Day | 8 | Hrs./Day |
| 4 | Working Days/Year | 250 | Days/Year |
| 5 | Energy Efficient BLDC Fan Rated power | 28 | W |
| 6 | Energy Saving Potential | 25476 | kWh/Year |
| 7 | Load Factor | 0.8 | |
| 8 | Expected Annual Energy Saving | 20380 | kWh/Year |
| 9 | Per Unit Charges | 6.3 | Rs/kWh |
| 10 | Expected Money Saving | 1,28,399 | Rs./Year |
| 11 | Cost of New Ceiling Fan | 1,600 | Rs./Pices |
| 12 | Investment on New Fan Purchasing | 926400 | Rs. |
| 13 | Maintenance Investment@5% | 46,320 | Rs. |
| 14 | Total Investment | 9,72,720 | Rs. |
| 15 | Simple Pay Back Period | 7.6 | Year |

Total Calculated Monetary Saving Potential in Ceiling Fan = Rs 1,28,399/-

4.2 Case Study

Replacement of conventional (tube light) 40 Watt by energy efficient 20 Watt LED tube light

| Sr. No. | Items | Parameters | Units |
|---------|--|------------|------------|
| 1 | Total Power Consumption by T-8 conventional tube light | 40 | Watt |
| 2 | No of T-8 | 16 | Nos. |
| 3 | Working Hrs./Day | 8 | Hrs./Day |
| 4 | Working Days/Year | 250 | Days/Year |
| 5 | Rated Power of Energy Efficient T-5 (LED) | 20 | W |
| 6 | Energy Saving Potential | 640 | kWh/Year |
| 7 | Load Factor | 0.8 | |
| 8 | Expected Annual Energy Saving | 512 | kWh/Year |
| 9 | Overall, Per Unit Charges | 6.3 | Rs./kWh |
| 10 | Expected Money Saving | 3225 | Rs./Year |
| 11 | Cost of T-5 | 200 | Rs./ Pices |
| 12 | Investment on New Light Purchasing | 3200 | Rs. |
| 13 | Maintenance Investment @5% | 160 | Rs. |
| 14 | Total Investment | 3,360 | Rs |
| 15 | Simple Pay Back Period | 13 | Month |

Total Calculated Monetary Saving Potential in light = Rs. 3,225/-



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**END OF THE REPORT
THANKS**