TAMIL NADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

Melakottaiyur, Chennai-127

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

6.5.2 : Institution has adopted the following for Quality assurance*:*

1.Academic and Administrative Audit (AAA) and follow up action taken
2.Conferences, Seminars, Workshops on quality conducted
3.Collaborative quality initiatives with other institution(s)
4.Orientation programme on quality issues for teachers and students
5.Participation in NIRF and other recognized ranking like Shanghai Ranking, QS Ranking Times Ranking etc
6.Any other quality audit recognized by state, national or international agencies

GREEN & ENERGY AUDIT

S.No.	Supportive Documents	Page No.
1	GREEN AUDIT	03 – 55
2	ENERGY AUDIT	56 – 117
3	Green Campus, Environment and Energy Usage Policy	118 – 125
4	GREEN CAMPUS – MIYAWAKI FOREST	126 – 138
5	GREEN CAMPUS AWARDS	139 – 143

தமிழ்நாடு உடற்கல்வியியல் மற்றும் விளையாட்டுப் பல்கலைக்கழகம்
TAMIL NADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY
(Estd. by the Govt. of Tamil Nadu Under Act No.9 of 2005. A State Govt. University)
Accredited with 'B' Grade by NAAC
Website : www.tnpesu.org
Email : regtnpesu@gmail.com
Phone No : 044-27477906
reg.sec.tnpesu@gmail.com
Vandalur - Kelambakkam Road, Melakottaiyur Post, Chennai – 600 127. Tamil Nadu. India

Dr. I. LILLY PUSHPAM
Registrar

19.06.2024

Certificate

It is certified that the supportive documents enclosed are related to the metrics 6.5.2 under Criteria 6 regarding Institution has adopted the following for Quality assurance: Academic and Administrative Audit (AAA) and follow up action taken, Conferences, Seminars, Workshops on quality conducted, Collaborative quality initiatives with other institution(s), Orientation programme on quality issues for teachers and students, Participation in NIRF and other recognized ranking like Shanghai Ranking, QS Ranking Times Ranking

Registrar
Registrar
Tamilnadu Physical Education and Sports University
Chennai - 600 127.

TAMIL NADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

Melakottaiyur, Chennai-127

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

GREEN AUDIT

S.No.	Supportive Documents	Page No.
1	**GREEN AUDIT 2023**	**04 – 39**
2	**GREEN AUDIT 2021**	**40 – 55**

Criterion 6 - Governance, Leadership and Management
Key indicator – 6.5.2

GREEN AUDIT 2023

GREEN &ENVIRONMENT AUDIT REPORT

TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY
MELAKOTTAIYUR,CHENNAI-600127

MARCH 2023
QRO CERTIFICATIONS
CHENNAI

TABLE OF CONTENTS

Topic	Page No.
Executive Summary	1
Introduction	1
About the College	2
Objectives of the study	3
Benefits of Green Audit	3
Methodology	4
Observation and Recommendations	4
Water Use	4
Waste Management	8
E Waste Management	11
Green Area Management	14
Sanitation and hygiene	22
Green initiatives and best practices	23
Environmental Monitoring	24
Conclusions	28
Acknowledgement	29
Annexure- I	30
Annexure-II	31
Annexure-III	32
Annexure-IV	33

Green &Environment Audit Report - 2023
TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

Executive Summary

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 institute which will pave way for sustainable development.

TNPESU believes that there is an urgent need to address these fundamental environmental problems and reverse the trends. The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the Green Policy adopted by the institution.

It works on the several facets of 'Green Campus' including Water Conservation, Tree Plantation, Waste Management, Paperless Work, and Alternative Energy. With this in mind, the specific objectives of the audit was to evaluate the adequacy of the management control framework of environment sustainability as well as the degree to which the Departments are in compliance with the applicable regulations, policies and standards. It can make a tremendous impact on student health and learning college operational costs and the environment. The criteria, methods and recommendations used in the audit were based on the identified risks.

Introduction

Green audit was initiated with the beginning of 1970s with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. It is known as the systematic identification, quantification, recording, reporting and analysis of components of environmental diversity.

It is the duty of organizations to carry out the Green Audits of their ongoing processes for various reasons such as; to make sure whether they are performing in accordance with relevant rules and regulations, to improve the procedures and ability of materials, to analyze the potential duties and to determine a way which can lower the cost and add to the revenue.

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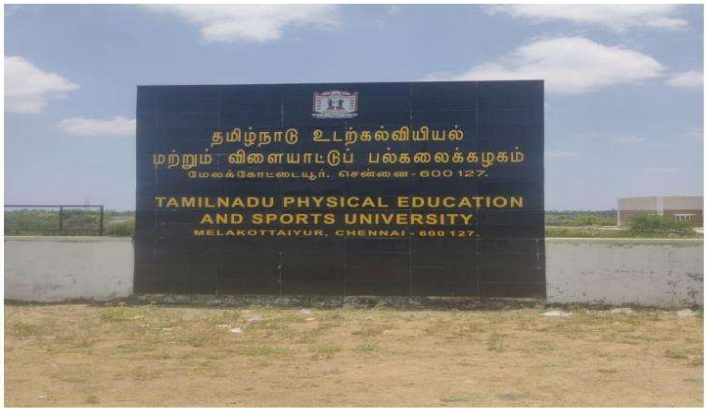
Green Audit is assigned to the Criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India that declares the institutions as Grade a, Grade B or Grade C according to the scores assigned at the time of accreditation. The intention of organizing Green Audit is to upgrade the environment condition in and around the institutes, colleges, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmental friendly institute.

About the College

The Tamil Nadu Physical Education and Sports University established by an Act of the Government of Tamil Nadu in 2004, is unique and the first of its kind in India as an affiliatory University, exclusively for Physical Education and Sports Accredited with ISO 9001 – 2015 Certification for Quality Management System It has been recognized as a premier institution of higher learning for job-oriented courses.



The campus is spread over an area of 127 acres of land with Huge built up area .The college offers Under Graduate Courses and Post Graduate and Research courses in Sports and Allied Fields & There are 421 students and 30 teaching faculty in the college which is promising to grow rapidly.

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The College offers job-oriented courses, extra-curricular activities and technologically advanced facilities accessible to the faculty, the students and the support staff. Here, each individual is encouraged to step beyond the confines of academic and administrative disciplines to explore and intervene in the larger interests of the TNPESU community that thrives on participation and the desire to venture into newer vistas.

Objectives of the Study

The main objective of the green audit is to promote the Environment Management and Conservation in the College Campus. The purpose of the audit is 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:

- To introduce and aware students to real concerns of environment and its
- Sustainability.
- To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use of the campus.
- To establish a baseline data to assess future sustainability by avoiding the
- Interruptions in environment that are more difficult to handle and their corrections requiring high cost.
- To bring out a status report on environmental compliance.

Benefits of green audit

- Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the college.
- Impart environmental education through systematic environmental Management approach and Improving environmental standards
- To create a green campus.
- To enable waste management through reduction of waste generation, solid- waste and water recycling.

3

Methodology

In order to perform green audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the following areas to summarize the present status of environment management in the campus:

- Water management
- Energy Conservation
- Waste management
- E-waste management
- Green area management
- Environment Monitoring

Observations and Recommendations

Water Use

The study observed that the main source of water for the institute is received from two bore wells. Water is used for drinking purpose, toilets and gardening. The waste water from the RO water purifier is used for gardening purpose. During the survey, no loss of water is observed, neither by any leakages, or by over flow of water from overhead tanks. The data collected from all the departments is examined and verified. On an average the total use of water in the college is 30,000 L/day, which include 23,000 L/day for domestic, 5,000 L/day for gardening purposes and 2,000 L/day for drinking purpose.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

Pond inside the Campus

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

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TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

Rain water harvesting units are also functional for recharging ground water level. The rain water collected from all floors of the building and Harvested in the recharge well available inside the campus .

Rain Water Harvesting Implemented inside the campus

6

Recommendations

- There is a need for monitoring and controlling overflow and periodically supervision drills should be arranged.
- Minimize wastage of water and use of electricity during the reverse osmosis process and ensure that the equipment used are regularly serviced and in good condition.
- The cleaning products used by staff should have a minimal detrimental impact on the environment. They should be biodegradable and non-toxic.
- Ensure that all cleaning products used by college staff have a minimal detrimental impact on the environment, i.e. they are biodegradable and non-toxic, even where this exceeds the Control of Substances Hazardous to Health (COSHH) regulations.
- Gardens should be watered by using drip/sprinkler irrigation system to minimize water use.

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Waste Management

This indicator addresses waste production and disposal of different wastes like paper, food, plastic, biodegradable, construction, glass, dust etc. Furthermore, solid waste often includes wasted material resources that could otherwise be channeled into better service through recycling, repair, and reuse. Solid waste generation and management is a burning issue. Unscientific handling of solid waste can create threats to everyone. The survey focused on volume, type and current management practice of solid waste generated in the campus.

Observations

Liquid waste management

They have a **Mini RO plant** in all the blocks which is easily access to all the students &staffs to provide water for drinking and Cooking Purpose in Mess & Canteen

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KEY INDICATOR – 6.5.2

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TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

Purified Water in all the Blocks

Solid waste management

Waste generated from tree droppings and lawn management is major solid waste generated in the campus. Separate dustbins are provided for Bio-degradable and Plastic waste in order to segregate them at the source itself. Single sided used papers are reused for writing and printing in all the departments to minimize the usage of papers. Important and confidential reports/ papers are sent for pulping and recycling after completion of their preservation period.

Chemical waste generated in laboratories that are potentially hazardous are segregated. Very less plastic waste (0.1Kg/day) is generated by some departments, office, garden etc Metal waste and wooden waste is stored and sent to authorized scrap agents for further processing. Glass bottles are reused in the laboratories.

The college had Placed separate bins to collect biodegradable and non-biodegradablewaste generated in the campus.

9

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

Green &Environment Audit Report - 2023
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Separate Bins for Degradable & Non Bio Degradable

Plastic Free Campus

10

Recommendations

- The amount of waste generated from classrooms and staff rooms can be minimized.
- Full use of all recycling facilities provided by City Municipality and private suppliers can be utilized for waste disposal.
- Sufficient, accessible and well-publicized collection points can be made available for recyclable waste, with responsibility for recycling clearly allocated.
- If Biomedical Waste Accumulated Ensure to Proper Government Authorized Vendor to collect it.
- Solid Waste Management awareness Training Recommended for all the works one who are Involved in Gardening & Sweeping Work

E-waste Management

E-waste is a consumer and business electronic equipment that is near or at the end of its useful life. This waste makes up about 5% of all municipal solid waste worldwide. It is hazardous than other waste because electronic components contain cadmium, lead, mercury, and Polychlorinated biphenyls (PCBs) that can damage human health and the environment.

Observations

E-waste generated in the campus is of minimal quantity. It is being effectively managed, keeping in mind the environmental hazards that may arise if not disposed properly.

The cartridges of laser printers are refilled outside the college campus. Administration Awareness programmes are being conducted regarding E-waste Management in various departments. The E- wastes and defective items from computer laboratories are being stored properly.

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TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

The dismantled hardware of personal computers are used in PC trouble shooting lab. This is put to use to conduct practical courses for Students and The dismantled electronic spare parts are immediately sold for reuse. The minimal amount of e-waste that is generated after reusing is sent to recycler at specific intervals.

E-Waste is Properly Collected in the campus

E-Waste is Properly Collected and Disposed Frequently

Recommendations

- Use reusable resources and containers and avoid unnecessary packaging wherever possible.
- The management should take an initiative to purchase recycled resources when they are available.
- Recycle or safely dispose of white goods, computers and electrical appliances.
- The Management engage proper Vendor to dispose the E Waste frequently.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

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TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

Green Area Management

This includes the plants, greenery and sustainability of the campus to ensure that the buildings conform to green standards. This also helps in ensuring that the Environmental Policy enacted, enforced and reviewed using various environmental awareness programmes.

Observations

Campus is located in the vicinity of many trees (species) to maintain the bio-diversity. Various tree plantation programs are being organized at college campus and surrounding villages through NSS (National Service Scheme) unit. This program helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among villagers. The plantation program includes various type of indigenous species of ornamental and medicinal wild plant species.

The college cultivates vegetables for its own use through organic farming initiatives.

Green Area Management Inside The campus

14

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KEY INDICATOR – 6.5.2

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TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

15

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KEY INDICATOR – 6.5.2

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TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

Green Belt Across The campus

16

MIYAWAKI FOREST

A Miyawaki forest has been planted in the north-east corner of the campus Miyawaki is a technique pioneered by the Japanese botanist, Akira Miyawaki that helps build dense, native forests. The approach ensures plants to grow 10 times faster and the resulting plantation will be 30times denser than usual. It involves planting dozens of native species in the same area, and becomes maintenance-free after the first three years.

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KEY INDICATOR – 6.5.2

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Miyawaki Forest Inside The campus

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World Environment Day Celebrated Inside The campus

19

Sanitary Napkin Incinerator

To educate and create awareness of use of Sanitary Napkins and provide easy access to Sanitary Napkins by installation Simple Vending Machines in our girls toilet so that Girls/Women get habituated to use this Sanitary Napkins for their better health care. Secondly, to solve the problem of sanitary napkin disposal by installing incinerators which shall reduce spread of infection due to unhygienic disposal of sanitary napkins, reduce environmental pollution due to non-biodegradable sanitary napkins and reduce clogging of public drainage system due to spongy nature of napkins.

Sanitary Napkin Incinerator inside The Campus

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KEY INDICATOR – 6.5.2

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TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

Recommendations

- Review periodically the list of trees planted in the garden, allot numbers to the trees and keep records. Assign scientific names to the trees.
- Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service.
- Create awareness of environmental sustainability and take actions to ensure environmental sustainability.
- Establish a College Environmental Committee that will hold responsibility for the enactment, enforcement and review of the Environmental Policy. The
- Environmental Committee shall be the source of advice and guidance to staff and students on how to implement this Policy.
- Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation and findings.
- Indoor plantation to inculcate interest in students, Bonsai can planted in corridor to bond a relation with nature.
- Green library should be established.

Sanitation and Hygiene

Unsafe operation of educational institution can lead to transmission of diseases. It can cause negative impacts to students, their families, institute reputation and overall development. Therefore, good health and sanitation practices are very important especially considering the ongoing Covid'19 pandemic.

The provision of safe water and sanitation facilities is a first step towards a healthy physical learning environment. However, the mere provision of facilities does not make them sustainable or ensure the desired impact. Hygiene practices are employed as preventative measures to reduce the incidence and spreading of disease. Hygiene education aims to promote those practices that will help prevent water and sanitation-related diseases as well as inculcating healthy behaviours in the future generation of

adults. Therefore, the combination of facilities, correct behavioural practices and education are meant to have a positive impact on the health and hygiene conditions of the community as a whole, both nowand in the future.

1.Drinking water: Clean water as per drinking water standards have been ensured to students through Reverse Osmosis plant. RO plants of different capacity (6 nos.) have been installed.

2.Water Supply: Adequate and clean water supply through Public Water Supply and borewell system has been ensured.

3.Sanitation: Adequate number of urinals/toilets have been operational in main Campus, Hostel, and Other areas. No open and flowing latrines were noticed. Sanitation facilities are found to be proper and adequate.

4.Waste Management: Waste management bins are placed at each block to store and dispose through municipality. During audit, no unattended waste dumping was noticed.

5.Awareness: Hygiene awareness posters especially related to Covid'19 is displayed atvarious locations in the campus. Overall, campus follows very good sanitation practices.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
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TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

Green Initiatives and Best Practices

The list of few important green initiatives and good environmental practices adopted by the campus is given below.

- Rainwater harvesting pits are constructed at appropriate locations to improve local ground water table.
- Installed solar Plant to meet partial power requirement of the Campus
- Replaced 60% of CFL lights with LED lights as part of energy conservation measures. Also, some of the old fans were replaced with energy efficient super fans.
- Engagement of authorized paper recycling vendor to manage bulk paper waste generated.
- Establishment of Organic Cultivation
- Celebration Of World Environment Day and creating Environment Awareness to all Students & Staffs
- Restricted movement of vehicles inside the campus. Parking space inside campus is provided for vehicles, however, no movement of vehicles inside campus is encouraged.
- Awareness posters on resource conservation, good sanitation and hygiene drive.
- Strictly follow the Plastic Free zone inside the campus is Encouraged.

Environmental Monitoring

As part of green audit of campus, the Green Audit Assessment Team has carried out the environmental monitoring of campus. This includes Illumination, Noise level, ventilation and indoor Air quality of the class rooms. It was observed that Illumination and Ventilation is adequate considering natural light and air velocity present. Noise level in the campus is well below the limit.

