

GREEN AUDIT REPORT (IQAC)



Sree Sakthi Engineering College

**(Accredited by NAAC, Approved by AICTE,
Affiliated to Anna University)**

Bettathapuram, Karamadai, Coimbatore - 641104, Tamil Nadu, INDIA.

GREEN AUDIT ASSESSMENT TEAM

Dr.R.PRABHU, PRINCIPAL

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INTRODUCTION

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of various establishments. It aims to analyze environmental practices within and outside of the concerned sites, which will have an impact on the eco-friendly ambience. It provides staff and students better understanding of Green impact on campus.

Thus it is imperative that the college evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institutes which will lead for sustainable development and at the same time reduce a sizable amount of atmospheric carbon-di-oxide from the environment. The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

OBJECTIVES:

In recent time, the Green Audit of an institution has been becoming a paramount important for self assessment of the institution which reflects the role of the institution in mitigating the present environmental problems. The college has been putting efforts to keep our environment clean since its inception. But the auditing of this non-scholastic effort of the college has not been documented. Therefore, The college, with the advice of the Internal Quality Assessment Cell (IQAC) has set up an environmental quality assessment body (GREEN CAMPUS) that aimed at performing the green audit of the institution to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards.

The main objectives of carrying out Green Audit are:

1. To map the Geographical Location of the college
2. To document the tree diversity of the college.
3. To record the meteorological parameter of Karamadai where college is situated.
4. To document the ambient environmental condition of water of the College.
5. To introduce and aware students to real concerns of environment and its sustainability.
6. To create a green campus.

7. To assess whether non-academic activities of the Institution support the collection, recovery, reuse and recycling of solid wastes that harm the environment.
8. To identify gaps and suggest recommendations to improve the Green Campus status of the institution.

ABOUT THE COLLEGE

Sree Sakthi Engineering College believes in Success Tomorrow, Begins with SSEC Today, a private engineering college Founded in 2010 under the auspices of Sree Sakthi Charitable trust by its founder chairman Shri. N.Dharmalingam and correspondent Dr. S. Karthikeyan. The College has grown with the community to meet the lifelong learning needs. This College is located at Karamadai, 25Kms away from Coimbatore on the Ooty to Coimbatore National Highways. The College is located in a natural environment. The College offers five bachelor degree and one master degree.

The college is affiliated to Anna University and Approved by All India Council for Technical Education. Student success is the College's primary goal. With a 20:1 student-faculty ratio, the College is committed to working closely with students to help them reach their educational goals. Students learn from Highly qualified facilities. The SSEC provides students with a quality, relevant curriculum. Supporting the College's mission to offer high quality, affordable, and accessible educational opportunities. While students at SSEC immerse themselves in academics, the college has a lot in store for them outside the classroom.

Student life includes participation in recreational & co-curricular activities, sports and cultural. In short, at SSEC, students will find an academic and social environment where everyone- from faculty members to peers help shape their future.

GEOGRAPHICAL LOCATION

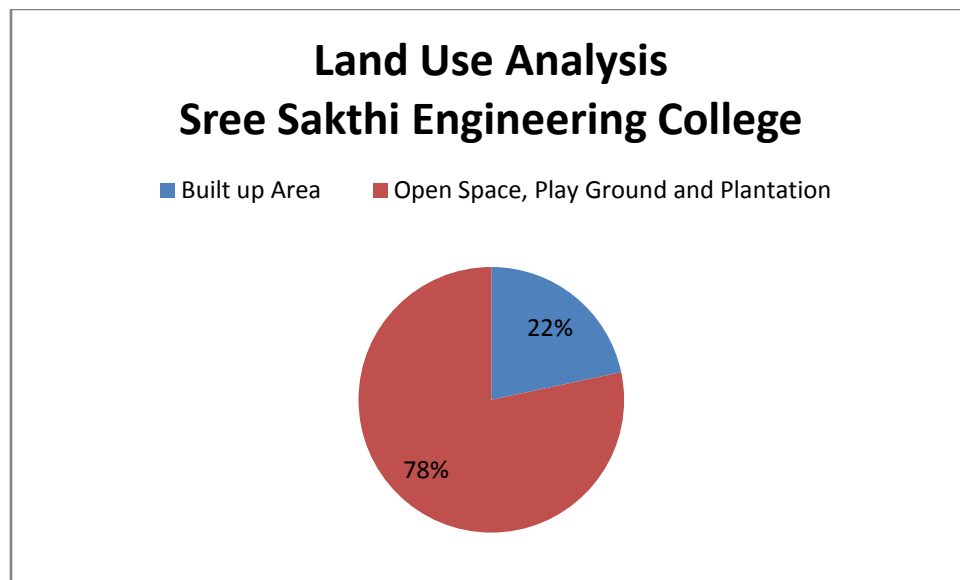
(Lat - 11.221446700000001, Long-76.94717726637191)



LAND USE ANALYSIS

LAND USE DATA OF SREE SAKTHI ENGINEERING COLLEGE.

