

ENERGY AUDIT REPORT
GOVERNMENT SCIENCE COLLEGE,
CHATRAPUR

2023-24



GOVT. SCIENCE COLLEGE
CHATRAPUR,
GANJAM, ODISHA, INDIA

Energy Audit Committee:

MEMBERS (External):

1. Dr Pritiranjana Sahoo, Associate Professor, Electrical Engineering Department, NIST University
2. Dr Aswini Kumar Nayak, Assistant Professor, Electrical Engineering Department, NIST University.

CONVENOR: Sri Pradyumna Madhei, H.O.D., Dept. of Physics

MEMBERS (Internal)

1. Sri Santosh Kumar Behera, Lecturer in Physics
2. Smt. Arati Dikhit, Jr. Lecturer in Physics



GOVT. SCIENCE COLLEGE, CHATRAPUR



CERTIFICATE

This is to certify that an Energy Audit of Govt. Science College, Chatrapur has been conducted in May- June of 2024 to assess energy load, costs and consumption reliability to supply of energy, energy conservation and steps to be taken to reduce energy consumption.

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Introduction

Govt. Science College, Chatrapur started functioning in 8th July 1969 and was accredited with 'B' level by NAAC. It provides Co-education and Multi-faculty teaching facilities in Arts, Commerce and Science streams. It provides 11 regular undergraduate and Post Graduate courses. It has Science Block, Humanities block, and library and other Block. In order to provide /Supply electricity a separate transformer is installed in the campus. There is huge electricity consumption in the class rooms, labs, corridor, offices staff rooms, auditorium and uses of equipment's in different blocks of the college. In broad sense energy efficiency means managing energy consumption in a more economical way otherwise it may increase the energy consumption cost and will be a financial burden for the institution. It includes improving the efficiency of energy extraction, transmission and increasing the productivity energy use.

Energy Audit

As per the energy conservation Act, 2001, energy audit is defined as the verification, monitoring, analysis and use of energy including submission of technical report containing recommendation for improving energy efficiency with cost benefit and an action plan to reduce energy consumption.

The energy audit includes following stages:

A team headed by **Sri Pradyumna Madhei**, Asst. Prof of Physics with supporting staffs to collect data in Arts Block. A team headed by **Sri Santosh Behera**, Lecturer in Physics with supporting staffs to collect data from Science Block. A team headed by **Smt. Arati Dikhit Jr.** Lecturer Physics with supporting staff to collect data from administrative & S.F. block.

In preliminary data collection phase, exhaustive data collection was performed using different tools. Different teams went to each block, departments, offices, library, auditorium etc. and collected the general information of each appliance and the power consumption of each appliance was recorded.

Detail analysis of data collected include calculation of energy consumption, analysis of latest electricity bill of the institute, understanding the tariff plan provided by TPSODL. On the basis of results of data analysis and observation & some steps for reducing power were recommended.

Data Collection

The audit team visited different blocks of Govt. Science College, Chatrapur and data of each electrical appliances with wattage or load of each block are collected. All the data were put in the table for each block with load in kW for easier understanding.

HUMANITY BLOCK

Room No	Tube Light/ CFL/ LED In Watt	Plug Point	Plug Point 15 Amp In Watt	Water Purifier	Ac In Watt	Table Fan/ Wall Fan In Watt	Ceiling Fan In Watt	Tv In Watt	Laptop, Desktop , Printer In Watt	Apparatus In Watt	Smart Board In Watt	Projector, Biometrics In Watt	Total Load In Watt
Ground Floor													
Principal Chamber	72	36	48	200	3500		140		590				4586
Account section	120	24	32			60	140		590				966
Estb. Section	168	24	32	200			280		590				1294
Room no-10	144	18					420						582
Room no-09	216	24					560						800
Room no-08	48	12					280						340
English Staff Room	120	24					140						284
Pol Science Staff Room	48	24					140						212
Odia Staff Room	48	12					140						200
Room no-07	216	24					700						940
Commerce Staff Room	72	24				240							336
Room no-06	240	24	16				630						910
Room no-05	216	36	48				630						930

Room No-16	144	12	32			140														328	
Corridor	225	6																			231

SCIENCE BLOCK

Ground Floor

Room No	Tube Light / CFL / LED In Watt	Plug Point	Plug Point 15 Amp In Watt	Water Purifier	Ac In Watt	Table Fan/W all Fan In Watt	Ceiling Fan In Watt	Tv In Watt	Laptop, Desktop, Printer In Watt	Apparatus In Watt	Smart Board In Watt	Projector, Biometrics In Watt	Total Load In Watt
Zoology Lab	288					350	560					800	1998
Zoology Staff Room	192	12					420						624
Toilet-1	48												48
Botany Storeroom	96	6	16				140						258
Botany Staff Room	96	12					140						248
Botany Lab	144	12					420					800	1376
Chemistry UG Classroom	144	36	16				420					800	1416
Chemistry Staff Room	96	6	12				140						254
Chemistry PG Classroom	96	6	32			70	140						344
Chemistry Storeroom	216	102	96				350						2264

