

ENERGY AUDIT REPORT



RAJAGIRI DAWOOD BATCHA COLLEGE OF ARTS & SCIENCE

Recognized by UGC under Section 2(f) & 12(B)
Affiliated to Bharathidasan University, Tiruchirapalli

AUDIT CONDUCTED BY

YOJO NETWORK & TRAINING CENTER



(Registered Audit Agencies)

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ACKNOWLEDGEMENT

Yojo Network & Training Center is thankful to the Board of Management, Head of Institution, Faculty and Technical team members of RAJAGIRI DAWOOD BATCHA COLLEGE OF ARTS AND SCIENCE for providing an opportunity to conduct a detailed Energy, Environment and Green Audit process in the college premises. It is our great pleasure which must be recorded here that the Management of RAJAGIRI DAWOOD BATCHA COLLEGE OF ARTS AND SCIENCE extended all possible support and assistance resulting in thorough completion of the audit process. The audit team appreciates the co-operation and guidance extended during the course of site visit and measurements. We are also thankful to all those who gave us the necessary inputs and information to carry out this very vital exercise of Environment and Green Audit.

Finally, we offer our sincere thanks to all the members in the engineering division/technical / non- technical divisions and office members who were directly and indirectly involved with us during collection of data and while conducting field measurements.

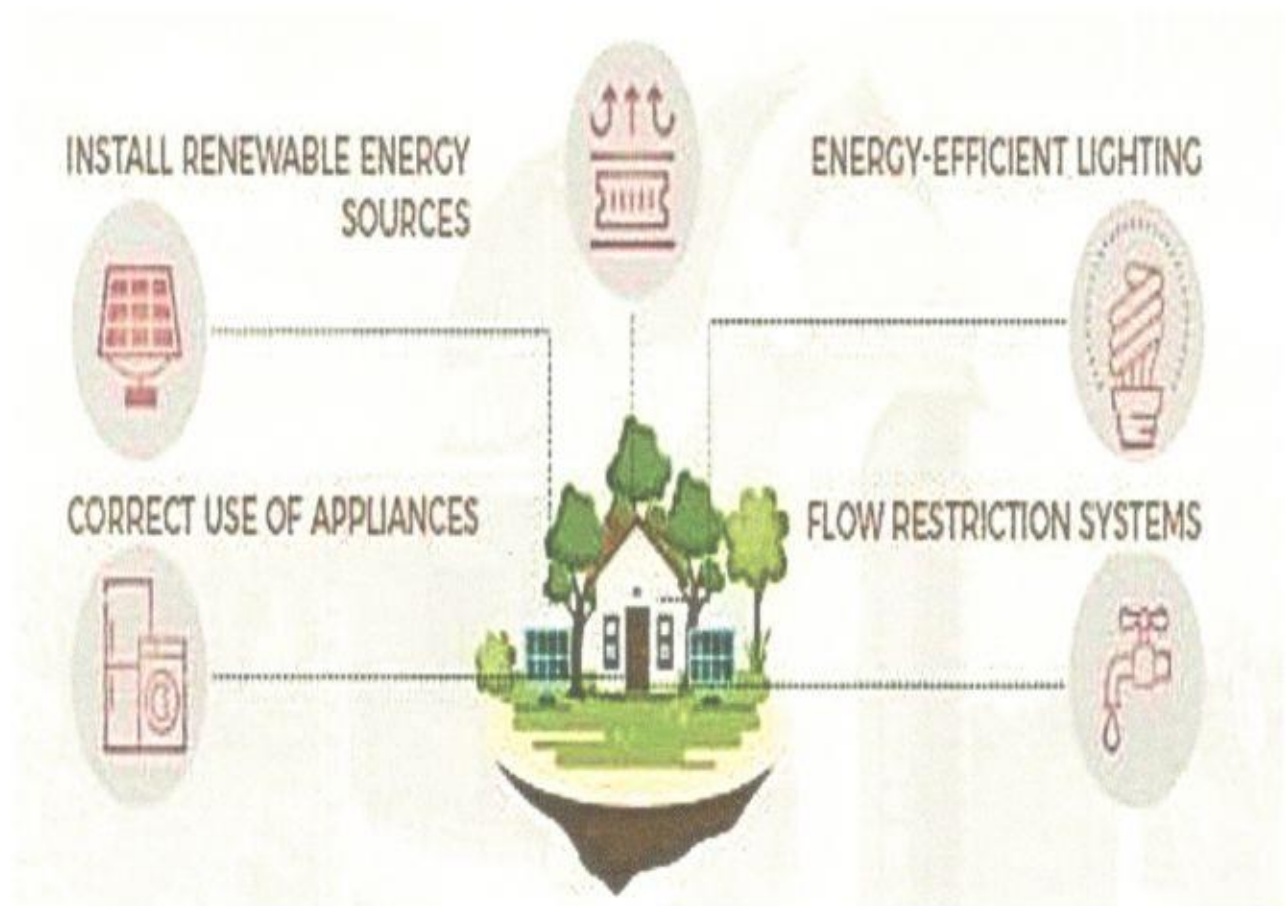
Audit Team Members

Er. V. Marimuthu., B.E., Er. V. Senthilkumar., B.E.,(EEE)	UKAS Certified Energy Auditor (KQ-233) Lead Auditor-ISO-9001:2015,14001:2015(EMS), UKAS, KQ Reg., COC. Carbon Footprint Auditor Mobile:+91-9047205733
