A REPORT ON
Energy Audit 2023-2024

Of

Rangapara College

Rangapara College

Rangapara, Sonitpur-784505, Assam, India

(Dr. Ranjan Kalita)
Principal
Rangapara College

http://www.rangaparacollege.com

ASSAM POWER DISTRIBUTION COMPANY LTD.
Reg. Office: - BijuleeBhawan, Paltanbazar, Guwahati – 781001, Assam
Office of the Sub Divisional Engineer
Balipara Electrical Sub Division:: APDCL(CAR), Balipara
CIN No. U 40109AS2003SGC007242
E-mail:-SDE.BALIPARA_ESD@apdcl.org

Dated: - 06-12-2024

FORWARDING CERTIFICATE

This is certified that the detailed Energy Audit in electrical utilities has been carried out by me in Rangapara College, Rangapara-784505, Sonitpur, Assam, India; to identify the energy consumption patterns in Rangapara College and according to find out the conservation potential and opportunities.

Place: Rangapara College, Rangapara

Signature

Sub-Divisional Engineer
Balipara Electrical Sub Division
APDCL, Balipara
06-12-2024

Date: 06-12-2024

(Dr. Ranjan Kalita)
Principal
Rangapara College

RANGAPARA COLLEGE Estd-1979 DL..... SONITPUR, ASSAM

RANGAPARA COLLEGE, RANGPARA, SONITPUR-784505, ASSAM, INDIA

ENERGY AUDIT COMMITTEE

Sl. No	Name	Designation	Signature
1	Dr. Ranjan Kalita	Principal	(Dr. Ranjan Kalita) Principal Rangapara College
2	Mr. Atul Sarmah	Vice principal	
3.	Dr. Pradip Barman	IQAC coordinator	
4.	Shri Jayanta Saharia	Executive Engineer	
5.	Dr. Bijoy Sankar Boruah	Coordinator	
6.	Dr. Luxmi Machahari	Member	
7.	Dr. Gitartha Kaushik	Member	
8.	Ms. Joon Moni Haloi	Member	

(Dr. Ranjan Kalita)
Principal
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ACKNOWLEDGEMENT

At the very beginning, I, Dr. Bijoy Sankar Boruah would like to acknowledge to our honorable Principal Dr. Rajan Kalita, Rangapara College for his support, motivation and inspiration during the preparation of energy report. I would also like to thank IQAC cell and all the members of energy audit committee for their suggestion at different stage for making this report in a proper way.

Place: Rangapara College, Rangapara

Date: 06/12/2024

Dr. Bijoy Sankar Boruah
Coordinator of Energy Audit
Assistant Professor, Rangapara College

(Dr. Ranjan Kalita)
Principal
Rangapara College

ENERGY AUDIT CERTIFICATE

This is certified that the "Energy Audit 2023-2024" for Rangapara College, Rangapara-784505, Sonitpur Assam, India has been conducted to assess the energy cost, methods adoption for energy conservation and way to reduce energy consumption.

Place: Rangapara College, Rangapara

Date : 06/12/2024

Dr. Ranjan Kalita
Principal, Rangapara College
Chairman, Energy Audit Committee

Principal
Rangapara College

Shri Jayanta Saharia
Exe. Engineer
Pollution Control Board, Assam
Regional Office Tezpur
(Internal Auditor)

PREFACE

Energy audit provides a systematic approach for making decision in energy management. It implies the analysis of energy consumed per year and how much of cost for it. It tells us the various way to reduce the cost of energy consumption, how to conserve energy and what are the policies that we may take to conserve energy. For a developing country for obtaining the sustainable development energy audit is very important. In this report, we have reported the energy audit of 2023-2024 of Rangapara College for the period of June 2023 to May 2024. All the required data such as number of fan, LEDs, Tube lights, A/C, electronics instruments etc. are collected by visiting each and every part of the college campus. The final reported is prepared base on the electricity bill provided by power distribution company, Assam power distribution corporate limited (APDCL).