CATEGORIES OF LAND USE	AREA IN SQ METRES
BUILT UP AREA	9803.60
OPEN SPACE, PLAY GROUND AND PLANTATION	35445.40
TOTAL AREA	45249.90



FINDINGS:

Sree Sakthi Engineering College, which was established in the year 2010, has an eco-friendly environment. It has a long legacy of healthy environmental practices including periodic plantation, their preservation and maintenance. Its land use is such that about 78 % of the total area is open land and plantation that generates a better and sustainable campus environment.

TREE DIVERSITY OF SREE SAKTHI ENGINEERING COLLEGE

Sree Sakthi Engineering College is within the geo-position (Lat - 11.221446700000001, Long-76.94717726637191) in Coimbatore, Tamil Nadu, India. It encompasses an area of about 12.18 acre. The area is immensely diverse with a variety of tree species performing a variety of functions. Most of these tree species are planted in different periods of time through various plantation programmes organized by the authority and have become an integral part of the college. The trees of the college have increased the quality of life of the college in terms of contributing to our environment by providing oxygen, improving air quality, climate amelioration, conservation of water, preserving soil, and controlling climate by moderating the effects of the sun, rain and wind. Leaves absorb and filter the sun's radiant energy, keeping things cool in summer. A thick belt of large shady trees in the periphery of the college have found to be bringing down noise and cut down dust and storms.

The following are the tree species with whom we are being attached.

S.No	Name of the Plant	Count
1.	Scotch pine	48
2.	Carob	31
3.	Persian tree	12
4.	Ditchreed	04
5.	African tulip tree	01
6.	Cretan brake	01
7.	Cyprus turpentine	01
8.	Brome rain tree	03
9.	Umbraa tree	01
10.	Indian almond	04
11.	Indas tree	02
12.	Varnish tree	06
13.	Brazilian pepper tree	02
14.	Carpathian walnut	01
15.	Canary Island Date Palm	32
16.	Capa de Obispo	38
17.	Senegal Date palm	02
18.	Caucasian boxwood	04
19.	Carpathain walnut	02
20.	Indian bean	02
21.	False Acasia	08
22.	Swamp Wattle	15
23.	Neem Tree	65
24.	Sweet bay	02
25.	Chinese wisteria	07
26.	Blue gum	06

27.	Orchid tree	14
28.	Mountain ebony	02
29.	Mimosa	17
30.	Indian Lawler	06
31.	Argentine amanrath	01
32.	Adams Apple	02
33.	Lemon tree	01
34.	Flame wood	19
35.	Coconut tree	04
36.	Mango tree	05
37.	Banana Tree	05
38.	Dram stick	01
39.	Cape periwinkle	10
40.	Goa Tree	04
41.	Variegated croton	04
42.	Pigeon berry	01
43.	Christ plant	01
44.	Asparagus fern	04
45.	Great bougainvillea	13
46.	Calico plant	22
47.	Meddler	01
48.	Rooster tree	04
49.	Annatto	03
50.	Peregrine	43
51.	Clive	12
52.	Cemetery tree	12
53.	Tree heath	10
54.	Eared willow	01
55.	Long-pod cassia	01
56.	Malayan Banyan	19
57.	Cuban Royal palm	21
58.	Bamboo	97
59.	Laurustinus	17
60.	Dates tree	01
61.	Pomegranate	02
62.	Sago cycus	01
63.	Bine wood	08









RECOMMENDATIONS

The green audit assists in the process of testing performance in the environmental area and is fast becoming an indispensable aid to decision making in a college. The green audit reports assist in the process of attaining an eco friendly approach to the sustainable development of the college. Hope that the results presented in the green auditing report will serve as a guide for educating the college community on the existing environment related practices and resource usage at the college as well as generate new activities and innovative practices. A few recommendations are added to curb the menace of waste management using eco-friendly and scientific techniques. This may lead to the prosperous future in context of Green Campus and thus sustainable environment and community development.

An outside view, perspective and opinion often helps staffs who have been too close to problems or methods to see the value of alternative approaches

CONCLUSIONS

Considering the fact that the institution is predominantly an engineering college, there is significant environmental research both by faculty and students. The environmental awareness initiatives are substantial to achieve green campus. The installation of solar water heater and paperless work system practices are noteworthy.

