TECHNICAL REPORT OF ENERGY AUDIT

Submitted to

YENEPOYA (DEEMED TO BE UNIVERSITY)
MANGALORE - 575 018, KARNATAKA, INDIA.

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Submitted by

NATURE SCIENCE FOUNDATION

(A Unique Research and Development Centre for Society Improvement)

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1. Introduction

An energy audit is a survey in which the study of energy flows for the purpose of conservation is examined at an organization. It refers to a technique or system that seeks to reduce the amount of energy used in the Organization without impacting the output. The audit includes suggestions of alternative means and methods for achieving energy savings to a greater extend. Conventionally, electrical energy is generated by means of fossil fuels, hydraulic and wind. The availability of fossil fuels and their depletion rate, insist the need for alternate energy systems and conservation of electric energy. In general, the primary objective of an energy auditing and management of energy consumption is to offer goods or services at the lowest possible cost and with the least amount of environmental impact (Backlund and Thollander, 2015). The need for an energy audit is to identify the savings potential and cost reducing methods, understand the ways in which fuel is used, where, the waste occurs and find the scope for improvement.

An energy audit is proposed and conducted to ensure that energy saving practices are implemented and followed in Educational Institutions and Industrial sectors in a sustainable way. Preparation and completion of a questionnaire, physical examination of the campus, observation and examination of documentation, key person interviews, data analysis, measurements and suggestions are all part of the audit process. Energy audit involves several facts including energy savings potential, energy management, finding alternatives, etc. (Cabrera *et al*., 2010) With these facts in mind, the audit's specific objectives are to assess the competence of the sustainability management and control system, as well as the departments' compliance with applicable rules, policies, and standards. It has the potential to have a significant influence on the organization's operational cost as well as the environmental impact (Singh *et al*., 2012).

Energy Conservation Building Code (ECBC) is established in the year 2017 which provides minimum requirements for the energy-efficient design and construction of buildings across India. It also provides two additional sets of incremental requirements for buildings to achieve enhanced levels of energy efficiency that go beyond the minimum requirements. Bureau of Energy Efficiency (BEE) came into force in 2002 towards implementation of energy saving practices in an organization. Energy-efficiency labels are information affixed to manufactured products and usually communicate the product energy performance (Ingle, 2014). BEE has developed a scheme for energy efficiency labelling of buildings coinciding with the star ratings of the building at accelerating energy efficiency activities. BEE Star Rating Scheme is based on actual performance of the building as well as equipment in terms of specific energy usage termed as 'Energy Performance Indicator' by means of star ratings labelled items used which will be useful for energy savings in a sustainable manner (Mishraand and Patel, 2016).

Energy audit programme provide aid in maintaining a focus on energy price variations, energy supply availability and efficiency, determining an appropriate energy mix, identifying energy-saving technology, retrofitting for energy-saving equipment and so on. In general, an energy audit process dealt with the driving conservation concepts into reality by giving technically possible solutions within a specified time

limit while also considering the economic and other organizational issues (Asnani and Bhawana, 2015). It also dealt with the uncover ways to cut operating expenses or reduce energy use per unit of production in terms of savings. It serves as a "benchmark" (reference point) for managing energy in the organization for planning more energy-efficient use across the board (Cabrera *et al*., 2010).

2. Need for an Energy Audit

In an organization, the top three operating expenses are energy labour and materials. Relating the manageability of the cost or potential cost savings in each of the above components, energy management is found to be the top ranker, and thus energy management constitutes the essential part in reducing the cost. Energy Audit helps in understanding the ways energy and fuel are being used in any organization, and identifies the areas where wastes occur and the scope for improvement exists. The Energy Audit gives a positive orientation to the energy cost reduction, preventive maintenance quality control programmes and will help to keep focus on variations which occur in the energy costs, availability, and reliability of supply of energy. The main objective of Energy Audit is to find ways to reduce energy consumption per unit of product output. The Energy Audit provides a "bench-mark" (Reference point) and a basic planning for managing energy and for more effective use of energy throughout the organization.

The Ecofriendly-campus concept essentially focuses on the efficient use of energy conservation and its savings opportunities in a sustainable way. It also gives importance for reduction of contribution to carbon emissions, carbon footprint calculation, use of star rated equipment, encouraging energy use conservation practices in all buildings, reduce the organization's energy consumption, reduce wastes to landfill, and integrating environmental considerations into all contracts and services considered to have significant environmental impacts.

Auditing for Energy Management may be studied in terms of energy savings and opportunities. In general, energy cannot be seen, but we know it is there in wire, pipes and other non-living materials because it shows visible effects in the forms of heat, light and power. The energy consumption, energy sources, energy monitoring, lighting, vehicle movement, electrical and electronics appliances, and transportation are addressed by this indicator. Energy usage is an important aspect of campus sustainability and requires no explanation for its inclusion in the assessment. However, energy saving, and opportunities may be taken into consideration while energy is extensively used. An old incandescent bulb uses approximately 50W to 100W while an energy efficient LED uses only less than 10W which shows the positive indication on energy savings. Energy auditing deals with the conservation methods to reduce its consumption related to environmental degradation. In addition, suggestions and recommendations might be given after auditing which in turn useful for energy savings. Thus, it is essential for any environmentally responsible institution to examine its energy use practices at least once in two or three years using internal and external auditors.

The conduct of energy audit using internal and external energy auditors is playing important role in any organization in terms of energy management. The Energy audit is able to measure the impact of energy potential in an organization so that it helps in determining the better ways to manage the impact on environment. In addition to liquid and solid wastes, biomedical and electronic wastes energy potential and biodiversity audits, attempts may be made to measure the carbon footprint in the organization based on the amount of carbon emissions created by the electrical appliances, vehicles, and human population. It takes into consideration the measure of bulk of CO_2 equivalents exhaled by the organization by which the carbon footprint accounting is done. It is necessary to know how much the organization is contributing towards sustainable development in terms of energy management is being done. It is therefore recommended to measure the carbon footprint in each organization which may be useful for maintaining the ecofriendly campus to the stakeholders.

3. Aims and Objectives of an Energy Audit

An energy audit is a useful tool for developing and implementing comprehensive energy management plans of an organization. The aim of an energy audit is to identify the energy efficiency, conservation, and savings opportunities at the premises of the audit sites in a systematic manner. The audit process is carried out as per the following.

- Review of energy saving opportunities and measures implemented in the audit sites.
- Identification of additional various energy conservation measures and saving opportunities.
- Implementation of alternative energy resources for energy saving opportunities and decision making in the field of energy management.
- Providing a technical information on how to build an energy balance as well as guidance to be sought for particular applications.
- Detailed analysis on the calculation of energy consumption, analysis of latest electricity bill of the campus, understanding the tariff plan provided by the central and State Electricity Board.
- List ways that the use of energy in terms of electricity, electric stove, kettle, microwave, LPG, firewood, Petrol, diesel and others.
- Analysis of electricity bill amount for the last two to three years, amount paid for LPG cylinders for last one year and amount paid for water consumption for human beings and watering to the plants.
- Use of incandescent (tungsten) bulb and CFL bulbs, fans, air conditioners, cooling apparatus, heaters, computers, photo copiers, inverter, generators and laboratory equipment and instruments installed in the organization (for example- 60-watt bulb x 6hours x number of bulbs = kwh).
- Alternative energy sources / nonconventional energy sources are employed / installed in the organization (photovoltaic cells for solar energy, windmill, energy efficient stoves, Biogas, etc.).
- Creating awareness among the stakeholders on energy conservation and utilization.

4. Benefits of an Energy Audit

- **Reduced Energy Expenses:** The most obvious benefit is that the less energy the Organization uses, the less money that the Organization will have to spend on energy costs.
- **Identify Problems:** An energy audit can also help to identify any issues that the equipment might have. For example, the auditor could find small leaks in the compressed air system. These leaks would cost a significant amount of money if it is not noticed. Auditors can also detect dangerous health risks like the carbon monoxide that's emitted from equipment that hasn't been vented properly. With a regular energy audit, the organization will be able to address these kinds of issues promptly to help ensure the health and safety of the staff members.
- **Increased Employee Comfort:** During the audit, the Organization might learn about changes that have been made regarding insulation and air sealing. Completing these enhancements will help create a more reliable and more efficiently cooled or heated space for the employees. In turn, more comfortable employees tend to be more productive, so not only will the Organization save on energy costs, but may also improve overall well-being.
- **Personalized Recommendations:** Working with an energy expert can help learn about new energy-efficient technologies. The professional will customize a plan, recommending which upgrades will give the most return on investment. These might include updated lighting systems, a new HVAC system, weatherization measures like insulation and air sealing, and more. While some of the recommendations might have a substantial up-front cost that many of them will pay for themselves in a short period of time with significantly reduced energy expenses.
- **Show Environmental Concern:** By taking steps to be more energy efficient, the Organization will be showing the employees and clients that the organization cares about the impact on the environment.
- **Increased Property Value:** Using the recommendations of an energy auditor to make facility more energy efficient could also help to increase its overall worth. Things like solar panels, high-efficiency LED lighting, and weatherization procedures are all things that contribute to a higher property value.
- **Longer Equipment Lifespan:** An energy auditor might recommend to update some of the equipment for maximum energy savings. If the Organization decide to upgrade, it will not only save on energy costs, but also expect the equipment to last a long time. This is because newer, more energy-efficient equipment doesn't have to work as hard as older, outdated units to provide the same level of performance.
- **Energy audit evaluation:** Energy audits will evaluate the Organization "as a whole", the aim is to consider a wide range of available alternatives (Electrical, Mechanical, Thermal Water and Transportation).
- **Energy audit Opportunities:** The audit will not only inform about the opportunities but also provide information with financial analysis. This will enable prioritization based on financial benefit and return on investment. It provides technical information regarding the proposed energy conservation measures.
- **Analysing the quality of Energy Audit:** A good quality audit will investigate the historical energy usage and find the essential issues using statistical methods. It

Provides information with emissions analysis to help understand the benefits of the decisions from an environmental standpoint. The audit provides benchmark information to help compare the energy use performance with others.

5. Procedures followed in an Energy Audit

In order to conduct an energy audit, several methods are adopted in the audit sites in which walk-through audit is conducted. The balance of total energy inputs with total energy outputs and identification of all energy streams in a facility are taken into account. The amount of energy used by each of its energy streams are calculated as per the methodology mentioned in the audit Manual. The top three operating expenses of the Organization are typically observed to be energy (both electrical and thermal), labour and materials. During the audit, physical verification of Lighting, Ceiling, Table and Exhaust Fans, A/C machines, Solar panels, Heaters, Generators, Uninterrupted power supply machines and ventilators load fixtures and verification of installed energy efficient system's capacities are carried out. Inspection of when the cost or prospective cost savings in each of the above components are considered, energy always wins, and the energy management task becomes a key cost reduction area. The energy audit assisted in better understanding how energy and fuel are used in the Organization as well as identifying waste factors and development potential towards energy savings opportunities. Finally, after the audit process, the energy audit included suggestions for energy cost reduction, preventive maintenance and quality control activities, all of which are critical for the utility operations in the auditee (Organization).