(Dr. Ranjan Kalita)
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1. INTRODUCTION

For a developing country energy plays an important role for achieve of sustainable development. Energy implies the ability to do work. It means that more and more use of energy, more and more work is done, i.e. fast development. But we want a sustainable development for our country. Therefore our aim is to use of energy in such a way that it may give us a sustainable development without affecting the environment.

Educational institutes are the one of the basic building blocks of a society. To create a healthy society, we require a healthy environment. A proper planning only can create a healthy and sustainable society. Therefore, analysis of energy used in an educational institution becomes a very important parameter. The analysis report will help us to figure out the various sectors in which how much energy is consumed. After analyzing the report, we can make an energy conservation plane.

Energy audit is a key factor that will provide a systematic approach for making decision in the area of energy management. It tells us the way how to reduce the cost of energy consumption, how to conserve energy and what are the approaches that we may take to conserve energy. According to Energy conservation act 2001, energy audit is not only the monitoring, verification and analysis of consumption of energy but also submission of a technical report that must have a planning for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption. An energy audit has three phases -pre audit phase, audit phase and post audit phase.

In this report, we have reported the energy audit of 2022-2023 of Rangapara College for the period of June 2023 to May 2024. All the required data such as number of fan, LEDs, tube lights, A/C, electronics instruments etc. are collected by visiting each and every part of the college campus. The final reported has been prepared base on the electricity bill provided by Assam power distribution corporate limited (APDCL).

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2. PRE AUDIT PHASE

2.1 DATA COLLECTION

Table 1: Consumption of electric energy and bill amount

Sl. No.	Month	Consumption Unit (Kwh)	Bill Amount (Rs)
1	June-2023	8899.010	84534.00
2	July-2023	6527.820	65456.00
3	August-2023	11321.10	104796.00
4	September -2023	13976.98	134458.00
5	October -2023	10441.13	105751.00
6	November-2023	5900.000	63407.00
7	December-2023	4944.640	56330.00
8	January-2024	4087.410	47838.00
9	February-2024	4782.460	53186.00
10	March -2024	5503.070	61089.57
11	April-2024	5794.680	63389.00
12	May-2024	6923.760	72790.00
	Total	**89102.06**	**913024.6**

The average per month electric energy consumption= **89102.06**÷12=**7425.17 Kwh**

And the average per month electricity bill amount Rs.= **913024.6** ÷12= Rs. **76085.38**

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2.2 ELECTRIC ENERGY CONSUMED ELEMENTS

Table 2: List of Electric energy consumed elements

LED	281	Filter	2
FAN	342	Sound box	6
Stand fan	4	Microphone sound box	3
Wall fan	3	MIC	2
Led Tube light	319	Sound system	1
CCTV	33	Punching machine	1
TV	3	Street light	13
AC	8	freeze	2
Ex fan	13	Water Pump	1
Printer	11		
Desktop	42	Electrical instrument in Chemistry Lab	6
Laptop	6	Electrical instrument in Zoology Lab	8
Inverter	6	Electrical instrument in Physics Lab	79
Wifi	5	Electrical instrument in Botany Lab	11
Projector	3		
Display	1		

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3. AUDIT PHASE

3.1 DATA ANALYSIS AND OBSERVATION

In the table 1, we have shown the electric energy consumed data and the bill amount and these data are collected from Assam Power Distribution Company Limited from June 2023 to May 2024. In the table 2, we have shown the number of electric energy consumed elements within Rangapara college campus. Based on the table 1 we have made two pie diagrams as shown in figure 1 and figure 2.

