

# M/S. KAMAKHYA ELECTRICALS

Mahatma Gandhi Road, Nagaon (Assam) : Mobile : 94350-63586

**Govt. Regd. Electrical Contractor & Supplier**

Specialist In : Wiring Installation, Motor Generator & Electrical Pumpset repairing, Panel board construction,  
Electrical Project drawing, Estimating & Erection of H.T. & L.T.O.H., Line & Sub-station.

Ref. No. ....

Date 4/1/2023.

To

Mr. Luit Hazarika, The Principal I/C, Hatichong College, Nagaon, Assam

Subject: Submission of Energy Audit Report.

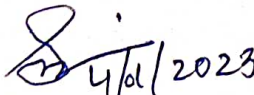
Dear Sir,

As per your prayer, the energy audit of Hatichong College, Nagaon was conducted in the month of December, 2022 to collect data and instantaneous measurement. During the inspection, the College's major mechanical equipment, fans, Tube Lights, LED lights, Computers, Xerox Machines, Punching Machine, Projectors, Power Generator, and all electric devices were evaluated. We also conducted several diagnostic tests on the college to help us quantify the energy efficiency of the institution. After collecting the required data and analyzing those data, Energy Audit Report has been prepared which includes our finding and necessary recommendation to explore energy conservation opportunities. The energy consumption is costing approximately Rs. 50000.00 (Fifty thousand only) per year. The report also facilitated to improve opportunities that will lower energy consumption of the college. The Report has been attached along with this letter for your consideration. We hope that this activity reduce the overall energy consumption of the College campus and improve the energy efficiency.

Thanking You  
Study Team:

College representative

Audit Team.

  
Md. Saiqul Islam  
Assistant Professor  
Department of Economics  
Hatichong College, Hatichong,  
Nagaon, Assam

M/S Kamakhya Electricals  
M.G. Road, Nagaon  
  
(Bikash Jyoti Deb)  
Proprietor & Electrical Consultant

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Ref. No. ....

Date 11/1/22 .....

## ENERGY AUDIT REPORT HATICHONG COLLEGE, HATICHONG, NAGAON, ASSAM

We are grateful to be a part of the preparation of Energy Audit Report of Hatichong College, Hatichong, Nagaon, Assam for the year 2021-22 (from 31st Dec, 2021 to 31st December, 2022). As a part of audit methodology, we have visited Hatichong College, Hatichong, Nagaon, Assam campus on 2nd January, 2023 to collect data and to take some instantaneous measurements. We have studied the present energy consumption pattern, assessed the actual operating load, illumination study and energy conservation in lighting system. The summary of the Report is as follows -

1. The average monthly energy consumption of the college campus is 350 units.
2. Annual bill is Rs. 44343/-
3. Average unite rate is Rs. 6.45/-(Grid Power)
4. Cost of Generator fuel for the year 2021-22= Rs. 15000/-
5. No A/C is found in the campus.
6. Tube lights used should be replaced by LED lights
7. Presently there is no personal transformer for college. It is recommended to install an extra transformer of at least 63KVA for the college campus.
8. College has 20 Kilowatt Diesel Generator set for uninterrupted power supply in case of supply failure from APDCL.
9. Open lid found in main panel box and need to be closed.
10. Earthing should be taken through the panel instead of wall connection.
11. Rusted wiring found in some places which needs to be replaced.
12. No solar LED Street lights were seen in the campus. Required solar energy to minimize electricity bill.
13. The campus area is well facilitated with CCTVs for security purpose.
14. Load unbalancing found during field visit in electrical distribution system of campus area and hence load needs to be balanced.
15. Distribution panel boxes need to be cleaned.

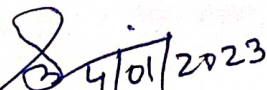
Following our previous recommendations, the college set up a few fire extinguishers in the campus area. (Both old and new building)

We, hope that this activity will improve the energy efficiency and reduce the overall energy consumption of the College campus.

College representative: Submitted By:

Internal Auditor:

External Auditor:



Md. Saiqul Islam  
Assistant Professor

Department of Economics  
Hatichong College, Hatichong  
Nagaon

M/S Kamakhya Electricals  
M.G. Road, Nagaon



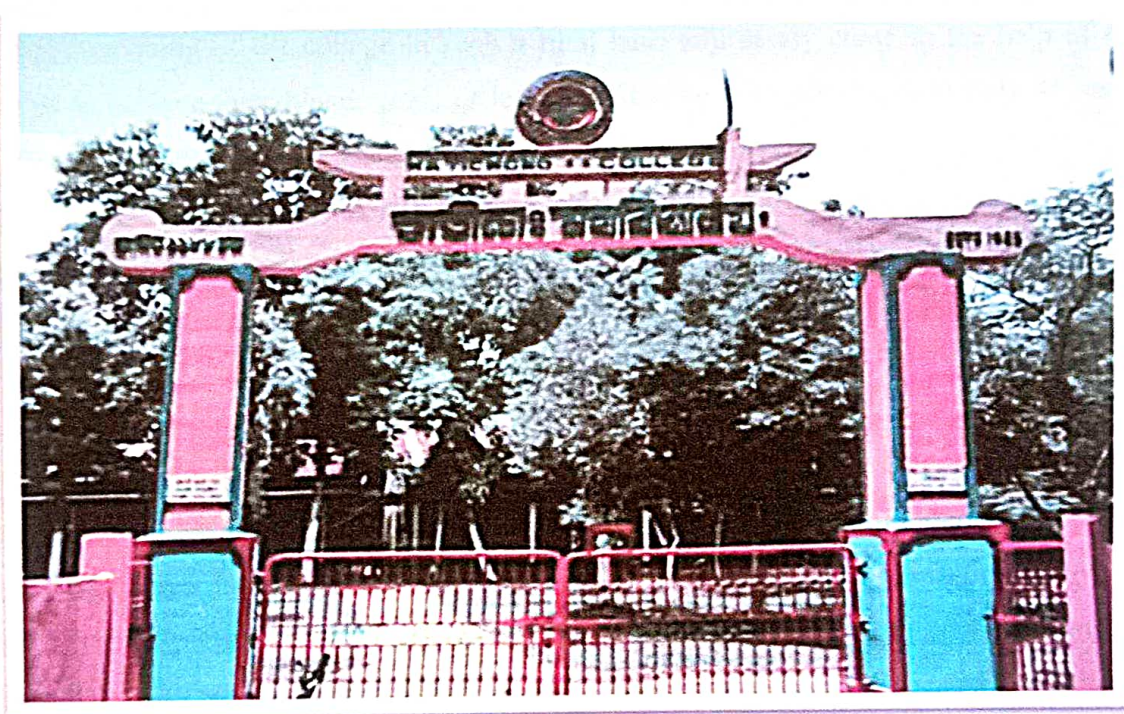
(Bikash Jyoti Deb)