The following surveys were conducted:

1. Ambient air quality by NABL approved air sampler
2. Lux monitoring
3. Noise monitoring
4. Co2 Monitoring

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

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TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

Ambient Air Quality Monitoring

Ambient air quality monitoring can help in providing a strategic solution towards air purification and help lead a safer life. Also, air quality monitoring in the college campus not only develops trust among the parents but ensures that the administration cares about their Students and Staff.

Ambient Air Quality Monitoring Inside the Campus

25

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

Green &Environment Audit Report - 2023
TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

Lux&Noise Monitoring

Illumination is one of the most important environmental factors in the classroom. Many Doctors have discovered that lighting settings have significant impact on students' performance. So Lux monitoring can help in providing a Comfort Vision Environment to Students.

When assessing noise exposure in campus environments, it can be difficult to determine whether the level of sound has reached a point where it interferes with student learning and staff productivity, or worse, becomes a threat to their health and well-being.

Lux & Noise Monitoring Inside The Campus

26

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

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TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

C02 Monitoring

CO2 levels can provide a direct indication of the CFM per person ventilation rate in College classrooms and can provide an ongoing indication if code required ventilation rates are being maintained. It is important to Maintain that CO2 levels a contaminant or pollutant at the levels normally measured in buildings (400 to 2000 ppm).Measurement Based On ASHRAE Standards

Co2 Monitoring Inside The Campus

27

Conclusion

Green audit is a systematic approach to understand the existing environmental practices and identify areas of improvement for attaining an eco-friendly approach to the sustainable development of the college. The report is prepared based on the site visit observations and information provided by the campus.

Overall, TNPESU has taken many environmentally friendly approaches and campaigns in the area of energy, water, solid waste, sanitation and green cover, which is highly commendable.

.The environmental awareness initiatives taken by the management are substantial. The installation of water recycling plants, paperless work system and Solar & Biogas Plant practices are remarkable. Besides, environmental awareness programmes initiated by the administration prove the campus is going green. Few recommendations are added for waste management and waste reduction using alternate eco-friendly and scientific techniques. This may lead to the prosperous future in context of Green Campus and thus aid in a sustainable environment and community development.

Acknowledgement

We are grateful to the management and committee members of Tamilnadu Physical Education and Sports University to award this prestigious project on green auditing. Further we sincerely thank the college staff for providing us the necessary facilities and co-operation during the audit. This ample co-operation helped us a lotin making this audit possible and successful.

FOR IGNITE ENGINEERING

ER.P.VIVEK M.E
LEAD GREEN ASSOCIATE
CHARTERED ENGINEER

FOR IGNITE ENGINEERING

ER.S.KARTHIGA M.E(Ph.d)
LEAD AUDITOR-ENVIRONMENT

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No.38/2, F1 Ranga Flats, Bharathiyar Street, Near Indian Bank,
Hasthinapuram Road, Chrompet, Chennai - 44.
Regional Office : Pondicherry, Coimbatore & Andra Pradesh
Contact : 8778740104, 9384381615 | Email : igniteengg@gmail.com

ISO 9001:2015 ISO14001

AMBIENT AIR MONITORING

Report No	**IES-NO-AR-72-155-2023**	**Report Date:**	**30.03.2023**
Customer Name & Address		Sample Reference No:	IES-NO-AR-72-155-2023
M/s. **TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY CHENNAI**		Sample Description:	Ambient Air
		Sample Drawn by:	Laboratory
		Sample Collected Date:	28.03.2023
		Qty of sample Received:	Filter Paper(2nos) & Approx 25ml Solution(4nos)
		Sample Received On:	28.03.2023
		Test Commenced On:	28.03.2023
		Test Completed On:	30.03.2023
		Sampling Method:	IES-SOP-ARS-01 to 11
		Sample Mark:	Near to Admin Block

S.No	Name of the Test	Test Method	Units	Results	Max. Annual Average Limits Of NAAQs
1.	Ammonia (as NH_3)	CPCB Guidelines,Volume I, NAAQMS/36/2012-13	$\mu g/m^3$	<5.0	100
2.	Arsenic (as As)	CPCB Guidelines,Volume I, NAAQMS/36/2012-13	$\mu g/m^3$	<0.1	6.0
3.	Benzene (as C_6H_6)	IS 5182 (Part 11): 2006 (Reaffirmed 2017)	$\mu g/m^3$	<0.5	5.0
4.	Benza (α) Pyrene(as $C_{20}H_{12}$)	CPCB Guidelines,Volume I, NAAQMS/36/2012-13	$\mu g/m^3$	<0.5	1.0
5.	Carbon Monoxide (as CO)	Instruments Manual Based SOP No.EL-SOP-ARS-17	$\mu g/m^3$	<1.2	2.0
6.	Lead (as Pb)	IS 5182 (Part 22): 2004 (Reaffirmed 2014) Clause No.5	$\mu g/m^3$	<0.5	0.5
7.	Nickel (as Nil)	CPCB Guidelines,Volume I, NAAQMS/36/2012-13	$\mu g/m^3$	<1.0	20
8.	Oxidants (as Ozone O_3)	IS 5182 (Part IX)- 19747 (Reaffirmed 2014)	$\mu g/m^3$	<10.0	100
9.	Oxidants of Nitrogen (as Ozone NO_2)	IS 5182 (Part 6): 2006 (Reaffirmed 2017)	$\mu g/m^3$	18.1	40
10.	Particulate Matter (as PM_{10})	IS 5182 (Part 23): 2006 (Reaffirmed 2017)	$\mu g/m^3$	32.1	60
11.	Particulate Matter (as $PM_{2.5}$)	EPA 40 CFR Part 50-Appendix L	$\mu g/m^3$	25.1	40
12.	Sulphur Dioxide (as SO_2)	IS 5182 (Part 2): 2001 (Reaffirmed 2017)	$\mu g/m^3$	9.3	50

<--------END OF REPORT---------->

NOTES:
The Concentrations of the parameters tested in the above Location are within the prescribed annual average limits of **NAAQs tolerance limits.**

Report Confirmed by

FOR IGNITE ENVIRONMENTAL SERVICES

Authorized Signatory

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Environmental Testing & Analysis, Calibration of Instruments

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Regional Office : Pondicherry, Coimbatore & Andra Pradesh
Contact : 8778740104, 9384381615 | Email : igniteengg@gmail.com

ISO 9001:2015 ISO14001

AMBIENT AIR MONITORING

Report No	IES-NO-AR-72-156-2023	Report Date	30.03.2023
Customer Name & Address		Sample Reference No:	IES-NO-AR-72-155-2023
M/s TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY CHENNAI		Sample Description:	Ambient Air
		Sample Drawn by:	Laboratory
		Sample Collected Date:	28.03.2023
		Qty of sample Received:	Filter Paper(2nos) & Approx 25ml Solution(4nos)
		Sample Received On:	28.03.2023
		Test Commenced On:	28.03.2023
		Test Completed On:	30.03.2023
		Sampling Method:	IES-SOP-ARS-01 to 11
		Sample Mark:	Near to Boys Hostel

S.No	Name of the Test	Test Method	Units	Results	Max. Annual Average Limits Of NAAQs
1.	Ammonia (as NH_3)	CPCB Guidelines,Volume I, NAAQMS/36/2012-13	$\mu g/m^3$	6.3	100
2.	Arsenic (as As)	CPCB Guidelines,Volume I, NAAQMS/36/2012-13	$\mu g/m^3$	<0.1	6.0
3.	Benzene (as C_6H_6)	IS 5182 (Part 11): 2006 (Reaffirmed 2017)	$\mu g/m^3$	<0.5	5.0
4.	Benza (α) Pyrene(as $C_{20}H_{12}$)	CPCB Guidelines,Volume I, NAAQMS/36/2012-13	$\mu g/m^3$	<0.5	1.0
5.	Carbon Monoxide (as CO)	Instruments Manual Based SOP No.EL-SOP-ARS-17	$\mu g/m^3$	<1.1	2.0
6.	Lead (as Pb)	IS 5182 (Part 22): 2004 (Reaffirmed 2014) Clause No.5	$\mu g/m^3$	<0.5	0.5
7.	Nickel (as Nil)	CPCB Guidelines,Volume I, NAAQMS/36/2012-13	$\mu g/m^3$	<1.0	20
8.	Oxidants (as Ozone O_3)	IS 5182 (Part IX)- 19747 (Reaffirmed 2014)	$\mu g/m^3$	<10.0	100
9.	Oxidants of Nitrogen (as Ozone NO_2)	IS 5182 (Part 6): 2006 (Reaffirmed 2017)	$\mu g/m^3$	24.2	40
10.	Particulate Matter (as PM_{10})	IS 5182 (Part 23): 2006 (Reaffirmed 2017)	$\mu g/m^3$	42.1	60
11.	Particulate Matter (as $PM_{2.5}$)	EPA 40 CFR Part 50-Appendix L	$\mu g/m^3$	21.0	40
12.	Sulphur Dioxide (as SO_2)	IS 5182 (Part 2): 2001 (Reaffirmed 2017)	$\mu g/m^3$	12.3	50

<----------END OF REPORT---------->

NOTES:

The Concentrations of the parameters tested in the above Location are within the prescribed annual average limits of **NAAQs tolerance limits.**

Report Confirmed by

FOR IGNITE ENVIRONMENTAL SERVICES

Authorized Signatory

Criterion 6 - Governance, Leadership and Management
Key indicator – 6.5.2

IGNITE ENVIRONMENTAL SERVICES
An ISO 9001:2015 Certified Organization
Environmental Testing & Analysis, Calibration of Instruments
IGNITE Engineering – THE SPARK OF SOLUTIONS
No.38/2, F1 Ranga Flats, Bharathiyar Street, Near Indian Bank,
Hasthinapuram Road, Chrompet, Chennai - 44.
Regional Office : Pondicherry, Coimbatore & Andra Pradesh
Contact : 8778740104, 9384381615 | Email : igniteengg@gmail.com
ISO 9001:2015 ISO14001

NOISE MONITORING

Report No	**EL-NO-NE-26-755-2023**	**Report Date:**	**30.03.2023**
Customer Name & Address ***M/s. TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY*** ***CHENNAI-127***		Sample of Reference No:	IES-NO-IN-26-755-2023
		Sample Description:	Light
		Monitoring By:	Laboratory
		Monitoring Date:	30.03.2023
		Data received On:	30.03.2023
		Sampling Method:	IS:9989- 1981 (Reaffirmed 2001)
		Monitoring unit:	Db (A)

S.no	Name of the Location	Monitoring Distance in m	Monitoring Time	Day Time (6.00 a.m -10.00 p.m)		
				Minimum	Maximum	L Equivalent
1.	Central Library	Site	11 AM –12PM	58.9	59.3	57.3
2.	Office	Site	11 AM –12PM	60.9	65.3	62.1
3.	VC Room	Site	11 AM –12PM	57.0	59.0	55.6
4.	Canteen	Site	11 AM –12PM	59.2	61.5	60.0
5.	Computer Lab	Site	11 AM –12PM	55.1	62.1	57.3
Permissible Limit For Noise as Per The Factories Rules 1950				Maximum 90.0		

<----------End of Report---------->

NOTES:
The sound levels tested in the above locations are within the prescribed limits of **Factories rules 1950 Standard Limits**

Report Confirmed by

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Environmental Testing & Analysis, Calibration of Instruments

IGNITE Engineering – THE SPARK OF SOLUTIONS

No.38/2, F1 Ranga Flats, Bharathiyar Street, Near Indian Bank,
Hasthinapuram Road, Chrompet, Chennai - 44.
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Contact : 8778740104, 9384381615 | Email : igniteengg@gmail.com

ISO 9001:2015 ISO14001

ILLUMINATION MONITORING

Report No	**IES-NO-IN-26-756-2023**	**Report Date:**	**30.03.2023**
Customer Name & Address		Sample of Reference No:	IES-NO-IN-26-756-2023
M/s. TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY		Sample Description:	Light
		Monitoring By:	Laboratory
CHENNAI-127		Monitoring Date:	30.03.2023
		Data Received On:	30.03.2023
		Sampling Method:	IS:9989- 1981 (Reaffirmed 2001)
		Monitoring unit:	Db (A)

S.no	Name of the Location	Monitoring Distance in m	Monitoring Time	Day Time (6.00 a.m -10.00 p.m)		
				Minimum	Maximum	L Equivalent
1.	Central Library	0.9	11 AM –12PM	349	431	409
2.	Office	0.9	11 AM –12PM	228	239	242
3.	VC Room	0.9	11 AM –12PM	304	322	320
4.	Canteen	0.9	11 AM –12PM	561	567	212
5.	Computer Lab	0.9	11 AM –12PM	423	446	434
Permissible Limit For Light as Per The Factories Rules, 1950				Maximum 65		

<----------End of Report---------->

NOTES:
The above Location Light levels are fulfill the necessities of **Factories Rules 1950 standard.**

Report Confirmed by

FOR IGNITE ENVIRONMENTAL SERVICES

Authorized Signatory

IGNITE ENGINEERING EHSE DIVISION

IGNITE ENVIRONMENTAL SERVICES

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Environmental Testing & Analysis, Calibration of Instruments

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No.38/2, F1 Ranga Flats, Bharathiyar Street, Near Indian Bank,
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Regional Office : Pondicherry, Coimbatore & Andra Pradesh
Contact : 8778740104, 9384381615 | Email : igniteengg@gmail.com

ISO 9001:2015 ISO14001

TEST REPORT

Sample Ref No: EES/AS/544/2023	Date of Sampling: 28.03.2023
Issued To:	Report Date/Report No: 30.03.2023

M/s. TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY
Melakottaiyur Chennai-600127

Page 1 of 1

Group :Atmospheric Pollution	Sample Drawn By/Date : IES/28.03.2023
Discipline : Chemical Testing	Received On : 28.03.2023
Sample Description : Indoor Air Quality	Analysis Commenced On : 28.03.2023
Sampling Method : IS 5182, NIOSH & SOP	Analysis Completed On : 30.03.2023

Sl. No	Sampling Location	UNIT	RESULT Carbon-di-oxide (CO_2)	ASHRAE LIMITS
1	Central Library	ppm	385	1000
2	Office	ppm	415	
3	Principal Room	ppm	488	
4	Canteen	ppm	414	
5	Computer Lab	ppm	377	
6	Biomechanics	ppm	471	

ASHRAE- American Society of Hearing Refrigerating and Air-Conditioning Engineers,

----------End of Report----------

Authorized Signatory

Note 1. Test result shown in this test report relate only to the items tested

2. This test Report shall not be reproduce anywhere except in full and in same format without the approval of the Laboratory

GREEN AUDIT 2021

TUV INDIA
TUV NORD GROUP

Registered & Head Office :
TUV INDIA PRIVATE LIMITED
827, 2nd floor, Dhun Building
Anna Salai,
Chennai 600 002, India
CIN : U74140MH1989PTC052930
Phone : (044) 28528875 / 1052
Toll Free : 1800-209-0902
Fax : (044) 28521676
Email : chennai@tuv-nord.com
Website : www.tuv-nord.com/in

Date: 5th March 2021

Certification

This is to certify that the **Green, Energy and Environment Audit** at **Tamil Nadu Physical Education & Sports University** has been successfully completed for the period 2019-21 and found that **Tamil Nadu Physical Education & Sports University** conform to the norms of standard Green Practices. The audit was conducted during the month of February 2021.

N Pradeep Kumar

Associate Vice President – Certification, Tamil Nadu Region

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

GREEN AUDIT

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

8 GREEN HOUSE GAS EMISSION

Climate change resulting from human activities is now recognised as one of the most pressing environmental issues facing the world's population. In addressing this problem, governments, the international community and industry are moving to control emissions of greenhouse gases (GHGs), setting targets such as those agreed at the Kyoto Conference in 1997. These moves will continue in the future and, inevitably, businesses and other organizations will increasingly have to account for and report on GHG emissions.

In the college campus total occupants is 847 (approx..) and 367 students are stay in the college hostel and we consider the total travel distance per day is 20 km(approx..) and GHG emission for per kilo meter is 0.000185 tCO_2 / Km. So per day CO_2 emission level is 1.77 tCO_2 for travelling. The total energy unit consumption is 21,82,442 kWh per year and CO2 emission factor for electricity is 0.85. It is equivalent to 1855 tons of CO2. For HVAC system installed capacity is 152 TR and charged refrigerant quantity is 60.5 GWP tons and standard refrigerant gas leakage is 2%, It is equivalent to 1.2 tons of CO2. For Diesel operated 63 KVA DG is installed in site and one-year fuel consumption is 839 liters and CO2 emission factor for diesel is 0.00268 tCO2/liter. So one year CO2 emission from DG is 2.24 tCO2.

