

**GREEN & ENVIRONMENT AUDIT
OF
SRI DEVARAJ URS ACADEMY OF HIGHER
EDUCATION AND RESEARCH, TAMAKA, KOLAR**



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By



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Table of Contents

1	Introduction	4
1.1	Green Audit & Environment Audit.....	4
1.2	About Sri Devaraj Urs Academy of Higher Education and Research	4
1.3	Objectives of the Audit	5
1.4	Scope of the Project	6
1.5	Field observed Deficiencies.....	8
2	Campus Profile	11
2.1	Student hostel	12
2.1.1	Accommodation Details for Men's Hostel.....	12
2.1.2	Accommodation Details for Women's Hostel	13
3	Methodology and Analysis.....	16
3.1	Data Collection	16
3.1.1	Preliminary Data Collection	16
3.1.2	Categories of Land Use (Built Up Area)	17
3.1.3	Flora & Fauna	19
3.2	Data Analysis	19
3.2.1	Energy Consumption.....	19
3.2.2	Compliance Report.....	20
3.2.2.1	Air Quality Monitoring.....	20
3.2.2.2	Water Quality Monitoring	21
3.2.2.3	Assessment of Waste Generation and Disposal Practices	22
3.2.2.4	Analysis on Recycling Treated Water	23
4	Audit Areas and Findings	24
4.1	Energy Management.....	24
4.2	Water Management	25
4.3	Waste Management	26
4.4	Biodiversity	27
4.5	Environmental Awareness	28
4.6	Carbon Footprint	29
4.7	Hazardous Material Management	29
4.8	Disaster Management	30
4.9	Water Quality Testing.....	30
5	Conclusions and Recommendations	31
5.1	Recommendations.....	31
5.2	Recommendations for Awareness and Training in Green & Environment Audit:.....	35
5.3	Recommendations for Waste Management in Green Audit:	36
	Annexure 1 Site Audit Pics	39
	Annexure 2 Air Quality Test Report	44
	Annexure 3 Water Quality Test Report	46

1 Introduction

1.1 Green Audit & Environment Audit

A Green and Environment Audit is a systematic and documented process of evaluating an organization's environmental performance. It assesses the impact of an organization's activities on the environment and identifies areas for improvement in resource utilization, waste reduction, and overall environmental sustainability. It's a crucial tool for promoting environmental awareness and responsibility within institutions, businesses, and communities. Green audits typically involve data collection, analysis, and reporting on various environmental parameters such as energy consumption, water usage, waste generation, air quality, and green cover. The findings of a green audit provide a basis for developing and implementing environmental management plans aimed at minimizing environmental impacts and promoting sustainable practices. Ultimately, a Green Audit serves as a valuable mechanism for organizations to demonstrate their commitment to environmental stewardship and contribute to a healthier planet.

1.2 About Sri Devaraj Urs Academy of Higher Education and Research

Sri Devaraj Urs Academy of Higher Education and Research (SDUAHER), located in Tamaka, Kolar, Karnataka, is a prominent institution dedicated to medical education, research, and healthcare. Established in 1986 as Sri Devaraj Urs Medical College by the Sri Devaraj Urs Educational Trust for Backward Classes, founded by Shri. R.L. Jalappa in 1984, the institution aimed to provide quality medical services, particularly to rural communities. Named after former Karnataka Chief Minister Sri Devaraj Urs, known for his social reforms, the institution achieved deemed-to-be-university status in 2007 under the UGC Act 1956.

SDUAHER offers a comprehensive range of undergraduate, postgraduate, and doctoral programs in various medical disciplines, including medicine (MBBS), postgraduate specialties (MD, MS), super-specialty programs, and allied health sciences. The academy boasts modern infrastructure, including well-equipped classrooms, laboratories, a library, a teaching hospital for clinical training, and student hostels. Recognized by the UGC and NMC

and accredited by NAAC, SDUAHER is committed to its mission of providing quality medical education, conducting research, and delivering healthcare services with a focus on serving underserved populations, striving to be a center of excellence in the field.

1.3 Objectives of the Audit

- **To assess the current environmental status:** This involves evaluating the organization's current practices related to resource consumption (water, energy, materials), waste generation, emissions, and other environmental impacts. This forms a baseline for future improvements.
- **To identify areas for improvement:** By analyzing the data collected, the audit aims to pinpoint areas where the organization can reduce its environmental footprint, such as reducing energy and water consumption, minimizing waste generation, improving recycling rates, and adopting more sustainable practices.
- **To promote environmental awareness:** The audit process itself raises awareness among staff, students, and other stakeholders about environmental issues and the organization's impact. It encourages a culture of environmental responsibility and encourages participation in sustainable initiatives.
- **To ensure compliance with environmental regulations:** The audit can help organizations identify any gaps in compliance with local, national, or international environmental regulations and standards.
- **To develop an environmental management plan:** Based on the audit findings, a plan can be developed with specific, measurable, achievable, relevant, and time-bound (SMART) targets for environmental improvement.
- **To reduce environmental risks and liabilities:** By identifying and addressing environmental issues, the audit helps minimize the organization's exposure to environmental risks and potential legal liabilities.

- **To enhance the organization's image and reputation:** Demonstrating a commitment to environmental sustainability through a Green Audit can improve the organization's public image and reputation among stakeholders, including customers, investors, and the community.
- **To promote sustainable practices:** The overall goal is to encourage the adoption of sustainable practices throughout the organization's operations, contributing to a more environmentally responsible and sustainable future.

1.4 Scope of the Project

The scope of a Audit includes:

1. Areas of Focus:

1.1 Resource Management:

Water: Assessment of water consumption, sources, conservation measures, wastewater treatment, and reuse.

Energy: Evaluation of energy consumption (electricity, fossil fuels), energy efficiency measures, and use of renewable energy.

Materials: Analysis of material consumption, procurement practices, and waste generation.

1.2 Waste Management:

Assessment of solid waste, liquid waste, hazardous waste (including biomedical waste in a medical setting), and e-waste generation, segregation, collection, treatment, and disposal practices.

1.3 Green Cover and Biodiversity:

Evaluation of green spaces, landscaping, tree cover, and biodiversity on campus.

1.4 Transportation:

Assessment of transportation patterns, modes of transport used by students and staff, and initiatives to promote sustainable transportation.

1.5 Air Quality:

Assessment of indoor and outdoor air quality, sources of air pollution, and measures to improve air quality.

1.6 Environmental Awareness and Education:

Evaluation of environmental awareness programs, training, and integration of sustainability into the curriculum.

2. Physical Boundaries:

The scope should clearly define the physical boundaries of the audit. This usually includes all buildings, grounds, and facilities within the organization's campus or operational area.

3. Time Period:

The audit should specify the time period covered by the assessment. This is usually a specific academic year or a defined period (e.g., the past 12 months).

4. Data Collection Methods:

The scope should outline the methods that will be used for data collection, such as:


- ✓ Document review (policies, reports, records)
- ✓ Surveys and questionnaires
- ✓ Interviews with key personnel
- ✓ Site visits and observations
- ✓ Measurements and monitoring

1.5 Field observed Deficiencies

Sl. No.	Deficiency	Remarks
1		Bio Medical Waste Need safe storage & disposal Properly
2		Rain water harvesting Area Need to be Cleaned Properly

<p>3</p>		<p>ETP Plant Area Need to be cleaned it and Proper Maintenances Required</p>
<p>4</p>		<p>ETP Plant Outlet Pipe Need to be Proper Maintained</p>
<p>5</p>		<p>Water Treatment Plant - Tank Area need to be cleaned Properly</p>

<p>6</p>		<p>Dhanvantari Herbal Garden - Need Maintenance Properly</p>
<p>7</p>		<p>STP Plant Tank Area need to be properly Maintained</p>
<p>8</p>		<p>STP Plant - Motor Area need to be Maintained Properly</p>

9		<p>Water Treatment Plant - Tank Area need to be cleaned Properly</p>
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2 Campus Profile

Sri Devaraj Urs Medical College, a constituent college of Sri Devaraj Urs Academy of Higher Education and Research, is situated in the serene Tamaka village of Kolar, Karnataka, spanning a sprawling 72-acre campus surrounded by lush greenery. Established in 1986, the institution has grown into a hub for quality medical education, healthcare, and research. Conveniently located just 75 kilometers from Bengaluru and Bengaluru International Airport, the campus offers excellent accessibility. With a total built-up area of 85,000 square meters, it encompasses administrative blocks, academic buildings, a teaching hospital, and residential accommodations. The campus hosts a vibrant community, including 2,100 students, 1,300 faculty members, and 54 dedicated staff, fostering a dynamic environment for learning and innovation.

The institution’s academic facilities include modern lecture halls equipped with advanced audio-visual aids, a well-stocked library with extensive digital and physical resources, and specialized laboratories supporting cutting-edge research in biochemistry, microbiology, and clinical sciences. At the heart of the campus lies the R.L. Jalappa Hospital and Research Centre, a multispecialty teaching hospital providing secondary and tertiary healthcare services to Kolar and its neighboring regions, including parts of Tamil Nadu and Andhra

Pradesh. The hospital features state-of-the-art facilities such as a Trauma Centre, ICU, and diagnostic imaging services like CT and MRI, catering to both rural and urban populations while also serving as a vital resource for accident victims along the highways.

The campus includes comfortable residential facilities for students, with well-furnished hostels and dining services, alongside residential quarters for faculty and staff. Community outreach is a core aspect of the institution, with free medical camps regularly conducted in remote villages and taluks, as well as an outpatient unit in Kolar town, ensuring healthcare access for underserved populations. Accredited by NAAC and certified by ISO 9001-2000, the institution maintains a strong reputation for quality in medical education and processes, further validated by recognition from the Medical Council of India (MCI). In its commitment to sustainability, the campus is designed to promote eco-friendly practices, fostering a tranquil environment ideal for education and healthcare. With plans to introduce doctoral programs in Biochemistry and Microbiology and a fellowship in Head and Neck Onco-Surgery, the institution continues to expand its academic horizons. Additionally, it is revising its MBBS curriculum to align with the latest MCI guidelines, reinforcing its mission to develop skilled medical professionals who cater to the needs of society while maintaining high standards in education, healthcare, and research.

2.1 Student hostel

The institution Hostels are independent units in respects to its internal administration under the overall supervision of council of Wardens & Hostel Management. The hostels are situated within the campus & have separate hostel office & mess within the hostel premises.

2.1.1 Accommodation Details for Men's Hostel

Hostel Name	Total Rooms	Total Capacity	Present Occupants
UG Men's Hostel	163	377	314

Intern's Men's Hostel	48	94	61
PG Men's Hostel	80	158	74
NRI Men's Hostel	31	57	42
Total	322	686	492

2.1.2 Accommodation Details for Women's Hostel

Type of Hostel	Total Rooms	Total Capacity	Present Occupants
NUGH	98	294	226
PGWH	112	228	140
SWH(AHS)	77	214	90
NRI	31	61	47
JWH	18	44	38
IWH (Guest Rooms)	12	24	0
Total	348	865	541

There are various facilities available at Sri Devaraj Urs Academy of Higher Education and Research (SDUAHER), Kolar. Here's a breakdown of the information:

Facilities:

- **Drinking Water:** RO-UV Plant for clean drinking and cooking water.

- **Student Amenities:**
 - Reading Room for studying.
 - Recreation Hall with TV for relaxation.
 - Gym for fitness activities.
 - Newspaper facility for access to current affairs.
 - Wi-Fi connectivity throughout the campus.
 - Visitors Lounge for guests.
- **Food:** Food Court with various food stalls offering good quality food.
- **Sports & Fitness Centre:** Indoor and outdoor sports facilities for both men and women.
- **Library:**
 - Well-equipped library with a vast collection of medical resources.
 - Central air conditioning and Wi-Fi access.
 - Serves as a learning resource centre for students, faculty, and researchers.
 - Extended opening hours on weekdays, Sundays, and second Saturdays.
 - Dedicated book reading section.
- **Geo Tag Gallery:** Galleries showcasing images with geotagging information.
- **Banking Facility:** Separate bank and ATM services available within the campus for convenience.
- **Student Clubs:**
 - Various clubs exist to encourage student participation and development in different areas:
 - Sports Club
 - ICMR Club (likely related to Indian Council of Medical Research)
 - DEMEDCON Club
 - SANKEERNA Club
 - Literacy Club
 - Cultural Club
- **Information Centre:** Utilizes new technology to improve processes and services.
- **Campus Store:** Provides various items (details not mentioned).



- **Student Counselling Centre:** Offers professional counselling services to support students.
- **Digital Classrooms & Laboratories:**
 - Spacious classrooms equipped with Information and Communication Technology (ICT) tools like podiums, internet access, and smart boards.
 - Promotes technology-based teaching methods.

3 Methodology and Analysis

3.1 Data Collection

3.1.1 Preliminary Data Collection

In the preliminary data collection phase, an exhaustive and systematic approach was adopted to gather relevant information across various aspects of the campus. The objective was to understand the current practices, resource utilization, and areas requiring intervention. The following steps were undertaken for data collection:

1. Observation:

- Direct visits were conducted in key areas, including academic departments, the library, the canteen, and other operational spaces.
- Visual assessments provided insights into the campus layout, facilities, and day-to-day resource usage.

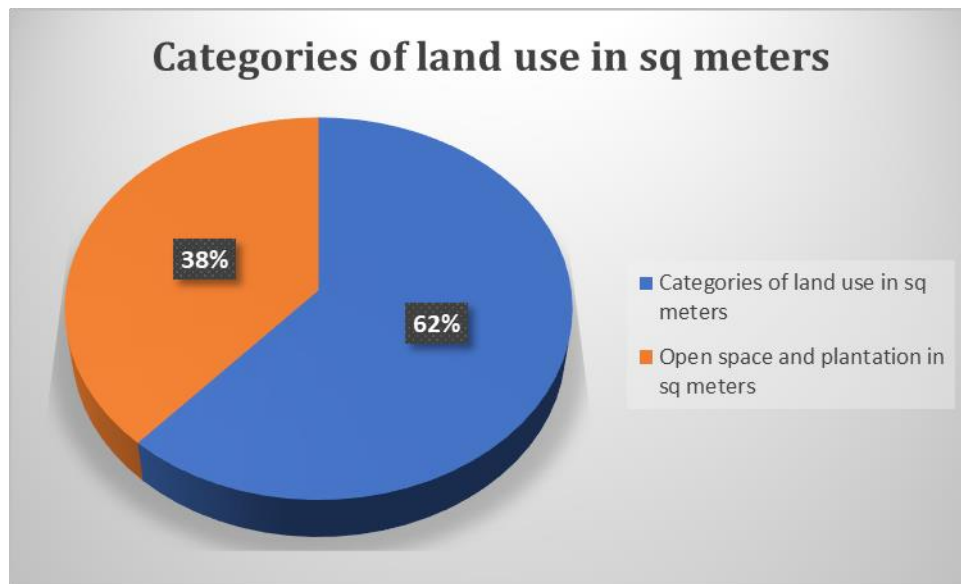
2. Surveys and Communication:

- Structured surveys and interviews were held with responsible personnel overseeing energy, water, and waste management.
- Discussions were focused on gathering qualitative and quantitative data regarding existing practices, challenges, and areas of improvement.

3. Measurements and Recordings:

- The power consumption of appliances was recorded. In cases where direct readings were not feasible, average values were calculated based on typical usage scenarios.
- Historical data and operational logs were reviewed to corroborate observations and ensure data reliability.

Categories of land use in sq meters	72 acres, 30 Gunta, 294399.00 Sq.mt
Open space and plantation	183897.68
Built up Area	42 acres

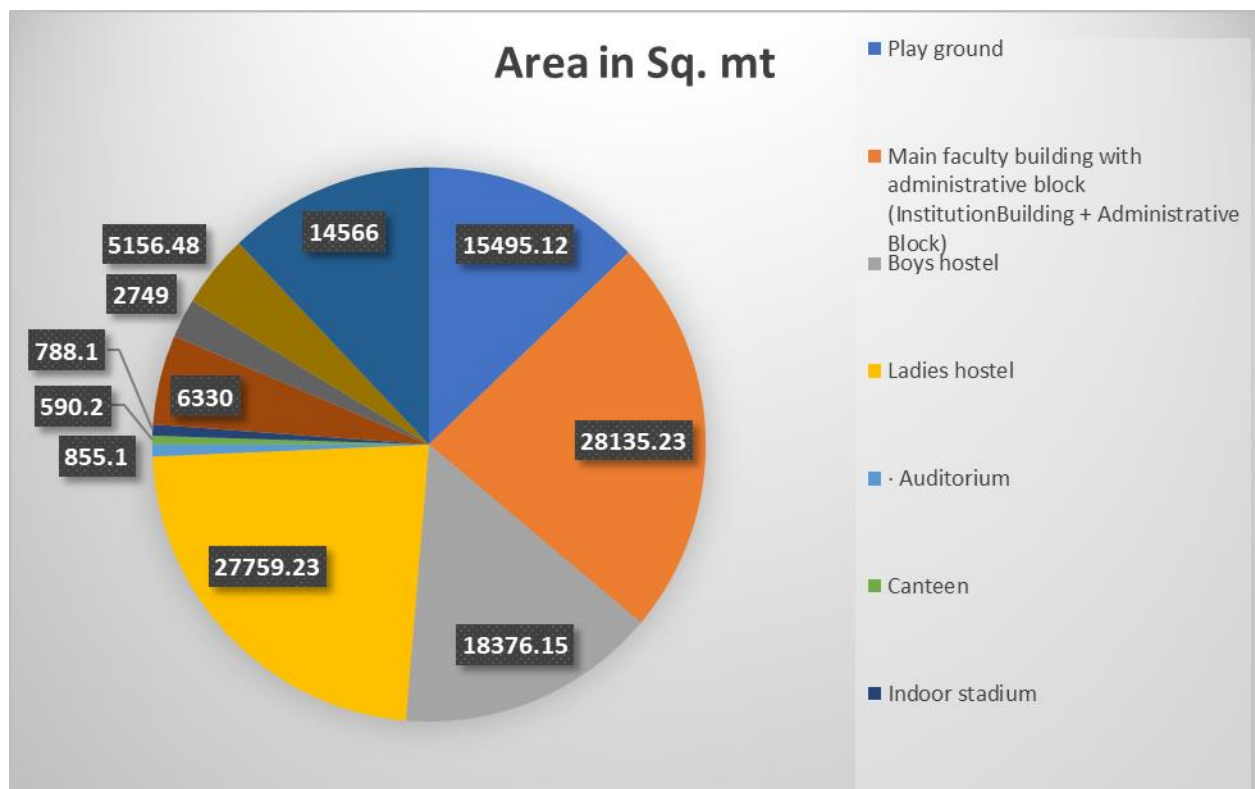


Graphical representation of Land use

3.1.2 Categories of Land Use (Built Up Area)

DESCRIPTION	AREA IN SQ. MT
Play ground	15495 sq. mt.
Main faculty building with administrative block (Institution Building + Administrative Block)	(25980 + 2155) 28135 Sq. mt.
Boys hostel	18376 Sq. mt.
Ladies hostel	27759 Sq. mt

· Auditorium	1827 + 580 2407 Sq. mt.
Canteen	590 + 265 855 Sq. mt.
Indoor stadium	788 Sq. mt.
Lab	Institution + Hospital 6330 Sq. mt. (3886 + 2444)
Toilets	Institution + Hospital 2749 Sq. mt. (1190 Nos. (Each 1.52 x 1.52)
Etc Hospital	5156.48 Sq. mt.
Etc (Quarters)	14566 Sq. mt.
Total	153121.48 Sq. mt.



