SAI RAJESWARI INSTITUTE OF TECHNOLOGY

Approved by AICTE, New Delhi and Affiliated to JNTUA, Anantapuramu
Lingapuram (V), Proddatur - 516 362, Y S R District, Andhra Pradesh

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the following Water conservation facilities available in the Institution:

1. Rain water harvesting
2. Borewell/Open well recharge
3. Construction of tanks and bunds
4. Waste water recycling
5. Maintenance of water bodies and distribution system in the campus

Option selected:

A. All of the above.

Sai Rajeswari Institute of Technology ★ PRODDATUR ★

PRINCIPAL
PRINCIPAL
Sai Rajeswari Institute of Technology
PRODDATUR, Y.S.R. Dist.

CRITERION VII–INSTITUTIONAL VALUES AND BEST PRACTICES

7.1 Institutional Values and Social Responsibilities

7.1.4 - Green audits on water conservation is regularly undertaken by the institution

Initiatives Undertaken by The Institution For Green audits on water conservation

Metric Number	Parameter
7.1.4	Green audit On water conservation audit Report

RAVI PANDURANGAN

Digitally signed by RAVI PANDURANGAN
Date: 2025.03.28 14:43:53 +05'30'

ENCFD ENERGY SERVICES

Beeramguda, Hyderabad-502032,
Email: encfdenergy.services@gmail.com
BEE Certified Energy Auditor, (Cert NO: 10953)
ISO: 9001-2015 Certified (Cert No: E2024049802)
ISO: 50001-2015 Certified (Cert No: IN56924G)

ENVIRONMENTAL AUDIT CERTIFICATE

Certificate No: EES/SRIT/23-24/03 **Date: 23/04/2024**

This is to certify that we have conducted Environmental Audit at Sai Rajeswari Institute of Technology, Mydukur Road, Lingapuram, Balaji Nagar, Proddatur-516362, Andhra Pradesh, in the Academic year 2023-24.

The Institute has adopted following Environment Friendly Initiatives:

- Usage of Energy Efficient LED Light Fitting
- Installation of Campus Energy Monitoring System
- Separate dustbins for egregation of Waste at Source
- Running a biogas plant to handle the organic waste
- E-waste Management for Proper Disposal and Recycling of Electronic Waste
- Provision of Sanitary Waste Incinerator
- Implementation of Rain Water Management Project
- Tree Plantation in the campus
- Creation of awareness on Trees' Conservation by Display of Boards

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Green & Eco Friendly.

For ENCFD Energy Services,

Obula Reddy Kummitha,
B Tech, M Tech & Ph.D.
BEE Certified Energy Auditor, EA-10953

ENVIRONMENTAL AUDIT REPORT

of

SAI RAJESWARI INSTITUTE OF TECHNOLOGY

Mydukur Road Lingapuram, Balaji Nagar, Proddatur-516362, Andhra Pradesh

Year: 2023 - 24

Prepared by:

ENCFD ENERGY SERVICES

Plot 28/A, Thulasivanam Colony, Beeramguda,
Usikabavi, Hyderabad-502032
Tel: 09640853603 Email: encfdenergy.services@gmail.com

ENCFD ENERGY SERVICES HYDERABAD

REGISTRATION CERTIFICATES

Reg No.: EA-34924/23 Certificate No.: 10953

National Productivity Council
(National Certifying Agency)
PROVISIONAL CERTIFICATE

This is to certify that Mr / Mrs / Ms **OBULA REDDY KUMMITHA**
son / daughter of Mr **KUMMITHA CHIMPIRI REDDY** *has passed the National certification Examination for Energy Auditors held in* **March 2023** *conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India. He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.*

He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for Accredited Energy Auditor and issuance of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the Bureau of Energy Efficiency issues an official certificate.

Place : Chennai, India
Date : 07th July 2023

Digitally Signed: DEVERAPALLI SRIENIVASULU
On Jul 07 04:34:26 IST 2023
Ref: NPC AP Chennai

Controller of Examination

BEE Certified Energy Auditor

Registration Certificate

This is to certify that

ENCFD ENERGY SERVICES

PLOT NO.28/A, THULASIVANAM COLONY, USUKIBAVI AMEERNPUR, ROAD NO 2, HYDRABAD, TELANGANA, SANGAREDDY - 502032, INDIA

has been assessed by RAPL and found to comply with the requirements of

ISO 9001 : 2015
Quality Management Systems

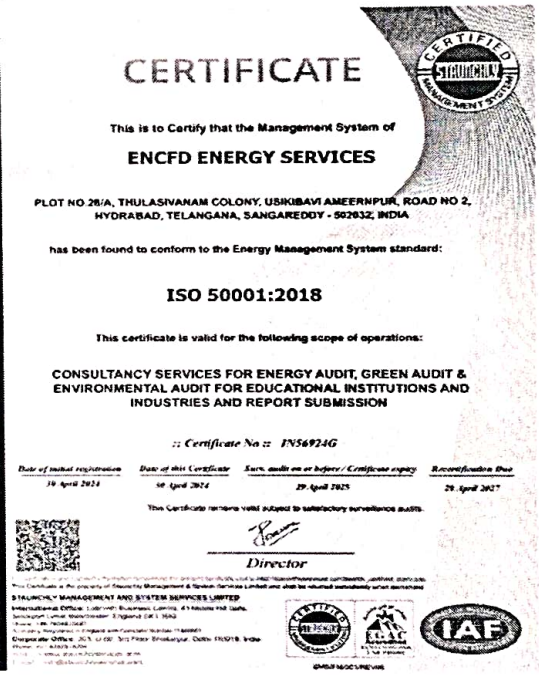
For the following activities:

CONSULTANCY SERVICES FOR ENERGY AUDIT, GREEN AUDIT & ENVIRONMENTAL AUDIT FOR EDUCATIONAL INSTITUTIONS AND INDUSTRIES & SUBMISSION OF AUDIT CERTIFICATE AND REPORT

Certificate Number: E2024049602
Date of certification: 22-04-2024
1st Surveillance on or before: 21-04-2025
Final Surveillance on or before: 21-04-2026
Certification Valid Until: 21-04-2027

Director (Certification)
Royal Assessments Pvt. Ltd.

Accredited
QMS Certification CAB# 119012



CERTIFICATE

This is to Certify that the Management System of

ENCFD ENERGY SERVICES

PLOT NO.28/A, THULASIVANAM COLONY, USUKIBAVI AMEERNPUR, ROAD NO 2, HYDRABAD, TELANGANA, SANGAREDDY - 502032, INDIA

has been found to conform to the Energy Management System standard:

ISO 50001:2018

This certificate is valid for the following scope of operations:

CONSULTANCY SERVICES FOR ENERGY AUDIT, GREEN AUDIT & ENVIRONMENTAL AUDIT FOR EDUCATIONAL INSTITUTIONS AND INDUSTRIES AND REPORT SUBMISSION

:: Certificate No :: IN56924G

Date of initial registration	Date of this Certificate	Sure, audit on or before / Certificate expiry	Recertification Due
30 April 2024	30 April 2024	29 April 2025	29 April 2027

This Certificate remains valid subject to satisfactory surveillance audits.

Director

STRUTHERS MANAGEMENT AND SYSTEM SERVICES LIMITED

ISO: 9001-2015 Certificate

ISO: 50001-2018 Certificate

INDEX

ACKNOWLEDGEMENT

We ENCFD Energy Services, Hyderabad, express our sincere gratitude to the management of Sai Rajeswari Institute of Technology, Mydukur Road Lingapuram, Balaji Nagar, Proddatur, Andhra Pradesh-516362, for awarding us the assignment of Environmental Audit of their Campus for the Academic Year: 2023 – 24.

We are thankful to all the Staff members for helping us during the field study. A special thanks to Dr. Pandurangan Ravi, Principal, and Mr. C. Chinna Suresh Babu, HOD & Associate Professor, for providing all the required information and helping us during their campus visit.

For ENCFD Energy Services,

Obula Reddy Kummitha,
B Tech, M Tech & Ph.D.
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EXECUTIVE SUMMARY

1. Sai Rajeswari Institute of Technology, Mydukur Road Lingapuram, Balaji Nagar, Proddatur, Andhra Pradesh 516362, consumes Energy in the form of **Electrical Energy;** used for various Electrical Equipment, office & other facilities.

2. Pollution due to Institute Activities:

- **Air pollution:** Mainly CO_2 on account of Electricity Consumption
- **Solid Waste:** Recyclable Waste and Bio degradable Garden Waste
- **Liquid Waste:** Human liquid waste

3. Present Energy Consumption & CO_2 Emission:

No	Particulars	Value	Unit
1	Annual Energy Purchased	**108613**	kWh
2	Annual CO_2 Emissions	**97.75**	MT

4. Renewable Energy Recommendation for Reducing CO_2 Emissions:

- At present, the institute is not utilizing any renewable energy sources. Complete electricity is obtained exclusively from the utility. Therefore, the energy audit team has firmly advised the installation of a solar power plant with a minimum capacity that is equivalent to their annual energy consumption.

5. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	**85**	**27**	**57**
2	Minimum	**76**	**25**	**50**

6. Indoor Comfort Conditions:

No	Parameter/Value	Temperature, °C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	**36.5**	**59**	**320**	**51**
2	Minimum	**28.0**	**52**	**265**	**39**

7. Waste Management:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source by dust collecting bins
2	Organic Waste	Running a biogas plant for organic waste handling
3	Sanitary Waste	Installed a sanitary waste burning machine at girls rest rooms
4	Liquid Waste	Planning to install a sewage treatment plant of 6000 Ltr/day

		capacity
5	E Waste	Had MOU with Friends Computers, Proddatur

8. Rain Water Management:

The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is used to increase the Underground Water Table & recharging the bore well.

9. Environment Friendly Initiatives:

- Tree Plantation in the campus.
- Creation of awareness on environment with Posters display like reduce-reuse-recycle.