Total Global Warming Impact in CO2 Equivalent

S No	GHG source	Tonnes of CO2 Equivalent
1	Road Transport	1.77
2	Electricity	1855
3	HVAC System	1.2
4	DG Operation	2.24
	Total GHG Emission	**1860.21**

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

9 SITE OBSERVATION REPORT

Site Observation Report (SOR)			
Report No.	C&A/SOR/01	**Date**	28.02.2021
Location	College Campus		
Observation Images			

Description
Treated drinking water is provided for the whole campus.
Potential Sustainability Measures
Purified drinking water dispenser is kept at each floor level.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

Site Observation Report (SOR)			
Report No.	C&A/SOR/02	**Date**	28.02.2021
Location	Hostel Mess		
Observation Images			

Description
In hostel canteen 20 m3 bio gas plant is installed.
Potential Sustainability Measures
It is recommended to use the cattle dung use in the bio gas plant.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

Site Observation Report (SOR)			
Report No.	C&A/SOR/03	**Date**	28.02.2021
Location	HVAC System		
Observation Images			

Description
High Efficient AC System.
Potential Sustainability Measures
It reduces the power consumption and it is highly efficient.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

Site Observation Report (SOR)			
Report No.	C&A/SOR/04	**Date**	28.02.2021
Location	Dust Bin		

Observation Images

Description

Different type waste collection bins are kept for the collection of waste.

Potential Sustainability Measures

This measure helps in reducing the segregation of waste at source.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

Site Observation Report (SOR)			
Report No.	C&A/SOR/05	**Date**	28.02.2021
Location	Hostel Mess		

Observation Images

Description

Good ventilation and Day light is available in the hostel mess

Potential Sustainability Measures

In the hostel mess good daylight and ventilation are available, it gives good atmosphere to the students have their food.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

Site Observation Report (SOR)			
Report No.	C&A/SOR/06	**Date**	28.02.2021
Location	Academic Block Terrace		
Observation Images			

Description
Cooling tiles are installed in the academic block terrace area
Potential Sustainability Measures
This helps in reducing the HVAC consumptions and maintain the good thermal comfort.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

Site Observation Report (SOR)			
Report No.	C&A/SOR/07	**Date**	28.02.2021
Location	Rest Room		

Observation Images

Description

In rest rooms water urinals are installed.

Potential Sustainability Measures

To reduce water consumption, these urinals shall be replaced with Water less urinals.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

Site Observation Report (SOR)			
Report No.	C&A/SOR/08	**Date**	28.02.2021
Location	Roof Top Solar PV		

Observation Images

Description

Work Order is released for Roof top solar PV.

Potential Sustainability Measures

20kVA solar photovoltaic energy plant is going to install in the roof top and it is connecting with net metering.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

10 PERFORMANCE IMPROVEMENT MEASURES (PIM'S)

PIM 1: Water saving through the efficient dual flush water closet

Annual Water Savings	1281.6 L/annum
Recurring Annual Savings Potential	Rs. 0.11 Lakhs
One-time Cost of Implementation	Rs.0.05 Lakhs
Payback period	6 Months

Present System:

Presently average water flow in the faucets is 8 LPM it is high compared to the NBC Standards. This leads to lot of water consumption.

Proposed System:

It is recommended to install low flow aerator based faucets in the flow rate of 2.4 LPM as per the standards in common/lavatory rooms. This saves huge of water consumption.

Description	Value	Units	Formula
Average measured flow	8	LPM	A
Average usage per day	60	min/day	B
No of taps	60	Nos.	C
Annual water consumption	8,640	KL/yr	D =(AxBxCx300)/1000
Water consumption cost (Approx.)	9	Rs/KL	E
Present Water Consumption cost	77,760	Rs/Yr	F=ExD
After installing aerators 70% water reduction	2.4	LPM	G
Annual water Savings	7358.4	KL/yr	H =((A-G)xBxCx365))/1000
Annual Saving, Rs	0.11	Lakhs	I=HxE
Investment, Rs	0.05	Lakhs	J
Payback period	6	Months	K=J/Ix12

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

PIM 2: Tube light lamps to be changed with appropriate LED lamps to reduce power consumption

Annual Energy Savings	2520 kWh/annum
Recurring Annual Savings Potential	Rs. 0.25 Lacs
One-time Cost of Implementation	Rs. 0.5 Lacs
Payback period	24 months

Present System

During the survey, it is observed that some class room and exterior lights are 36W tube lamps are installed with electronic/electromagnetic ballast. These lamps are outdated and power consumption is higher with low lumens output.

Proposed System

It is recommended to replace 15W LED lamps. It gives more lumens and reduces power consumption.

Description	Value	Units	Formula
Total power consumption in Exterior Lighting	1	kW	A
Present Annual Operating Hours	4,200	hrs	B
Present Annual Energy Consumption	4,200	kWh	C=AxB
Proposed Power consumption after installing LED lamps (considering 40% reduction)	0.4	kW	D = (A-(A*40%))
Proposed Energy Consumption	1680	kWh	E=DxB
Proposed Energy savings in Units	2520	kWh	F=C-D
Power cost	10.2	Rs/kWh	G
Annual Power cost savings	0.25	Rs	H =FXG
One-time cost of implementation	0.5	Rs	I
Payback period	24	Months	J=I/H x12

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

PIM 3: Replacing old celling fan to Super fans

Annual Energy Savings	16,128 kWh/annum
Recurring Annual Savings Potential	Rs. 1.64 Lakhs
One-time Cost of Implementation	Rs. 4.8 Lakhs
Payback period	35 Months

Present System:

Presently there is old model high energy consumption fans are installed at campus; it is consuming more energy.

Proposed System:

It is recommended to install super fans to reduce the power consumption and armature coil failure.

Description	Value	Units	Formula
Annual Energy Consumption	53760	kWh/yr	A
Proposed Fan Annual Energy Consumption	30	%	B
Annual Energy Savings	16128	kWh/yr	C =BX10%
Unit power cost	10.2	Rs/kWh	D
Annual Cost Savings	1.64	Rs Lakhs	E
One time implementation cost	4.8	Rs lakhs	F
Payback	35	Months	G=F/E x 12

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

PIM 4: Install Solar PV in roof top to reduce overall power consumption

Annual Energy Savings	657, 000 kWh/annum
Recurring Annual Savings Potential	Rs 67 Lakhs
One-time Cost of Implementation	Rs 300.0 Lakhs
Payback period	53 Months

Present System:

Presently TNEB power supply is catering to whole building facility, this leads the power consumption.

Proposed System:

To avoid the TNEB power consumption, this can be avoided by installing Solar PV on Roof Top

Description	Value	Units	Formula
Area of the roof required for PV	40000	Sq.ft	A
Area required for 1 kW PV	100	sq.ft	B
Potential of PV panels	400	kW	C
Average Units generation per kW panel	1,800.0	kWh/day	E = C X 4.5 kWh
Annual Energy Generation	657,000	kWh	F = E X 365
Unit power cost	10.2	Rs/kWh	G
Annual Cost Savings	67	Rs Lakhs	H
One time implementation	300	Rs lakhs	I
Payback	53	Months	J=I/H x 12

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

11 GOOD PRACTICES AT TAMIL NADU PHYSICAL EDUCATION & SPORTS UNIVERSITY CAMPUS

During TUVI's Audit, it is observed that M/s Tamil Nadu Physical Education and Sport University has already adopted the following Performance Improvement Measures in its facility;

12.1 LED Lights in Building facility

LED street light is installed in the college campus is a good replacement of Energy. It reduces the EB energy consumption.

12.2 Solar PV System

Solar PV is installed in the roof top of 20 kW is a good replacement of Energy. It reduces the EB energy consumption.

12.3 Bio Gas

Food Waste is converted to bio gas; it is a good example of waste to Energy. It is reducing the hostel mess LPG consumption.

12.4 Green Campus

The college total site is 125 acers and more than 100 acer is complete green vegetation is retained.

12.5 Shuttle Service

College is operating a shuttle service for students and it is connecting Tambaram bus depot to college. It reduces the overall CO_2 footprint to a great extent with avoiding individual transport.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

ENERGY AUDIT

S.No.	Supportive Documents	Page No.
1	ENERGY AUDIT 2023	57 – 85
2	ENERGY AUDIT 2021	86 – 117

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

ENERGY AUDIT 2023

ENERGY AUDIT REPORT

TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

March 2023

Report by

QRO CERTIFICATIONS

38/2, F1 Ranga Flats, Chrompet, Chennai - 600044
e-mail:qrocertifications@gmail.com mobile number: 8438218994

0

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

TABLE OF CONTENTS

S.No	Topic	Page
1	About the college	2
2	Introduction	3
3	Objectives of Energy Audit	4
4	Benefits of Energy Audit	5
5	Stages of Energy Audit	6
6	Energy Management	8
7	Observations	8
7.1	Solar Panels	9
7.2	Diesel Generator	10
7.3	Biogas Plant	11
8	Carbon Foot Printing	13
9	Power analysis & Audit	16
11	Recommendations	23
12	Conclusion	23
13	Acknowledgement	24

1

1. ABOUT THE COLLEGE

The Tamil Nadu Physical Education and Sports University established by an Act of the Government of Tamil Nadu in 2004, is unique and the first of its kind in India as an affiliatory University, exclusively for Physical Education and Sports. After obtaining the accent from his Excellency the president of India on 5th August 2005, the said act came into force with effect from 15th September 2005. Accredited with ISO 9001 – 2015 Certification for Quality Management System It has been recognized as a premier institution of higher learning for job-oriented courses The College maintains high standards of excellence in the academic sphere and in the physical amenities and facilities intended to implement the educational programme. The College endeavours to enroll students who hold high standards of performance, discipline and achievement.

VISION

"To engage in relentless pursuit of Excellence in the promotion and development of Physical Education and Sports through innovative programmes in teaching, coaching, research and outreach activities and evolve a holistic approach to the betterment of human resources through a harmonious blend of body, mind and spirit**"** "

MISSION

1. To create an ideal academic environment for Learning, Scholarship, Professionalism, and Collaboration that fosters Excellence in active student learning and professional growth.
2. To design and introduce innovative, integrated, inter-disciplinary curriculum in Physical Education and various Sports and games and allied areas and provide Leadership to the Profession.
3. To offer unique graduate, Post-graduate and research Programmes in Physical Education, Sports and allied fields.
4. To produce competent health conscious Physical Education teachers at various levels, who will be fully equipped to impart instruction in Physical Education and undertake physical activity programmes for children and youth.
5. To develop High-Tech research facilities and contribute to the body to knowledge through scholarly work and publications, and disseminate the findings to the professionals, faculty and students.

2

2. INTRODUCTION

The Energy Conservation Act, 2001 defines Energy Audit as "the verification, monitoring, and analysis of the use of energy including submission of technical report containing recommendations for improving energy efficiency with cost-benefit analysis and an action plan to reduce energy consumption".

It is an analysis of energy flows for energy conservation and to find energy losses. It is a process of collection of detailed data related to energy usage and comparison of collected results.It is a process by which we can reduce the amount of energy input to the system without a negative impact on the output.

It includes Inspection, Survey and Analysis of energy flows for energy conservation in a building, a process, or a system to reduce the amount of energy input into the system without negatively affecting the output(s) plugged. It is the quickest, cheapest, and cleanest way to reduce energy consumption.

An energy audit, sometimes referred to as an energy survey or an energy inventory, is an examination of the total energy used in a particular property. The analysis is designed to provide a relatively quick and simple method of determining not only how much energy is being consumed but where and when.

The energy audit will also identify deficiencies in operating procedures and in physical facilities. Once these deficiencies have been identified, it will be apparent where to concentrate efforts to save energy. The energy audit is the beginning of and the basis for an effective energy-management programme.

Increasingly in the last several decades, the demand to lower increasingly expensive energy costs and move towards a sustainable future has made energy audits greatly important.

Criterion 6 - Governance, Leadership and Management
Key indicator – 6.5.2

3. OBJECTIVES OF ENERGY AUDIT

4

4. BENEFITS OF ENERGY AUDIT

- Energy audits will evaluate your facility "as a whole", their goal is not to evaluate single measures but to consider a wide range of available alternatives (Electrical, Mechanical, Envelope and Water).
- It will analyse your historical energy use and find potential issues using statistical methods.
- The audit will not only inform you of opportunities but provide you with financial analysis. This will enable prioritization based on financial benefit and return on investment.
- Provide you with solid, easy-to-understand technical information regarding the proposed energy conservation measures
- Provide you with benchmark information to help you understand your energy use performance compared to others in your field and area.
- Provide you with an emissions analysis to help you understand the benefits of your decisions from an environmental standpoint.
- Understand where energy is used, and which areas are worth focusing on the most (energy hogs).
- The cost-benefit analysis of the audit report would help decision-makers prioritize opportunities and evaluate them as investments.
- These indicators would include, rate of return, net present value, cash flow analysis, and payback.

5. STAGES OF ENERGY AUDIT

A structured methodology to carry out an energy audit is necessary for efficient working. An initial study of the site should always be carried out, as the planning of the procedures necessary for an audit is most important.

The stages of an energy audit are:

- Phase – I Pre-audit phase
- Phase – II Audit phase
- Phase – III Post-audit phase

Phase – I Pre-audit phase

An initial site visit may take one day and gives the Energy Auditor/Engineer an opportunity to meet the personnel concerned, familiarize him with the site, and assess the procedures necessary to carry out the energy audit.

During the initial site visit, the Energy Auditor/Engineer should carry out the following actions:-

- Discuss with the site's senior management the aims of the energy audit.
- Discuss economic guidelines associated with the recommendations of the audit.
- Analyse the major energy consumption data with the relevant personnel.
- Obtain site drawings where available - building layout, steam distribution, compressed air distribution, electricity distribution etc. the site accompanied by engineering/production.

The main aims of this visit are: -

- To finalise the Energy Audit team
- To identify the main energy-consuming areas/plant items to be surveyed during the audit.
- To identify any existing instrumentation/ additional metering required.
- To decide whether any meters will have to be installed prior to the audit eg. kWh, steam, oil, or gas meters.
- To identify the instrumentation required for carrying out the audit.
- To plan with time frame
- To collect macro data on plant energy resources, major energy consuming centers
- To create awareness through meetings/ programme

Phase – II Audit phase

The information to be collected during this audit phase includes:

- Energy consumption by type of energy, by department, by major items of process equipment, by end-use
- Material balance data (raw materials, intermediate and final products, recycled materials, use of scrap or waste products, production of by-products for re-use in other industries, etc.)
- Energy cost and tariff data
- Process and material flow diagrams
- Generation and distribution of site services (eg.compressed air, steam).
- Sources of energy supply (e.g. electricity from the grid or self-generation)
- Potential for fuel substitution, process modifications, and the use of co-generation systems (combined heat and power generation).
- Energy Management procedures and energy awareness training programs within the establishment.

7

Phase – III Post-audit phase

- Plan and schedule an action plan for implementing the corrective measures.
- Follow-up and periodic review.

6. ENERGY MANAGEMENT

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliance, natural gas, and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment. The study carried out also analyzed the use of alternate energy resources that are eco-friendly.

7. OBSERVATIONS

The source of energy for all the buildings within the campus is electricity only. The institution consumes about **1800kW/Month**. However, **20KW** of the daily electricity requirement is supplied from **solar energy**.

The campus contains Lights and fans in use. The entire campus including common facility centers are equipped with LED lamps and LED tube lights, except at few locations. Besides this, photovoltaic cells are also installed in the campus as an alternate renewable source of energy.

Computers are set to automatic power saving mode when not in use. Solar water heaters are installed in hostel buildings and staff quarters as to promote renewable energy. Also, campus administration runs switch–off drill on regular basis. Equipment like Computers is used in power saving mode.

8

7.1 Solar panels

Solar panel systems are extremely durable and require little to no maintenance over their productive lifetime, which can span 25 years or more. Solar systems are also extremely easy to maintain. The main maintenance that these panels require is an occasional dusting to remove dirt, leaves, or any other fragments. Each kilowatt-hour (kWh) of solar that is generated will substantially reduce greenhouse gas emissions like CO_2, as well as other dangerous pollutants such as sulfur oxides, nitrogen oxides, and particulate matter.

Solar panels in the campus

9

Photo voltaic cells control unit

7.2 Diesel generator

The college campus is Equipped With Diesel Generators for power backup.The generators were tested for their efficiency, and physical and operating conditions and found to be fit.