Graphical representation of land use (Built up Area)

3.1.3 Flora & Fauna

DESCRIPTION- FLORA	QTY
Tamarind Trees	7
Avenue Trees	111
Neem Trees	236
Jack Fruit Trees	15
Mango Trees	69
Coconut Trees	356
Jamoon Trees	110
Amla trees	37
Singapore Cherry Trees	89
Champak Trees	68
Jungle Trees	612
Teak Trees	368
Paneer Trees	7
Bogan Villa Plants	321
Teak Wood Trees	2891
DESCRIPTION- FAUNA	Zoological name
SPIDERS	Araneae
Reptiles	Reptilia
Birds	Aves
Mammals	Mammalia

3.2 Data Analysis

3.2.1 Energy Consumption

A detailed analysis of the collected data was carried out to evaluate energy consumption, water usage, and other environmental factors.

Consumption of Electricity per year in kW-hr	
2019-2020	5610993
2020-2021	5891542.65
2021-2022	6186119.783
2022-2023	6495425.772
2023-2024	6000000
Total	30184081.2

Details of Electrical Equipment & Generators	Qty.
HT35 Installation	
500 KVA Transformer	1
750 KVA Transformer	1
630 KVA Transformer	1
500 KVA DG Set	1
750 KVA DG Set	1
630 KVA DG Set	1
HT60 Installation	
630 KVA Transformer	1
500 KVA Transformer	1
250 KVA Transformer	1

3.2.2 Compliance Report

3.2.2.1 Air Quality Monitoring

Air quality monitoring was carried out at various locations across the campus to ensure compliance with the National Ambient Air Quality (NAAQ) standards. The following areas were chosen as monitoring points due to their significance in terms of potential air quality

impact and daily human activity:

- In front of RLJ Center School
- Near Coconut Garden
- Near Diesel Generator (DG) Room
- Near Doctor's Quatres
- Near Sewage Treatment Plant (STP) Area
- Near Nursing College
- In front of Boys Hostel
- In front of Ladies Hostel
- In front of Medical College
- In front of the Academy Building
- Near Hospital Main Gate Entrance
- Near Main Gate

In the annexure the air quality report is attached.

3.2.2.2 Water Quality Monitoring

Water quality analysis within the Green Audit of Sri Devaraj Urs Academy of Higher Education and Research should encompass a comprehensive assessment of water used across the campus. This involves analyzing various physical, chemical, and microbiological parameters to ensure safety and identify areas for improvement. Specifically, testing should be conducted at key points including the source water (whether from municipal supply, wells, or other sources), the output of the RO-UV plants used for drinking and cooking water purification, water from various usage points within academic buildings (laboratories, restrooms), hospital facilities (sterilization units, laundry), and wastewater discharge points before it leaves the campus.

The analysis should evaluate parameters such as temperature, turbidity, pH, hardness, dissolved oxygen (DO), chemical and biological oxygen demand (COD and BOD), chlorides, sulfates, nitrates, heavy metals (especially relevant given the medical setting), residual

chlorine in treated water, and the presence of coliform bacteria (total and fecal, including E. coli). This comprehensive approach allows for a thorough understanding of water quality at every stage of its use within the institution, enabling targeted recommendations for improvement in treatment, conservation, and wastewater management, particularly addressing the specific needs and potential contaminants associated with a medical and research environment. The annexure contains the water quality report.

3.2.2.3 Assessment of Waste Generation and Disposal Practices

Sr. No.	Point of Disposal	Type of Waste	Qty in Kg - Per Annum	Mode of Disposal	Remarks
1	Canteen	Solid Waste	12678	Outsourced vide P.O NO. 016 Dated : 29/04/2019	The generated wastes are disposed as per the legal requirements.
2	Library	Paper Waste	656		
3	Store	Packing Material	1220		
4	Office	Papers & Electronic Waste	235	E - Waste Disposed to authorized Recycler	
5	Garden	Leaves and Branch cutting	3780	Outsourced vide P.O NO. 016 Dated : 29/04/2019	
6	Auditorium	General Waste	210		
7	Bathrooms	Pad & Napkin	120		
8	Classrooms	Paper & General waste	190		
9	Lab	Bio Medical Waste	2250	Disposed to Authorized agency	
10	Premises	Garbage	10000	Disposed through Proper incinerator	

3.2.2.4 Analysis on Recycling Treated Water

STP AND RECYCLING TREATED WATER	Qty	REMARKS
300 KLD STP treated water per day	300	The treated water is using for gardening and Toilet flush of Hostels & Quarters.
250 KLD ETP treated water	250	
TOTAL KLD	550	

4 Audit Areas and Findings

4.1 Energy Management

Current Practices	Audit Findings	Recommendations
<ul style="list-style-type: none"> The institution relies on a mix of renewable and non-renewable energy sources to meet its energy requirements. Energy-efficient appliances such as LED lights, sensor-based lighting, and energy-efficient street lights are being used to reduce energy consumption. The campus has solar panels and water heaters installed to supplement its energy needs 	<ul style="list-style-type: none"> Total Energy Consumption: 60,00,000 kWh/year. Renewable Energy Sources: Solar panels, water heaters, and heat pumps contribute to energy savings. Capacity of Renewable Energy Systems: The installed capacity of renewable energy systems is 1,820 kW, which helps in reducing the dependency on conventional energy sources. Energy-Saving Measures: Power-saving measures include the installation of sensor-based lighting and timers to automatically switch off lights when not needed. Awareness Programs: Awareness programs on energy 	<ul style="list-style-type: none"> Expand the installation of renewable energy systems such as additional solar panels and wind turbines to further reduce reliance on non-renewable energy sources. Invest in energy-efficient HVAC systems and other high-energy-consuming appliances to optimize energy usage. Increase the awareness programs to include more practical measures that can be adopted by students and staff, such as promoting the use of natural ventilation and efficient use of electronic devices.

	<p>conservation are conducted to engage students and staff in reducing energy consumption.</p>	
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4.2 Water Management

Current Practices	Audit Findings	Recommendations
<ul style="list-style-type: none"> The campus utilizes borewells as the primary water source. Rainwater harvesting systems are in place, along with wastewater treatment systems (STP and ETP) to recycle water for non-potable uses. Regular leak detection and repair measures are employed to minimize water wastage. 	<ul style="list-style-type: none"> Water Sources: Borewells (10 units) are the primary water source for the campus. Daily Water Consumption: 1,550 KLD is used on a daily basis across the campus. Rainwater Harvesting: Rainwater harvesting systems are operational with a capacity of 300 KLD (STP) and 250 KLD (ETP). Water Recycling: The campus has effective greywater recycling systems, ensuring that treated water is reused for irrigation and other non-potable applications. 	<ul style="list-style-type: none"> Increase the capacity of rainwater harvesting systems to handle the growing water demand, especially during the dry months. Implement water-efficient fixtures and fittings across the campus to reduce water consumption in toilets, kitchens, and other areas. Encourage students and staff to adopt water-saving practices, such as using water-efficient appliances and reducing water wastage.

	<ul style="list-style-type: none"> • Leak Detection Systems: Leak detection and repair mechanisms are in place to reduce water wastage. 	
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4.3 Waste Management

Current Practices	Audit Findings	Recommendations
<ul style="list-style-type: none"> • Waste segregation is practiced across the campus, with separate bins for wet, dry, and biomedical waste. • Organic waste (e.g., kitchen, garden, agricultural waste) is composted, while non-biodegradable waste is disposed of according to standard procedures. • E-waste management and recycling are not actively implemented, although an inventory of hazardous materials is maintained. 	<ul style="list-style-type: none"> • Waste Segregation: Effective waste segregation is in place with color-coded bins (yellow for biomedical, green for biodegradable, and red for non-biodegradable waste). • Biodegradable Waste Disposal: Organic waste is composted, and compost is used for landscaping and gardening. • E-Waste Management: No formal tie-ups with recyclers for e-waste or hazardous waste disposal. • Composting: Composting for kitchen waste, garden waste, and 	<ul style="list-style-type: none"> • Establish partnerships with certified e-waste recyclers to ensure proper disposal and recycling of electronic waste. • Set up dedicated areas for hazardous waste disposal and ensure that all hazardous materials are safely stored and disposed of according to regulations. • Expand composting initiatives by creating additional composting pits and biogas plants to process larger quantities of organic waste.

	<p>agricultural waste is actively practiced.</p> <ul style="list-style-type: none"> • Awareness on Waste Segregation: Students and staff are aware of the waste segregation practices and follow them diligently. 	
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4.4 Biodiversity

Current Practices	Audit Findings	Recommendations
<ul style="list-style-type: none"> • The campus is home to a wide range of trees, shrubs, and plants. • Tree-planting initiatives are regularly conducted, and the campus has mapped and labeled its biodiversity. • The use of organic fertilizers for landscaping is encouraged to maintain a healthy environment. 	<ul style="list-style-type: none"> • Green Cover: The campus boasts a green cover with over 4,800 trees, shrubs, and plants. • Biodiversity Mapping: Flora and fauna are mapped and labeled across the campus. • Tree-Planting Initiatives: Regular tree-planting drives are conducted to increase green cover. • Wildlife Conservation: There are efforts to conserve wildlife, including bird nests, 	<ul style="list-style-type: none"> • Increase biodiversity by planting native species and creating more natural habitats for wildlife. • Enhance the campus's wildlife conservation programs by establishing butterfly gardens, ponds, and bird sanctuaries. • Implement more sustainable landscaping practices to conserve water and enhance biodiversity.

	<p>butterfly gardens, and ponds.</p> <ul style="list-style-type: none"> • Landscaping: Landscaping is maintained using organic fertilizers, promoting a sustainable ecosystem. 	
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4.5 Environmental Awareness

Current Practices	Audit Findings	Recommendations
<ul style="list-style-type: none"> • Environmental education programs are offered as part of the curriculum, and students participate in various green activities. • Students and staff are involved in environmental campaigns, including plantation drives and clean-up programs. 	<ul style="list-style-type: none"> • Environmental Education Programs: Programs on sustainability and environmental issues are available to students. • Green Activities Participation: Students and staff participate in green activities, such as plantation drives and clean-up initiatives. • Environmental Campaigns: The institution regularly organizes environmental campaigns and events to raise awareness. 	<ul style="list-style-type: none"> • Strengthen the environmental education curriculum by incorporating more hands-on activities, field visits, and workshops. • Increase participation in local environmental campaigns and foster partnerships with NGOs and governmental bodies to broaden the impact. • Encourage more sustainable practices among students and staff by providing incentives for green behavior.

4.6 Carbon Footprint

Current Practices	Audit Findings	Recommendations
<ul style="list-style-type: none"> The institution has taken measures to reduce its carbon footprint, such as carpooling programs and the installation of EV charging stations. 	<ul style="list-style-type: none"> Carbon Reduction Measures: Measures such as carpooling and the availability of EV charging stations are being implemented. Scope 1, 2, and 3 Emissions: The audit did not specifically estimate the scope of emissions; however, the institution is making strides to mitigate its carbon footprint. 	<ul style="list-style-type: none"> Conduct a detailed carbon footprint assessment (Scope 1, Scope 2, and Scope 3 emissions) to identify and target key areas for reduction. Increase the number of EV charging stations and offer incentives for students and staff to use electric vehicles. Implement energy-saving programs to further reduce emissions from high-energy-consuming operations.

4.7 Hazardous Material Management

Current Practices	Audit Findings	Recommendations
<ul style="list-style-type: none"> Hazardous materials, such as chemicals in laboratories, are safely stored, and Material Safety Data Sheets (MSDS) are available. 	<ul style="list-style-type: none"> Hazardous Material Inventory: Proper inventory and storage of hazardous chemicals are maintained. MSDS Availability: MSDS for hazardous materials 	<ul style="list-style-type: none"> Establish a clear protocol for the safe disposal of hazardous materials and ensure that all relevant personnel are trained in these procedures.

	are readily available.	<ul style="list-style-type: none"> Conduct regular audits of hazardous material handling and ensure that safety standards are adhered to consistently.
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4.8 Disaster Management

Current Practices	Audit Findings	Recommendations
<ul style="list-style-type: none"> The campus has emergency preparedness plans in place for fire, flood, and other natural disasters. Fire safety equipment is available, and drills are conducted periodically. 	<ul style="list-style-type: none"> Emergency Preparedness: Emergency preparedness plans for fire, flood, and other disasters are in place. Fire Safety: Fire safety equipment is well-maintained, and periodic fire drills are conducted. 	<ul style="list-style-type: none"> Regularly update the disaster management plan to incorporate new risks and improve response times. Increase awareness among students and staff about disaster preparedness and evacuation procedures.

4.9 Water Quality Testing

Current Practices	Audit Findings	Recommendations
<ul style="list-style-type: none"> Regular testing of water quality is conducted to ensure it is safe for drinking and irrigation purposes. 	<ul style="list-style-type: none"> Water Quality Testing: Water quality is tested regularly for drinking and irrigation purposes, with reports available. 	<ul style="list-style-type: none"> Continue regular water quality testing, but expand the scope to include testing for additional contaminants, such as heavy metals and pesticides.

5 Conclusions and Recommendations

5.1 Recommendations

Conducting Green & Environmental audit is crucial for assessing and improving the ecological footprint of an institution. The following are detailed recommendations categorized under key areas for a college to enhance its environmental performance for NAAC accreditation:

1. Energy Management

- **Implement Renewable Energy Solutions:** Install solar panels or wind turbines to reduce reliance on conventional energy sources.
- **Energy Efficiency Measures:**
 - Replace traditional lighting with LED lights.
 - Use energy-efficient appliances (5-star rated equipment).
 - Install energy-efficient HVAC systems.
- **Automation:**
 - Implement motion sensors for lights in classrooms, washrooms, and corridors.
 - Use smart meters for monitoring energy consumption.
- **Awareness Programs:** Conduct energy-saving awareness campaigns among students and staff.

2. Water Management

- **Rainwater Harvesting:**
 - Install rainwater harvesting systems to recharge groundwater levels.
 - Use collected rainwater for gardening or non-potable uses.
- **Water Conservation Measures:**
 - Fix leaking taps and pipelines promptly.
 - Install water-saving fixtures like low-flow faucets and dual-flush toilets.
- **Wastewater Treatment:**

- Establish a sewage treatment plant (STP) for recycling wastewater.
- Use treated water for landscaping and flushing purposes.
- **Water Audit:**
 - Conduct periodic water audits to identify areas of wastage.

3. Waste Management

- **Solid Waste Segregation:**
 - Place color-coded bins for biodegradable, non-biodegradable, and hazardous waste.
 - Establish a central waste segregation facility.
- **Composting:**
 - Set up vermicomposting units or organic waste composters for biodegradable waste.
 - Use compost for campus landscaping and gardening.
- **E-Waste Management:**
 - Tie up with authorized e-waste recyclers.
 - Conduct regular e-waste collection drives.
- **Paperless Initiatives:**
 - Promote digital platforms for administrative tasks and reduce paper usage.
 - Encourage double-sided printing and reusing one-sided paper.

4. Biodiversity and Green Campus Initiatives

- **Tree Plantation:**
 - Organize tree plantation drives to enhance green cover on campus.
 - Use native species for landscaping to support local biodiversity.
- **Botanical Garden:**
 - Develop a botanical garden with medicinal plants and trees for educational purposes.
- **Habitat Preservation:**
 - Create spaces like butterfly gardens and bird feeders to attract local fauna.

- Maintain a register of flora and fauna found on the campus.

5. Pollution Control

- **Air Quality Improvement:**
 - Use electric or battery-operated vehicles for campus transport.
 - Ban the use of personal vehicles within the campus.
 - Install air-purifying plants in indoor and outdoor spaces.
- **Noise Pollution Control:**
 - Enforce no-honking zones within the campus.
 - Use soundproofing measures in auditoriums and classrooms.
- **Water Pollution Prevention:**
 - Avoid direct discharge of untreated wastewater into natural water bodies.

6. Carbon Footprint Reduction

- **Carbon Neutral Initiatives:**
 - Calculate and monitor the campus carbon footprint annually.
 - Offset emissions by increasing green cover or participating in carbon credit programs.
- **Sustainable Transport:**
 - Promote the use of bicycles or carpooling among students and staff.
- **Solar and Wind Power:**
 - Expand the use of renewable energy sources to reduce dependence on fossil fuels.

7. Campus Sustainability Practices

- **Green Building Initiatives:**
 - Ensure campus buildings comply with green building standards like LEED or GRIHA.
 - Improve insulation and use reflective paints to reduce cooling requirements.
- **Eco-Friendly Procurement:**
 - Source environmentally friendly products for cleaning, maintenance, and

operations.

