

KANDI RAJ COLLEGE

Energy audit

Session: 2023- '24



KANDI RAJ COLLEGE

(Govt. Sponsored)

NAAC Accredited-Grade : B+

Kandi, Murshidabad, West Bengal-742137

☎ 03484-255230

✉ principalkrc.krc@gmail.com

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🌐 www.kec.edu.in

Ref.

Date :

To

M/S Delta Trading Enterprises Engineers and Contractors (Reg.No. – 9784, Licence Board),
Electrical, Kolkata)

Village & P.O.- Eroali, P.S. – Khargram, District- Murshidabad, West Bengal

Subject: A Request for providing certificate for Energy Audit of Kandi Raj College

Respected Sir,

With due respect I would like to inform you that we have to submit Energy Audit report to our concerned authority and it is very much essential as well as vital.

Hence, I would earnestly request you to conduct Energy Audit in our college premises and submit the report at the earliest so that we may submit your report to our concerned authority.

Awaiting your earliest positive response.

Thanking you,

Dr. Soma Datta,
Principal,
Kandi Raj College,
Kandi, Murshidabad

Principal
Kandi Raj College
Kandi, Murshidabad





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DECLARATION

The Energy Audit conducted and prepared by our college are completely based on self-inquiry and data collected by energy audit team. The perception about the audit was conducted on various electrical equipments used daily.


Signature of Members

Abhijit Dutta

Ramprasad

Annu Kumari Das.

Countersigned by


Dr. Soma Datta,
Principal,
Kandi Raj College,
Kandi, Murshidabad

Principal
Kandi Raj College
Kandi, Murshidabad



M/S DELTA TRADING ENTERPRISES

Engineers and Contractors (Reg. No. – 9784, Licence Board), Electrical, Kolkata)

Village & P.O.- Eroali, P.S. – Khargram, District- Murshidabad, West Bengal

Ref. No.

Date: 06/06/24

TO WHOM IT MAY CONCERN

With Reference to your letter no. 82A/KRC/24 dated 20/05/24, regarding the ENERGY AUDIT inside the campus of Kandi Raj College, Kandi, Murshidabad, we have physically checked the entire campus which revealed that the Energy Audit status in respect of different electrical equipments effectively managed the energy consumption at minimum cost and eco-friendly. Kindly find the enclosed energy audit report of Kandi Raj College, Kandi, Murshidabad.

Namer of the Supervisor: CHANCHAL KAR

SCC No.- ~~11351~~ 445082

Parts – 1.2.4, 6A, 7A, 7B, 11& 112 only

Chanchal Kar
Chanchal Kar LEE.
Govt. Supervisor(Elect)
SCC No.- 445082
Parts- 1,2,4,6,7,11 &12
Vill.& P.O.- Eroali, Msd.
Ph.- 7001997365

M/s. Delta Trading Enterprise
Chanchal Kar
Partid



Energy Audit, Kandi Raj College

Energy Audit team

1. Dr. Abhijit Dutta (Assistant Professor in Physics)
2. Dr. Atanu Kumar Das (Assistant Professor in Physics)
3. Mr. Dilip Majhi (Casual Staff working as Electrician in College)

Preface

Data collection for Energy Audit of Campus was conceded by a team mentioned before for the period of July 2023 to June 2024. This audit was undertaken as a convenience to know progress of the college regarding energy competence. To minimize energy utilization, this audit required to recognize mainly energy efficient appliances. The data was collected from each Classroom, Laboratories, Library, Administrative office and Departmental staff rooms. In this data, total number of Tube Light, Computers, LED Bulbs, Fan, ACs, Air-Conditioner, electric instruments in laboratories, etc. was taken into consideration.

Objective of Energy Audit

When the object of study is an occupied building then reducing energy consumption while maintaining or improving Students and Staff comfort, health and safety are of primary concern. Beyond simply identifying the sources of energy use, an energy audit seeks to prioritize the energy uses according to the greatest to least cost-effective opportunities for energy savings.

Introduction

Energy auditing applies the law of conservation of energy. It simply means that we can account for energy because it is neither created nor destroyed in the facilities and systems we operate.

In the last several decades, energy audits have exploded as the demand to lower increasingly expensive energy costs and move towards a sustainable future have made energy audits greatly important. Their importance is magnified since energy spending is a major expense everywhere. Audits performed externally tend to focus on energy-saving technologies and capital improvements. It also reveals energy-saving opportunities that are less capital intensive and focus more on operations. Organizations that conduct an





Energy Audit, Kandi Raj College

energy audit internally gain considerable experience in how to manage their energy consumption and costs. By going through the auditing process, one can understand that energy is a manageable expense. The people become able to analyze use of energy and are more aware of how their day-to-day actions affect energy consumption.

