



ਭੇਰਾ ਘਰ ਮੇਰਾ ਅਸੈ
ESTD. 1875



GOVERNMENT MOHINDRA COLLEGE PATIALA

(Affiliated to Punjabi University, Patiala)



NAAC ACCREDITED GRADE A+ CYCLE-I

NAAC REACCREDITED GRADE A (CGPA 3.86) CYCLE-II

AISHE CODE: C-22146

INTERNAL QUALITY ASSURANCE CELL (IQAC)

AMARJIT SINGH (PES-I)
Principal

LOVELEEN PARMAR
IQAC Coordinator

MOHAMMAD SOHAIL
IQAC Co-Coordinator

Contact:

Telephone: 0175-2321695

Website: <https://govtmohindracollege.in/>

email: gcmohindrapatiala@gmail.com



INTERNAL QUALITY ASSURANCE CELL

IQAC



GOVERNMENT MOHINDRA COLLEGE, PATIALA

Supporting Documents/Additional Information

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

The institutional environment and energy initiatives are confirmed through the following

1. Energy audit

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2023

Detailed Energy Audit Report



Government Mohindra College
Lower Mall Road, Patiala,
Punjab- 147001

Submitted to:



Punjab Energy Development Agency
Solar passive complex, Plot No. 1&2,
Sector-33D, Chandigarh, 160020

Report Submitted by:

Indona Innovative Solutions
8/W-11, Railway Road, Dinanagar, Punjab- 143531



Acknowledgement

Indona Innovative Solutions take the opportunity to express our profound gratitude to Punjab Energy Development Agency to giving us an opportunity to conduct detailed energy audit & Preparation for energy efficiency improvements at Government Mohindra College, Patiala. We would like to place on record our sincere thanks to:

- Chief Executive Officer– Sh. Sh. Ravi Bhagat, IAS
- Director - Sh. M.P Singh
- Joint Director – Sh. Kulbir Singh
- Project Engineer – Sh. Money Khanna
- Project Coordinator Govt Mohindra College – Sh. Sahil

We would also like to extend gratitude to the Principal of Government Mohindra College, Patiala and the entire staff who have rendered their valuable assistance during the course of study. We do hope that you will find the recommendations given in this report useful in helping you to save energy.

A handwritten signature in black ink, appearing to read 'Devinder Singh', is written over a light blue rectangular stamp.

INDONA INNOVATIVE SOLUTIONS
Regd. off.: Railway Road
Opp. Onkar Feed Store, Dina Nagar,
Punjab -143531

Devinder Singh

Indona Innovative Solutions

Punjab



List of Abbreviations used in this report

APFC	Automatic Power Factor Correction Capacitor
DG	Diesel Generator
EL	Electronics
EPI	Energy Performance Index
FTL	Fluorescent Tube Light
HSD	High speed diesel
HT	High Tension
HV	High Voltage
LT	Low Tension
LV	Low Voltage
MDI	Maximum Demand Index
PA	Power Analyzer
PBP	Payback Period
SFC	Specific fuel consumption
SPV	Solar Photovoltaic

Assumptions for calculation

Operating days per annum	250
Operating hours per day	8
Unit Cost(inclusive of Electricity Duty, Rs./kWh	7.62
Average Power Factor	0.950



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1. Executive Summary

Government Mohindra College, Patiala is located at district Patiala, Punjab. It is one of the oldest institutions in the entire North India. Since inception in **1875**, the College has covered a long journey of about 140 years in a regal style bolstered by the untiring efforts of the teaching faculty and scintillating achievements of its alumni in all fields of Sports, Culture, Academics, Civil and Defence Services, Industry, Commerce, Business, Politics etc.

The entire college campus has fifteen number of electricity connection from PSPCL. The connected load is around 306.76kW while the contract load/demand (sanctioned load) from PSPCL is 398.02kW. The annual energy consumption in the campus from Grid and DG Set is 1, 83, 227kWh. An intensive energy audit was conducted during to identify the energy conservation potential in the campus. The details of the facility and saving potential identified in the campus are as below:

Description	Values
Name of the building	Government Mohindra College
Name and address of ownership	Patiala, Punjab
Number of Floors	G+2
Climate Condition of the region	Composite
Connected Load, kW	306.7
Total Area, m ²	87,868.89
Construction Area, m ²	15,843.44
Contract Demand/Load as per Electricity Bill, kW	398.02
Incoming Voltage	0.415
Existing Annual Energy consumption from all sources, kWh	1,83,227
Average Unit Price inclusive of Electricity duty, Rs/kWh	Rs 7.62/kWh
Proposed Annual Energy saving, kWh	38432
Proposed Energy saving potential, %	21.0%
Proposed Annual Monetary saving from reduction in energy consumption, Rs.	2,95,855
Proposed total Investment, Rs	5,54,650
Simple Payback period, years	1.89
Proposed Annual Monetary saving from reduction in energy consumption and Demand Reduction, Rs.	3,34,403
Simple Payback period based upon reduction in energy consumption and Demand Reduction, years	1.66
Energy Saving from Installation of SPV	Heritage building so solar installation was not accepted by college



An intensive energy audit was conducted during to identify the energy conservation potential in the building. The performance assessment of the utilities and the data analysis was carried out to identify the potential and found that there is huge electrical energy saving potential. The saving potential is based upon the recommendation and implementation of Energy conservation measures. The list of major energy conservation measures is as below:

S. No.	Description	Energy Consumption in Present scenario, kWh	Energy consumption after implementation of measure, kWh	Annual Energy Saving, kWh	Annual Monetry saving, Rs.	Investment, Rs	Simple Payback period, Years
1	Reduction in load from 60kW to 30kW at Account number 3000059625 to reduce fixed charges in electricity bill				41,548	Nil	Immediate
2	Improvement in annual average power factor from 0.95 to 0.99 by installing APFC at main incomer	1,92,870	1,85,077	7,793	59,381	78,500	1.32
3	Installation of Photo sensor in lift lobby and staircase area to maximum use of natural light in place of artificial light	10,440	9,174	1,266	9,646	20,300	2.10
4	Replacement of 100 number of FTL-12 lights with new energy efficient 20W LED lights to reduce energy consumption	6,750	2,500	4,250	32,385	45,000	1.39
5	Replacement of 33 number of T- 5 lights with new energy efficient 20W LED lights to reduce energy consumption	2,178	1,320	858	6,538	14,850	2.27



S. No.	Description	Energy Consumption in Present scenario, kWh	Energy consumption after implementation of measure, kWh	Annual Energy Saving, kWh	Annual Monetry saving, Rs.	Investment, Rs	Simple Payback period, Years
6	Replacement of 100 number of old ceiling fans with Energy efficient star rated BLDC ceiling fans	17,600	6,160	11,440	87,173	2,40,000	2.75
7	Installation of Upgraded Energy monitoring and management system in Energy distribution network to maximize the optimum energy utilization	1,83,227	1,70,401	12,826	97,733	1,56,000	1.60
Total saving after reduction in energy Consumption				38,432	2,92,855	5,54,650	1.89
Total saving after reduction in energy Consumption and demand				38,432	3,34,403	5,54,650	1.66
RE Energy Saving		As per discussion with College staff, it is a heritage building so the measure for solar installation was not accepted by college at time of discussion.					

Table 1: List of Energy Conservation Measures



The measures have been categorized based upon payback period (as long terms and medium term measures). The measures with payback period less than 3 years are medium term and more than 3 years are long terms. The list of these measures is as below:

S. No.	Description	Simple Payback period, Years	Type of measures
1	Reduction in load from 60kW to 30kW at Account number 3000059625 to reduce fixed charges in electricity bill		Short Term
2	Improvement in annual average power factor from 0.95 to 0.99 by installing APFC at main incomer	1.32	Medium Term
3	Replacement of 100 number of FTL- 12 lights with new energy efficient 20W LED lights to reduce energy consumption	1.39	Medium Term
4	Installation of Upgraded Energy monitoring and management system in Energy distribution network to maximize the optimum energy utilization	1.60	Medium Term
5	Installation of Photo sensor in lift lobby and staircase area to maximum use of natural light in place of artificial light	2.10	Medium Term
6	Replacement of 33 number of T- 5 lights with new energy efficient 20W LED lights to reduce energy consumption	2.27	Medium Term
7	Replacement of 100 number of old ceiling fans with Energy efficient star rated BLDC ceiling fans	2.75	Medium Term

Table 2: Classification of Energy conservation measures on payback basis



The lists of utilities that are considered for replacement or installation are:

Name of Equipment/Utility	Capacity of new installation	Number
Capacity of capacitor bank consider for installation	40kVAr(5kVAr*6+10kVAr)	1
Load considered for PIR Sensor Installation and de-lamping	For 5.8kW (in 8 Rooms)	8
FTL- 12 lights for replacement	20W	100
T- 5 lights for replacement	20W	33
Old ceiling fans replacement	35W	100

2. Project Background and Introduction

2.1. About the Project

Punjab Energy Development Agency was formed in September 1991 as a state nodal agency for promotion and development of renewable energy programmes/projects and energy conservation programme in the state of Punjab. PEDDA is registered as a Society under the Societies Act of 1860. The Punjab Energy Development Agency (PEDDA) was established in 1991 by the Government of Punjab in order to provide a long term perspective of future energy scenario. The objectives of PEDDA include:

- Promotion, development and implementation of alternative/non-conventional energy technologies programs and projects.
- Implementation of comprehensive energy conservation programme in the industrial, agricultural, commercial and household sector.
- Promotion and development of new and emerging technology areas (e.g. biomass co-generation).
- Collection of energy data to build a reliable database to provide required information to the State Government to form its energy policy and planning for future.

Government Mohindra College, Patiala, with a view to support and promote energy efficiency and conservation wishes has requested to PEDDA for conducting Energy Audit at their college campus. In response of the request, the PEDDA has deputed the team for Energy Audit.

The general description of the facility for which energy audit was conducted is given below:

Description	Details
Name of Building Organization	Government Mohindra College
Address	Lower Mall Road Patiala, Punjab 147001
Audit Date	19/07/2023
Climate	Humid subtropical climate

Table 3: General details about Facility

2.2. Government Mohindra College, Patiala

Govt. Mohindra College, Patiala, is one of the oldest institutions in the entire North India. At the time of its inception in **1875**, it was the only institution of its kind in a vast area stretching from Lahore to Delhi. Since its inception, the College has covered a long journey of about 140 years in a regal style bolstered by the untiring efforts of the teaching faculty and scintillating achievements of its alumni in all fields of Sports, Culture, Academics, Civil and Defence Services, Industry, Commerce, Business, Politics and so on and so forth.

In recognition of its contribution to higher learning the Govt. of India issued a commemorative Postage Stamp on Mohindra College on March 14, 1988. Later on the State Govt. adjudged the college as one of the four 'Model' colleges of the State. The College was awarded the A+ **Grade** by the '**NAAC**' in April 2003 in the Cycle-I of NAAC and in the Cycle-II, the college is awarded with "**A**" **Grade** with a CGPA "**3.86**" by the '**NAAC**' in February 2016, **the highest score given to any college in the country**. In 2006 the University Grants Commission accorded CPE status to the College under its scheme of '**Colleges with Potential for Excellence**', a status which the College enjoyed until 2014. In 2009, the Department of Biotechnology of the Ministry of Science and Technology, Govt. of India, selected the college for financial assistance under its '**Star College in Life Sciences Scheme**'. The College has been selected for being a Community College under the Community College Scheme of the UGC. The arial view of the college is as below:



Figure 1: Aerial view of the Government Mohindra College, Patiala

To run the day to day activities, the college has electricity supply from Punjab State Power Corporation Limited (PSPCL).



2.3. Objective of Energy Audit

1. The objective of the Energy Audit is to ensure optimum energy efficiency of the operations and to maintain awareness on optimum utilization of energy resources.
2. The other purpose is to identify potential for decrease in annual energy consumption.
3. Identifying the quality and cost of various energy inputs.
4. Assessing present pattern of energy consumption at different utility level.
5. Identifying potential areas of thermal and electrical energy conservation.
6. Providing most viable energy conservation measure based upon the cost benefit analysis.
7. Fixing of energy saving potential targets in individual sections.

3. Methodology adopted for Energy Audit

The general methodology followed is captured in the following figure –



Figure 2: Methodology

Step 1: Data Collection

1. The data required for preparation of detailed energy audit report is collected from various sources which electrical department, water supply department, PEDAs office and Site In charge/operators etc.
2. The secondary data collected comprised of climate condition, electrical bill data, electrical distribution system, existing metering system, tariff order and subsidy details, electricity consumption pattern, seasonal energy and fuel consumption etc.

Step 2: Field Studies

1. The field level data collection includes detailed energy audit and physical measurements of various operating parameters for different utilities. The objective of detailed audit is to determine the energy performance of existing utilities, which mainly involves electrical energy consumption, performance parameters and comparison of both.
2. In addition, information like mode of energy distribution, back-up power source etc are also explored.

Step 3: Interactions with different Stakeholders

3. The energy performance analysis of the utilities was carried out and scouting was done to select the appropriate capacity energy efficiency measures.
4. Interactions with leading manufacturers / suppliers are also carried out for selection and understanding the operational behaviour. The study of pump curves carried out to check the impact on pump efficiencies with change in one or the other parameter. During the interaction, the efficiency range of different types of pumps (both star labelled and non- star labelled but higher efficiency) pumps along with technical details, budgetary quotes, suppliers of spare parts etc. is also discussed.

Step 4: Preparation of Best Practices Manual and Monitoring & Verification Protocol

5. The findings from the study of existing systems were thoroughly analyzed and factors attributing to lower system efficiencies were identified. Practices pertaining to existing operating and maintenance and factor for improvement these practices were also explored.



6. Best standard operating and maintenance practices are suggested with respect to the pumping stations. The measures pertaining to selection of pipelines, safety of electrical equipments are also suggested in the report.
7. In order to ensure the energy savings, appropriate monitoring and verification protocol need to be in place. Detailed monitoring and verification protocol is provided to capture the performance parameters and to accommodate the uncertainties in the savings.

Step 5: Cost Benefit Analysis

8. Carried out cost benefit analysis for investments made in different energy efficiency measures. Estimation of energy saving potential and associated monetary benefits with payback period was also done.