- Avoid single-use plastics; encourage biodegradable alternatives.
- **Awareness and Training:**
 - Conduct workshops and seminars on sustainability and environmental responsibility.
 - Include environmental education as part of the curriculum.

8. Monitoring and Reporting

- **Environmental Policy:**
 - Develop and display an environmental policy for the institution.
 - Establish clear goals for waste reduction, energy savings, and resource conservation.
- **Monitoring Systems:**
 - Install sensors for real-time monitoring of energy, water, and waste.
 - Maintain detailed records of environmental metrics.
- **Annual Environmental Report:**
 - Prepare an annual environmental performance report and share it with stakeholders.
 - Highlight improvements, initiatives, and future plans.

9. Social and Community Engagement

- **Outreach Programs:**
 - Collaborate with local communities for environmental awareness campaigns.
 - Encourage students to participate in community service related to environment conservation.
- **Green Clubs:**
 - Establish green clubs or eco-clubs to lead sustainability initiatives on campus.
 - Organize inter-college competitions on environmental themes.

10. Compliance with Regulations

- Ensure compliance with national and state environmental laws.
- Obtain necessary certifications, such as ISO 14001 (Environmental Management System).

5.2 Recommendations for Awareness and Training in Green & Environment Audit:

1. Workshops and Seminars

Conduct regular workshops and guest lectures on topics like energy conservation, water management, waste segregation, and sustainable living.

Invite environmental experts, NGOs, or government officials to speak about pressing environmental issues.

2. Student Involvement Programs

Form eco-clubs or green committees to engage students in environmental activities.

Organize competitions like poster-making, essay writing, or quizzes on environmental themes.

Include green practices in academic projects, like designing eco-friendly systems or conducting environmental research.

3. Training Programs for Staff

Provide training sessions for administrative, maintenance, and housekeeping staff on waste management, water conservation, and eco-friendly practices.

Encourage faculty to integrate sustainability topics into their teaching.

4. Awareness Campaigns

Launch awareness drives, such as "Save Energy Day" or "No Plastic Week," to motivate behavioral changes.

Use social media, newsletters, and posters to promote green practices.

5. Practical Demonstrations

Set up live demonstration areas, such as rainwater harvesting systems, composting units, or renewable energy setups, for hands-on learning.

Use field trips to expose students and staff to successful green initiatives in nearby institutions or industries.

6. Interactive Activities

Host tree plantation drives, campus clean-ups, and e-waste collection campaigns.

Organize eco-treks or biodiversity walks to connect participants with nature.

7. Green Audit Training

Train a group of staff and students to conduct mini green audits on campus.

Involve them in tracking the implementation of eco-friendly practices and identifying areas of improvement.

8. Sustainability Pledge

Encourage students and staff to take a pledge to adopt sustainable habits, such as reducing single-use plastics or saving electricity.

9. Incorporation in Curriculum

Introduce short courses or modules on environmental sustainability and green practices.

Include case studies and assignments related to green audits to deepen understanding.

10. Feedback and Continuous Improvement

Collect feedback from participants after awareness and training programs.

Use the insights to improve future sessions and address specific knowledge gaps.

5.3 Recommendations for Waste Management in Green Audit:

1. Waste Segregation

Install separate bins for biodegradable, non-biodegradable, and recyclable waste in classrooms, offices, hostels, and outdoor spaces.



Use color-coded bins for easier identification (e.g., green for organic, blue for recyclables, and red for hazardous waste).

Display signage near bins to educate users on proper segregation practices.

2. Composting Organic Waste

Set up composting units for biodegradable waste generated from canteens, hostels, and gardens.

Use the compost produced for landscaping and gardening within the campus.

Conduct awareness programs to encourage the collection of organic waste.

3. Recycling Non-Biodegradable Waste

Partner with authorized recyclers to collect paper, plastics, and metals regularly.

Encourage students and staff to minimize single-use plastics by promoting alternatives like reusable bottles, bags, and cutlery.

Establish a collection point for recyclable materials like paper, cardboard, and plastic.

4. E-Waste Management

Organize e-waste collection drives for old computers, electronic devices, and batteries.

Collaborate with certified e-waste disposal vendors for safe recycling and disposal.

Educate staff and students about the importance of responsible e-waste disposal.

5. Hazardous Waste Management

Ensure the safe disposal of hazardous wastes such as laboratory chemicals, expired medicines, or batteries through authorized agencies.

Store hazardous waste in labeled, secure containers to prevent accidents or leaks.

6. Paper Waste Reduction

Implement a paperless policy by promoting the use of digital platforms for communication, assignments, and record-keeping.

Set up double-sided printing as a default option on all printers.



Encourage reusing one-sided printed papers for notes or drafts.

7. Awareness and Training

Conduct training sessions for housekeeping and maintenance staff on proper waste segregation and handling.

Organize awareness campaigns, workshops, and posters to educate the campus community on waste management practices.

9. Monitoring and Reporting

Maintain a waste audit log to track the types and quantities of waste generated.

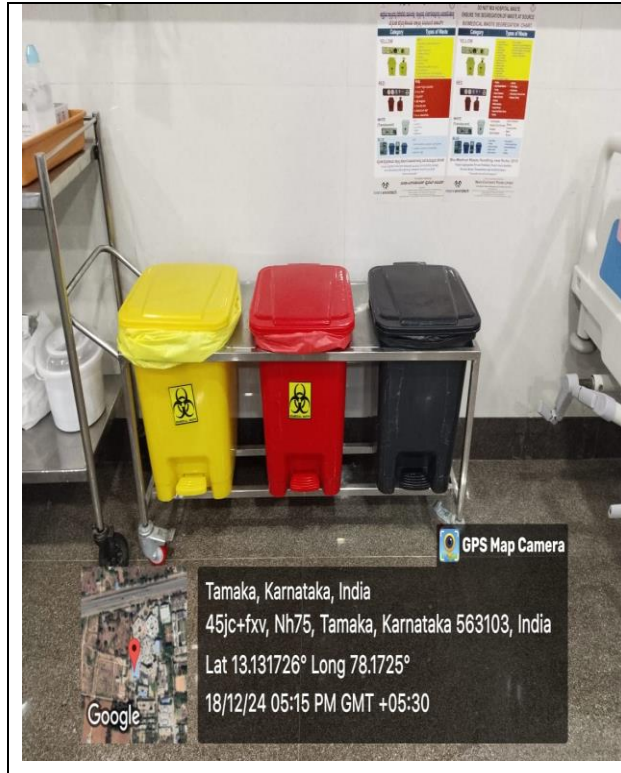
Regularly evaluate the effectiveness of waste management practices and update policies as needed.

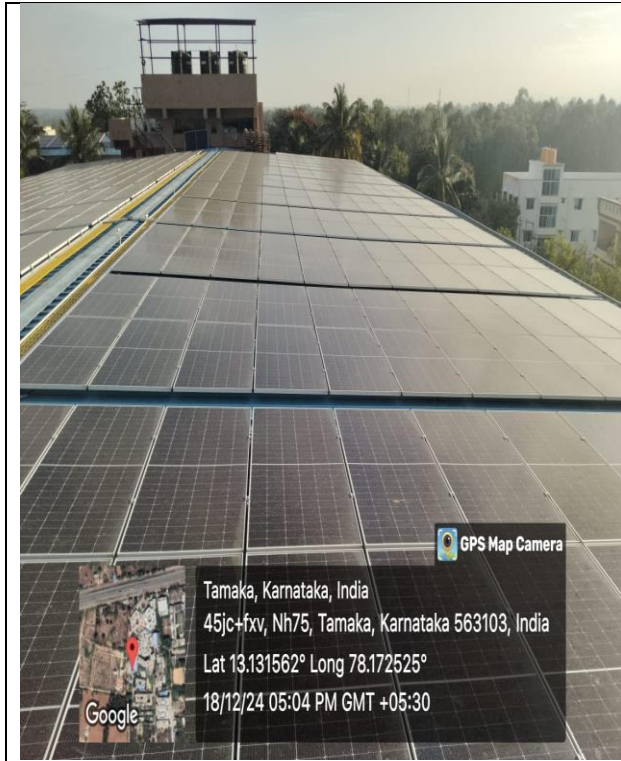
Conclusion

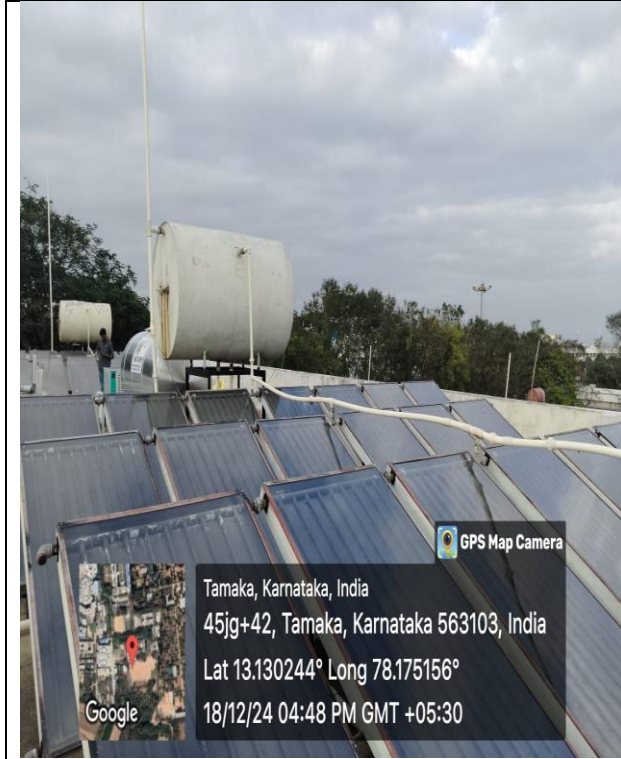
By implementing these recommendations, the college can achieve a sustainable and eco-friendly campus, aligning with NAAC accreditation requirements. These measures also foster a culture of environmental responsibility among students and staff, contributing to long-term ecological conservation.

Annexure

Annexure 1 Site Audit Pics











Annexure 2 Air Quality Test Report



AES TESTING LABORATORY

(ISO 9001:2005/ISO45001:2018 Certified Laboratory/NABL Accredited Laboratory)



44, 45, 1st Main Road, Vinayaka Nagar, Bagalagunte, Nagasandra Post, Bangalore - 560 073.

Mob : 9538555792, 9538555283, 9000565208, Email : aestestinglaboratory@gmail.com Web : www.aeslabs.co.in

AMBIENT AIR QUALITY REPORT

Name of the Company & Address	M/s. Sri DevarajUrs Academy of Higher Education & Research Tamaka, Kolar.
Name of the Location	In front of College Main Gate
Date of Sampling:	11/09/2024
Date of Analysis	12/09/2024
Sampled By	Lab Representative
Report Date:	14/09/2024
Report No:	AESTL/24/09/ED/040

Results:

Sl no.	Parameters	Units	Results	NAAQ Standard	Test Method
1	Respirable Suspended Particulate Matter (PM ₁₀)	µg/m ³	61.6	100 Max	IS:5182 (Part 23) 2017
2	Sulphur Dioxide (SO ₂)	µg/m ³	23.7	80 Max	IS:5182 (Part 2) 2017
3	Oxides of Nitrogen (NO ₂)	µg/m ³	33.3	80 Max	IS:5182 (Part 6) 2017

NAAQ- National Ambient air Quality

Report Status: The Results are within the Standards.

****End of Report****



AES TESTING LABORATORY

(ISO 9001:2005/ISO45001:2018 Certified Laboratory/NABL Accredited Laboratory)



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3	Oxides of Nitrogen (NO ₂)	µg/m ³	33.3	80 Max	IS:5182 (Part 6) 2017

NAAQ- National Ambient air Quality

Report Status: The Results are within the Standards.

****End of Report****

Annexure 3 Water Quality Test Report



AES TESTING LABORATORY

(ISO 9001:2005/ISO45001:2018 Certified Laboratory/NABL Accredited Laboratory)



44, 45, 1st Main Road, Vinayaka Nagar, Bagalagunte, Nagasandra Post, Bangalore - 560 073.

Mob : 9538555792, 9538555283, 9000565208, Email : aestestinglaboratory@gmail.com Web : www.aeslabs.co.in

TEST REPORT

Page: 1 of 1

Report No: AESTL/24/09/W/0138	Report Date : 16/09/2024
Issued To: M/s. R.L. Jalappa Hospital Tamaka, Kolar.	Customer Reference: Verbal
	Date of Receipt : 11/09/2024
	Date of test Start : 11/09/2024
	Date of Completion of test: 16/09/2024
Sample Received By: Customer	Sample Particulars : Softener water (Girls Hostel)

Tests	Results	Maximum Acceptable Limits (in mg/L)	Maximum Permissible Limits (in mg/L)	Protocol IS-3025
		(As per IS 10500:2012)		
Odour	Agreeable	Agreeable	Agreeable	IS:3025/Part-5
Turbidity, NTU	<1.0	1	5	IS:3025/Part-10
Total Suspended Solids, mg/L	<2.0	----	----	IS:3025/Part-17
pH Value	7.00	6.5 – 8.5	No Relaxation	IS:3025/Part-11
Electrical Conductivity, μ s/cm	3469	----	----	IS:3025/Part-14
Total Dissolved Solids, mg/L	2161.0	500	2000	IS:3025/Part-16
Total Hardness as CaCO ₃ , mg/L	470.0	200	600	IS:3025/Part-21
Calcium Hardness, mg/L	300.0	----	----	IS:3025/Part-40
Magnesium Hardness, mg/L	170.0	----	----	IS:3025/Part-46
Chloride as Cl, mg/L	760.0	250	1000	IS:3025/Part-32
Sulphate as SO ₄ , mg/L	62.3	200	400	IS:3025/Part-24
Nitrate as NO ₃ , mg/L	8.9	45	No Relaxation	IS:3025/Part-34
Nitrite as NO ₂ , mg/L	Absent	----	----	IS:3025/Part-34
Fluoride as F, mg/L	0.64	1.0	1.5	IS:3025/Part-60
Iron as Fe, mg/L	0.12	0.3	No Relaxation	IS:3025/Part-53
Total Alkalinity as CaCO ₃ , mg/L	448.0	200	600	IS:3025/Part-23
Phenolphthalein Alkalinity, mg/L	Nil	----	----	IS:3025/Part-23
Reactive Silica as SiO ₂ , mg/L	61.4	----	----	IS:3025/Part-35
Colloidal Silica as CSiO ₂ , mg/L	30.7	----	----	IS:3025/Part-35
Sodium as Na, mg/L	121.0	----	----	IS:3025/Part-45
Total Coliform Count/100ml	18 MPN	Shall not be detectable in any 100ml sample		IS 1622: 1981-RA 2018
E. Coli /100ml	3 MPN	Shall not be detectable in any 100ml sample		IS 1622: 1981-RA 2018

Remarks: The given water sample not fit for domestic purpose as per IS 10500 : 2012 for above physical , chemical and microbiological testing.

Tested By : 

*****End of the Report*****


Authorised Signature

Note : 1. The Result listed pertain only to tested samples and applicable parameters. 2. Samples will be destroyed after 15 days from the date of issue of test certificate unless & otherwise Specified. 3. This Report is not be reproduced either wholly or in part and can not be used an evidence in the court of law and should not any advertising media without prior Written permission. 4. Sampling not done by us, unless specified.

Power Quality Analysis Report

17th- 19th December – 2024

Report No: 3303/597

Sri Devaraj Urs Academy of Higher Education and Research

Tamaka, Kolar-563101, Karnataka

By M.N SARAVANAN

TRANSERECT

Testing and Commissioning Engineers Pvt. Ltd.

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MEASURING INSTRUMENTS | | SOLAR |
| ENERGY AUDIT | | THERMOGRAPHY | | SECURE METERS |

Table of Contents

Report Information.....	3
Acknowledgements.....	4
Assumptions.....	5
Analysis Instrument used	5
Overview	6
Analysis.....	8
Tolerances	8
Detail Report	9
Electrical Description.....	9
Executive Summary	10
Brief about Site.....	10
Analysis of Electricity Billing.....	11
Trend graph.....	16
750kVA Transformer Output 1250A 4P ACB	16
630kVA Transformer Output 1000A 4P ACB	21

Report Information

Report No	3303/597		
Site Name	Sri Devaraj Urs Academy of Higher Education and Research		
Site Address	Tamaka, Kolar-563101, Karnataka		
Site Contact Person	Mr. Kantharaj	M: 9880554132	
Scope of Work	Power Quality Analysis and Report		
Equipment Details	Fluke Power Quality analyzer (Model Fluke 1775)	Sr. No 65667514	Calibration Due Date: 20.06.2026
Activity Date	Start: 17.12.2024	End: 19.12.2024	
Document Identification	SDUAHER PQA Analysis Report	Original Document	Report Date 20.12.2024 Version: Rev-0
Team Lead – Auditing			
Audit by	Mr. Kiran N C		
Team Lead – Reporting			
Report Prepared by	Ms. Anusha N V		
Manager – Application Engineering			
Report Checked by	Mr. M.N Saravanan		

Acknowledgements

We express our sincere gratitude to the entire team of **Sri Devaraj Urs Academy of Higher Education and Research** for giving us this opportunity and extending all kinds of support to conduct the Energy/ PQA/ Thermography Audit study at your premises. We are thankful and would express our sense of gratitude for the support and cooperation they rendered during the course of this analysis.

To the Management and Facility team of

Sri Devaraj Urs Academy of Higher Education and Research

We hope you find our recommendation useful in helping you reduce failure and improve the power quality. We have made every attempt to adhere to high quality standards in both data collection and analysis as well as in presentation throughout the report. We welcome your suggestion on improvement.

For Transerect Testing & Commissioning Engineers Pvt Ltd

Disclaimer: The summary of analysis findings and recommendations are based on the complete comprehensive study conducted at site. The comments and analysis are arrived based on the monitored data and the information collected from the client during the analysis period. Any modifications done in the facility after the analysis period are not covered in this report. It is essential to take into consideration, the effect of the additional loads and their interference in the existing power distribution network. The recommendations are based on International Standards and Guidelines and are applicable to any load in information technology environment.

