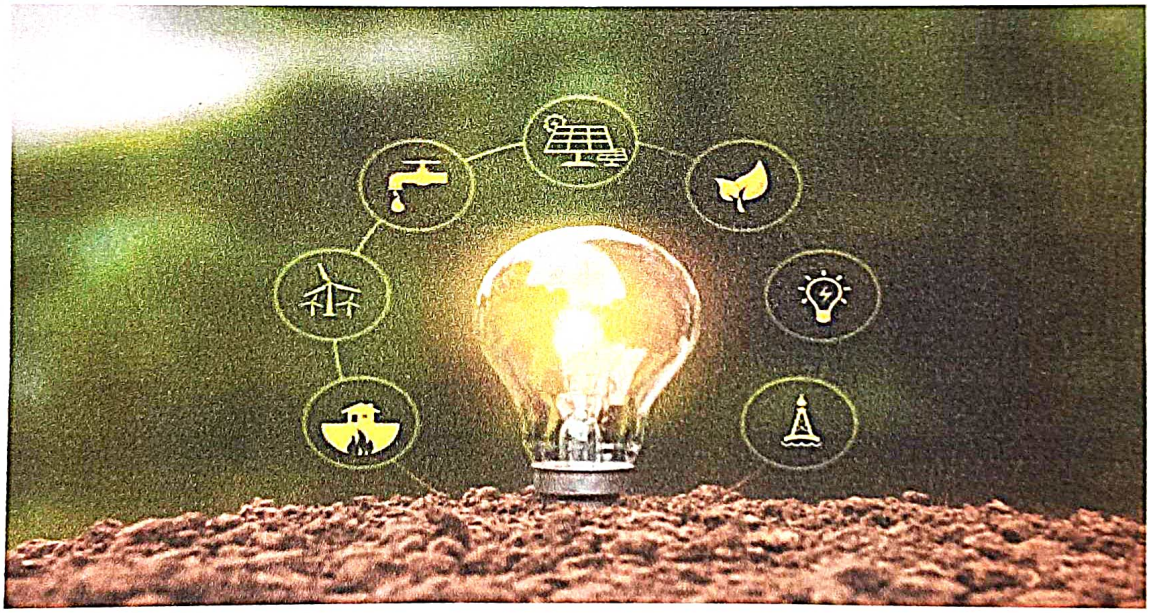
A REPORT ON
Energy Audit 2020-2021

Of

Rangapara College



Rangapara College

Rangapara, Sonitpur-784505, Assam, India

http://www.rangaparacollege.com

A REPORT ON
Energy Audit 2020-2021

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Rangapara, Sonitpur-784505, Assam, India

(Dr. Ranjan Kalita)
Principal
Rangapara College

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Assam Power Distribution Company Limited
Reg. Office: - BijuleeBhawan, Paltanbazar, Guwahati – 781001
Office of the Asstt. Executive Engineer
Balipara Electrical Sub Division:: APDCL(CAR), Balipara
CIN No. U 40109AS2003SGC007242 Ph. :(03714)-234325
E-mail:- besdsde@gmail.com

Forwarding Certificate

This is certified that the detailed Energy Audit in electrical consumptions has been carried by me in Rangapara College, Rangapara-784505, Sontipur, Assam, India; in order to identify the energy consumption pattern in Rangapara College and accordingly to find out the conservation potentials and opportunities.

Place: Balipara

Date: 22/11/2021

ASSAM POWER DISTRIBUTION CO. LTD. SL NO. DATE BALIPARA ELECT SUB DIVN

Signature

Sub-Divisional Engineer
(Balipara Electrical Sub-Division)
APDCL. CAZ. Balipara

(Dr. Ranjan Kalita)
Principal
Rangapara College

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

ENERGY AUDIT COMMITTEE

Sl. No	Name	Designation	Signature
1	Dr. Ranjan Kalita	Principal	
2	Dr. Ranendra Mohan Deka	Vice-Principal	
3	Mr. Atul Sarmah	IQAC Coordinator	
4	Dr. Dipankar Kalita	Auditor HOD, E.E. GIMT-Tezpur	
5	Dr. Bijoy Sankar Boruah	Coordinator	
6	Dr. Luxmi Machahari	Member	
7	Dr. Gitartha Kaushik	Member	
8	Ms. Joon Moni Haloi	Member	

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 thank the IQAC cell and all the members of energy audit committee for their suggestion at different stage for making this report in a proper way. I am also thankful to B.Sc. 3rd semester Physics major students for their involvement in data collection process.

Place: Rangapara College, Rangapara

Date: 22/11/2021

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

ENERGY AUDIT CERTIFICATE

This is certify that the "Energy Audit 2020-2021" 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 : 22/11/2021

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

Dr. Dipankar Kalita
Auditor
HOD, Department of Electrical Engineering
GIMT-Tezpur

PREFACE

Energy audit implies the analysis of energy consumed per year and how much of cost for it. 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. For a developing country for obtaining the sustainable development energy audit is very important. In this report, we have reported the energy audit of 2020-2021 of Rangapara College for the period of October 2020 to September 2021. 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).