The audit involved visiting the campus and physical verification of the loads and sources installed. The entire campus is divided into different sections and those sections are audited in which electrical fittings and energy supply are monitored. The production process flow is studied and electricity consumption are measured. Location of the electrical machines, conditions of them and their accessories are inspected through physical verification is observed as per the regulation of Indian Green Building Council and World Green Building Council. The energy bill from the supply utility company (Example: Karnataka Electric Generation and Distribution Corporation Limited, Karnataka) is audited and assessed for the load demand requirement and efficient consumption of energy. Stakeholders are interacted with the scope for improvement and energy management during the audit. Potential areas in which the scope of energy conservation and saving opportunities available in the current context have been identified and suggested for implementation to the Organization. The level of carbon dioxide might be measured in different places across the Organization campus using a portable CO_2 Analyzer to calculate the carbon footprint. It may be useful to check where carbon emission is prominent which could be taken into account to reduce.

The audit involves visiting physical position of load & carry out inventory of load. Due measurement of electrical load of equipment & circuit is carried out. Energy bill received from KEB is audited & studied for KWH requirement & how efficiently energy is used. Various positions are interacted, familiarized with energy audit & involved for successful & result oriented energy audit. Energy conservation & saving opportunities are identified during round & measurement for implementation.

6. Types of Energy Audit

The Energy Audit types depends on the following factors:

- Industry/ Organization type and its function
- Intense and the extent to which final audit is required, and
- The magnitude of cost reduction

Thus Energy Audit can be classified into the following types.

1) Preliminary Energy Audit
2) Detailed Energy Audit
3) Potential and magnitude of Energy Audit
4) Comprehensive Energy Audit

6.1. Preliminary Energy Audit Methodology

Preliminary energy audit gives a quick access to:

- Estimating and establishing energy consumption in the organization
- Estimate the scope of audit
- Identify the areas of maximum energy consumption
- Identify the areas of improvement
- Setting benchmark
- Performing Preliminary energy audit uses existing data.

6.2. Detailed Energy Audit Methodology

The detailed Energy audit offers the most accurate estimation of energy savings and cost. A comprehensive audit provides a detailed energy implementation plans for a facility, as it evaluates all major energy consumption systems. It considers the effects of all projects, accounts for the energy use of all major equipment, and includes detailed energy cost saving calculations and project cost. Energy Balance is the key element in detailed energy audit. The estimated use is compared to utility bill charges. There are three phases in detailed energy audit

Phase I - Pre -Audit Phase
Phase II - Audit Phase
Phase III - Post Audit Phase

6.3. Potential and Magnitude of Energy Audit

A systematic and structured method is necessary for an efficient working of energy audit process. An initial site study is carried out for planning the procedures necessary for an audit.

Initial Site Study and Preparation for Detailed Auditing

An initial site study visit might take one or two days and gives the Energy Auditor an opportunity to meet the concerned person (Auditee), to familiarize with the site and to assess the procedures necessary to carry out the energy audit.

During the initial site visit the Energy Auditor carries out the following actions: -

- Discussing the aims of the energy audit with the audit study site's management.
- Discussing the economic factors associated with the recommendations of the audit.
- Analysing the major energy consumption data with the concerned person.

- Obtaining the available audit site drawings – building layout, electricity distribution, steam distribution, compressed air distribution, etc.
- Conducting Walk-through audit around site.

The main aims of this visit are:

- Finalising the Audit team members
- Identifying and analysing the main energy consuming areas during the audit.
- Identifying existing instrumentation/ additional metering required.
- To decide if any meters will have to be installed prior to the audit eg. kWh, steam, oil or gas meters.
- Identifying the instruments required for carrying out the audit.
- Planning the time management
- Collecting the macro data on major energy consuming areas.
- Conducting awareness meetings/ programmes.

6.4. Comprehensive Energy Audit

A comprehensive audit can take from several weeks to several months depending on the nature and complexity of the site to complete the audit process. Detailed study is carried out to establish, and investigate, energy and material balances for specific departments. Possible checks of plant operations were carried out over extended periods of time, at nights and at weekends as well as during normal daytime working hours, to ensure that nothing is overlooked.

The audit report includes list of energy inputs and product outputs by major department or by major processing function and estimates the efficiency of each step of the Organization. The methods for improving the efficiency will be listed, and it also includes preliminary assessment of the cost of the improvements and expected payback on any capital investment needed. The audit report concludes with specific recommendations for detailed engineering studies and feasibility analysis. The comprehensive energy audit is useful in identifying the major energy consuming areas to be surveyed during the audit and to identify any existing instrumentation/ additional metering required. Proper care should be taken while identifying the instrumentation required for carrying out the audit and to plan the time management for collecting the macro data from energy consuming areas. The audit report is definitely useful for energy management.

The information to be collected during the detailed audit includes:

1. Energy consumption by type of energy, by department/area, by type of process equipment, by end-use
2. Energy cost and tariff data
3. The distribution and generation of site services (eg. Electricity, Compressed air, steam).
4. Sources of energy and its supply (e.g. electricity from the grid or self-generation)
5. Potential alternative for fuel substitution, process modifications, and the use of co-generation systems (combined heat and power generation).
6. Energy conservation and management awareness training programs within the Organization.

The audit team collects the following baseline data:

- Major Equipment details, process/technology used
- Water consumption
- Fuel usage
- Capacity utilisation
- Electrical energy consumption
- Steam consumption
- Yield/ Efficiency

7. Carbon footprint by measuring Carbon dioxide level in the Campus

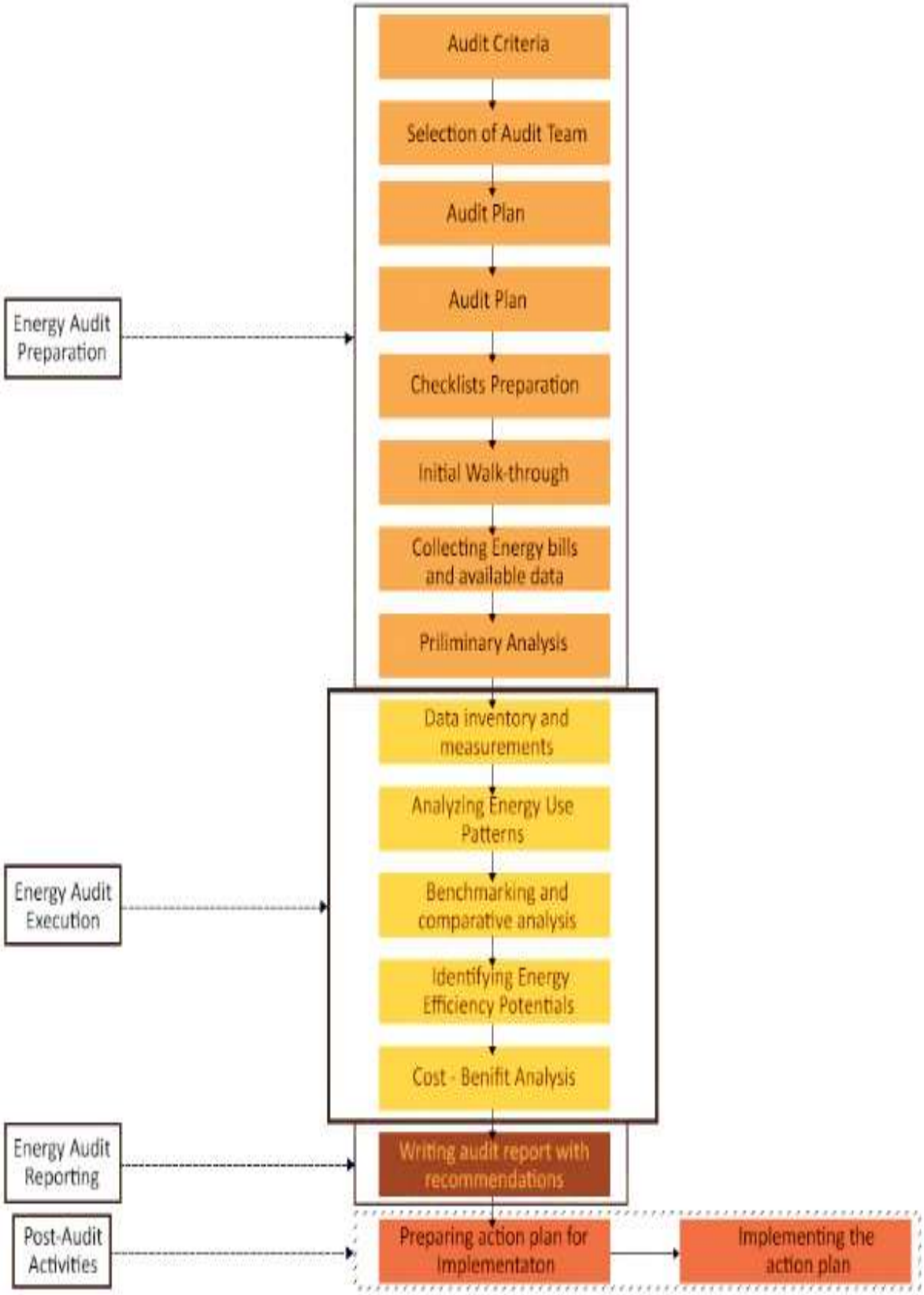
The level of Carbon dioxide is measured in different places across the Organization campus using a portable CO_2 Analyzer (Non dispersive infra-red meter). In addition, CO_2 meter is also displayed the readings of atmospheric temperature, relative humidity, and dew point in the places, where the level CO_2 is measured. The meter started measurements of CO_2 level in the atmosphere after powered ON and updated the readings every second in the display screen. If the operating environment is changed (example from high to low temperature) which took 30 seconds for CO_2 sensor to respond and 30 minutes for flexibility in relative humidity. The meter features an audible alarm to give warnings when CO_2 concentration exceeds the set limit. It emits beeps (Abt.80Db) when CO_2 level goes over the set value and stops when any key (except SET) is pressed, or the readings fall below the set values.

The Carbon footprint per year is calculated (www.carbonfootprint.com) based on electricity usage per year in which CO_2 emission from electricity and the sum of transportation per year in terms of number of the shuttle buses service operated by the Organization and number of cars, motorcycles and trucks entering in the Organization campus. These factors are multiplied with total number of trips in each day and approximate travel distance of vehicles covered in each day with a coefficient (0.01) to calculate the emission of CO_2 in metric tons per year.