Proprietor & Electrical Consultant

# HATICHONG COLLEGE, NAGAON, ASSAM

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*Estd. 1988*



## ENERGY AUDIT REPORT

**HATICHONG COLLEGE, HATICHONG  
NAGAON (ASSAM)-782142**

**Email- [hatichongcollege@gmail.com](mailto:hatichongcollege@gmail.com)**

**[www.hatichongcollege.org.in](http://www.hatichongcollege.org.in)**

## **1. About the College:**

Hatichong College, the only educational institute, imparting higher education, comprising the three Mouzas– Hatichong, Silpukhuri and Mikirbheta was founded on 1st August 1988 nearby Kujidah H.S School, Nagoan. As the ultimate consequence of a general meeting held on the 19th April 1987 at Kujidah, the institute was set up temporarily at Kujidah H.S. School (inside) campus, containing 45 students. The founder principalship was enriched by late Hobibur Rahman and the function of the institute was shifted to the Present Bhavan in 1993. The pioneers, emerging from the mentioned mouzas are to be revealed a note of gratitude in this behalf. It would be worth-while to draw the attention on a pivotal specialty that the college is Pragged with an effort to fulfill the burning desire of higher education in such a rural region. The healthy flourishing of the college in such a rural base will surely come to the help of needy students to achieve their higher goals of learning. Starting with enrolment of only 45 students and 10 teachers in 1988, the college has now been blossomed with an enrolment of 578 students in degree (Arts ) including M.A (IDOL) in 4 Subjects. Over the year, the college has produced many illustrious personalities in various walks of life. The College is affiliated to Guwahati University and registered under 2(F) and 12(B) of the University Grants Commission Act, 1956.

## **2. Background:**

Energy is one of the most important inputs for the overall economic development of any country. In the case of the developing countries, the energy sector assumes a critical importance in view of the ever increasing energy needs requiring huge investments to meet them. In Indian context also it plays a crucial role in almost all major sectors of the economy including agriculture, industry, transport, commercial, residential (domestic) and educational institutions. As a result the consumption or use of energy in different forms has been steadily rising all over the country, which has shown a steady growth rate in the past few years. This has led to the sudden increase in the dependence of the state on fossil fuels and electricity. The Government of India enacted the Energy Conservation Act, 2001 in October 2001. The Energy Conservation Act, 2001 became effective from 1st March, 2002. The Act provides for institutionalizing and strengthening delivery mechanism for energy efficiency programs in the country and provides a framework for the much-needed coordination between various Government entities.

Hatichong College, Nagaon is an educational institute in Nagaon district of Assam taking oath of reducing energy intensity in the College Campus by conducting Energy Audit. An assessment of energy consumption, energy sources used, energy management, lighting devices used and other appliances used by the college campus community is an important aspect of sustainability of the community. Hence this is a relevant aspect of the assessment. The audit team assessed the number of electrical appliances and their respective uses in terms of consumption of energy per month in KWh. This indicates the energy management of the campus. Based on the assessment, we made suggestions and recommendations.

#### **Objective of Audit:**

The overall objective of the report is to quantify energy saving in existing system and achieve reduction in energy consumption pattern. The objectives of the Audit are as follows...

- To carry out the rate energy consumption.
- To evaluate the performance of the equipment.
- To find out the energy saving opportunities.
- To quantify the total energy savings.
- To find out the ways to achieve energy efficiency.

#### **3. Scope of the Work:**

- a. Review the existing energy consumption capacity of the college campus.
- b. Assessment of electrical load base on electrical fittings
- c. Review the Generator set operation along with the consumption details.

#### **4. Methodology Adopted for Conducting the Audit**

##### **a. Interview with Key Facility Personnel**

During the preliminary audit, a meeting is organized between the auditor and key operating personnel to start the assignment. The agenda of the meeting focuses on: audit objectives and scope of work, facility rules and regulations, roles and responsibilities of project team members, and description of scheduled project activities.

##### **b. Document Review**

During the initial visit by the facility representatives, the available documentation are reviewed which includes all facility operation and maintenance procedures and logs – sheets/ registers for the previous years, electricity bills etc.

### c. Facility Inspection

After a thorough review of the operating documentation of the institution, the major energy consuming processes in the facility are further investigated by the representatives.

### d. Utility Analysis

The utility analysis is a detailed review for the previous months. Data reviewed includes energy usage and energy consumption pattern.

### e. Prepare a Report Summarizing Audit Findings

The findings and recommendations are summarized in this report. The report includes a description of the facilities and their operation and a discussion of all major energy consuming systems.

## 5. Building Description:

The following Tables show the basic information about the building and the utilities of Hatichong College, Nagaon.

**Table 1**

Sl. No	Basic Building Data	Value
1	Connected Load	25 KW
2	Contract Demand	41 KVA
3	Installed Capacity of DG Set	20 KVA
4	Annual Electricity Consumption (from 30 <sup>th</sup> December, 2020 to 3 <sup>th</sup> December, 2021)	4200 Units
5	Annual cost of electricity consumption	Rs. 36000.00
6	Total Numbers of building covered	Entire Campus
6.1	Working hours (Academic and Administration building)	8 Hrs (8.30 AM to 4.30 PM)
6.2	Working Days/week	6 Days
6.3	Whether sub-metering of electricity consumption for each building	No



**Table 2****Electricity Bills for the Academic Year 2021 - 22**

Sl. No	Month	Year	Consumption (kWh)	Amount (Rs)
1	January	2022	165	1652/-
2	February	2022	169	3290/-
3	March	2022	247	3154/-
4	April	2022	232	2266/-
5	May	2022	350	4007/-
6	June	2022	170	320/-
7	July	2022	439	8630/-
8	August	2022	517	5352/-
9	September	2022	433	5169/-
10	October	2022	389	4451/-
11	November	2022	380	3665/-
12	December	2022	282	2687/-
<b>Total:-</b>			<b>3773</b>	<b>44343/-</b>