TESTING	COMMISSIONING	CALIBRATION	NABL	FILTRATION
TRANSFORMER	LIASIONING	CEIG APPROVALS	POWER	SOLAR
ELECTRICAL PROJECTS	MEASURING INSTRUMENTS			

| ENERGY AUDIT |
| THERMOGRAPHY |
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Assumptions

1. The Analysis team has collected the data from the site through direct measurements and from plant personnel.
2. The electrical measurements are done at the main LT Panel assuming that all the circuit breakers down the line are ON.
3. Information obtained from the employees is assumed to be true and accurate.
4. Measurements made during the Analysis have been envisaged to represent the regular trend.
5. The Analysis does not address any issue it Local Building laws and bye-laws.

Analysis Instrument used

Fluke 1775 Power Quality and Energy Analyzer



Fluke 1775 Power Quality and Energy Analyzer (3-Phase 4 CT Portable Power Quality and Energy Analyzer) with a facility to connect 4 CTs and 5 voltages, its energy audits, harmonic studies & maintenance studies with a large in-built memory.

Overview

All electrical devices work properly without any failure, if input power is well within set limits of electrical properties. So, Power Quality Study determines the health of the electrical distribution system to the load. Without the proper power, an electrical device (or load) may malfunction, fail prematurely or not operate at all. There are many parameters in which electrical power can be of poor quality and there are many more causes of such poor-quality power.

Some of the parameters that influence power quality are explained below.

Voltage & frequency

Voltage and frequency should be close to the nominal values of 230V (400V) and 50 Hz.

Power Factor

Power factor is used to understand what level of power is being used for useful work. The value of power factor can be interpreted as below.

PF = 0 to 1: not all supplied power is consumed; a certain amount of reactive power is present. Current leads (capacitive load) or lags (inductive load).

PF = 1: all supplied power is consumed by the device. Voltage and current are in phase.

PF = -1: device generates power. Current and voltage are in phase.

PF = -1 to 0: device is generating power. Current leads or lags.

Dips & Swells

Dips & Swells records Dips, Interruptions, Rapid Voltage Changes, and Swells. Dips (Sags) and Swells are fast deviations from the normal voltage. Magnitude may be ten up to hundreds of volts. Duration may vary from a half cycle to a few seconds as defined in EN61000-4-30.

During a dip the voltage drops; during a swell the voltage rises. The trigger conditions for dips and swells are threshold and hysteresis. Dips and swells are characterized by duration, magnitude, and time of occurrence.

The occurrence of Dips (Sags) and Swells may indicate a weak power distribution system. It may cause reset and loss of data in computer systems and process controllers. By monitoring the voltage and current trend at the power service entrance, you can find out if the cause of the voltage dip is inside or outside the building. The cause is inside the building (downstream) when voltage drops while current rises; it is outside (upstream) when both voltage and current drop.

Harmonics

Harmonics are periodic distortions of voltage, current, or power sine waves. A waveform can be considered as a combination of various sine waves with different frequencies and magnitudes. The contribution of each of these components to the full signal is measured. Readings can be given as a percentage of the fundamental, as a percentage of all harmonics combined (Rms value), or as Rms value. Harmonics are often caused by non-linear loads such as switched mode power supplies in computers, TV’s and adjustable speed motor drives. Harmonics can cause transformers, conductors, and motors to overheat.

The Table below represents harmonics level limit (IEEE 519 - 1992):

Current Distortion Limits for General Distribution Systems (120 V Through 69.000V)						
Maximum Harmonic Current Distortion in Percent of I_L Individual Harmonic Order (Odd Harmonics)						
I_{sc}/I_L	<11	11<h<17	17<h<23	23<h<35	35<h	T00
<20*	4.0	2.0	1.5	0.6	0.3	5.0
20<50	7.0	3.5	2.5	1.0	0.5	8.0
50<100	10.0	4.5	4.0	1.5	0.7	12.0
100<1000	15.0	7.0	6.0	2.5	1.0	15.0
>1000	15.0	7.0	6.0	2.5	1.4	20.0

Where:
 I_{sc} = Maximum short-circuit current at PCC.
 I_L = Maximum demand load current (fundamental frequency component) at PCC.

Transients

Transients are fast spikes on the voltage waveform. Transients can have so much energy that sensitive electronic equipment can be affected or even damaged. Disturbances such as transients in a power distribution system can cause malfunctions in many types of equipment. For example, computers may reset and equipment subjected to repeated transients can eventually fail. Events occur intermittently, making it necessary to monitor the system for a period of time to find them.

Flicker

Flicker quantifies the luminance fluctuation of lamps caused by supply voltage variations. The algorithm behind the measurement meets EN61000-4-15 and is based on a perceptual model of the human eye / brain sensory system. The Analyzer converts duration and magnitude of voltage variations into an ‘annoyance factor’ caused by the resulting flicker of a 60 W lamp. A high flicker reading means that most people would find the luminance changes irritating. The voltage variation can be relatively small.

Permissible limits (IEC 61000)

PST< 1

Plt<1

Methodology

The field measurement methodology adopted included the following processes and equipment's:

- Fluke 1775 Power Analyzers: Power analyzer (with inbuilt format to comply IEC61000-4-30 standard for the power quality measurements) is logged for verifying total connected electrical load of residential building (kW), the overall system Power Factor (PF), and other parameters including total current drawn (A) and Voltage (V), - to establish baseline system performance
- Fluke – Clamp-On Meter: for measuring electrical parameters of individual equipment - to establish baseline system performance

Purpose of study

The purpose of this Analysis was to study the Electrical parameters of the facility. The following electrical parameter was continuously monitored.

- Voltage
- Current
- Frequency
- power
- Under Voltage (Sag) or Over Voltage (Swell)
- Transients
- Harmonics

Analysis

Power analyzer (with inbuilt format to comply IEC61000-4-30 standard for the power quality measurements) is logged.

Source Nominal Voltage: 400V / 230V 50Hz

Measurement of the Line (L), Neutral (N) and Equipment Grounding Conductor (G) voltages are made to confirm that branch circuits are properly connected and the Equipment Grounding Conductor connection is functioning.

Tolerances

Nominal Voltage: 400V/ 230V +/- 10%, Voltage level can be specified (415-240 V / 433-250 V) as per the customer or equipment requirements

Nominal Frequency: 50Hz (49.5Hz to 50.2Hz)

Total Voltage Harmonic Distortion: 5% max up to 69kV.

Exception: THD values greater than the stated limits may be judged acceptable if agreed.

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Detail Report

Electrical Description

Sri Devaraj Urs Academy of Higher Education and Research is a Deemed University located in Tamaka, Kolar, Karnataka, India.

The facility is getting power from BESCO 11kV HT. there are 2 Transformer as listed below

Sr. No	Measured Feeders
01	750kVA Transformer Output with OLTC 1250A 4P ACB
02	630kVA Transformer Output with OLTC 1000A 4P ACB

Executive Summary

- The summary of all measured electrical parameters is tabulated below.
- Trends and detailed analysis of the different power quality parameters has been submitted as annexure.
- The electrical parameter's data marked in **Red** are above permissible limits.

Brief about Site

The Energy Audit is being carried out to estimate their energy consumption and undertake energy efficiency improvement measures. The Bureau of Energy Efficiency (BEE) has also set few standards in implementing the energy efficient measures.

The overall objective is to quantify energy saving in existing system and achieve reduction in energy consumption pattern.

- To study the present pattern of energy consumption
- To evaluate the performance of the equipment
- To find out the energy saving opportunities
- To quantify the total energy savings
- To find out the ways to achieve energy efficiency

Analysis of Electricity Billing

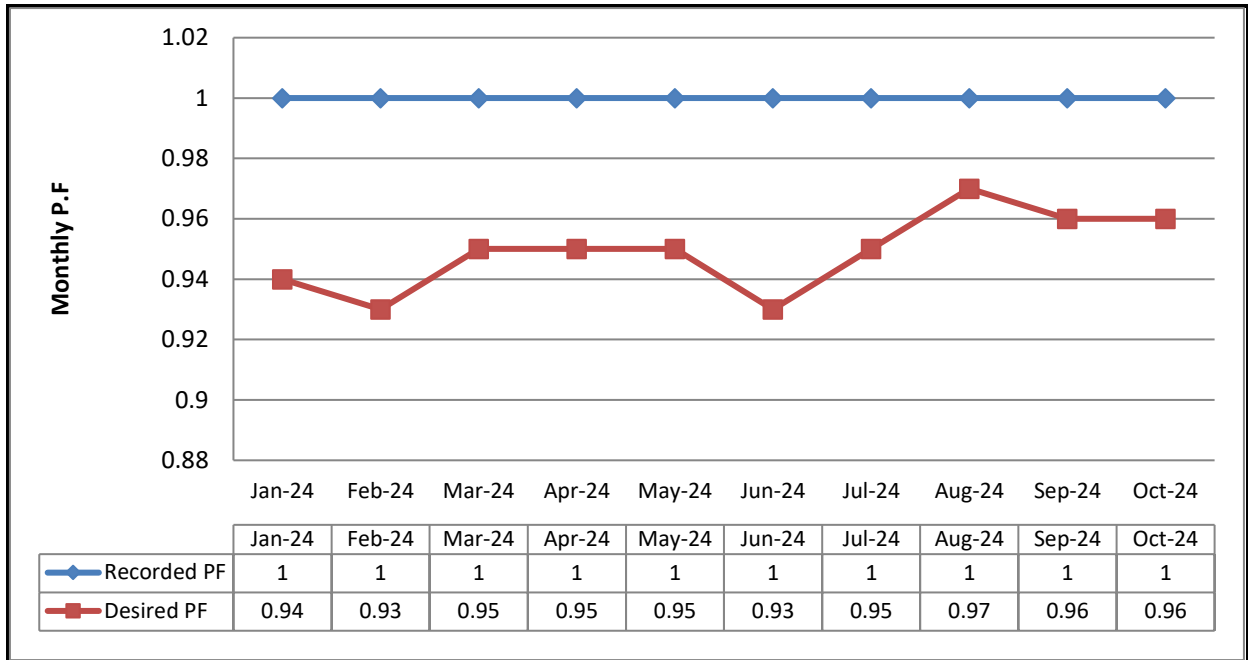
RR No. KRUHT35 The Tariff structure is under **HT-2(C)(i)** Billing and is as follows.

The baseline energy consumption of the branch was researched through utility bills. The annual energy consumption (Jan-2024 to Oct-2024) was 2460800 kWh.

Description						
Contract Demand (kVA)				1000		
85% of Contract Demand (kVA)				850		
Meter constant				5000		
Sr. No.	Month	Monthly Consumption kWh	CD kVA	Billing Demand kVA 85%	Recorded Demand kVA	PF
1	Jan-24	194200	1000	850	555.5	0.94
2	Feb-24	204150	1000	850	582	0.93
3	Mar-24	233950	1000	850	567.5	0.95
4	Apr-24	258950	1000	850	819.5	0.95
5	May-24	292500	1000	850	919.5	0.95
6	June-24	286800	1000	850	803.5	0.93
7	July-24	238600	1000	850	775.5	0.95
8	Aug-24	255700	1000	850	707	0.97
9	Sep-24	251050	1000	850	765.5	0.96
10	Oct-24	244900	1000	850	636	0.96
Total		2460800				
Average		246080				0.95

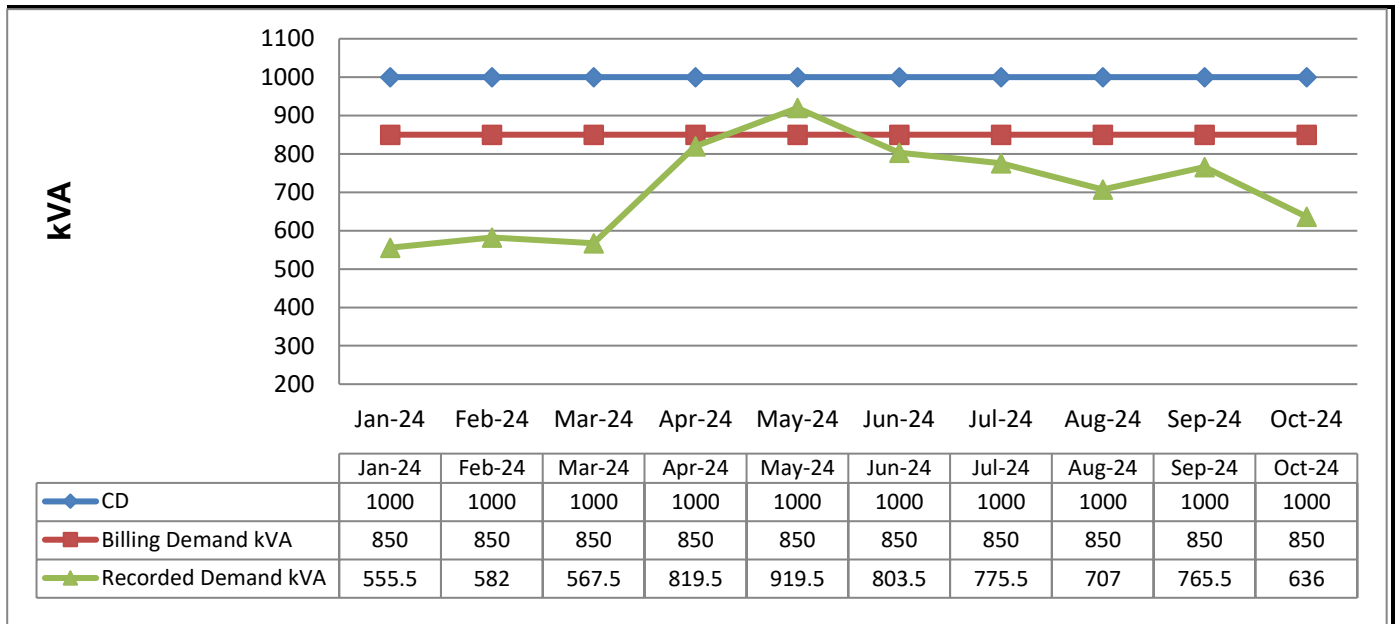
Note: minimum value kwh recorded 194200 units and maximum value kwh 292500units

Monthly Power Factor Variation Graph (Jan 2024 to Oct 2024)



- Presently maintained power factor (PF) is around 0.95

Monthly Power Demand (kVA) Variation Graph (Jan 2024 to Oct 2024)

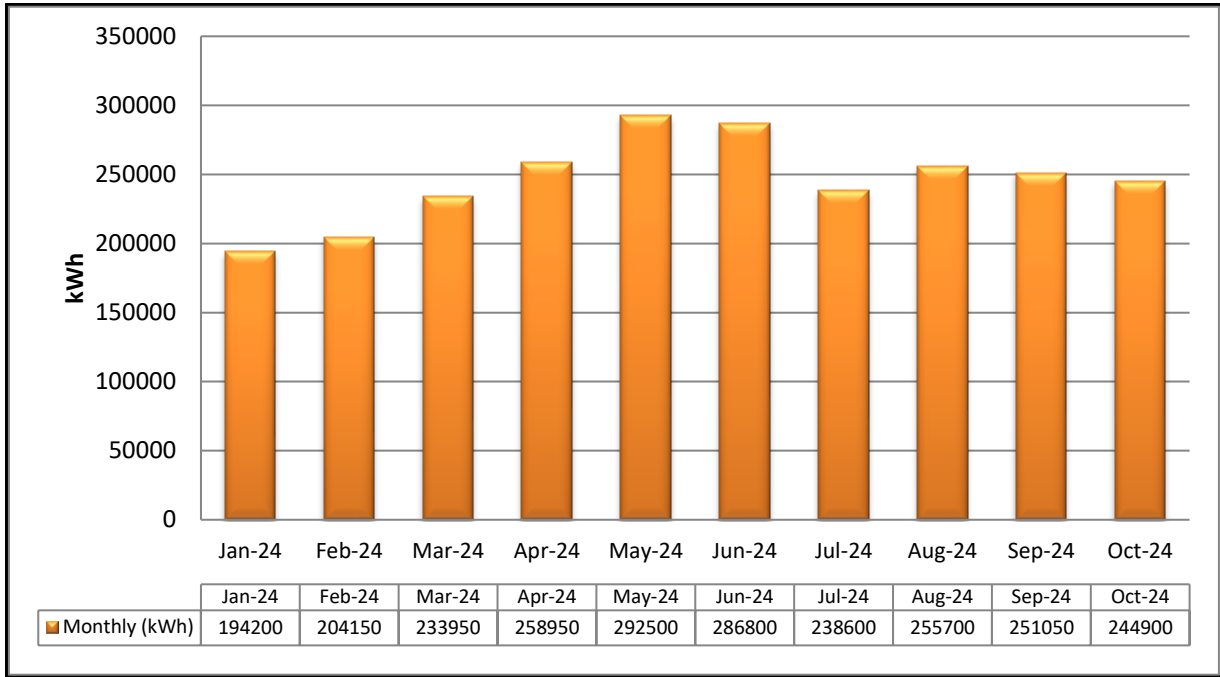


- The maximum Recorded demand is around 91.95% of CD. The recorded demand is within the CD.