An energy audit is the key to developing an energy management program. Although energy audits have various degrees of complexity; the audit is designed to determine how energy is being used. This information can then be used to identify opportunities to improve efficiency, decrease energy costs and reduce greenhouse gas emissions that contribute to climate change. Energy audits can also verify the effectiveness of energy management Programs that have been implemented. Energy audits can be done using internal resources.

In the present study, Institutional electricity audit has been done. Practical laboratory instruments, Fans, air conditioners, Computers etc. are considered. Exact contribution of bulb, fans, computer, instruments etc. in the total requirement of electricity. We studied all these mentioned things by collecting exactly data form survey.

Electric Connections

We have three meters for college campus and Staff Quarters. One meter is dedicatedly used for Air-Conditioner, One for others electrical equipment and one for Staff Quarter. Following three are the meters no.

- P1053933
- B2557041
- P1053934

Data Collection

All required data is collected by the team for the survey of the college. In all Buildings, in Every Class room and Department, how many Fans, Tube lights CFL Bulbs, Computer, Printer, A.C. and instrument on electricity etc were measured. According to survey following data is collected.





Energy Audit, Kandi Raj College

Dept.	No. of Tube Light	No. of Led	No. of Fan	No. of Computer	No. of Printer	No. of Exhaust Fan	No. of Projector	No. of Fridge	Network System	AC	Sound System	Instruments load	Total Watt
Chemistry	36	13	16	3	2	4	2	3	1	0	50	3000	8080
Physics	16	16	19	7	1	1	0	1	0	0	50	2000	6240
Physical Education (Dept.)	5	4	6	0	0	0	0	0	0	0	0	0	600
Computer Science (Dept.)	8	6	5	15	1	2	1	0	1	2	0	0	7030
Geography (Dept.)	24	10	8	6	2	2	1	0	1	0	0	200	4090
Zoology (Dept.+ Lab.)	10	0	4	1	0	1	0	1	1	0	0	200	1390
Science Building Staircase	6	0	0	0	0	0	0	0	0	0	0	500	740
Physiology (Dept.+ Lab.)	7	6	6	1	1	2	0	0	1	0	0	200	1550
Botany (Dept.+ Lab.)	14	0	7	1	1	1	1	1		0	0	300	2230
Mathematics	14	9	13	3	1	1	2	0	1	0	0	0	2930
Economics (Dept.)	3	2	2	1	1	1	0	0	1	0	0	0	860
Sanskrit (Dept.)	2	2	1	1	1	0	0	0	0	0	0	0	660
Bengali (Dept.)	2	1	2	1	0	0	0	0	1	0	0	0	510
Philosophy (Dept.)	2	2	2	1	1	1	0	0	0	0	0	0	770
English (Dept.)	1	1	2	1	1	0	0	0	0	0	0	0	670
History Dept.	1	2	2	1	1	0	0	0	1	0	0	0	730
Education Dept.	2	1	1	1	0	0	0	0	0	0	0	0	400
Pol. Sc. Dept.	1	1	1	1	1	0	0	0	0	0	0	0	610
Staff Room and Surrounding	0	24	8	0	0	2	0	0	2	2	250	200	3370
Library office	16	15	18	4	2	2	1	0	1	0	0	0	3720
Multi Gym	3	7	6	0	0	0	0	0	0	0	0	0	550
Guard Room	0	1	1	0	0	0	0	0	0	0	0	0	70
Principal Room	0	8	4	1	1	0	2	0	2	1	0	1000	3320
Head Clerk Room	5	2	4	2	2	0	0	0	1	0	0	0	1510
Office Computer Room	2	1	1	2	1	0	0	0	0	0	0	250	1150
Student Section	3	2	6	1	1	0	0	0	0	0	0	0	1000
Scholarship Section	2	0	1	1	1	0	0	0	0	0	0	0	640
Cash Room	2	2	2	2	1	0	0	0	1	1	0	0	2020
Account Section	3	4	3	1	1	1	0	0	0	0	0	0	890
Canteen	2	1	3	0	0	0	0	1	0	0	0	250	720
Night Guard Room	1	0	1	0	0	0	0	0	0	0	0	0	100
Staff Room Toilet (Male)	2	0	0	0	0	1	0	0	0	0	0	0	130