**Table 3**

The following Electric/ Electronic devices are found in the college for the year 2021 - 22

Year	Sl No	Name of Electric Device	Nos	Remarks
<b>2021-22</b>	1	Tube lights	06	
	2	LED Lights	100	
	3	Celling Fans	70	
	4	Stand Fan	01	
	5	Table Fan	01	
	6	Wall Fan	01	
	7	Inverter	01	
	8	Punching Machine	01	
	9	LED TV	01	



10	Smart TV	02	
11	Digital Board	01	
12	Computer	12	
13	Aqua guard Filter	03	
14	Water Cooler	01	
15	Water Pump (Electric Motor)	02	
16	Projector	02	
17	Induction Stove	01	
18	Electric Kettle	03	
19	Power Generator 20 Kilowatt	01	
20	False/Panel LED Light	96	

### Observation on electricity bill analysis

1. The average monthly energy consumption of the college campus is **314.42** units.
2. Annual bill is Rs. **44343/-**

### 6. Detail of Diesel Generator (DG) Set:

#### Review of present Diesel Generator (DG) Set:

There is one (1) no of DG sets with capacity of 20 KVA, which aims used to provide backup power during load shading hours.

**Table 4**

Make:	MOHINDRA POWEROL
Model	3335 TC GM C2
Rated kVA	20 kVA
Rated kW	17 kW
Voltage	240 V
Frequency	50 Hz
Phase	1 Phase
RPM	1500
HP	70
pf	0.8





Figure 1

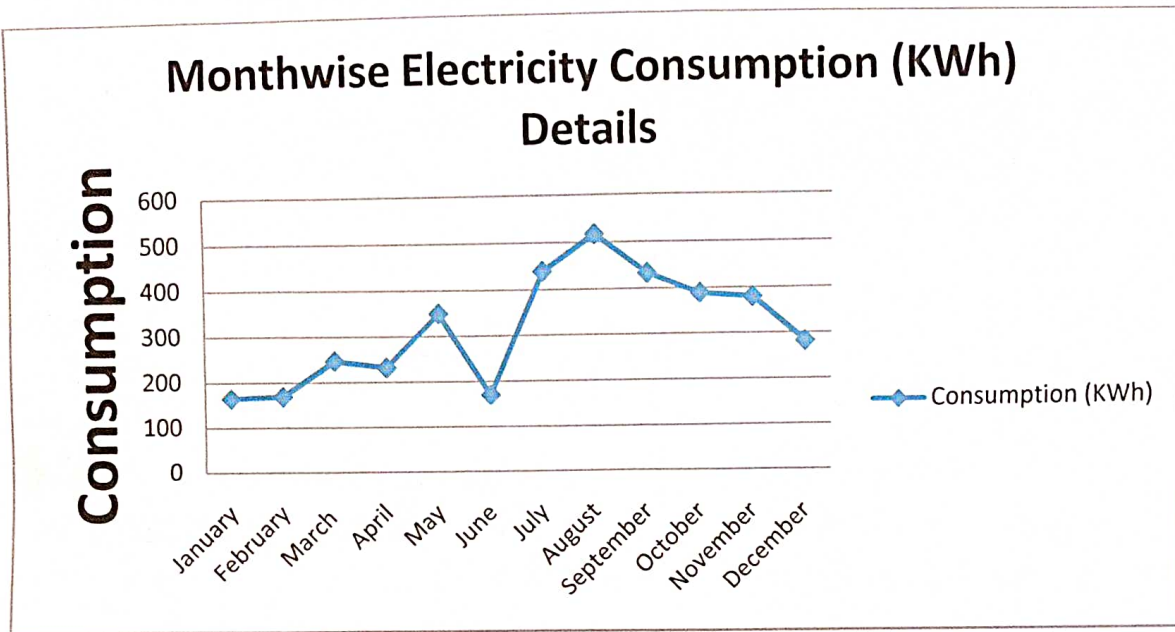
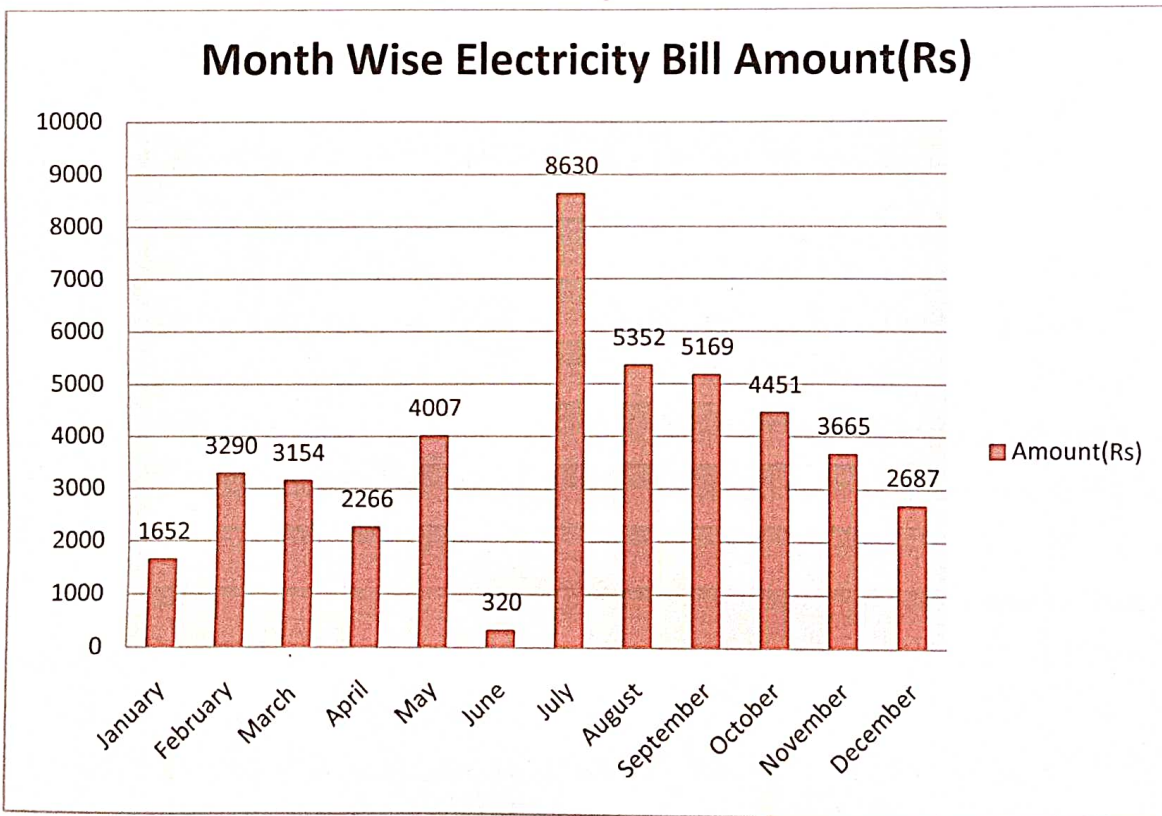


Figure 2



M/S KAMAKHYA ELECTRIC  
Date: 12/23  
M.G. Road, Nagaon (Assam)

## **7. Water Pumping System**

The campus has total Two (2) numbers of water pumps which are used to meet the daily water requirement in the entire campus.