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[| TRANSFORMER |](#) [| LIASIONING |](#) [| CEIG APPROVALS |](#) [| POWER |](#) [| SOLAR |](#)
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[| ENERGY AUDIT |](#)
[| THERMOGRAPHY |](#)
[| SECURE METERS |](#)

Monthly Power Demand (kWh) Variation Graph (Jan 2024 to Oct 2024)



Observation and Recommendation

Parameters	Compliance limits	750kVA Transformer			
		L1	L2	L3	Total
Voltage (P-N) V	EN 50160 230V±10%	246.5	248.1	248.8	
Voltage (P-P) V	400±10%	442.5	446.3	442.6	
N-G (V)	Load dependent	3.5			
Current (A)	Load dependent	585.6	567.8	528.1	
Neutral Current (A)	Load dependent	324.9			
Frequency (Hz)	CEA limits 49.5 to 50.2Hz	49.64-50.25			
PF (Avg.)	Load dependent	0.98	0.97	0.97	0.96
Power (kVA)	Load dependent	130.69	129.59	127.11	384.47
Power (kW)	Load dependent	124.46	122.59	120.32	364.88
%V – THD.	IEEE 519-2014 less than 5%	2.8	2.7	2.8	
%I – THD.	IEEE 519-2014 less than 8%	29.7	28.5	31.9	

750kVA Transformer Output 1250A 4P ACB

- Maximum power demand recorded = 384.47 kVA
- Transformer utilization (Instantaneous) – $384.47/750 = 51.26\%$ (Plus 5 % cushion for peak loads)
- Recorded highest load 364.88kW
- Average Energy consumed (kWh) 4378 kWh
- The line voltage (L-N) variation recorded at the output was 246.5 – 248.8V
- Neutral – Ground (N-G) voltage 3.5V is within limits
- Frequency variation was within the limits
- Power Factor (PF) is been maintained at 0.96, **Recommend to maintain the PF very close to Unity**
- Voltage Harmonics are within limits
- **Current harmonics are not within the limits, which are beyond prescribed IEEE 519-2014 limits, recommended to install an active harmonics filter to reduce the current harmonics and to maintain the PF.**
- Load is balanced

Observation and Recommendation

Parameters	Compliance limits	630kVA Transformer			
		L1	L2	L3	Total
Voltage (P-N) V	EN 50160 230V±10%	244.6	245.4	243.3	
Voltage (P-P) V	400±10%	443.5	439.4	439.5	
N-G (V)	Load dependent	9.5			
Current (A)	Load dependent	441.2	372.8	386.0	
Neutral Current (A)	Load dependent	126.4			
Frequency (Hz)	CEA limits 49.5 to 50.2Hz	49.83-50.35			
PF (Avg.)	Load dependent	0.94	0.92	0.94	0.91
Power (kVA)	Load dependent	85.96	72.71	77.10	229.46
Power (kW)	Load dependent	77.75	65.23	71.38	206.71
%V – THD.	IEEE 519-2014 less than 5%	2.2	2.1	2.3	
%I – THD.	IEEE 519-2014 less than 8%	8.1	10.8	12.4	

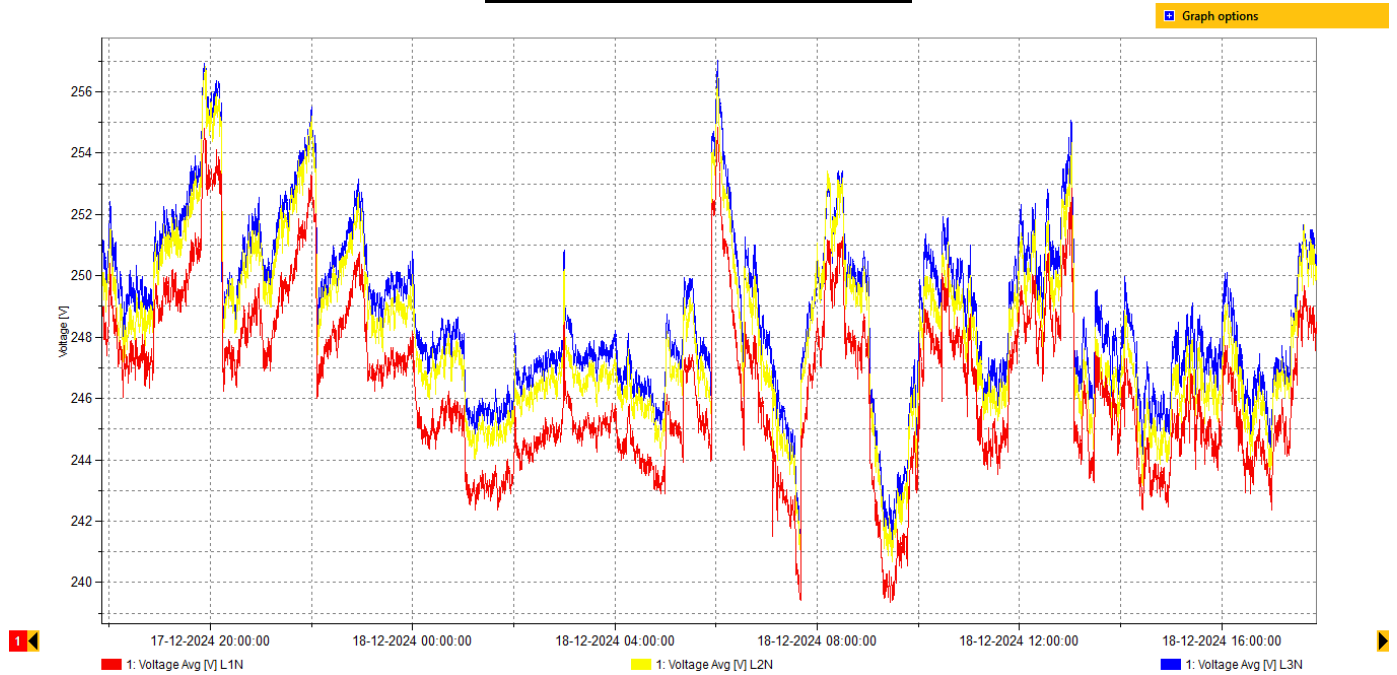
630kVA Transformer Output 1000A 4P ACB

- Maximum power demand recorded = 229.46 kVA
- Transformer utilization (Instantaneous) – $229.46/630 = 36.42\%$ (Plus 5 % cushion for peak loads)
- Recorded highest load 206.71kW
- Average Energy consumed (kWh) 2975 kWh
- The line voltage (L-N) variation recorded at the output was 243.3 – 245.4V
- Neutral – Ground (N-G) voltage 9.5V is not within limits (less than 1% of normal voltage) check the earth pit and its connectivity.
- Frequency variation was within the limits
- Power Factor (PF) is been maintained at 0.91, **Recommend to maintain the PF very close to Unity**
- Voltage harmonics are within limits.
- **Current harmonics are not within the limits, which are beyond prescribed IEEE 519-2014 limits. recommended to install an active harmonics filter to reduce the current harmonics and to maintain the PF.**
- Load is balanced

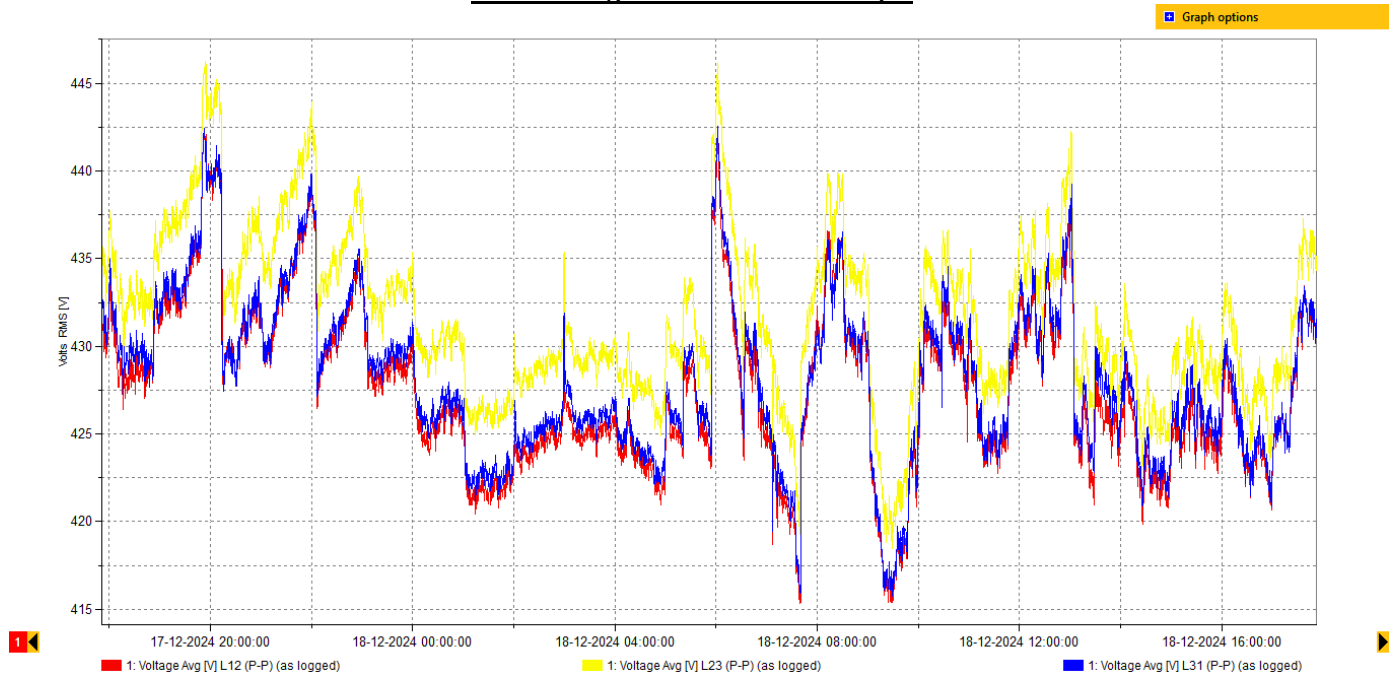
Trend graph

750kVA Transformer Output 1250A 4P ACB

Star Voltage v/s Time Trend Graph



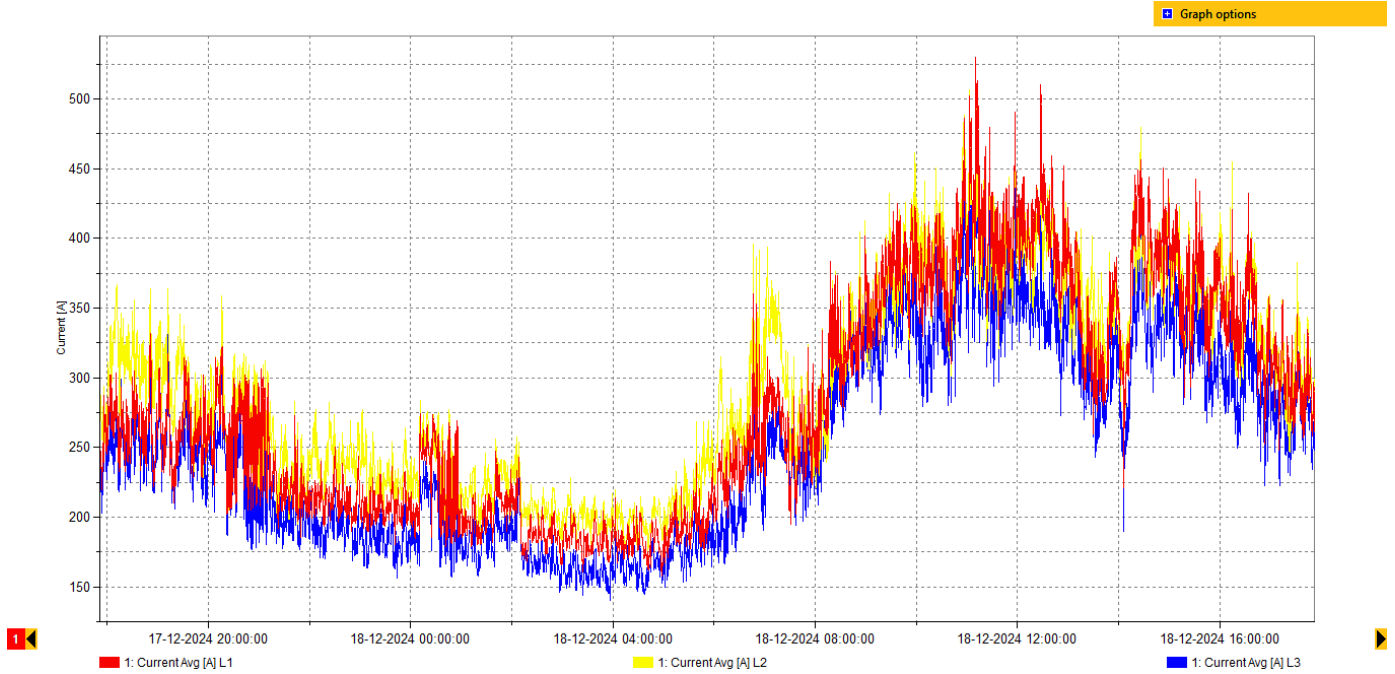
Delta Voltage v/s Time Trend Graph



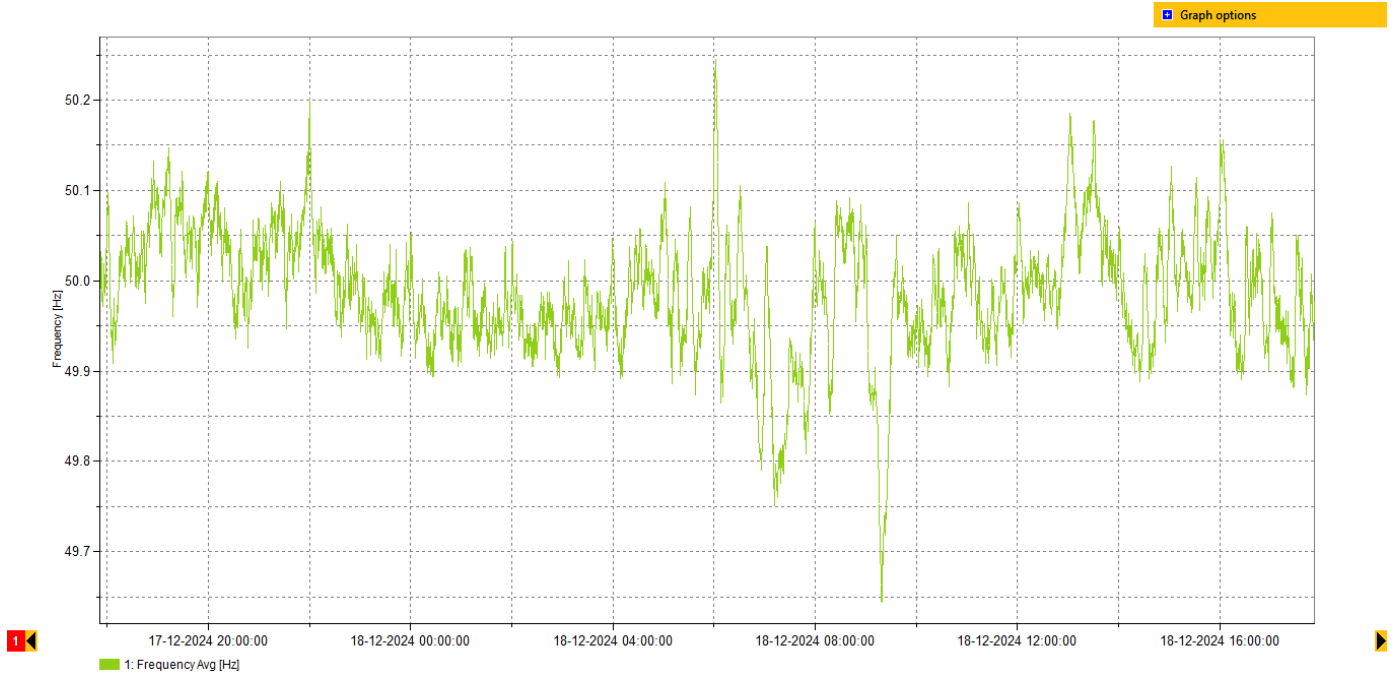
| TESTING | COMMISSIONING | CALIBRATION | NABL | FILTRATION |
| TRANSFORMER | LIAISONING | CEIG APPROVALS | POWER | SOLAR |
| ELECTRICAL PROJECTS | MEASURING INSTRUMENTS |