10. Assumption:

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of **CO_2** into atmosphere

11. References:

- For CO_2 Emissions: www.tatapower.com
- For Various Indoor Air Parameters: www.ishrae.com
- For AQI Quality Standards: www.cpcb.com

ABBREVIATIONS

Kg	:	Kilo Gram
SRIT	:	Sai Rajeswari Institute of Technology
MT	:	Metric Ton
kWh	:	kilo-Watt Hour
LPD	:	Liters per Day
LED	:	Light Emitting Diode
AQI	:	Air Quality Index
PM-2.5	:	Particulate Matter of Size 2.5 Micron
PM-10	:	Particulate Matter of Size 10 Micron
CPCB	:	Central Pollution Control Board
ISHRAE	:	The Indian Society of Heating & Refrigerating & Air Conditioning Engineers

CHAPTER-I
INTRODUCTION

1. Important Definitions:

1.1. Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

1.2. Environmental Audit: Definition:

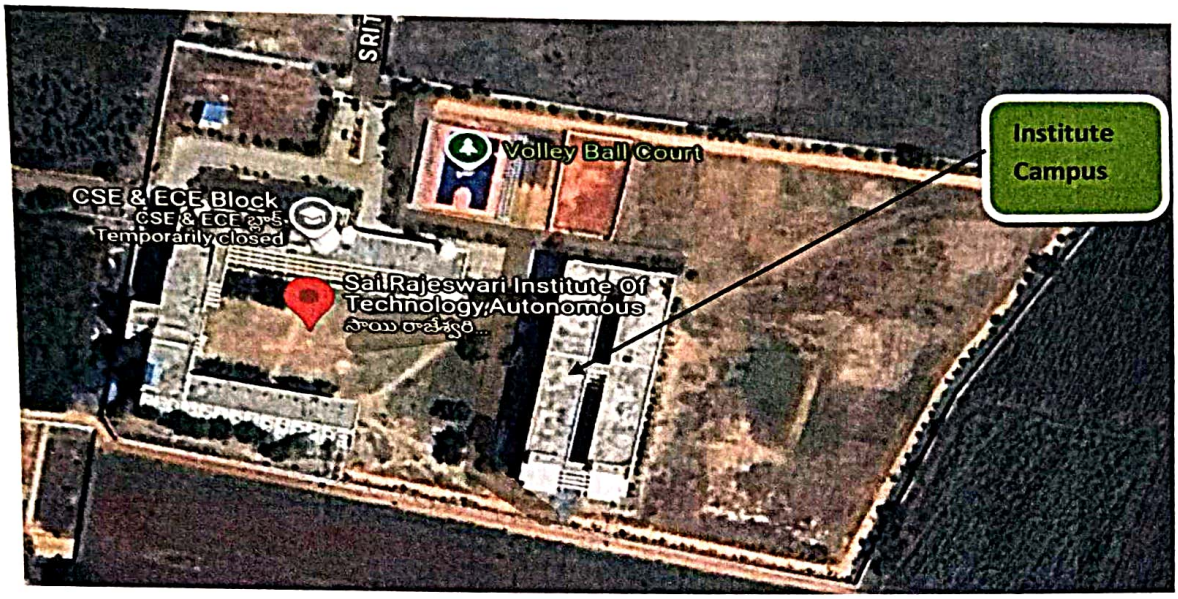
An audit which aims at verification and validation to ensure that various environmental laws are compiled with and adequate care has been taken towards environmental protection and preservation

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment

1.3. Environmental Pollutant: means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

1.4 Audit Procedural Steps:

1.5 Google Earth Image:

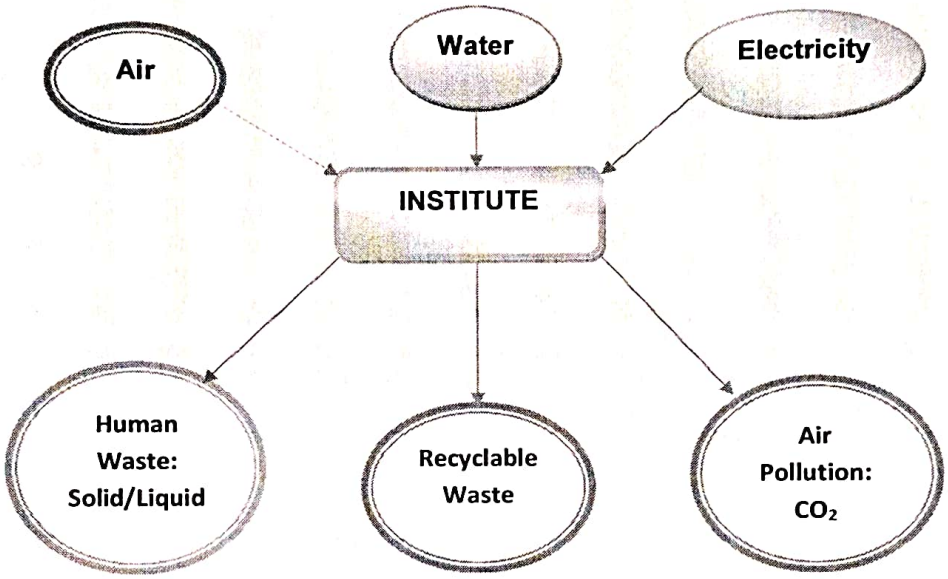


CHAPTER-II
STUDY OF RECOURCES CONSUMPTION & CO_2 EMISSION

The Institute consumes the following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the Institute System & Environment as under.
Chart No 1: Representation of Institute as System & Study of Resources & Waste



Now we compute the Generation of CO_2 on account of consumption of Electrical Energy.
The basis of Calculation for CO_2 emissions due to Electrical Energy is as under.

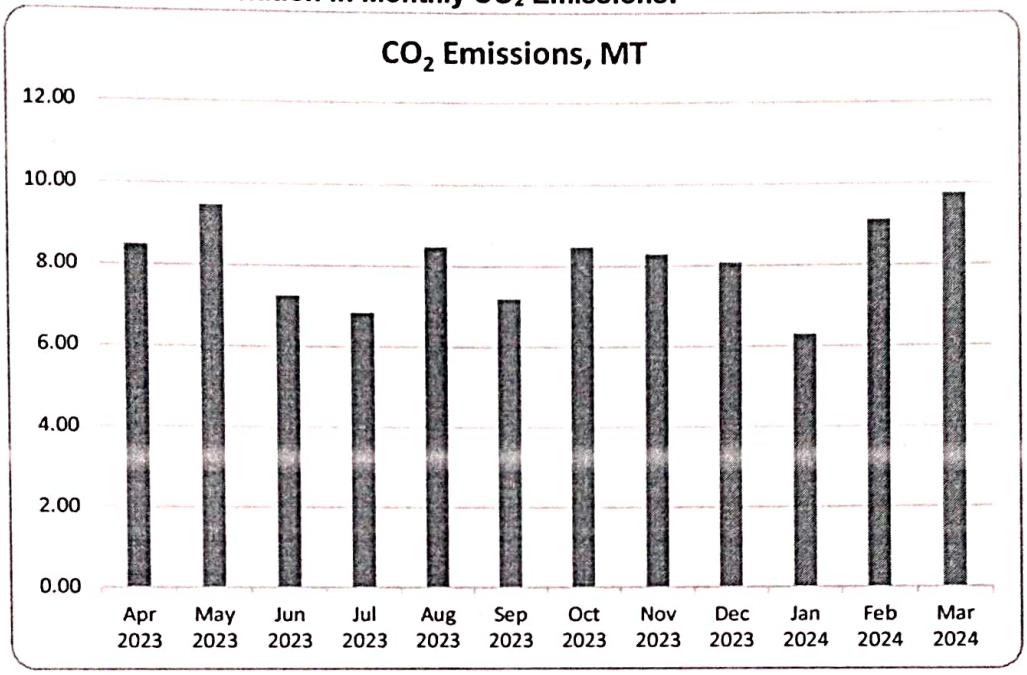
- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Table No 1: Electrical Energy Analysis & CO_2 Emission: 2023-24:

S.No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr 2023	9430	8.49
2	May 2023	10525	9.47
3	Jun 2023	8066	7.26
4	Jul 2023	7610	6.85
5	Aug 2023	9423	8.48
6	Sep 2023	7989	7.19
7	Oct 2023	9423	8.48
8	Nov 2023	9217	8.30
9	Dec 2023	8978	8.08
10	Jan 2024	6995	6.30

11	Feb 2024	10124	9.11
12	Mar 2024	10833	9.75
13	Total	108613	97.75

Chart No 2: Variation in Monthly CO_2 Emissions:



CHAPTER III
ALTERATIVE FOR CO_2 EMISSION REDUCTION

At present, the institute is not utilizing any renewable energy sources. Complete electricity is obtained exclusively from the utility. Therefore, the energy audit team has firmly advised the installation of a solar power plant with a minimum capacity that is equivalent to their annual energy consumption.

Currently the institution is consuming 108613 kwh of electricity yearly. Hence the institute is recommended to install a solar power plant to mitigate the usage of grid electricity and finally CO_2 emissions reduction.

Table No 2: Recommended Solar PV Plant Energy for Reducing CO_2 Emissions:

No	Particulars	Value	Unit
1	Annual Solar Energy to be Generated	**108613**	kWh
2	1 kWh of Electrical Energy is equivalent to	**0.9**	Kg of CO_2
3	Annual Reduction in CO_2 Emissions, =1*2/1000	**97.75**	MT

Comment: From the above table it is clearly find that the yearly generated 97.75 MT of CO_2 emissions can be decreased by installing a roof top solar PV plant.

CHAPTER IV
STUDY OF INDOOR AIR QUALITY

4.1 Importance of Air Quality:

Air: The common name given to the atmospheric gases used in breathing and photosynthesis.

By volume, Dry Air contains 78.09% Nitrogen, 20.95% Oxygen, 0.93% Argon, 0.039% carbon dioxide, and small amounts of other gases.

On average, a person inhales about **14,000 liters** of air every day. Therefore, poor air quality may affect the quality of life now and for future generations by affecting the health, the environment, the economy and the city's livability.

Rapid urbanization and industrialization have added other elements/compounds to the pure air and thus caused the increase in pollution. In order to prevent, control and abate air pollution, the Air (Prevention and Control of Pollution) Act was enacted in 1981.

Air quality is a measure of the suitability of air for breathing by people, plants and animals.

According to Section 2(b) of Air (Prevention and control of pollution) Act, 1981 '**air pollution**' has been defined as **'the presence in the atmosphere of any air pollutant.'**

4.2 Air Quality Index:

An **Air Quality Index (AQI)** is a number used by government agencies to measure the **air pollution** levels and communicate it to the population.

We present herewith following important Parameters.

1. AQI- Air Quality Index
2. PM-2.5- Particulate Matter of Size 2.5 micron
3. PM-10- Particulate Matter of Size 10 micron

Table No 3: Indoor Air Quality Parameters at some places:

No	Location	AQI	PM-2.5	PM-10
1	SRIT Principle office	77	25	56
2	SRIT Class rooms	85	27	57
3	SRIT Library	76	25	50
	Maximum	**85**	**27**	**57**
	Minimum	**76**	**25**	**50**

From the analysis of indoor air quality, it is identified that the institute air quality is satisfactory as per the air quality standards.

