

ENERGY, ENVIRONMENT & GREEN AUDIT REPORT

AUDIT CONDUCTED FOR



**SRI RAAJA RAAJAN COLLEGE OF ENGINEERING & TECHNOLOGY
KARAIKUDI, SIVAGANGAI DT. TAMIL NADU, INDIA.**

**AUDIT CONDUCTED BY
YOJO NETWORK & TRAINING CENTER**



YOJO NETWORK

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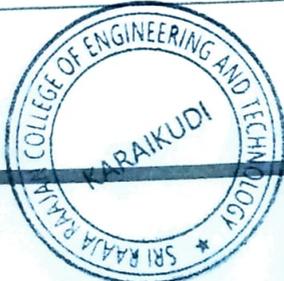
ACKNOWLEDGEMENT

Yojo Network & Training Center, Kumbakonam – 612 001 is thankful to the Board of Management, Head of Institution, Faculty and Technical team members of Sri Raaja Raajan College of Engineering and Technology, Karaikudi, Sivagangai Dt, Taminadu 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 Sri Raaja Raajan College of Engineering & Technology 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 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.

<u>Management Team Members</u>	
Dr.S.Subbiah	Chairman
Dr.A.Elango	Principal

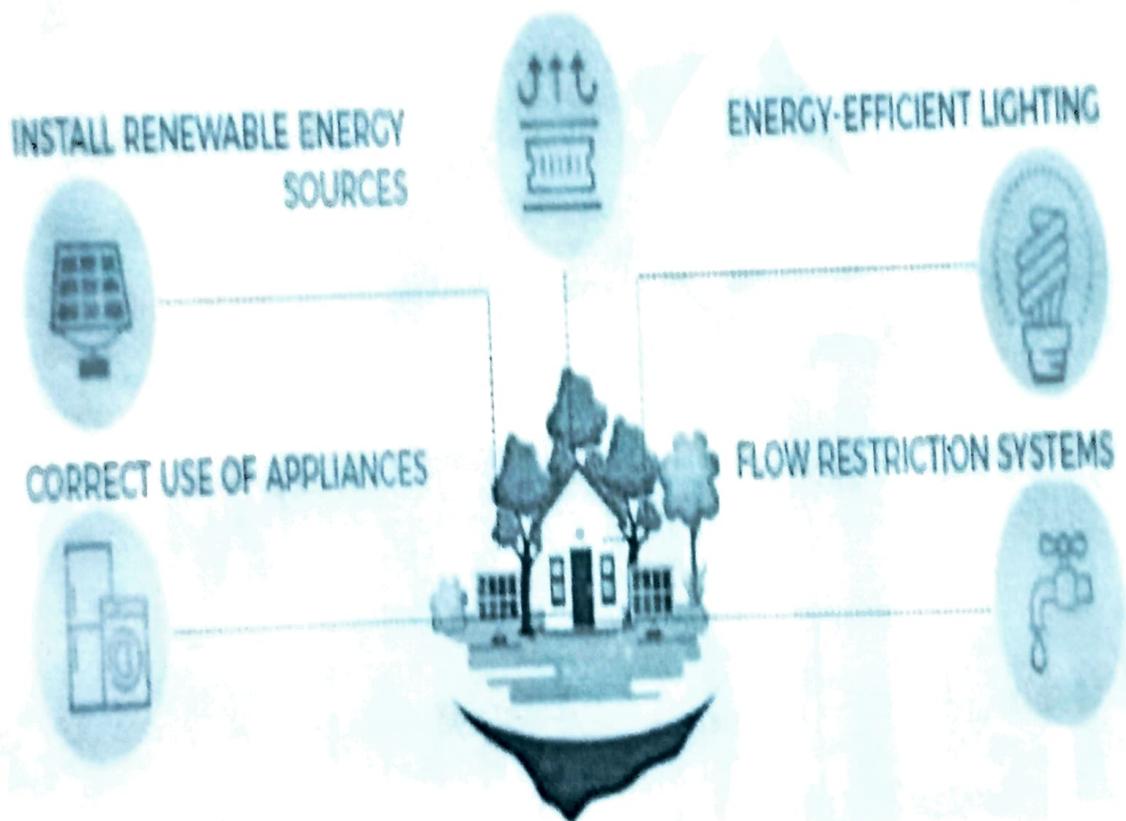
<u>Audit Team Members</u>	
Er. V. Marimuthu., B.E.,	UKAS Certified Energy Auditor (KQ-233)
Er. C. Saravanakumar., B.E.,	Lead Auditor-ISO-9001:2015 14001:2015(EMS), UKAS, KQ Reg., COC. Carbon Footprint Auditor Mobile:+91-9047205733
Er. R. Rajkumar, B.E.,	Audit Associate