3.1 Instruments Used for Energy Audit

The following portable instruments were used for data measurement:

- 3 – phase Power Analyser
- Single phase Power Analyser
- Ultrasonic Water Flow Meter
- Anemometer
- Hygrometer
- Digital Thermometer
- Infrared Thermometer
- Pressure gauge
- Lux Meter
- Stroboscope

4. Present Energy Scenario of Government Mohindra College, Patiala

In Government Mohindra College, Patiala, the electrical energy is required to meet the daily operational activities. This facility is receiving 0.415kV power supply from Punjab State Power Corporation Limited (PSPCL) as main source of power supply. The entire campus has fifteen (15) number of electricity connections from PSPCL and then power supply is coming at LT panel installed in the respective areas. There are three number of DG Sets to cater the energy supply in critical areas at time of power failure. In annual energy bill, major contribution is due to Electrical Energy consumption from grid and least is from DG Set. The fuel (HSD) is also used in the facility but fuel is also used for electrical energy generation. The electrical energy from different sources on annual basis is as below:

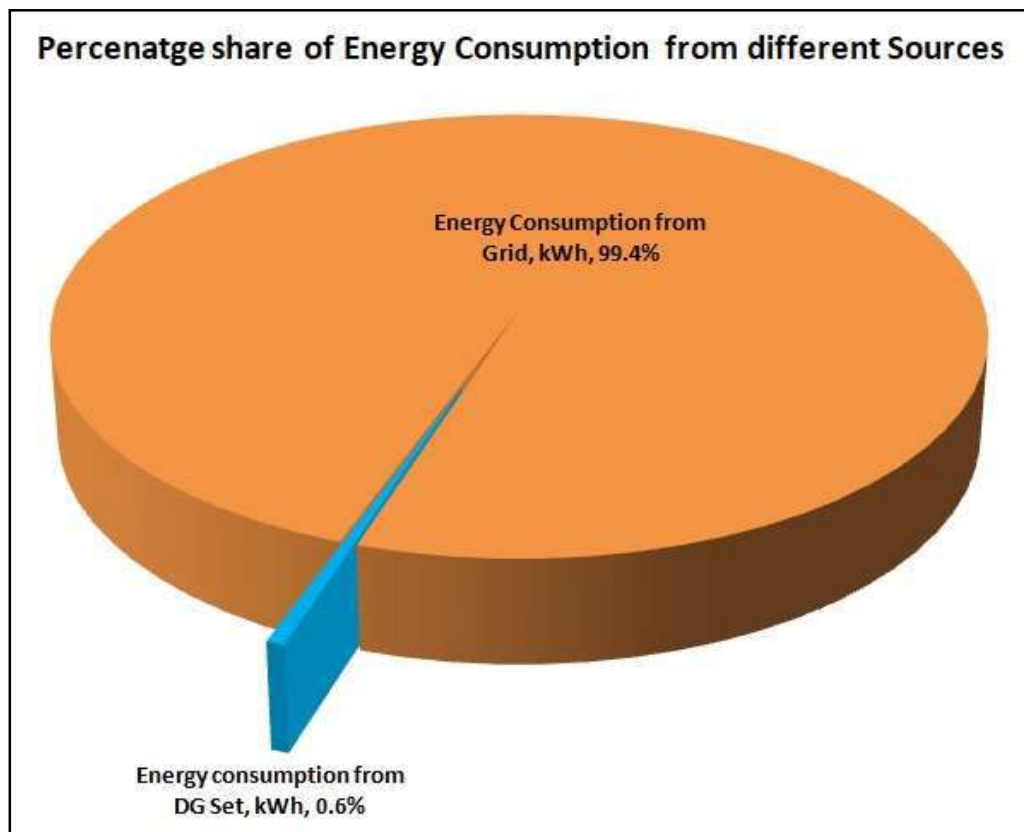


Figure 3: Percentage Share of Energy consumption from different sources

Month	Energy Consumption from Grid, kWh	Energy consumption from DG Set, kWh	Total Energy Consumption, kWh
Aug-22	17,382	52	17,434
Sep-22	16,508	16	16,524
Oct-22	19,630	265	19,895
Nov-22	11,814		11,814
Dec-22	10,821	201	11,022
Jan-23	9,961		9,961



Feb-23	11,628		11,628
Mar-23	10,179	52	10,231
Apr-23	12,595	221	12,816
May-23	20,385	218	20,603
Jun-23	18,071		18,071
Jul-23	23,228		23,228
Total	1,82,202	1,025	1,83,227
Maximum	23,228	265	23,228
Average	15,184	146	15,269
Minimum	9,961	16	9,961

Table 4: Energy consumption from different sources

As per annual energy consumption data, this facility is mainly dependent on grid supply. The contribution the energy consumption from the grid is 99.4% of the total annual energy consumption.

In this facility HSD is also consumed for power generation in DG Sets. Since there are very few power cuts in this region, most of fuel consumption is during the DG Sets testing. Based upon the fuel consumption during DG testing and generation from DG Sets is only 0.6% (1,025kWh) of total annual energy consumption.

5. Electricity Distribution System

5.1 Main Incomer

As mentioned earlier the main source of electrical power supply is 0.415kV from grid which received at fifteen numbers of connections. After that the power is distributed to different areas connected close to that area. The list of connection reference/ account number and location of energy meter is as below:

S. No.	Account Number	Connection Type/Category	Sanctioned Load/Demand	Location of Meter
1	3000049020	SAP-SBM-DS-GEN	11.30	Science Block First Floor
2	3000049021	SAP-SBM-DS DOMESTIC FOR DPC-0	6.00	Care Taker Room
3	3000049022	DS DOMESTIC FOR DPC	30.00	Main Computer Lab
4	3000049044	DS DOMESTIC FOR DPC	25.00	Multipurpose Hall
5	3000049045	SAP-SBM-DS-GEN	19.08	Girls Hostel
6	3000049046	DS DOMESTIC FOR DPC	30.00	MA Block
7	3000049047	DS DOMESTIC FOR DPC	35.00	Principal Office Block
8	3000049048	DS DOMESTIC FOR DPC	35.00	PTA Block
9	3000059624	DS DOMESTIC FOR DPC	50.00	Science Block Ground Floor
10	3000059625	DS RATE CATEGORY FOR DS>50 KW FOR DPC	60.00	Main Building
11	3000060284	SP SMALL POWER FOR DPC	7.54	Principal Residence
12	3000060314	SP SMALL POWER FOR DPC	11.56	Agriculture Farm
13	3000060317	SP SMALL POWER FOR DPC	7.54	Near Principal Residence Tubewell
14	3005318994	DS DOMESTIC FOR DPC	35.00	New Library and Girls common Room
15	3005319244	DS DOMESTIC FOR DPC	35.00	Law Block and Old Mess

Table 5: List of energy meters and location

The visual inspection of electrical installation in the premises including Electrical room, Low tension switch gear panel, Distribution boards, lighting installations, earthing arrangements were found satisfactory.

5.2 Connected Load

Electrical Load contributes towards the total possible energy consumed by a system, circuit, component, device or equipment that is connected to a source of electric power. Electrical load is further broken down into connected Load and demand load. The connected load is defined as the sum of continuous ratings of all the equipment connected to the electrical power station. It is the maximum load of all the equipment and appliances at a particular time over a particular time span. In this building connected load is around 306.76kW. The break-up of the connected load is as below:

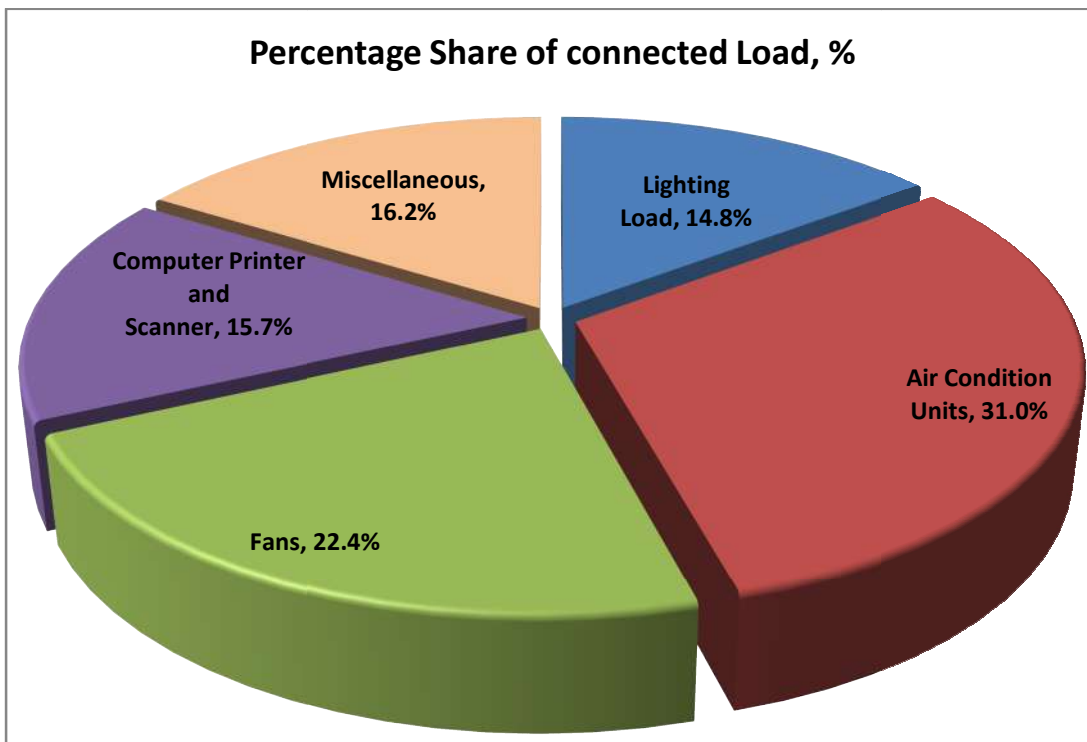


Figure 4: Connected Load Share

Description	Percentage Share, %	Connected Load, kW
Lighting Load	14.8%	45.28
Air Condition Units	31.0%	95.18
Fans	22.4%	68.60
Computer Printer and Scanner	15.7%	48.10
Miscellaneous	16.2%	49.60
Total		306.76

Table 6: Connected Load



6. Bill Analysis

The bill analysis is done for the facility for and compared with the tariff orders of the respective years to check if there any additional charge, penalty, or any excess charges. The major highlights from the bill analysis are:

S. No.	Account Number	Category	Location of Meter	Connected Load, kW	Demand Charges, Rs/kVA	Rs/kWh
1	3000049020	SAP-SBM-DS-GEN	Science Block First Floor	11.30	110	0-100: Rs/kWh5.34, 100-300: Rs/kWh7.15 and 100-300: Rs/kWh7.75
2	3000049021	SAP-SBM-DS DOMESTIC FOR DPC-0	Care Taker Room	6.00	75	0-100: Rs/kWh4.44 101-300: Rs/kWh6.64
3	3000049022	DS DOMESTIC FOR DPC	Main Computer Lab	30.00	110	0-100: Rs/kWh5.34, 101-300: Rs/kWh7.15 and 301-500: Rs/kWh7.75
4	3000049044	DS DOMESTIC FOR DPC	Multipurpose Hall	25.00	110	0-100: Rs/kWh5.34, 101-300: Rs/kWh7.15 and 301-500: Rs/kWh7.75
5	3000049045	SAP-SBM-DS-GEN	Girls Hostel	19.08	110	0-100: Rs/kWh5.34, 101-300: Rs/kWh7.15 and 301-500: Rs/kWh7.75
6	3000049046	DS DOMESTIC FOR DPC	MA Block	30.00	110	0-100: Rs/kWh5.34, 101-300: Rs/kWh7.15 and 301-500: Rs/kWh7.75
7	3000049047	DS DOMESTIC FOR DPC	Principal Office Block	35.00	110	0-100: Rs/kWh5.34, 101-300: Rs/kWh7.15 and 301-500: Rs/kWh7.75
8	3000049048	DS DOMESTIC FOR DPC	PTA Block	35.00	110	0-100: Rs/kWh5.34, 101-300: Rs/kWh7.15 and 301-500: Rs/kWh7.75
9	3000059624	DS DOMESTIC FOR DPC	Science Block Ground Floor	50.00	110	5.34



S. No.	Account Number	Category	Location of Meter	Connected Load, kW	Demand Charges, Rs/kVA	Rs/kWh
10	3000059625	DS RATE CATEGORY FOR DS>50 KW FOR DPC	Main Building	60.00	130	6.75
11	3000060284	SP SMALL POWER FOR DPC	Principal Residence	7.54	105	5.67
12	3000060314	SP SMALL POWER FOR DPC	Agriculture Farm	11.56	105	5.67
13	3000060317	SP SMALL POWER FOR DPC	Near Principal Residence Tubewell	7.54	105	5.76
14	3005318994	DS DOMESTIC FOR DPC	New Library and Girls common Room	35.00	110	0-100: Rs/kWh5.34, 101-300: Rs/kWh7.15 and 301-500: Rs/kWh7.75
15	3005319244	DS DOMESTIC FOR DPC	Law Block and Old Mess	35.00	110	0-100: Rs/kWh5.34, 101-300: Rs/kWh7.15 and 301-500: Rs/kWh7.75

Table 7: Components of electricity bill

The annual energy consumption as per electricity bill is as below:

Mon th	300004 9020	300004 9021	300004 9022	300004 9044	300004 9045	300004 9046	300004 9047	300004 9048	300005 9624	300005 9625	300006 0284	300006 0314	300006 0317	300531 8994	300531 9244
Aug -22	1,286	197	679	235	2,442	1,823	4,050	2,087	1,497	1,664	34	0	0	742	646
Sep -22	1,066	233	926	521	1,185	1,799	3,620	2,056	1,796	1,672	208	0	0	778	648
Oct- 22	765	365	955	526	4,308	1,854	2,906	2,266	1,960	2,467	10	0	0	898	350
Nov	468	29	351	376	4,127	110	1,216	1,328	1,387	1,640	17	0	23	628	114



Month	300004 9020	300004 9021	300004 9022	300004 9044	300004 9045	300004 9046	300004 9047	300004 9048	300005 9624	300005 9625	300006 0284	300006 0314	300006 0317	300531 8994	300531 9244
-22															
Dec-22	348	20	75	293	5,500	1,235	806	567	925	613	22	0	12	269	136
Jan-23	0	0	59	638	4,928	976	740	501	797	573	44	0	7	268	430
Feb-23	424	55	79	708	4,789	1,343	898	711	836	725	60	0	0	372	628
Mar-23	358	0	85	340	5,105	1,102	716	596	810	513	28	0	0	292	234
Apr-23	269	308	623	351	5,004	1,247	1,026	1,067	1,003	911	26	0	2	462	296
May-23	471	385	722	468	7,159	2,227	2,368	1,908	1,627	1,549	21	0	0	754	726
Jun-23	847	87	564	342	5,242	2,032	2,698	2,321	1,009	1,698	37	0	0	612	582
Jul-23	1,594	88	722	550	8,888	1,859	2,778	2,052	950	2,224	37	0	0	640	846

Table 8: Energy Consumption at each connection



The bill analysis is done for the facility and compared with the tariff orders of the respective years to check if there are any additional charges, penalty, or any excess charges. The major highlights from the bill analysis are:

6.1 Contract Load

The contract load/demand for this facility is 398.02kVA and the minimum billable demand is 80% of the contract demand. The period, for which bill analysis has been done, the demand is charged for Rs 110/kVA.