### **Observation**

The percentage of loading for the 1 HP motor is 100% and for the 0.5 HP motor is 0 % is acceptable as per the energy conservation measure.

## **9. Conclusion and Recommendations:**

### **Energy Management:**

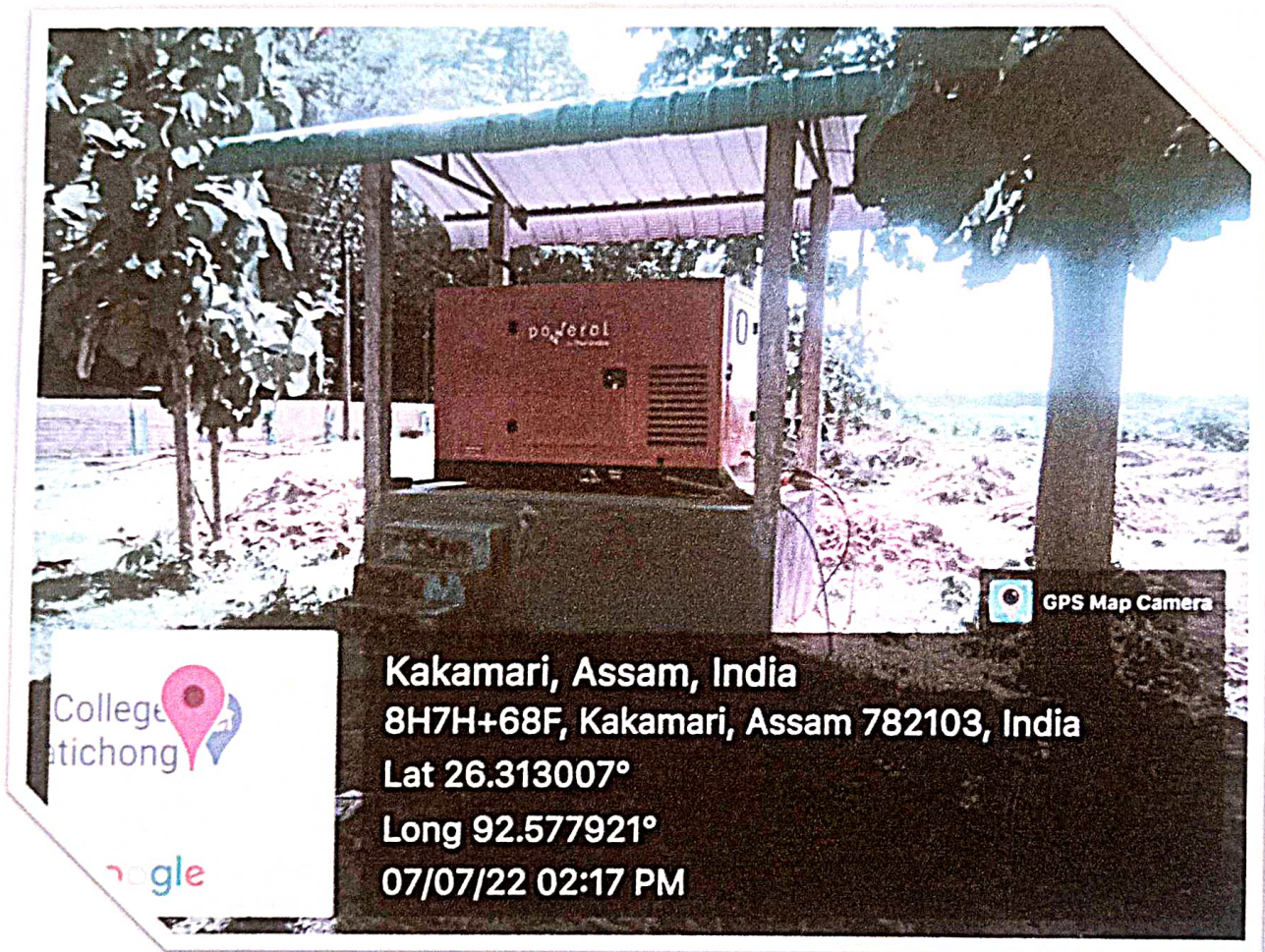
Following recommendations are made for eco-friendly energy consumption-

1. Natural light should be used as far as possible to meet the required illumination level. Especially requirement of artificial light is less during daytime. While using the artificial lights care should be taken so as the lights in each area can be switched off partially when not in use. Also proper naming or numbering of the switches will facilitate the use of them by occupants or staff.
2. Maintenance & operating staff should be trained / informed about the energy management issues & procedures. To implement an effective preventive maintenance program, the operational staff must be given comprehensive training on each type of equipment, regarding system fundamentals, use of reference material & manuals, maintenance procedures, service guidelines & warranty information. Proper maintenance schedules could be supplied to them for different equipment.
3. Replacement of remaining 20% tube lights by LED lights can help the institute to save a huge amount of electricity consumption.
4. Awareness can be created among the students for the efficient use of electricity and safety precaution and signboards may be hanged in the college campus for the efficient use of electricity.
5. Presently there is no personal transformer for college. It is recommended to install an extra transformer of at least 63 kva for the college campus.
6. Open lid found in main panel box and need to be closed.
7. Earthing should be taken through the panel instead of wall connection.
8. Rusted wiring found in some places which needs to be replaced.
9. No solar LED Street lights were seen in the campus. Required solar energy to minimize electricity bill.
10. Load unbalancing found during field visit in electrical distribution system of campus area and hence load needs to be balanced.