Humans contribute to a massive increase of carbon dioxide emissions by burning fossil fuels, deforestation, and other industrial activities. Methane (CH_4) is largely released by coal, oil, and natural gas industries. Anthropogenic activities are responsible for almost all of the increase in greenhouse gases in the atmosphere over the last 150 years. The largest source of greenhouse gas emissions from human activities is from burning fossil fuels for electricity, heat, and transportation.

Calculating Carbon Foot Print

The Methodology of the Audit is presented in the following chart



Flow chart of Energy Audit Methodology

8. Energy Audit Process

Energy audit is a sequence of tasks performed in a planned manner. It requires discussion, survey, collection of data, analysis, and reporting.

Opening Meeting with Audit Teem of Nature Science Foundation Registrar and Management Representatives of Yenepoya (Deemed to be University) Mangalore, Karnataka.

8.1. Steps involved in an Energy Audit

Step 1: Opening meeting among the audit team and auditees
Step 2: Planning and organizing the energy audit
Step 3: Conduct a walk-through audit at different sites
Step 4: Macro data collection and observation
Step 5: Analysis of data collected from the Organization
Step 6: Best practices followed in the Organization towards energy savings
Step 7: Recommendations for further improvement
Step 8: Exit meeting after the audit to discuss about the audit findings

8.2. Systems studied during the Energy Audit

- Physical verification of lighting, fan a/c machines, ventilators load fixtures.
- Verification of installed energy efficient systems.
- Inspection of Solar panel, Generators, Uninterrupted power supply machines.
- Inspect and verify the maintenance aspects of installed Generators and additional backup power sources.
- Analyse the electricity consumption through the supply utility company (Example: Karnataka Electric Generation and Distribution Corporation Limited, Karnataka).
- Review the potential usage of alternative energy resources.
- Review the energy conservation awareness among the stakeholders for optimum use of electricity and its savings.

8.3. Planning and organizing the Energy Audit

Planning and organizing are the integral part of the energy audit. An initial visit to the audit sites is organized and the areas to be inspected are listed. Following the listing, information on the energy consumption of various blocks in the recent past is obtained, and a planned analysis is carried out.

8.4. Walk-through Audit Process

Simple audit, screening audit or visual audit are the other names, by which walk-through audits are addressed. The main purpose of the walk-through audit is to obtain general information about the sites in which electrical energy is being used at the maximum. More specific information has been obtained from the maintenance and operational people during the time walk-through audit. It also included a walk-through of the facility to become familiar with the building's operation and a brief evaluation of facility utility bills (amount paid for electricity) and other operating data. During the audit the primary problem areas are discovered.

8.5. Macro Data collection and observation

Current level operation and practices within the campus are assessed and then the data regarding the number of electrical loads connected in each section are collected. The power ratings of each component and their respective hours of operation are also observed and documented for preparing the recommendations to the Organization.

8.6. Measurements in the Energy Audit process

An energy audit required measurements, such as the energy identification and quantification, and these quantities necessitate the instruments used in a consistent way. Some of the basic electrical parameters are monitored during the energy audit such as Voltage (V), Current (I), Power factor, active power (Kw), apparent power (demand in Kva), reactive power (Kvar), energy consumption (Kwh), frequency (Hz), harmonics, illumination level, etc. Temperature and heat flow, radiation, air and gas flow, liquid flow, speed, air velocity, noise and vibration, dust concentration, TDS, Ph, moisture content, relative humidity, flue gas analysis – CO_2, O_2, CO, SO_2, NO_2, combustion efficiency are the mechanical, thermal and other parameters that are analysed during the audit depending upon the requirements

9. About the Institution

9.1. Yenepoya (Deemed to be University)

In 1991, the Islamic Academy of education, a not-for-profit trust committed to the upliftment of minorities in general and Muslims in particular, was established by entrepreneur Mr. Yenepoya Abdulla Kunhi as its Chairman. The trustees perceived a hiatus in the area of Health Professional education and so decided to start a Dental college. Within a short span of time, the Yenepoya Dental College was granted permission in 1992; recognized under section 3(A) of the UGC Act, 1956 by the Dental Council of India to educate aspiring students to become dentists. Soon, with one successful milestone after another Trust launched the Yenepoya Institute of Nursing Sciences (1994), the Yenepoya Medical College (1999), the Yenepoya Nursing College (2002) and the Yenepoya Physiotherapy College (2003). All these colleges offer Graduate, Postgraduate, Ph.D., and various certification programs.

From its inception, the management dreamt of providing quality higher education, and towards this goal hired the best in their profession. In a healthy campus with natural surroundings, the trust raised buildings designed to bring out the best learning environs, in the distant suburbs of Mangalore.

The Islamic Academy of Education in its quest towards excellence in professional education decided to sponsor the formation of a new trust with the sole purpose of creating a Deemed-to-be University (2007). Recognizing the yeoman service provided over the years by these institutions, the Ministry of Human Resource Development, Union of India, on the recommendation of the University Grants Commission granted recognition to Yenepoya University Trust a Deemed-to-be University status under section 3A of the UGC Act 1956 in 2008. This opened a new chapter in the history of Yenepoya Institutions.

The University campus located in Nithyananda Nagar, Deralakatte has been accorded with all modern infrastructure facilities that include fully furnished classrooms, well-maintained science laboratories, residential quarters for staff and separate lodging facilities for boys and girls. The saga of Yenepoya Deemed to be University is yet to unfold and greater achievements are around the corner. To prove that quality has been the signature of the institutions and more than just lip service, we have been accredited by NAAC with “A+” grade with CGPA 3.47 on 10 August, 2022. The Deemed to be University has been ranked the Third Best University among best Young Universities in Karnataka by K-SURF, Government of Karnataka 2016 and ranked in top 100 (95th) in range in NIRF of MHRD, Govt. of Indian Universities category in the country.

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Vision

- To provide access to quality higher education, ensuring equity to create a vibrant knowledge capital and to create inspiring leaders of tomorrow who can take this country to the forefront of developed nations.

Mission

- To foster academic excellence and global competencies among students.
- To create an environment for the generation of new knowledge through meaningful research, adopting latest methods of pedagogy and incorporating modern principles of academics integrated with highest ethical standards.
- To extend the knowledge acquired and new knowledge generated for the development of the community.

9.2. About Nature Science Foundation (NSF)

NSF is ISO 9001:2015, 14001:2015, 45001:2018 & 50001:2018 certified and registered with Ministry of Micro, Small and Medium Enterprise (MSME), Government of India Organization functioning energetically towards the noble cause of nature conservation and environmental protection. NSF is managed by a board of trustees of NSF Public Charitable Trust under the TN Societies registration Act 1975 (TN Act 27 of 1975) on 29th November, 2017 at Peelamedu, Coimbatore- 641 004, Tamil Nadu, India with Certificate of Registration No. 114 / 2017. In addition, NSF has 12A, 80G and Form 10AC certificates for income tax exemption and implanting various Government schemes. The main motto of the NSF is to “Save the Nature to Save the Future” and “Go Green to Save the Planet”. NSF Branch Offices are also functioning effectively at Gorakhpur, Uttar Pradesh and Faridabad, Haryana, India to adopt the ‘Go Green Concept’ in a big way. NSF family is wide spread across India with over 115 state-wise Lead auditors to conduct Green and Environment Audits.

NSF is functioning strenuously to conduct different awareness programmes and implement various schemes to public and school / college students towards the noble cause of nature protection. Some of the programmes are also being organized for the benefit of tribal communities to create the supply chain for biodiversity conservation studies. The objectives along with vision and mission are illustrated to promote educational and environmental awareness programmes through social activities for enhancing the quality of life and to conserve nature from environmental pollutants using traditional and modern technologies for sustainable land management. NSF is educating the tribal community children through social service and towards the upliftment of tribes as a whole and make them as entrepreneurs.

International Eco Club Student Chapter (IECSC) has been established for Student volunteers and faculty members are encouraged to conduct National and International events, Student Technical Symposium, Distinguished lecture programme, Environment Day celebration, Ozone Day celebration, Project model exhibition, Awareness programmes on Environmental pollution, Biodiversity and Natural resources conservation etc. with the financial support of the Foundation. NSF is being released 'Magazine' and 'Newsletter' biannually to share the information about Environmental awareness programmes on biodiversity conservation, seminar on soil conservation, water management and solid waste management, restoration and afforestation programmes in Western Ghats of southern India.

In order to encourage the students, members of faculty, academicians, scientists, entrepreneurs and industrial experts those who are involving in nature protection and biodiversity conservation studies across the world, NSF tributes the deserved meritorious candidates with various awards and honours such as 'Best Faculty Award', 'Best Women Faculty', 'Best Scientist Award', 'Best Student Award', 'Best Research Scholar Award', 'Best Social Worker Award', 'Young Scientist Award', 'Life-Time Achievement Award' and 'Fellow of NSF'. These award and honours will be given to the deserved meritorious candidates during the 'Annual Meet and Award Distribution Ceremony' which will be conducted every year during the first week of January.

NSF has introduced various types of Audits such as 'Eco Audit', 'Green Audit', 'Energy Audit', 'Hygienic Audit' Water & Soil Audit, Plastic Waste Management Audit, Biomedical Waste Audit, Solid Waste Management Audit, E-Waste Management Audit, Academic & Administrative Audits including ISO certification process to Academic Institutions, R&D Organizations and Industries towards the accreditation process as well as maintaining a hygienic eco-friendly environment to the stakeholders in their campus. All audits will be conducted as per the Checklist prepared by the NSF ISO Criteria and in compliance with Government Law and Environmental Legislations including World / Indian Green Building Council and the concept of Swachh Bharath Abhiyan under Clean India Mission. Green campus and Environment Policy, Purchase Policy, Energy Policy, MoU, International Eco Club Student Chapter.