The month wise MDI demand for this facility is as below:

S. No.	Connection	Account Number	Contracted /demand Load, kW
1	Connection- 1	3000049020	11.30
2	Connection- 2	3000049021	6.00
3	Connection- 3	3000049022	30.00
4	Connection- 4	3000049044	25.00
5	Connection- 5	3000049045	19.08
6	Connection- 6	3000049046	30.00
7	Connection- 7	3000049047	35.00
8	Connection- 8	3000049048	35.00
9	Connection- 9	3000059624	50.00
10	Connection- 10	3000059625	60.00
11	Connection- 11	3000060284	7.54
12	Connection- 12	3000060314	11.56
13	Connection- 13	3000060317	7.54
14	Connection- 14	3005318994	35.00
15	Connection- 15	3005319244	35.00

Figure 5: Contracted Load at each connection

From the bill analysis, it is clear that total connected load at all the connections is 398.02kW. Fixed charges are variable from 80% to 100% of the sanctioned load. The maximum demand is at connection- 10 and the location is Main building area.



6.2 Energy Consumption

The month wise energy consumption for the entire campus is as below:

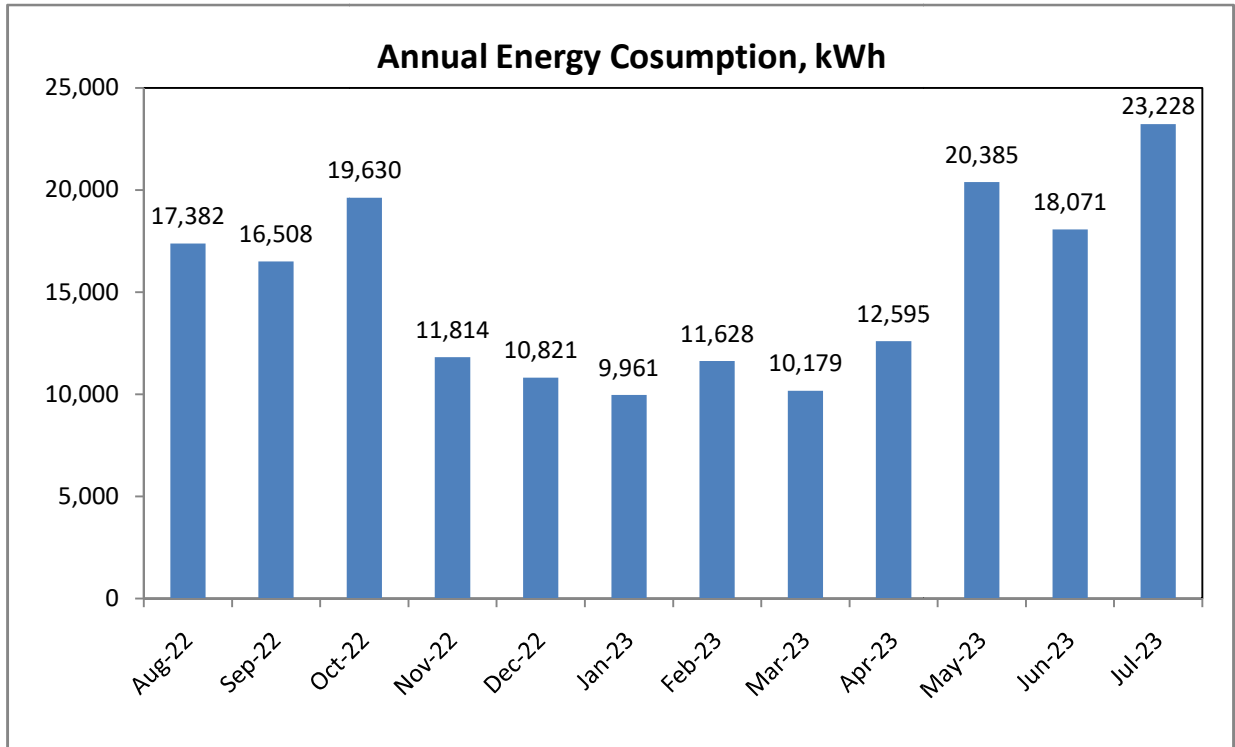


Figure 6: Month wise Energy Consumption

On annual basis, the collective annual energy consumption from all the connections is 1, 82,202kWh. The maximum energy consumption in one billing month is 23,228kWh in July- 2023 while the minimum energy consumption is 9,961kWh during January- 2023.



6.3 Power Factor Variation

It is observed that at connection 3000059625, the energy consumption is charged at Rs./kVAh and power factor is also mentioned. The power factor variation is as below:

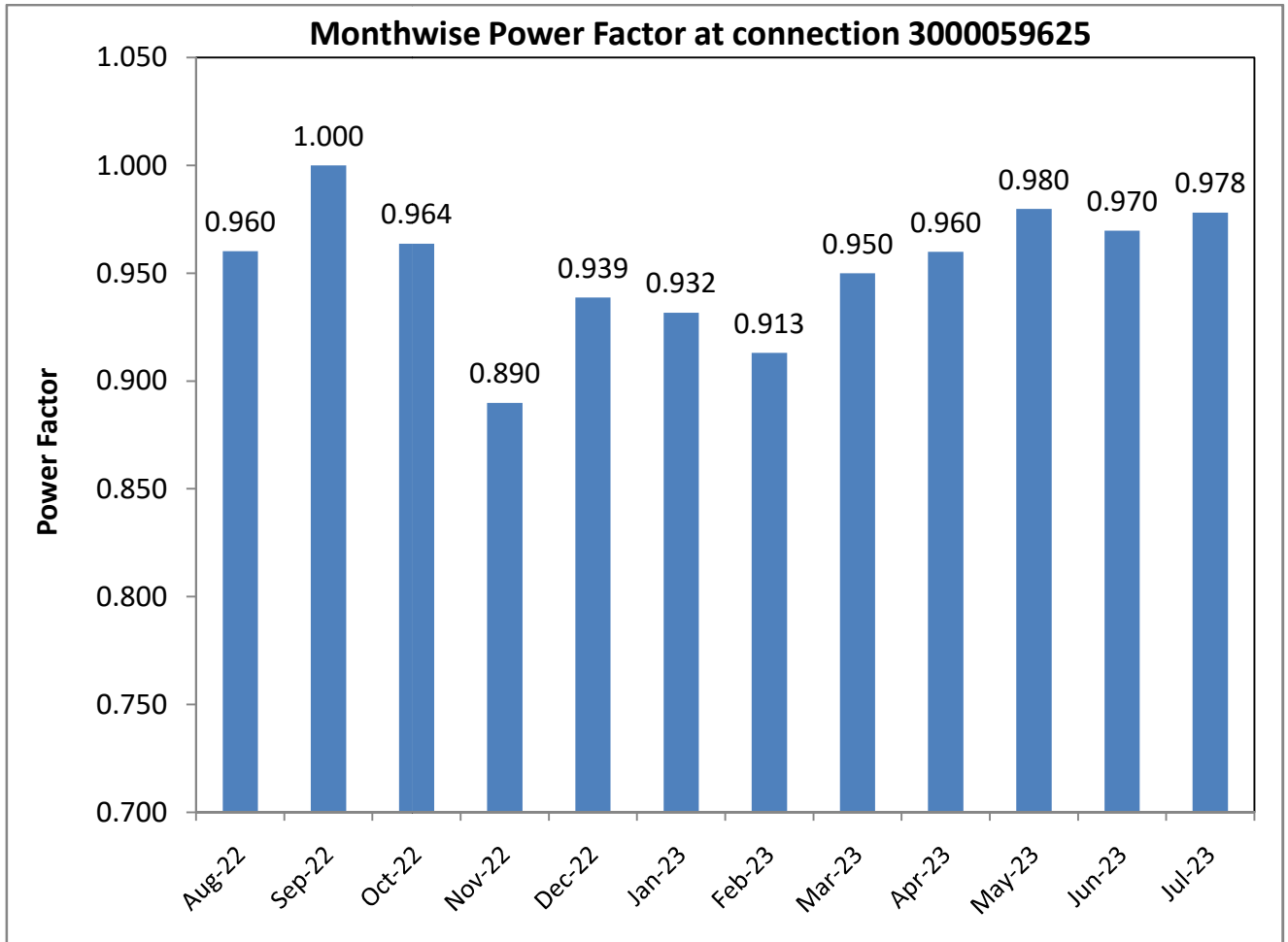


Figure 7: Month wise Power Factor

The power factor close to unity is always preferable whenever the billing is in Rs/kVAh. The annual average power factor at this connection is only 0.953 which indicates there is potential for improvement in power factor.



7. Power Quality

Power quality determines the fitness of electrical power to consumer devices. Synchronization of the voltage frequency and phase allows electrical systems to function in their intended manner without significant loss of performance or life. It is used to describe electric power that drives an electrical load and the load's ability to function properly. Without the proper power, an electrical device (or load) may malfunction, fail prematurely or not operate at all. There are many ways in which electric power can be of poor quality such as voltage unbalance, harmonics etc. **Fluke make Power Analyser** to check power quality of the system. Under Power Quality, the various parameters measured and calculated are as below:

1. Load Variation
2. Voltage Variation
3. Power factor variation
4. Harmonics level

As per design, this is 8hr running facility so the maximum energy consumption is during day time. At night only minimum supporting load runs. The power analyser is used to record the parameters at main incomer. The power analyzer is used to record the power parameter at main incomer. The recorded value at main incomer is as below:

Account Number	Measured current, A			Voltage	Power Factor	Power, kW	Apparent Power, kVA
3000049020	25.7	1.8	1.2	412.6	0.93	6.36	6.84
3000049021	2.0	0.3	0.5	415.3	0.92	0.62	0.67
3000049022	7.9	6.8	11.8	415.2	0.95	6.04	6.35
3000049044	23.8	7.9	10.6	414.7	0.95	9.62	10.13
3000049045	4.9	1.0	1.2	415.3	0.92	1.57	1.70
3000049046	17.6	13.0	5.6	415.7	0.94	8.17	8.69
3000049047	17.1	11.8	2.5	416.5	0.9	6.80	7.55
3000049048	18.8	33.9	3.7	415.3	0.92	12.44	13.52
3000059624	11.7	0.9	1.5	414.8	0.92	3.11	3.38
3000059625	17.8	0.0	1.6	416.4	0.9	4.20	4.66
3000060284	5.6	9.0	9.9	415.6	0.92	5.41	5.88
3005318994	11.8	12.7	7.8	413.5	0.88	6.79	7.71
3005319244	15.0	16.5	18.4	413.6	0.91	10.84	11.92
3000060314	Not in use						
3000060317	Not in use						

Table 9: Details of the recorded Parameters at main incomer



Based upon the recorded data by power analyser, the various descriptions are as below:

7.1 Load Variation

Since this is basically a 08 hrs running facility, maximum energy consumption is observed during day time. The variation of total load at different meters is as below:

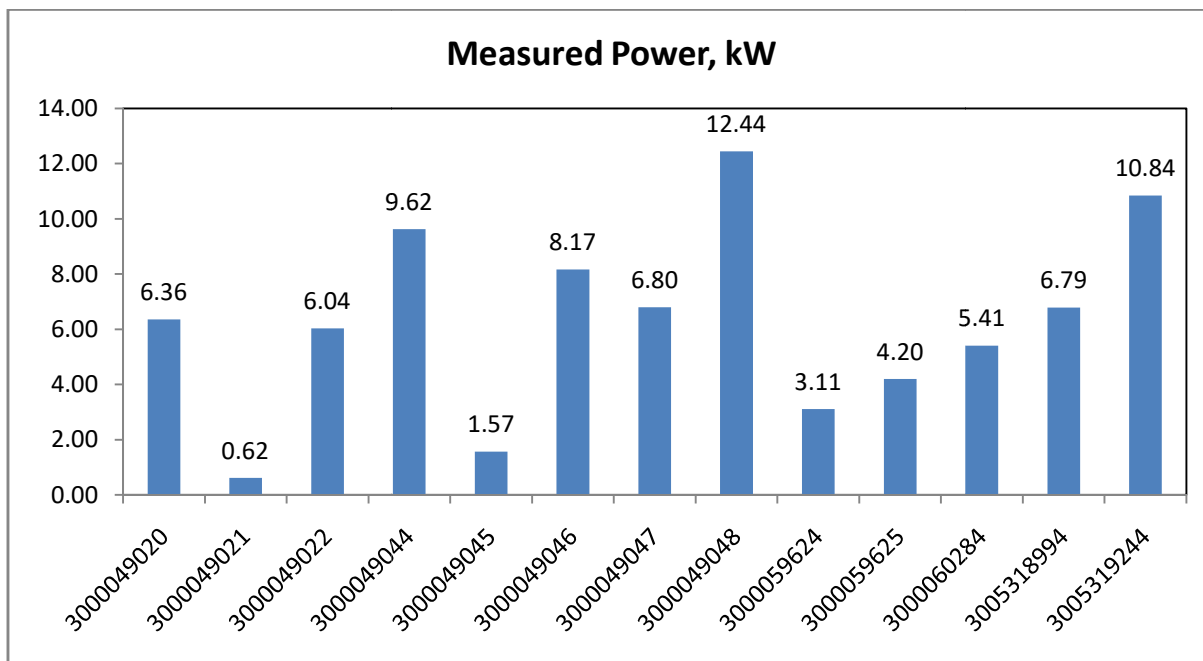


Figure 8: Trend of load variation

The maximum power is measured at PTA block (Account number 3000049048) was 12.44kW.