CHAPTER V
STUDY OF INDOOR COMFORT CONDITION PARAMETERS

In this Chapter, we present the various Indoor Comfort Parameters measured during the Audit.
The Parameters include:

1. Temperature
2. Humidity
3. Lux Level
4. Noise Level.

Table No 4: Study of Indoor Comfort Condition Parameters:

No	Location	Temperature, ^{0}C	Humidity, %	Lux Level	Noise Level, dB
1	SRIT Principle office	28	52	320	39
2	SRIT Class rooms	36.5	59	265	51
3	SRIT Library	32	57	285	41
	Maximum	**36.5**	**59**	**320**	**51**
	Minimum	**28**	**52**	**265**	**39**

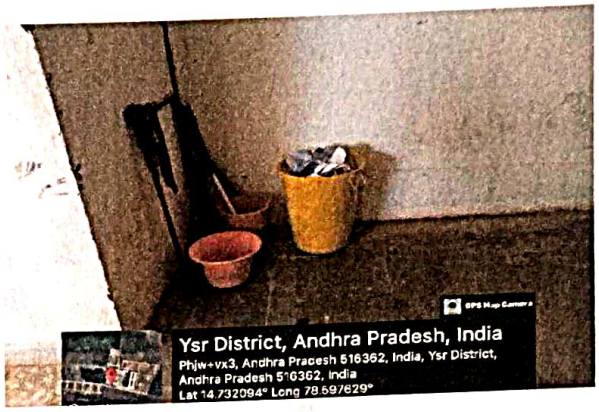
The thermal comfort conditions are satisfactory with desired humidity, temperature and required level of lighting in the classrooms and library and also the noise level is minimum.

CHAPTER VI
STUDY OF WASTE MANAGEMENT AND RECOMMENDATIONS

6.1 Segregation of Waste at Source:

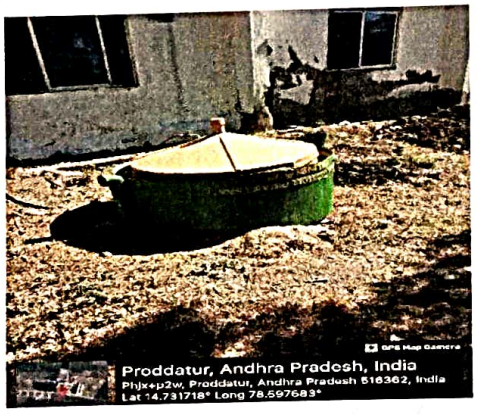
The Waste is segregated at source and the recyclable waste, like paper waste is handed over to authorized waste collecting agent for further recycling.

Photograph of Waste Collection Bin:



6.2 Organic Waste Management:

The institute is running a biogas plant to handle the organic waste generated from the hostels and gardens as shown below:



6.3 Sanitary Waste Management:

The institute is installed a sanitary burning machine at college washrooms.

6.4 Liquid Waste Management:

The institute is recommended to install a Sewage Treatment Plant of Capacity **6 KLPD**. So that the treated Water can be used for gardening purpose.

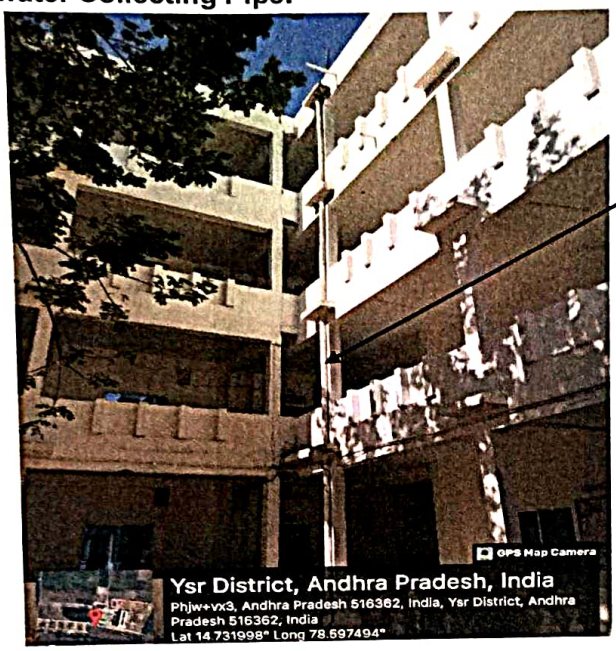
6.5 E Waste Management:

The Institute consist of a Memorandum of Understanding with Friends Computers, Proddatur for disposal of E-Waste.

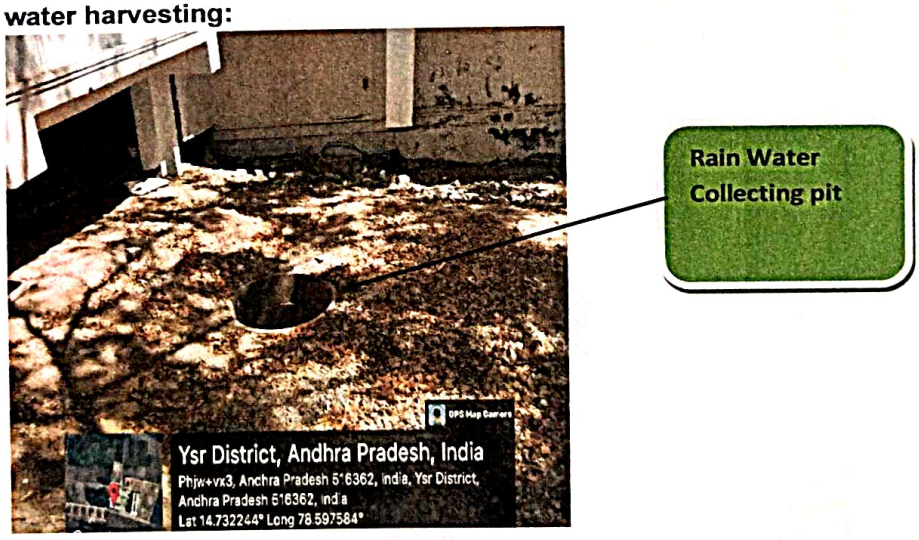
CHAPTER-VII
STUDY OF RAIN WATER MANAGEMENT

The Institute has implemented the Rain Water Management Project. The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used to increase the Underground Water Table as well as to recharge the bore well.

Photograph of Rain water Collecting Pipe:



Separate Pits for rain water harvesting:

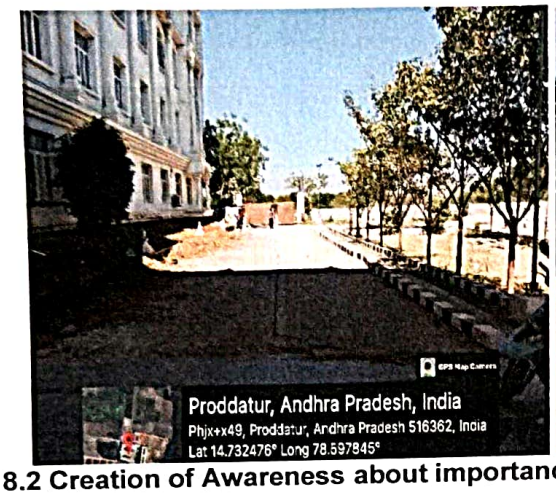


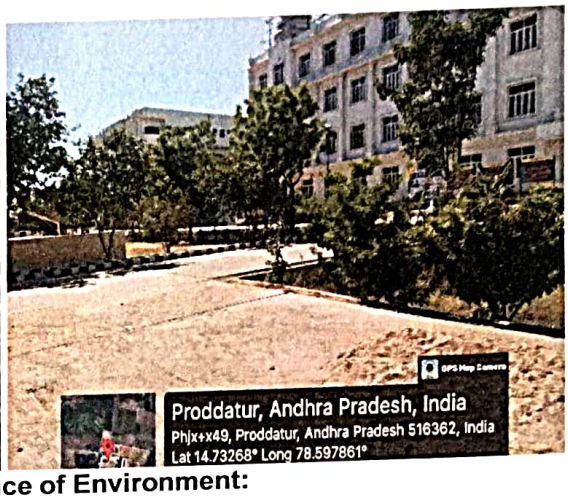
CHAPTER-VIII
STUDY OF ECO-FRIENDLY INITIATIVES

8.1 Internal Tree Plantation:

The Institute has well maintained landscaped Lawn and Garden in the campus.

Photograph of Internal Tree plantation on either side of roads:

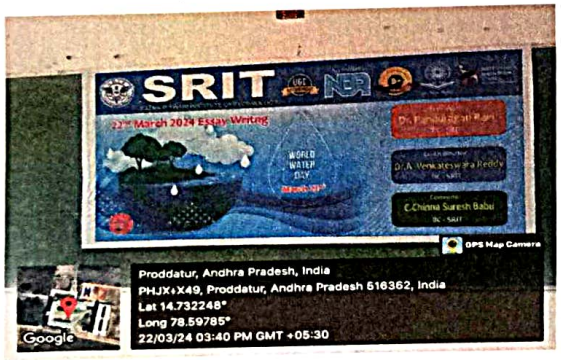


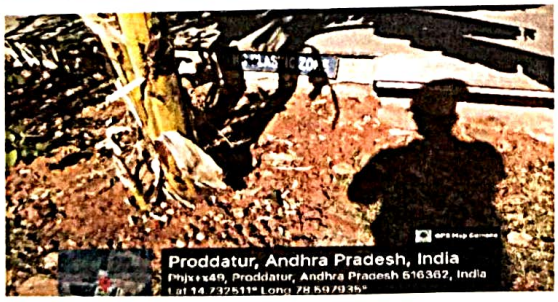


8.2 Creation of Awareness about importance of Environment:

The Institute has displayed posters emphasizing on importance of proper water usage and plastic free campus:

Some Events/photographs on environment awareness:





ANNEXURE-I:

AIR QUALITY, NOISE & INDOOR COMFORT STANDARDS:

1. Category Wise Air Quality Index Values & Concentration of PM 2.5 & PM10:

No	Category	AQI Value	Concentration Range, PM 2.5	Concentration Range, PM 10
1	Good	0 to 50	0 to 30	0 to 50
2	Satisfactory	51 to 100	31 to 60	51 to 100
3	Moderately Polluted	101 to 200	61 to 90	101 to 250
4	Poor	201 to 300	91 to 120	251 to 350
5	Very Poor	301 to 400	121 to 250	351 to 430
6	Severe	401 to 500	250 +	430 +

2. Recommended Noise Level Standards:

No	Location	Noise Level dB
1	Auditoriums	20-25
2	Outdoor Playground	55
3	Occupied Class Room	40-45
4	Un occupied Class Room	35
5	Apartment, Homes	35-40
6	Offices	45-50
7	Libraries	35-40
8	Restaurants	50-55

3. Thermal Comfort Conditions: For Non-conditioned Buildings:

No	Parameter	Value
1	Temperature	Less Than 33^{0}C
2	Humidity	Less Than 70%

For ENCFD Energy Services,

Obula Reddy Kummitha,
B Tech, M Tech & Ph.D.
BEE Certified Energy Auditor, EA-10953

ENCFD ENERGY SERVICES

Beeramguda, Hyderabad-502032,
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The Institute has adopted following Green & Sustainable Practices:

- Usage of Energy Efficient LED Light Fitting
- Installation of Campus Energy Monitoring System
- Segregation of Waste at Source
- Provision of Sanitary Waste Incinerator
- Implementation of Rain Water Management Project
- Maintenance of Good Internal Road
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan
- Creation of awareness on Trees' and environment by Display of Boards

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Green.