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INTRODUCTION TO ENERGY- ENVIRONMENT-GREEN AUDIT

5 IDEAS FOR A SUSTAINABLE INSTITUTION INSULATE YOUR INSTITUTION





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1.1 : Preface about the Institution:

- Sri Raaja Raajan College of Engineering and Technology was established in 2010 by Sri Muthumari Charitable and Educational Trust with a view to create an Engineering Degree Institute to fulfill the long felt public need of an Institute of Excellence in Karaikudi.
- The trust is located at Amaravathipurur, - midway between Karaikudi and Devakottai
- Sri Muthumari Charitable and Educational Trust is assisted by the Governing and Advisory Council in matters of Policy, Planning and Development of the Institutions.
- The Trust lays stress on providing quality education and maintaining high degree of discipline. To meet the demands of the people
- SRR CET has Six UG Programs and One PG Programs in the most coveted disciplines considering both industrial need and public preference. These courses would lead to award of the Degree of Bachelor of Engineering (B. E.) and Master of Engineering (M.E.)
- SRR CET is approved by AICTE and is affiliated to Anna University ,Chennai.

1.2 :Quality Policy:

Sri Raaja Raajan College of Engineering & Technology 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
- RESOURCE MOBILISATION POLICY
- ENVIRONMENT POLICY
- ENERGY POLICY
- WASTE MANAGEMENT POLICY
- ADMISSION POLICY
- RESEARCH AND PUBLICATIONS POLICY
- E-GOVERNANCE POLICY
- GRIEVANCE & REDRESSAL POLICY
- E-GOVERNANCE POLICY
- DIFFERENTLY ABLED PERSON 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).
- **Environmental Audit:** Identification of history of activities, present environmental practices followed, monitoring records and known sources of environmental issues inside the college.
- **Green Audit:** Assessment on Campus greenery in terms of mature trees, flowering shrubs, bushes, medicinal plants, adoption of green energy generation and utilization, reduction of CO₂ due to green energy system and identification of possible implementation and enhancement of current greenery practices.

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, waste reduction, reuse and recycling.**
- Formation of methodology for long term road map for maintaining green environment within the campus and encourage the stakeholders for continuous improvements.

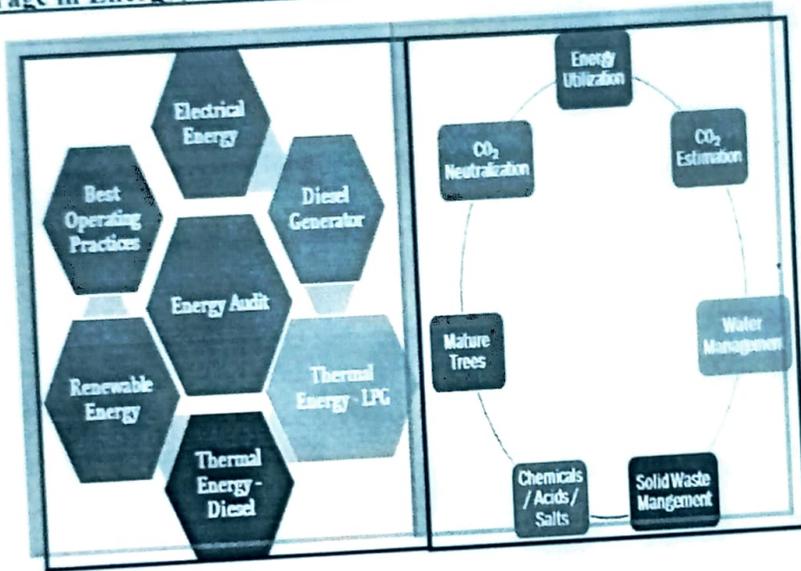
1.5 : Standards Used:

- 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.

- Ministry of Environment, Forest and Climate Change Notification on “Battery Waste Management Rules, 2020” & “E- Waste (Management) Rules, 2016”, & “Solid Waste Management Rules, 2015”s.