Voltage Variation

The voltage level at each phase of 0.415kV supply is measured at all connections and is as below:

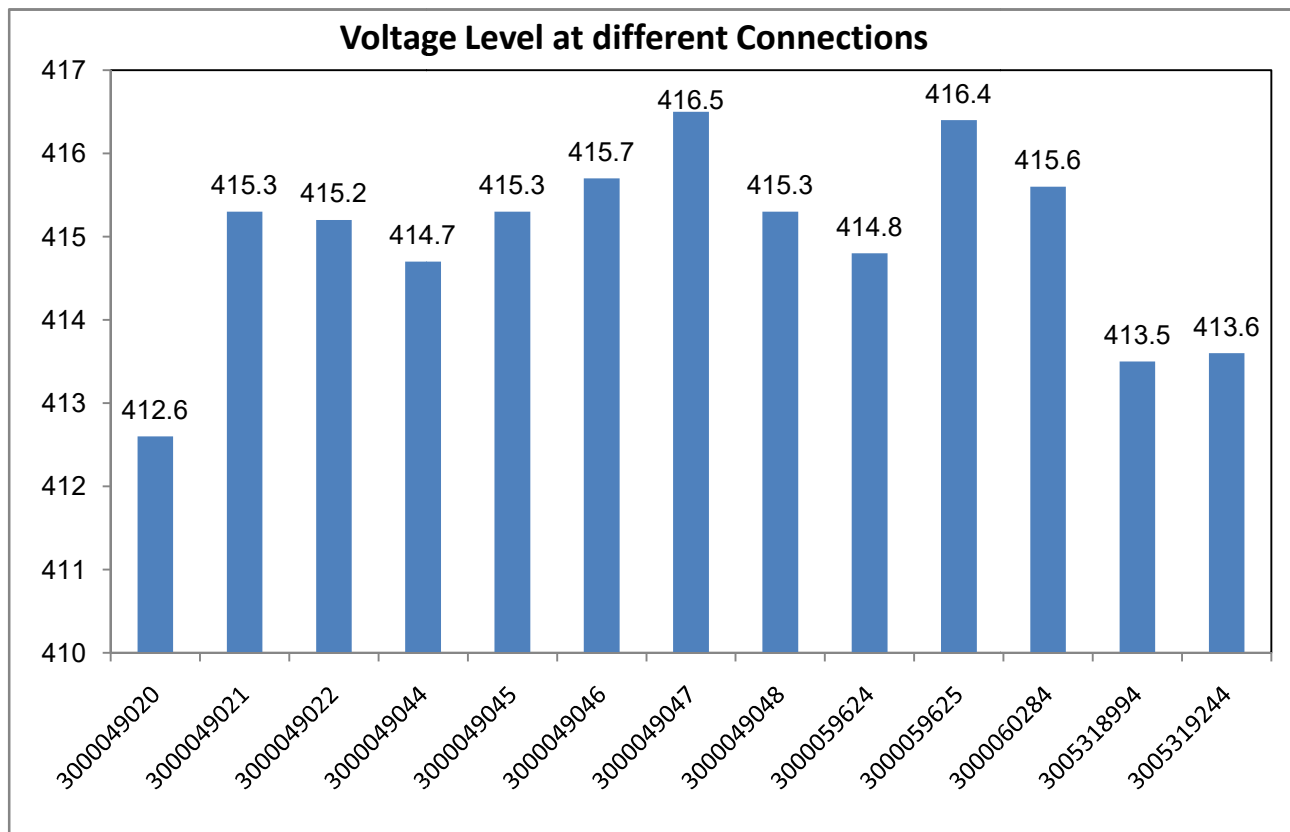


Figure 9: Trend of Voltage Variation

The voltage level was varying from 412.6V to 416.5V.

7.2 Power Factor

In an electric power system, a load with a low power factor draws more current than a load with high power factor for the same amount of useful power transferred.

It is observed that the average power factor is coming 0.92 at running load. There are no capacitor panels installed at load end in the premises to maintain the power factor. The variation of Power Factor at main incomer is as below:

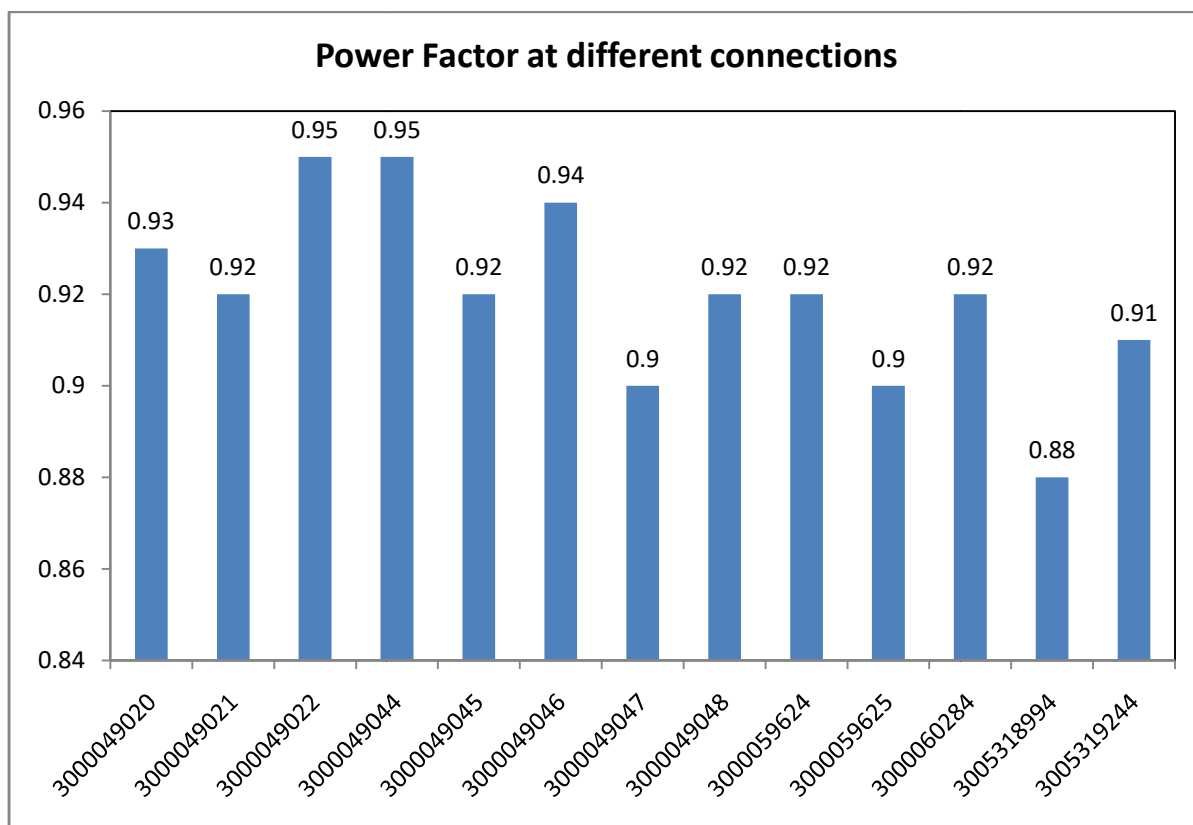


Figure 10: Trend of Power Factor

The average operating power factor is varying from 0.88 to 0.95 at different connections. Power factor is the ratio of working power in kW to apparent power in kVA. It compares the real power being consumed to the apparent power, or demand of the load. The power available to perform work is called real power. The power factor close is very good for electrical distribution system however poor power factor means that you're using power inefficiently. The power factor can be improved with APFC. It triggers the capacitor banks of suitable capacity automatically in multiple stages by directly sensing the reactive load to maintain the higher power factor.

7.3 Harmonics

Ideally, voltage and current waveforms are perfect sinusoids. However, due to the increased popularity of electronic and other non-linear loads, these waveforms get distorted. This deviation from a perfect sine wave can be represented by harmonics—sinusoidal components having a frequency that is an integral multiple of the fundamental frequency. Thus, a pure voltage or current sine wave has no distortion and no harmonics, and a non-sinusoidal wave has distortion and harmonics. To quantify the distortion, the term total harmonic distortion (THD) is used. The term expresses the distortion as a percentage of the fundamental (pure sine) of voltage and current waveforms.

<i>IEEE Std 519-1992 Harmonic Voltage Limits</i>		
Bus Voltage at PCC	Individual Voltage Distortion (%)	Total Voltage Distortion THD (%)
69 kV and below	3.0	5.0
69.001 kV through 161 kV	1.5	2.5
161.001 kV and above	1.0	1.5

NOTE: High-voltage systems can have up to 2.0% THD where the cause is an HVDC terminal that will attenuate by the time it is tapped for a user.

Current Distortion Limits for General Distribution Systems (120 V Through 69000 V)						
Maximum Harmonic Current Distortion in Percent of I_L						
Individual Harmonic Order (Odd Harmonics)						
I_{sc}/I_L	<11	$11 \leq h < 17$	$17 \leq h < 23$	$23 \leq h < 35$	$35 \leq h$	TDD
<20*	4.0	2.0	1.5	0.6	0.3	5.0
20<50	7.0	3.5	2.5	1.0	0.5	8.0
50<100	10.0	4.5	4.0	1.5	0.7	12.0
100<1000	12.0	5.5	5.0	2.0	1.0	15.0
>1000	15.0	7.0	6.0	2.5	1.4	20.0

Even harmonics are limited to 25% of the odd harmonic limits above.

Current distortions that result in a dc offset, e.g. half-wave converters, are not allowed.

* All power generation equipment is limited to these values of current distortion, regardless of actual I_{sc}/I_L .

Where:

- I_{sc} = maximum short-circuit current at PCC.
- I_L = maximum demand load current (fundamental frequency component) at PCC.
- TDD = Total demand distortion (RSS), harmonic current distortion in % of maximum demand load current (15 or 30 min demand).
- PCC = Point of common coupling.

Harmonics are created from equipment's containing electronics that control other apparatus, e.g. variable speed drives, soft starters, static compensators, rectifiers and heating furnaces, etc.

Problems due to Harmonics

- Malfunctioning of control systems since electronic meters, relays, etc. are matched to the fundamental frequency
- Overloading of capacitors, leading to malfunctioning and premature ageing
- Miss-operation or failure of electronic equipment
- Interference with telecommunications and computers
- Increased losses, e.g. machines will operate at increased temperature and can be overheated
- Resonance problems between the inductive and capacitive parts of the power network
- Disturbances in ripple control systems
- High currents in neutral conductors.

The harmonic analysis based upon the data recorded in power analyser is carried out and it is observed that both Voltage and Current THD% is within the limit values in main incomer. The detail analysis is as below table.

Parameters	Voltage THD (%)			Current THD (%)		
	R-Phase	Y-Phase	B-Phase	R-Phase	Y-Phase	B-Phase
Maximum	2.0	2.3	1.9	3.8	3.1	3.3
Average	1.8	1.9	1.6	2.9	2.8	3.0
Minimum	1.2	1.6	1.3	2.6	2.5	2.8

Table 10: Details of harmonics level at main incomer

It is clear that As per IEEE-519, 1992, there is no higher level of harmonics at any of the main incomer.

8. Electrical Utilities

There is manufacturing facility can be divided as following sections:

8.1 Diesel Generator Set

Introduction

There is one DG sets which cater to the running load corresponding to load from PSPCL in case of power failure. The contribution of energy generation from DG Set is only 0.6 %(inclusive of testing). The energy generation data is calculated based upon the fuel consumption and the Specific fuel consumption 3.45kWh/lit. The month wise energy consumption from DG Set is as below:

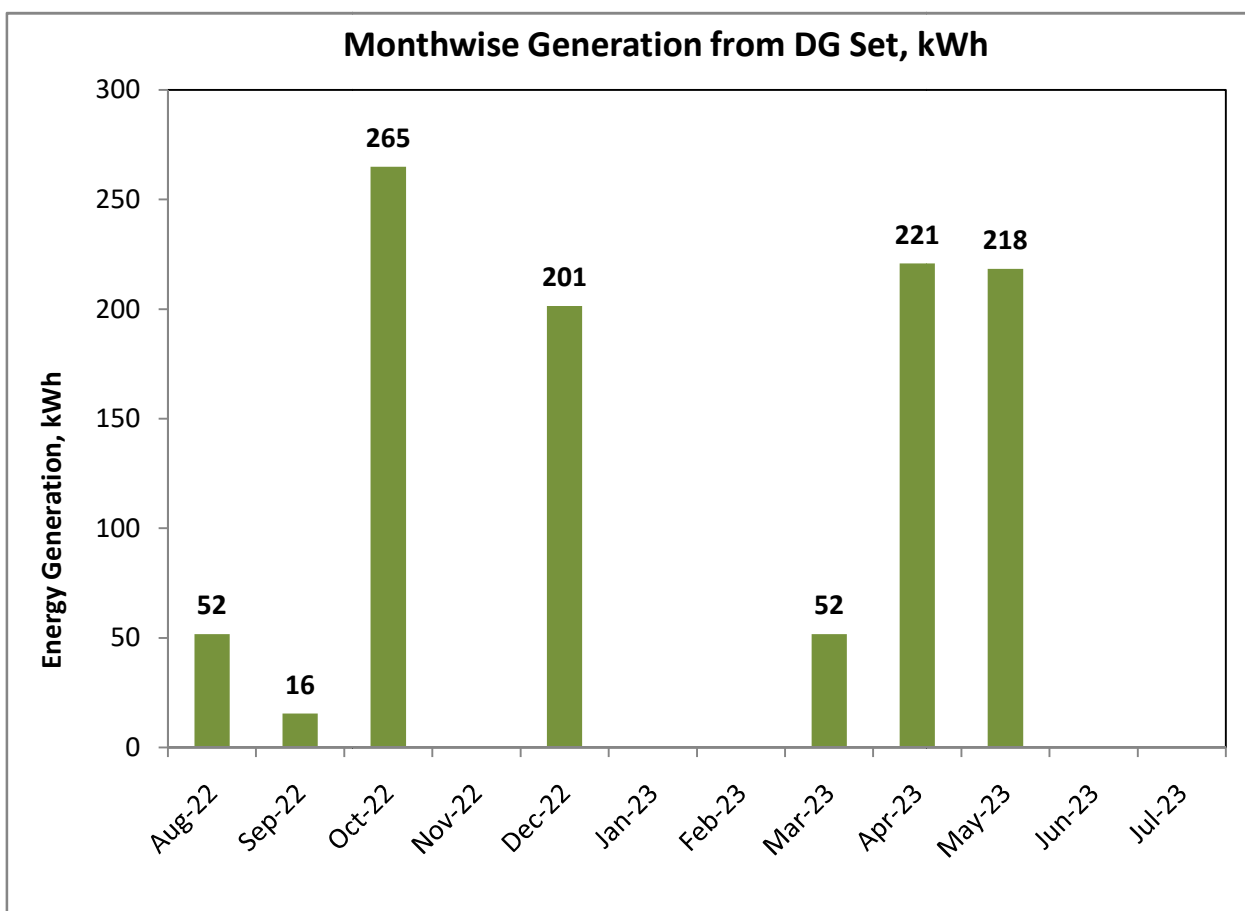


Figure 11: Month wise generation from DG sets

There are few general recommendations for DG Set as below:

- Specific Fuel Consumption (SFC) expressed in litre/hour or gm/kWh is an indication of performance of a DG Set. This parameter is of direct relevance to end users as it relates to the operating costs of generating electricity from diesel generator sets. The quantity of diesel consumption is recorded on regular basis however there is no provision for recording of energy generation from DG Set. It is recommended to install the energy meter for each DG set to keep record of the performance of evaluation of DG sets.