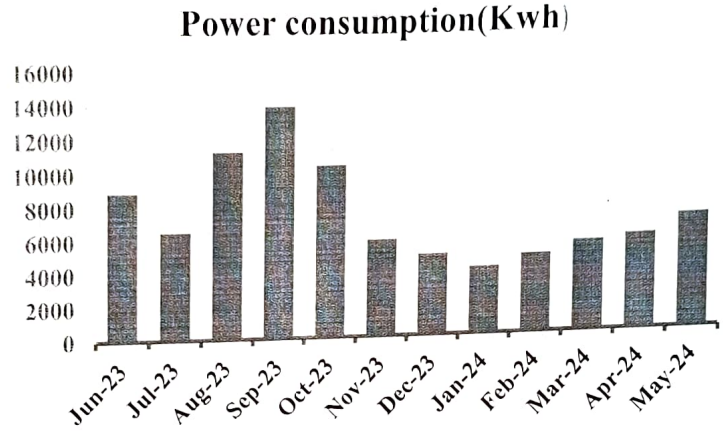

Figure1: Power consumption pattern from June 2023 to May 2024.

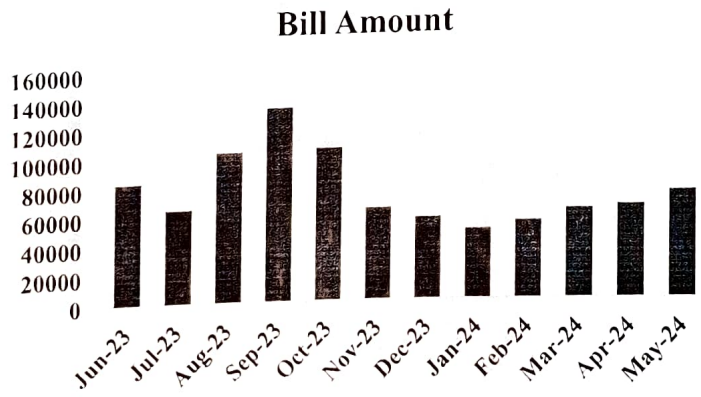

Figure2: Electric energy bill from June 2023 to May 2024

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Figure 1 represents the consumption of electric energy in Kilowatt hour per month. From this figure we can conclude that in the month of september 2023, consumption of electric energy is highest for which bill amount is 134458.00. The highest electric energy consumption occurs in these months because of summer season. It is also noticed the lowest electric energy consumption take place in the month of January 2024 and February 2024. For both of these two months consumption of electric energy is found 4087.41 Kwh and 4782.46 kwh respectively. The reason for the low electric energy consumption is because of winter season. From the figure 1, we also observe a seasonal variation of electric energy consumption from summer to winter. Figure 2, represents the per month electric energy consumption bill amount. It is noticed that the bill amount is minimum in the month of January 2024 and February 2024 while bill amount is higher in the month of September 2023. The average per month electric energy consumption is 7425.17 Kwh and the average electricity bill amount is Rs. 76085.38. During the data collection it is also found that Rangapara College has a one electricity generator, and 8 solar street lights. In the College campus LPG cylinder are used in both girl's and boy's hostels. Also in canteen LPG cylinders are used for cooking purpose. In chemistry Laboratory there is a two LPG cylinder for practical purpose. The number of LPG cylinder required per month in the Rangapara College campus is approximately 10.

3.2 COMPARISON OF ENERGY CONSUMPTION FOR THE PERIOD 2020-2021, 2021-2022, 2022-2023 AND 2023-2024

1. In 2020-2021 Energy Audit the average per month electric energy consumption was found 5018.22 Kwh and the average per month electricity bill amount was Rs. 43,700.00. But in 2021-2022 Energy Audit, it is observed that the average per month electric energy consumption is 5,807.78 Kwh and the average per month electricity bill amount is Rs. 51,166.45. Similarly for the period 2022-2023, value of average energy consumption per month is 6273.67 Kwh for which bill amount is Rs. 57725.58. For the session 2023-2024, average value of electric energy consumption is found 7425.17 Kwh while the bill amount is Rs. 76085.38. In figure 3, histogram is shown for demonstration of average energy consumption. A linear growth of energy consumption is observed. It is because of increasing global warming and renovation of buildings.