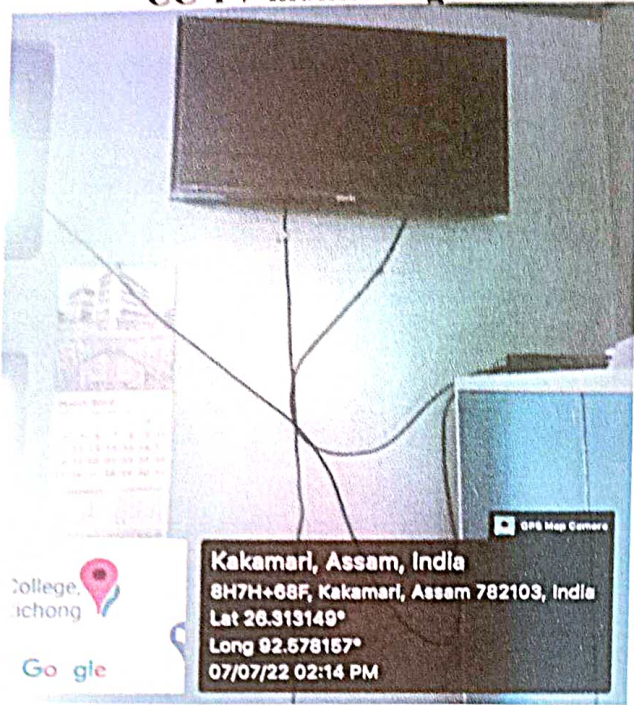
11. Distribution panel boxes need to be cleaned.

