



SASURIE COLLEGE OF ENGINEERING

Approved by AICTE, New Delhi. Affiliated to Anna University, Chennai

Near NH544, Coimbatore Bypass, Near Vijayamangalam Tollgate, Tirupur 638056

NAAC DOCUMENTS

QUALITY INDICATOR FRAME WORK

CRITERION - 7

INSTITUTIONAL VALUES & BEST PRACTICES

SUBMITTED BY

IQAC

INTERNAL QUALITY ASSURANCE CELL

SASURIE COLLEGE OF ENGINEERING



7.1 Institutional Values and Social Responsibilities

7.1.3 Quality audits on environment and energy regularly undertaken by the institution. The institutional environmental and energy initiatives are confirmed through the following

1. Green audit / Environmental audit
2. Energy audit
3. Clean and green campus initiatives
4. Beyond the campus environmental promotion activities

**ENERGY AUDIT REPORT FROM
THE RECOGNIZED BODIES**

| | | |
|--------------------|--|------------|
| Criterion 7 | Institutional Values and and Best Practices | 100 |
|--------------------|--|------------|

Key Indicator 7.1 - Institutional Values and Social Responsibilities

7.1.3 Quality audits on environment and energy regularly undertaken by the institution. The institutional environmental and energy initiatives are confirmed through the following

1. Green audit / Environmental audit
2. Energy audit
3. Clean and green campus initiatives
4. Beyond the campus environmental promotion activities

Responses: **Option A. All of the above**

**ENERGY AUDIT
REPORT FROM
THE RECOGNIZED BODIES**

ENERGY AUDIT REPORT



SASURIE COLLEGE OF ENGINEERING
VIJAYAMANGALAM, TIRUPPUR - 638056
TAMILNADU



AUDIT CONDUCTED BY
YOJO NETWORK & TRAINING CENTER
(Registered Audit Agencies)
GST no: 33AYXPP0304R1ZT
(Chennai ♦ Kumbakonam ♦ Karaikal)

E-mail: yojoauditnetwork@gmail.com



ACKNOWLEDGEMENT

Yojo Network & Training Center is thankful to the Board of Management, Head of Institution, Faculty and Technical team members of SASURIE COLLEGE OF ENGINEERING for providing an opportunity to conduct a detailed Energy Audit process in the Institution premises from 08 May 2023 to 13 May 2023. It is our great pleasure which must be recorded here that the Management of SASURIE COLLEGE OF ENGINEERING 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 Energy Audit.

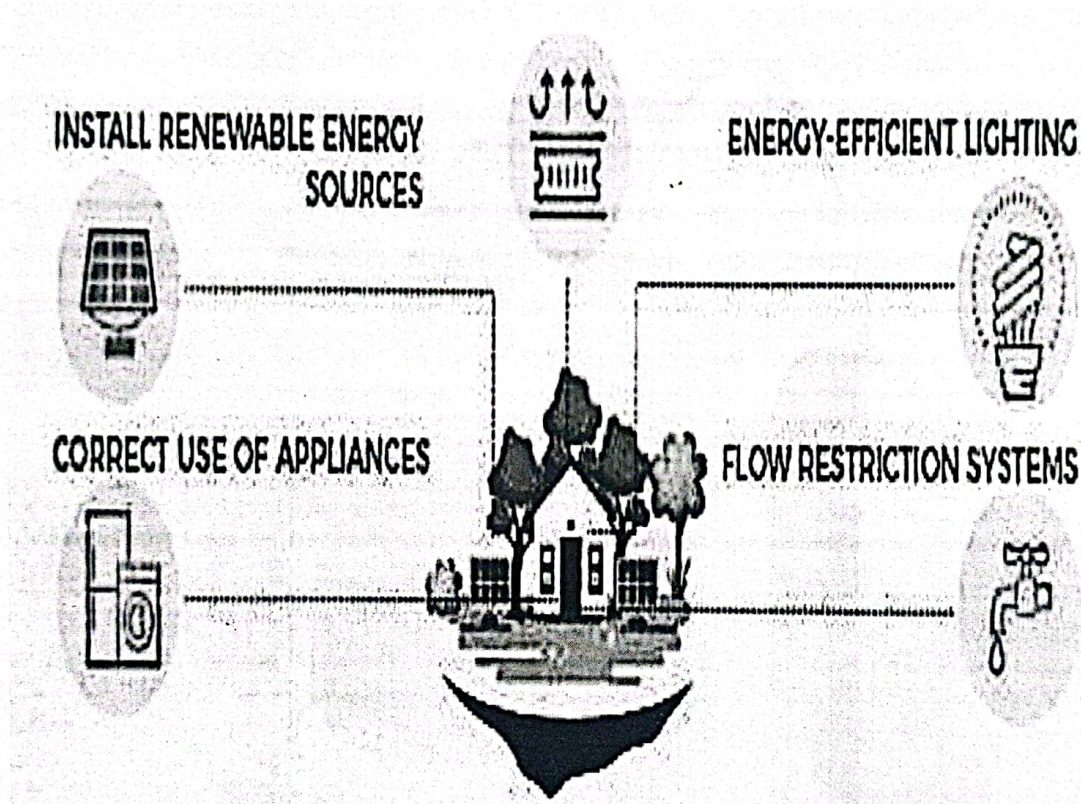
Finally, we offer our sincere thanks to all the members in the Engineering division / technical / non- technical divisions and office members who were directly and indirectly involved with us during collection of data and while conducting field measurements.