Diesel Generator Inside the Campus

10

7.3 Biogas Plant

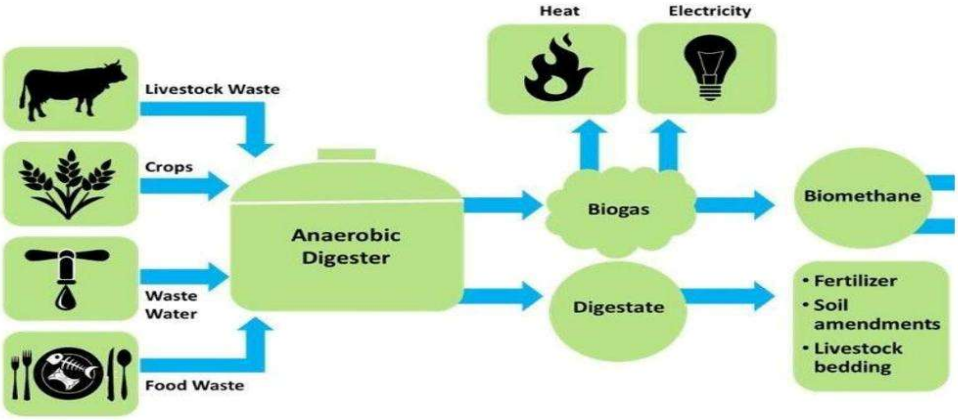
In TNPESU, kitchen waste is used to generate thermal energy for cooking and heating. The biogas produced from food waste, decomposable organic material,and kitchen waste, consisting of methane and a little amount of carbon dioxide is an alternative fuel for cooking gas (LPG).

Kitchen waste is processed and moistened to produce a suspension that subsequently undergoes a fermentation process. Fermentation produces biogas – a valuable energy source – that is desulphurised by biological means. Also, the waste materials can be disposed of efficiently without any odour or flies and the digested slurry from the bio-gas unit can be used as organic manure in the garden.

The major components of the bio-gas plant are a digester tank, an inlet for feeding the kitchen waste, a gas holder tank, an outlet for the digested slurry, and the gas delivery system for taking out and utilizing the produced gas.

The College campus is equipped With $1m^3$ Capacity Biogas Plant to promote the use of alternate energy.Eco-friendly technology allows to produce renewable natural gas in the form of biomethane.The facility processes about10kg of kitchen waste every day. The major waste is organic waste from College hostels, as well as leftover food from campus canteens and expired food.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2



Biogas production

Biogas Plant Installed inside the Campus

12

8.Carbon Foot Printing

Carbon Footprint refers to the potential climatic impact (Global Warming) of the Greenhouse Gases (GHG) emitted directly or indirectly due to an organization's activities. A Carbon Footprint Disclosure of any educational institution is very important to understand such that its key emission sources can be identified and necessary mitigation measures can be adopted for carbon reduction. In today's date, very few colleges disclose their carbon emissions. TNPESU has taken a initiative to compute its carbon footprint and set a benchmark for other Colleges/Universities. The college has adopted a carbon reduction strategy to undertake this project.

8.1 Objectives Of Carbon Foot Printing

- Identify key emission sources of GHG at the campus
- Compute Scopes of emissions for operations carried out at TNPESU Campus
- Analyze the results and provide cost effective & efficient measures for reducing the GHG emissions.

13

8.2 CARBON FOOT SURVEY & ESTIMATION INSIDE THE CAMPUS

Sl.No	Mode of Transport	No of Vehicles	Travellers	To & Fro Km/Per
1	Two Wheelers (Single/Shared)	15	20	20
2	Own Car (Single/Shared)	25	20	15
3	Mini Bus / Private Van	3	200	30
4	Public Transportation / College Bus	-	3000	30

Sl.No	Description	Emission Rate	Annual Consumption/Quantity	Eqt.Co_2 Tonnes/Year
I	Electrical Energy consumption	0.80 kg/kwh	12884kwh	103.91
	Diesel consumption	2.653 kg of Co_2/litre	6000litres	15.92
	LPG	2.983 kg of Co_2/kg	1786kg	5.33
	Fire Wood	1.65-1.80 kg of Co_2/kg	28 T	46.2
II	Food Waste	1.9 kg of Co_2/kg	3.75 T	7.125
	Paper Waste	1.725 kg of Co_2/kg	5.85 T	10.09
	Water Waste	0.298 kg of Co_2/kl	1760kl	0.524
	Plastic Waste	6 kg of Co_2/kg	200 kg	1.2
	Glass/Other	0.77 kg of Co_2/kg	10	0.065
	Sanitary Napkin	0.5 kg of Co_2/kg	2275 kg	1.1375
III	Two Wheelers	2.38 kg of Co_2/L	10000*250/50=50000	103
	Own Car	2.653 kg of Co_2/L	800*250/20=10000	26.52
	Mini Bus / Van	2.653 kg of Co_2/L	90*250/8=2812	7.46
IV	Events	Approx	500*8*1.5=6000kg	15.91
Total				**155.836**

14

Recommendations

- Regular maintenance of the air conditioners and refrigerators should be done and records should be maintained
- Reheating of food can be done on induction / microwave minimizing the use of LPG.
- sub-metering system for electricity usage may help to identify high energy consumption areas.
- The systems (computers, laptops, air conditioners, refrigerators etc.) should be procured for the college considering the latest energy efficient technologies in the markets. (For ex All in One Units etc.)
- Occupancy sensors should be installed in the classrooms and offices.

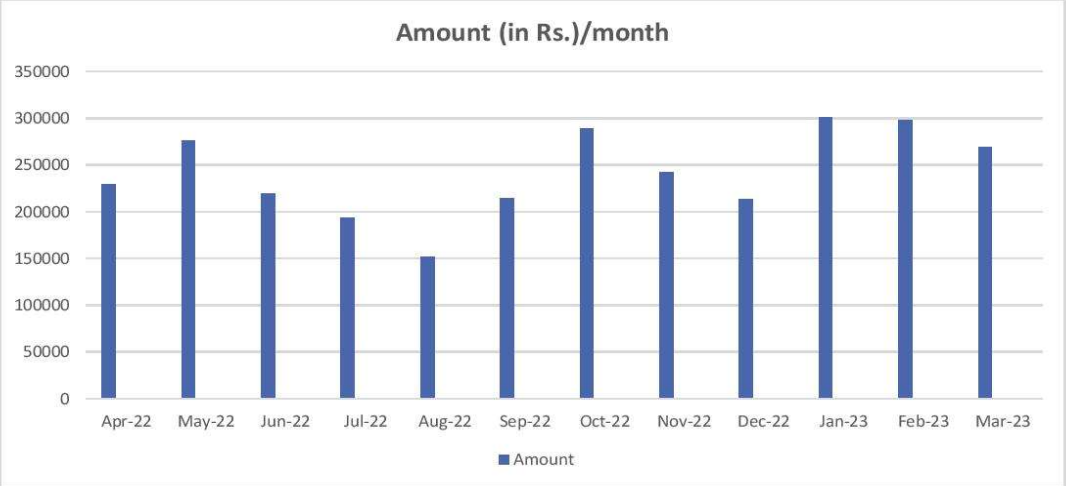
15

9. POWER CONSUMPTION ANALYSIS

The power consumed by the college for a year on a monthly basis is depicted below:

S.No	Month/year	Units consumed (kw/h)	Bill amount
1	03/2023	38430	269010
2	02/2023	42569	297983
3	01/2023	43037	301259
4	12/2022	33615	213988
5	11/2022	34604	242228
6	10/2022	42557	289600
7	09/2022	33797	214610
8	08/2022	23879	151631
9	07/2022	30425	193198
10	06/2022	34580	219583
11	05/2022	43441	275850
12	04/2022	36157	229596

16



9.1 POWER QUALITY AUDIT

A power quality audit checks the reliability, efficiency, and safety of an organization's electrical system. The audit verifies the following aspects:

The continuity of the power supply: It checks if the power in the network is available on a regular basis and can ensure the efficient operation of the equipment.

The quality of the voltage: It checks if there are no low or high-frequency disturbances in the network capable of damaging the system components.

17

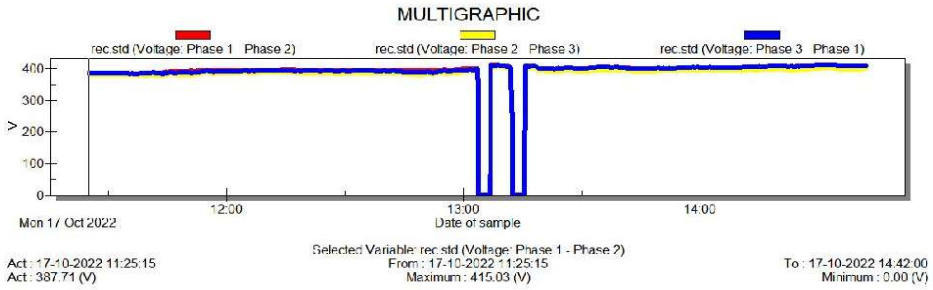
Benefits Of Power Quality Analysis

- Assist in preventative and predictive maintenance
- Identify source and frequency of events
- Establish precise location and timing of events
- Develop maintenance schedules
- Monitor and trend conditions
- Analyse harmonics, Flicker, Transients frequency variation,voltage variations (sag & swell).
- Ensure equipment performance
- Assess the sensitivity of process equipment to disturbances
- Evaluate performance against specifications

Observations

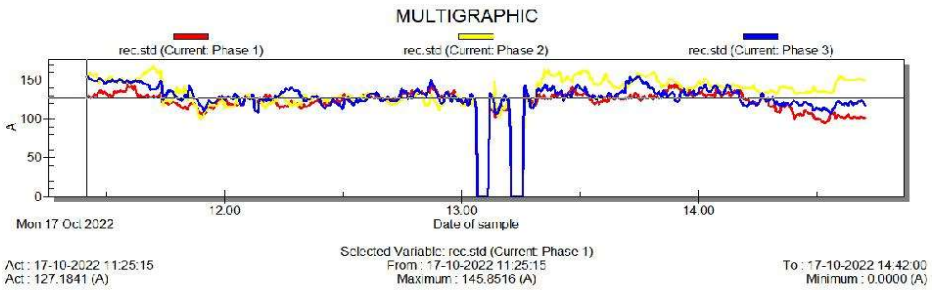
TRANSFORMER LT SIDE

Voltage profile

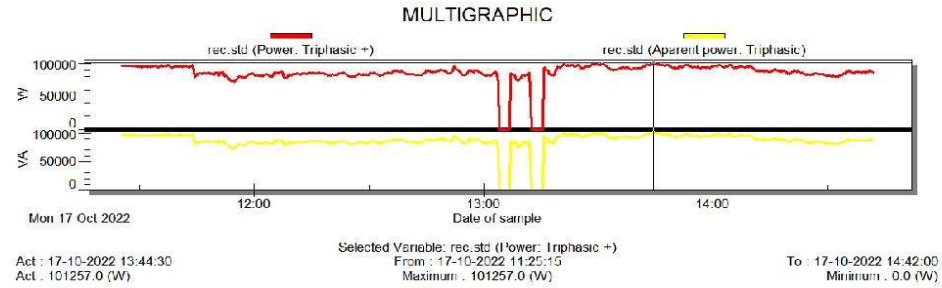


18

Current profile



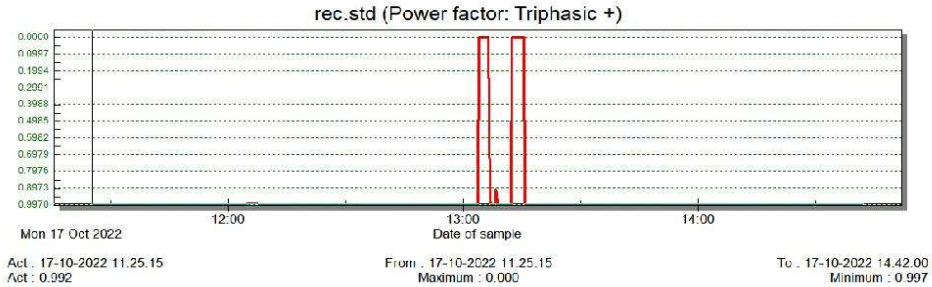
Load Profile



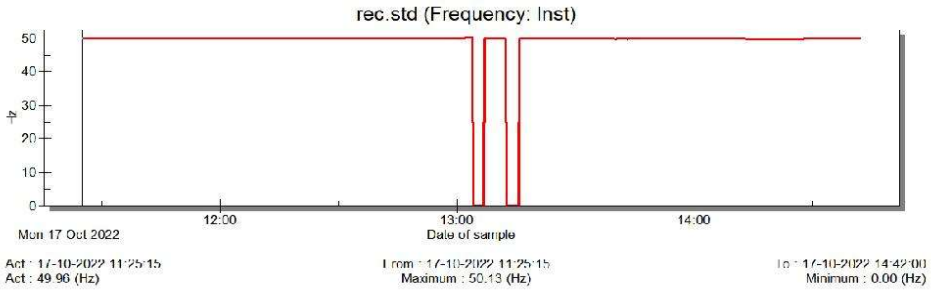
19

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

Power Factor Profile

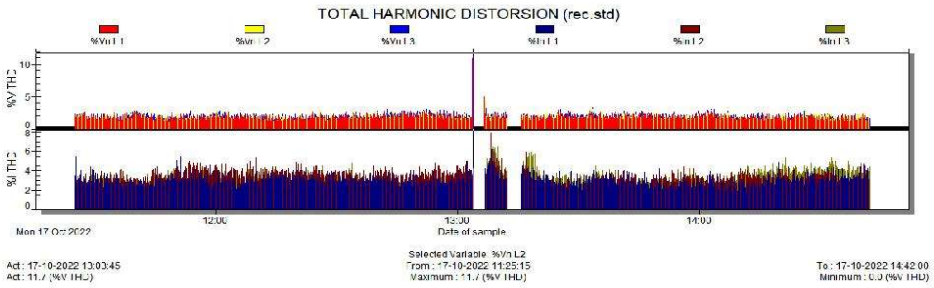


Frequency



20

Total Harmonic Distortion



Individual Harmonics

Individual Harmonics							
As per IEEE-519, 2014, permissible % of individual voltage harmonics is 5 % Current harmonics for <11 order is 10 %	Order of Harmonics	Voltage			Current		
		R	Y	B	R	Y	B
	3	0.21	0.36	0.41	2.18	3.16	2.04
	5	0.38	0.84	1.01	0.57	0.74	1.6
	7	1.45	1.2	1.23	0.47	1.17	1.44
	9	0.22	0.23	0.42	0.67	0.66	0.56
	11	0.34	0.27	0.55	0.47	0.59	0.29

21

Summary:

S. No	Description	Remarks	
1	Location	INCOMING MAIN POWER HOUSE	
2	Voltage	Incoming voltage is varying from 379.3 V to 387.7 V.	
3	Load Current, A	Varying from 101.3A A to 127.18 A.	
4	Power, Kw	Varying from 98.45 kW to 101.257 kW.	
5	Power, kVA	Varying from 98.23 kVA to 101.885 kVA.	
6	THD Voltage (%)	R	1.8
		Y	2.2
		B	2.6
7	THD current (%)	R	2.8
		Y	3.8
		B	2.8
8	Power Factor	Varying from -0.99 to 0.99	
9	Frequency, Hz	Varying from 49.8 Hz to 50.13 Hz.	
10	Any Interruption observed. if yes details	Yes. Power cut From 13:04:15 to 13:06:45 and 13:12:30 to 13:15:30	
11	Voltage Sags	No	
12	Over voltage	No	
13	Voltage unbalance, %	Varying from 0.5 % to 1.4 %.	
14	Current unbalance, %	Varying from 0.1 % to 12.8 %.	

Remarks:

- Current unbalance is slightly higher than acceptable level.

11. RECOMMENDATIONS

- The management should support more of renewable and carbon-neutral electricity options in any energy- purchasing consortium, with the aim of supplying all college properties with electricity that can be attributed to renewable and carbon-neutral sources.
- The campus administration should run switch–off drills on regular basis.
- 5–star rated Air Conditioners, Fans and CFLs should be used.

22

12. CONCLUSION

Energy Rating

After the complete survey and analysis of the campus as per ISO 50001:2018 energy management system standards, we rate the campus **Score 4/5.**

Energy Conservation is the wave of the future. The world is quickly moving towards Energy sustainability. An energy-efficient organization is a step toward the direction of renewable energy, environmental protection, and sustainable living. Thus, concluded that by energy auditing we identify cost-effective ways to improve the comfort and efficiency of buildings.

13. ACKNOWLEDGEMENT

We are grateful to the management and committee members of Tamilnadu Physical Education and Sports University to award this prestigious project on energy auditing. Further, we sincerely thank the college staff for providing us with the necessary facilities and cooperation during the audit. This ample co-operation helped us a lot in making this audit possible and successful.