| ENERGY AUDIT |
| THERMOGRAPHY |
| SECURE METERS |

Current v/s Time Trend Graph



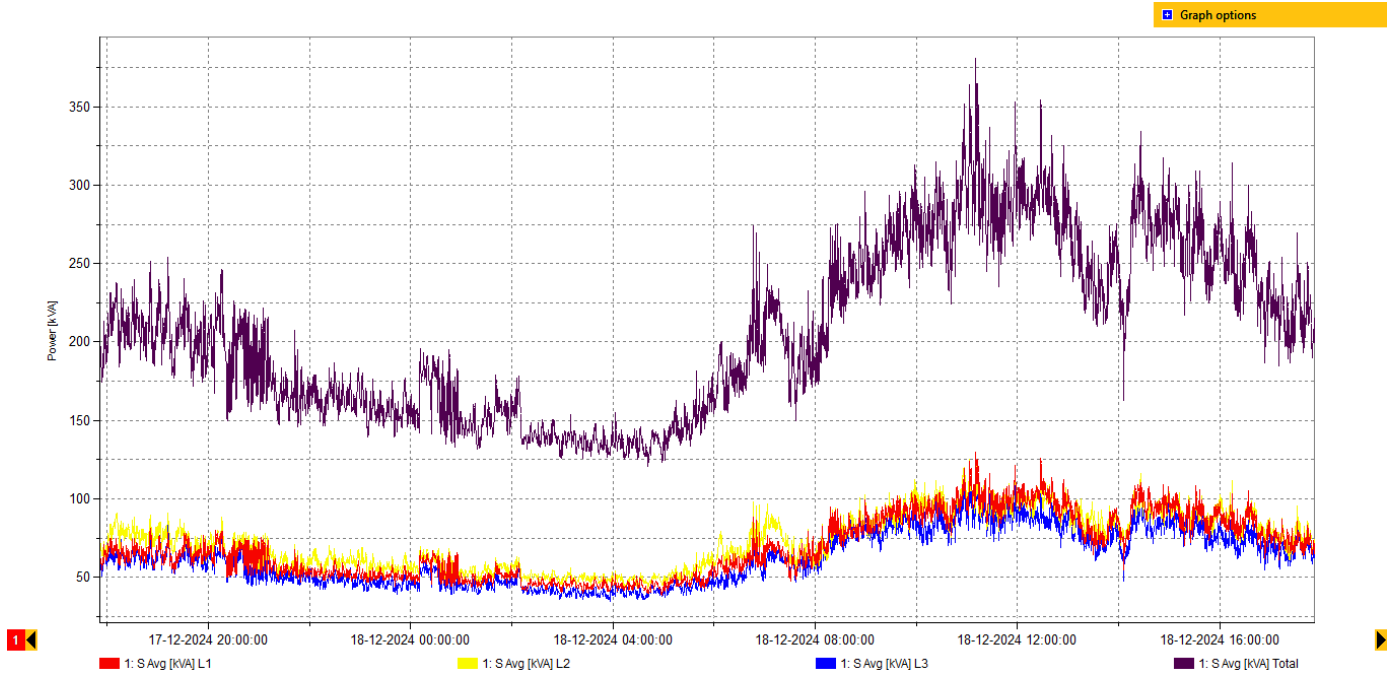
Frequency v/s Time Trend Graph



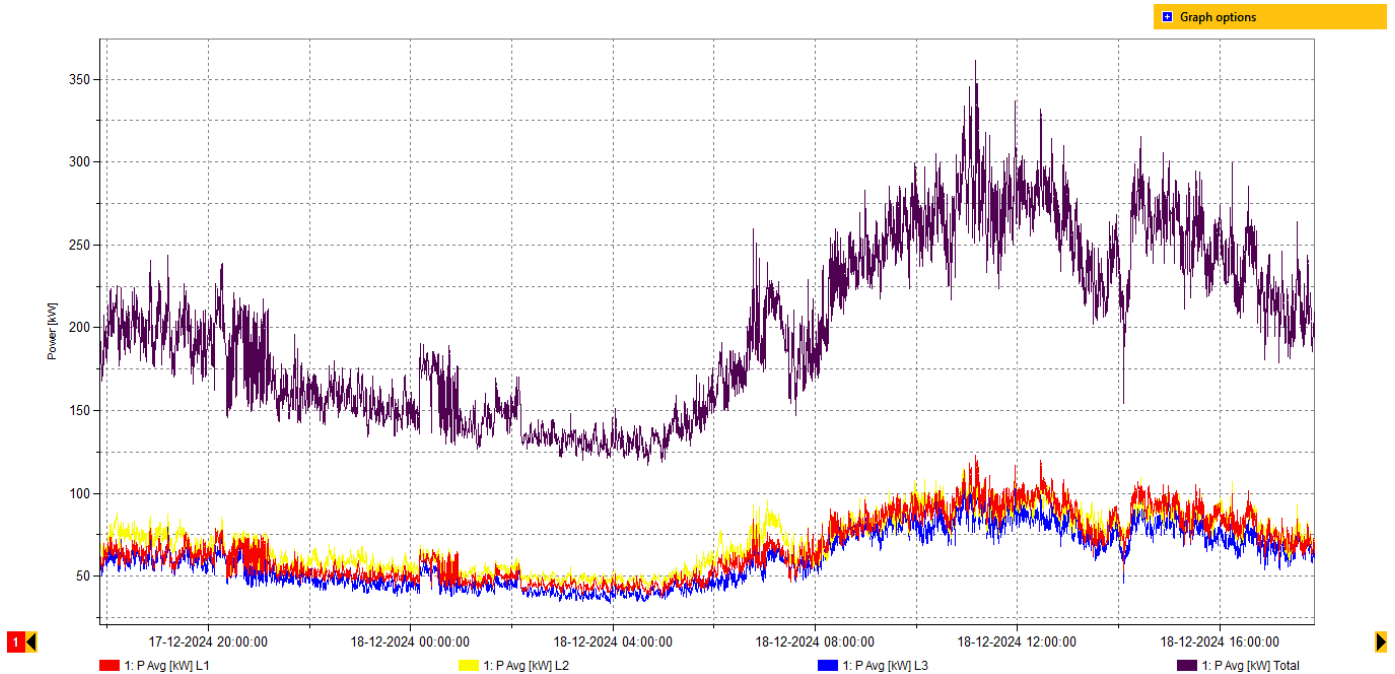
TESTING	COMMISSIONING	CALIBRATION	NABL	FILTRATION
TRANSFORMER	LIASIONING	CEIG APPROVALS	POWER	SOLAR
ELECTRICAL PROJECTS	MEASURING INSTRUMENTS			

| ENERGY AUDIT |
| THERMOGRAPHY |
| SECURE METERS |

Power (kVA) v/s Time Trend Graph



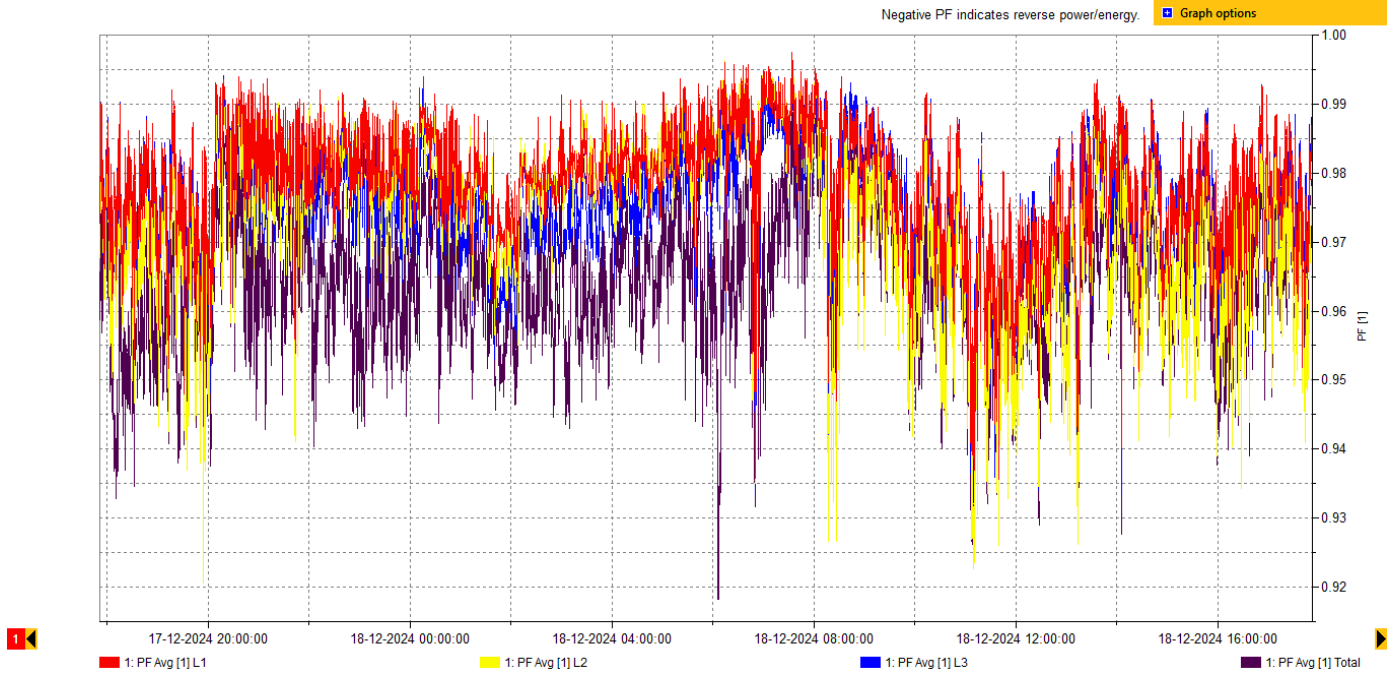
Power (kW) v/s Time Trend Graph



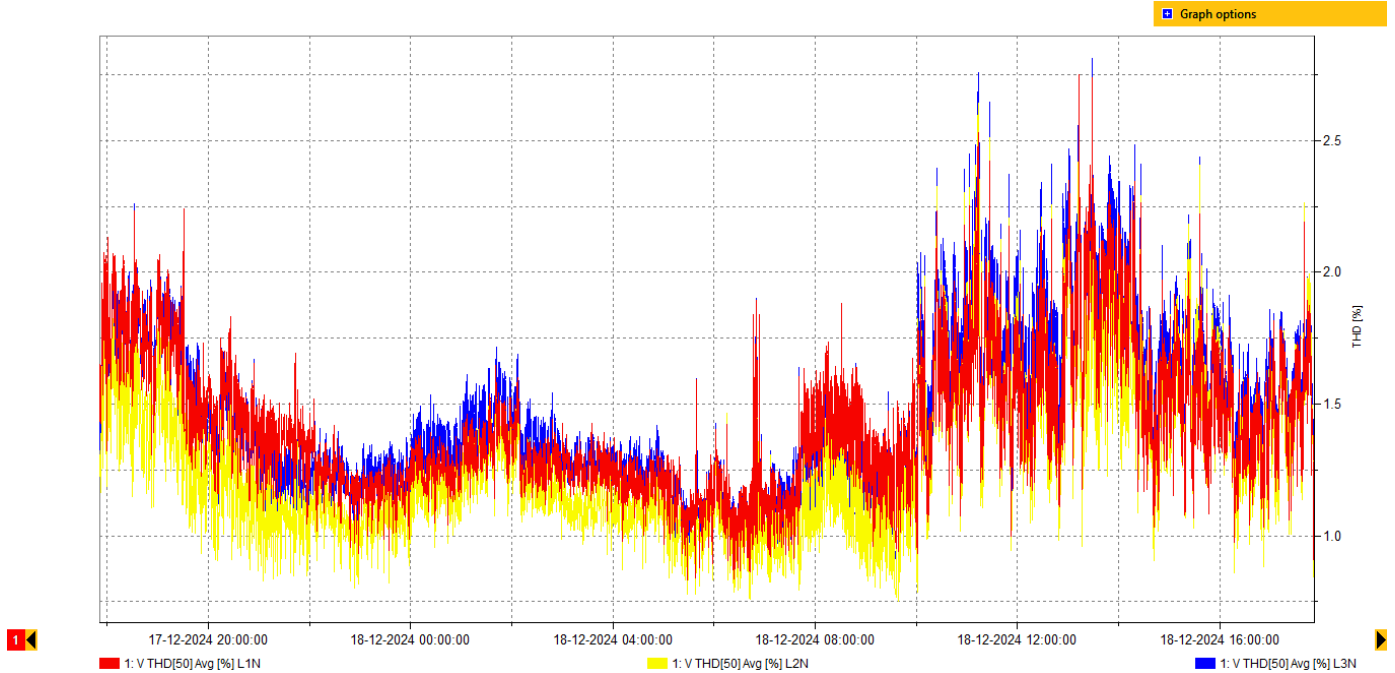
TESTING	COMMISSIONING	CALIBRATION	NABL	FILTRATION
TRANSFORMER	LIAISONING	CEIG APPROVALS	POWER	SOLAR
ELECTRICAL PROJECTS	MEASURING INSTRUMENTS			

| ENERGY AUDIT |
| THERMOGRAPHY |
| SECURE METERS |

PF v/s Time Trend Graph



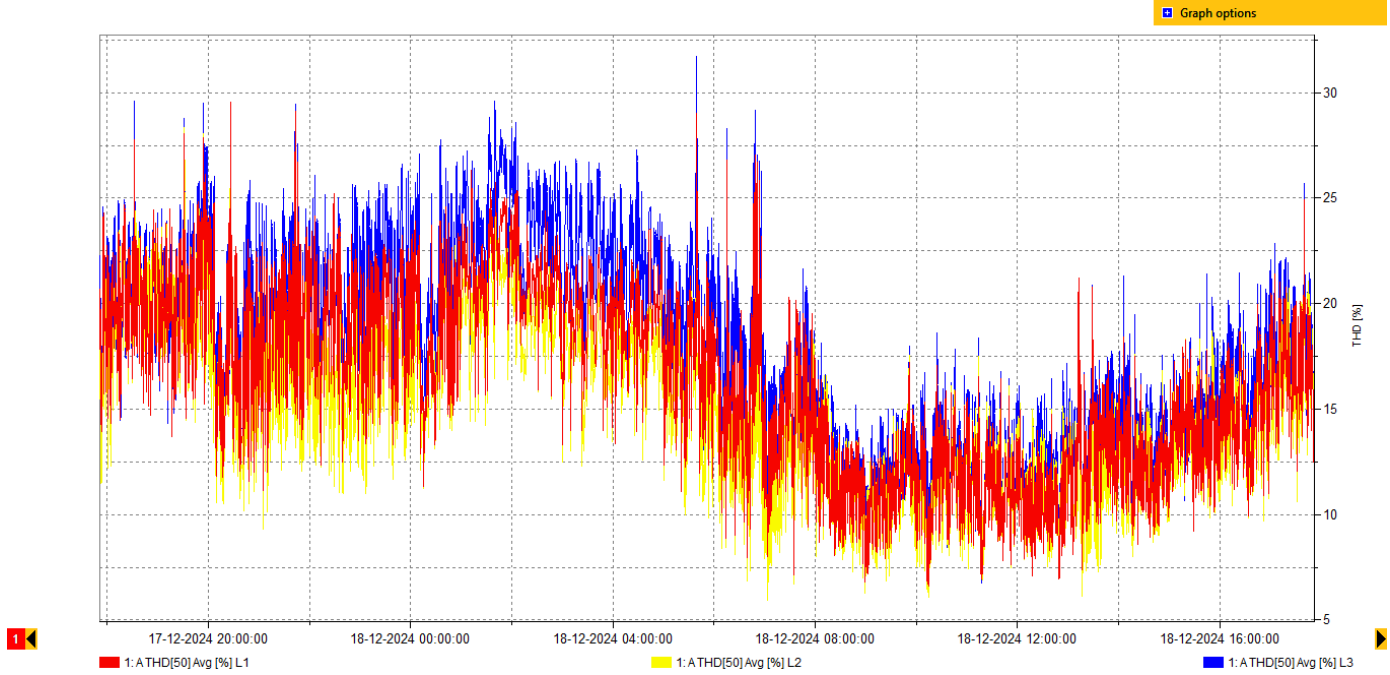
Voltage Harmonics v/s Time Trend Graph



| TESTING | COMMISSIONING | CALIBRATION | NABL | FILTRATION |
| TRANSFORMER | LIASIONING | CEIG APPROVALS | POWER | SOLAR |
| ELECTRICAL PROJECTS | MEASURING INSTRUMENTS |

| ENERGY AUDIT |
| THERMOGRAPHY |
| SECURE METERS |

Current Harmonics v/s Time Trend Graph

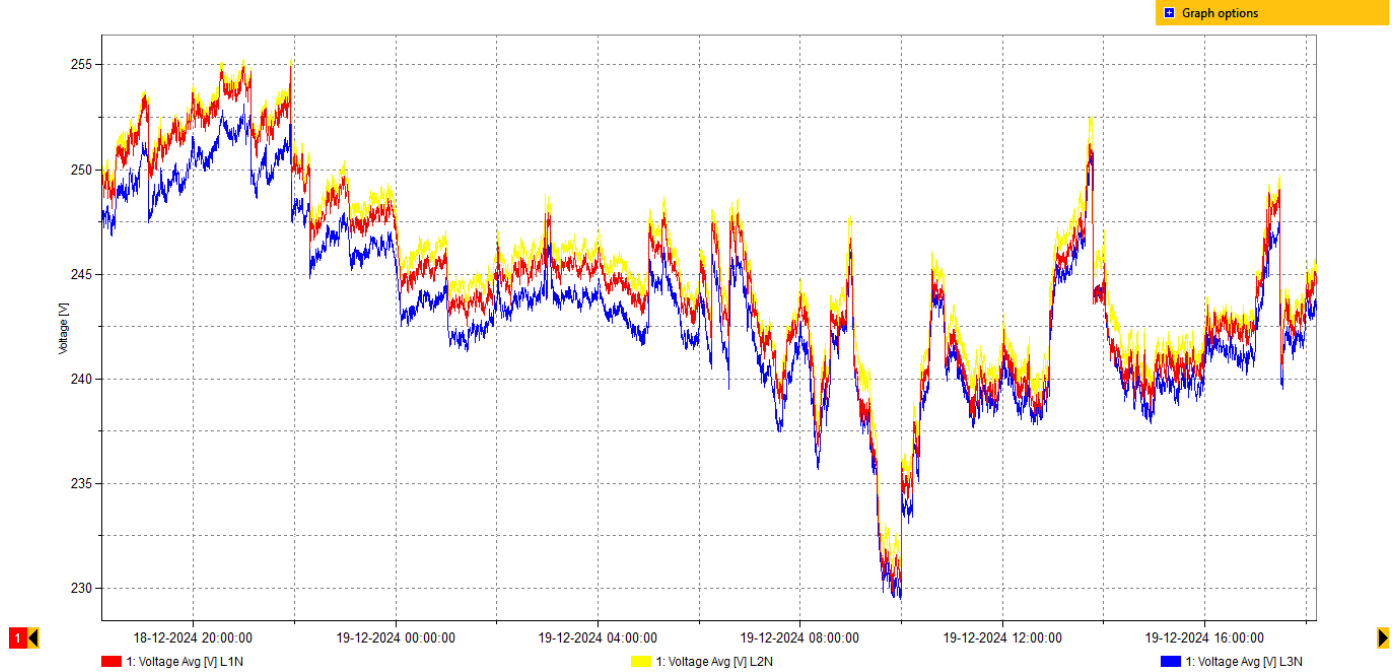


TESTING		COMMISSIONING		CALIBRATION		NABL		FILTRATION
TRANSFORMER		LIASIONING		CEIG APPROVALS		POWER		SOLAR
ELECTRICAL PROJECTS		MEASURING INSTRUMENTS						