Audit processes are being conducted through the certified Auditors as per the following by the NSF

Audit	Certified Auditors	Certified Auditors
Green Audit	• IGBC - Indian Green Building Council • GBCRS - Green Building Code and Green Ratings Systems • GRIHA – Green Rating for Integrated Habitat Assessment	➢ Dr. S. Rajalakshmi ➢ Dr. R. Mary Josephine ➢ Dr. B. Mythili Gnanamangai ➢ Er. N. Shanmugapriyan
Energy Audit	• BEE - Bureau of Energy Efficiency • LEED - Leadership in Energy and Environmental Design • CII-GreenCo – GreenCo Rating System Felicitator	➢ Er. D. Dinesh kumar ➢ Er. N. Shanmugapriyan ➢ Dr. N. Balasubramaniam ➢ Dr. P. Thirumoorthi ➢ Dr. G. Murugananth
Environment Audit	• IGBC -Indian Green Building Council • ASSOCHAM - Associated Chambers of Commerce and Industry of India • FSRS – Fire Safety & Rescue Services	➢ Dr. S. Rajalakshmi ➢ Dr. A. Geetha Karthi ➢ Dr. R. Mary Josephine ➢ Dr. B. Mythili Gnanamangai ➢ Er. N. Shanmugapriyan
Hygiene Audit	• FSMS – Food Safety Management System & • Occupational Safety & Health (ISO 22000:2018) • SBICM - Swatch Bharath under India Clean Mission	➢ Mrs. Gaanaappriya Mohan ➢ Dr. R, Sudhakaran ➢ Dr. N. Saranya
Waste Management Audits	• Water & Soil Audit, Plastic Waste Management Audit, Biomedical Waste Audit, Solid Waste Management Audit, E-Waste Management Audit as per the Checklist of NSF	➢ Mrs. Gaanaappriya Mohan ➢ Dr. R, Sudhakaran ➢ Er. N. Shanmugapriyan
Academic & Administrative Audits	• Academic & Administrative Audits as per the NAAC Criteria and ISO implantation procedure	➢ Dr. B. Anirudhan ➢ Dr. B. Shreeram

	• In compliance with the Environmental legislations and rules and regulations	
ISO Certification	• QMS (9001:2015), • EMS (14001: 2015), • OHS (45001: 2018), • ISMS (27001:2018), • FSMS (22000: 2018), • QMSMD (13485: 2016), • EnMS (50001: 2018)	➢ Dr. S. Rajalakshmi ➢ Dr. A. Geetha Karthi ➢ Mrs. Gaanaappriya Mohan ➢ Dr. R. Mary Josephine

10. Audit Details

Date / Day of Audit	**:**	**22.12.2022**
Venue of Audit	**:**	**Yenepoya (Deemed to be University)** Mangalore - 575 018, Karnataka, India.
Audited by	**:**	**Nature Science Foundation,** Coimbatore, Tamil Nadu, India.
Audit type	**:**	**Energy Audit**
Name of Auditing Chairman	**:**	**Dr. S. Rajalakshmi Jayaseelan,** Chairman of NSF & ISO QMS, EMS, OHSMS, EnMS Auditor.
Name of IGBC AP Auditor	**:**	**Dr. B. Mythili Gnanamangai,** Vice Chairman of NSF, Indian Green Building Council Accredited Professional.
Name of Subject Expert-I	**:**	**Mr. B.S.C. Naveen Kumar,** Senior Faculty, Mahatma Gandhi National Council of Rural Education, Ministry of Higher Education, Hyderabad.
Name of Subject Expert-II	**:**	**Dr. D. Vinoth Kumar** Joint Director of NSF & ISO EnMS Auditor.
Name of Subject Expert-III	**:**	**Er. D. Dinesh Kumar,** Certified Lead Auditor, IGBC, ASSOCHEM, GRIHA & LEED
Name of the Energy Auditor	**:**	**Dr. N. Balasubramanian,** Certified Bureau of Energy Efficiency Auditors of NSF.
Name of the Eco Auditor	**:**	**Er. S. Srinivash,** Tamil Nadu Fire and Rescue Services, Chennai.
Name of Eco & Green Officer	**:**	**Ms. T. Joys Ememmal,** Environment, Energy & Green Council Programme Officer, NSF.

11. Observations of the Energy Audit

11.1. Facilities visited during the Energy Audit

Date	Section where Energy Audit is conducted
22.12.2022	Administrative Block
	Power House
	Faculty Rooms
	Classrooms
	Seminar Halls
	Auditorium
	Laboratories
	Computer Centres
	Well, Sump and pumps.
	Sewage Treatment Plant
	Hostel
	Library

In the sections, the services offered are monitored, verified and analysed on the aspects of energy consumption. In all these areas lighting systems forms the major consumable of electrical energy. Three phase electricity service connections are available in the campus. The electricity consumption charges are audited and studied for the load demand requirement and efficient consumption of energy. Stake holders are interacted and the scope for improvement has been discussed. Potential areas in which scope of energy conservation and saving opportunities available have been identified and suggested for implementation.

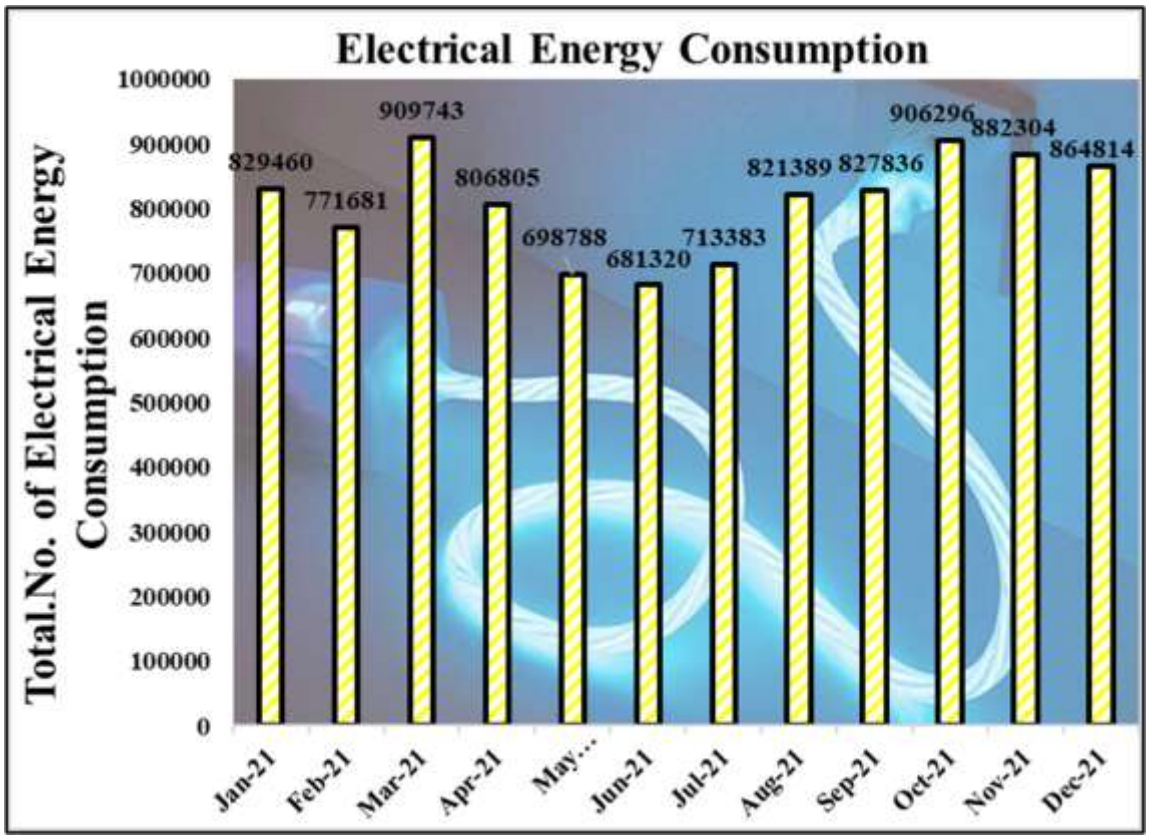
11.2. Systems Studied during the Energy Audit

1. Lighting fixtures are verified physically.
2. Installation of energy efficient lighting systems are verified.
3. Installation of safety systems are verified
4. Installation of power backup systems (generators and UPS) are verified on the aspect of maintenance and consumption.
5. Electricity consumption through the TSSPDCL bills was analysed.
6. The energy conservation awareness among the stakeholders for optimum use of electricity and its savings are reviewed.

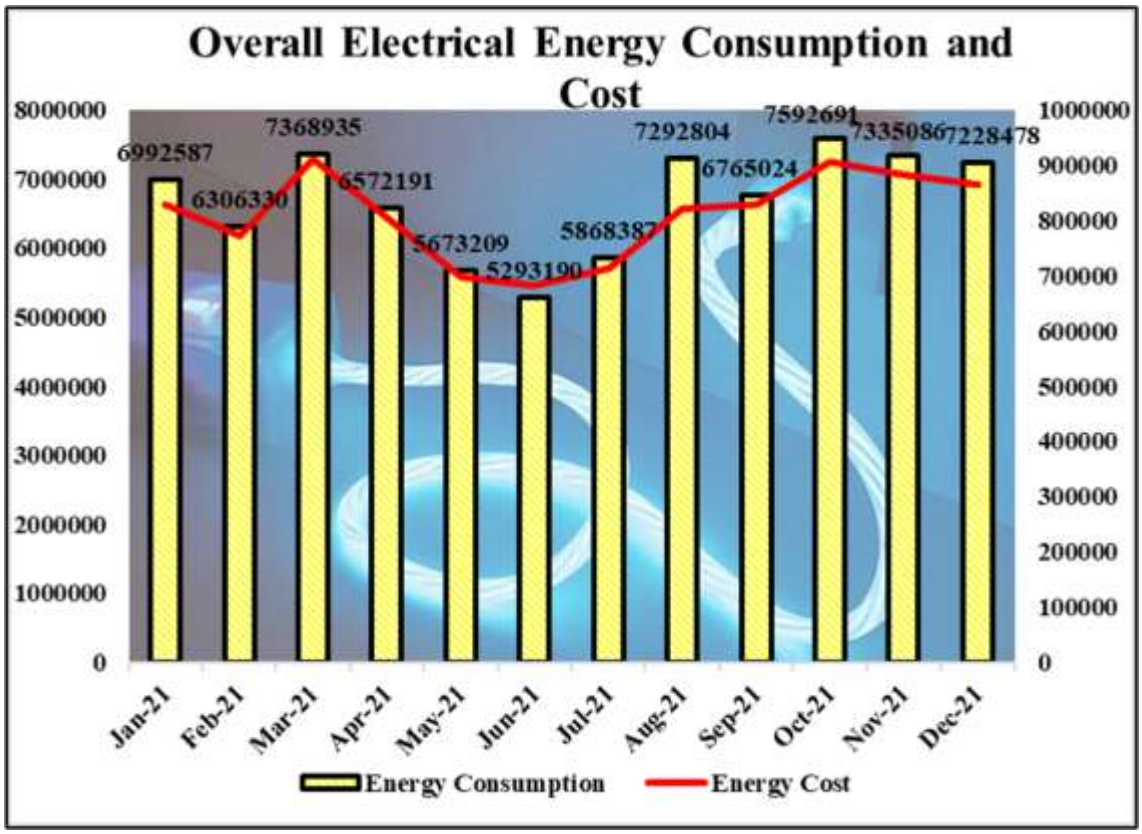
11.3. Energy Consumption and Cost Profile

The following chart shows the profile of energy consumed and the cost for one year by the stakeholders.