Energy Audit, Kandi Raj College

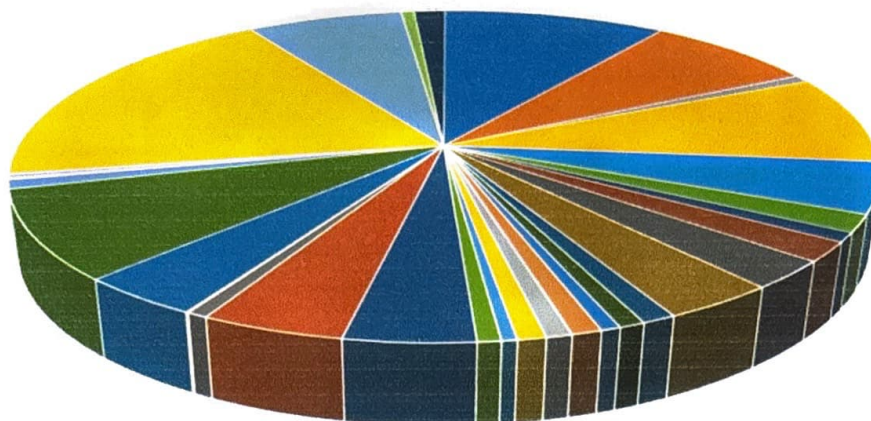
Staff Room Toilet (Female)	2	0	0	0	0	1	0	0	0	0	0	0	130
Classroom B001	0	3	2	0	0	0	0	0	0	0	0	0	150
Classroom B002	4	4	4	0	0	0	0	0	0	0	0	0	440
Classroom B003	4	4	4	0	0	0	0	0	0	0	0	0	440
Classroom B101	2	4	4	0	0	0	0	0	0	0	0	0	360
Classroom B102	2	4	4	0	0	0	0	0	0	0	0	0	360
Classroom A001	6	4	9	0	0	0	0	0	0	0	250	0	1070
Classroom A002	0	4	4	0	0	0	0	0	0	0	0	0	280
Classroom A003	0	2	1	0	0	0	0	0	0	0	0	0	80
Classroom A004	4	6	8	0	0	0	0	0	0	0	250	0	950
Classroom A005	6	1	6	0	0	0	0	0	0	0	0	0	610
Classroom A006	6	0	6	0	0	0	0	0	0	0	0	0	600
Classroom A101	4	2	9	0	0	0	0	0	0	0	0	0	720
Classroom A102	6	4	10	0	0	0	0	0	0	0	250	0	1130
Classroom A103	0	4	7	0	0	0	0	0	0	0	0	0	460
Classroom A104	0	4	4	0	0	0	0	0	0	0	0	0	280
Classroom A105	0	1	1	0	0	0	0	0	0	0	0	0	70
Classroom A106	0	2	3	0	0	0	0	0	0	0	0	0	200
Classroom A107	3	2	6	0	0	0	0	0	0	0	0	0	500
Classroom A108	2	4	4	0	0	0	0	0	0	0	0	0	360
Classroom A109	2	4	4	0	0	0	0	0	0	0	0	0	360
Classroom A110	4	0	4	0	0	0	0	0	0	0	0	0	400
Classroom A111	4	0	7	0	0	0	0	0	0	0	0	0	580
Classroom S001	4	2	5	0	0	0	1	0	0	1	0	50	1730
Classroom S002	3	2	4	0	0	0	1	0	0	0	0	0	580
Classroom S003	2	2	2	0	0	0	0	0	0	0	0	0	220
Classroom S004	2	2	2	0	0	0	1	0	0	0	0	0	420
Classroom S005	4	2	6	0	0	0	1	0	0	0	0	50	790
Classroom S201	4	2	4	0	0	0	0	0	0	0	0	0	420
Classroom S202	2	6	5	0	0	0	0	0	0	0	0	0	440
Classroom S203	2	2	2	0	0	0	0	0	0	0	0	0	220
Seminar Room	0	24	8	1	0	0	1	0	1	4	250	150	5620
Girls' Common Room	2	2	2	0	0	0	0	0	0	0	0	0	220
Boys' Common Room	2	0	3	0	0	0	0	0	0	0	0	0	260
Male Toilet	0	7	0	0	0	0	0	0	0	0	0	0	70
Campus Outside Area	10	20	0	0	0	0	0	0	0	0	0	500	1100
Whole Campus Count	293	279	309	60	25	23	15	7	17	11	1350	8850	
Whole Campus load (Watt)	11720	2790	18540	15000	6250	1150	3000	1400	850	11000	1350	8850	81900