Zoology UG Classroom	144	42	64						420										250	920
Chemistry PG Lab	216	54	64						420											754
CRL	96	18	16						140											270
Physics PG Classroom	120	18	32						140											310
Physics UG Classroom	216	72	32						420											740
Mathematics Staff Room	72	24	16						70											182
Mathematics UG Classroom	288	180	208						560										250	1486
Corridor	264								1050											1314

LIBRARY AND OTHER BLOCK

Room No	Tube Light / CFL / LED In Watt	Plug Point	Plug Point 15 Amp In Watt	Water Purifier	Ac In Watt	Table Fan/W all Fan In Watt	Ceiling Fan In Watt	Tv In Watt	Laptop, Desktop, Printer In Watt	Apparatus In Watt	Smart Board In Watt	Projector, Biometrics In Watt	Total Load In Watt
LIBRARY													
Ground floor	456	84	32			120	1260		590				2542
First floor	240	60	32				840						1172
Second floor	240	60	32				840						1172
Corridor	72												72
OTHER													
BCR	96	12					210						318
NSS Room	24	6					70						100
Side Room	24	6					70						100
Sports Room	24	6					70						100
English Lab		18	96		600				1360			250	2324
Corridor	24	6											30
YRC Room	96	24	16				210						346
NCC Naval Room	72	24					140						236

Data Analysis

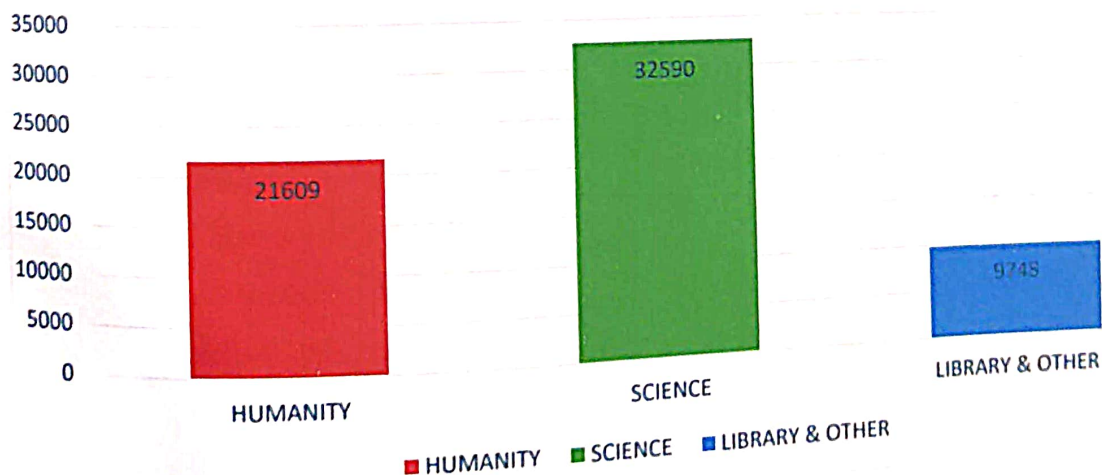
The collected data were then quantified according to the following criteria.

- Energy load of each appliance.
- Energy load in each block.
- Energy load in the college.

