ABSTRACT

The following report was created to help us better understand Sree Sakthi Engineering College's energy consumption pattern. The report focuses on energy conservation strategies.

SUMMARY

An energy audit is a study of a plant or facility to find out how and where energy is utilized, as well as to identify ways to save energy. There is now widespread agreement that new technologies, as well as increased usage of existing ones, offer the most promising prospects for the future. The usage of existing renewable energy technology, increased energy efficiency measures, and the spread of these technologies and options present opportunity.

This report is just one step, a mere mile marker towards our destination of achieving energy efficiency and we would like to emphasize that an energy audit is a continuous process. We have compiled a list of possible actions to conserve and efficiently utilize our scarce resources and identified their savings potential. The next step would be to prioritize their implementation.

The salient observations and recommendations are given below.

1. SSEC-Sree Sakthi Engineering College uses energy in the following forms:

   a. Electricity from TNEB

   b. High Speed Diesel Generator (HSDG)

Electrical energy is used for various applications, like:

- Computers
- Lighting
- Air-Conditioning
- Fans
- Other Lab Equipment.

- Hostel Kitchen
- Submersible Pumps

2. The average cost of energy is around **Rs.8/Unit**.

3. After the measurement and analysis, we proposed and installed following Solar Energy utilization in our campus.

Sl.No	Recommendations	Annual Saving Potential (Rs.)	Estimated Investment (Rs)	Pay Back period (Months)	Remarks
1	Providing Solar Water Heater for hostel	7,00,000	5,00,000	112 Months	Long Term

Note:

Total savings during the energy audit is estimated at 3.71Lakhs which is 31%of the total energy cost with an overall payback period of 5.88 Years.

INTRODUCTION TO ENERGY AUDIT

General

The Sree Sakthi Engineering College entrusted the work of conducting a Detailed Energy Audit of campus at SSEC with the main objectives as below:

- To study the present pattern of energy consumption
- To identify potential areas for energy optimization
- To recommend energy conservation proposals with cost benefit analysis.

Scope of Work, Methodology and Approach

Scope of work and methodology were as per the proposal .While undertaking data collection, field trials and their analysis, due care was always taken to avoid abnormal situations so as to generate normal/representative pattern of energy consumption at the facility.

Approach to Energy Audit

We focused our attention on energy management and optimization of energy efficiency of the systems, sub systems and equipments. The key to such performance evaluation lies in the sound knowledge of performance of equipments and system as a whole.

Energy Audit

The objective of Energy Audit is to balance the total energy inputs with its use and to identify the energy conservation opportunities in the stream.

Energy Audit also gives focused attention to energy cost and cost involved in achieving higher performance with technical and financial analysis. The best alternative is selected on financial analysis basis.

Energy Audit Methodology

Energy Audit Study is divided into following three steps

Historical Data Analysis

The historical data analysis involves establishment of energy consumption pattern to establish Base line data on energy consumption and its variation with change in production volumes.

Actual measurement and data analysis

This step involves actual site measurement and field trials using various portable measurement instruments. It also involves input to output analysis to establish actual operating equipment efficiency and finding out losses in the system.

Identification and evaluation of Energy Conservation Opportunities

This step involves evaluation of energy conservation opportunities identified during the energy audit. It gives potential of energy saving and investment required to implement the proposed modifications with payback period. All recommendations for reducing losses in the system are backed with its cost benefit analysis.

INTRODUCTION TO SREE SAKTHI ENGINEERING COLLEGE

General Details of Sree Sakthi Engineering College

Sl.No.	Particulars	Details
1.	Name of the Institute	Sree Sakthi Engineering College
2.	Address	Bettathapuram, Karamadai,Coimbatore-641104
3.	Year of Establishment	2010
4.	Courses Offered	**Diploma Courses** 1. Mechanical Engineering 2. Automobile Engineering 3. Petro Chemical Engineering **B.E(UG Courses Offered)** 1. Civil Engineering. 2. Computer Science and Engineering. 3. Electrical & Electronics Engineering 4. Electronics & Communication Engineering. 5. Mechanical Engineering **M.E(PG Course Offered)** 1.VLSIDesign
5.	Affiliation	Affiliated to Anna University, Approved by AICTE, Accredited by NAAC
6.	Total Building Carpet Area	2,50,000 sq. ft

STUDY OF ENERGY CONSUMPTION PROFILE

Source of Energy:

Sree Sakthi Engineering College uses Energy in following forms:

a. Electricity from TNEB

Sree Sakthi Engineering College receives Electricity from 147–West Karamadai TNEB Circle.

b. High Speed Diesel Generator(HSDG)

Diesel is used as a fuel Diesel Generator which in turn runs whenever power supply from TNEB is not available.

The following are the major consumers of electricity in the facility

- Computers(Backup Battery)
- Lighting
- Air-Conditioning
- Fans
- Other Lab Equipment.
- Hostel Kitchen
- Submersible Pumps

Specific Energy Consumption (SEC)

Specific Energy Consumption (SEC) is defined as energy usage per Square meter of area. It is calculated total electrical kWh/total area of the campus. By calculating SEC, we can crudely target the factors of energy efficiency or inefficiency. Holidays that are designated by the electric rate as Off-Peak days in the Off-Peak hours are also included. In the example above, there's a holiday, bringing the Off-Peak days to 10 and On-Peak days to 21.

General Recommendations

- All Class Rooms and labs to have display messages regarding optimum use of electrical appliances in the room like lights, fans, computers and projectors.
- Most of the time, all the tube lights in a class room are kept ON, even though, there is sufficient light level near the window opening. In such cases, the light row near the window may be kept OFF.
- All projectors to be kept OFF or in idle mode if there will be no presentation slides.
- All computers to have power saving settings to turn off monitors and hard discs, say after10 minutes/30 minutes.
- The comfort air conditioning temperature to beset between24˚C to 26˚C.
- Lights in toilet area may be kept OFF during day time

PRINCIPAL
Dr.G. RANGANATHAN B.E.,M.E.,Ph.D,
PRINCIPAL
SREE SAKTHI ENGINEERING COLLEGE
COIMBATORE - 641 104.