Er. R. Rajkumar, B.E.,	Audit Associate

ENERGY AUDIT REPORT

INTRODUCTION TO ENERGY AUDIT

5 IDEAS FOR A SUSTAINABLE INSTITUTION





1.1 : Preface about the Institution:

The Dawood Batcha Educational and Charitable Trust, established in Chennai in 1998 under the chairmanship of Dr. M.A. Dawood Batcha Ph.D., is dedicated to the operation of educational establishments, particularly in rural areas. Its inaugural institution, RAJAGIRI DAWOOD BATCHA COLLEGE OF ARTS AND SCIENCE in Papanasam, Thanjavur Dt, was initiated in 1999. Subsequently, in 2003, the RDB Institutions of Management, endorsed by the All-India Council for Technical Education, New Delhi, were integrated into this college.

The institutions' high quality fosters self-reliance and success among students, equipping them to become conscientious citizens of India, driven by commitment, dedication, loyalty, and sincerity.

The motto "AIM HIGH, AIM FAR" has been adopted as the guiding principle for the educational institutions administered by the Trust.

1.2 : Quality Policy:

Rajagiri Dawood Batcha College of Arts And Science maintains various policies to enhance the growth of the students, staff along with the growth of the Institution.

The policies are as follows:

- GREEN POLICY
- CODE OF CONDUCT
- ENVIRONMENT POLICY
- ENERGY POLICY
- WASTE MANAGEMENT POLICY
- E-GOVERNANCE POLICY

1.3 : Scope of the Audit Process:

- Energy Audit: To conduct a detailed energy audit in the college campus with a main focus to identify judicious usage of electrical and thermal energy (where, when, why and how energy is being utilized).

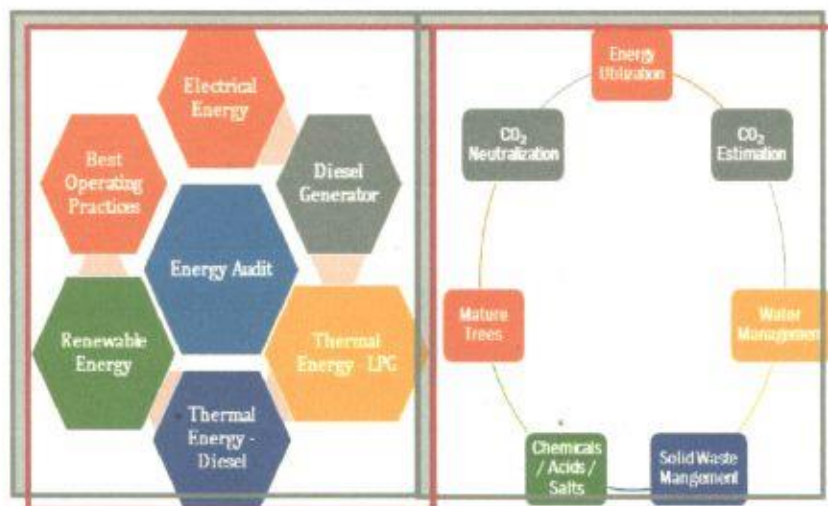
1.4 :Outcomes of the Audit Process:

- Recommendations based on field measurement with achievable Energy Conservation (ENCON) proposals under No cost / Low cost and Cost investment categories.
- Minimization of present energy cost by adjusting and optimizing energy usage and reduction of energy wastage without affecting the regular activities.
- Identification of possible cost and energy saving from energy conservation.

1.5 :Standards Used:

- Bureau of Energy Efficiency Guidelines to conduct the detailed energy audit process.
- **ISO 14064-Part-1** – Specification with guidance at the organization level for quantification and reporting of GHG emissions and removals (Second Edition).
- **ISO 14064-Part-2** – Specification with guidance at the project level for quantification, monitoring and reporting of GHG emissions reductions or removal enhancement (Second Edition-2019).
- **ISO 14064-Part-3** – Specification with guidance for the verification and validation of GHG statements (Second Edition-2019).
- The Green house Gas Protocol- a Corporate Accounting and Reporting Standard (Revised Edition) released by World Resources Institute & World Business Council for Sustainable Development – 2014.

1.6 : Coverage in Energy Audit Process:



1.7 : List of Faculty Members Involved in Audit Process & Data Collection:

S. No.	Faculty Details	Contribution
1.	Dr.V. Tamilvendhan AP/ Dept. of Commerce	Overall Coordinator for the Audit Process.
2.	Dr.M. Maduraveni AP/ Dept. of Tamil	Collection of Electrical Energy Parameters from College & Hostel.
3.	Mr. T. Elangovan, Electrician TANGEDCO	Collection E.B utility & D.G Details.
4.	Dr. M. Sugumar Coordinator IQAC Bharath College of Science & Management Thanjavur	External Member



ENERGY AUDIT REPORT

STUDY ON ENERGY CONSUMPTION & GENERATION PATTERN



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1.1 Assessment of Existing Electrical and Thermal Energy Systems

S. No.	Description	Details				
Electrical Energy (Consumption)						
1.	Name of the customer (As per the utility bill)	R D B COLLEGE, PAPANASAM				
2.	Type of Utility Supply, Service No. & Tariff.	LTSC. No: 06-428-013-312				
3.	Tariff Structure	Rs.12.00/kWh+Rs.120/ kw as demand charges (fixed charges accounted for the sanctioned demand)				
4.	Energy Suppliers	Tamil Nadu Generation & Distribution Corporation (TANGEDCO)				
5.	Permitted Demand(PD)	SC.No: 06-428-013-312-100.0 kW				
6.	Capacity of Diesel Generator (DG) Sets	63 KVA-1 No.				
		All are air-cooling. Internal fuel tank & separate earthing done				
7.	Annual Electricity Consumption (kWh)	2018-19	2019-20	2020-21	2021-22	2022-23
		96128	96914	27831.5	95182.8	96841
8.	Annual Electricity Generation from DG(kWh)	1107	1163	672	1127	1196
9.	Annual Diesel Consumption for DG (L)	4,322	4,418	1236	4548	4764