- Since the DG Set is used as backup power source, its availability and reliability is very important. To enhance both, it is recommended schedule Preventive maintenance of DG sets on half yearly basis. It will keep system healthy, better and uninterrupted power output at lesser fuel consumption.
- Calibrate fuel injection pumps frequently and Improve air filtration.
- Consider fuel oil additives in case they benefit fuel oil properties for DG set usage.
- Ensure fuel oil storage, handling and preparation as per manufacturers. Ensure compliance with maintenance checklist.
- The maximum permissible percentage unbalance in phase loads on DG sets is 10%.
- The permissible percentage overload on DG sets for 1 hour in every 12 hours of operation is 10%. Lower power factor of a DG set demands higher excitation currents.
- The sample data sheet which can be used for DG Set Performance on monthly basis and for each DG Set is as below:

Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Generation, kWh												
Fuel Consumption in Generation, lit												
SFC, lit/kWh												
Generation, kWh/lit												

Figure 12: Sample Performance Assessment Sheet for DG Set

8.2 Air condition Units

Introduction

There are 22 number of AC units installed in the campus and the connected load is around 95.18kW. The running load was also instantaneous only because these areas were not occupied. The computer lab new is not in operation so the AC load is not contributing towards the running load. The connected load of AC units is as below:

Area Code	Type of AC Unit	Number	Connected Load, kW	Measured Power, kW
2	Split AC	2	3.7	1.2
18	Split AC	1	1.85	
20	Split AC	3	5.55	1.6
22	Split AC	1	1.85	
23	Split AC	1	1.85	
44,45	Split AC	2	3.7	2.1
Biotech Lab 1	Split AC	1	1.85	
58	Split AC	1	1.85	
73	Split AC	1	1.85	
74	Split AC	2	3.7	
100 D	Split AC	1	1.85	
127	Split AC	5	9.25	3.1
130	Split AC	1	1.85	
138	Split AC	4	7.4	2.5
144	Split AC	1	1.85	
Law Staff Room	Split AC	1	1.85	
Sabha Bhawan	Split AC	8	14.8	
Library	Split AC	9	16.65	2.5
Caretaker Room	Split AC	1	1.85	
69	Window AC	2	3.36	1.6
70	Window AC	2	3.36	
73	Window AC	2	3.36	1.5
Total		52	95.18	16.1

Table 11: Details of AC units

The energy consumption of the AC units is 16.1kW however in actual, there are only few AC units which run continuously. The continuous running load is only 5.5kW.



There are few tips to Use Air Conditioner effectively all around the season:

1. Check and Change the Air Filter.
2. Use Smart Thermostat or AC Controllers.
3. Don't Let Your Thermostat Take the Heat.
4. Try to fix the AC unit in air sealed room to the extent possible.
5. Avoid Steep Temperature Changes and try to run AC unit at 25°C.

8.3 Lighting

Introduction

The total connected lighting load in the building is around 45.28 kW. The Mix of different types of luminaries such as FTL- 12, T-5 and different types of LED lights are installed in the campus. The Percentage share of different types of lightings is given below:

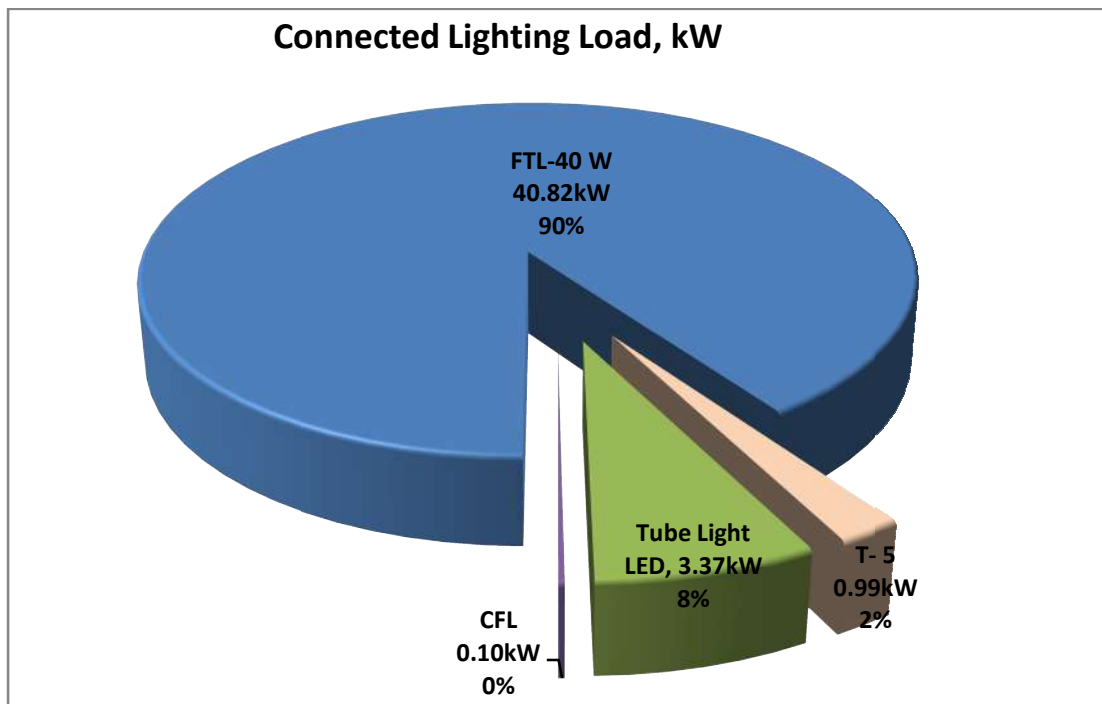


Figure 13: Percentage share of lighting Load

Performance Assessment

In the different areas of building, interior lighting requirements are for meeting average luminance on a horizontal plane, either throughout the interior, or in specific areas within the interior combined with general lighting of lower value. For assessing energy efficiency of lighting system, Inventory of the Lighting System is noted and the lux levels measurement at working level has been done with help of lux meter. The outdoor light level is approximately 1000 lux on a clear day. In a building in the area closest to the windows the light level may be reduced to approximately 450- 800 lux. In the middle area it may be as low as 125 - 350 lux. Additional lighting is often necessary to compensate low levels.

8.4 Fans

Introduction

The ceiling fans are more affordable than air conditioners and the right size can make a difference. The summers are very hot in the region so the energy consumption by the fans adds into the energy consumption in summer. Apart from ceiling fans, exhaust fans and wall fans are installed to maintain the required ambient temperature. The connected load of the fans is 68.6 and is tabulated as below:

Description	Average Rated Power, W	Number	Connected Load, kW
Ceiling Fans	80	760	60.80
Wall Fans, 50W	50	52	2.60
Exhaust	100	52	5.20
Total		864	68.6

Table 12: Connected load of fans

It is to be mentioned that the number of fans connected is far more than the actual number of fans running at anytime. So the running load of the fans is only 10-15% of the connected load of the fans.

8.5 Computers and multi-function devices

Introduction

These devices are installed in the staff room, labs and the office areas for the supporting and main stream activities. The connected load of these devices is around 49.1kW.

Description	Number	Connected load, kW
Computers	169	25.35
Printer	35	22.75
Projector	2	1
Total	206	49.1

Table 13: Connected load of Computers and multi-function devices

8.6 Miscellaneous Load

These devices are installed in the staff room, labs and the office areas for the supporting and main stream activities. The connected load of miscellaneous load is 16.35kW.

Description	Number	Connected load, kW
Refrigerator	7	2.45
Micro wave	5	7.5
Oven	13	19.5
Inverter	4	14
RO	7	1.4
Water Cooler	7	3.5
LED Screen	1	0.25
Projector	2	1
Total	46	49.6

Table 14: Details of miscellaneous load

These loads are not running continuous due to which the actual running load is only 6.8kW against the connected load of 49.6kW. The contribution of this load in annual energy is bill is very less.

9. Energy Conservation Measures and recommendations

9.1 Reduction in load from 60kW to 30kW at Account number 3000059625 to reduce fixed charges in electricity bill

Observation

From the trend of maximum demand index in the energy bill, it is clear that the recorded maximum demand for the facility is only 31.7 % while the minimum chargeable demand is 53.3kW.

Recommendation

It is recommended to reduce the connected load from 60kW to 30kW. The recommended demand is almost 36% higher than the maximum demand.

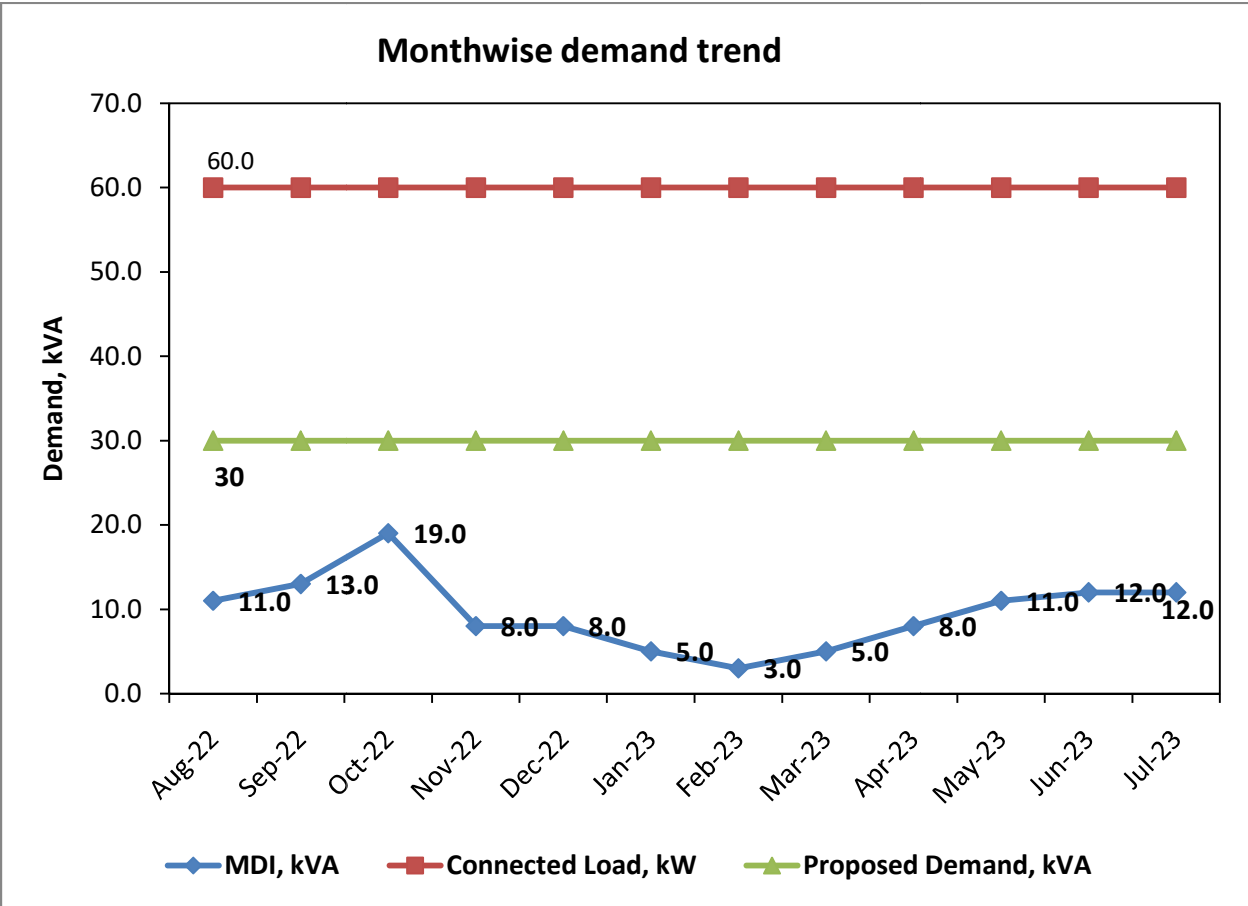


Figure 14: Current and recommended demand trend

The reduction in demand will lead to direct reduction in the energy bill. The calculated saving in energy bill is as below:

Description	UoM	Values
Present Contract load	kW	60.0
Minimum Chargeable demand	kW	53.3
Maximum Recorded demand	kW	19.0
Annual average recorded demand	kW	9.58
Recommended demand	kVA	30
Annual demand charges at present demand	Rs./annum	83,148
Annual demand charges at proposed demand	Rs./annum	41,600
Saving in fixed charges demand at recommended demand @INR 130/kVA	Rs	41,548
Investment	Rs	Nil
Payback period	Year	Immediate

9.2 Improvement in annual average power factor from the campus from 0.950 to 0.99 by installing APFC at main incomer

Observation

The annual average power factor as per electricity bill is 0.950. At present there is no provision for improvement in power factor for the facility at load end.

Recommendation

The recommended to install 40kVAr APFC to maintain power factor for the facility close to unity. APFC is an automatic power factor control panel which is used to improve the power factor, whenever required, by switching ON and OFF the required capacitor bank units automatically. It becomes very much important to reduce on electrical consumption for reducing expenditure and economizing the utility expenses by harnessing electrical utility by operation at desired power factor to curtail unwanted electricity penalty rising because of power factor drop. It also helps us to keep reactive power consumption low from the system and thus keeping MDI low.

The details of saving calculations are as below:

Description	UoM	Values
Average monthly Power Factor at Main supply		0.950
Recommended Minimum Power Factor		0.990
Annual Energy consumption from Main supply	kWh	1,92,870
Annual Energy consumption as per average power factor	kWh	1,83,227
Actual Energy consumption at improved power factor	kWh	1,85,077
Energy saving as excess reactive power drawn	kWh	7,793
Capacity of capacitor bank consider for installation	kVAr	40
Annual monetary saving @Rs7.62/kWh	Rs	59,381
Investment	Rs	78,500
Payback period	Year	1.3

9.3 Installation of PIR (Passive Infrared) type occupancy sensor for individual rooms computer lab and common room area to reduce the energy consumption

Observation

It is observed that in many room the light, fans and AC units were running even when no occupant in the room. After office hours in few rooms, the fan supply was on lead to energy consumption irrespective of useful output.