This may lead to the prosperous future in context of Green Campus & thus sustainable environment and community development. As part of green audit of campus, we carried out the environmental monitoring of campus includes Ventilation of the class room. It was observed that

Illumination and Ventilation is adequate considering natural light and air velocity present. Noise level in the campus is within the limit.

PRINCIPAL

ENVIRONMENTAL AUDIT REPORT



Sree Sakthi Engineering College

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Bettathapuram, Karamadai, Coimbatore - 641104, Tamil Nadu, INDIA.

ENVIRONMENTAL AUDIT ASSESSMENT TEAM

Dr.A.SWAMINATHAN, HOD/CIVIL

Mr.R.ARUMUGAM, HOD/MECH

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OBJECTIVES:

The main objectives of carrying out Environmental Audit are:

1. To map the Geographical Location of the college
2. To study the Weather Data of the college location.
3. To document the ambient environmental condition of water of the College.
4. To document the pollution level inside the campus.

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GEOGRAPHICAL LOCATION

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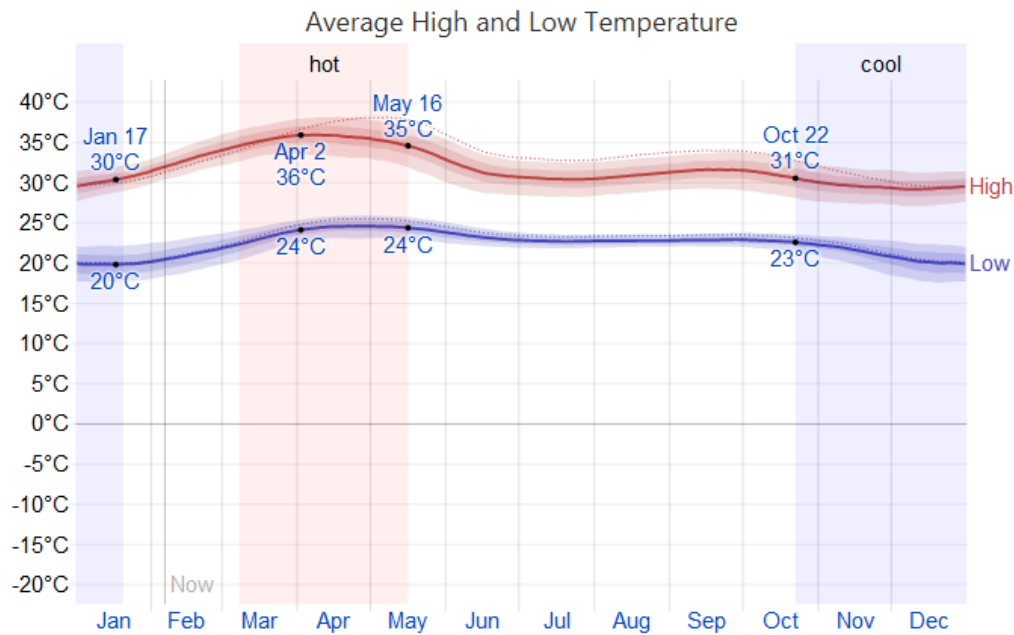
WEATHER DATA

In Sree Sakthi Engineering College, the wet season is oppressive and overcast, the dry season is humid and partly cloudy, and it is hot year round. Over the course of the year, the temperature typically varies from 20°C to 36°C and is rarely below 18°C or above 38°C.

Temperature

The hot season lasts for 2.3 months, from March 8 to May 16, with an average daily high temperature above 35°C. The hottest day of the year is April 2, with an average high of 36°C and low of 24°C.

The cool season lasts for 2.9 months, from October 22 to January 20, with an average daily high temperature below 31°C. The coldest day of the year is January 17, with an average low of 20°C and high of 30°C.