Electrical Energy Consumption Profile



Overall Electrical Energy Consumption and Cost profile



11.4. Power supply Equipment and Major Loads

Table 1. Major Equipment related to Electrical energy utilization

S.No.	Major And Minor Equipment, Instrument and Machineries Utility on Day-To-Day Basis	Rating / Capacity	Quantity (Nos)
1	2x2 Grid Light 36 Watts	36	3414
2	4" 20-Watt Led Tube Light	20	5727
3	2" 20 Watts Led Tube Light	20	1314
4	40-Watt Normal Tube Light	40	4303
5	20-Watt Normal Tube Light	20	47
6	9-Watt Spot Light	9	138
7	3-Watt Spot Light	3	73
8	5-Watt Led Bulb	5	973
9	9-Watt Led Bulb	9	3039
10	18-Watt Cfl Light	18	249
11	5-Watt Foot Lamp	18	6
12	18 Watts Round Light	5	844
13	8 Watts Led Round Light	18	93
14	50 Watt Flood Light	8	76
15	30 Watt Flood Light	30	13
16	4" 20 Watt Tube Light	30	349
17	1'x1' Led Light	20	105
18	50 Watt Led Floodlight	10	122
19	100 Watt Led Floodlight	100	74
20	200 Watt Led Floodlight	100	48
21	250 Watt Led Floodlight	200	29
22	40 Watt Street Light	250	130
23	Sensor Light	40	5
24	Aviation Lamp Light	45	1
25	Zero Watt Bulb	Nil	69
26	X Ray View Box 36 Watt	Nil	112
27	Ceiling Fan	Nil	8814
28	Pedastal Fan	Nil	333
29	Table Fan	Nil	8
30	Wall Mounted Fan	Nil	735
31	Bunker Fan	Nil	6
32	Industrial Fan	Nil	7
33	Exhaust Fan	Nil	1593
34	Dg	Nil	1
	125 Kva	Nil	Nil
	160 Kva	Nil	1
	250 Kva	Nil	2
	320 Kva	Nil	1
	380 Kva	Nil	3
	625 Kva	Nil	2

	750 Kva	Nil	1
	1250 Kva	Nil	1
35	Transformers	Nil	Nil
	250 Kva	Nil	2
	315 Kva	Nil	1
	500 Kva	Nil	5
	630 Kva	Nil	1
	750 Kva	Nil	2
	4000 Kva	Nil	1
36	Solar Panels	Nil	Nil
	125.45 Kw	Nil	1
	66.95 Kw	Nil	1
	114.075 Kw	Nil	1
	91.65 Kw	Nil	1
	56.55 Kw	Nil	1
37	Lifts	Nil	Nil
	6 Passenger	Nil	2
	8 Passenger	Nil	9
	10 Passenger	Nil	2
	13 Passenger	Nil	3
	15 Passenger	Nil	2
	16 Passenger	Nil	3
	20 Passenger	Nil	4
	Goods	Nil	2
38	Ac	Nil	Nil
	0.8 Tr Split	Nil	15
	1 Tr Split	Nil	542
	1.5 Tr Split	Nil	457
	2 Tr Split	Nil	225
	2.5 Tr Split	Nil	11
	3 Tr Split	Nil	35
	1 Tr Window	Nil	226
	1.5 Tr Window	Nil	62
	2 Tr Window	Nil	5
	1.5 Tr Tower	Nil	1
	2 Tr Tower	Nil	18
	4 Tr Tower	Nil	12
	1.5 Tr Caseete	Nil	37
	2 Tr Casette	Nil	25
	2.25 Casette	Nil	3
	3 Tr Casette	Nil	9
	4 Tr Casette	Nil	3
	3 Tr Duc table	Nil	2
	4.5 Tr Duc table	Nil	4
	5.5 Tr Duc table	Nil	7
	8.5 Tr Duc table	Nil	22

	11 Tr Duc table	Nil	2
	Total	Nil	1723
39	Ro Water Plant	Nil	18
	Dialysis Plant	Nil	1
40	Refrigerator Single Door	Nil	299
41	Refrigerator Double Door	Nil	134
42	Deep Freezer	Nil	28
43	Aqua guard	Nil	29
44	Cooler	Nil	141
45	Geyser 6 Litre	Nil	8
46	20 Litre	Nil	231
47	Stabilizer 240 V	Nil	434
	Motor & Pump	Nil	Nil
	1.5 Hp Submersible	Nil	2
	2 Hp Submersible	Nil	15
	3 Hp Submersible	Nil	13
	5 Hp Submersible	Nil	20
	7.5 Hp Submersible	Nil	33
	10 Hp Submersible	Nil	1
	0.25 Hp Monoblock	Nil	1
	0.5 Hp Monoblock	Nil	13
	1.5 Hp Monoblock	Nil	5
	2 Hp Monoblock	Nil	1
	2.5 Hp Monoblock	Nil	2
	3 Hp Monoblock	Nil	3
	5 Hp Monoblock	Nil	10
	10 Hp Monoblock	Nil	3
	15 Hp Monoblock	Nil	1
	60 Hp Monoblock	Nil	3
	0.75 Hp Motor	Nil	1
	0.5 Hp Motor	Nil	4
	1 Hp Pressure Pump	Nil	10
	2 Hp Pressure Pump	Nil	1
	0.5 Hp Booster Pump	Nil	15
	5 Hp Booster Pump	Nil	2
	7.5 Hp Booster Pump	Nil	2
	Air Blower 7.5 Hp	Nil	4
	11 Hp Motor	Nil	2
	12 Hp Motor	Nil	2
48	15 Hp Motor	Nil	1
	Amplifier	Nil	47
	Speaker	Nil	139
	Mike	Nil	72
49	Mixer Set	Nil	1
	Printer	Nil	300
50	Computers	Nil	1114

	Laptops	Nil	2718
	I Pad	Nil	385
	Xerox Machine	Nil	11
	Scanners	Nil	71
	Fax Machine	Nil	5
	Insect Catcher	Nil	2
	Smart Tv Benq	Nil	94
	Tv	Nil	199
	Telephone	Nil	603
	Servers	Nil	9
	Cc Camera	Nil	1026
	Camera	Nil	10
	Sensor Tape	Nil	26
	P A Speaker	Nil	75
	Projector	Nil	53
51	Internet Connectivity	Nil	Nil
52	Iron Box	Nil	380
53	Oven	Nil	398
54	Coffee Machine	Nil	5
55	Ban marry (Heater) 1 Kw	Nil	16
56	Induction Cooker	Nil	69
57	Tea Kettle	Nil	377
58	3 Phase Mixer	Nil	1
59	Roodent Refiller	Nil	4
60	Heat Pump	Nil	2
61	Note Machine	Nil	1
62	Induction Stove 2000watt	Nil	1
63	Sandwich Maker	Nil	1
64	Cool Case	Nil	1
65	Exhaust Duct 3 Phase	Nil	11
	Washing Machine 7.2 Kg	Nil	49
	Washing Machine 11 Kg	Nil	3
	Washing Extractor 6kg	12 KW	3
	Washing Extractor 11 Kg	10 KW	2
	Washing Extractor 120 Kg	25 HP	2
	Washing Extractor 60 Kg	30 HP	4
	Washing Extractor 45 Kg	20 HP	2
	Washing Extractor 30 Kg	7.5 HP	2
	Dryer 11 Kg	3 HP	4
	Dryer 25 Kg	8 HP	6
	Dryer 60 Kg	6 HP	2
66	Dryer 120 Kg	5 HP	1

Electrical Load Details of Bio-Medical Equipment Installed In Yenepoya Medical College Hospital				
SI. No.	**Descriptions of Equipment**	**Each Eqpt. Load**	**Nos. of Equipment.**	**Total Load (KW)**
1	X-Ray Machine (800MA)	50KW	1	50KW
2	X-Ray Machine (800MA)	63KW	1	63KW
3	X-Ray Machine (600MA)	48KW	1	48KW
4	X-Ray Machine (600MA)	40KW	1	40KW
5	X-Ray Machine (400MA)	30KW	1	30KW
6	X-Ray Machine (300MA)	23KW	1	23KW
7	CT Scan (128 Slice)	Connected To 120 KVA Online UPS	1	108KW
8	3T MRI Machine	Connected To 100KVA Online UPS	1	90KW
9	CR Printer	580W	1	0.58KW
10	CR Printer	350W	1	0.35KW
11	CR Reader	290VA	1	0.261KW
12	CR Reader	190VA	1	0.171KW
13	MRI Laser Printer	580W	1	0.58KW
14	Mammography	3.5KW	1	3.5KW
15	Portable X-Ray(60ma)	5KW	5	25KW
16	Portable X-Ray(100ma)	8KW	3	24KW
17	Cath lab	Connected To 160KVA Online UPS	1	144KW
18	C Arm	6KW	6	36KW
19	Ultrasound Machine	2KVA	11	19.8KW
20	Portable Ultrasound Machine	1KVA	4	3.6KW
21	Pressure Injector	500W	2	1KW
22	Fundus Camera	2KVA	1	1.8KW
23	Optho Green Laser With Slit Lamp	1.5KVA	1	1.35KW
24	Slit Lamp	0.5KVA	7	3.15KW
25	Vision Drum	500W	3	0.5KW
26	Humphrey Field Analyzer (Perimeter)	0.5KW	1	0.5KW
27	Kerato meter	0.5KVA	1	0.45KW
28	Nd. YAG LASER	1.5KVA	1	1.35KW
29	A-SCAN Biometer System	500W	1	0.5KW
30	Pachymeter	500W	1	0.5KW
31	OCT Machine	1KW	1	1KW

32	Ophthalmic Chair Unit With Slit Lamp & I-Chart	1KW	4	4KW
33	Specular Microscope	1KW	1	1KW
34	I-Chart	0.5KVA	5	2.25KW
35	B-Scan Machine With UBM	500W	1	0.5KW
36	A Scan Machine	500W	1	0.5KW
37	ENT Treatment Unit	1KW	3	3KW
38	ENT Endoscopy Camera	500W		0.5KW
39	Intracoustics Clinical Audiometer	200W	1	0.2KW
40	Bera (Brainstem Evoked Response Audiometer) Machine	230W	1	0.23KW
41	OAE MACHINE	250W	1	0.25KW
42	VNG MACHINE	250W	1	0.25KW
43	Clinical Immitance Audiometer	300W	1	0.3KW
44	Vagmi Therapy Unit With EGG	200W	1	0.2KW
45	DLCO Machine	350W	1	0.35KW
46	ECT MACHINE	300W	1	0.3KW
47	Whole Body Phototherapy Unit	3.5KW	1	3.5KW
48	Radio Frequency Cautery	200W	1	0.2KW
49	Fractional RF-Excited CO2 Laser	4KW	1	4KW
50	Long Pulsed Nd: Yag Laser Machine	4KW	1	4KW
51	Iontophoresis Machine	500W	1	0.5KW
52	Q-Switched Nd: YAG Laser	4KW	1	4KW
53	Video Dermo scope	300W	1	0.3KW
54	CO2 Laser 50W	4KW	1	4KW
55	Diabetic Foot Lab	2KW	1	2KW
56	Research Binocular Microscope	30W	1	0.03KW
57	Laminar Air Flow	400W	5	2KW
58	Trinocular Microscope	300W	1	0.3KW
59	ICSI Unit	2KVA	1	1.8KW
60	Phase Contrast Microscope	200W	1	0.2KW
61	Centrifuge	370W	30	11.1KW
62	Binocular Microscope	20W	16	0.32KW
63	Incubator	2.5KW	4	10KW
64	Urine Analyser	200W	1	0.2KW
65	ESR System	300W	1	0.3KW
66	Automated Microbiology System	5KVA	1	4.5KW