## Photo gallery

DG set



**CC TV monitoring**



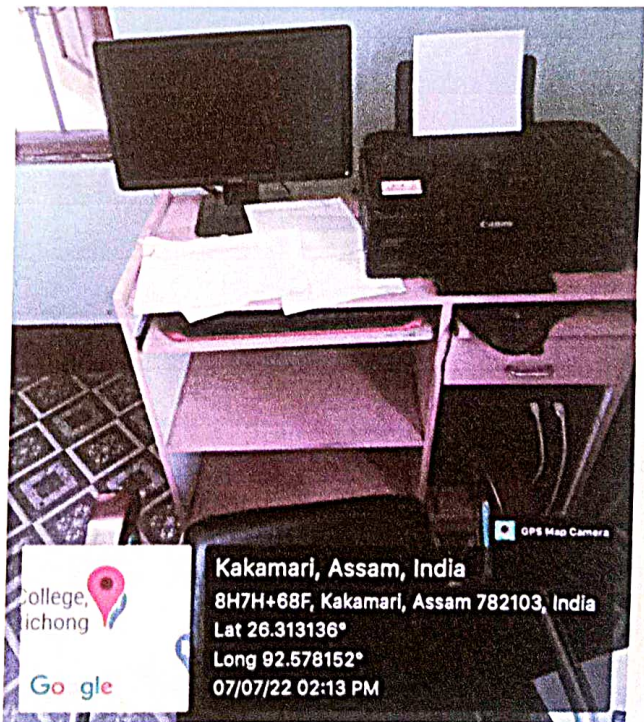
**Pump Set- 1**



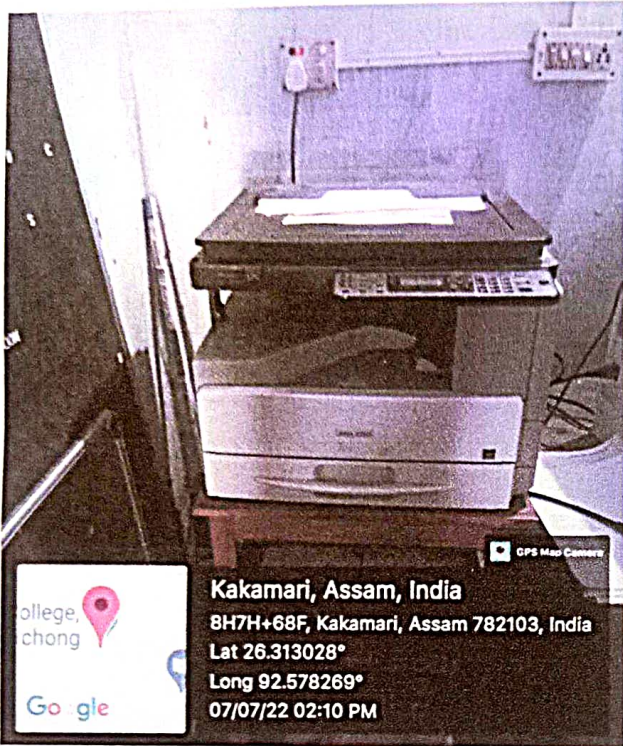
**Pump Set**



**Computer**



**Xerox Machine**



**Water Cooler**



**Electric Meter**



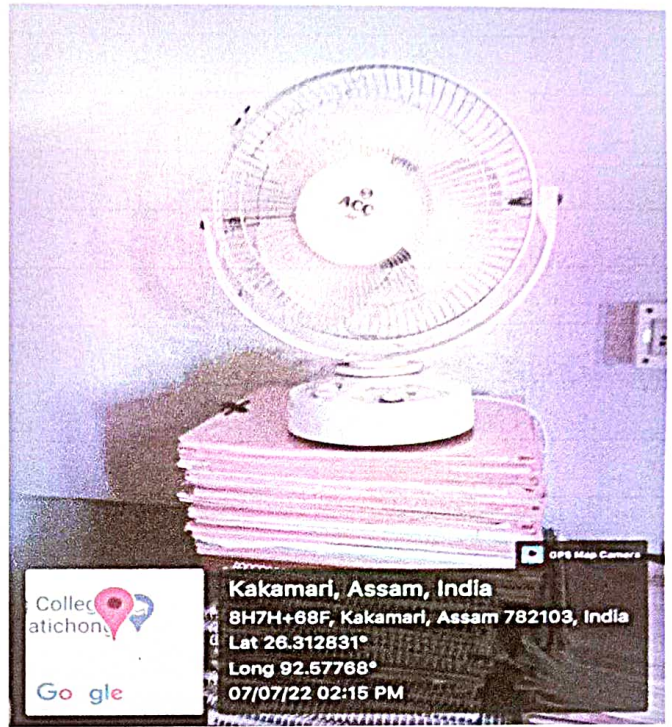
**Punching Machine**



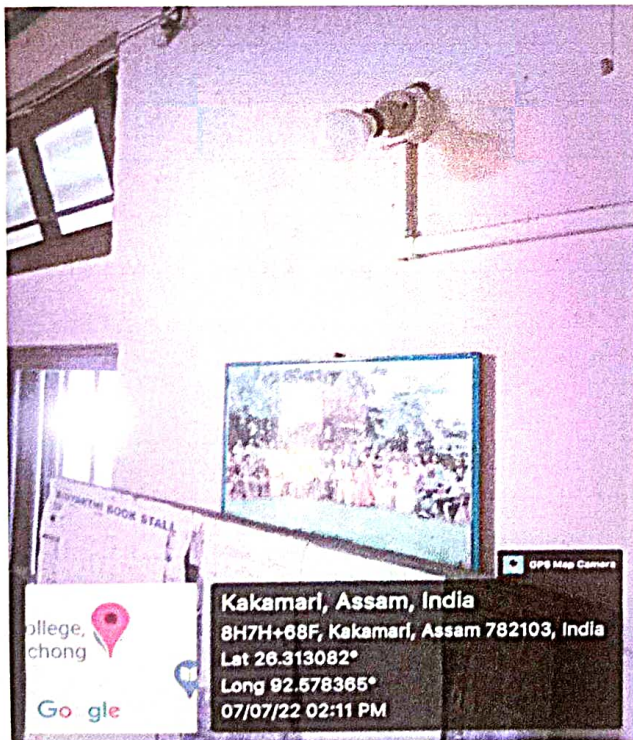