FOR QRO CERTIFICATIONS

ER.P.VIVEK M.E

CHARTERED ENGINEER &COMPETENT PERSON

24

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Regional Office : Pondicherry, Coimbatore & Andra Pradesh

Contact : 8778740104, 9384381615 | Email : igniteengg@gmail.com

ISO 9001:2015 ISO14001

AMBIENT AIR MONITORING

Report No	IES-NO-AR-72-156-2023	Report Date	30.03.2023
Customer Name & Address		Sample Reference No:	IES-NO-AR-72-155-2023
M/s TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY CHENNAI		Sample Description:	Ambient Air
		Sample Drawn by:	Laboratory
		Sample Collected Date:	28.03.2023
		Qty of sample Received:	Filter Paper(2nos) & Approx 25ml Solution(4nos)
		Sample Received On:	28.03.2023
		Test Commenced On:	28.03.2023
		Test Completed On:	30.03.2023
		Sampling Method:	IES-SOP-ARS-01 to 11
		Sample Mark:	Near to Boys Hostel

S.No	Name of the Test	Test Method	Units	Results	Max. Annual Average Limits Of NAAQs
1.	Ammonia (as NH_3)	CPCB Guidelines,Volume I, NAAQMS/36/2012-13	$\mu g/m^3$	6.3	100
2.	Arsenic (as As)	CPCB Guidelines,Volume I, NAAQMS/36/2012-13	$\mu g/m^3$	<0.1	6.0
3.	Benzene (as C_6H_6)	IS 5182 (Part 11): 2006 (Reaffirmed 2017)	$\mu g/m^3$	<0.5	5.0
4.	Benza (α) Pyrene(as $C_{20}H_{12}$)	CPCB Guidelines,Volume I, NAAQMS/36/2012-13	$\mu g/m^3$	<0.5	1.0
5.	Carbon Monoxide (as CO)	Instruments Manual Based SOP No.EL-SOP-ARS-17	$\mu g/m^3$	<1.1	2.0
6.	Lead (as Pb)	IS 5182 (Part 22): 2004 (Reaffirmed 2014) Clause No.5	$\mu g/m^3$	<0.5	0.5
7.	Nickel (as Nil)	CPCB Guidelines,Volume I, NAAQMS/36/2012-13	$\mu g/m^3$	<1.0	20
8.	Oxidants (as Ozone O_3)	IS 5182 (Part IX)- 19747 (Reaffirmed 2014)	$\mu g/m^3$	<10.0	100
9.	Oxidants of Nitrogen (as Ozone NO_2)	IS 5182 (Part 6): 2006 (Reaffirmed 2017)	$\mu g/m^3$	24.2	40
10.	Particulate Matter (as PM_{10})	IS 5182 (Part 23): 2006 (Reaffirmed 2017)	$\mu g/m^3$	42.1	60
11.	Particulate Matter (as $PM_{2.5}$)	EPA 40 CFR Part 50-Appendix L	$\mu g/m^3$	21.0	40
12.	Sulphur Dioxide (as SO_2)	IS 5182 (Part 2): 2001 (Reaffirmed 2017)	$\mu g/m^3$	12.3	50

<----------END OF REPORT---------->

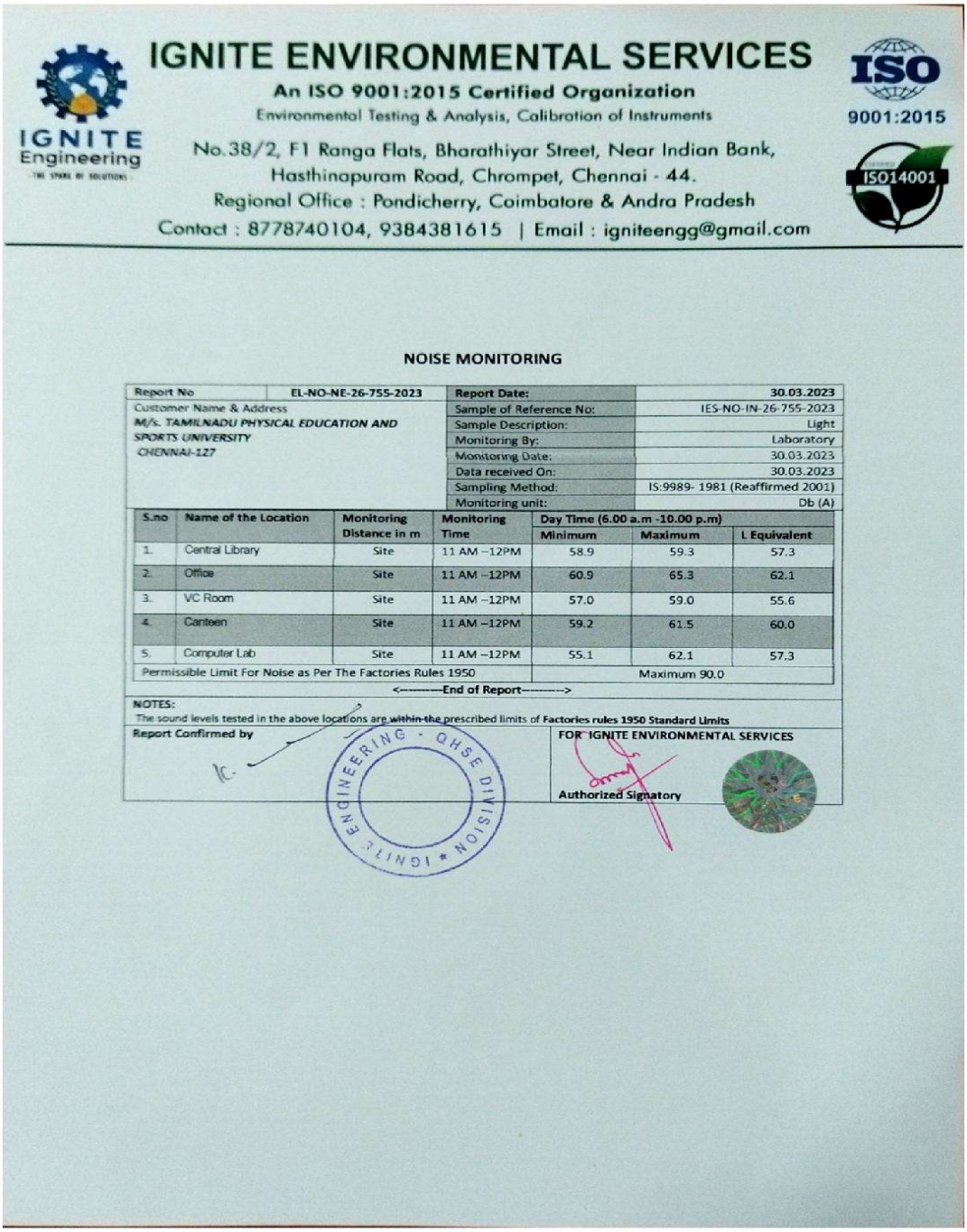
NOTES:

The Concentrations of the parameters tested in the above Location are within the prescribed annual average limits of NAAQs tolerance limits.

Report Confirmed by

FOR IGNITE ENVIRONMENTAL SERVICES

Authorized Signatory



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ISO14001

NOISE MONITORING

Report No	**EL-NO-NE-26-755-2023**	**Report Date:**	**30.03.2023**
Customer Name & Address		Sample of Reference No:	IES-NO-IN-26-755-2023
M/s. TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY CHENNAI-127		Sample Description:	Light
		Monitoring By:	Laboratory
		Monitoring Date:	30.03.2023
		Data received On:	30.03.2023
		Sampling Method:	IS:9989- 1981 (Reaffirmed 2001)
		Monitoring unit:	Db (A)

S.no	Name of the Location	Monitoring Distance in m	Monitoring Time	Day Time (6.00 a.m -10.00 p.m)		
				Minimum	Maximum	L Equivalent
1.	Central Library	Site	11 AM –12PM	58.9	59.3	57.3
2.	Office	Site	11 AM –12PM	60.9	65.3	62.1
3.	VC Room	Site	11 AM –12PM	57.0	59.0	55.6
4.	Canteen	Site	11 AM –12PM	59.2	61.5	60.0
5.	Computer Lab	Site	11 AM –12PM	55.1	62.1	57.3
Permissible Limit For Noise as Per The Factories Rules 1950				Maximum 90.0		

<----------End of Report---------->

NOTES:

The sound levels tested in the above locations are ~~within the~~ prescribed limits of **Factories rules 1950 Standard Limits**

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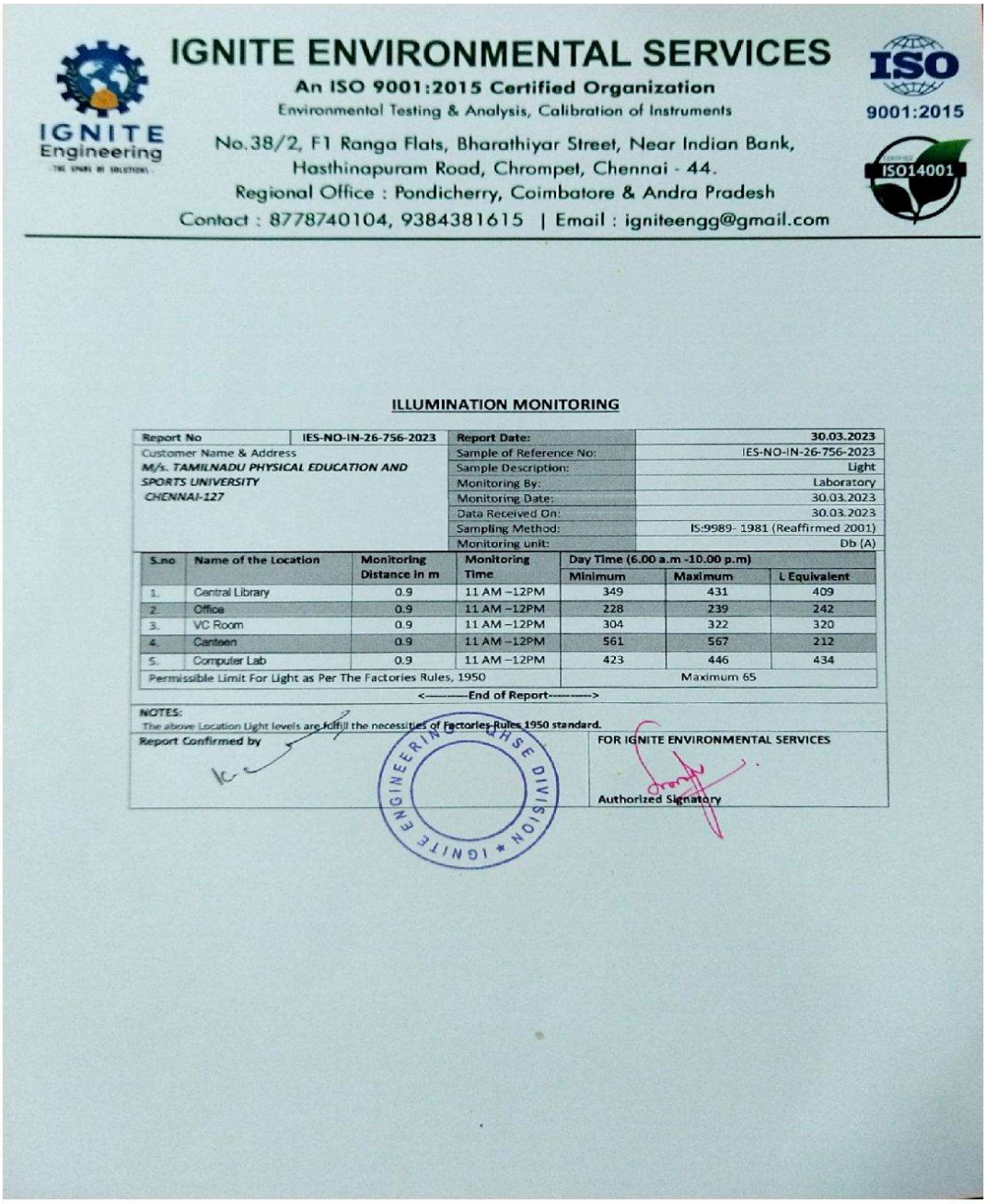
CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2



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IGNITE Engineering

ISO 9001:2015

ISO14001

ILLUMINATION MONITORING

Report No	IES-NO-IN-26-756-2023	**Report Date:**	30.03.2023
Customer Name & Address		Sample of Reference No:	IES-NO-IN-26-756-2023
M/s. TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY CHENNAI-127		Sample Description:	Light
		Monitoring By:	Laboratory
		Monitoring Date:	30.03.2023
		Data Received On:	30.03.2023
		Sampling Method:	IS:9989- 1981 (Reaffirmed 2001)
		Monitoring unit:	Db (A)

S.no	Name of the Location	Monitoring Distance in m	Monitoring Time	Day Time (6.00 a.m -10.00 p.m)		
				Minimum	Maximum	L Equivalent
1.	Central Library	0.9	11 AM –12PM	349	431	409
2.	Office	0.9	11 AM –12PM	228	239	242
3.	VC Room	0.9	11 AM –12PM	304	322	320
4.	Canteen	0.9	11 AM –12PM	561	567	212
5.	Computer Lab	0.9	11 AM –12PM	423	446	434
Permissible Limit For Light as Per The Factories Rules, 1950				Maximum 65		

<----------End of Report---------->

NOTES:
The above Location Light levels are fulfill the necessities of Factories Rules 1950 standard.

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Environmental Testing & Analysis, Calibration of Instruments

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Regional Office : Pondicherry, Coimbatore & Andra Pradesh
Contact : 8778740104, 9384381615 | Email : igniteengg@gmail.com

ISO 9001:2015 ISO14001

TEST REPORT

Sample Ref No: EES/AS/544/2023	Date of Sampling: 28.03.2023
Issued To:	Report Date/Report No: 30.03.2023

M/s. TAMILNADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY
Melakottaiyur Chennai-600127

Page 1 of 1

Group	:Atmospheric Pollution	Sample Drawn By/Date	: IES/28.03.2023
Discipline	: Chemical Testing	Received On	: 28.03.2023
Sample Description	: Indoor Air Quality	Analysis Commenced On	: 28.03.2023
Sampling Method	: IS 5182, NIOSH & SOP	Analysis Completed On	: 30.03.2023

Sl. No	Sampling Location	UNIT	RESULT Carbon-di-oxide (CO_2)	ASHRAE LIMITS
1	Central Library	ppm	385	1000
2	Office	ppm	415	
3	Principal Room	ppm	488	
4	Canteen	ppm	414	
5	Computer Lab	ppm	377	
6	Biomechanics	ppm	471	

ASHRAE- American Society of Hearing Refrigerating and Air-Conditioning Engineers,

----------End of Report----------

Authorized Signatory

Note 1. Test result shown in this test report relate only to the items tested

2. This test Report shall not be reproduce anywhere except in full and in same format without the approval of the Laboratory

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

ENERGY AUDIT 2021

TUV INDIA
TUV NORD GROUP

Registered & Head Office :
TUV INDIA PRIVATE LIMITED
627, 2nd floor, Dhun Building
Anna Salai,
Chennai 600 002, India
CIN : U74140MH1989PTC052930
Phone : (044) 28528875 / 1052
Toll Free : 1800-209-0902
Fax : (044) 28521676
Email : chennai@tuv-nord.com
Website : www.tuv-nord.com/in

Date: 5th March 2021

Certification

This is to certify that the **Green, Energy and Environment Audit** at **Tamil Nadu Physical Education & Sports University** has been successfully completed for the period 2019-21 and found that **Tamil Nadu Physical Education & Sports University** conform to the norms of standard Green Practices. The audit was conducted during the month of February 2021.

N Pradeep Kumar

Associate Vice President – Certification, Tamil Nadu Region

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

GREEN AUDIT REPORT

For

TAMIL NADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

Melakottaiyur, Chennai.

By

TÜV INDIA PRIVATE LIMITED,
TÜV NORD GROUP
2nd floor, Dhun Building, 827,
Anna Salai, Mount Road, Chennai – 600 002

March 2021

ACKNOWLEDGEMENT

TUV India Pvt Ltd wishes to thank all the staff and Management of **Tamil Nadu Physical Education and Sports University (TNPESU)**, Chennai Management & Technical Team for the kind cooperation and assistance extended to our Auditors during the course of the Green audit.

Auditors

Prabhu Kiran S

Prakash G

TUV INDIA
TUV NORD GROUP

Registered & Head Office :
TUV INDIA PRIVATE LIMITED
827, 2nd floor, Dhun Building
Anna Salai,
Chennai 600 002, India
CIN : U74140MH1989PTC052930
Phone : (044) 28528875 / 1052
Toll Free : 1800-209-0902
Fax : (044) 28521676
Email : chennai@tuv-nord.com
Website : www.tuv-nord.com/in

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Associate Vice President – Certification, Tamil Nadu Region

Table of Contents

1. EXECUTIVE SUMMARY 5

2. LIST OF PERFORMANCE IMPROVEMENT MEASURES AT TAMIL NADU PHYSICAL EDUCATION AND SPORT UNIVERSITY, CHENNAI. 6

3. PROJECT BACKGROUND 7

4. GREEN AUDIT 8

5. ELECTRICAL SYSTEM 9

5.1 ELECTRICAL BILL ANALYSIS 11

5.2 UNIT COST ANALYSIS 13

5.3 LIGHTING ANALYSIS 15

5.4 LIGHTING ANALYSIS 15

5.5 LIGHTING POWER DENSITY 16

6. HEATING VENTILATING & AIR CONDITIONING (HVAC) 17

6.1 PERFORMANCE ANALYSIS OF SPLIT UNITS 17

6.2 INDOOR AIR QUALITY 20

7 WATER 21

7.1 PERFORMANCE ANALYSIS OF WATER FAUCETS 22

7.2 PERFORMANCE ANALYSIS OF DOMESTIC WATER PUMPS 23

7.3 WATER NEUTRALITY 24

7.4 WATER QUALITY ANALYSIS 26

7.5 WATER BALANCE CHART 27

7.6 RAINWATER HARVESTING SYSTEM 27

8 WASTE MANAGEMENT SYSTEM 28

9 GREEN HOUSE GAS EMISSION 31

10 SITE OBSERVATION REPORT 33

11 PERFORMANCE IMPROVEMENT MEASURES (PIM'S) 41

12 GOOD PRACTICES AT TNPESU CAMPUS 45

1. EXECUTIVE SUMMARY

Green Audit of Tamil Nadu Physical Education and Sports University was carried out by TUV India Pvt Ltd team during Feb 2021.