For ENCFD Energy Services,

23/4/24

Obula Reddy Kummitha,
B Tech, M Tech & Ph.D.
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GREEN AUDIT REPORT

of

SAI RAJESWARI INSTITUTE OF TECHNOLOGY

Mydukur Road Lingapuram, Balaji Nagar, Proddatur-516362, Andhra Pradesh

Year: 2023-24

Prepared by:

ENCFD ENERGY SERVICES

Plot 28/A, Thulasivanam Colony, Beeramguda,
Usikabavi, Hyderabad-502032
Tel: 09640853603 Email: encfdenergy.services@gmail.com

REGISTRATION CERTIFICATES

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This is to certify that Mr./Mrs./Ms. OBULA REDDY KUMMITHA
son / daughter of Mr. KUMMITHA CHIMPIRI REDDY *has passed the National certification Examination for Energy Auditors held in* March 2023 *conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India. He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.*

He/She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for Accredited Energy Auditor and issuance of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the Bureau of Energy Efficiency issues an official certificate.

Place : Chennai, India
Date : 07th July 2023

Digitally Signed DEVERAPALLI SREENIVASULU
Fri Jul 07 08:34:28 IST 2023
Cnfc NPC AIP Chennai

Controller of Examination

Certified Energy auditor

Registration Certificate

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ENCFD ENERGY SERVICES

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2nd Surveillance on or before: 21/04/2026
Certification Valid Until: 21/04/2027

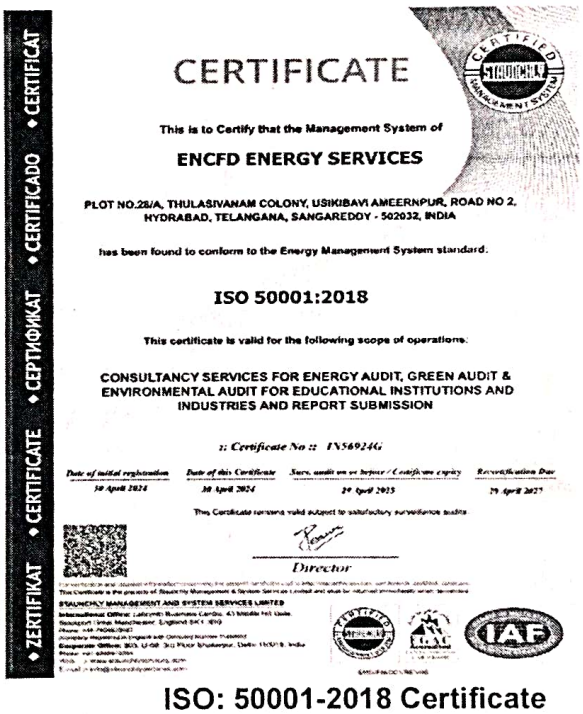
Director (Certification)
Royal Assessments Pvt. Ltd.

IAF EGAC Accredited QMS Certification CAB# 119012

This Certificate remains the property of Royal Assessments Private Limited. Must be returned on request or if certificate is withdrawn. Validity of this certificate is subject to successful surveillance audits. RAPL is accredited by EGAC, EGAC is member of International Accreditation Forum (IAF) and signatory of MLA.

◆ CERTIFICAT ◆ CERTIFICADO ◆ СЕРТИФИКАТ ◆ CERTIFICATE ◆ ZERTIFIKAT

ISO: 9001-2015 Certificate



CERTIFICATE

This is to Certify that the Management System of

ENCFD ENERGY SERVICES

PLOT NO.28/A, THULASIVANAM COLONY, USIKIBAVI AMEERNPUR, ROAD NO 2, HYDRABAD, TELANGANA, SANGAREDDY - 502032, INDIA

has been found to conform to the Energy Management System standard.

ISO 50001:2018

This certificate is valid for the following scope of operations:

CONSULTANCY SERVICES FOR ENERGY AUDIT, GREEN AUDIT & ENVIRONMENTAL AUDIT FOR EDUCATIONAL INSTITUTIONS AND INDUSTRIES AND REPORT SUBMISSION

:: Certificate No :: TN569246

Date of initial registration	Date of this Certificate	Next audit on or before / Certificate expiry	Recertification Due
30 April 2024	30 April 2024	29 April 2025	29 April 2027

This Certificate remains valid subject to satisfactory surveillance audits

Director

STAUNCH MANAGEMENT AND SYSTEM SERVICES LIMITED

ISO: 50001-2018 Certificate

INDEX

ACKNOWLEDGEMENT

We ENCFD Energy Services, Hyderabad, express our sincere gratitude to the management of Sai Rajeswari Institute of Technology, Mydukur Road Lingapuram, Balaji Nagar, Proddatur, Andhra Pradesh-516362, for awarding us the assignment of Green Audit of their Campus for the Academic Year: 2023 – 24.

We are thankful to all the Staff members for helping us during the field study. A special thanks to Dr. Pandurangan Ravi, Principal, and Mr. C. Chinna Suresh Babu, HOD & Associate Professor, for providing all the required information and helping us during their campus visit.

For ENCFD Energy Services,

Obula Reddy Kummitha,
B Tech, M Tech & Ph.D.
BEE Certified Energy Auditor, EA-10953

EXECUTIVE SUMMARY

1. Sai Rajeswari Institute of Technology, Mydukur Road Lingapuram, Balaji Nagar, Proddatur, Andhra Pradesh-516362, consumes Energy in the form of **Electrical Energy;** used for various Electrical Equipment, office & other facilities.

2. Present Energy Consumption & CO_2 Emission:

No	Particulars	Value	Unit
1	Annual Energy Purchased	**108613**	kWh
2	Annual CO_2 Emissions	**97.75**	MT

3. Renewable Energy usage & Reduction in CO_2 Emissions:

- At present, the institute is not utilizing any renewable energy sources. Complete electricity is obtained exclusively from the utility. Therefore, the energy audit team has firmly advised the installation of a solar power plant with a minimum capacity that is equivalent to their annual energy consumption.

4. Waste Management:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source by dust collecting bins
2	Organic Waste	Running a biogas plant to process the organic waste
3	Sanitary Waste	Installed a sanitary waste burning machine
4	Liquid Waste	The institute is recommended to install a sewage treatment plant
5	E Waste	Had MOU with Friends Computers, Proddatur

5. Rain Water Management:

The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is used to increase the Underground Water Table & recharging the bore well.

6. Green & Sustainable Practices:

- Maintenance of good Internal Road &Tree Plantation in the campus.
- Provision of Ramp for Divyangajan
- Conducting various events on "Environment" to create awareness among the students and faculty.
- Creation of awareness on importance of Trees' Conservation by Display of Posters

7. Assumption:

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of **CO_2** into atmosphere

8. Reference:

- For CO_2 Emissions: www.tatapower.com

ABBREVIATIONS

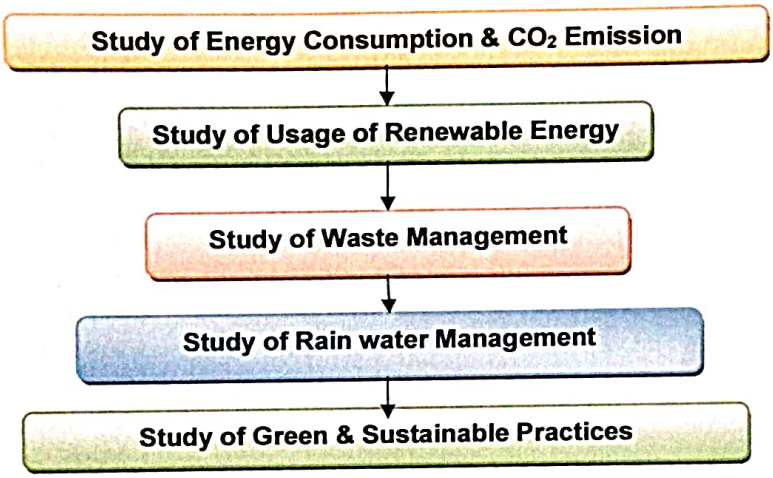
BEE	Bureau of Energy Efficiency
kWp	Kilo Watt Peak
SRIT	Sai Rajeswari Institute of Technology
kWh	Kilo Watt Hour
LPD	Liters Per Day
Kg	Kilo Gram
MT	Metric Ton
CO_2	Carbon Di Oxide
Qty	Quantity

CHAPTER-I
INTRODUCTION

1.1 Introduction:

A Green Audit is conducted at Sai Rajeswari Institute of Technology, Mydukur Road Lingapuram, Balaji Nagar, Proddatur, Andhra Pradesh-516362.

1.2 Audit Procedural Steps:



1.3 Google Earth Image:

CHAPTER-II
STUDY OF ENERGY CONSUMPTION & CO_2 EMISSION

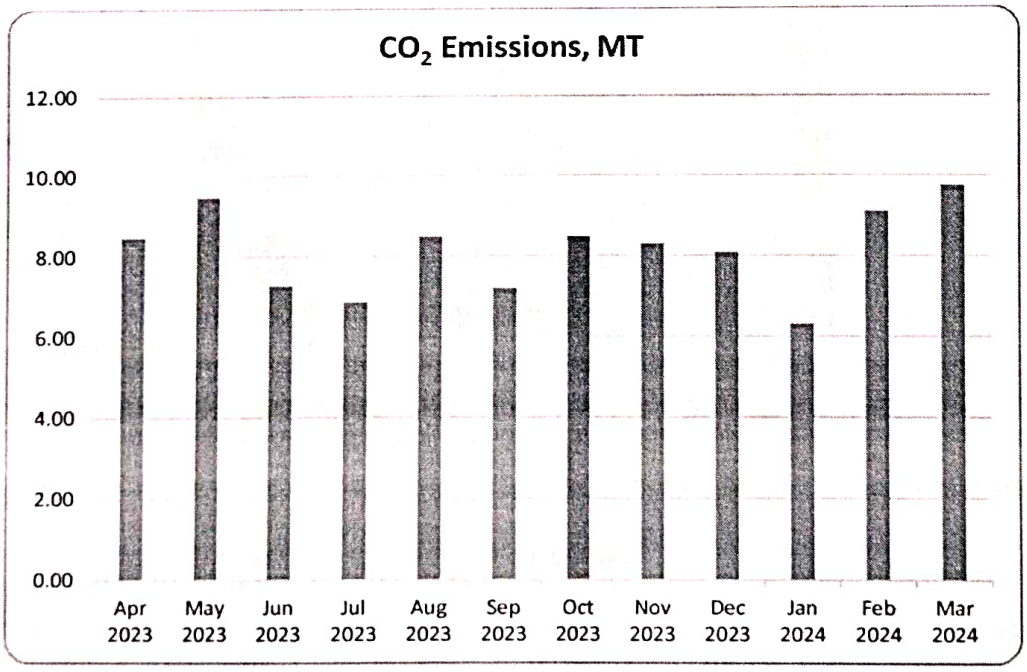
A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

Basis for computation of CO_2 Emissions: 1 kWh of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere.