67	Paralens With Microscope	30W	1	0.03KW
68	Benchtop Blood Gas Analyser (ABG)	1KW	4	4KW
69	Cyclomixer	300W	2	0.6KW
70	Fully Automated Chemistry Analyser	6KVA	2	10.8KW
71	6-Part Haematology Analyser	730W	2	1.46KW
72	Full Automated Coagulation Analyser	3KVA	1	2.7KW
73	Blood Mixer (Roller)	230W	3	0.69KW
74	Ph Meter	100W	2	0.2KW
75	Elisa Washer	300W	1	0.3KW
76	Elisa Reader	300W	1	0.3KW
77	Haemoglobin (HBA1C) Testing System	1KVA	2	1.8KW
78	Automated Blood Culture System	3KVA	1	2.7KW
79	Rotary Shaker	200W	1	0.2KW
80	Hot Air Oven	300W	1	0.3KW
81	Blood Bank Refrigerator	800W	4	3.2KW
82	Water Bath	300W	2	0.6KW
83	Microscope	20W	24	0.48KW
84	Blood Bank Refrigerated Centrifuge	3600	2	3.6KW
85	Blood Weighing Scale	10W	1	0.01KW
86	Platelet Agitator With Incubator (PAI)	800W	1	0.8KW
87	Cryo Bath	1.6KW	1	1.6KW
88	-40C Deep Freezer	2.5KW	1	2.5KW
89	-80C Deep Freezer	3.5KW	3	10.5KW
90	Tube Sealer	200W	2	0.4KW
91	Blood Collection Monitor	100W	4	0.4KW
92	Donor Couch	200W	3	0.6KW
93	Plasma Expressor	30W	1	0.03KW
94	Fully Automated Immunology Analyzer	3KVA	2	1.8KW
95	Automated Blood Testing Workstation	3KVA	1	1.8KW
96	Automatic Component Extractor	750W	1	0.75KW
97	Vertical Autoclave (300*500mm)	2KW	2	4KW
98	5-Part Haematology Analyser	700W	1	0.7KW
99	Apheresis Machine	2KVA	1	1.8KW
100	Biosafety Cabinet	650W	5	3.25KW

101	Cyclomixer	100W	1	0.1KW
102	RT PCR (Thermal Cycler) Machine	1.5KVA	1	1.35KW
103	Micro Centrifuge (Aerosol Tight Rotor 24x1.5/2ml)	370W	3	1.11KW
104	CPMA Machine	100 W	1	0.100 KW
105	US Therapy Machine	50 W	1	0.050 KW
106	IFT Machine	50 W	1	0.050 KW
107	Shock Wave	700 W	1	0.700 KW
108	Traction	200 W	1	0.200 KW
109	OT Light	300W	18	5.4KW
110	OT Table	600W	18	10.8KW
111	Cautery Machine	350W	21	7.35KW
112	Operating Microscope With HD Camera	1.5KW	6	9KW
113	ENT Sinus Endoscope Full Set	2KW	1	2KW
114	Nerve Monitor	500W	1	0.5KW
115	Micro Motor	300W	7	2.1KW
116	Arthroscopy System With Accessories	2KW	1	2KW
117	Debrider	230W	1	0.23KW
118	Shaver System	250W	2	0.25KW
119	Coblation System	250W	1	0.25KW
120	Battery Operated Drill System	12W	4	0.048KW
121	Electric Drill Machine	200W	5	1KW
122	Flash Sterilizer	2KW	1	2KW
123	Phaco Machine	300W	1	0.3KW
124	Vitrectomy Machine	230W	1	0.23KW
125	Neuro Drill	345W	2	0.69KW
126	Intubation Video Scope	1.5KW	1	1.5KW
127	HD Laparoscopic Full Set	484VA	2	0.44KW
128	Medical Body Composition Analyzer	2KVA	1	1.8KW
129	Harmonic Generator System With Scalpel	300W	2	0.6KW
130	3D Laparoscopy System	484VA	1	0.44KW
131	Robotic Machine	5KW	1	5KW
132	Tourniquet	500W	5	2.5KW
133	Sternum Saw System	12W	1	0.012KW
134	Urology Endoscopy Set	484VA	2	0.44KW
135	LASER 100W	10KVA	1	9KW
136	Multipara Monitor	90W	295	265.5KW
137	Defibrillator	130w	24	3.12KW
138	ECG Machine	70W	27	18.9KW

139	Fetal Monitor	90W	7	0.63KW
140	TMT Machine	4KVA	1	3.6KW
141	Pulse Oximeter	50W	8	0.4KW
142	Syring Pump	30W	187	5.61KW
143	Infusion Pump	50W	93	4.65KW
144	Patient Warmer	750W	23	17.25KW
145	Bipap Machine	480W	15	7.2KW
146	LED Examination Lamp (Spot Light)	14W	27	0.378KW
147	Nebulizer	130VA	89	10.413KW
148	Electrical Suction Apparatus	750W	30	22.5KW
149	DVT Pump	230W	15	3.45KW
150	Electronic Weighing Machine	50W	21	1.05KW
151	High Flow Meter	230W	20	4.6KW
152	Dialysis Machine	3KVA	22	59.4KW
153	Dialysis Repressor	1.5KVA	1	1.35KW
154	Vacuum Extractor Machine	750W	3	2.25KW
155	Anaesthesia Workstation	50W	15	0.75KW
156	Ventilator	120W	24	2.88KW
157	Ventilator	50W	28	1.4KW
158	Mobile LT Light	100W	6	0.6KW
159	Infant Radiant Warmer	800W	27	21.6KW
160	LED PHOTOTHERAPY	150W	16	2.4KW
161	Closed Incubator	400W	1	0.4KW
162	Transport Incubator	400W	1	0.4KW
163	Steam Sterilizer (800Ltr)	40KW	1	40KW
164	Autoclave (Horizontal Cylindrical Steam Sterilizer)	18KW	1	18KW
165	Ulrasonic Cleaner	1380W	1	1.38KW
166	Plasma Sterilizer	3400W	1	3.4KW
167	ETO Machine	3KW	1	3KW
168	Heart Lung Machine	3KVA	1	2.7KW
169	Heater Cooler Unit (Hemotherm)	8KVA	1	7.2KW
170	Centrifugal Pump For ECMO	1KVA	1	0.9KW
171	Heater Unit For ECMO	1KVA	1	0.9KW
172	Intra-Aortic Balloon Pump (IABP)	1KVA	1	0.9KW
173	Overhead Stirrer	70W	1	Nil
174	Brookfield Viscometer	20W, 150VA	1	Nil
175	Trinocular Microscope	20 W,	1	Nil
176	FLUORESCENCE MICROSCOPE	100 W	1	Nil
177	FTIR Spectrophotometer	75 VA	1	Nil

178	Minilysehomogeniser	1 Kva, 110-230V	1	Nil
179	Shaker	230 V	1	Nil
180	Microvolume Spectrophotometer (Nanodrop)	700 Ma	1	Nil
181	Vortex Mixer	240 V	1	Nil
182	Digital Stirring Hotplate	23 VAC	1	Nil
183	Digital BOMB Calorimeter	1000 W	1	Nil
184	GC Chromatography	230 V	1	Nil
185	UV Spectrophotometer	250 V	1	Nil
186	Ice Flaker	1.05 Kw	1	Nil
187	Cooling Centrifuge	1400 W	1	Nil
188	Co2 Incubator	115 V, 5.6 A	1	Nil
189	Laminar Flow Hood	70 W	1	Nil
190	Stereo Zoom Microscope	20 W	1	Nil
191	Inverted Microscope	30 W	1	Nil
192	Deep Freezer (-80)	440 V	1	Nil
193	Sonicator	500 W	1	Nil
194	Bench Type Fume Hood	20 A, 240 V	1	Nil
195	Water Bath	230 V, 50Hz	1	Nil
196	Flow Cytometer	240 V, 50/60Hz	1	Nil
197	Vortex		1	Nil
198	Water Distiller	230 V, 50Hz	1	Nil
199	Digital Ultrasonic Cleaner	170 W, 230 V, 50Hz	1	Nil
200	PCR/Thermocycler	240 VAC, 60 Hz	1	Nil
201	Vortexer	250 V	1	Nil
202	Hot Plate	250 W	1	Nil
203	Magnetic Stirrer	250 W	1	Nil
204	Analytical Balance	300 Ma	1	Nil
205	Mini Centrifuge	230 V, 50 Hz	1	Nil
206	Centrifuge	230 V, 50 Hz	1	Nil
207	Conductivity Meter		1	Nil
208	Mufffle Furnace	230 V, 50 Hz	1	Nil
209	Tissue Flotation Bath	240 V, 50/60Hz	1	Nil
210	Microtome	240 V, 50-60 Hz, 180 VA	1	Nil
211	Heated Parafin Embedded Module	230 V,	1	Nil
212	Tissue Processor	240 V	1	Nil
213	Auto Haematology Analyzer	240 V	1	Nil

214	Urine Analyzer	240 VAC, 40VA	1	Nil
215	Biochemical Analyzer	90 W, 260 V	1	Nil
216	Microscope	230 V	1	Nil
217	Laminar Air Flow (Biosafety)	230 V	1	Nil
218	Water Bath	230 V, 50Hz	1	Nil
219	Cooling Centrifuge	230 V	1	Nil
220	Thermo Cycler	250 V	1	Nil
221	UV Spectrophotometer	250 V	1	Nil
222	Magnetic Stirrer/Hot Plate	250 V	1	Nil
223	Hot Air Oven	1200 W	1	Nil
224	Electronic Weighing Balance	13 W	1	Nil
225	Ph Meter	1.25 W	1	Nil
226	Digital Colony Counter	220 V	1	Nil
227	Photoelectric Colorimeter	230 V	1	Nil
228	Shaking Incubator	260 V	1	Nil
229	Speed Vac Concentrator	230 VAC	1	Nil
230	Hybridization Oven/ UV Cross Linker		1	Nil
231	Electrophoresis Unit	300 Ma	1	Nil
232	Fluorescence Spectrophotometer	380 VA	1	Nil
233	Multimode Microplate Reader	240 V	1	Nil
234	Gel Rocker		1	Nil
235	Deep Freezer (-40)	230 V	1	Nil
236	Incubator	230 V	1	Nil
237	Microprocessor Controlled Biological Safety Cabinet	230 V	1	Nil
238	Biosafe - Laminar Air Flow Cabinet	230 V	1	Nil
239	Biosafe - Laminar Air Flow Cabinet	230 V	1	Nil
240	Water Bath	230 V	1	Nil
241	Cyclomixer	230 V	1	Nil
242	Cooling Centrifuge	230 V	1	Nil
243	Laminar Air Flow Cabinet	230 V	1	Nil
244	Centrifuge	1.6 KVA	1	Nil
245	Electrolyte Analyzer	65 W, 24 V	1	Nil
246	Flash Chromatograph	250	1	Nil
247	UV Spectrophotometer	240 V	1	Nil
248	Deep Freezer (-80)	230 V	1	Nil
249	Multi Slot Dry Incubator	150 W	1	Nil
250	Incubator	230 V	1	Nil
251	Hot Air Oven	1200 W	1	Nil
252	BOD (Cooling) Incubator	220 VAC	1	Nil