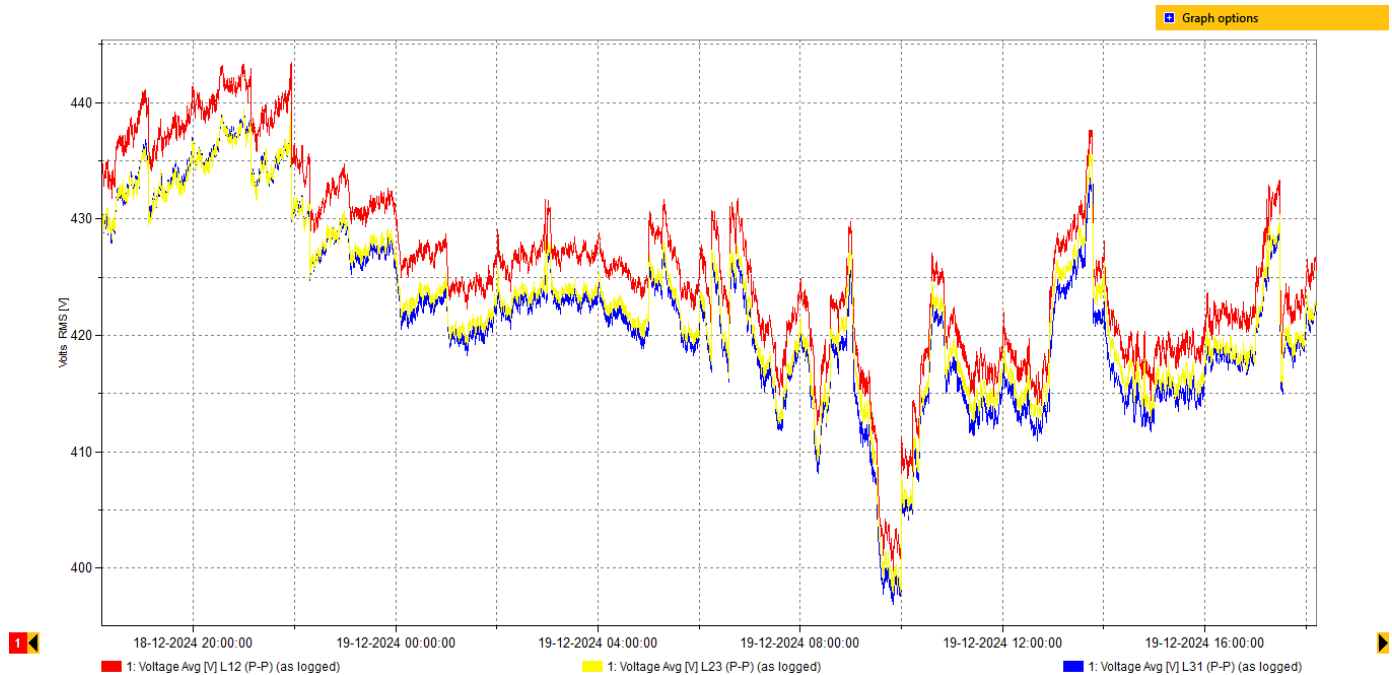
| ENERGY AUDIT |
| THERMOGRAPHY |
| SECURE METERS |

630kVA Transformer Output 1000A 4P ACB

Star Voltage v/s Time Trend Graph



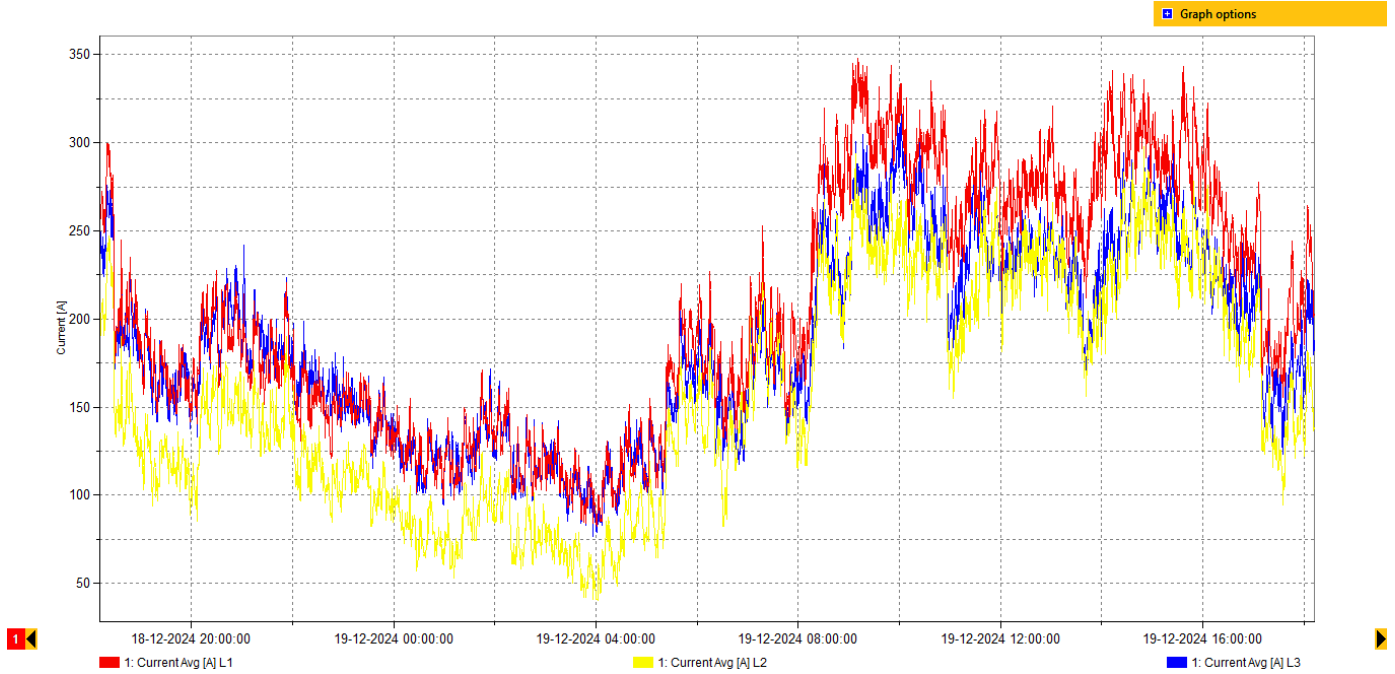
Delta Voltage v/s Time Trend Graph



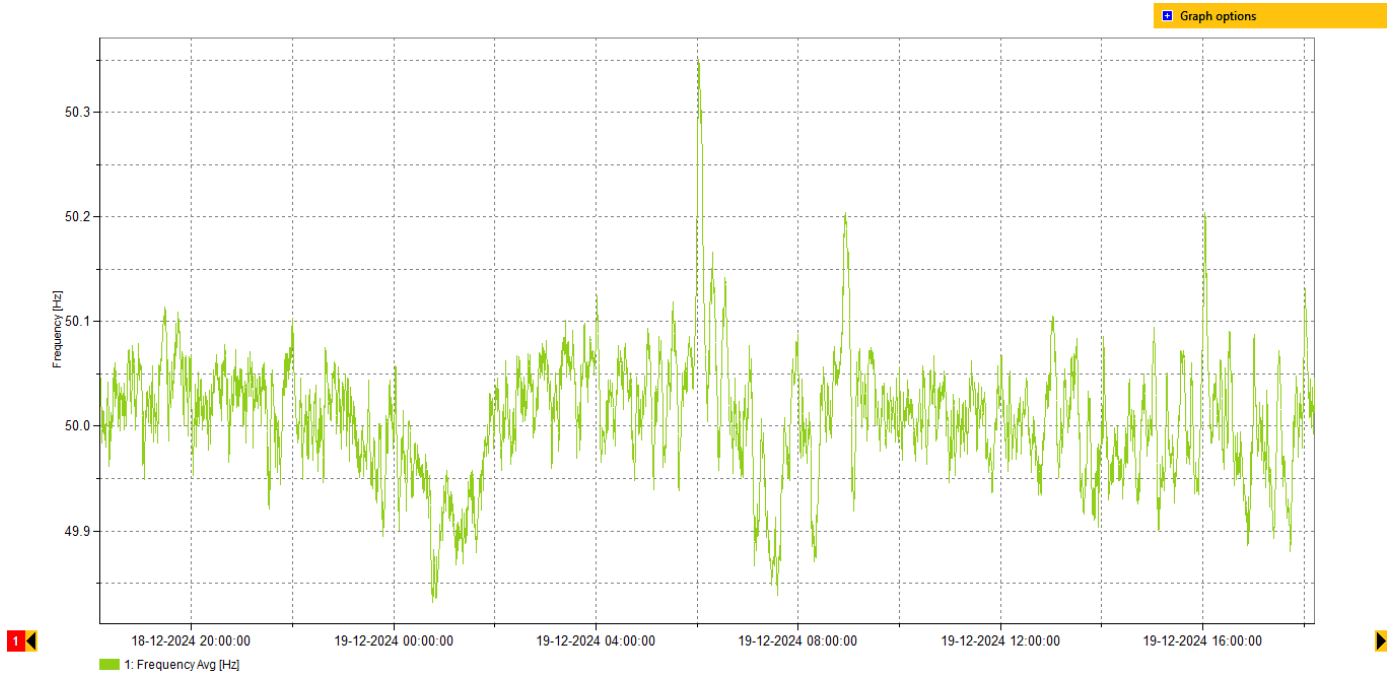
| TESTING | COMMISSIONING | CALIBRATION | NABL | FILTRATION |
| TRANSFORMER | LIASIONING | CEIG APPROVALS | POWER | SOLAR |
| ELECTRICAL PROJECTS | MEASURING INSTRUMENTS |

| ENERGY AUDIT |
| THERMOGRAPHY |
| SECURE METERS |

Current v/s Time Trend Graph



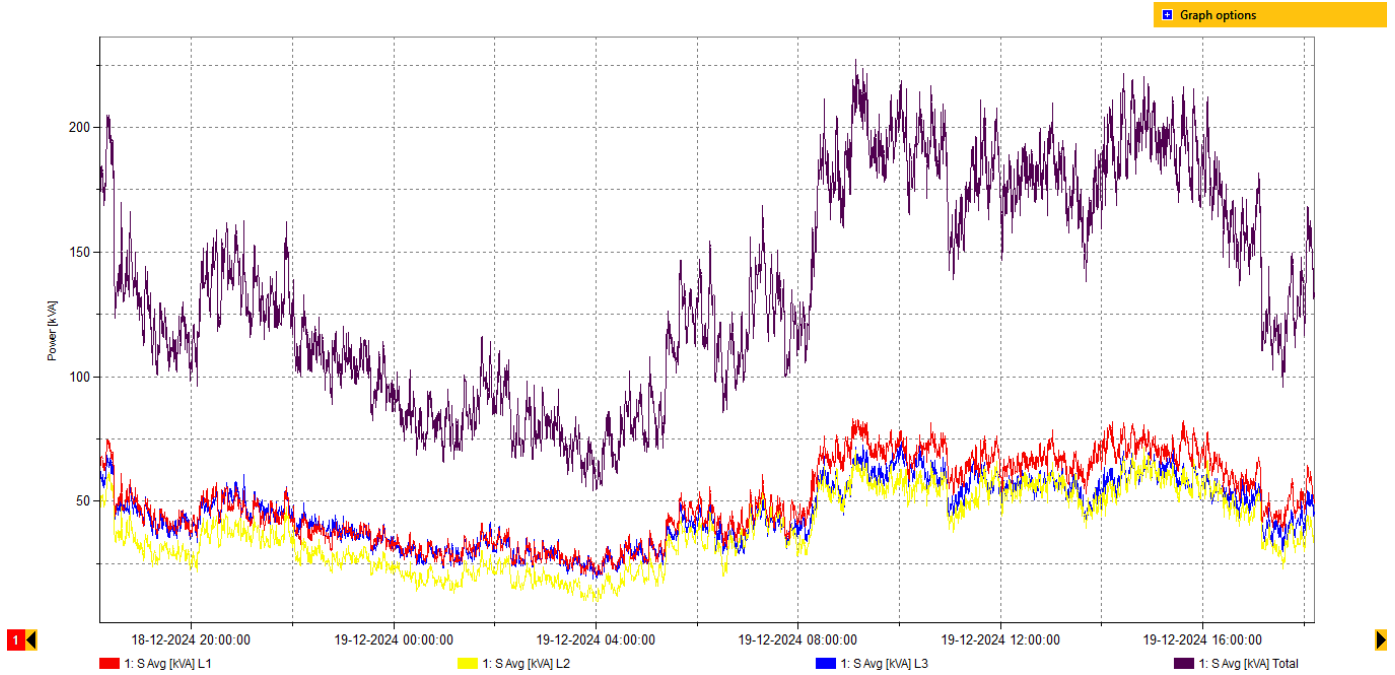
Frequency v/s Time Trend Graph



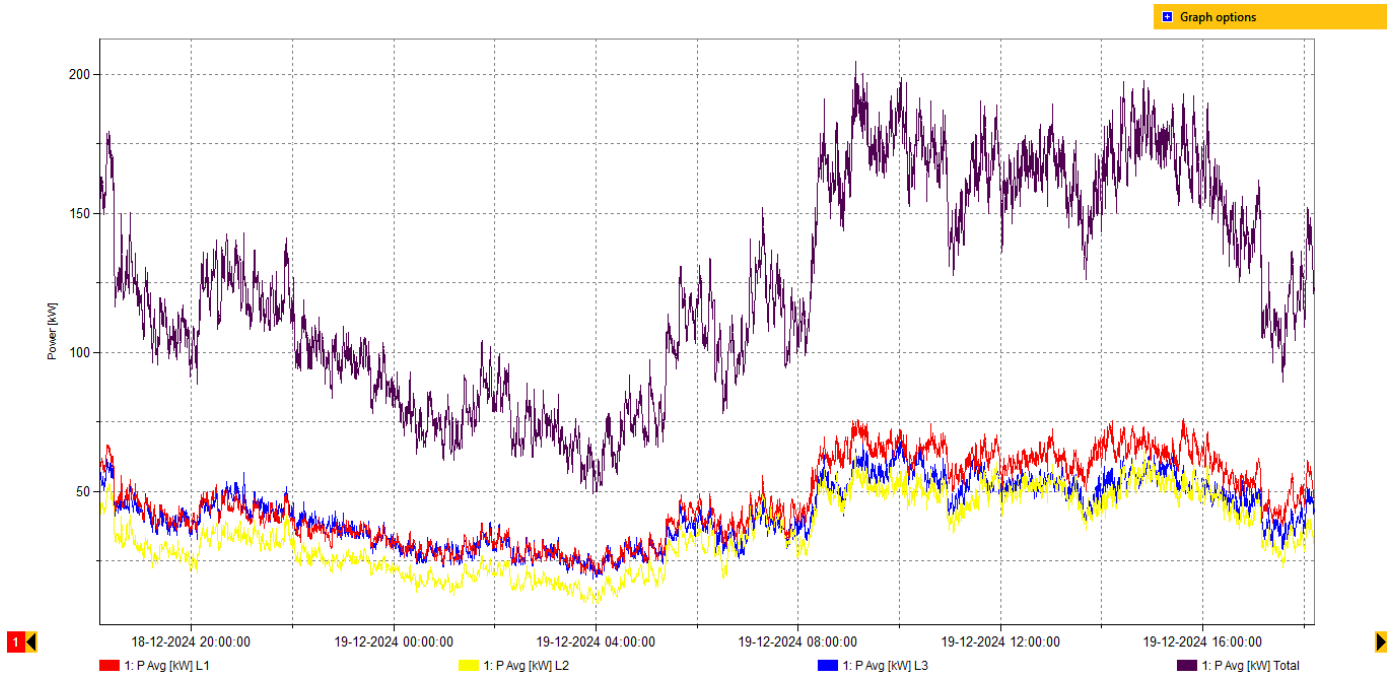
TESTING		COMMISSIONING		CALIBRATION		NABL		FILTRATION
TRANSFORMER		LIASIONING		CEIG APPROVALS		POWER		SOLAR
ELECTRICAL PROJECTS		MEASURING INSTRUMENTS						