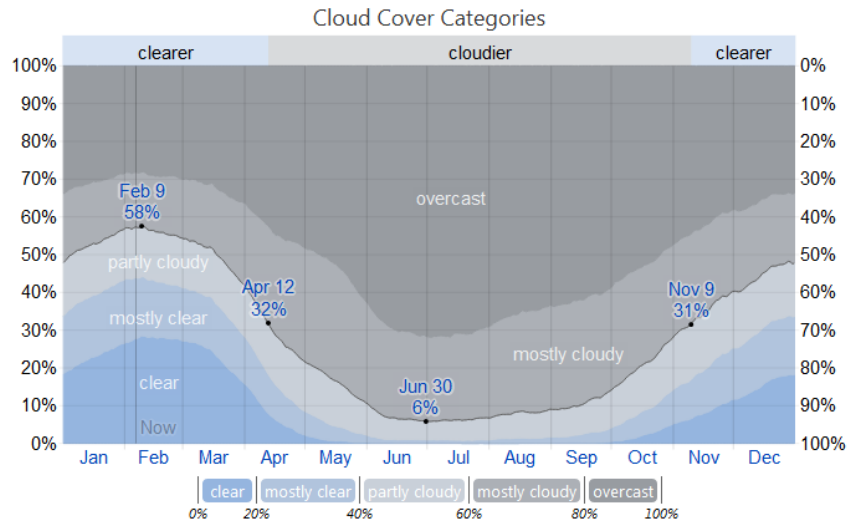


Clouds

The average percentage of the sky covered by clouds experiences *extreme* seasonal variation over the course of the year.

The *clearer* part of the year begins around *November 9* and lasts for *5.1 months*, ending around *April 12*. On *February 9*, the *clearest* day of the year, the sky is *clear, mostly clear, or partly cloudy* 58% of the time, and *overcast or mostly cloudy* 42% of the time.

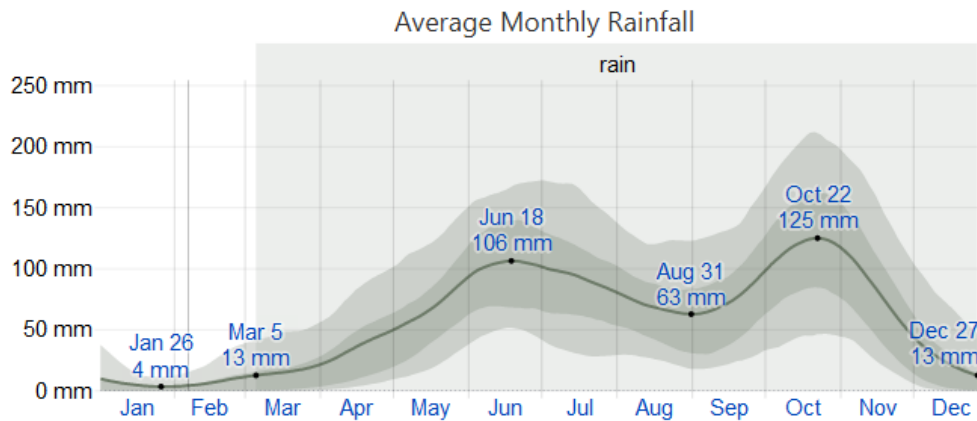
The *cloudier* part of the year begins around *April 12* and lasts for *6.9 months*, ending around *November 9*. On *June 30*, the *cloudiest* day of the year, the sky is *overcast* or *mostly cloudy* 94% of the time, and *clear*, *mostly clear*, or *partly cloudy* 6% of the time.



Rainfall

To show variation within the months and not just the monthly totals, we show the rainfall accumulated over a sliding 31-day period centered on each day of the year. The *rainy* period of the year lasts for *9.7 months*, from *March 5* to *December 27*, with a sliding 31-day rainfall of at least *13 millimeters*. The *most rain* falls during the 31 days centered on *October 22*, with an average total accumulation of *125 millimeters*.

The *rainless* period of the year lasts for *2.3 months*, from *December 27* to *March 5*. The *least rain* falls around *January 26*, with an average total accumulation of *4 millimeters*.



WATER ANALYSIS REPORT

The water sample collected from the campus is tested on 01.04.2019.