### Ceiling Fan



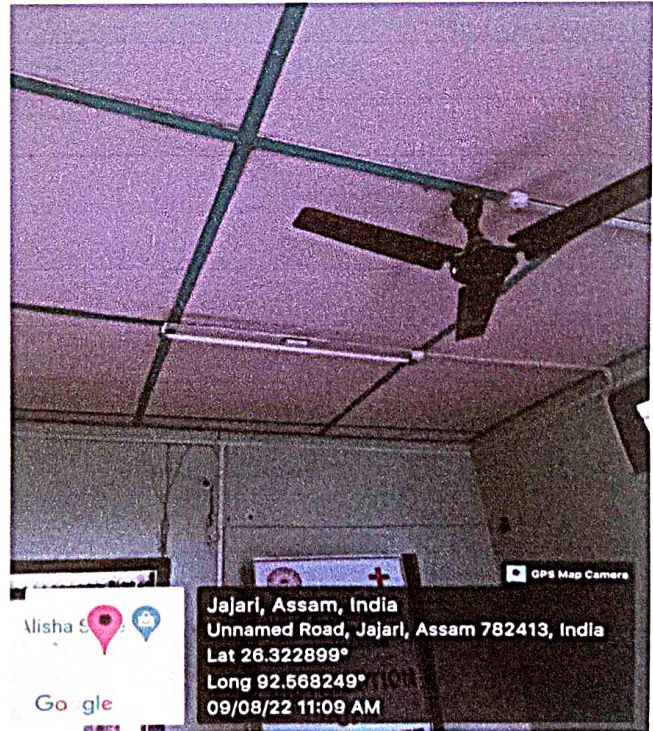
### Table Fan



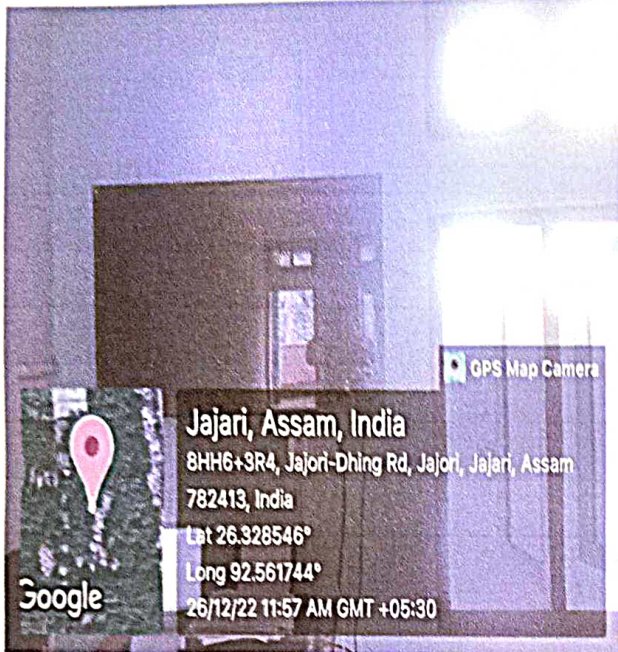
### LED Light



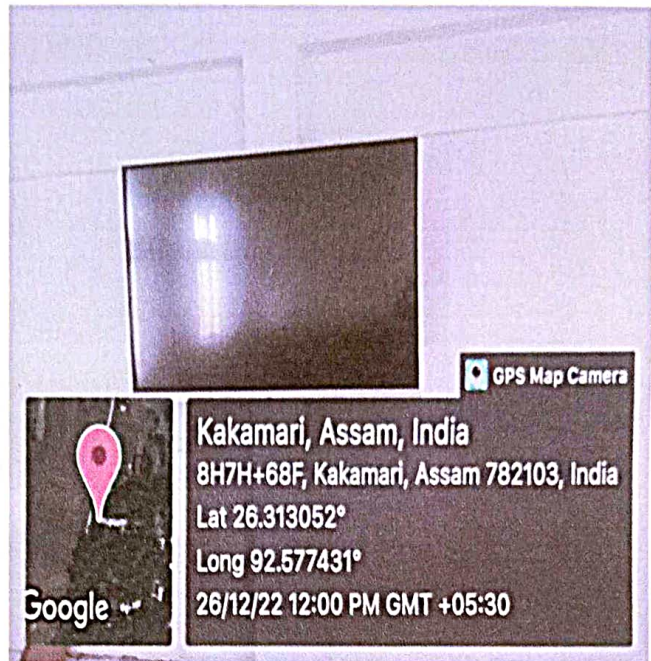
### Tube Light



### Smart TV for Presentation



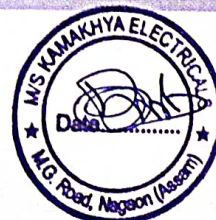
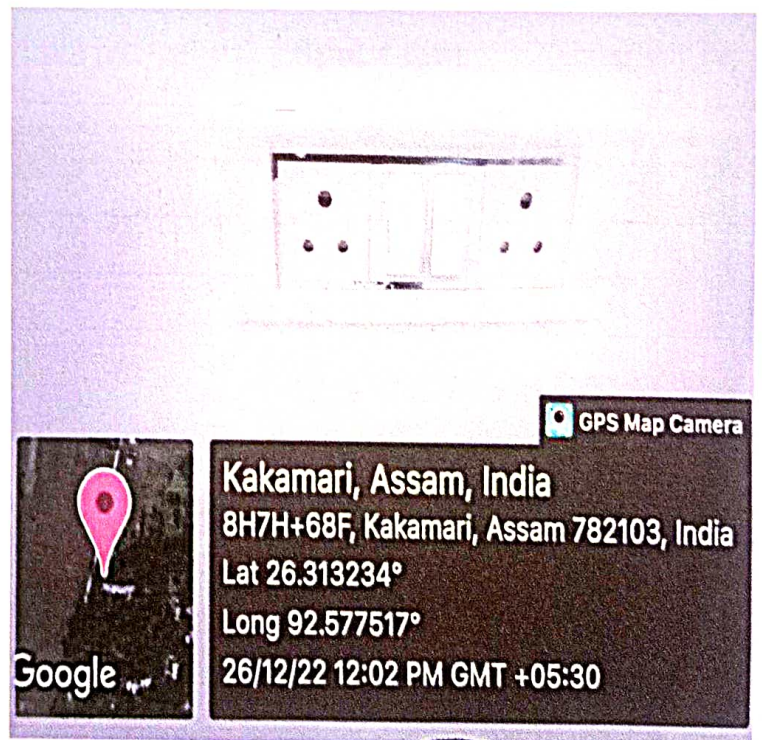
### Digital Board