The approach taken in this facility included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and associated systems & equipment, including the electrical, lighting & AC systems, and operational & maintenance procedures. Sample measurements were taken using various instruments like ALM Power Analyzer, clamp meter, Infrared Thermometer, Lux meter, Humidity meter, CO_2 meter, etc. Operational Data were also collected from the past records. The study covered the following areas to summarize the present status of environment management in the campus:

- Water management
- Energy Conservation
- Waste management
- Green area management

The report accounts for the energy consumption patterns of the Tamil Nadu Physical Education and Sports University based on actual assessment. The report compiles a list of possible actions to TUVI and efficiently access the available scarce resources and their saving potential was also identified.

The overall annual energy consumption is 21,82,442 kWh/annum. The annual greenhouse gas emissions equivalent for electricity is **1855 tons of CO_2** (0.85kg of CO_2 emits /kWh of unit generation).

Total Global Warming Impact in CO2 Equivalent

S. No	GHG source	Tonnes of CO2 Equivalent
1	Road Transport	1.77
2	Electricity	1855
3	HVAC System	1.2
4	DG Operation	2.24
Total GHG Emission		**1860.21**

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

Overall 31% **i.e. 6,77.081.6 kWh** unit's savings identified on above mentioned categories with average payback of **53 months** and reduced annual greenhouse gas emissions equivalent to **575.5 tons of CO_2.**

2. LIST OF PERFORMANCE IMPROVEMENT MEASURES AT TAMIL NADU PHYSICAL EDUCATION AND SPORT UNIVERSITY, CHENNAI.

S No	ECM Description	Annual Energy savings kWh	Annual savings, Lacs.	Cost of Measure, Lac.	Payback Months
1	PIM 1: Water saving through the efficient dual flush water closet	1281.6 L/Annum	0.11	0.05	6
2	PIM 2: Tube light lamps to be changed with appropriate LED lamps to reduce power consumption	2520	0.25	0.5	24
3	PIM 3: Replacing old celling fan to Super fans	16,128	1.64	4.8	35
4	PIM 4: Install Solar PV in roof top to reduce overall power consumption	6,57,100	67	300	53
Total		**6,77,081.6**	**69**	**305.35**	**53**

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

3. PROJECT BACKGROUND

The Tamil Nadu Physical Education and Sports University (TNPESU) is India's first state university for Physical Education and Sports located at Melakottaiyur, Chennai. It was established by an Act of the Government of Tamil Nadu in 2004. The University is UGC approved and offers regular and distance learning UG, PG, Diploma, Certificate and PG Diploma programmes in the fields of Physical Education, Yoga, Exercise Physiology, Bio-Mechanics, Sports Management, Sports Psychology and Sociology, Advanced Sports Training and Sports Technology. Tamil Nadu Physical Education and Sports University has a "B++" grade accreditation by the National Assessment and Accreditation Council [NAAC]. Tamil Nadu Physical Education and Sports University has an area of 125 acres which is spread in the outer of Chennai city.

Tamil Nadu Physical Education and Sport University major facilities: -

- Indoor & Outdoor stadium
- Health Centre
- Food Court
- Recreational Center
- Sports Pavilion and Gymnasium

4. GREEN AUDIT

The main objective of the green audit is to promote the Environment Management and Conservation in the College Campus. The purpose of the audit is 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:

- To introduce and aware students to real concerns of environment and its sustainability
- To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use on the campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requires high cost.

Green Audit also includes the preliminary analysis and more detailed energy calculations-financial analysis of proposed Performance Improvement Measures (PIM). The financial analysis provides the facility team the understanding of the financial benefits in implementing specific Performance Improvement Measures. Utility bills were collected for three months' period to allow the auditor to evaluate the facility's energy/demand rate structures and energy usage profiles. A detailed financial analysis is performed for each measure based on implementation cost estimates; site-specific operating cost savings, and the customer's investment criteria. Sufficient detail is provided to justify project implementation.

Criterion 6 - Governance, Leadership and Management
Key indicator – 6.5.2

ENERGY AUDIT

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

5. ELECTRICAL SYSTEM

The electrical power is availed from Telangana Southern Power Distribution Company Limited (TSSPDCL). The power is distributed through LT panel located in the Facility Area. The power is distributed to the college through transformer of loading position 11KV/433V, 315kVA distribution transformer.

There is 1 No. of 45 kVA & 1 Nos. of 160 kVA DG set for the backup to handle any grid power interruption.

HT 11/433V

↓

TR -1 & 2 500kVA

DG-1 63 kVA →

↓

- Administrative Block
- Academic Block
- Gents Hostel
- Ladies Hostel
- Gents Mess Hall
- Ladies Mess Hall
- Electric Panel Room 1
- Electric Panel Room 2
- Vice Chancellors Quarters
- Registrars Quarters
- Assistant Professors Quarters
- Office Assistants Quarters
- Indoor Stadium
- Sports Hostel

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

5.1 ELECTRICAL BILL ANALYSIS

The Energy bill data were analyzed from Jan 2020 to Dec 2020, the total electricity bill for the year 2020 is Rs.21,82,442 and energy unit consumption is 2,19,190 kWh.

Month	Energy Consumption kWh	Energy Cost Rs	Unit Cost Rs/kWh
Jan-20	29,630	2,54,219	8.58
Feb-20	23,147	2,13,051	9.20
Mar-20	21,979	2,05,635	9.36
Apr-20	11,098	1,36,540	12.30
May-20	14,638	1,59,019	10.86
Jun-20	14,800	1,60,048	10.81
Jul-20	13,937	1,54,568	11.09
Aug-20	16,138	1,68,544	10.44
Sep-20	18,948	1,84,108	9.72
Oct-20	18,974	1,86,603	9.83
Nov-20	15,920	1,67,160	10.50
Dec-20	19,981	1,92,947	9.66
Total	**219,190**	**21,82,442**	**10.20**

Table: Energy Bill Analysis Jan'20 to Dec'20

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

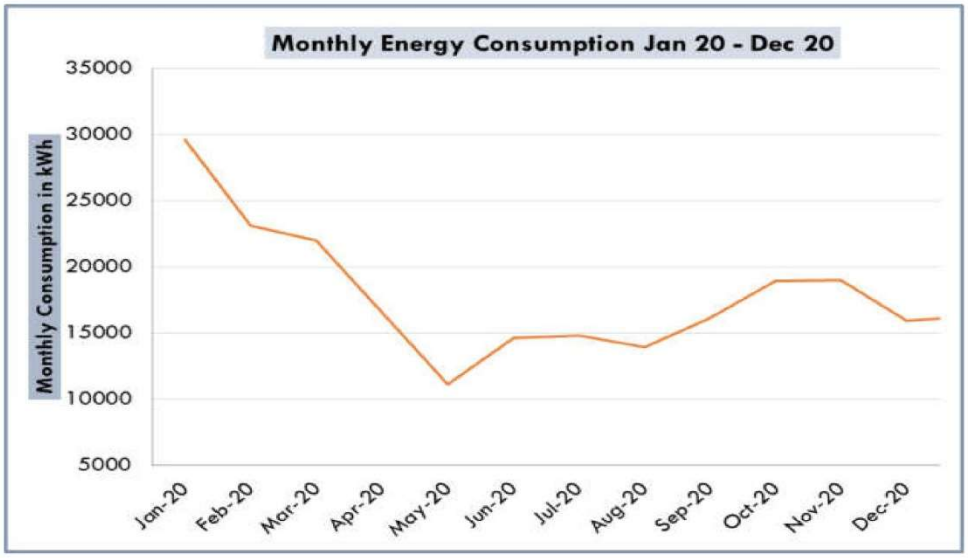

Chart: kWh Consumption analysis – During Jan 2020 energy consumption is high

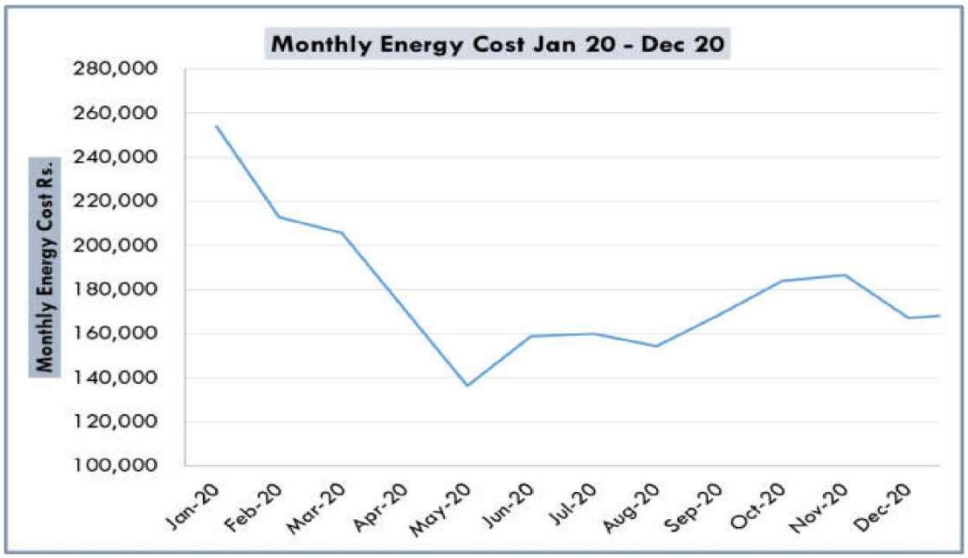

Chart: Monthly Energy Cost Analysis – During Jan 2020 energy cost is high

5.2 UNIT COST ANALYSIS

The Energy bill data from Jan 2020 to Dec 2020 were analyzed. Per unit cost for the period of study was calculated to be Rs 10.20/kWh.

Month	Energy Consumption kWh	Energy Cost Rs	Unit Cost Rs/kWh
Jan-20	29,630	2,54,219	8.58
Feb-20	23,147	2,13,051	9.20
Mar-20	21,979	2,05,635	9.36
Apr-20	11,098	1,36,540	12.30
May-20	14,638	1,59,019	10.86
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Total	**219,190**	**21,82,442**	**10.20**

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

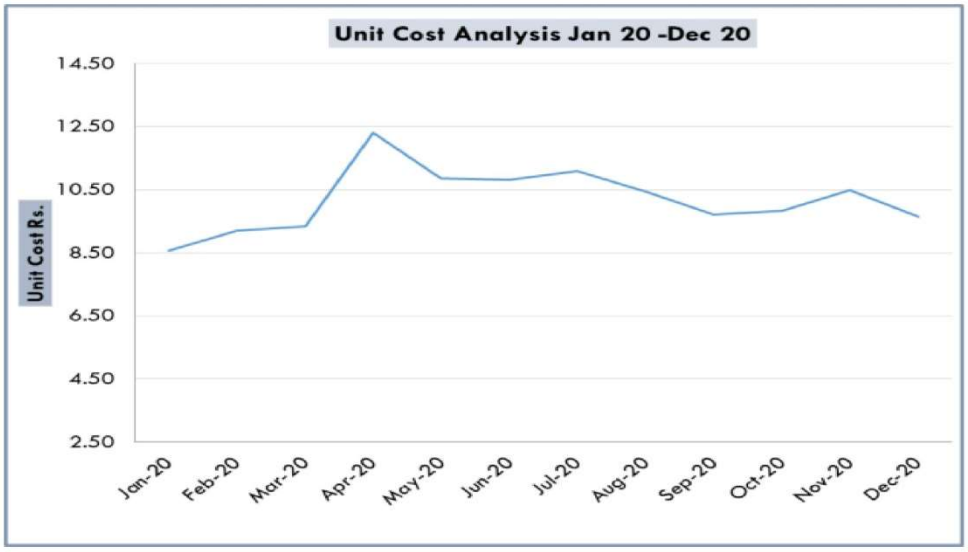


Chart: Monthly Unit Cost – During Apr 2020 Unit Cost Rate is high.

5.3 LIGHTING ANALYSIS

Good lighting is necessary to enable work to be done well and in comfort. A facility with bad lighting is an inefficient one, though it may look attractive. Poor lighting can be combated by good eyesight and by keenness on work but at the eventual expenses of efficiency, wellbeing and comfort. Hence, the designer of the building should pay sufficient attention to the need for good lighting.

The lighting details of the facility were studied. The various type of light fitting used are 15W LED, 20W LED, 30W LED & 36W TL lamps.

5.4 LIGHTING ANALYSIS

S. No	Description	LUX Level	Baseline Lux Level as per NBC	Remarks
1	Principal Room	170, 195, 210, 280,324	300	Ok
2	Library Hall	200, 260, 230, 162,290,332	300	Ok
3	Auditorium	117, 135, 180, 190, 210, 340	300	Ok
4	Server Room	120, 140, 280,320	200	Ok
5	Gents Mess Hall	210,280,320,440	200	Ok
6	Ladies Mess Hall	230,260,310,460	200	Ok
7	Gents Hostel Room	210,280,260,320	50	Ok
8	Ladies Hostel Room	265, 285, 330	50	Ok
11	Lecture Hall 1	250,320,380	300	Ok
12	Lecture Hall 2	230,260,340	300	Ok
13	Lecture Hall 3	220,250,330	300	Ok
14	Lecture Hall 4	250,275,315	300	Ok
15	Lecture Hall 5	235,285,350	300	Ok
16	Lecture Hall 6	270,290,340	300	Ok

Comments:

Lux level is measured during day light availability and it is very good level compared to NBC standards.

5.5 LIGHTING POWER DENSITY

S No	Description	Fixture Details	Fixture Wattage	No. of fixtures	Total Wattage	Area Sq.ft	Actual LPD W/sq.ft	ASHRAE LPD W/sq.ft
1	Gents Mess Hall	36 W TL	36	15	540	2064	0.26	1.21
2	Ladies Mess Hall	36 W TL	36	15	540	1160	0.47	1.21
3	Library Reading Hall	36 W TL	36	48	1728	2760	0.63	0.93
4	Ladies Hostel room 1	36 W TL	36	15	540	1456	0.37	1.21
5	Ladies Hostel room 2	36 W TL	36	15	540	1456	0.37	1.21
6	Ladies Hostel room 3	36 W TL	36	15	540	1456	0.37	1.21
7	Gents Hostel Room 1	36 W TL	36	15	540	1456	0.37	1.21
8	Gents Hostel Room 2	36 W TL	36	15	540	1456	0.37	1.21
9	Gents Hostel Room 3	36 W TL	36	15	540	1456	0.37	1.21
10	Class Room G15	20 W LED	20	12	240	520	0.46	1.24
11	Class Room G16	20 W LED	20	12	240	520	0.46	1.24
12	Class Room G17	20 W LED	20	12	240	520	0.46	1.24
13	Class Room G18	20 W LED	20	12	240	520	0.46	1.24
14	Academic Block Lobby 1	36 W TL	36	4	144	220	0.65	0.9
15	Academic Block Lobby 2	36 W TL	36	4	144	220	0.65	0.9
16	Admin Block Lobby	36 W TL	36	2	72	140	0.51	0.9

Comments:

LPD is within in the ASHRAE limit. We recommended to replace the 36 W TL to 20 W LED for better energy savings.

6. HEATING VENTILATING & AIR CONDITIONING (HVAC)

In College campus for human thermal comfort, sum of 152 TR capacities of split units installed, in Library computer lab, Admin Block and Academic Block are installed in the campus to meet the cooling requirement. Along with this, for ventilation in the facility, ceiling and exhaust fans are installed.