Recommendation

It is recommended to install the occupancy sensor for individual rooms, computer lab and common room area to switch off running load when there is no occupant. Occupancy sensors are one kind of devices used for detecting occupancy in space automatically deactivates the light so that the energy can be conserved. This sensor may also activate the lights. This device can also activate the lights routinely by detecting the occurrence of people and provides security and convenience help. The strategies based on occupancy can generate 24% of normal savings of lighting energy. Based upon the running load, the calculated energy saving is as below:

Description	UoM	Value
Connected lighting load	kW	5.8
Load reduction after de-lamping and re-orientation	%	10
Connected load after de-lamping and re-orientation@7.5%	kW	5.22
Expected reduction in energy consumption after installation of Photo sensors	%	7.5%
Operating Hours	Hrs.	8
Operating Days	Days	250
Annual Energy Consumption at present scenario	kWh	10,440
Annual Energy Consumption after installation of photo sensors and de-lamping	kWh	9,174
Annual Energy Saving	kWh	1,266
Annual monetary saving @Rs7.62/kWh	Rs.	9,646
Investment for installation of photo sensors, de-lamping and re-orientation	Rs.	20,300
Payback Period, months	Years	2.1

9.4 Replacement of 100 number FTL- 12 (Fluorescent tube lights) with new energy efficient 20 LED lights to reduce energy consumption

Observation

The connected load of the FTL- 12 fluorescent tube lights considered for replacement is around 5.4kW. These lights require the installation of ballast to stabilize the internal current that produces light. The ballast also leads to the additional power consumption in the energy consumption of the fitting.

Recommendation

FTL- 12 can be replaced with LED tube in the exiting fixture. It will give better lux level reduces energy consumption by more than 50%. The calculated saving after replacement is as below:

Description	UoM	Values
Number of fitting		100
Rated power of FTL- 12 fittings with Ballast	W	54
Average Operating Hours	hours	5
Number of operating days	days/annum	250
Proposed Wattage of LED	W	20
Annual Energy Consumption at present scenario	kWh	6,750
Annual Energy Consumption after implementation	kWh	2,500
Annual Energy Saving	kWh	4,250
Estimated monetary saving @INR7.62/kWh	Rs.	32,385
Investment, Rs.450/Watt	Rs.	45,000
Payback Period, months	Years	1.4

9.5 Replacement of 33 number of T- 5 (Fluorescent tube lights) with new energy efficient 20W LED lights to reduce energy consumption

Observation

There are only 33 number of T- 5 tube lights which has connected load around 1.1kW. These lights require the use of a ballast to stabilize the internal current that produces light. The ballast also leads to the additional power consumption in the energy consumption of the fitting.

Recommendation

T- 5 tube lights can be replaced with 20W LED tube light. It will give better lux level reduces energy consumption by more than 30%. The calculated saving after replacement is as below:

Description	UoM	Values
Number of fitting		33
Connected Load consider for replacement	kWh	1.1
Average Operating Hours	hours	8
Number of operating days	days/annum	250
Proposed Wattage of LED	W	20
Annual Energy Consumption at present scenario	kWh	2,178
Annual Energy Consumption after implementation	kWh	1,320
Annual Energy Saving	kWh	858
Estimated monetary saving @INR7.62/kWh	Rs.	6,538
Investment, Rs.450/Watt	Rs.	14,850
Payback Period, months	Years	2.3

9.6 Replacement of 100 number of old ceiling fans with Energy efficient star rated BLDC ceiling fans

Observation

The connected load of the fans installed in the building considered for replacement based upon number of running hours is 10.0kW. These fans are old/conventional and having low energy efficiency. The conventional ceiling fans built with an AC Induction Motor (ACIM). Typically, old fans may consume up to 100W.

Recommendation

Super Energy Efficient ceiling fans use enhanced semiconductor technology consume 35W or lesser power with no compromise in air delivery. These fans have a BLDC motor (Brushless DC Motor) with micro-controllers and save over 50% of the power consumed by regular fans. Energy-efficient fans or power-saving ceiling fans are another product in this category which uses a minimum level of electronic technology to reduce power consumption. They are BEE (Bureau of Energy Efficiency) 5 star rated fans and consume only 35W. They have an electronic step or an electronic fine-tuning regulator. The saving calculations are as follows:

Description	UoM	Value
Average running load of existing Fans	W	100
No. of fans	Qty	100
Total Load	kW	10.0
Average running load of Proposed Fans	W	35
Total Load after replacement	kW	3.5
Operating Hours	Hrs.	8
Operating Days	Days	220
Annual Energy Consumption	kWh	17600
Annual Energy Consumption after implementation	kWh	6160
Energy Saving	kWh	11,440
Estimated monetary saving @INR 7.62/kVAh	INR	87,173
Investment @Rs 2400/fan	INR	2,40,000
Simple Payback period	Years	2.75

9.7 Installation of Upgraded Energy monitoring and management system in Energy distribution network to maximize the optimum energy utilization

The Measurement and Verification (M&V) Plan is a document that defines project-specific M&V methods and techniques that will be used to determine and verify the Nominated Energy Efficiency Value (i.e., the demand reduction) resulting from an Energy Efficiency Resource. In addition to providing accurate and conservative methods to calculate the Nominated EE Value, a good M&V Plan is clear, consistent, and repeatable. All the assumptions, procedures, and data for the M&V Plan should be recorded properly so that they may be easily referenced and verified by others. The data included should be sufficient for a third party to audit the M&V procedures and verify the Nominated EE Value of an EE Resource. M&V activities include, but are not limited to, site surveys, demand and energy measurements, metering of key variables, data analyses, calculations, and quality assurance procedures. All of these key components need to be adequately detailed in the M&V Plan.

Observation

After discussion with the officials on observation during the site visit, following observations are concluded on energy consumption for batch size:

1. During energy audit period after discussion with the different officials, it came to notice that the monitoring of energy consumption is done on monthly basis only.
2. There is no record of energy consumption section/electrical panel was as no energy meters are installed. Section wise there are many factors which will lead to variation in energy consumption. Clearly
3. College has installed PSPCL energy meters at main incomer only.
4. There is no provision for reordering energy consumption on daily basis. The track of load variation is not possible without these energy meters.

Recommendation

Considering all above facts we recommend the installation of Energy Monitoring System. Energy Monitoring System come with different software and parameters (regular and tailor made both) to best capture the process behaviour. It has all the standard reports that one would expect from an EMS with following parameters:

- Real-time views & trends
- Historical views & trends
- Energy Reports
- Alarm Reports

The detail presentations of the parameters at standard screens and features make system understanding very easy. Once data is recorded, next time directly parameter will be captured for same quantity and material. This will lead to minimum variation of energy consumption with better control of parameter without human intervention. The one snapshot of report prepared is as below:

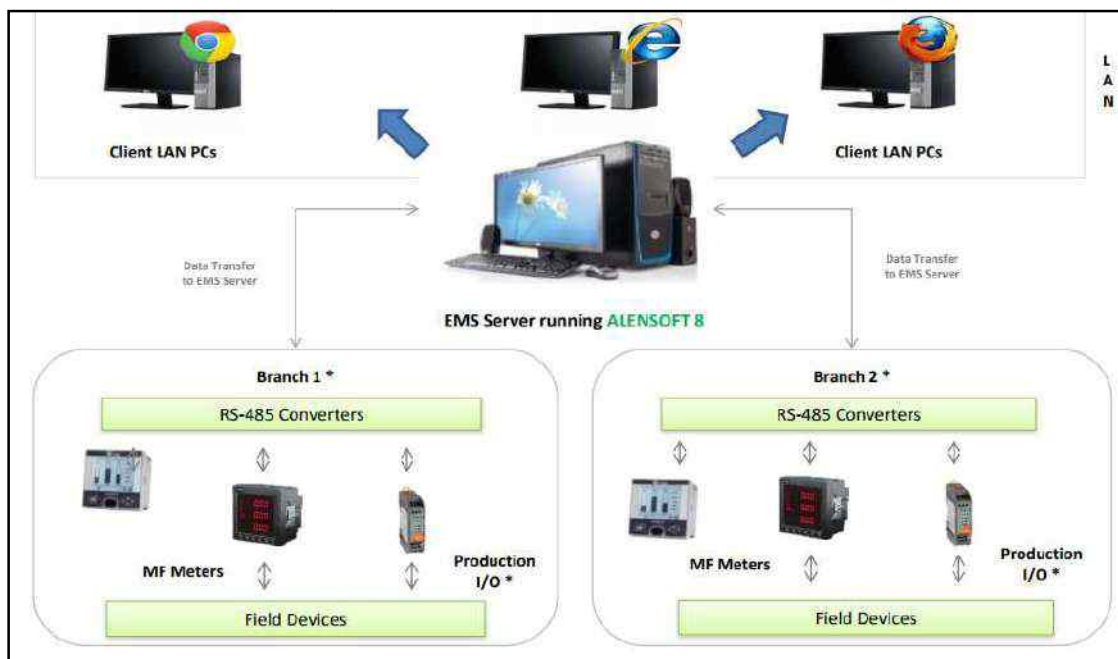


Figure 15: EnMS Report Snapshot

The calculated saving from installation of energy monitoring system is as below:

Description	UoM	Value
Annual energy consumption in the building	kWh	1,83,227
Expected reduction in energy consumption after implementation of Energy Monitoring system	%	7%
Annual Energy Consumption after implementation of measure	kWh	1,70,401
Annual Energy Saving	kWh	12,826
Estimated monetary saving @INR7.62/kWh	Rs.	97,733
Investment for Implementation of Energy monitoring and Controlling system	Rs.	1,56,000
Payback Period	Years	1.60



Annexure I. Copy of Electricity Bill

Connection 300049020

PUNJAB STATE POWER CORPORATION LIMITED (Regd. Office P.S.E.B. Head Office, The Mall Patiala-147001, Ph. 1912), CIN: U40109PB20108GC033813 E-mail: 1912@pspcol.in, Website: www.pspcol.in, GSTIN NO: 03AAF05120Q1ZC						Billing Category SAP-SBM-DS DOMESTIC FOR DPC-0	
Sub Division	Division	Circle	Feeder Code	Bill Cycle	Billing Group	Bill No.	
MODEL TOWN COMMERCIAL - 2	MODEL TOWN DIVISION	PATIALA	FDC000000036	3	0	50218711049	
Consumer Name: MR. P MOHINDRA COLLEGE		Consumer GSTIN:	A/C No.: 300049020	Old A/C No.: P17MC460158L		Issue Date: 10-JUN-2023	
Address: D- DHILLON COLONY MOHINDRA COLLEGE MOHINDRA COLLEGE PATIALA DHILLON COLONY MOHINDRA COLLEGE MOHINDRA COLLEGE PATIALA		Email ID: gomohXXXXXXXXXX@gmail.com	Mobile No: 98XXXXX786	MRU: P17MC46		Connection Date: 19830720	
Meter No.	Make	Capacity	Digit	Meter Status	Bill Status		
8712759-0	AVON METERS PVT.LTD	(10-60)	5	N	AVERAGE		
Connected Load(kW)	Category	Security Cons. Amount	Meter Security	Interest of Security	Concession Units		
11.3	SAP-SBM-DS DOMESTIC FOR DPC-0	480	0	0	0		
Reading Date	Reading	Multipplier	Old Meter Units Consumed (kWh):0				
New	Old	New	Old	Current Meter Units Consumed (kWh):847			
10-JUN-2023	11-May-2023	40526	39679	Total Units Consumed (kWh):847			
(A) Fixed Charges	(a) Load(80%)	(b) Rate/kWh/Month	(c) Bill Period	FC = a x b x c x 12/365			
	9.04	110	30	963			
(B) Energy Charges	Units	Rate/kWh	Amount	Total Energy Charges			
100kWh/month	100	5.34	524.9	6159			
101-300kWh/month	200	7.15	1412.45				
301-500kWh/month	547	7.75	4221.25				
(C) FCA	Units	Rate kWh	Amount				
	0	0	0				
*Additional Surcharge	847	0.3	0				
(D) Rentals	Meter Rentals	MCB Rentals	Other	SGST	CGST	Total Rentals	
	11	9	0	1.8	1.8	23.6	
(E) Taxes	ED	IDF	Municipal Tax	Cow Cess	Others	Total Taxes	
	926	356	142	17	0	1441	
(F) Previous Adjustment Amount	Fixed Charges	Energy Charges	FCA + Rentals	Taxes		Total	
	0	0	0	0		0	
(G) Previous Unpaid Bill Arrears	Pending Amount	Late Payment Surcharge	Interest	Others	Total		
	-9	0	0	0	-9		
(H) Sundry Charges	Fixed Charges	Energy Charges	FCA + Rentals	Taxes		Total	
Notice No:	0	0	0	0		0	
Date:							
(I) Sundry Allowance	Fixed Charges	Energy Charges	FCA + Rentals	Taxes		Total	Curr/Prev Rounding Amount
Notice No:	0	0	0	0		0	-2.67/-4.93
Date:							
(J) Subsidy	Subsidised Units	Others	GoP Subsidy Amount				
	0		0				
(K) SC WSD Amount Withheld	(L) Net Bill Amount Payable (A + B + C + D + E + F + G + H - I - J - K)			Rs.8570/-			
	0			Eight Thousand Five Hundred Seventy Rupees Only			
DueDate Cash/Online	DueDate Cheque/DD	Amount Payable by due date	Simple Interest on delayed payment @ 1.5%p.m		Amount Payable within 1 month after due date		
21-Jun-2023	21-Jun-2023	Rs. 8570	Rs. 129		Rs. 8699		
Consumption History for 6 Cycles							
Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6		
1286	0	795	468	340	424		
Payment History:							
3490.00/- Dated : 20230517							
Message:							
1. Payments exceeding Rs.20,000/- shall be accepted in digital mode only w.e.f. 01-07-2021.							
2. In case the payment of billed amount is not made by the due date, the power supply shall be liable for disconnection after expiry of 15 days of the due date and this may be taken as notice under section 56 of the Electricity Act 2003 read with regulation 32 of the Supply Code, 2014.							
3.							
4. CHARGES HAS BEEN CHARGED AS ED @ 13% OF SOP, MT @ 2% OF SOP, IDF @ 5% OF SOP, COWCESS @ 1 OR 2 PAISA PER KWH/VAH							
GST Description INVOICE CUM BILL OF SUPPLY							
Description (HSN Code)	Quantity	UQC	Non-Taxable Amount	Taxable Amount	CGST 9%	SGST 9%	Total
Meter Rent (997319)	1	-	0	11	3.6	3.6	14.6
MCB Rent (997319)	1	-	0	9	0	0	9
Electrical Energy (271500)	847	UNT-Units	7122	0	0	0	7122
Powered by O/o CE(IT) PSPCL				Print Date: 07-19-2023 11:33 AM			