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1. INTRODUCTION

Energy plays an important role for a developing country. 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 block of a society. To create a healthy society, we require a healthy environment. A proper planning only can create a good healthy and sustainable development society. Therefore analysis of energy used in an educational institution becomes a very important parameter to measure sustainable development. 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 definitely 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 2020-2021 of Rangapara College for the period of October 2020 to November 2021. 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 on the basis of 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	October-2020	5473.07	48223.00
2	November-2020	5428.11	47580.00
3	December-2020	4942.55	44547.00
4	January-2021	4436.00	41036.00
5	February-2021	4456.980	30179.00
6	March-2021	5551.000	48763.00
7	April-2021	5817.760	49363.00
8	May-2021	3467.880	33781.00
9	June-2021	3692.670	34971.00
10	July-2021	4280.140	39282.00
11	August-2021	4262.160	39749.00
12	September-2021	8411.00	66926.00
	Total	**60,218.64**	**5,24,400.00**

The average per month electric energy consumption = 60,218.64 ÷ 12 = 5018.22 Kwh

And the average per month electricity bill amount Rs. = 5,24,400.00 ÷ 12 = Rs. 43,700.00

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2.2 NO. OF ELECTRIC ENERGY CONSUMED ELEMENTS

Table 2: List of Electric energy consumed elements

CFL	15
LED	244
FAN	325
Stand fan	4
Wall fan	3
Led Tube light	319
CCTV	33
TV	3
AC	8
Ex-fan	13
Printer	11
Desktop	42
Laptop	6
Inverter	6
Wifi	5
Projector	2
Display	1

Filter	2
Power bulb	6
Sound box	6
Microphone sound box	3
MIC	2
Sanitizer machine	1
Sound system	1
Punching machine	1
Street light	13
freeze	1
Water Pump	1
Electrical instrument in Chemistry Lab	6
Electrical instrument in Zoology Lab	8
Electrical instrument in Physics Lab	79
Electrical instrument in Botany Lab	11

3. AUDIT PHASE

3.1 DATA ANALYSIS AND OBSERVATION

In table 1, we have shown the electric energy consumed data and the bill amount and these data's is collected from Assam Power Distribution Company Limited. The data is collected over the period from October 2020 to September 2021. In the table 2, we have shown the number of electric energy consumed elements in Rangapara college campus. Based on the table 1 we have made two histograms as shown in figure 1 and figure 2. Figure 1 represents the consumed of

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electric energy in Kilowatt hour per month. From this figure we can conclude that in the month of September 2021, consumption of electric energy is higher than the other months. The highest electric energy consumption occurs in this month because of summer season. It is also noticed the lowest electric energy consumption take place in May 2021. The reason for the low electric energy consumption is because of Lockdown for Covid -19 Pandemic. From the figure 1 we also observe a seasonal variation of electric energy consumption from summer to winter. In figure 2, we represent the per month electric energy consumption bill amount. It is noticed that the bill amount is minimum in the month of February 2021. From the table 1 we can easily calculate that the average per month electric energy consumption is 5018.22 Kwh and the average per month electricity bill amount is Rs. 43,700.00.

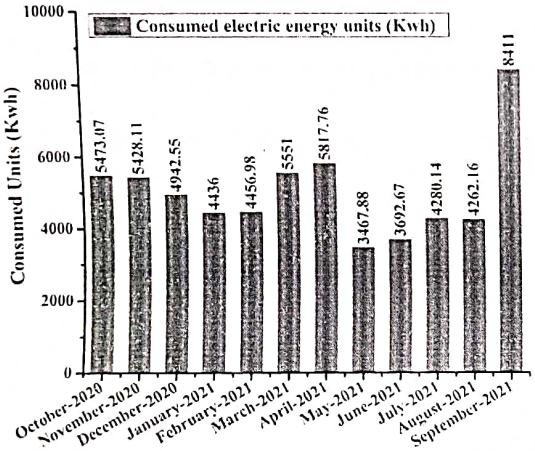

Figure1: Histogram of electric energy consumption from October-2020 to September 2021

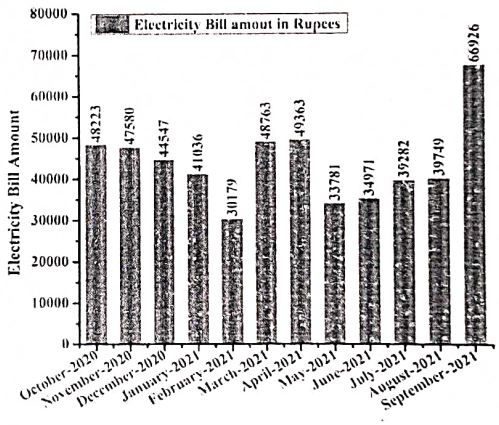

Figure 2: Histogram of electric energy bill from October-2020 to September 2021

During the data collection it is also found that Rangapara College has one electricity generator, and 8 solar street lights. In the College campus LPG cylinder are used in both girls' and boys' 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.

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3.2 SUGGESTIONS FOR BETTER ENERGY EFFICIENCY

1. Replace all street light by solar light.
2. Replace the entire CFL, incandescent and tube light with LED bulb or LED tube.
3. Use computers and all other electronic equipment in power saving mode.
4. Monitor and control the overflowing of water tank or use automated sensors to stop the flow 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.

3.3 CONSOLIDATION OF AUDIT FINDINGS

1. The average monthly use of electricity in the college is not too high.
2. The methods taken 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 of such as "energy management", "energy conservation" and "go green, save energy and save earth" etc. will be a part of our action plane before the next energy audit. Use of banner and sign indication within the college campus also helps us to save energy. We will also try to implement all the suggestions for better energy efficiency.

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5. CONCLUSION

Conclusively, the energy report of Rangapara College has been done for the year 2020 -2021. 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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