6.1 PERFORMANCE ANALYSIS OF SPLIT UNITS

Admin Block Server Room AC 1		
Description	**Name Plate Details**	
Make	Voltas	
Motor Power, kW	1.77	
Rated Current, A	7.9	
Refrigerant & Charge	R-22, 1.13 kg	
Capacity, TR	2	
Star Rated	5 Star	
Inside Air Flow, CMH	1080	
Performance Analysis		
Description	**Actual**	**Units**
Motor running current	5.8	A
Voltage	227.2	V
PF	0.91	
Motor power	1.51	kW
Supply air quantity	110	CFM
Supply air temperature	19.3	°C
Relative humidity	62	%
Return air temperature	21.8	°C
CO_2 Level	765	PPM

Comments:

Power consumption is within the design limit and CO_2 level is within limits.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

Admin Block Server Room AC 2		
Description	**Name Plate Details**	
Make	Voltas	
Motor Power, kW	1.77	
Rated Current, A	7.9	
Refrigerant & Charge	R-22, 1.13 kg	
Capacity, TR	2	
Star Rated	5 Star	
Inside Air Flow, CMH	1080	
Performance Analysis		
Description	**Actual**	**Units**
Motor running current	5.6	A
Voltage	221.9	V
PF	0.9	
Motor power	1.48	kW
Supply air quantity	105	CFM
Supply air temperature	21.1	°C
Relative humidity	61	%
Return air temperature	22.7	°C
CO_2 Level	756	PPM

Comments:

Power consumption is within the design limit and CO_2 level is within limits.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

Academic Block Health Care Room AC 1		
Description	**Name Plate Details**	
Make	LLOYD	
Motor Power, kW	1.59	
Rated Current, A	7.0	
Refrigerant & Charge	R-22, 1.08 kg	
Capacity, TR	1.5	
Star Rated	3 Star	
Performance Analysis		
Description	**Actual**	**Units**
Motor running current	6.7	A
Voltage	223.7	V
PF	0.9	
Motor power	1.5	kW
Supply air quantity	96	CFM
Supply air temperature	21.5	°C
Relative humidity	65	%
Return air temperature	22.9	°C
CO_2 Level	670	PPM

Comments:

Power consumption is within the design limit and CO_2 level is within limits.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

6.2 INDOOR AIR QUALITY

Indoor air quality (IAQ) is a term which refers to the air quality within and around buildings and structures, especially as it relates to the health and comfort of building occupants. IAQ can be affected by various gases, volatile organic compounds etc. Source control, filtration and the use of ventilation to dilute contaminants are the primary methods for improving indoor air quality in most buildings. Determination of IAQ involves the collection of air samples at various locations of the building.

During the course of audit, the Indoor air quality survey was carried out at various locations in the building.

S.No	Area	Temperature	CO_2 ppm	Relative Humidity %
1	Auditorium	21.6	640	61
2	Library Computer Lab - 1	23.4	810	60
3	Health Care room	20.8	670	65
4	Admin Block Server room	19.9	765	61

Comments:

On an overall observation, the occupant comfort temperature shall be maintained at 24°C, & Humidity needs to be maintained at < 60%. CO2 level is good.

Criterion 6 - Governance, Leadership and Management
Key indicator – 6.5.2

Water Audit

7. WATER

Drinking Water for the entire college is taken from quarry and it treated by proper RO system. RO water system are installed in each block to meet the drinking water requirement. For flushing, irrigation and cleaning purpose water is taken from the same quarry, water is pumped to the raw water sump then the OHT at terrace levels.

6.3 PERFORMANCE ANALYSIS OF WATER FAUCETS

Water flow is measured in faucets of College toilets wash basin, urinals & water closets.

S. No.	Description	NBC Baseline (LPM)	Actual (LPM)
1	First floor gents toilet wash basin 1	1.5	7.1
2	First floor gents toilet wash basin 2	1.5	6.8
3	Ground Floor ladies toilet tap 1	3	17.0
4	Ground Floor ladies toilet tap 2	3	18.9
5	Wash basin tap 1	1.5	11.0
6	Wash basin tap 2	1.5	13.0
7	Water Closets	6	6.0
8	Academic Block first floor Wash basin tap 1	1.5	7.5
9	Academic Block first floor water closet 1	6	6.0
10	Academic Block first floor water closet 2	6	6.0
11	Admin Block ground floor Wash basin tap 1	1.5	5.5
12	Admin Block ground floor water closet 1	6	6.0

Comments: Water flow in the faucets and tap are high in above highlighted area comparing to the NBC standard. The baseline standards are as per the NBC 2016 part no: 9 section 1 table – 2.

6.4 PERFORMANCE ANALYSIS OF DOMESTIC WATER PUMPS

Water Pump-1

Description	Bore Well Water Pump -1
Installed motor power, kW	3.75
No. of Phase	3
Description	**Readings**
Voltage, V	404.8
Current, A	4.8
Power Factor, PF	0.943
Power consumption, kW	3.17

Comments:

Power consumption is within the design limit. Water meter shall be installed in outlet of the quarry motor pipe to measure the water consumption from the quarry and consumption in each block. Quarry water Consumption Record shall be maintained on daily, monthly basis to arrive at the water balancing.

Sump Water Pump-1

Description	Sump Water Pump -1
Make	C R I
Capacity, m^3/hr	9
Motor current, A	3.0
Motor RPM	2880
Installed motor power, kW	1.1
Head, m	32
Description	**Readings**
Voltage, V	421
Current, A	2.1
Power Factor, PF	0.787
Power consumption, kW	0.9

Comments:

Power consumption is within the design limit. Water meter shall be installed at the overhead tank outlet to measure the water consumption from the terrace tank. Water Consumption Record shall be maintained on daily, monthly basis to arrive at the Water balancing.

Sump Water Pump -2

Description	Sump Water Pump -1
Make	C R I
Capacity, m^3/hr	9
Motor current, A	3.0
Motor RPM	2880
Installed motor power, kW	1.1
Head, m	32
Description	**Readings**
Voltage, V	421
Current, A	2.8
Power Factor, PF	0.823
Power consumption, kW	1.69

Comments:

Power consumption is within the design limit. Water meter shall be installed at the overhead tank outlet to measure the water consumption from the terrace tank. Water Consumption Record shall be maintained on daily, monthly basis to arrive at the Water balancing.

6.5 WATER NEUTRALITY

Presently quarry water is used to meet the entire buildings water requirement.

Strategies for Water Neutrality: -

a. **Low flow aerators.**

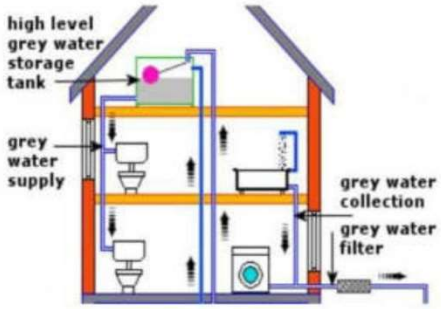
To reduce the fresh water consumption, by installing the aerators for faucets in all common area restrooms, landscape irrigation, canteen etc. This measure reduces the water consumption by 40% from the baseline of NBC.

b. Sewage Treatment Plant

To reduce the potable water consumption by installing the sewage treatment plant (STP). In the college campus 2 hostel blocks are there and totally per day water consumption is 120 KL per day. So the waste water generation will be around 120 KL per day. So the recommended STP plant size will be 120 KLD. This treated water will be used for landscape irrigation & toilet flushing purpose.

c. Dual Plumbing System.

To reduce the potable water consumption by installing the dual flush system (3/6 LPF). To further reduce the fresh water consumption, use the STP treated water as mentioned above.



d. Native Plant Species.

For landscape irrigation, fresh potable water is being used. To reduce water consumption for landscape, in some places drip irrigation method is being used. However, in some places hose pipe irrigation is being used and this result in more water consumption. It is recommended to install drip irrigation for all shrubs & tree type species and sprinkler irrigation for turf area. To reduce the water consumption by replacing the drought tolerant/xeriscape species.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

6.6 WATER QUALITY ANALYSIS

In College campus, drinking water is taken from tanker lorry (Costly) and municipal corporation water. Normally, for drinking water daily consumption of lorry water - 8000 liters and municipal water - 250 liters, so totally 8250 liters per day is consumed. For landscape irrigation, floor cleaning & toilet flushing water is taken from two bore well and the total dissolved solid (TDS) level is given below.

Location	Water TDS level	Temperature in ° C
Quarry Water	640	31.4
Ground Floor Water Cooler	260	27.6
Second Floor Water Cooler	253	25.6

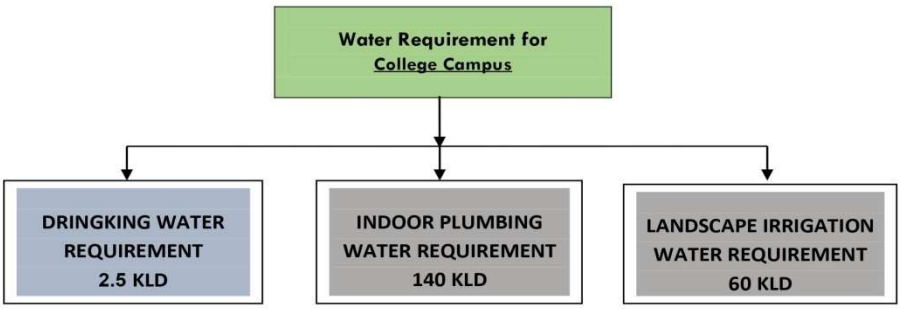
Comments:

As per the WHO recommended drinking water TDS level is < 300. In our campus drinking water TDS level is within the limit. For quarry, water treatment system is required to reduce the TDS level.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

6.7 WATER BALANCE CHART

Source of drinking water is from the quarry water, to underground reservoir, it is transferred to Overhead tank and supplying the water with the help RO systems. And same quarry water is in usage to meet the landscape irrigation, cleaning & toilet purpose. There is no sewage plant installed in this plant, sewage is connected through the municipal sewerage line.



6.8 RAINWATER HARVESTING SYSTEM

In college campus rainwater is collected and recharge the ground with the help of a quarry water reservoir and Melakottaiyur Lake and the lake and reservoir is located near to the college campus. Rainwater trenches are built according to the slope of the surface level and it connect the roof and non-roof rainwater to rainwater harvesting system.

Criterion 6 - Governance, Leadership and Management
Key indicator – 6.5.2

Waste Audit

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

7 WASTE MANAGEMENT SYSTEM

In college campus, separate dry waste and wet waste type of waste collection bins are provided for collection of waste. All waste generated from the building operation was analyzed. A waste audit was performed on 28/02/2021 at Tamil Nadu Physical Education and Sports University, Chennai to identify opportunities to divert waste streams from landfills and to determine further source reduction opportunities.

Waste Treatment:

Different types of waste are collected from the hostel mess & other places are sent to Municipal. In the college campus is the common solid waste management center for segregation and effective management of waste generated in the college premises. The unit has specific sections where solid waste is segregated as 'wet' and 'dry'. The dry waste such as plastics, papers, cartons, e-waste and scrap are separated and sent to 'recycle vendor' for recycling. The organic waste such as dried leaves and kitchen refuse from the canteen are used for composting.

Month	Cardboard Waste, Kg	Paper Waste, Kg	Plastic Waste, Kg	Bottle Kg	Total Waste, Kg
Mar-19	-	338	-	-	338
Apr-19	-	338	-	-	338
May-19	-	2082	-	-	2082
Jun-19	-	1106	-	-	1106
Sep-19	133	6697	108	16	6954
Oct-19	42	3651	71	20	3784
Nov-19	57	108	29	-	194
Dec-19	131	87	92	30	340
Jan-20	133	19	41	-	193
Feb-20	90	164	99	54	407
Mar-20	27	61	46	-	134
Jan-21	41	7	105	-	153
Feb-21	3802	3070	126	9	7007

Waste Audit Procedure:

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

- Waste auditing was carried out by sorting and measuring the building's waste over a given time period, i.e. 24 hours' time. And Audit team selected a time period of 16th Feb 2021.
- The Audit Team was equipped with all necessary safety and personal protective devices including safety glasses, respirator masks, coveralls and gloves.
- The Audit team has taken the waste audit form and marked the following types:
    - Papers
    - Tissue paper
    - Pet bottles
    - Plastic covers
    - Printed hard paper
    - Food waste
- Each waste type was separated and measured for the weight through a weighing scale. The values were entered in the waste audit form and compared against the total weight of all wastes.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

GREEN CAMPUS, ENVIRONMENT AND ENERGY USAGE POLICY

Weblink (Page No.29-34) : https://www.tnpesu.org/upload/POLICIES.pdf

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

தமிழ்நாடு உடற்கல்வியியல் மற்றும் விளையாட்டுப் பல்கலைக்கழகம்
TAMIL NADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY
(Estd. by the Govt. of Tamil Nadu Under Act No.9 of 2005. A State Govt. University)

POLICIES

S.No.	List of Policies	Page No.
1	Research promotion policy	2-8
2	Code of conduct for students, teachers andnon-teaching staff	9-20
3	Policy on systems and procedures for maintaining and utilizing physical, Academic and support facilities	21-23
4	E-governance policy	24-28
5	Green campus, environment and energy usage policy	29-34
6	Consultancy Policy	35-39
7	Information Technology Policy	40-44
8	Policy on grievance redressal (sexual harassment committee and antiragging committee)	45-48
9	Resource mobilization policy and strategies for optimal utilisation of resources	49-53

Criterion 6 - Governance, Leadership and Management
Key indicator – 6.5.2

தமிழ்நாடு உடற்கல்வியியல் மற்றும் விளையாட்டுப் பல்கலைக்கழகம்

TAMILNADUPHYSICALEDUCATIONANDSPORTSUNIVERSITY

Melakottaiyur,Chennai-127

GREEN CAMPUS, ENVIRONMENT AND ENERGY USAGE POLICY

Tamil Nadu Physical Education and Sports University
Chennai - 600127

GREEN CAMPUS, ENVIRONMENTAND ENERGY USAGEPOLICY

1.Preface :

Tamil Nadu Physical Education and Sports University protects its own environment with its green campus initiative and keeps pollution free campus. Environment development is its basic work with the educational policies implemented on the campus. Environmental conscious administration, the staff and the students of the University look after the environment carefully.

2.Definition of Terms:

A Green Campus is a place where environmental friendly practices and education combine to promote sustainable and eco-friendly practices in the campus. The green campus concept offers an institution the opportunity to take the lead in redefining its environmental culture and developing new paradigms by creating sustainable solutions to environmental, social and economic needs of the mankind.

3. Objectives of the Green Campus, environment and energy usage policy:

i. To create awareness regarding environmental policy amongst the students and the staff members.

ii. To maintain pollution free campus by avoiding tobacco, pan-masala, chewing on the campus. As per the govt. rules and regulations regarding the instructions of tobacco free campus signboards are displayed at various places on the campus.

iii. To Use Solar Energy on University Campus by installing Solar Lamps and Solar water Heaters .

iv. To sensitize the students and staff regarding the use of drinking water properly and other water sources sensibly.

v. To encourage tree plantation and maintenances of trees in the campus among students and staff.

v. To bring in use **the 'Rain Water Harvesting' on the campus.**

vi. To maximize the use of ICT and minimize the use of paper. It will help to go towards **'Paperless Office'.**

viii. To use the solid waste through vermin-compost on the campus and use it as a fertilizer.

viii. To use 'Use me' dust bins in the campus so as to keep campus clean

ix. To protect and nurture the Flora and Fauna on the campus

x. To maintain green campus, 'Green Audit' is done regularly.

4) Green Campus Environment and Energy Usage Practices in the University

(a) Restricted Entry of Automobiles:

The movement of automobiles vehicles such as two wheeler, cars and other heavy vehicles are restricted from the administrative block of the University. The car parking and two wheeler parking are available next to the administrative block so that no vehicles could enter into campus beyond administrative block.

(b) Use of Bicycles/Battery powered vehicles:

The University encourages the use of bicycles by the students as well as the staff of the University so as to make the campus pollution free.

(c) Pedestrian Friendly Pathways:

The pedestrian friendly pathway will be added for the people from the main gate to the administrative block of the University campus.

(d) Ban on use of Plastic:

The University has banned the use of single use plastics inside the campus. In this regard, the plastics awareness day was observed in the university campus so as to make the students and staff known the impact of the uses of single use plastics.

(e) Green Audit**:**

The University campus has more than 1,200 well grown trees which make the campus Eco-friendly. The University, with the help of Forest Department, conduct tree plantation drive in the University regularly. An exclusive green house has been setup in the University in which more than one hundred ornamental plants which looks beautiful. Besides these initiatives, lawns

with plants are there in front of the administrative building, science block, hostels & also cycling velodrome. All these efforts make the University campus greenish and eco-friendly. The forest officials visited the campus for conducting the green audit and submitted the report. Wherever possible in the front position of the University buildings such as administrative service block, hostel, indoor stadium and cycling velodrome are landscaped with plants and trees and the same are well maintained.