Connection 300049021

PUNJAB STATE POWER CORPORATION LIMITED							Billing Category	
(Portal for Electricity Bill Payments New Electricity Connections Load Extensions)							SAP-SBM-DS DOMESTIC FOR DPC-0	
(Regd. Office P.S.E.B. Head Office, The Mall Patiala-147001, Ph. 1912), CIN: U40109PB20108GC033813 E-mail: 1912@pspl.in, Website: www.pspol.in, GSTIN NO: 03AAFCP5120Q1ZC								
Sub Division	Division	Circle	Feeder Code	Bill Cycle	Billing Group	Bill No.		
MODEL TOWN COMMERCIAL - 2	MODEL TOWN DIVISION	PATIALA	FDC000004837	3	0	53007095136		
Consumer Name: MR. P M COLLEGE		Consumer GSTIN:	A/C No.:	Old A/C No.:	Issue Date:			
Address: D- DHILLON COLONY MOHINDRA COLLEGE MOHINDRA COLLEGE PATIALA-1		Email ID:	Mobile No.:	MRU:	Connection Date:			
5001112-0		Make	Capacity	Digit	Meter Status	Bill Status		
5001112-0		ALLIED ENGINEERING W	(10-60)	6	0	OK		
Connected Load(kW)	Category	Security Cons. Amount	Meter Security	Interest of Security	Concession Units			
6	SAP-SBM-DS DOMESTIC FOR DPC-0	1890	0	0	0			
Reading Date		Reading		Multiplier	Old Meter Units Consumed (kWh):0			
New	Old	New	Old		Current Meter Units Consumed (kWh):88			
01-JUN-2023	01-May-2023	246	158	0	Total Units Consumed (kWh):88			
(A) Fixed Charges	(a) Load(90%)	(b) Rate/kWMonth	(c) Bill Period	FC = a x b x c x 12/365				
	4.8	75	31	334				
(B) Energy Charges	Units	Rate/kWh	Amount	Total Energy Charges				
100kWh/month	88	4.44	362.72					
101-300kWh/month	0	0	0					
301-500kWh/month	0	0	0	363				
(C) FCA	Units	Rate kWh	Amount					
	0	0	0					
*Additional Surcharge	88	0.3	0					
(D) Rentals	Meter Rentals	MCB Rentals	Other	SGST	CGST	Total Rentals		
	11.37	9.3	0	1.86	1.86	24.39		
(E) Taxes	ED	IDF	Municipal Tax	Cow Cess	Others	Total Taxes		
	90	35	14	2	0	141		
(F) Previous Adjustment Amount	Fixed Charges	Energy Charges	FCA + Rentals	Taxes	Total			
	0	0	0	0	0			
(G) Previous Unpaid Bill Arrears	Pending Amount	Late Payment Surcharge	Interest	Others	Total			
	-510	0	0	0	-510			
(H) Sundry Charges	Fixed Charges	Energy Charges	FCA + Rentals	Taxes	Total			
Notice No:	0	0	0	0	0			
Date:								
(I) Sundry Allowance	Fixed Charges	Energy Charges	FCA + Rentals	Taxes	Total	Curr/Prev Rounding Amount		
Notice No:	0	0	0	0	0	0.89/-3.28		
Date:								
(J) Subsidy	Subsidised Units		Others		GoP Subsidy Amount			
	0		0		0			
(K) SC WSD Amount Withheld	(L) Net Bill Amount Payable (A + B + C + D + E - F + G + H - I - J - K)			Rs.350/-				
0				Three Hundred Fifty Rupees Only				
DueDate Cash/Online	DueDate Cheque/DD	Amount Payable by due date		Simple interest on delayed payment @ 1.5% p.m	Amount Payable within 1 month after due date			
19-Jun-2023	15-Jun-2023	Rs. 350		Rs. 5	Rs. 355			
Consumption History for 6 Cycles								
Cycle 1		Cycle 2		Cycle 3		Cycle 4		Cycle 5
385		0		55		0		308
158								
Payment History:								
960.00/- Dated : 20230502								
Message:								
1. Payments exceeding Rs.20,000/- shall be accepted in digital mode only w.e.f. 01-07-2021.								
2. In case the payment of billed amount is not made by the due date, the power supply shall be liable for disconnection after expiry of 15 days of the due date and this may be taken as notice under section 56 of the Electricity Act 2003 read with regulation 32 of the Supply Code, 2014.								
3.								
4. CHARGES HAS BEEN CHARGED AS ED @ 13% OF SOP, MT @ 2% OF SOP, IDF @ 5% OF SOP, COWCESS @ 1 OR 2 PAISA PER KWH/KVAH								
GST Description INVOICE CUM BILL OF SUPPLY								
Description (HSN Code)	Quantity	UQC	Non-Taxable Amount	Taxable Amount	CGST 9%	SGST 9%	Total	
Meter Rent (997319)	1	-	0	11.37	3.72	3.72	15.09	
MCB Rent (997319)	1	-	0	9	0	0	9	
Electrical Energy (271800)	88	UNT-Units	697	0	0	0	697	
Powered by O/o CE(IT) PSPCL								
Print Date: 07-19-2023 11:36 AM								



Connection 300049022

PUNJAB STATE POWER CORPORATION LIMITED (Regd. Office P.S.E.B. Head Office, The Mall Patiala-147001, Ph. 1912), CIN: U46109PB2010SGC033813 E-mail: 1912@pspcd.in, Website: www.pspd.in, GSTIN NO: 03AAFCP5120G1ZC Original for Recipient Duplicate for Supplier, Taxable Invoice, Invoice-cum-Bill of Supply										Billing Category	
										D5 DOMESTIC FOR DPC	
Sub Division	Division	Circle	Bill Cycle			Bill Date		Bill No.			
MODEL TOWN COMMERCIAL - 2	MODEL TOWN DIVISION	PATIALA	03-2023			15-JUN-2023		50216764397			
A/C No.: 3000049022	Load	Contract Demand	Tariff Type	Bill Status	Due Date		Bill Amount				
Consumer Name: MR. PRINCIPAL Address: 0. DHILLON COLONY MOHINDRA COLLEGE MOHINDRA COLLEGE PATIALA-1	30.00		DS DOMESTIC FOR DPC	O	26-Jun-2023		Rs. 7740/-				
GST No.:	Details of Meter			Meter Status	CT Make		CT No.				
Connection Date: 01-12-2011	Voltage Supply	Meter Number	Make	Capacity	Digit	Meter Status		CT No.			
Mobile No.: 98XXXXX786	0.415	12417860	HIMACHAL ENERGY	2.5-5	6	O		2662 2664 2669			
Feeder Code	Date of New Reading	Date of Old Reading	Bill Period	Meter Security	Securt Cons.	Security cons/Meter Security Interest					
FDC000004637	14-JUN-2023	19-MAY-2023	25	5980	11100						
Meter Reading											
Details	Old Reading	New Reading	Current Units	Meter Multiplier	Line CT Ratio	Meter CT Ratio	Overall Multiplier	MMTS Correction	Old Meter Cons.	Unit Consumed	
KWH	12487	13031		1.00	100/5	100/5	1.00			564	
KVAH	12555	13148		1.00	100/5	100/5	1.00			593	
MDI	9	7		1.00	100/5	100/5	1.00			7	
(A) Fixed Charges											
Contract Demand (L) KVA	Actual Demand KVA (A)	80% of (L) KVA (B)	A or B whichever greater KVA (C)	Rate per KVA per month (R)	Billing Days (D)	A: Fixed Charges Amount = CxRx12/365					
	7	2.00	24.00	110.00	28	2257.00					
(B) Energy Charges											
	Units	Rate/kWh	Amount	B: Total Energy Charges							
0-100	87	5.34	464.58								
100-300	173	7.15	1236.95								
300-500	364	7.75	2356.00	4658							
500 & ABOVE	0		0.00								
(C) Fuel Cost Adjustment Charges											
Total Energy Charges	KVAH Consumption	Rate of FCS/KVAH	C: Amount	Unit	Rate	Amount	C: FCA + Addl Surcharges				
4058		0.00				0.00	4058				
(D) Rental Charges											
Meter Rent for PSPCL Meter	MCB, CT/PT Unit Rental	Rent for any other equipment	Total Rent	HSN Code	SGST	CGST	Total GST	D: Total Rent with Tax			
71.93	55.47		127.4		11.46	11.46	22.92	150.32			
(E) Surcharges											
Voltage Surcharge			Demand Surcharge			ToD Surcharge					
Supply Voltage	Catered Voltage	Surcharge Rate	Voltage Surcharge Amount	Demand In excess	Rate of Demand Surcharge	Amount of Demand Surcharge	Peak Hours KVAH	Rate	Amount	E: Total Surcharge (Rs.)	
0.415	0.415		0.00	0.00	0.00	0.00			0.00	0.00	
(F) Rebates											
Voltage Rebates					ToD Rebates						
Units	HT/EHT Rebate	Amount	Non-Peak Hours KVAH			Rate	Amount	F: Total Rebates (Rs.)			
0.00	0.00	0.00	0.00				0.00	0.00			
(G) Previous Adjustment Amount Notice No.: - and Date: -											
Units	Fixed Charges	Energy Charges	FCA	Rentals	Surcharges(+)	Rebates(-)	Taxes	Subsidy	Total	G: Net Previous Adjustment (Rs.)	
							0		0-5	0-5	
(H) Sundry Charges/Allowances Notice No.: - and Date: -											
Late Payment Interest	Units	Fixed Charges	Energy Charges	FCA	Rentals	Surcharges(+)	Rebates(-)	Taxes	Subsidy	Total	H: Net Sundry Charges/Allowances (Rs.)
(I) Subsidy											
Subsidised KVAH	Rate for Subsidy		Amount							I: Net Subsidy (Rs.)	
593	0.00		0.00							0.00	
(J) Taxation											
Electricity Duty	Municipal Tax	DF	Cow Cess	Total Tax	Net Energy Charges	TCS/TDS	Curr/Prev Rounding Amount		NET BILL AMOUNT		
821.00	126.00	316.00	11.00	1274		0.00			Rs. 7740/-		
										Seven Thousand Seven Hundred Forty Rupees Only	
(K) Total Billied Amount											



Connection 300049025

PUNJAB STATE POWER CORPORATION LIMITED (Regd. Office P.S.E.B. Head Office, The Mall Patiala-147001, Ph. 1912), CIN: U40109PB20108GC033813 E-mail: 1912@pspcil.in, Website: www.pspcl.in, GSTIN NO: 03AFCPS120Q1ZC							Billing Category SAP-SBM-NRS NRS WITH DPC-0	
Sub Division	Division	Circle	Feeder Code	Bill Cycle	Billing Group	Bill No.		
MODEL TOWN COMMERCIAL - 2	MODEL TOWN DIVISION	PATIALA	FDC000004637	5	0	50222148499		
Consumer Name: MR. P MOHINDRA COLLEGE		Consumer GSTIN:	A/C No.: 300049025	Old A/C No.: P17MC460196F	Issue Date: 01-AUG-2023			
Address: D- DHILLON COLONY MOHINDRA COLONY MOHINDRA COLONY PATIALA-147		Email ID: gomoXXXXXX@gmail.com	Mobile No.: 73XXXXXX796	MRU: P17MC46	Connection Date: 19850503			
Meter No.	Make	Capacity	Digit	Meter Status	Bill Status			
5001120-0	ALLIED ENGINEERING W	(10-60)	6	OK	OK			
Connected Load(kW)	Category	Security Cons. Amount	Meter Security	Interest of Security	Concession Units			
1.3	SAP-SBM-NRS WITH DPC-0	80	0	0	0			
Reading Date		Reading	Multiplier	Old Meter Units Consumed (kWh):0				
New	Old	New	Old	Current Meter Units Consumed (kWh):28				
01-AUG-2023	01-JUL-2023	1419	1391	Total Units Consumed (kWh):28				
(A) Fixed Charges	(a) Load(80%)	(b) Rate/kWh/Month	(c) Bill Period	FC = a x b x c x 12/365				
1.04	1.04	70	31	74				
(B) Energy Charges	Units	Rate/kWh	Amount	Total Energy Charges				
100kWh/month	28	6.91	193.48	193				
101-300kWh/month	0	0	0					
301-500kWh/month	0	0	0					
(C) FCA	Units	Rate/kWh	Amount					
0	0	0.3	0					
*Additional Surcharge	28	0.3	0					
(D) Rentals	Meter Rentals	MCB Rentals	Other	SGST	CGST	Total Rentals		
11	9	0	1.8	1.8	23.6			
(E) Taxes	ED	IDF	Municipal Tax	Cow Cess	Others	Total Taxes		
35	13	5	1	0	54			
(F) Previous Adjustment Amount	Fixed Charges	Energy Charges	FCA + Rentals	Taxes	Total			
0	0	0	0	0	0			
(G) Previous Unpaid Bill Arrears	Pending Amount	Late Payment Surcharge	Interest	Others	Total			
0	0	0	0	0	0			
(H) Sundry Charges	Fixed Charges	Energy Charges	FCA + Rentals	Taxes	Total			
Notice No:	0	0	0	0	0			
Date:								
(I) Sundry Allowance	Fixed Charges	Energy Charges	FCA + Rentals	Taxes	Total	Curr/Prev Rounding Amount		
Notice No:	0	0	0	0	0	-2.58/-2.02		
Date:								
(J) Subsidy	Subsidised Units	Others	GoP Subsidy Amount					
0	0	0	0					
(K) SC WSD Amount Withheld	(L) Net Bill Amount Payable (A + B + C + D + E + F + G + H + I + J + K)				Rs.340/-			
0					Three Hundred Forty Rupees Only			