TESTING PARAMETER	UNITS	RESULT	ACCEPTABLE LIMITS	PERMISSIBLE LIMITS	METHOD OF TESTS
Physical Parameters					
Color	Hazen unit	036	5 max	15 max	IS 3025 (part-4)
Odour	-	Agreeable	Agreeable	Agreeable	IS 3025 (part-5)
pH value	-	7.01	6.5 to 8.5	6.5 to 8.5	IS 3025 (part-11)
Taste	-	Agreeable	Agreeable	Agreeable	IS 3025 (part-4)
Turbidity	NTU	0.21	1 Max	5 Max	IS 3025 (part-4)
Electrical Conductivity	Ms/cm	0.03	-	-	-
Total Dissolved Solids	mg / l	52	500 Max	2000 Max	IS 3025 (part-16)
Total Suspended Solids	mg / l	Absent	-	-	IS 3025 (part-17)
GENERAL PARAMETERS					
Total Hardness	mg / l	15.89	200 Max	600 Max	IS 3025 (part-21)
Total Alkalinity	mg / l	35	200 Max	600 Max	IS 3025 (part-23)
Oil & Grease	mg / l	Absent	0.01 Max	0.01 Max	IS 3025 (part-39)
Carbonate	mg / l	Nil	-	-	IS 3025 (part-51)
Bicarbonate	mg / l	35	-	-	IS 3025 (part-51)
Iron	mg / l	0.003	1.0 Max	1.0 Max	IS 3025 (part-53)
Calcium (Ca)	mg / l	6	75 Max	200 Max	IS 3025 (part-40)
Chloride (Cl)	mg / l	15.95	250 Max	1000 Max	IS 3025 (part-32)
Copper (Cu)	mg / l	.002	0.05 Max	1.5 Max	IS 3025 (part-42)
Fluoride (F)	mg / l	.001	1.0 Max	1.5 Max	IS 3025 (part-60)

RECOMMENDATIONS

The environmental audit assists in the process of testing performance in the environmental area and is fast becoming an indispensable aid to decision making in a college. The Environmental audit reports assist in the process of attaining an eco friendly approach to the sustainable development of the college. Hope that the results presented in the Environmental audit report will serve as a guide for educating the college community on the existing environment related practices and resource usage at the college as well as generate new activities and innovative practices. A few recommendations are added to curb the menace of waste management using eco-friendly and scientific techniques.

Common Recommendations

WATER

- Remove damaged taps and install sensitive taps is possible.
- Establish more number of rain water harvesting systems for each building.
- Establish water treatment systems.
- Awareness programs on water conservation to be conducted.
- Install display boards to control over exploitation of water.

ENERGY

- Employment of more solar panels and other renewable energy sources.
- Conduct more save energy awareness programs for students and staff.
- More energy efficient fans should be replaced.
- Observe a power saving day every year.
- Automatic power switch off systems may be introduced.

WASTE

- Solid waste treatment system to be established.
- Practice of waste segregation to be initiated.
- Avoid paper plates and cups for all functions in the college.

CONCLUSIONS

Considering the fact that the institution is predominantly an engineering college, there is significant environmental research both by faculty and students. The environmental awareness

initiatives are substantial. The installation of solar water heater and paperless work system practices are noteworthy.

Few recommendations are added to curb the menace of waste management using ecofriendly and scientific techniques.

PRINCIPAL



SREE SAKTHI ENGINEERING COLLEGE

KARAMADAI, COIMBATORE-641104

(Affiliated to Anna University, Approved by AICTE, Accredited by NAAC)

ABSTRACT

The following report has been prepared with a view to facilitate our understanding of the energy consumption pattern of Sree Sakthi Engineering College. The report focuses on energy efficiency measures.

SUMMARY

An energy audit is a study of a plant or facility to determine how and where energy is used and to identify methods for energy savings. There is now a universal recognition of the fact that new technologies and much greater use of some that already exist provide the most hopeful prospects for the future. The opportunities lie in the use of existing renewable energy technologies, greater efforts at energy efficiency and the dissemination of these technologies and options.

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.



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- Hostel Kitchen
- Submersible Pumps

2. The average cost of energy is around **Rs. 7.5 /Unit**.

3. After the measurement and analysis, we proposed and implemented following Energy Efficiency Improvement measures

Sl.No	Recommendations	Annual Saving Potential (Rs.)	Estimated Investment (Rs)	Pay Back period (Months)	Remarks
1	Providing Solar Water Heater 24 hours for hostel	7,50,000	5,00,000	112 Months	Long Term

Note:

Total savings during the energy audit is estimated at 3.51 Lakhs which is 31 % of the total energy cost with an overall payback period of 5.78 Years.



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INTRODUCTION TO ENERGY AUDIT

1.1 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.

1.2 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.

1.2.1 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.

1.2.2 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.

1.2.3 Energy Audit Methodology

Energy Audit Study is divided into following three steps

Historical Data Analysis



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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.



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INTRODUCTION TO SREE SAKTHI ENGINEERING COLLEGE

2.1 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. VLSI Design
5.	Affiliation	Affiliated to Anna University, Approved by AICTE, Accredited by NAAC
6.	Total Building Carpet Area	2,50,000 sq. ft



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STUDY OF ENERGY CONSUMPTION PROFILE

3.1 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

3.2 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.



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- 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 after 10 minutes/30 minutes.
- The comfort air conditioning temperature to be set between 24°C to 26°C.
- Lights in toilet area may be kept OFF during day time