Table No 1: Electrical Energy Analysis & CO_2 Emission: 2023-24:

S.No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr 2023	9430	8.49
2	May 2023	10525	9.47
3	Jun 2023	8066	7.26
4	Jul 2023	7610	6.85
5	Aug 2023	9423	8.48
6	Sep 2023	7989	7.19
7	Oct 2023	9423	8.48
8	Nov 2023	9217	8.30
9	Dec 2023	8978	8.08
10	Jan 2024	6995	6.30
11	Feb 2024	10124	9.11
12	Mar 2024	10833	9.75
13	**Total**	**108613**	**97.75**

Chart No 1: Variation in Monthly CO_2 Emissions:



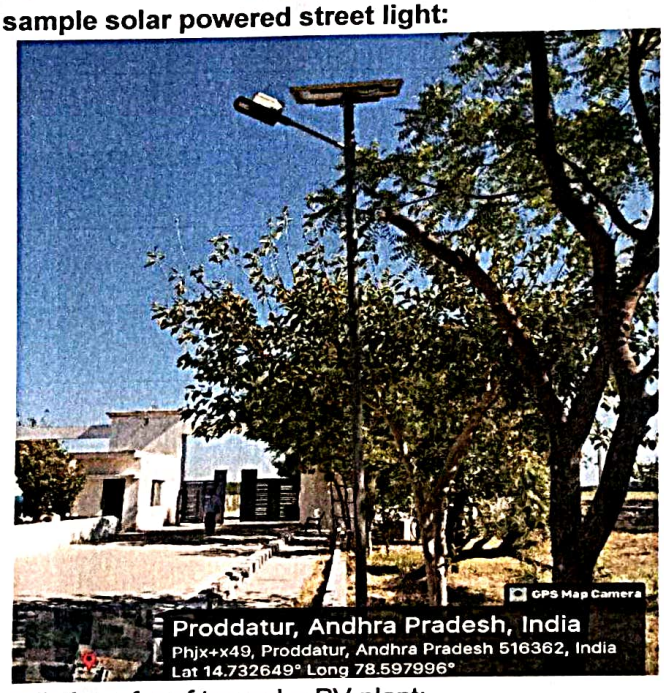
CHAPTER III
STUDY FOR USAGE OF ANY RENEWABLE ENERGY

At present, the institute is not utilizing any renewable energy sources. Complete electricity is obtained exclusively from the utility. Therefore, the energy audit team has firmly advised the installation of a solar power plant with a minimum capacity that is equivalent to their annual energy consumption.

Currently the institution is consuming 108613 kwh of electricity yearly. Hence the institute is recommended to install a solar power plant to mitigate the usage of grid electricity and finally CO_2 emissions reduction.

The institute has been setup standalone solar powered street lights which can save electricity consumption. Since the street light is solar-powered, it **saves the equivalent grid electricity** of **~131.4 kWh/year** for each light. For multiple lights, this savings can be multiplied accordingly.

Photograph for a sample solar powered street light:



Advantages with installation of roof top solar PV plant:

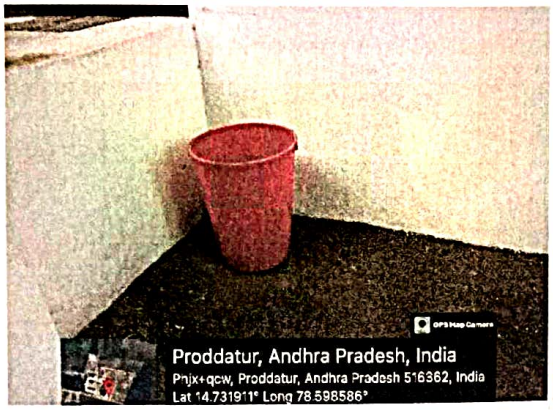
- The yearly generated electricity bills can be reduced drastically
- The generation of CO_2 emissions also can be reduced.
- Solar power plants with peak generation can generate excess power, which can be sold to the grid to generate cash.
- Maintain uninterrupted power supply to all utilities.

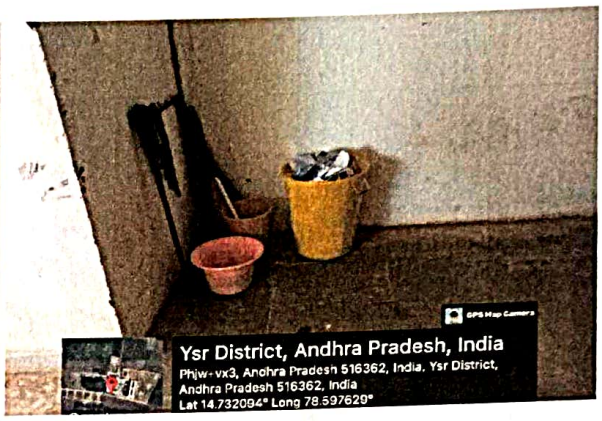
CHAPTER IV
STUDY OF WASTE MANAGEMENT AND RECOMMENDATIONS

4.1 Segregation of Waste at Source:

The Waste is segregated at source and the recyclable waste, like paper waste is handed over to authorized waste collecting agent for further recycling.

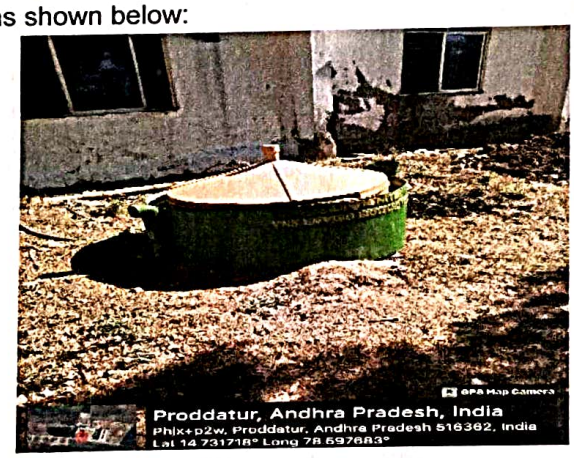
Photograph of Waste Collection Bin:





4.2 Organic Waste Management:

The institute is running a biogas plant to handle the organic waste generated from the hostels and gardens as shown below:



6.3 Sanitary Waste Management:

The institute is installed a sanitary burning machine at college washrooms.

6.4 Liquid Waste Management:

The institute is recommended to install a Sewage Treatment Plant of Capacity **6 KLPD**. So that the treated Water can be used for gardening purpose.

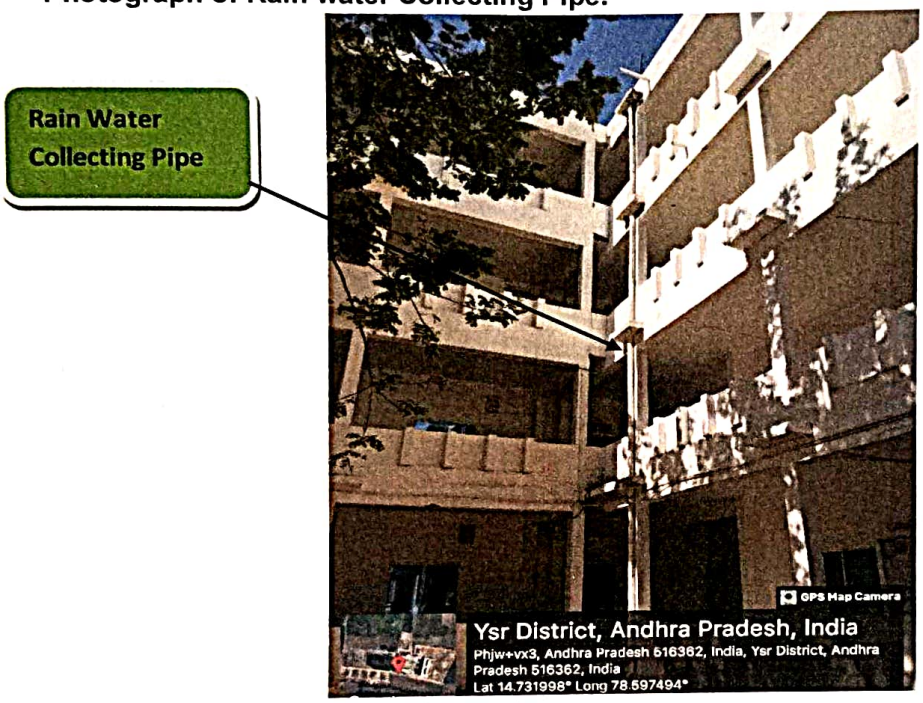
6.5 E Waste Management:

The Institute consist of a Memorandum of Understanding with Friends Computers, Proddatur for disposal of E-Waste.

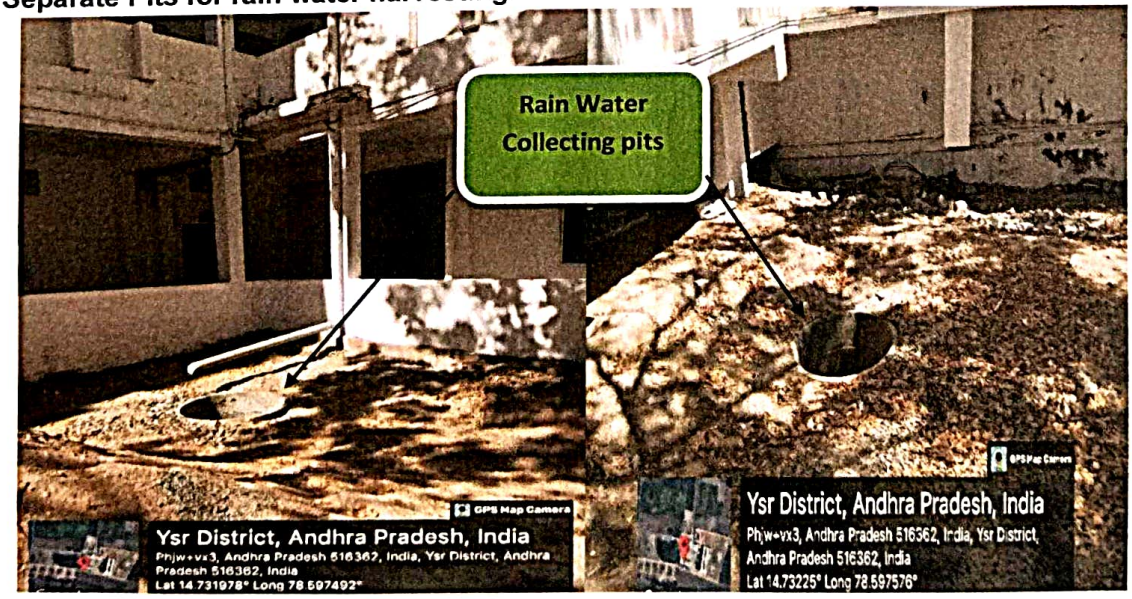
CHAPTER-V
STUDY OF RAIN WATER MANAGEMENT

The Institute has implemented the Rain Water Management Project. The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used to increase the Underground Water Table as well as to recharge the bore well.