253	Rotary Shaker	220 VAC	1	Nil
254	Laminar Air Flow (Biosafety)	230 V	1	Nil
255	Deep Freezer	220 V	1	Nil
256	Water Bath	230 V, 50Hz	1	Nil
257	Autoclave	3500 V	1	Nil
258	Autoclave	3500V	1	Nil
259	Micropulser (Electroporator)	240 V	1	Nil
260	Fast Transfer-1, Semi Dry System	240 V	1	Nil
261	Digital Power Supply With Digital Timer	250 V	1	Nil
262	Incubator Shaker	220 VAC	1	Nil
263	Binocular Microscope	250 V	1	Nil
264	Deep Freezer (-20)	220 V	1	Nil
265	Water Bath	230 V, 50Hz	1	Nil
266	Centrifuge	220 V	1	Nil
267	Autoclave	3500 W	1	Nil
268	Freezer	220 V	1	Nil
269	(-20) Freezer	220 V	1	Nil
270	Elisa Reader	240 A	1	Nil
271	Elisa Washer	240 V	1	Nil
272	Vortex Mixer	240 V	1	Nil
273	Digital Rotary Evaparator	240 V	1	Nil
274	FILM PROCESSOR	1400 W, 240 V	1	Nil
275	Growth Chamber	3.19kv	1	Nil
276	Magnetic Stirrer	250 V	1	Nil
277	Magnetic Stirrer	250 V	1	Nil
278	Magnetic Stirrer	250 V	1	Nil
279	Lyophilizer	230 V	1	Nil
280	Rheometer	150 VA	1	Nil
281	Electro Phoresis Unit	480 V	1	Nil
282	Vortex Mixer	50 W	1	Nil
283	Bench Top Shaker	250 V	1	Nil
284	Hot Plate	230 V	1	Nil
285	Microvolume Spectro Phoro Meter	110 V	1	Nil
286	Rotory Evaporator	240 V	1	Nil
287	Weghing Balance	13 W	1	Nil
288	Biosafety Cabinet 4 Feet	230 V	1	Nil
289	Hi Loop Electric Sterilizer	350 W	1	Nil
290	Autoclave	3500 V	1	Nil
291	Ultrasonic Water Bath	500 W	1	Nil
292	Cell Counter	12 V	1	Nil
293	Binocular Microscope	20 W,	1	Nil

294	Binocular Microscope	20 W,	1	Nil
295	Binocular Microscope	20 W,	1	Nil
296	Binocular Microscope	20 W,	1	Nil
297	Binocular Microscope	20 W,	1	Nil
298	Minicentrifuge	55 W	1	Nil
299	Minicentrifuge	55 W	1	Nil
300	Magnetic Stirrer	230 V	1	Nil
301	Magnetic Stirrer	230 V	1	Nil
302	Spinwin Tim Micro Centrifuge	55 W	1	Nil
303	Spinix Vortex Shaker	50 W	1	Nil
304	Stereo Microscope	20 W,	1	Nil
305	Dry Bath	480 W	1	Nil
306	Vacuum Oven	230 V	1	Nil
307	Water Bath Shaker		1	Nil
308	Incubator	230 V	1	Nil
309	Precision Weighing Balance	12 V	1	Nil
310	Galaxy 48G CO2 Incubator	230 V	1	Nil
311	CO2 Incubator	230 V	1	Nil
312	Darkfield Microscope	20 W	1	Nil
313	Ph Meter	125 W	1	Nil
314	Incubator	230 V	1	Nil
315	Stereo Microscope	20 W,	1	Nil
316	Dry Barh Incubator	230 V	1	Nil
317	Electrophoresis Power Supply Unit	300 Ma	1	Nil
318	Biosafety Cabinet	230 V	1	Nil
319	Biosafety Cabinet	230 V	1	Nil
320	Deep Freezer	230 V	1	Nil
321	Microbiological Incubator	230 V	1	Nil
322	Vortex Mixer	50 W	1	Nil
323	Mini Centrifuge	55 W	1	Nil
324	Dry Bath	600 W	1	Nil
325	Shaking Incubator	1000 W	1	Nil
326	Shaking (BOD) Incubator	1000 W	1	Nil
327	MCR 92 Modular Compact Rheometer	480 W	1	Nil
328	MC-03 Micro Microfuge	55 W	1	Nil
329	Gel Rocker	230 V	1	Nil
330	Cooling Centrifuge	1350 W	1	Nil
331	Analytical Balance: Upto 200g/1gm Increment	Nil	2	Nil
332	Digital Colorimeters	Nil	5	Nil
333	Student Microscopes	Nil	100	Nil
334	Semi Autoanalyzer	Nil	2	Nil
335	Boiling Water Baths	Nil	4	Nil

336	Constant Temperature Water Bath Tank Capacity: (Temperature Range 5 To 80o Celsius)	Nil	2	Nil
337	ELISA (Demonstration)	Demonstration	1	Nil
338	Autoanalyzer (Either in The Institution or Elsewhere on A Visit)	Demonstration	1	Nil
339	Complete Electrophoresis Apparatus with Power Supply (Paper, PAGE, Agarose)	Nil	2	Nil
341	Densitometer With Computer	Nil	1	Nil
342	Vortex Mixers	Nil	4	Nil
343	Incubator 37oc	Nil	5	Nil
344	Digital Analytical Balance	Nil	1	Nil
345	Balance Micro	Nil	1	Nil
346	Anaerobic Apparatus	Nil	2	Nil
347	Balance Electronic Digital	Nil	2	Nil
348	Biosafety Cabinet (BSC) Class 2A/2B (Calibrated)	Nil	4	Nil
349	BOD Incubator	Nil	1	Nil
350	CO2 Incubator/Candle Jar	Nil	2	Nil
351	Distilled Water Plant	Nil	1each	Nil
352	Elisa Reader	Nil	2	Nil
353	Elisa Washer	Nil	2	Nil
354	Hot Air Oven	Nil	2	Nil
355	Incubator	Nil	3	Nil
356	Laminar Flow	Nil	1	Nil
357	Micrometre Eye Pieces	Nil	2	Nil
358	Micrometre Stage	Nil	2	Nil
359	Microscope Binocular	Nil	Every Faculty	Nil
360	Microscope With Universal Condenser Containing Oil Immersion, Bright Field, Phase	Nil	1	Nil
361	Contrast & Dark Ground	Nil	1	Nil
362	Multimedia Projector	Nil	2	Nil
363	Serum Inspissators	Nil	1	Nil
364	VDRL Shaker	Nil	2	Nil
365	Oil-Immersion Lens For Student Microscope	Nil	50	Nil
366	Automated Blood Culture System	Nil	1	Nil
367	Colony Counter	Nil Nil	1	Nil

370	Assembly Perfusion Operator For Mammalian Heart	Nil	1	Nil
369	Algesimeter	Nil	1	Nil
371	Physiograph	Nil	1	Nil
372	Cook's Pole Climbing Apparatus /Any Other Equipment For Behavioural	Nil	1	Nil
373	Digital Ph Meter	Nil	8	Nil
374	Electronconulsiometer	Nil	1	Nil
375	Flame Photometer	Nil	1	Nil
376	Photoectometer	Nil	1	Nil
377	Rota Rod	Nil	1	Nil
378	Phethysmograph	Nil	1	Nil
379	Spectrophotometer	Nil	2	Nil
380	Electrocardiograph-Portable	Nil	1	Nil
381	Digital Polygraph	Nil	1	Nil
382	Non-Invasive Rodent B P Apparatus	Nil		Nil
383	Elevated Plus Maze	Nil	1	Nil
384	Hebb-Williams Maze	Nil	1	Nil
385	Light And Dark Arena	Nil	1	Nil
386	Open Maze	Nil	1	Nil
387	Plethysmograph Digital	Nil	1	Nil
388	Electric Hot Plate	Nil	2	Nil
389	Deionizer	Nil	1	Nil
390	Organ Bath For Bioassay	Nil	4	Nil
391	Soxhlet Apparatus	Nil	3	Nil
392	Rotavapor	Nil	1	Nil
393	Histamine Chamber With Manometer	Nil	1	Nil
394	Centrifuge	Nil	7	Nil
395	Autoclave Electric	Nil	8	Nil
396	Hot Air Oven	Nil	6	Nil
397	Welding Machine	200 WATT	1	Nil
398	Stand Drill Machine	2 HP	1	Nil
399	Cutting Machine	2000 WATT	1	Nil
400	Diesel Lifting Machine	0.5 HP	1	Nil
401	Trosser Topper	2 HP	2	Nil
402	Calender Machine	5 HP	1	Nil
403		7 HP	1	Nil
404	Air Blower	5 HP	1	Nil
405		15 HP	1	Nil
406	Iron Table	6 HP	5	Nil

407	Calm Down Machine	6 HP	1	Nil
408	Sealing Machine	24 HP	1	Nil
409	Mixer	3 HP	4	Nil
410	Bun Devider	1 HP	1	Nil
411	Fresh Air	3 HP	4	Nil
412	Oven	44 KW	3	Nil
413	Grinder	Nil	6	Nil
414	Chicken Cutting Machine	0.5 HP	1	Nil
415	Air Compressor	5 HP	1	Nil
416		20 HP	1	Nil

Table 2. Annual Energy Consumption of Fuels

S.No	Month	Units Consumed (kWh)	Diesel Consumption (Lt)	Petrol Consumption (Rs)	LPG Consumption (no. of cylinders)
1	January-21	822255	21460	3908	58
2	February-21	835485	16590	3756	62
3	March-21	1065750	17775	4015	64
4	April-21	1051050	19675	4125	59
5	May-21	1026585	15015	4121	61
6	June-21	961965	15010	4086	64
7	July-21	895860	22845	4085	62
8	August-21	925860	15725	3954	58
9	September-21	942165	14940	3648	57
10	October-21	985860	14725	4082	64
11	November-21	1006425	17277	4001	57
12	December-21	1005251	17450	3954	64

Table 3: Electrical Energy Consumption and Cost Profile in Yenepoya (Deemed to be University) Mangalore, Karnataka.