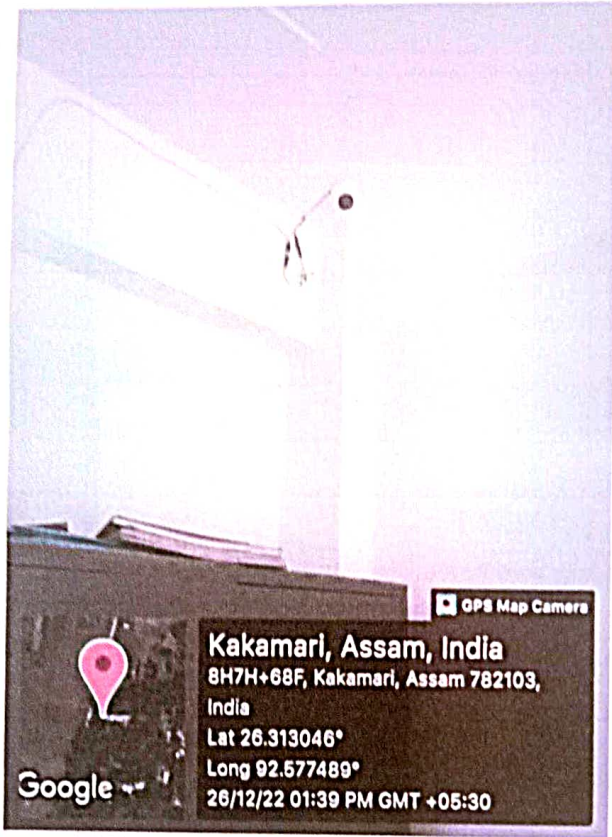
### MCB/Isolator



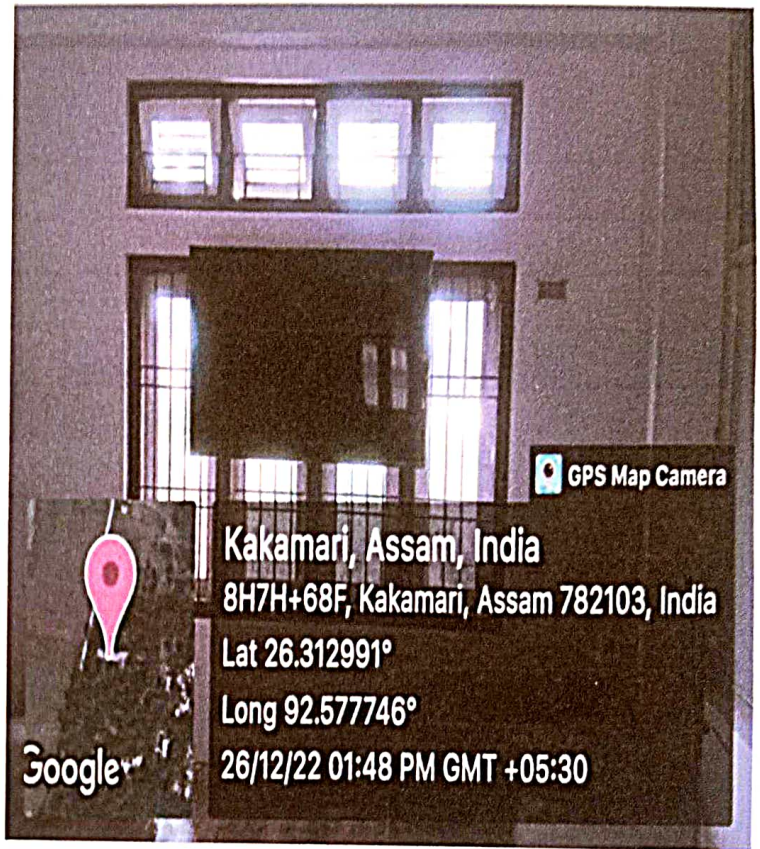
### Modular Board



### CC TV Camera



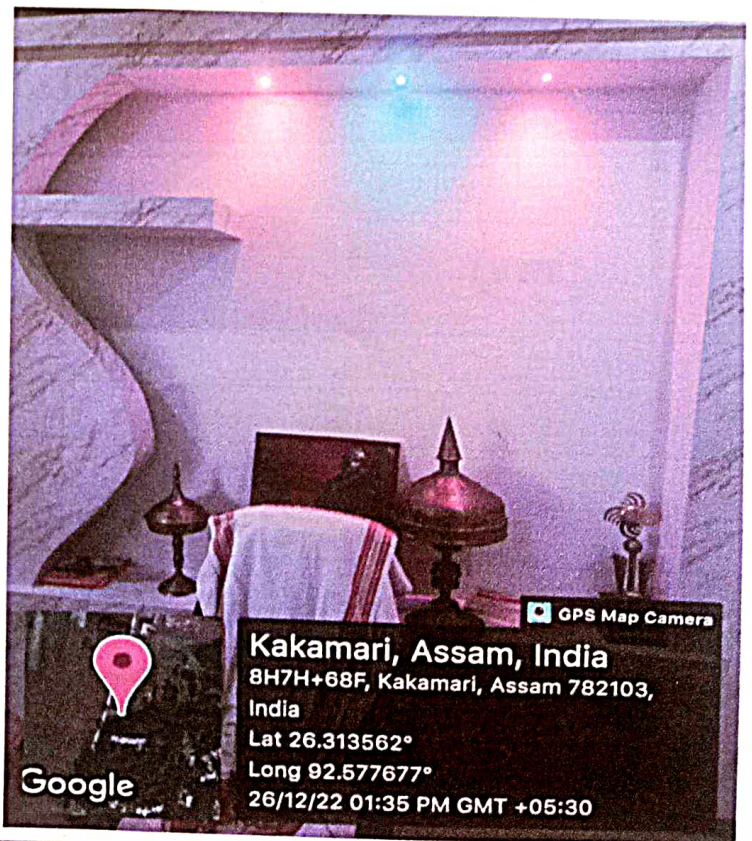
### Smart TV for Presentation



### Xerox Machine (New)




### Spot Light






# Electricity Bill Model



**APDCL Revenue Bill**

\* Downloaded & developed by APDCL IT Team \*



Sub-Division: **UDAGIRAH (112)**  
 DIR No: **057**  
 Consumer Number: **11200007795**

**PRINCIPAL HATCHUNG COLLEGE  
KUAPAR**

Bill Number: **132044 112-55-03**  
 /08/2022-15:08:01 37.4  
 Bill Period: From 01/07/2022 to 31/08/2022  
 Bill Date: **03/09/2022**  
 Bill Type: **Normal Bill**  
 Total days: **31**  
 Due Date: **18/08/2022**

Category: **LT GENERAL PURPO**  
 SL (Educational Institution) = **LT GENERAL PURPO**  
 Meter No: **X1317801**  
 Connection: **3 phase**  
 MF: **1**  
 Connected Load: **7.56 kW**  
 Current Reading: **3391**  
 Previous Reading: **2957**  
 Units Consumed: **439.6**  
 Power Factor: **99**  
 PF Penalty/Rebate: **13.0**  
 Units Billed: **426.0**


BILL			
Sl	Unit	Rate	Charge
1	426.0	X 6.45	= 2747.7
2	0.0	X 0.0	= 0.0
3	0.0	X 0.0	= 0.0
Energy amount:			= 2747.7
Fixed Charge:			= 652.27
Total Govt Subsidy:			= -0.0
Payable Energy Charge:			= 2747.7
Payable Fixed Charge:			= 652.27
Meter Rent:			= 0.0
Electricity Duty:			= 170.0
FPPPA:			= -21.3
Current Surcharge:			= 43.12
Current Demand:			= 3591.79
Principal Arrear:			= 2874.49
D/S Surcharge:			= 44.46
Total Arrear:			= 2918.95
Misc payable:			= 0.0
Adjustment:			= 0.0
<b>Net Bill:</b>			<b>= 6511</b>

Out-station collection date: **NA**  
 Out-station collection centre name: **NA**  
**IMPORTANT INFORMATION**  
 You are requested to kindly use the number 11200 0007795 for making online payment.  
**\*\* THANK YOU \*\***  
 Notice

Under section 56(1) of TP Act 2003, power supply to your premises will be disconnected at any time due to non-payment of bill amount within due date.


**ACKNOWLEDGMENT**

Consumer Number: **11200007795**  
 Name: **PRINCIPAL HATCHUNG COLLEGE**  
 Bill amount: **6511**  
 Due Date: **18/08/2022**  
 Signature



**APDCL Revenue Bill**

\* Downloaded & developed by APDCL IT Team \*



Sub-Division: **UDAGIRAH (112)**  
 DIR No: **057**  
 Consumer Number: **11200007795**

**PRINCIPAL HATCHUNG COLLEGE  
KUAPAR**

Bill Number: **132044 112-55-03**  
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 Bill Period: From 01/07/2022 to 31/08/2022  
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 Bill Type: **Normal Bill**  
 Total days: **31**  
 Due Date: **18/08/2022**

Category: **LT GENERAL PURPO**  
 SL (Educational Institution) = **LT GENERAL PURPO**  
 Meter No: **X1317801**  
 Connection: **3 phase**  
 MF: **1**  
 Connected Load: **7.56 kW**  
 Current Reading: **2957**  
 Previous Reading: **1784.0**  
 Units Consumed: **247.0**  
 Power Factor: **99**  
 PF Penalty/Rebate: **7.0**  
 Units Billed: **240.0**

BILL			
Sl	Unit	Rate	Charge
1	240.0	X 6.45	= 1548.0
2	0.0	X 0.0	= 0.0
3	0.0	X 0.0	= 0.0
Energy amount:			= 1548.0
Fixed Charge:			= 652.27
Total Govt Subsidy:			= -0.0
Payable Energy Charge:			= 1548.0
Payable Fixed Charge:			= 652.27
Meter Rent:			= 0.0
Electricity Duty:			= 102.94
FPPPA:			= 0.0
Current Surcharge:			= 46.83
Current Demand:			= 2198.96
Principal Arrear:			= 0.0
D/S Surcharge:			= 0.0
Total Arrear:			= 0.0
Misc payable:			= 0.0
Adjustment:			= 0.0
<b>Net Bill:</b>			<b>= 2196</b>

Out-station collection date: **NA**  
 Out-station collection centre name: **NA**  
**IMPORTANT INFORMATION**  
 You are requested to kindly use the number 11200 0007795 for making online payment.  
**\*\* THANK YOU \*\***  
 Notice

Under section 56(1) of TP Act 2003, power supply to your premises will be disconnected at any time due to non-payment of bill amount within due date.

**ACKNOWLEDGMENT**

Consumer Number: **11200007795**  
 Name: **PRINCIPAL HATCHUNG COLLEGE**  
 Bill amount: **2196**  
 Due Date: **18/08/2022**  
 Signature