Photograph of Rain water Collecting Pipe:



Separate Pits for rain water harvesting:



CHAPTER-VI
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Roads & Internal Tree Plantation:

The Institute has well maintained internal road to facilitate the easy movement of the students within the campus. The Campus has more than 280 Trees in the Campus.

Photograph of Internal Road & Tree Plantation:

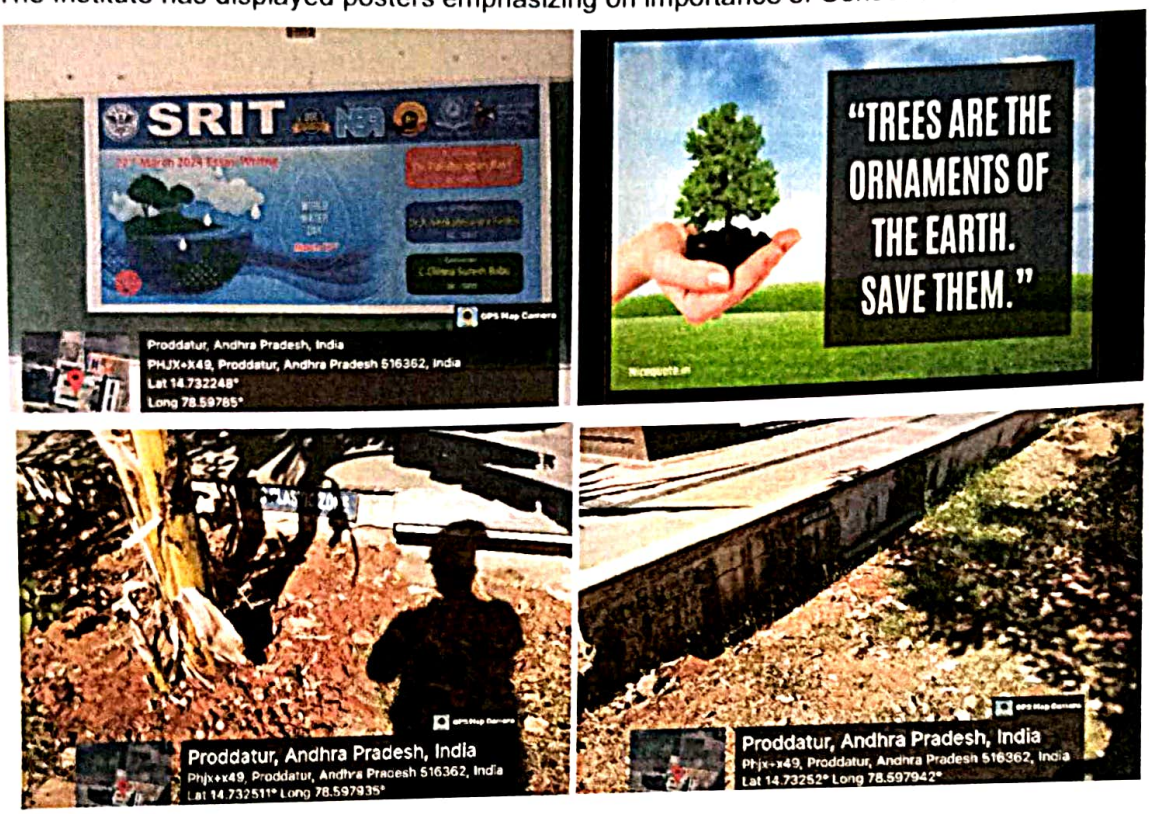
7.2 Provision of Ramp:

For easy movement of Divyangajan, the Institute has made provision of Ramps.

Photograph of Ramp:

7.3 Creation of Awareness about importance of Environment:

The Institute has displayed posters emphasizing on importance of Conservation as follows:



For ENCFD Energy Services,

23/4/24

Obula Reddy Kummitha,
B Tech, M Tech & Ph.D.
BEE Certified Energy Auditor, EA-10953

ENVIRONMENTAL AUDIT REPORT

of

SAI RAJESWARI INSTITUTE OF TECHNOLOGY

Mydukur Road Lingapuram, Balaji Nagar, Proddatur-516362, Andhra Pradesh

Year: 2023 - 24

Prepared by:

ENCFD ENERGY SERVICES

Plot 28/A, Thulasivanam Colony, Beeramguda,
Usikabavi, Hyderabad-502032
Tel: 09640853603 Email: encfdenergy.services@gmail.com

ENCFD ENERGY SERVICES HYDERABAD

REGISTRATION CERTIFICATES

Reg No.: EA-34924/23 Certificate No.: 10953

National Productivity Council
(National Certifying Agency)
PROVISIONAL CERTIFICATE

This is to certify that Mr / Mrs / Ms **OBULA REDDY KUMMITHA**
son / daughter of Mr **KUMMITHA CHIMPIRI REDDY** *has passed the National certification Examination for Energy Auditors held in* **March 2023** *conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India. He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.*

He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for Accredited Energy Auditor and issuance of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the Bureau of Energy Efficiency issues an official certificate.

Place : Chennai, India
Date : 07th July 2023

Digitally Signed: DEVERAPALLI SRIENIVASULU
On Jul 07 04:34:26 IST 2023
Ref: NPC AP Chennai

Controller of Examination

BEE Certified Energy Auditor

Registration Certificate

This is to certify that

ENCFD ENERGY SERVICES

PLOT NO.28/A, THULASIVANAM COLONY, USUKIBAVI AMEERNPUR, ROAD NO 2, HYDRABAD, TELANGANA, SANGAREDDY - 502032, INDIA

has been assessed by RAPL and found to comply with the requirements of

ISO 9001 : 2015
Quality Management Systems

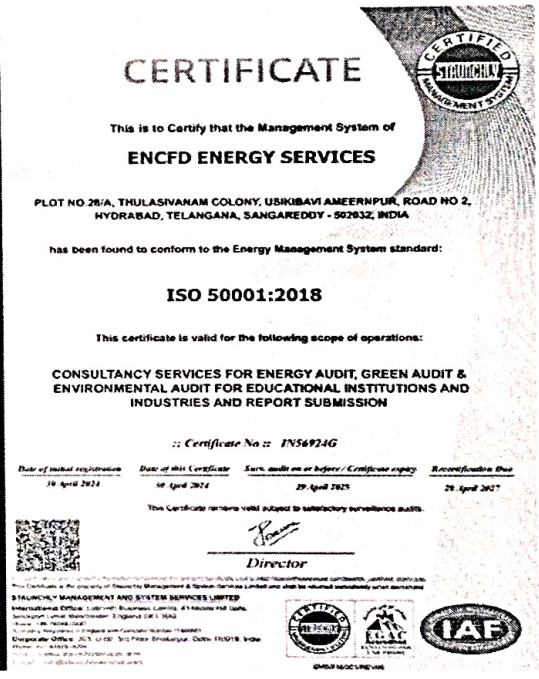
For the following activities:

CONSULTANCY SERVICES FOR ENERGY AUDIT, GREEN AUDIT & ENVIRONMENTAL AUDIT FOR EDUCATIONAL INSTITUTIONS AND INDUSTRIES & SUBMISSION OF AUDIT CERTIFICATE AND REPORT

Certificate Number: E2024049602
Date of certification: 22-04-2024
1st Surveillance on or before: 21-04-2025
Final Surveillance on or before: 21-04-2026
Certification Valid Until: 21-04-2027

Director (Certification)
Royal Assessments Pvt. Ltd.

Accredited
QMS Certification CAB# 119012



CERTIFICATE

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:: Certificate No :: IN56924G

Date of initial registration	Date of this Certificate	Sure, audit on or before / Certificate expiry	Recertification Due
30 April 2024	30 April 2024	29 April 2025	29 April 2027

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Director

STRUTHERS MANAGEMENT AND SYSTEM SERVICES LIMITED

ISO: 9001-2015 Certificate

ISO: 50001-2018 Certificate

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EXECUTIVE SUMMARY

1. Sai Rajeswari Institute of Technology, Mydukur Road Lingapuram, Balaji Nagar, Proddatur, Andhra Pradesh 516362, consumes Energy in the form of **Electrical Energy;** used for various Electrical Equipment, office & other facilities.

2. Pollution due to Institute Activities:

- **Air pollution:** Mainly CO_2 on account of Electricity Consumption
- **Solid Waste:** Recyclable Waste and Bio degradable Garden Waste
- **Liquid Waste:** Human liquid waste

3. Present Energy Consumption & CO_2 Emission:

No	Particulars	Value	Unit
1	Annual Energy Purchased	**108613**	kWh
2	Annual CO_2 Emissions	**97.75**	MT

4. Renewable Energy Recommendation for Reducing CO_2 Emissions:

- At present, the institute is not utilizing any renewable energy sources. Complete electricity is obtained exclusively from the utility. Therefore, the energy audit team has firmly advised the installation of a solar power plant with a minimum capacity that is equivalent to their annual energy consumption.

5. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	**85**	**27**	**57**
2	Minimum	**76**	**25**	**50**

6. Indoor Comfort Conditions:

No	Parameter/Value	Temperature, °C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	**36.5**	**59**	**320**	**51**
2	Minimum	**28.0**	**52**	**265**	**39**

7. Waste Management:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source by dust collecting bins
2	Organic Waste	Running a biogas plant for organic waste handling
3	Sanitary Waste	Installed a sanitary waste burning machine at girls rest rooms
4	Liquid Waste	Planning to install a sewage treatment plant of 6000 Ltr/day

		capacity
5	E Waste	Had MOU with Friends Computers, Proddatur

8. Rain Water Management:

The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is used to increase the Underground Water Table & recharging the bore well.

9. Environment Friendly Initiatives:

- Tree Plantation in the campus.
- Creation of awareness on environment with Posters display like reduce-reuse-recycle.