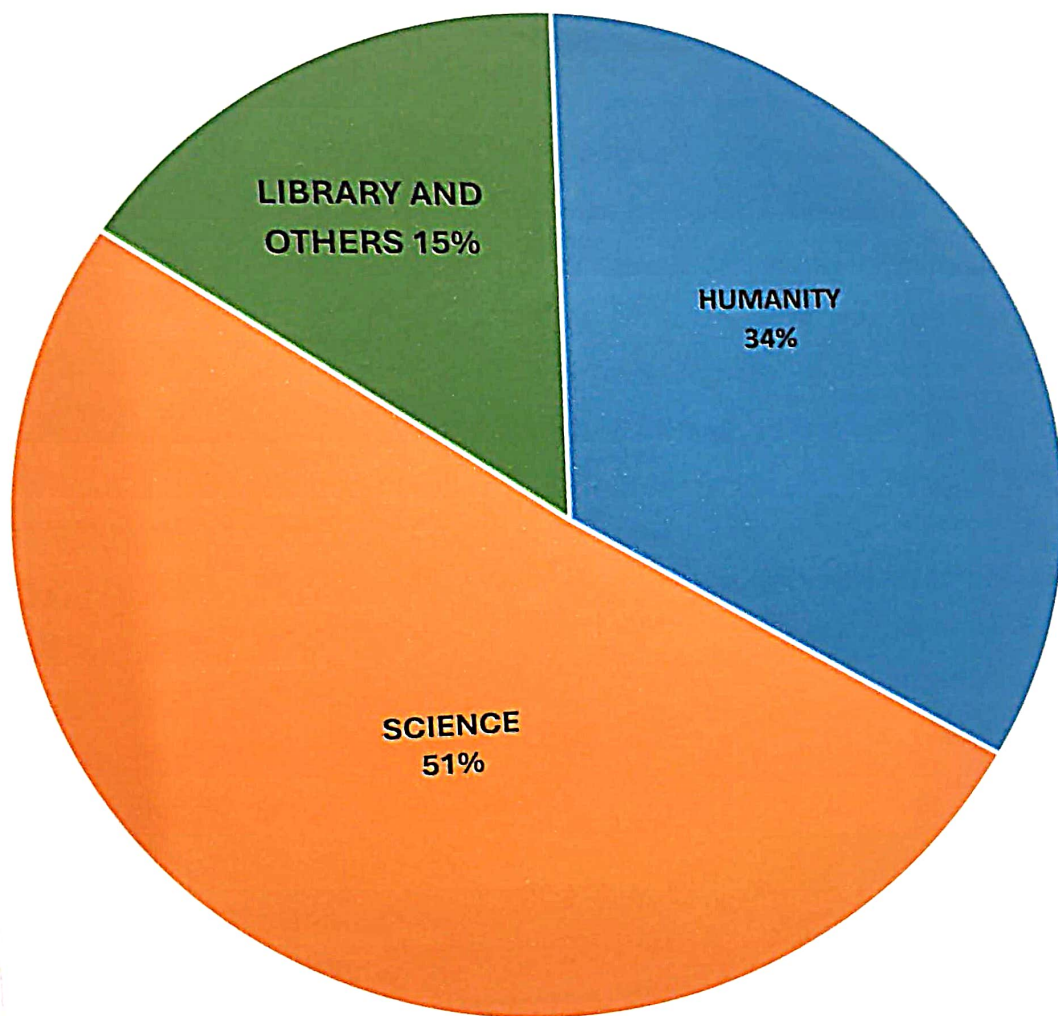
The quantified data were put in a tabular form and with suitable diagram for easy reference and understanding of the energy consumption.

ENERGY AUDIT		
GOVT SCIENCE COLLEGE, CHATRAPUR		
SL NO	NAME OF THE BLOCK	ELECTRIC LOAD IN WATT
01	HUMANITY	21609
02	SCIENCE	32590
03	LIBRARY & OTHER	9748
	TOTAL LOAD	63947

ENERGY AUDIT GOVT SCIENCE COLLEGE, CHATRAPUR



**ENERGY AUDIT
GOVT SCIENCE COLLEGE, CHATRAPUR**



■ HUMANITY ■ SCIENCE ■ LIBRARY & OTHER

ENERGY CONSUMED IN MONTHS 2023-24

GOVT. SCIENCE COLLEGE, CHATRAPUR

SL. NO.	MONTH	UNIT CONSUMED IN KWH	COST/UNIT IN Rs	ENERGY BILL IN Rs
01	JUNE-2023	2596.78	6.20	16100.04
02	AUGUST-2023	3710	6.20	23002.00
03	OCTOBER-2023	3474	6.20	21538.80
04	DECEMBER-2023	1816.26	6.20	11260.81
05	FEBRUARY-2024	3124	6.20	19368.80
06	MAY-2024	3464	6.20	21476.80

Suggestions and Recommendations

From Physical observation and data analysis team recommended following points:

- Upgrading of technologies in Laboratory equipment's.
- Replacing old electrical cables in some places in Humanity block and Science block for safety and power loss.
- Replacement of LCD monitors with LED.
- Use of master switch outside each room to save energy.
- Old appliances should be replaced to reduce energy consumption.
- Replacement of old generation computer and TV with LED.
- MCB panel in each department for safety and to reduce power consumption.
- Installation of roof top Solar panel.
- Steps should be taken to make roof top solar panel operational.

Conclusion

Since the organization is a well-established, long time run establishment with good reputation, there is significant scope for conserving energy and made the campus as self-sustained in energy. The energy efficiency lighting schemes awareness among stake holder and necessary power backup are being practiced by the institution. Electrical wire, switch board, stabilizer and WIFI switch is properly covered. In some places of Humanity block and Science block cables are weak and in needs of replacement to avoid energy loss. Each block needs installation of meter and panel system in each department to avoid loss of energy. The roof top solar panel should be operational in Humanity block to reduce electric energy load. It is better for conceal wiring in Humanity block and Science block to reduce power loss. Steps may be taken to install roof top solar panel in Science block and Library building to save energy bill. The overall electrical system in the college is satisfactory and needs further improvement.


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