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


ENERGY AUDIT REPORT

INTRODUCTION TO ENERGY AUDIT

5 IDEAS FOR A SUSTAINABLE INSTITUTION



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PRINCIPAL

 **SASURIE COLLEGE OF ENGINEERING,**
Vijayamangalam - 638 056, Tirupur (Dt).



1.1 : Preface about the Institution:

SASURIE COLLEGE OF ENGINEERING was seeded by Ponmudi Muthusamy Gounder Trust in the year 2001 to offer B.E / B.Tech, M.E / M.Tech degree courses to inculcate quality education for rural students. This institution is located on the outskirts of Tiruppur district and about 6 kilometers from Vijayamangalam Toll Plaza and almost in a rural atmosphere.

The Institution offers 8 UG [B.E. – Civil, CSE, ECE, EEE, Mech, CSE (Cyber Security) and B.Tech – AI&DS, IT] and 6 PG [MBA, ME. – CSE, Applied Electronics, VLSI Design, Power Electronics and Drives and M.Tech. – IT] programs. This Institution has a good digital library with 300 Mbps high- speed internet facilities to the benefit of students and faculty. The well-stocked library having more number of International and National Journals and Magazines. This Institution has well-qualified faculties, modern infrastructure with well-equipped laboratories. The main building has G+3 floors with a total carpet area of 19,047 Sq.m.

1.2 : Quality Policy:

SASURIE COLLEGE OF ENGINEERING 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 Institution campus with a main focus to identify judicious usage of electrical and thermal energy (where, when, why and how energy is being utilized).

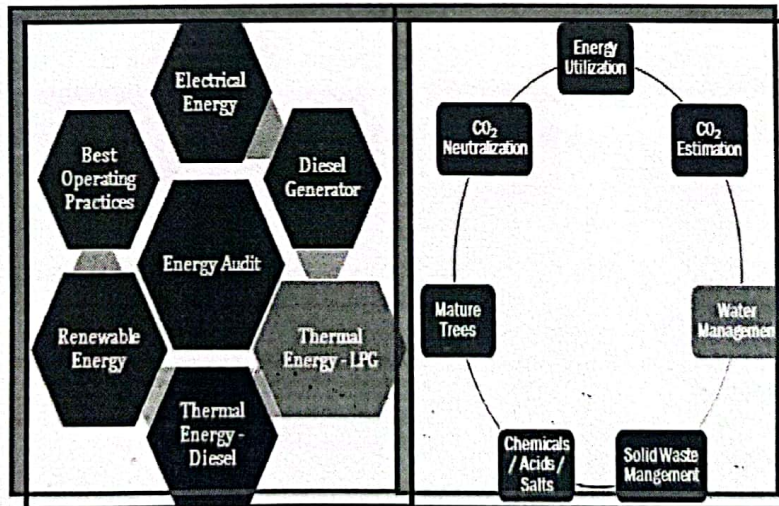
1.4: Outcomes of the Audit Process:

- 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:

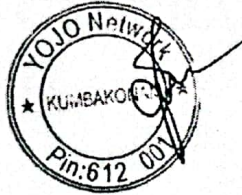
- Bureau of Energy Efficiency Guidelines to conduct the detailed energy audit process.
- ISO 14064-Part-1 – Specification with guidance at the organization level for quantification and reporting of GHG emissions and removals (Second Edition).
- ISO 14064-Part-2 – Specification with guidance at the project 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.G.SRINIVASAN. Prof / Dept. of EEE | Overall Coordinator for the Audit Process. |
| 2. | Mr.S. MOHANRAJ, AP/ Dept. of EEE | Collection of Electrical Energy Parameters from Institution & Hostel. |
| 3. | Mr.S.SATHYAMOORTHY, AP/ Dept. of EEE | Collection E.B utility & D.G Details. |
| 4. | Dr. Saravanan Principal & Chairperson IQAC New Prince Shri Bhavani Institution of Engineering and Technology, Medavakkam, Chennai | External Member |




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ENERGY AUDIT REPORT

STUDY ON ENERGY CONSUMPTION

&

GENERATION PATTERN



AUDIT CONDUCTED BY
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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) | THE PRESIDENT SASURIE COLLEGE OF ENGINEERING | | | | |
| 2. | Type of Utility Supply, Service No. & Tariff. | LTSC. No: 04-057-008-370 | | | | |
| 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: 04-057-008-370 – 120.0 kW | | | | |
| 6. | Capacity of Diesel Generator (DG) Sets | 250k VA – 1 No. and 180kVA – 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 |
| | | 96864 | 1,04544 | 34,848 | 69,696 | 80,544 |
| 8. | Annual Electricity Generation from DG(kWh) | 7264 | 8886 | 1742 | 4878 | 2416 |
| 9. | Annual Diesel Consumption for DG (L) | 9443 | 11552 | 2264 | 6341 | 3140 |



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| 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 |
| | | 1140 | 950 | 380 | 712 | 855 |
| 12. | Annual Diesel Consumption for Transport (L) | 28329 | 22656 | 6792 | 16023 | 20276 |
| 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 24 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 equipments | | | | |
| 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 85 kVA | | | | |



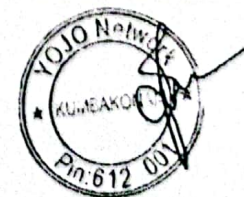


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(Chennai + Kumbakonam + Karaikal)

| TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LIMITED | | | | | | | | |
|--|---------------|------------------------|----|---|-------------------------|--------------------------------|-----------------------|--------------------|
| Registered Office : No:144, NPKRR Alanganai, Anna Salai, Chennai - 600 002 | | | | | | | | |
| Tax Invoice for LT Current Consumption Charges for the Month of October 2023 | | | | | | | | |
| Section | | | | VJAYAMANGALAM | | | | |
| Circle | | | | ERODE | | | | |
| Distribution | | | | DASAMPALAYAM | | | | |
| Service Connection Number | | | | 04-057-008-370 | | | | |
| Name/Address & GST of the Consumer | | | | GSTN No: 33AADCT4784E1ZC | | | | |
| THE PRESIDENT Sasurie College Of Engineering, D/o: 8/140, Vijayamangalam, Naduvayal | | | | Invoice No. L426231011151462 / Date: 25/10/2023 | | | | |
| State: TAMILNADU | | State Code: 33 | | Tariff Applied | LM282 | Sanctioned Load | 112.0 KW | |
| Consumer GST No: | | | | Phase | 3 phase | Invoice Type | INVOICE | |
| Pay This Bill By Online in https://www.tnecnet.org/qwp/qwpay | | | | CT/Non-CT | CT | Place of Supply | Tamil Nadu | |
| | | | | Meter No. | 8339330 | Supply Type | Regular | |
| | | | | Solar RTS | NO | Reverse Charge | NO | |
| | | | | Welding | NO | Billing Cycle | Bi-Monthly | |
| | | | | Bill Period | 25/09/2023 - 25/10/2023 | மின்னகம் 94987 94987 | | |
| | | | | Bill Amount | Rs.76,427/- | | | |
| | | | | Due Date | 14/11/2023 | | | |
| Energy Consumption | Final Reading | Initial Reading | MF | Consumption [After MF & DT Loss] | Max Dmd Recorded | Max Dmd Recorded with MF | Power Factor Recorded | |
| READING | 4305.67 | 4204.77 | 40 | 4038.0 | 0.79 | 31.44 | 0.92 | |
| DATE | 25/10/2023 | 25/09/2023 | | | | | | |
| STATUS | Normal | Normal | | | | | | |
| SAVE ELECTRICITY | | PARTICULARS | | HSN/SAC | Base Amount Rs. | CGST @9% | SGST @9% | Invoice Amount Rs. |
| SECURITY DEPOSIT | | Energy Charges | | 2716 0000 | 36868.86 | | | 36868.86 |
| Balance as of 01-04-2022 | | Fixed Charges | | 2716 0000 | 37184.00 | | | 37184.00 |
| Interest Credited on above after TDS | | Sub Total (a) | | | 74052.86 | | | 74052.86 |
| Collection During the Year | | Less: | | | | | | |
| Refund made in the Year | | Govt Subsidy | | 2716 0000 | -0.00 | | | -0.00 |
| Balance as of 25/10/2023 | | Sub Total (b) | | | -0.00 | | | -0.00 |
| MCD as of 25/10/2023 | | Welding Sur Chr | | 996 912 | | | | |
| OLD ARREARS / CREDITS | | Excess MD Charges | | 996 912 | | | | |
| Particulars | | Penalty for LPF | | 996 912 | | | | |
| Period | | Net Work Charges | | 998 631 | | | | |
| Amount | | Sub Total (c) | | | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | | Electricity Tax | | | 2374.60 | | | 2374.60 |
| ADVANCE CC ACCOUNT | | TCS /TDS [u/s 206(1C)] | | | 0.00 | 0.00 | 0.00 | 0.00 |
| Balance as of 25/08/2023 | | Sub Total (d) | | | 2374.60 | 0.00 | 0.00 | 2374.60 |
| Collection During the Period | | Other Charges | | 996 912 | | | | |
| Interest Allowed | | ASD Demand | | | | | | |
| Adjusted (including this Bill) | | Old Arrears | | | | | | |
| Balance as of 25/10/2023 | | Sub Total (e) | | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Less: | | | | | | |
| | | Adjustments | | | | | | |
| | | Advance CC Ad | | | | | | |
| | | Refund Of SD | | | | | | |
| | | Sub Total (f) | | | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Round off (g) | | | -0.46 | | | -0.46 |
| | | Net Payable Amt | | (a+b+c+d+e+f-g) | 76,427.00 | 0.00 | 0.00 | 76,427.00 |
| | | | | | | | | |
| (Rupees: Seventy Six thousand Four hundred Twenty Seven only) | | | | | | | | |
| Note: 1. Bill amount shall be payable within the due date to avoid disconnection as per Sec 56(1) of Electricity Act 2003. 2. Payment after due date will attract delayed payment surcharge and other charges as applicable. 3. This is system generated invoice Does not require signature. | | | | | | | | |
| Asst Engineer/VJAYAMANGALAM | | | | | | | | |

1.2 : Recommendations and Best Operating Practices:



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- 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.



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AUDIT SUMMARY & CONCLUSION



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SUMMARY OF THE AUDIT PROCESS:

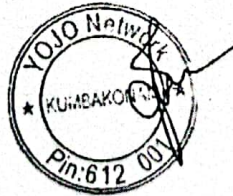
In order to make SASURIE COLLEGE OF ENGINEERING campus 100% energy efficient, the audit team recommends implementing the following measures:

i. Energy Conservation & Management – Electrical Energy:

- Implement Energy Management System (EMS) to accurately measure & monitor energy flow
- Increase the installed 20kVA Solar PV system capacity into 50kVA
- 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 clean stove burners and ensure that the flame is light bluish color in the kitchen.




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COMPLETION OF THE REPORT

This report is prepared as a part of the Energy Audit process conducted at SASURIE COLLEGE OF ENGINEERING, Tiruppur from 08 May 2023 to 13 May 2023 by YOJO Network and Training Center (Certified NGO Audit Company), Tamil Nadu.




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(Chennai ♦ Kumbakonam ♦ Karaikal)

CERTIFICATE FOR ENERGY AUDIT PROCESS

This is to certify that, we have conducted the ENERGY AUDIT at SASURIE COLLEGE OF ENGINEERING, Vijayamangalam, Tiruppur Dt, Tamil Nadu, India from 08 May 2023 to 13 May 2023 and it is **appreciated that, the institution strictly follows energy conservation measures for the usage of electrical and thermal energy.**

The process investigated 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 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



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[Signature]
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