(f) Energy Audit:

The University ensures that no energy is wasted unnecessarily in its campus. The university has employed adequate man power to monitor energy consumption in the university campus which leads to energy conservation of the total lighting requirements. At least 20% of the lightings is through LED bulbs. The University has decided to replace all the existing blubs by LED bulbs in another one year. The students of different classes are informed to optimize the use of energy in their respective classes. Further, the University has also taken initiatives to conserve energy through sensor base technology for some of the facilities especially at the Administration Block of the University

(g) Environmental Audit:

The university takes at most care in conserving the environment in the campus through the following initiatives:

i. The usage of single use plastics is totally banned in the campus.
ii. All automobiles (two wheelers & four wheelers) are not allowed inside the campus after administrative buildings of the University.
iii. Parking for both two wheelers and four wheelers are available near to the administrative building of the University.
iv. Students and Staff are encouraged to use bicycles for local mobility.
v. Wastages are segregated as biodegradable & non-biodegradable and the same are collected by local panchayat (municipality) people.
vi. The NSS unit of the university in collaboration with forest officials conducts programmes of planting of trees regularly in the campus.
vii. The University maintains the ecosystem in such a way that wild birds and animals are safe and free to move around.

viii. The University makes sure that the take and the quarry available inside the campus are not contaminated but protected and preserved carefully.

(h) Beyond the campus environmental promotion activities:

The University recognizes the need for preserving the environment not only within the campus but also beyond the campus through the efforts of students of all courses continuously by the Village Placement Program (VPP). At least one day is fully devoted by the students for exclusively planting of tress in the nearby villages out of the total five days of the Village Placement Program. This is a compulsory academic program for all the final year students. By this initiatives of the University, the schools, temples, other public places of nearby villages are cleaned and planted tress for conserving the environment.

(i) Water Conservation facilities available in the Institution:

1) Rain Water Harvesting:

The 125 acre University campus consists of a lake of 15 acres and a quarry of 8 acres. The buildings of the University having provisions for rain water harvesting and the downstream of the campus make way for the rain water to store in the lake and also quarry which are the source of water for the entire campus. It is very well maintained taken care of by the University.

2) Borewell / Open well recharge:

The University has three open wells which are very well maintained and also has a bore well which is used to bring water from the quarry to different buildings of the University.

3) Construction of Tanks and bunds:

The University has one overhead tank with the capacity of 20,000 liters which caters to the need of hostel and mess. Besides this, each building has a overhead tank for providing water for the use of people in the respective building.

4) Maintenance of Water bodies and distribution system in the campus:

The University maintains water bodies properly and make sure that the distribution of water to different building optimally through a systematic distribution system without any wastage of water.

(j) SOLID WASTES:

- In the University campus, the solid wastes are categorized as biodegradable and non-biodegradable and the same are accumulated at different collection bins, the people from local Punchayat collect this solid wastes twice in a week.
- The paper wastes generated from different sections of the University are disposed once in three months.
- All the others kinds of scraps such as wooden material, plastics, steels, materials are disposed by Scraps Disposal Committee once in three months.

(k) LIQUID WASTES:

- The University makes sure that the use of water is optimized by all the Departments and Sections. The liquid wastes from the rest rooms and wash rooms of the hostel, administrative building and academic building, quarters etc., are reused for watering the plants and trees in the nearby area of the respective buildings. In order to avoid the wastages of water, the plumbers of the Estate Office check the pipe lines and taps regularly to arrest water leakages if any.
- The drinking water facilities are very well taken care of and thereby, it is ensured that no drinking water is wasted in the campus.

(n) E-WASTES MANAGEMENT

- The e- wastes accumulated from different Departments and sections of the University are taken back by the company which is maintaining the computer hardware in the University through an agreement.

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GREEN CAMPUS INITIATIVE

MIYAWAKI FOREST

@

TNPESU

Criterion 6 - Governance, Leadership and Management
Key indicator – 6.5.2

MIYAWAKI FOREST – 2022

Criterion 6 - Governance, Leadership and Management
Key indicator – 6.5.2

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

MIYAWAKI FOREST – 2024

Criterion 6 - Governance, Leadership and Management
Key indicator – 6.5.2

தமிழ்நாடு உடற்கல்வியியல் மற்றும் விளையாட்டுப் பல்கலைக்கழகம்

TAMIL NADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

(Estd. by the Govt. of Tamil Nadu Under Act No. 9 of 2005)

Accredited with "B + " Grade by NAAC

Melakottaiyur Post, Vandalur-Kelambakkam Road, Chennai - 600 127. Tamil Nadu, India.

Tel : 044 - 27477906 E-mail : regtnpesu@gmail.com Website : www.tnpesu.org

Dr.V.Gopinath
Registrar

OP.No.582A/970/TNPESU/Regr/Green Environment/2022 Date: 28.02.2022

To,

The Program Manager,
M/s Saytrees, Say Trees
Environmental Trust,
BNG (U) BGR / 26/2013-2014,
Bangalore - 560100

Sir/Madam,

Sub: TNPESU - Creation of Miyawaki Forest - University Campus - Approval given - reg. Establishment Dr.Grace Helina - Professor - Transfer of TPF Amount - requested - reg.

Ref: Letters of Saytrees.

*****

I am by direction to inform that this University has given approval to your company towards execution of works pertaining to creation of Miyawaki Forest in the land behind the quarters of Vice-Chancellor and Registrar and quarry belt.

The Memorandum of Understanding will be made between your company and TNPESU at later stage.

Thanking you,

Yours faithfully,

V. 28/2/2022

Registrar

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

MEMORANDUM OF UNDERSTANDING BETWEEN SAYTREES & TAMIL NADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

This Memorandum of Understanding (the "**MOU**") is executed on this _____ by and between:

SayTrees Environmental Trust, a non-governmental organisation, incorporated under the provisions of Indian Trusts Act, 1882, and having its registered office at No. 6, 1st cross, first floor, Basapura, Near Hosa Road Junction, Bengaluru, Karnataka 560100, hereinafter referred to as "SayTrees" of the
ONE PART;

And

Tamil Nadu Physical Education and Sports University_Melakottaiyur, Chennai, Tamil Nadu 600127 , hereinafter referred to as "Tamil Nadu Physical Education and Sports University" which expression shall, unless it be repugnant to the subject or context thereof, include its successors and permitted assignees, of the
OTHER PART

"SayTrees Environmental Trust" and the **"Tamil Nadu Physical Education and Sports University"** may hereinafter individually be referred to as **"Party"**, and collectively as **"Parties"**.

WHEREAS

1. SayTrees Environmental Trust is a non-governmental organization working in the field of afforestation and environment restoration since the year 2007. Since its inception, SayTrees has planted 52 Miyawaki forests with a total of over 5,50,000 saplings, with the support of 50,000 volunteers and several corporates and thus has experience and expertise in creating Miyawaki forests.
2. The Tamil Nadu Physical Education and Sports University and Say Trees are both desirous of creating a Miyawaki forest as an initiative to restore the environment and mitigate climate change. The terms and conditions for the partnership are listed below.

The Parties have had the initial discussions on the site selection, land details and other essentials for creating the Miyawaki forest. Hence, this MoU is a record of the process completed so far, as well as crucial terms and conditions for the creation, maintenance and permanent survival of the forest.

1. **Site Selection and Land Ownership:** After careful consideration, SayTrees has selected one site (shortlisted by the Tamil Nadu Physical Education and Sports University) and found its conditions suitable for the growth and survival of the forest. The coordinates of the said land are (12°49'56.76"N),(80° 8'35.09"E). The plot is owned by Tamil Nadu Physical Education and Sports University. The owner/s have duly consented to the use of the land for the creation of the forest. Copies of the concerned documents regarding the land ownership and permission for its use are attached hereto as Annexure A and Annexure B respectively.

2. **Land Area:** The main plantation area measures around 3.30 acres, and it will be surrounded by a 1.5-mt. wide trench on each side. The total land area will account for the trench which will be dug on all sides of the plantation area, as an additional protective measure for the forest.

3. **Water and Electricity:** The Tamil Nadu Physical Education and Sports University will provide a source of electricity and water for the regular upkeep of the forest for a period of two years. There will be one primary source and two backup sources for each. SayTrees will check and confirm these sources at the time of plantation. All expenses regarding electricity and water (if any) will be borne by the Tamil Nadu Physical Education and Sports University

4. **On the Expenses and Delivery of Essential Services and Materials:** SayTrees will prepare a list of the materials necessary at all stages of the creation and upkeep of the forest. We will connect with vendors with the support and recommendations of the Tamil Nadu Physical Education and Sports University (as needed), place orders, make direct payments to the vendors and ensure smooth delivery. Such materials include saplings, cocopeat, vermicompost, support sticks, etc. Materials for the upkeep of the forest such as biofertilisers and mulching are also included. Services and other deliverables include machine (JCB / Poclain) costs, agronomic expert costs, costs of team visits, etc. All costs incurred for the setting up of the forest -

from land preparation to maintenance of the forest - including but not limited to the costs mentioned in this paragraph, shall be borne by SayTrees alone, for the duration of two years.

5. **Agronomic Expert:** SayTrees will appoint an agronomic expert who will visit the forest at time periods stipulated as per the Miyawaki technique. This expert shall also be available for phone and video counselling, as needed. He / She / They will be responsible for any troubleshooting and problem solving in the first two years of the forest. SayTrees will ensure that the expert also proactively keeps in touch with the Tamil Nadu Physical Education and Sports University and caretaker, and receives regular updates on the forest.

6. **Sapling Plantation and Caretaking:** It will be the responsibility of the Saytrees to Plant & maintain the plant saplings in the land allocated by Tamil Nadu Physical Education and Sports University. We will deploy a full-time caretaker for the regular upkeep of the forest. The salary of the said person for a period of two years will be borne by SayTrees.

7. **Installation of Name Board:** The Tamil Nadu Physical Education and Sports University will support the installation of a name board at the forest entrance, to acknowledge the funders who have contributed towards the creation of the forest.

8. **Funding and Communication with Funder/s:** SayTrees will be entitled to raise funds for the forest and handle the end-to-end communication with the funder/s or funding organization. This includes (but is not limited to) coordinating site visits and trips, answering queries, finalizing the budget, sharing expense reports, working on an audit report, sharing photos and updates, etc.

9. **On Exchange of Funds:** Funds for the forest will be directly sourced by SayTrees from the funder/s or funding organization. At no point will the funder/s give any funds to the Tamil Nadu Physical Education and Sports University. For the materials and services necessary for the forest, SayTrees will transfer allocated funds from the budget to vendors / service providers directly.

10. **On the Permanent Survival of the Forest:** The forest should survive forever. The Tamil Nadu Physical Education and Sports University will offer 100% support and commitment towards this endeavour. Hence, the Tamil Nadu Physical Education and Sports University will also ensure that the saplings planted in the forest will never be removed nor cut, and the land alloted to the forest will never be allotted for any purpose other than as a forest. The Tamil Nadu Physical Education and Sports University will also protect the land from grazing, fire or any other harm.

11. **On Miscellaneous Costs:** In case of any unforeseen emergency expenditures for disaster management, re-plantation of saplings, etc. SayTrees will proactively step in

and allocate miscellaneous / safety costs from the budget. The extent of the expenditure and intervention will be determined by SayTrees in consultation with the Tamil Nadu Physical Education and Sports University and agronomic expert.

1. **Term**

1.1. This MOU shall be effective from the date of execution. The Tamil Nadu Physical Education and Sports University will be committed to ensure its survival in perpetuity.

2. **Publicity and Translation of Materials**

2.1. SayTrees will acknowledge the Tamil Nadu Physical Education and Sports University while sharing updates about the forest in online or print media, and vice versa.

3. **Notice**

3.1. All communications given under or pursuant to this MOU by a Party to the other Party shall be deemed to have been given when hand delivered by messenger or courier or sent by registered post or speed post or email (and in the case of email, to be subsequently followed up by delivery through any other means).

If to Say Trees Environmental Trust:
[No. 6, 1st cross, first floor, Basapura, Near Hosa Road Junction, Bengaluru, Karnataka 560100]

If to Tamil Nadu Physical Education and Sports University:
[Tamil Nadu Physical Education and Sports University Melakottaiyur, Chennai, Tamil Nadu 600127]

Or to such other addresses as a Party may from time to time designate by written notice to the other.

4. **Force Majeure**

4.1. Neither Party shall be liable to the other Party for any failure or delay in performance of any of its obligations under this MOU if such failure or delay is either partly or wholly due to any occurrence beyond the control of the Parties, including, without limitation, any Acts of God, or of any governmental body, or of public enemy, riots, embargoes, (the "Force Majeure"), which hinder the performance of obligations under this MOU.

4.2. Upon the occurrence of any such Force Majeure condition, the Party affected by Force Majeure condition shall as soon as reasonably practicably notify the other Party of the nature and extent thereof and the Parties shall enter into bonafide discussions with a view to assessing its effects, or to agreeing upon such alternative arrangements as may be fair and reasonable. If the Force Majeure condition continues for more than two months, either party shall have the option to terminate this MOU issuing not less than two months' notice to the other party.

5. Miscellaneous

5.1. The Parties agree that they shall cooperate with each other, subject to mutually agreed terms and conditions for executing this MOU.

6. Neither Party shall assign its rights and obligations under this MOU to any third party without the prior written consent of the other Party.

In witness whereof the Parties have caused this MOU to be executed through their authorized representative on the day and year first above written.

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed by their respective duly authorized officers as of the date first above written.

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

For and on behalf of

SayTrees Environmental Trust

Name: _____

Designation: _____

Witness: _____

For and on behalf of

Tamil Nadu Physical Education and Sports University

_____

Name: _____

Designation: _____

Witness: _____

saytrees
www.saytrees.org

SayTrees Environmental Trust
BNG(U)BGR/26/2013-2014
Bangalore - 560100
PAN # AAMTS8900M

Office of the Registrar Tamil Nadu Physical Education Sports University Chennai-127
10 JAN 2022
168

save trees save earth

www.saytrees.org | info@saytrees.org | Ph# +91-8884200070

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80G exemption certificate no. - DIT(E)BLR/80G/I-372/AAMTS8900M/ITO(E)-1/Vol 2013-2014

To,
The Registrar
TNPESU,
Chennai-127.

SUBMITTED TO VICE-CHANCELLOR
Yes ☑
No ☐

Sub - Approval letter for creation of Miyawaki forest in TNPESU campus.

Respected Sir,

SayTrees is a registered NGO, which has been planting trees and creating forests for more than one decade. We have planted more than 20,000 saplings in Chennai along with Greater Chennai corporation & Integral Coach Factory. We intend to create a Miyawaki forest inside your university campus. SayTrees will take care of the forest for a period of 2 years from the date of plantation by engaging work force. Post maintenance period the forest becomes self-sustainable & maintenance free.

We will be planting about 30,000 native species saplings in the land provided to us. It will help the environment by providing Ecosystem services, help the generations to come & serve as a resource centre for the students of the university.

We would also require constant supply of water, electricity & security for the afforested area from your side & a permission letter stating that the approved land for Afforestation will not be diverted for any other construction activity in coming future.

Please acknowledge your approval for the creation of the forest by replying to this request letter.

Yours Sincerely,

V.Vishal,
Program Manager,
SayTrees Environmental Trust,
Banglore

GREEN CAMPUS AWARDS

S.No.	Supportive Documents	Page No.
1	GREEN CAMPUS AWARD	140 - 141
2	THE TREE PLANTATION AWARD	142
3	THE WATER CONSERVATION AWARD	143

Criterion 6 - Governance, Leadership and Management
Key indicator – 6.5.2

GREEN CAMPUS AWARD

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

THE TREE PLANTATION AWARD

Certificate
OF ACHIEVEMENT

LIONS CLUBS INTERNATIONAL
District 324 J - 2022-23

Lions Clubs International, District 324 J Proudly Present this Certification to
TAMIL NADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY
for TREE PLANTATION IN THE CAMPUS.
We herewith present THE TREE PLANTATION AWARD
During the Lions 19th Annual District Convention held at
Sri Natarajan Thirumana Mandapam, Redhills, Chennai-52 On 16th April 2023.

MJF Lion B.V.Ravindran (BVR)
District Governor

PMJF Lion Er.P.Jeyakodi
DCP - Convention

CRITERION 6 - GOVERNANCE, LEADERSHIP AND MANAGEMENT
KEY INDICATOR – 6.5.2

THE WATER CONSERVATION AWARD

Certificate
OF ACHIEVEMENT

LIONS CLUBS INTERNATIONAL
District 324 J - 2022-23

Lions Clubs International, District 324 J Proudly Present this Certification to
TAMIL NADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY
for WATER CONSERVATION IN THE CAMPUS.
We herewith present THE WATER CONSERVATION AWARD
During the Lions 19th Annual District Convention held at
Sri Natarajan Thirumana Mandapam, Redhills, Chennai-52 On 16th April 2023.

MJF Lion B.V.Ravindran (BVR)
District Governor

PMJF Lion Er.P.Jeyakodi
DCP - Convention