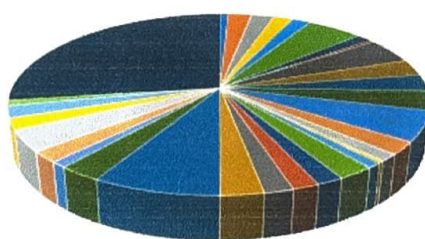
Energy Audit, Kandi Raj College

Overall load Distribution



- | | | |
|----------------------------|-------------------------|--------------------------|
| Chemistry Dept. | Physics Dept. | Physical Education Dept. |
| Computer Science Dept. | Geography Dept. | Zoology Dept. |
| Science Building Staircase | Physiology Dept. | Botany Dept. |
| Mathematics Dept. | Economics Dept. | Sanskrit Dept. |
| Bengali Dept. | Philosophy Dept. | English Dept. |
| History Dept. | Education Dept. | Pol. Sc. Dept. |
| Staff Room and Surrounding | Library | Multi Gym |
| Guard Room | Office of the Principal | College Office |
| Canteen | Night Guard Room | Toilet |
| All Classroom | Seminar Room | Students Common Room |
| Campus Open Area | | |

Classroom wise load distribution



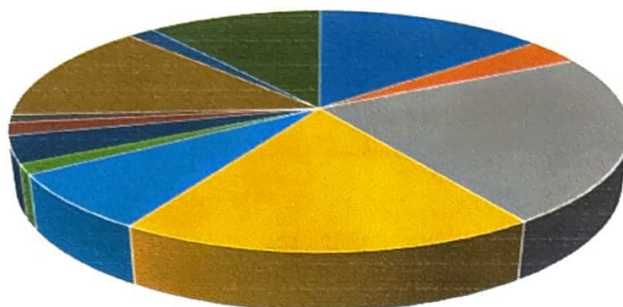
- | | | | | |
|----------------|----------------|----------------|----------------|----------------|
| Classroom B001 | Classroom B002 | Classroom B003 | Classroom B101 | Classroom B102 |
| Classroom A001 | Classroom A002 | Classroom A003 | Classroom A004 | Classroom A005 |
| Classroom A006 | Classroom A101 | Classroom A102 | Classroom A103 | Classroom A104 |
| Classroom A105 | Classroom A106 | Classroom A107 | Classroom A108 | Classroom A109 |
| Classroom A110 | Classroom A111 | Classroom S001 | Classroom S002 | Classroom S003 |
| Classroom S004 | Classroom S005 | Classroom S201 | Classroom S202 | Classroom S203 |
| Seminar Room | | | | |





Energy Audit, Kandi Raj College

Equipment wise Distribution



- | | |
|------------------|------------------------------------|
| ■ Tube Light | ■ Led |
| ■ Fan | ■ Computer |
| ■ Printer | ■ Exhaust Fan |
| ■ Projector | ■ Fridge |
| ■ Network System | ■ AC |
| ■ Sound System | ■ Laboratory and other Instruments |

Observation

Electricity is the main energy source for the college. Besides this, we have installed photovoltaic cell of 2 kWp by college own funding and 10kWp by West Bengal Pollution Control Board under Department of Environment, Govt. of west Bengal in the campus as an alternate renewable source of energy. Computers are run in power saving mode. Unnecessary consumption of power is not allowed and all switches are carefully operated.

Conclusion

Energy audit is an effective tool in identifying and perusing a comprehensive energy management program. A careful audit of any type will give the organization a plan with which it can effectively manage the energy consumption at minimum cost. Through this analysis, suggestion/ recommendations has been made to reduce the electrical power consumption in the college campus.





Energy Audit, Kandi Raj College

Energy Audit Committee:

1. Dr. Abhijit Dutta *Abhijit Dutta*.....
2. Dr. Atanu Kumar Das *Atanu Kumar Das*.....
3. Mr. Dilip Majhi *Dilip Majhi*.....

Checked and Signed by External Expert

Name: *CHANCHAL KAR*

Signature: *Chanchal Kar*

Designation: *Supervisor/Inspector*

Chanchal Kar LEE.
Govt. Supervisor(Elect)
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Soma Datta
.....

Dr. Soma Datta

Principal

Kandi Raj College, Murshidabad
Principal
Kandi Raj College
Kandi, Murshidabad