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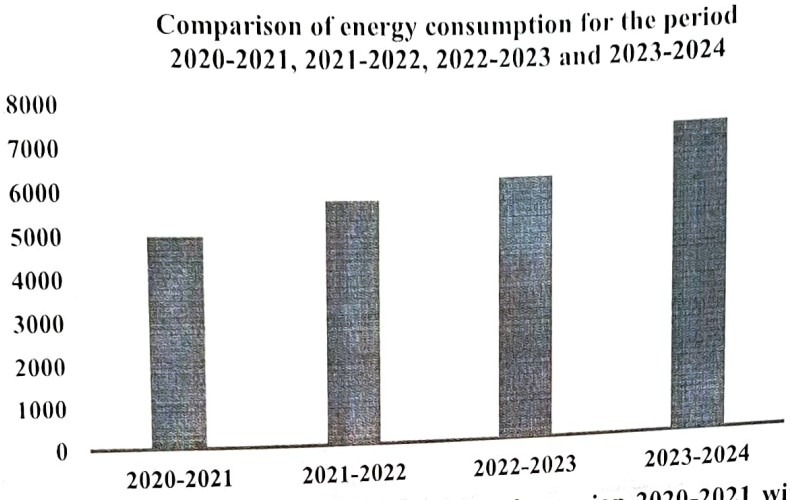

Figure: Comparison of Energy Consumption for the session 2020-2021 with session 2021-2022.

2. In 2023-2024 all the bulbs are replaced by LED bulb for better energy efficiency.

3. Manual Street lights are converted to automatic switches street lights.

4. Automated sensors are installed in the college central water tank.

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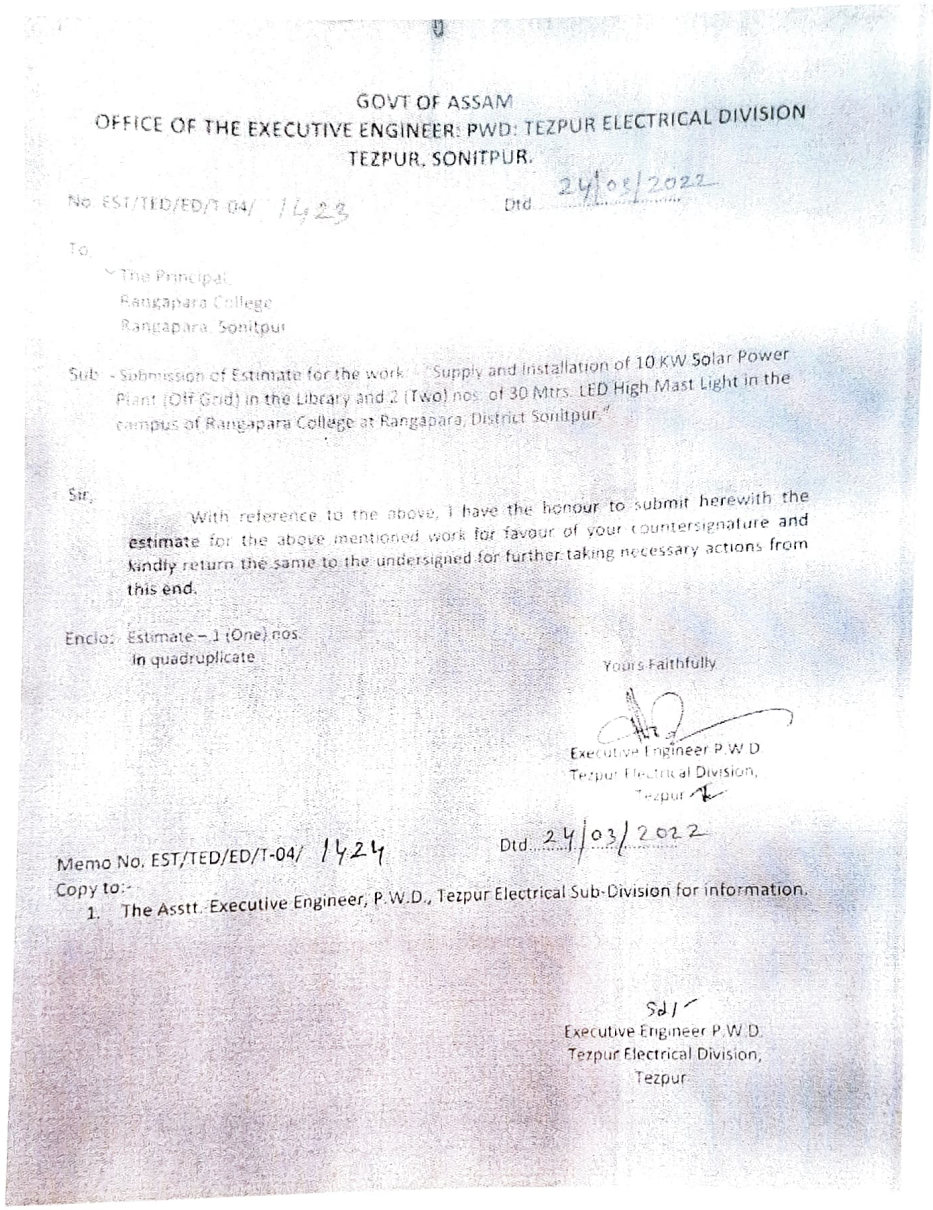
5. College has received solar power installation of 10 KW (yet to install) in the college central Library and 2 nos. of 30 Mters. LED high mast light. The award letter is attached below