Connection 300049044

PUNJAB STATE POWER CORPORATION LIMITED (Regd. Office: P.S.E.S. Head Office, The Mall Patiala-147001 Ph. 1912), CIN: U40100PB2016GGC000019 E-mail: 1913@pspc.in, Website: www.pspc.in, GSTIN NO: 03AAKCP9129G1ZC Original for Recipient Duplicate for Supplier, Taxable Invoice, Invoice-cum-Bill of Supply										Billing Category		
										DS DOMESTIC FOR DPC		
Sub-Division: MODEL TOWN COMMERCIAL - 2	Division: MODEL TOWN DIVISION	Circle: PATIALA	Bill Cycle: 04-2023	Bill Date: 19-JUL-2023	Bill No: 50022001561							
AVC No: 300049044	Consumer Name: SRM HOSTAL SUPERDENT	Address: D. DHILLOI COLONY MOHINDRA COLLEGE MOHINDRA COLLEGE PATIALA-1	Load: 25.00	Contract Demand: 08 DOMESTIC FOR DPC	Terf Type: D	Bill Status: D	Due Date: 31-JUL-2023	Call/Cheque: 31-JUL-2023	DD/Cheque: 31-JUL-2023	Bill Amount: Rs.7690/-		
GST No.: Connection Date: 01-11-1985 Mobile No.: 730000796	Voltage Supply: 0.415	Details of Meter: Meter Number: 19415103	Make: J.A.T	Capacity: F	Tag: D	Meter Status: D	CT Make: 7334 7317	CT No: 7310				
Feeder Code: FDC000004037	Date of New Reading: 17-JUL-2023	Date of Old Reading: 14-JUN-2023	Bill Period: 03	Meter Security: 1890	Security Cons: 8050	Security cons/Meter Security Inflow:						
Meter Reading												
Details	Old Reading	New Reading	Current Units	Meter Multiplier	Line CT Ratio	Meter CT Ratio	Overall Multiplier	MMTS Correction	Old Meter Cons.	Unit Consumed		
KWH	24619	25469		1.00	2005	2005	1.00			550		
KVAH	26599	27415		1.00	2005	2005	1.00			518		
MCI	0	0		1.00	2005	2005	1.00			0		
(A) Fixed Charges												
Contract Demand (L) KVA	Actual Demand KVA (A)	50% of (L) KVA (B)	A or B whichever greater KVA (C)	Rate per KVA per month (R)	Billing Days (D)	A. Fixed Charges Amount = CxRxDx12000						
0	0	0.00	00.00	110.00	03	2307.00						
(B) Energy Charges												
	Units	Rate/KWH	Amount	B. Total Energy Charges								
0-100	110	5.34	587.4									
100-200	220	7.15	1573.00									
200-500	220	7.75	1705.00	3665								
500 & ABOVE	0		0.00									
(C) Fuel Cost Adjustment Charges												
Total Energy Charges	KVAH Consumption	Rate of FCA/KVAH	C. Amount	Unit	Rate	Amount	C. FCA + Addl Surcharges					
3665		0.00	0.00			0.00	3665					
(D) Rental Charges												
Meter Rent for PSPCL Meter	MCI, CT/PT Unit Rental	Rent for any other equipment	Total Rent	ISN Code	GGST	CGST	Total GST	D. Total Rent with Tax				
01.3	20.4	161.7	183.4		14.56	14.56	29.12	190.82				
(E) Surcharges												
Voltage Surcharge			Demand Surcharge			ToD Surcharge						
Supply Voltage	Calced Voltage	Surcharge Rate	Voltage Surcharge Amount	Demand in excess	Rate of Demand Surcharge	Amount of Demand Surcharge	Peak Hours KVAH	Rate	Amount	E. Total Surcharge (Rs.)		
0.415	0.415		0.00	0.00	0.00	0.00	0.00		0.00	0.00		
(F) Rebates												
Voltage Rebate						ToD Rebate						
Units	HT/HTHT Rebate	Amount	Non-Peak Hours KVAH				Rate	Amount	F. Total Rebates (Rs.)			
0.00	0.00	0.00	0.00					0.00	0.00			
(G) Previous Adjustment Amount Notice No.: and Date:												
Units	Fixed Charges	Energy Charges	FCA	Rebate	Surcharges(+)	Rebates(-)	Taxes	Subsidy	Total	G. Net Previous Adjustment (Rs.)		
										0		
(H) Sundry Charges/Allowances Notice No.: and Date:												
Late Payment Interest	Units	Fixed Charges	Energy Charges	FCA	Rebate	Surcharges(+)	Rebates(-)	Taxes	Subsidy	Total	H. Net Sundry Charges/Allowances (Rs.)	
											0	
(I) Subsidy												
Subsidized KVAH	Rate for Subsidy	Amount					I. Net Subsidy (Rs.)					
018	0.00	0.00					0.00					
(J) Taxation												
Electricity Duty	Municipal Tax	EDF	Govt Cess	Total Tax	Net Energy Charges	TCS/TDG	Cur/Prev Rounding Amount	NET BILL AMOUNT				
013.00	125.00	013.00	11.00	1262		0.00		Rs.7690/-				
Seven Thousand Six Hundred Ninety Rupees Only												
(K) Total Billed Amount												



Connection 300059625

PUNJAB STATE POWER CORPORATION LIMITED (Regd. Office P.S.E.B. Head Office, The Mall Patiala-147001, Ph. 1512), CIN: U40109PB2010SG033613 E-mail: 1512@pspd.in, Website: www.pspcl.in, GSTIN NO: 03AAAF05120G1ZC										Billing Category	
										DS RATE CATEGORY FOR DS-50 KW FOR DPC	
Sub Division	Division	Circle	Bill Cycle	Bill Date	Bill No.						
MODEL TOWN COMMERCIAL - 2	MODEL TOWN DIVISION	PATIALA	04-2023	19-JUL-2023	50022001699						
A/C No.: 300059625	Load	Contract Demand	Tariff Type	Bill Status	Due Date	Bill Amount					
Old A/C No.:	60.00			0	31-Jul-2023	Rs.27610/-					
Consumer Name: M/S P MOHINDRA COLLEGE Address: 0, DHILLON COLONY MOHINDRA COLLEGE MOHINDRA COLLEGE PATIALA-1			DS RATE CATEGORY FOR DS-50 KW FOR DPC		Cash/Online	DD/Cheque					
GST No.: Connection Date: 10-12-2011 Mobile No.: 98XXXXX86			Details of Meter		Meter Status	CT Make	CT No.				
			Voltage Supply	Meter Number	Make	Capacity	Digit	77637	77434	77429	
			0.415	15423510	L&T	5-10	6	O			
Feeder Code	Date of New Reading	Date of Old Reading	Bill Period	Meter Security	Security Cons.	Security cons/Meter Security Interest					
FDC000004837	17-JUL-2023	14-JUN-2023	33	5950	20716.77						
Meter Reading											
Type	Old Reading	New Reading	Current Units	Meter Multiplier	Line CT Ratio	Meter CT Ratio	Overall Multiplier	MMTS Correction	Old Meter Cons.	Unit Consumed	
KWH	36037.00	36251.00		1.00	100/5	100/5	1.00			2224	
KVAH	38551.00	30816.00		1.00	100/5	100/5	1.00			2271	
MDI	12.39	12.86		1.00	100/5	100/5	1.00			12.66	
(A) Fixed Charges											
Contract Load / Contract Demand (L) KWH/KVA		Actual Load/Demand KWH/KVA (A)	90% of (L) KWH/KVA (B)	A or B whichever greater KWH/KVA (C)	Rate per KWH/KVA per month (R)	Billing Days (D)	A: Fixed Charges Amount -CxRxDx12/365				
		12.86	53.33	53.33	130.00	33	7522.00				
(B) Energy Charges											
KWH/KVAH	Tariff Rate	B: Amount	(C) Fuel Cost Adjustment Charges	KWH/KVAH Consumption	Rate of FCA/KWH-KVAH	C: Amount	*Additional Surcharge	Units	Tariff Rate	Amount	Total Energy Charges(No.) + FCA + Add. Surcharge
2274	6.75	16350			0.00				0.00		16350
(D) Rental Charges											
Meter Rent for PSPCL Meter	MCB, CT/PT Unit Rental	Rent for any other equipment	Total Rent	HSN Code	SGST	CGST	Total GST	D: Total Rent with Tax			
83	64		147		13.23	13.23	26.46	173.46			
(E) Surcharges											
Voltage Surcharge				Demand Surcharge			ToD Surcharge				
Supply Voltage	Catered Voltage	Surcharge Rate	Voltage Surcharge Amount	Demand in excess	Rate of Demand Surcharge	Amount of Demand Surcharge	Peak Hours KWH/KVAH	Rate	Amount	E: Total Surcharge (Rs.)	
0.415	0.415			0.00	0.00	0.00	0.00		0.00	0.00	
(F) Rebates											
Voltage Rebates						ToD Rebates					
Units	HT/EHT Rebate	Amount				Non-Peak Hours KWH/KVAH	Rate	Amount	F: Total Rebates (Rs.)		
2274	0.00	0.00				0.00		0.00	0.00		
(G) Previous Adjustment/Outstanding Amount Notice No.: and Date:											
Units	Fixed Charges	Energy Charges	FCA	Rentals	Surcharges(+)	Rebates(-)	Taxes	Subsidy	Total	G: Net Previous Adjustment (Rs.)	
	/	/	/	/	/	/	0		0/-54	0/-54	
(H) Sundry Charges/Allowances Notice No.: and Date: -											
Late Payment Interest	Units	Fixed Charges	Energy Charges	FCA	Rentals	Surcharges(+)	Rebates(-)	Taxes	Subsidy	Total	H: Net Sundry Charges/Allowances (Rs.)
	/	/	/0	/0	/0	/	/0	/0	/	0	0
(I) Subsidy											
Subsidised KWH/KVAH	Rate for Subsidy	Amount	I: Net Subsidy (Rs.)								
2274	0.00	0.00	0.00								
(J) Taxation											
Electricity Duty	Municipal Tax	IDF	Cow Cess	Total Tax (-)	Net Energy Charges	TCS/TDS	Curr/Prev Rounding Amount	NET BILL AMOUNT			
2973.00	457.00	1144.00	45.00	4619		0.00		Rs.27610/-			
Twenty Seven Thousand Six Hundred Ten Rupees Only											
(K) Total Billed Amount											
Due Date by Cash/Online	Due Date by DD/Cheque	Net Amount Payable by due date	Simple Interest on delayed payment @1.5%p.m.	Amount Payable within 1 month after due date							
31-Jul-2023	31-Jul-2023	27610	414								



Annexure II. ISO Certificate

LMS

CERTIFICATE

This is to Certify that the Management System of

INDONA INNOVATIVE SOLUTIONS

8/W-11, RAILWAY ROAD, OPPOSITE ONKAR FEED STORE,
DINANAGAR, GURDASPUR-143531, PUNJAB, INDIA

has been found to conform to the Quality Management System standard:

ISO 9001:2015

This certificate is valid for the following scope of operations:

PROVIDING ENERGY AUDIT, SAFETY AUDIT, INFRARED
THERMOGRAPHY, POWER QUALITY AND HARMONICS STUDY, AIR
AND WATER AUDIT, DESIGNING, PROJECT EXECUTION, TRAINING
AND SKILL DEVELOPMENT.

IAF Code: 34, 37 NACE Code: 74.90, 85.59

:: Certificate No :: IN121298A

Date of initial registration	Date of this Certificate	Surv. audit on or before / Certificate expiry	Recertification Due
08 December 2022	08 December 2022	07 December 2023	07 December 2025

This Certificate remains valid subject to satisfactory surveillance audits.





 Director



For verification and updated information concerning the present certificate visit to: www.lmsassessments.com
This Certificate is the property of LMS Certifications Private Limited and shall be returned immediately when demanded.


 IAF
 INSTITUTION FOR ADVANCED QUALITY
 CERTIFICATION - DELHI (INDIA)


 elaci
 Engineering, Logistics and
 Information Systems


 LMS




LMS Certifications Private Limited
 1, Anandham, Rainbow City, Fareedi Nagar,
 Lucknow - 226015, U.P. (INDIA).
 Phone : +91-9554645464
 Visit - www.lmsassessments.com
 E-mail - info@lmsassessments.com

LMS/PM001/QMS/REV08

CD-QMS-005



Annexure III. BEE Certificate

	ऊर्जा दक्षता ब्यूरो (भारत सरकार, विद्युत मंत्रालय) BUREAU OF ENERGY EFFICIENCY (Government of India, Ministry of Power)	
17/05/ESCO/22-23/ 4341 - 420		15th September, 2022
Shri Hardeep Kaur Partner Indona Innovative Solutions 8/W-11, Railway Road, Opposite Onkar Feed Store Dinanagar, District Gurdaspur, Punjab- 143531		
Sub: Empanelment of Energy Service Company (ESCO)		
Dear Sir,		
This has reference to your application for empanelment/ re-empanelment as an Energy Service Company with BEE in response to our advertisement for re-empanelment and fresh empanelment of ESCOs in the month of May, 2022.		
Consequent to scrutiny and evaluation of your documents by SEBI accredited Grading Agencies CRISIL /CARE Advisory/ICRA Analytics/SMERA/ IRR Advisory in terms of the approved parameters for evaluation, BEE is pleased to inform that your company Indona Innovative Solutions has qualified for empanelment with BEE as a Grade 3 Energy Service Company (ESCO). This empanelment would be effective from 16 th August, 2022 and will be valid till 15 th August, 2024.		
Further, the list of all the empanelled ESCOs along with grade assigned is uploaded on its website (www.beeindia.gov.in) for use by State/Central government/Public Sector agencies as well as by any other agency interested in implementing energy efficiency projects on ESCO mode. Please acknowledge your acceptance to this letter.		
Yours faithfully,		
		
(Arijit Sengupta) Director		
रक्षित एवं राष्ट्रहितायै ऊर्जा बचाव Save Energy for Benefit of Self and Nation		
बौधा तल, सेवा भवन, आर० को० पूरु, नई दिल्ली-110 066, वेबसाइट/Website : www.beeindia.gov.in 4th Floor, Sewa Bhawan, R.K. Puram, New Delhi-110 066 टेली/टेली: 91 (11) 26786700, फैक्स/Fax: 91 (11) 26178352		

Annexure IV. Onsite Measurements





Annexure V. Vendor List

For APFC

- Indona Innovative Solutions
- VSM Solutions
- Ensure Tech Solutions

For Interlocking and Automation

- Indona Innovative Solutions
- AKS Techno
- Delta Cooling Tower Pvt. Limited
- ENCON India Pvt. Limited

For Occupancy and Photo Sensor

- KAYER Engineers
- VSM Solutions
- Ensure Tech Solutions
- A R C Ventures

For Star Rated Appliances

- RL Consumer Products
- Philips India Limited
- Avni Energy Solutions Pvt Ltd

-----End of Report-----


Government Mohindra College, Patiala

Notice

Dated: September 15, 2023

Punjab Energy Development Authority Chandigarh has conducted the Energy Audit of the Government Mohindra College, Patiala and a copy of the detailed report has been submitted to our college as well. In the audit report certain recommendations have been made to improve the energy consumption. In this regard a committee has been formed of the following members to prepare a plan of action to implement the recommendations in the report. The Committee shall submit its report to the undersigned within a month from the issuance of this notice.

1. Dr Suneet Singh, Convener
2. Dr Hardeep Singh, Member
3. Assistant Prof. Harpreet Singh, Member
3. Dr Suveer Singh, Member


Principal
Principal
Govt. Mohindra College
PATIALA