Thermal Energy (Consumption)						
10.	Types of Thermal Energy Used	Liquefied Petroleum Gas (LPG)			Cooking	
		Diesel (Ordinary)			Transport + DG	
11.	Annual LPG Consumption (kg)	2018-19	2019-20	2020-21	2021-22	2022-23
		1756	1723	449	1745	1618
12.	Annual Diesel Consumption for Transport (L)	6371	6885	1011	7046	7085
General Loads (Both Electrical and Thermal)						
13.	Lighting System	Indoor lighting: LED based Energy efficient lamps				
		Outdoor lighting: All the street lightings are LED based Energy efficient lamps (20W).				
14.	Fan Loads(Ceiling)	<ul style="list-style-type: none"> All the indoor ceiling fans are conventional fans 				
15.	HVAC System	<ul style="list-style-type: none"> Unitary air conditioning system installed in the Required places Most of the AC units are Three star rated and the outdoor units are mostly placed in sunshade Total capacity of the AC system is 15 TR 				
16.	Motors and Pump loads	<ul style="list-style-type: none"> Mainly used for water distribution and purification Small motors are used in kitchen equipment's 				
17.	Uninterrupted Power System (UPS)	<ul style="list-style-type: none"> All the computers, servers, surveillance systems, projectors, telephonic units are connected with UPS with nominal back up time of 15-30 min The total capacity of the UPS is 75 kVA 				





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JULY 22
AUG 22

தமிழ்நாடு மின் உற்பத்தி மற்றும் பகிர்மானக் கழகம் விமரிசை
நாகப்பட்டினம் மின் பகிர்மான வட்டம் 9.9.2022

நவீன பவில, நாகப்பட்டினம்
அகாஷ் பவில, * நாகாலை
R.D.B.COLLEGE மின் கட்டண இரகீது வரிசை எண் :
NGT.A.X: 1500399

06-428-013-312 கட்டண மாதம் : Units: 7120

09-09-2022-11:02:30

வ. எண்	கட்டண விவரம்	தொகை (ரூ)
23100	CC Charges	61554
TANGEDCO		
Total		61554/-
Sixty One Thousand Five Hundred And Fifty Four ரூபாய்		61554

by Cheque (எழுத்தால்)

இதர விவரங்கள் :

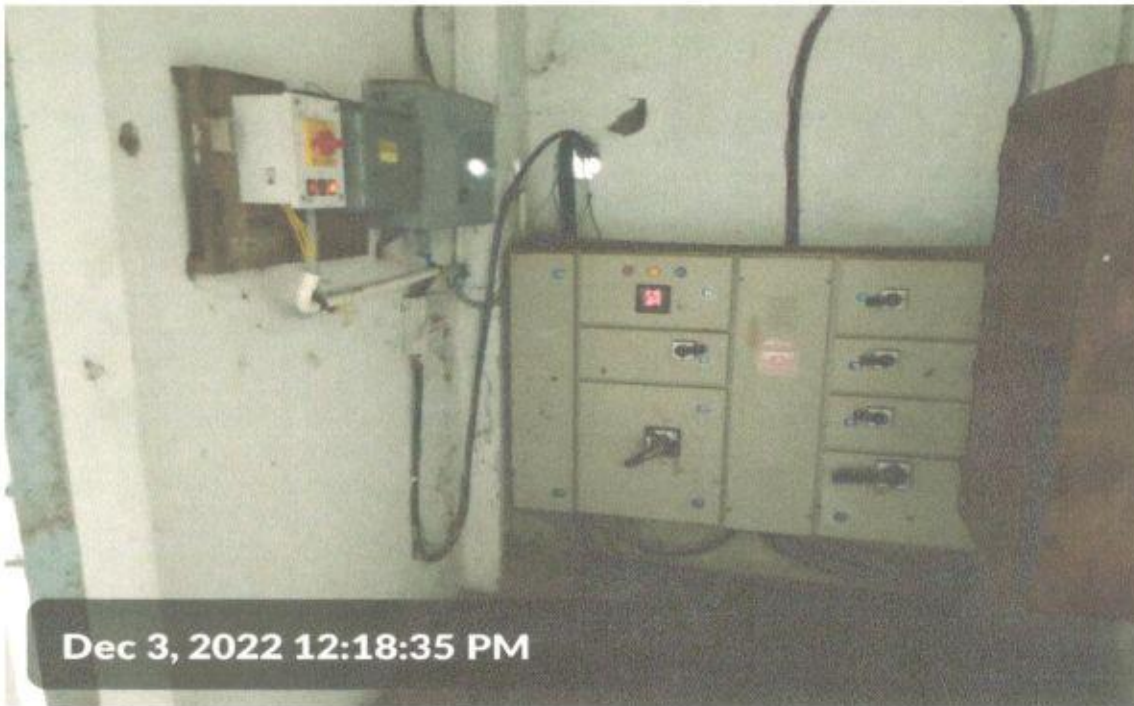
TANGEDCO CIN No : U40109TN200236C073746/2022 Amount: 111430/-
TANGEDCO GST No : 33AADCT47B4E1ZC
Bank Code : 27160000
SAC Code : 996912
Electrical Energy & Distribution services are taxable under GST