| ENERGY AUDIT |
| THERMOGRAPHY |
| SECURE METERS |

Power (kVA) v/s Time Trend Graph



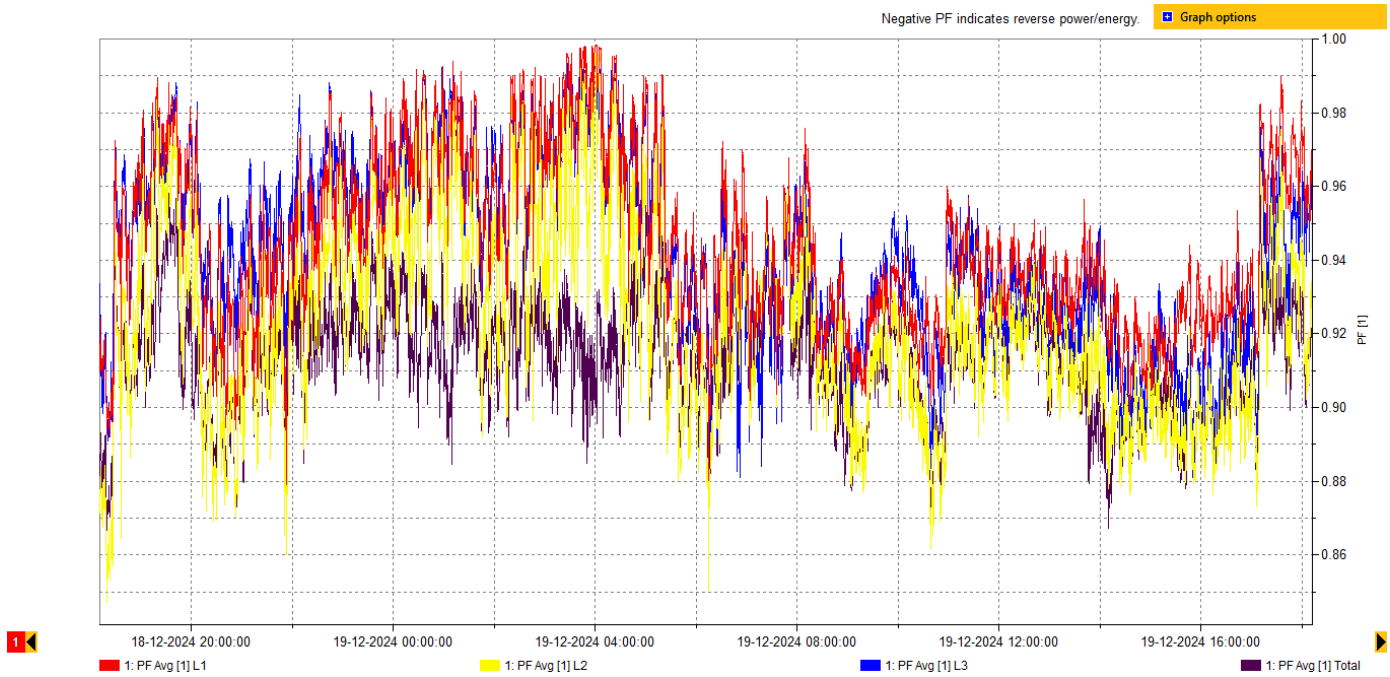
Power (kW) v/s Time Trend Graph



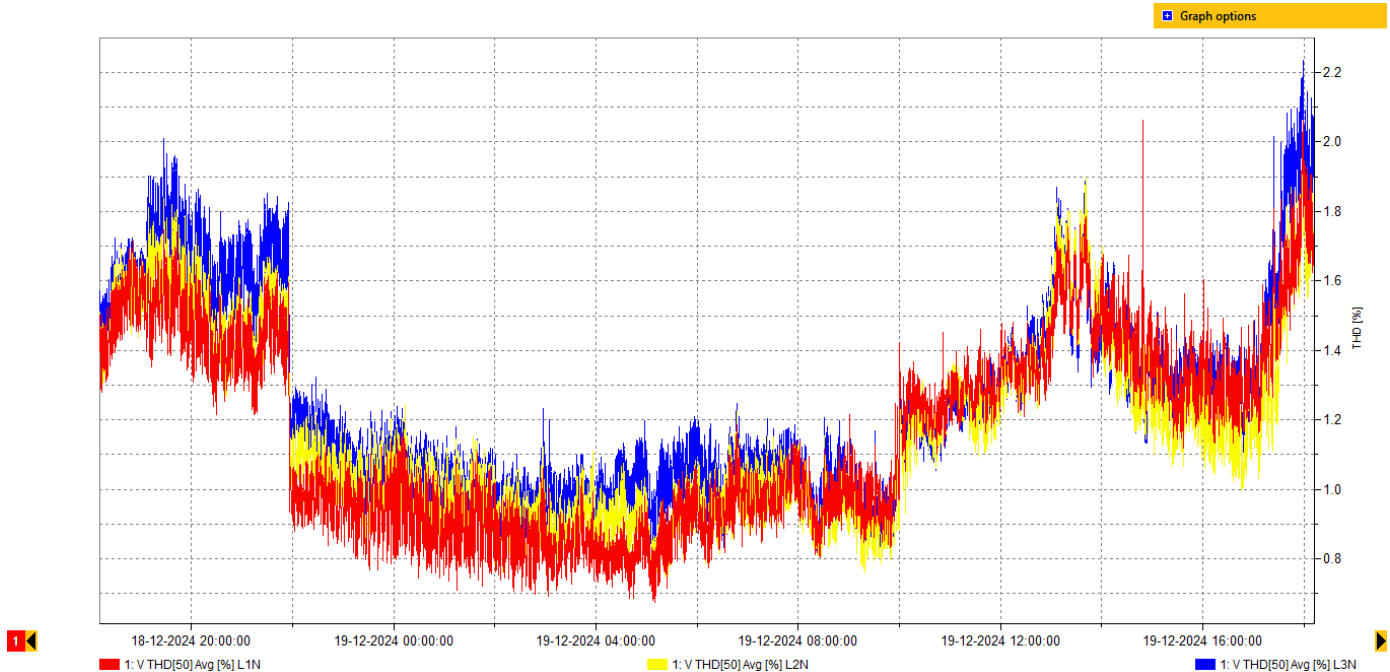
TESTING	COMMISSIONING	CALIBRATION	NABL	FILTRATION
TRANSFORMER	LIASIONING	CEIG APPROVALS	POWER	SOLAR
ELECTRICAL PROJECTS	MEASURING INSTRUMENTS			

| ENERGY AUDIT |
| THERMOGRAPHY |
| SECURE METERS |

PF v/s Time Trend Graph



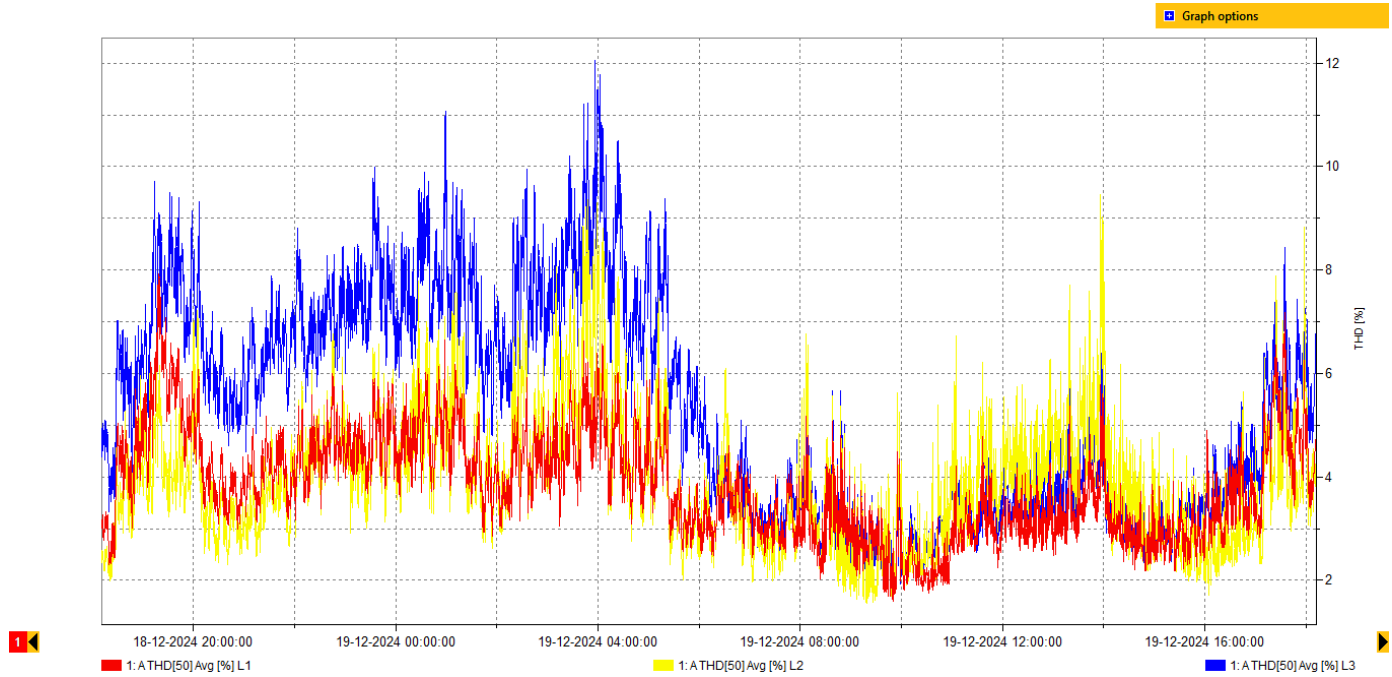
Voltage Harmonics v/s Time Trend Graph



TESTING	COMMISSIONING	CALIBRATION	NABL	FILTRATION
TRANSFORMER	LIASIONING	CEIG APPROVALS	POWER	SOLAR
ELECTRICAL PROJECTS	MEASURING INSTRUMENTS			

| ENERGY AUDIT |
| THERMOGRAPHY |
| SECURE METERS |

Current Harmonics v/s Time Trend Graph



TESTING	COMMISSIONING	CALIBRATION	NABL	FILTRATION
TRANSFORMER	LIASIONING	CEIG APPROVALS	POWER	SOLAR
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Sri Devaraj Urs Academy of Higher Education & Research
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Post Box 62, Tamaka, Kolar 563103, Karnataka
National Service Scheme



Event report

Title of the Event: BEST OUT OF WASTE

Date: 27TH January 2025

Time: 2:00 PM

Background/ Introduction:

The National Service Scheme (NSS) unit of RLJCOP Organized a "Best Out of Waste" activity on 27TH January 2025, focusing on fostering creativity and environmental awareness. The event was designed to encourage participants to rethink waste as a resource and utilize discarded materials to create innovative and functional items.

This activity served as a platform for students to explore sustainable practices while enhancing their problem-solving and teamwork skills. By transforming waste into useful products, the initiative emphasized the importance of reducing, reusing, and recycling as steps toward a cleaner and greener environment.

Venue: R. L. Jalappa College of Pharmacy, SDUAHER, Tamaka, Kolar-563103

Sponsors: NSS Cell, SDUAHER.

Participants: Students of R. L. Jalappa College of Pharmacy.

Photographs of the event:







R. L. Jalappa

**NSS Program officer
R. L. Jalappa College of Pharmacy,
SDUAHER, Tamaka, Kolar-563103.**



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National Service Scheme



Event report

Name of the event: Ek Ped Ma Ke Naam (Plant 4 Mother)

Date of the event: 17 September 2024.

Background/ Introduction:

The part of initiative taken by Hon'ble Prime minister Shree Narendra Modi, to make planet greener and more protective. A plantation drive was called on 17 September 2024 for all the departments, ministries, higher education institutions and all private sectors. As part of this SDUAHER also conducted a plantation activity in the campus. Where we had planted around 50 fruiting saplings near R L Jalappa Central School campus.

Venue: R L Jalappa Central School campus.

Sponsors: SDUAHER.

Participants: NSS volunteers and RLJCS students.

Photographs of the event:







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**National Service Scheme
Programme Co-ordinator
Sri Devaraj Urs Academy of
Higher Education & Research
Tamaka, Kolar**



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Tamaka, Kolar 563103, Karnataka
National Service Scheme



EVENT REPORT

Name of the event: NSS Activity – SWATCH BHARATH SEVAK ABHIYAN-2024

“Hazards of plastic on environment and humans”

Date of the event: 27/09/2024

Background/ Introduction: On the occasion of Swatch Bharath Sevak Abhiyan-2024 September 27th the Department of Community Health Nursing in coordination with NSS, SDUCON Organised an SWATCH BHARATH activity followed by health talk on plastic free environment at Mangasandra Village, Kolar Taluk. The aim was to create awareness among the Children's and to motivate them and their family members to keep their village and school premises clean and green.

The students of 1st year M.SC (N), IIIrd Year BSc(N) and IIIrd Year GNM enthusiastically participated in cleaning the surrounds of Mangasandra Village covering the streets, Milk Dairy, Anganwadi, School and Temples

- **Chief Guest:** -Mr. Kempanna, Head Master, Govt Higher Primary School Mangasandra addressed the gathering and delivered his heartfelt gratitude for organizing the programme.
- Dr. Malathi K.V, HOD of Community Health Nursing Department, SDUCON addressed the students and highlighted the important of SWATCH BHARATH and avoiding plastic usage to reduce the hazards on health and our environment.
- Vote of thanks: - Ms Glory 3rd year BSc(N).

Venue: - Mangasandra Village, Kolar, Taluk

Sponsors: - NSS Cell, SDUCON

Participants: - NSS volunteers and students of SDUCON

Photographs of events





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National Service Scheme



Malathi
NSS Program Officer
SDUCON, Tamaka, Kolar,



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National Service Scheme



Event report

Name of the event: Plantation as part of Meri Mati – Meri Desh

Date of the event: 9th June 2024.

Background/ Introduction:

As part of observing Meri Meti Meri Desh a sequential event of Azadi Ki Amruth Mahostav, the NSS volunteer planted 75 plants in the Murarji Desai campus Bangarpet.

Venue: Murarji Desai campus Bangarpet.

Sponsors: NSS, SDUAHER.

Participants: Unit I & II NSS volunteers.

Photographs of the event:





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**National Service Scheme
Programme Co-ordinator
Sri Devaraj Urs Academy of
Higher Education & Research
Tamaka, Kolar**



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EVENT REPORT

Name of the event: NSS Activity - “Swachhata Activities-Diwali with My Bharat”-2K24

Date of the event: 30th October 2024

Background/ Introduction: The Department of Community Health Nursing in coordination with NSS unit of SDUCON organized a Programme on -“Swachhata Activities-Diwali with My Bharat” on 30th October 2024 between 10am-12:30pm at markets and nearby areas of Kolar.

Students were divided into groups and cleaned the MG road, flower markets, private bus stand and nearby areas of Kolar market. from 10am to 12pm.

At the end of the Programme the students gave thanks to Municipal officer for guiding them and allowing them to do swachhata activities and the Programme ended at 12:30pm.

Venue: MG Road, Kolar

Sponsors: NSS Cell of RGUHS

Participants: NSS volunteers and students of SDUCON



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National Service Scheme



Event report

Name of the event: Swatch Bharath Activity

Date of the event: 2nd October 2024.

Background/ Introduction:

As part of observation of Swatch Bharath Abhiyan, the NSS cell of academy and NAAC VII task force members cleaned the steps and surrounding of the Markandayya temple and hill in Vokkalere village. The NSS volunteers collected all the plastic items which were lying on the steps and surrounding of the temple and hill steps.

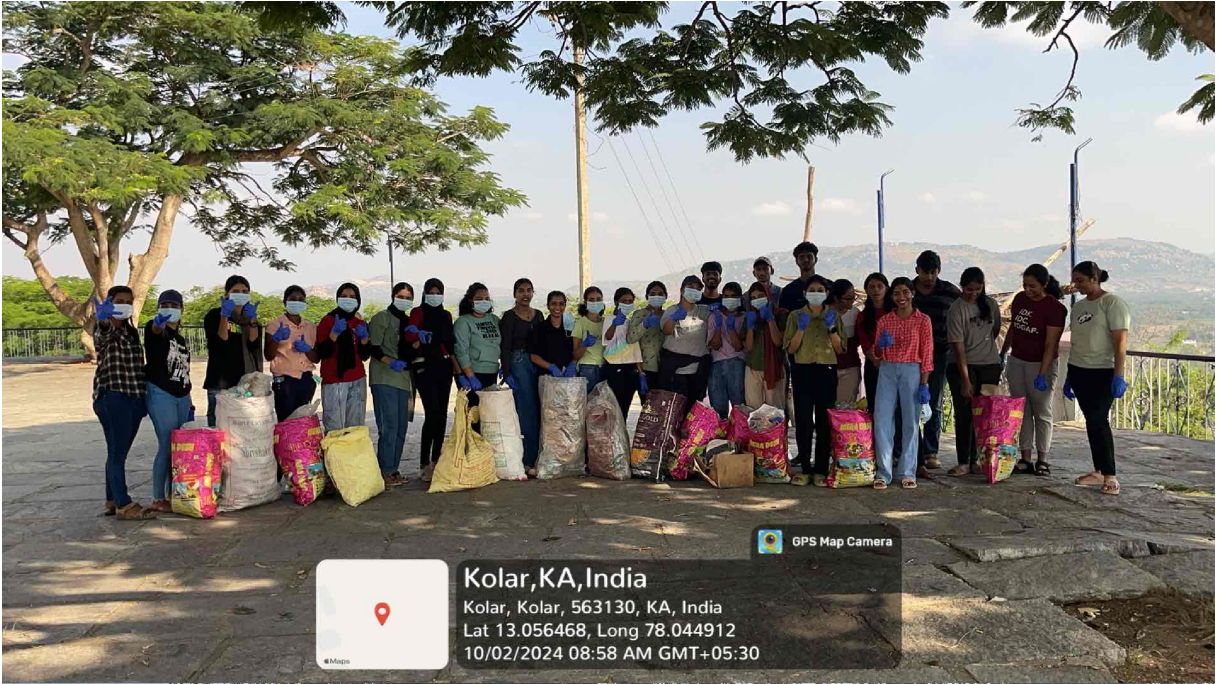
Venue: Markandayya Hill, Vokkaleri village, Kolar.

Sponsors: SDUAHER.

Participants: The NSS volunteers from Dept. of Speech Pathology & Audiology.

Photographs of the event:





Sri Devaraj Urs
**National Service Scheme
Programme Co-ordinator
Sri Devaraj Urs Academy of
Higher Education & Research
Tamaka, Kolar**



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National Service Scheme



Event report

Name of the event: Observation of Vanamahostava week

Date of the event: 3rd August 2024.

Background/ Introduction:

As part of observation of Vanamahostava week, the NSS cell of academy and NAAC VII task members did plantation work on 3rd August 2024. As part of this NSS volunteers had planted 100 plants at Vadaguru village, Kolar

Venue: Vadaguru village, Kolar

Sponsors: SDUAHER.

Participants: Unit I, II & III NSS volunteers.

Photographs of the event:





Kolar,KA,India
Kolar, Kolar, 563103, KA, India
Lat 13.141854, Long 78.205182
08/03/2024 10:23 AM GMT+05:30



08/03/2024 10:20 AM GMT+05:30
NSS Camp : plantation

E. Devaraj Urs
**National Service Scheme
Programme Co-ordinator
Sri Devaraj Urs Academy of
Higher Education & Research
Tamaka, Kolar**



**SRI DEVARAJ URS COLLEGE OF NURSING,
TAMAKA, KOLAR-563103**

Format	PRN-02
Issue No.	02
Rev.No.	00
Date:	01-09-2018

REPORT

Date: 7/6/2024

Name of the event: **WORLD ENVIRONMENT DAY-2024**

Date of the event: 5th June 2024

Background/ Introduction Department of Community Health Nursing & NSS unit of SDUCON celebrated "**WORLD ENVIRONMENT DAY -2024**" with the theme "**Land Restoration, Desertification and Drought Resilience**" for 2 days on 05-06-2024 at Sri Devaraj Urs Nursing College, Tamaka, Kolar & on 06-06-2024 in Government Higher Primary School, Devarayasamudra, Kolar. Aim of the programme was to create awareness among the students and public about protecting our mother nature and importance of environment.

- **Chief Guest:** - Dr. G. Vijayalakshmi, Principal, SDUCON, Tamaka, Kolar and
Mr. Srinivas, Head Master Government High School, Devarayasamudra.
- **Ms.Bindushree**, I-M.Sc(N) presented World-EnvironmentDay-2024
"Land Restoration, Desertification and Drought Resilience."
- **IV B.Sc (N), I GNM & III GNM** students of SDUCON participated in programme

Activity done: Plantation around the SDUCON College and Government High School, Devarayasamudra.

Photographs of the event on 05-06-2024



Inauguration of the programme



Theme presentation



Plantation around the college

Photographs of the event ON 06-06-2024



Inauguration of the programme



Role play



Plantation at Govt High School DRS