10. Assumption:

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of **CO_2** into atmosphere

11. References:

- For CO_2 Emissions: www.tatapower.com
- For Various Indoor Air Parameters: www.ishrae.com
- For AQI Quality Standards: www.cpcb.com

ABBREVIATIONS

Kg	:	Kilo Gram
SRIT	:	Sai Rajeswari Institute of Technology
MT	:	Metric Ton
kWh	:	kilo-Watt Hour
LPD	:	Liters per Day
LED	:	Light Emitting Diode
AQI	:	Air Quality Index
PM-2.5	:	Particulate Matter of Size 2.5 Micron
PM-10	:	Particulate Matter of Size 10 Micron
CPCB	:	Central Pollution Control Board
ISHRAE	:	The Indian Society of Heating & Refrigerating & Air Conditioning Engineers

CHAPTER-I
INTRODUCTION

1. Important Definitions:

1.1. Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

1.2. Environmental Audit: Definition:

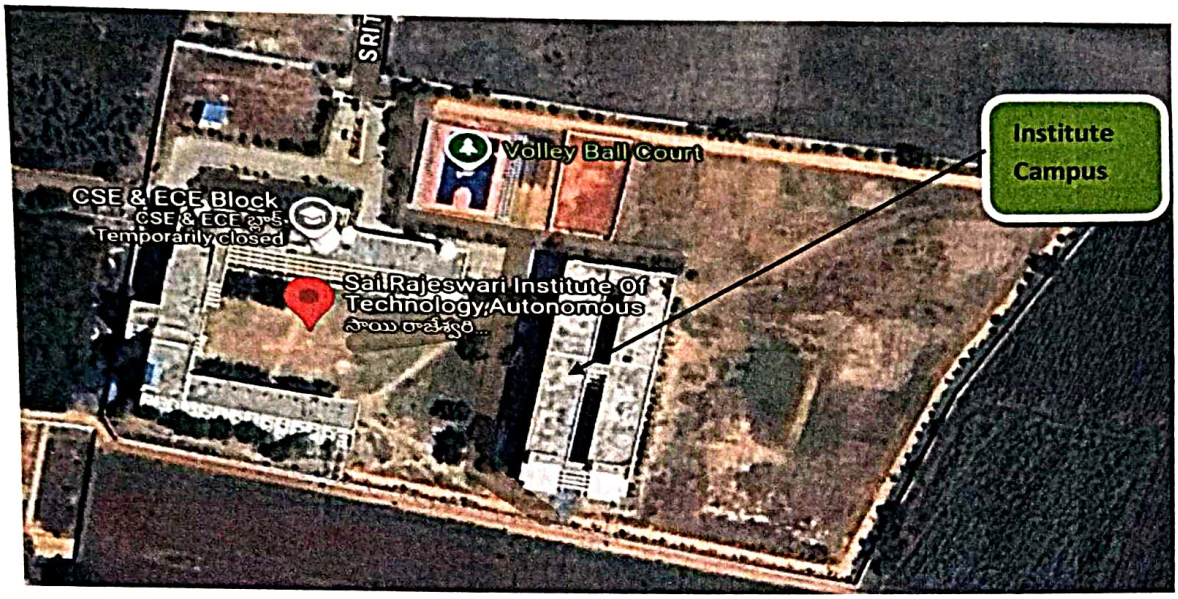
An audit which aims at verification and validation to ensure that various environmental laws are compiled with and adequate care has been taken towards environmental protection and preservation

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment

1.3. Environmental Pollutant: means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

1.4 Audit Procedural Steps:

1.5 Google Earth Image:

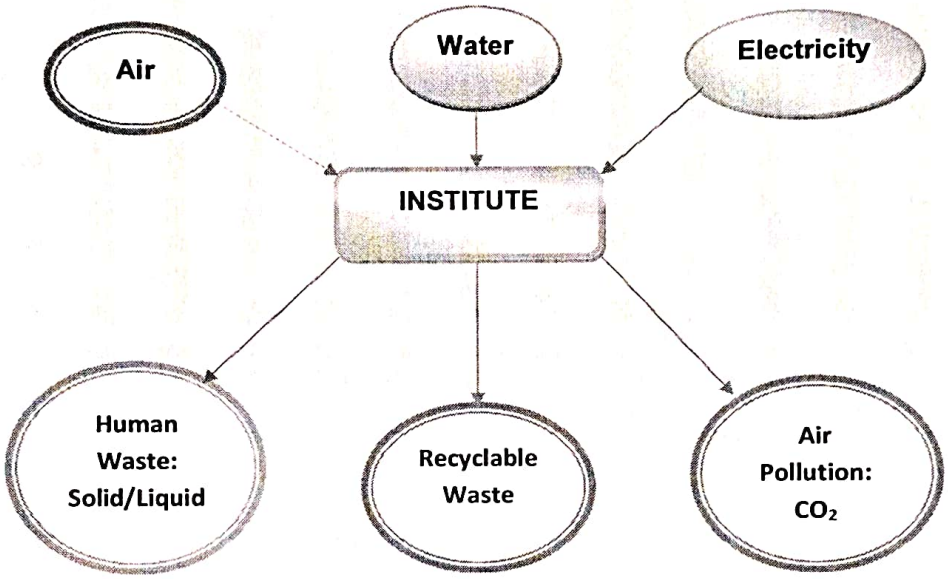


CHAPTER-II
STUDY OF RECOURCES CONSUMPTION & CO_2 EMISSION

The Institute consumes the following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the Institute System & Environment as under.
Chart No 1: Representation of Institute as System & Study of Resources & Waste



Now we compute the Generation of CO_2 on account of consumption of Electrical Energy.
The basis of Calculation for CO_2 emissions due to Electrical Energy is as under.

- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Table No 1: Electrical Energy Analysis & CO_2 Emission: 2023-24:

S.No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr 2023	9430	8.49
2	May 2023	10525	9.47
3	Jun 2023	8066	7.26
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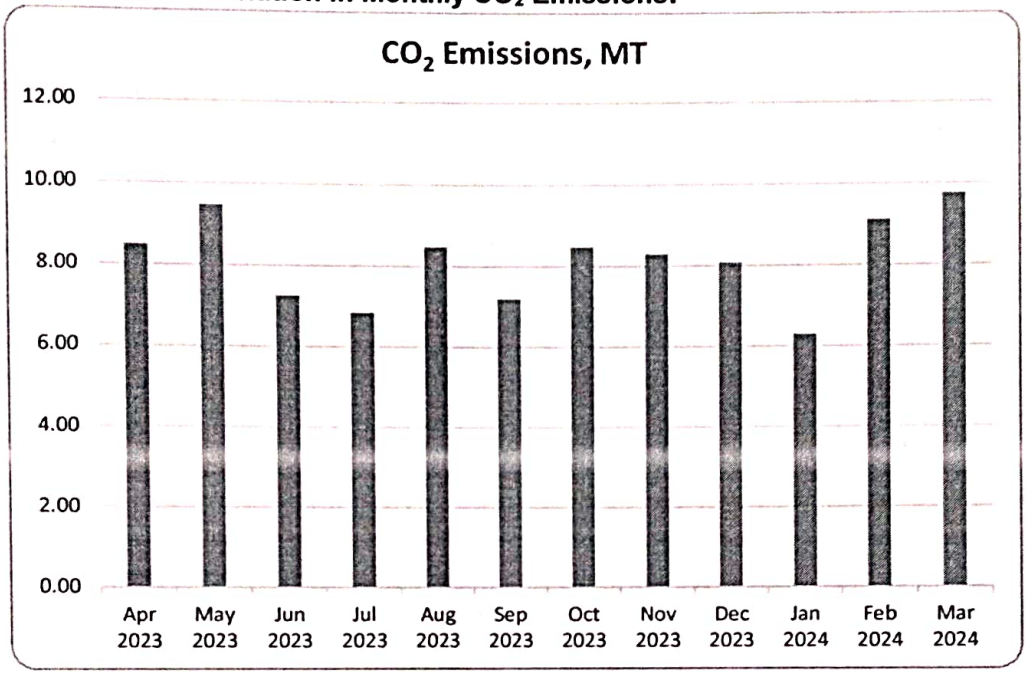
9	Dec 2023	8978	8.08
10	Jan 2024	6995	6.30

11	Feb 2024	10124	9.11
12	Mar 2024	10833	9.75
13	Total	108613	97.75

Chart No 2: Variation in Monthly CO_2 Emissions:



CHAPTER III
ALTERATIVE FOR CO_2 EMISSION REDUCTION

At present, the institute is not utilizing any renewable energy sources. Complete electricity is obtained exclusively from the utility. Therefore, the energy audit team has firmly advised the installation of a solar power plant with a minimum capacity that is equivalent to their annual energy consumption.

Currently the institution is consuming 108613 kwh of electricity yearly. Hence the institute is recommended to install a solar power plant to mitigate the usage of grid electricity and finally CO_2 emissions reduction.

Table No 2: Recommended Solar PV Plant Energy for Reducing CO_2 Emissions:

No	Particulars	Value	Unit
1	Annual Solar Energy to be Generated	**108613**	kWh
2	1 kWh of Electrical Energy is equivalent to	**0.9**	Kg of CO_2
3	Annual Reduction in CO_2 Emissions, =1*2/1000	**97.75**	MT

Comment: From the above table it is clearly find that the yearly generated 97.75 MT of CO_2 emissions can be decreased by installing a roof top solar PV plant.

CHAPTER IV
STUDY OF INDOOR AIR QUALITY

4.1 Importance of Air Quality:

Air: The common name given to the atmospheric gases used in breathing and photosynthesis.

By volume, Dry Air contains 78.09% Nitrogen, 20.95% Oxygen, 0.93% Argon, 0.039% carbon dioxide, and small amounts of other gases.

On average, a person inhales about **14,000 liters** of air every day. Therefore, poor air quality may affect the quality of life now and for future generations by affecting the health, the environment, the economy and the city's livability.

Rapid urbanization and industrialization have added other elements/compounds to the pure air and thus caused the increase in pollution. In order to prevent, control and abate air pollution, the Air (Prevention and Control of Pollution) Act was enacted in 1981.

Air quality is a measure of the suitability of air for breathing by people, plants and animals.

According to Section 2(b) of Air (Prevention and control of pollution) Act, 1981 '**air pollution**' has been defined as **'the presence in the atmosphere of any air pollutant.'**

4.2 Air Quality Index:

An **Air Quality Index (AQI)** is a number used by government agencies to measure the **air pollution** levels and communicate it to the population.

We present herewith following important Parameters.

1. AQI- Air Quality Index
2. PM-2.5- Particulate Matter of Size 2.5 micron
3. PM-10- Particulate Matter of Size 10 micron

Table No 3: Indoor Air Quality Parameters at some places:

No	Location	AQI	PM-2.5	PM-10
1	SRIT Principle office	77	25	56
2	SRIT Class rooms	85	27	57
3	SRIT Library	76	25	50
	Maximum	**85**	**27**	**57**
	Minimum	**76**	**25**	**50**

From the analysis of indoor air quality, it is identified that the institute air quality is satisfactory as per the air quality standards.