கணக்கீட்டாளர் / கணக்கீட்டு ஆய்வாளர் / கருவரை செய்தவரின் கையொப்பம்

1.2 : Recommendations and Best Operating Practices:

- All SSB must be fitted with digital energy meters and the readings must be taken daily. Or connect those meters with EMS and monitor the energy pattern of each building.
- Prepare block wise maintenance check list of electrical and thermal systems.
- Calculate the Unit per Liter (UPL) for every run of DG and average it for monthly.
- Install AIRCON energy saver gadget which works on dynamic un-saturation principle with the sensor algorithms so that the air conditioners run hours are cut by 20 to 25 %
- Similar to Fan, now BLDC based ACs are made available in the market; which consumes less amount of energy (Power) during its starting and running condition.





AUDIT SUMMARY & CONCLUSION



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SUMMARY OF THE AUDIT PROCESS:

In order to make Rajagiri Dawood Batcha College of Arts And Science campus 100 % energy efficient, the audit team recommends implementing the following measures:

i. Energy Conservation & Management – Electrical Energy:

- Implement Energy Management System (EMS) to accurately measure & monitor energy flow
- Prepare a policy plan to convert the distributed UPS layout into centralized UPS and save energy. This step also saves the maintenance time due to reduction in number of batteries
- Diesel flow meter must be fitted with each DG and calculate the UPL accurately
- Prepare suitable formats for all energy consumption and regularly follow the records. Make proper corrections; if it deviates from the standard operating procedure.

ii. Energy Conservation & Management – Thermal Energy:

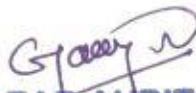
- Regularly cleaned stove burners and ensured that the flame in light bluish color in the kitchen.



COMPLETION OF THE REPORT

This report is prepared as a part of the Energy Audit process conducted at Rajagiri Dawood Batcha College of Arts And Science, Papanasam by YoJo Network and Training Center, Tamilnadu.




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CERTIFICATE FOR ENERGY AUDIT PROCESS

This is to certify that, we have conducted the ENERGY AUDIT at Rajagiri Dawood Batcha College of Arts And Science, Thanjavur Dt, Tamil Nadu, India **3/12/2022 to 9/12/2022** and it is **appreciated that, the institution strictly follows energy conservation measures for the use age of electrical and thermal energy.**

This process investigates the following activities;

- ✓ Conduction of detailed energy audit for electrical and thermal energy usage in the college campus and identify the energy conservation measures followed in the Institution
- ✓ Minimization of present energy cost by adjusting and optimizing energy usage and reduction of energy wastage without affecting the regular activities.
- ✓ Identification of possible cost and energy saving from energy conservation.
- ✓ Recommendation for SSB may be fitted with digital energy meters and the readings must be taken daily. Or connect those meters with EMS and monitor the energy pattern of each building
- ✓ Recommendation to install AIRCON energy saver gadget so that the air conditioners run hours are cut by 20 to 25 %.
- ✓ Recommendation to use BLDC based ACs are made available in the market; which consumes less amount of energy (Power) during its starting and running condition.

Thank You



Ganesh
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