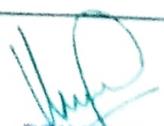
1.9 Coverage in Energy, Environment & Green Audit Process:



I.6 List of Faculty Members Involved in Audit Process & Data Collection:

S. No.	Faculty Details	Contribution
1.	V. Mahalinga Suresh Head & Vice Principal, Department of S & H.	Overall Coordinator for the Audit Process.
2.	N. Sathish Assistant Professor, Department of Civil	Collection of RO water & Water Distribution system.
3.	M. Ishabella Rani Assistant Professor, Department of ECE	Collection of Electrical Energy Parameters from College & Hostel.
4.	P. KaviPriya Devi Assistant Professor, Department of Civil	Fuel consumption of Transport Vehicles & Transport In charge.
5.	R. Vijay Asso. Professor, Department of Civil	Collection of Chemicals/Salts/ Acids.
6.	V. Sunder Physical Director	Collection of LPG & Fire Wood Data.
7.	D. Sivaraman Assistant Professor Department of Mechanical	Collection E.B utility & D.G Details.
8.	P. Sheeba Assistant Professor, Department of EEE	Collection of Trees & Plants with Botanical Name.




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**ENERGY, ENVIRONMENT &
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**PART-A: ENERGY AUDIT
REPORT**

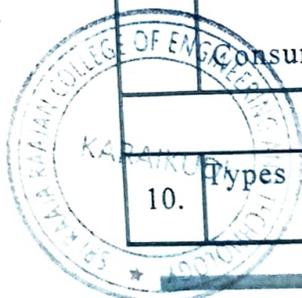
**STUDY ON ENERGY CONSUMPTION &
GENERATION PATTERN**



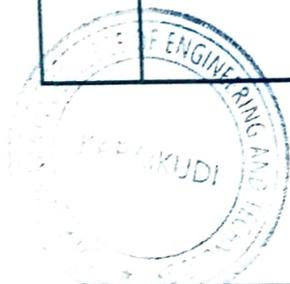


1.10: Assessment of Existing Electrical and Thermal Energy Systems:

S. No.	Description	Details				
Electrical Energy (Consumption)						
1.	Name of the customer (As per the utility bill)	Sri Raaja Raajan College of Engineering & Technology				
2.	Type of Utility Supply, Service No. & Tariff.	LTSC. No: 540-300-114-71; Tariff - IIB2.46KW				
3.	Tariff Structure	Rs.7.50/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: 145-001-485-100.0 kW				
6.	Capacity of Diesel Generator (DG) Sets	62.5 KVA-1 No. All are air-cooling. Internal fuel tank & separate earthing done				
7.	Annual Electricity Consumption (kWh)	2016-17	2017-18	2018-19	2019-20	2020-21
		47221.1	47194.3	47321.2	48156.5	21115.4
8.	Annual Electricity Generation from DG(kWh)	7,659	8,572	7,172	8,750	1,549
9.	Annual Diesel Consumption for DG (L)	4,375	4,451	4,974	4,231	1,195
Thermal Energy (Consumption)						
10.	Types of Thermal Energy	Liquefied Petroleum Gas (LPG)+			Cooking	



	Used	Coconut Bat (Local + Purchased)				
		Diesel (Ordinary)			Transport + DG	
11.	Annual LPG Consumption (kg)	2016-17	2017-18	2018-19	2019-20	2020-21
		1,603	1,714	1,816	1,675	210
12.	Annual Diesel Consumption for Transport (L)	-	-	-	-	-
13.	Annual Wood Consumption for Cooking (Tons)	15.9	11.5	12.6	19.2	3.8
General Loads (Both Electrical and Thermal)						
14.	Lighting System	Indoor lighting: Conversion of Florescent Tube Light (FTL) into LED in a phased manner				
		Outdoor lighting: All the street lightings are LED based Energy efficient lamps (100W).				
15.	Fan Loads(Ceiling)	<ul style="list-style-type: none"> All the indoor ceiling fans are conventional fans 				
16.	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 75.5 TR 				
17.	Motors and Pump loads	<ul style="list-style-type: none"> Mainly used for water distribution, purification, Waste water treatment Small motors are used in kitchen equipments 				
18.	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 backuptime of 15-30min The total capacity of the UPS is 80.5 kVA 				



1.1 : 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 system
- Calculate the Unit per Liter (UPL) for every run of DG and average it for monthly
- Adopt a policy and fix a target to convert the existing conventional lightings and fans into energy efficient lights and fans
- 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.
- Install a dedicated unbalanced type servo stabilizer (with suitable power rating maybe 15kVA, 3-Phase input; 3-Phase output) through which all the lighting loads may be connected to ensure the optimum voltage of say 210 V.
- It is essential and the right time to form an Energy Management Team.




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