CHAPTER V
STUDY OF INDOOR COMFORT CONDITION PARAMETERS

In this Chapter, we present the various Indoor Comfort Parameters measured during the Audit.
The Parameters include:

1. Temperature
2. Humidity
3. Lux Level
4. Noise Level.

Table No 4: Study of Indoor Comfort Condition Parameters:

No	Location	Temperature, ^{0}C	Humidity, %	Lux Level	Noise Level, dB
1	SRIT Principle office	28	52	320	39
2	SRIT Class rooms	36.5	59	265	51
3	SRIT Library	32	57	285	41
	Maximum	**36.5**	**59**	**320**	**51**
	Minimum	**28**	**52**	**265**	**39**

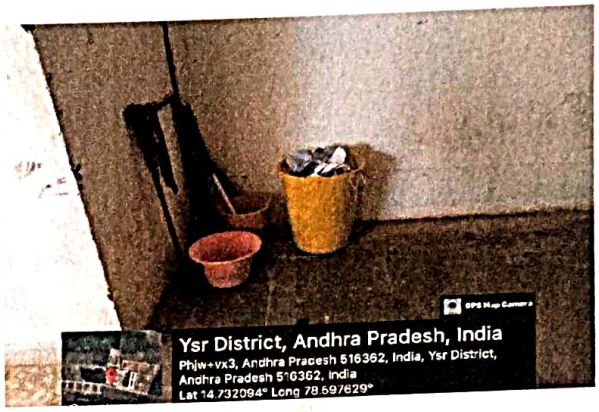
The thermal comfort conditions are satisfactory with desired humidity, temperature and required level of lighting in the classrooms and library and also the noise level is minimum.

CHAPTER VI
STUDY OF WASTE MANAGEMENT AND RECOMMENDATIONS

6.1 Segregation of Waste at Source:

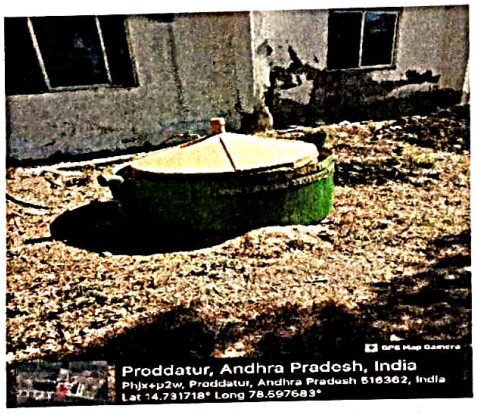
The Waste is segregated at source and the recyclable waste, like paper waste is handed over to authorized waste collecting agent for further recycling.

Photograph of Waste Collection Bin:



6.2 Organic Waste Management:

The institute is running a biogas plant to handle the organic waste generated from the hostels and gardens as shown below:



6.3 Sanitary Waste Management:

The institute is installed a sanitary burning machine at college washrooms.

6.4 Liquid Waste Management:

The institute is recommended to install a Sewage Treatment Plant of Capacity **6 KLPD**. So that the treated Water can be used for gardening purpose.

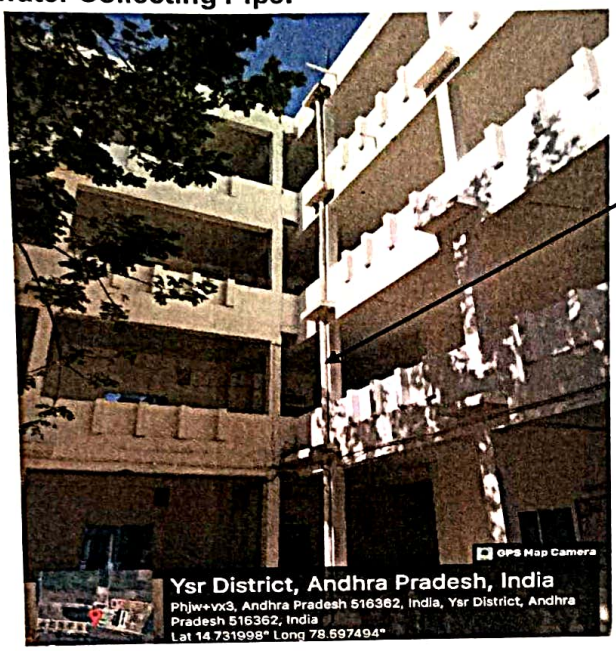
6.5 E Waste Management:

The Institute consist of a Memorandum of Understanding with Friends Computers, Proddatur for disposal of E-Waste.

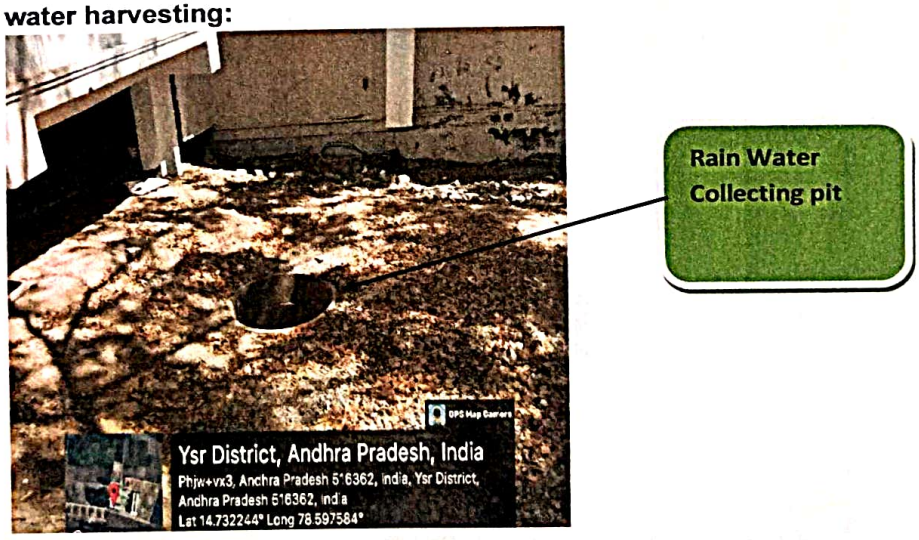
CHAPTER-VII
STUDY OF RAIN WATER MANAGEMENT

The Institute has implemented the Rain Water Management Project. The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used to increase the Underground Water Table as well as to recharge the bore well.

Photograph of Rain water Collecting Pipe:



Separate Pits for rain water harvesting:

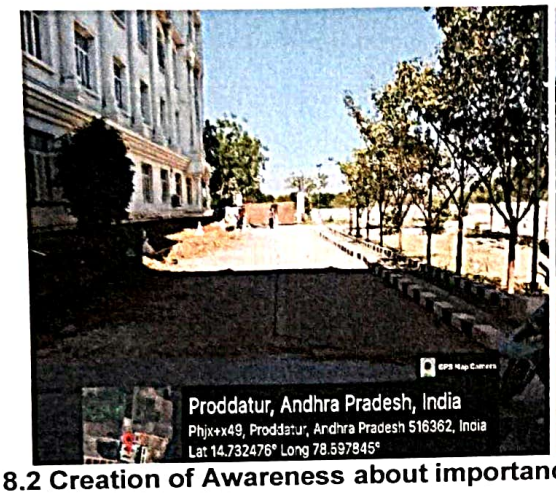


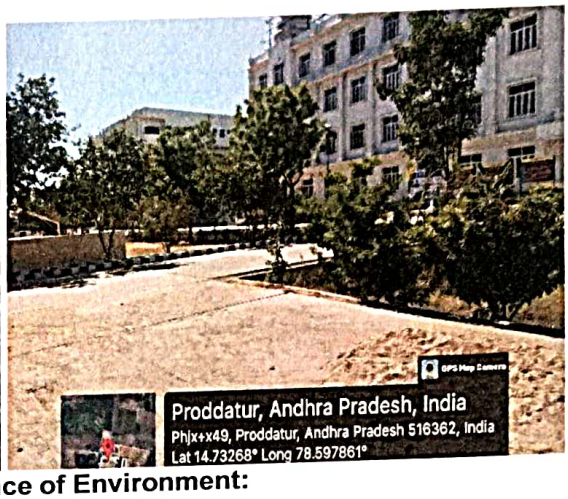
CHAPTER-VIII
STUDY OF ECO-FRIENDLY INITIATIVES

8.1 Internal Tree Plantation:

The Institute has well maintained landscaped Lawn and Garden in the campus.

Photograph of Internal Tree plantation on either side of roads:

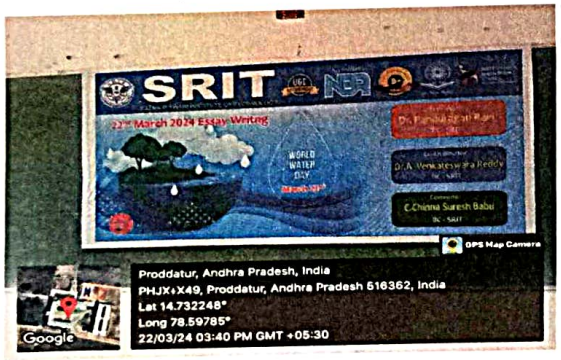


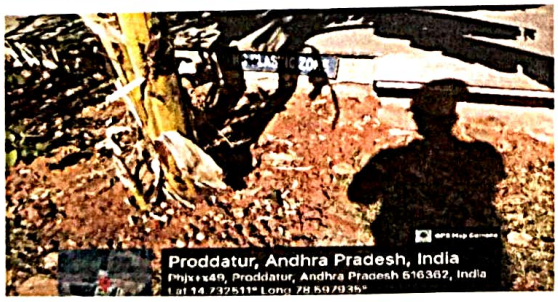


8.2 Creation of Awareness about importance of Environment:

The Institute has displayed posters emphasizing on importance of proper water usage and plastic free campus:

Some Events/photographs on environment awareness:





ANNEXURE-I:

AIR QUALITY, NOISE & INDOOR COMFORT STANDARDS:

1. Category Wise Air Quality Index Values & Concentration of PM 2.5 & PM10:

No	Category	AQI Value	Concentration Range, PM 2.5	Concentration Range, PM 10
1	Good	0 to 50	0 to 30	0 to 50
2	Satisfactory	51 to 100	31 to 60	51 to 100
3	Moderately Polluted	101 to 200	61 to 90	101 to 250
4	Poor	201 to 300	91 to 120	251 to 350
5	Very Poor	301 to 400	121 to 250	351 to 430
6	Severe	401 to 500	250 +	430 +

2. Recommended Noise Level Standards:

No	Location	Noise Level dB
1	Auditoriums	20-25
2	Outdoor Playground	55
3	Occupied Class Room	40-45
4	Un occupied Class Room	35
5	Apartment, Homes	35-40
6	Offices	45-50
7	Libraries	35-40
8	Restaurants	50-55

3. Thermal Comfort Conditions: For Non-conditioned Buildings:

No	Parameter	Value
1	Temperature	Less Than 33^{0}C
2	Humidity	Less Than 70%

For ENCFD Energy Services,

Obula Reddy Kummitha,
B Tech, M Tech & Ph.D.
BEE Certified Energy Auditor, EA-10953

RAVI PANDURANGAN

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