GOVT OF ASSAM
OFFICE OF THE EXECUTIVE ENGINEER: PWD: TEZPUR ELECTRICAL DIVISION
TEZPUR, SONITPUR.

No. EST/TED/ED/T-04/ 1423 Dtd. 24/03/2022

To,
The Principal,
Rangapara College
Rangapara, Sonitpur

Sub :- Submission of Estimate for the work :- "Supply and Installation of 10 KW Solar Power Plant (Off Grid) in the Library and 2 (Two) nos. of 30 Mtrs. LED High Mast Light in the campus of Rangapara College at Rangapara, District Sonitpur."

Sir,

With reference to the above, I have the honour to submit herewith the estimate for the above mentioned work for favour of your countersignature and kindly return the same to the undersigned for further taking necessary actions from this end.

Enclo: Estimate – 1 (One) nos.
in quadruplicate

Yours Faithfully

Executive Engineer P.W.D
Tezpur Electrical Division,
Tezpur

Memo No. EST/TED/ED/T-04/ 1424 Dtd. 24/03/2022

Copy to:-
1. The Asstt. Executive Engineer, P.W.D., Tezpur Electrical Sub-Division for information.

Sd/-
Executive Engineer P.W.D.
Tezpur Electrical Division,
Tezpur

(Dr. Ranjan Kalita)
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3.3 SUGGESTIONS FOR BETTER ENERGY EFFICIENCY

1. Increase the number of solar street light.
2. Use computers and all other electronic equipment in power saving mode.
4. Use automated sensors in washroom to stop water waste when not in use.
5. Turn off the appliance when we go out of the room.
6. Replace all the old electrical and electronics goods with new high rating one.
7. Run Ac in-between 24 to 25 degree temperature only.

3.4 CONSOLIDATION OF AUDIT FINDINGS

1. The per month use of electricity in the college is not too high.
2. The methods adopted by the college to reduce the energy consumption are sufficient.

4. POST AUDIT PHASE

4.1 ACTION PLAN FOR REDUCING ENERGY CONSUMPTION

Energy audit is a continuous process that has to be done per year. From the energy audit one can easily able to know how much of energy consumed in a year and how much per month. So it will help us to take the necessary steps to reduce the energy consumption. To reduce the energy consumption awareness programs will be a part of our action plane. Use of banner and sign indication within the college campus also helps us to save energy.

5. CONCLUSION

Conclusively, the energy report of Rangapara College has been done for the year 2023 -2024. From the energy report it is clear that college has focus on the point of sustainable development. It is also noticed that there is seasonal variation of electricity demand in the college campus. College has a very good number of LED bulbs and LED tube lights that helps to reduce the electric energy consumption.

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