SL. No	Months	Cost in Rs.	Rating / Capacity units in kWh
1.	January-21	6992587	829460
2.	February-21	6306330	771681
3.	March-21	7368935	909743
4.	April-21	6572191	806805
5.	May-21	5673209	698788
6.	June-21	5293190	681320
7.	July-21	5868387	713383
8.	August-21	7292804	821389
9.	September-21	6765024	827836
10.	October-21	7592691	906296
11.	November-21	7335086	882304
12.	December-21	7228478	864814

Table 4. Transportation Facilities available in the campus Yenepoya (Deemed to be University) Mangalore, Karnataka.

S.No	Type of Vehicle	Fuel Used	No. of Vehicles	Non-Pollution Certified (Y/N)
1.	Bus	Diesel	41	Y
2.	Tanker	Diesel	6	Y
3.	Car	Petrol	16	Y
4.	Car	Diesel	9	Y
5.	Mazda	Diesel	3	Y
6.	Jeep	Diesel	1	Y
7.	Pick Up	Diesel	1	Y
8.	Winger	Diesel	1	Y
9.	E-vehicle Buggies	Electricity	2	Y
10.	Car	Electricity	2	Y
11.	Bicycle	-	12	-
12.	Scooter	Electricity	29	Y

Transportation Facilities available in the campus
Yenepoya (Deemed to be University) Mangalore, Karnataka.

Table 5. 11.5 Quantitative and Qualitative Measurement at Yenepoya (Deemed to be University) Mangalore, Karnataka.

S.No.	Requirements and checklists of the audit	Conformity		
		Yes	No	NA
1.	Have internal Energy audit procedures been developed and implemented in the Organization?	✓		
2.	Have programmes for the achievement of energy efficiency and conservation objectives been established and implemented as on toĦday in the	✓		

	campus?			
3.	Has a Management Representative, Electrical Engineer, Staff in charge been assigned for energy savings on power consumptions?	✓		
4.	Have programmes for the achievement of prescribed financial outlay for current bills for each building in the campus towards power consumptions?	✓		
5.	Has the organization ensured that personnel performing environmental specific tasks have the required knowledge on energy audit (e.g. education, training programme, seminar, workshop, camp, etc.)?	✓		
6.	Are objectives and targets documented towards energy audit periodically and any Register is made?	✓		
7.	Any analysis of energy flows for energy conservation in terms of the amount of energy input into the system without negatively affecting the output in buildings	✓		
8.	Implications of alternative energy efficiency measures sufficient to satisfy the financial criteria of sophisticated investors	✓		
9.	Identification of the most efficient and cost-effective Energy Conservation Opportunities (ECOs) or Measures (ECMs) taken by the Management	✓		
10.	Are the following energy efficiency and conservation aspects considered in sufficient detail?			
	a. Fluorescent (tube) lights, Incandescent lamp and sodium vapour lights are replaced with CFL / LED	✓		
	b. Number of Uninterruptible power supply (UPS) and Power generators for power back-up to alternative current supply facility in each building	✓		
	c. Number of solar panels, solar lights, solar water heaters, electric water heater installed	✓		
	d. Automatic sprinkler system used for irrigation purpose		✓	
	e. Ultra-violet lights and any other harmful lights used with safety precautions		✓	
	f. Attempt in reducing the energy expense and carbon footprint	✓		
	g. Disposal facility for hazardous arise from electrical gadgets, equipment and installation	✓		
	h. Renewable energy utilization (solar panel, wind mill)	✓		
	i. Natural / Mechanical air ventilation at Indoor / Outdoor auditorium, stadium, seminar halls, etc.	✓		

	j. Sign boards indicating Switch OFF / ON, Danger at Electrical equipment and Power transformers in the campus	✓		
11.	Signing of MoU with Govt. and NGOs to ensure about the energy conservation and efficiency in the campus	✓		
12.	Conduction of awareness programmes and outreach programmes on the energy conservation and efficiency	✓		
13.	The details of public transport, battery operated / electric vehicles, biofuel use, exhaust fans, boiling water system, chillers and geysers on energy savings mode	✓		
14.	Projects and Dissertation works on the energy conservation and efficiency carried out by students and staff members	✓		
15.	Steps taken to take care of daylighting, AC machines heat emission and ecofriendly Refrigerators, etc.	✓		
16.	Use of water metering, IoT based energy efficiency practices, remote waterlines, automation of electrical fittings and gadgets to save energy	✓		
17.	Are all monitoring electrical equipment appropriately maintained and calibrated?	✓		
18.	Are any energy conservation technologies and retrofit for energy conservation equipment being implemented?	✓		
19.	Skylight roof ratio, fenestration plan and Daylight illuminance in building construction towards energy efficiency*			NA
20.	Any Automatic Lighting Shutoff with occupancy Sensors and Timers, Exterior / Interior lighting control facility*	✓		
21.	Have any rooms and guest suites a master control device at the main room entry that controls all permanently installed luminaires and switched receptacles*	✓		
22.	Total electricity usage divided by total campus' population (kWh per person)	✓		
23.	The ratio of renewable energy production divided by total energy usage per year	✓		
24.	Total carbon footprint divided by total campus' population (metric tons per person)	✓		
25.	Elements of green building implementation as reflected in all construction and renovation policies	✓		

26.	Greenhouse gas emission reduction awareness programme to the stakeholders	✓		
27.	Computers, Lap tops, I pad, Dot matrix Printer, Laser printers, Xerox Machines, Scanners, Server, Fax machine, Inverter with UPS	✓		
28.	**Equipment, Instruments and Machineries related to Life Sciences and Biological Sciences including Biotechnology, Nanotechnology, Food Technology, etc** Electronic Balances, pH Meter, Hot-air-oven, Microwave oven, Laminar Air Flow, Autoclave, Microscopes, Electophonic, Apparatus, Chromatography devices, Grinders, Mixers, Deep Freezers, BOD incubators, COD digester, Extraction apparatus, Incubators, Co2 incubators, Heating Mantle, Vaccum pump, Vortes Mixer, Magnetic stirrer, Gel rocker, Somicator, Growth chambers, Air curtains, Acrators, Spectrophotometers, Calorimeters, Turbidity meter, Colony counter water bath, Dry bath, Thermocycler, Gene gun, Gel documentation system, Trans illuminator, Ice maker, ELISA reader & Water, Aquarium, zebra fish/animal house facility, Mechanical & Orbital Shakers, cyclo mixer, Lyophilizer, Incinerators, Fermenters, Reactors, Particle size Analyser, XRD, FTR, Muffle furnace	✓		
29.	**Chemical Sciences and Engineering Equipment/Machines** Distillation unit, Flow through straight pipe, packed bed distillation, Roll crusher, jaw crusher, sieve analysis machine, Shell and tube heat exchangers, plate and frame filter press, Fume hood, Fluorimeter, Venturimeter, Orifice meter, Nephelometer, Membrane Filtration Apparatus, Sieve set Machine, Jar test apparatus	✓		
30.	DC Shut motor, DC Series motor, DC Compound motor, DC Shunt motor, DC Compound generator, Dc series generator, Single phase & Three phase transformers, Loading rheostat, Single phase & three phase, inductive & capacitive load, Power electronics trainer kits, Three phase squirrel cage indication motor, Three phase slip ring induction motor, AC generator, Stabilizers, synchronizer, Half and fully controlled converters, Buck, Boost and buck-boost converters, Single phase and three phase inverters, synchros, CRO, DS, CRO.			NA

11.6. Measurement of Carbon dioxide level in the Campus

Despite a massive increase in global warming, environmental changes and human population including many commercial activities now-a-days, the amount of carbon in Earth's atmosphere is playing an important role which act as a global indicator for checking the purity of the atmosphere. Using a portable CO_2 Analyzer, the level of carbon dioxide was measured in different places across Yenepoya (Deemed to be University) Mangalore, Karnataka. The observation showed that the concentration of CO_2 in the atmosphere is found to be low which did not exceed the critical limit of CO_2. It is further revealed that all the selected locations are having pure air with good air exchange which are free from pollutants (Table 6).

Measurement of CO_2 level of various location in Yenepoya (Deemed to be University) Mangalore, Karnataka.

Carbon footprint, amount of CO_2 emissions associated with all the activities of the College or other entities like building construction and anthropogenic activity by human beings includes direct emissions, such as those that result from fossil-fuel combustion from direct burning, transportation, industrial activities, as well as emissions from electricity generation. In addition, the carbon footprint also contributes to the greenhouse emission.

Table 6. Measurement of CO_2 level various location in Yenepoya (Deemed to be University) Mangalore, Karnataka.

S.No.	Different locations of the Organization's Campus	Carbon dioxide level (ppm)	Remarks
1.	Canteen	440	Aspirational
2.	Classroom	539	Within permissible limits
3.	Computer lab	336	Within permissible limits
4.	Parking area	445	Within permissible limits
5.	Open space	408	Within permissible limits
6.	Faculty room	565	Within permissible limits
7.	Library	425	Within permissible limits

Reference of Set values of CO_2 level

As per (ASHARE 62-2019) Indoor air Quality parameters Threshold values

Class A (Aspirational) = Ambient+ 350

Class B (Within Permissible limits) = Ambient + 500

Class C (Marginally Acceptable) = Ambient + 700

Calculation of Carbon Footprint at Yenepoya (Deemed to be University)

= (electricity usage per year in kWh/1000) x 0.84

= (9713819kWh/1000) x 0.84

= 8,159.607metric tons

Notes:

Electricity usage per year = 8,159.607kWh

0.84 is the coefficient to convert kWh to metric tons.

11.7. Ways to reduce Carbon Footprint

Evaluating and understanding the CO_2 emission can reduce the negative impact on the environment. Tiny changes can bring good impacts like when it comes to transportation, food, clothing, waste, etc., the following tips helps in reducing the carbon footprint.

Food

- Consumption of local and seasonal products.
- Limiting the consumption of meat and beef.
- Adopting sustainable fishing.
- Avoiding plastic packaging and practising the use of reusable bags.
- Sense of buying only necessary things.

Clothing

- Taking good care of clothes.
- Buying second hand products or borrowing
- Using the clothes made from recycled products with eco label

Transport

- Adopting carpooling practice, using cycles and public transport
- Usage of No Pollution certified vehicles.

Energy and waste

- Turning down the heating.
- Short showers
- Proper usage of water while brushing teeth or cleaning the dishes
- Proper care while charging the batteries.
- Selecting star rated equipment and EU Energy labelled products
- Reduce and recycle of wastes.

11.8. Light Intensity Measurement

Light intensity or light output is used to measure whether a particular light source provides enough light for an application needed. There is a well-established light level recommendation for a wide range of applications in lighting industry and also for the type of space. Understanding the light intensity helps to properly evaluate whether the space has adequate lighting conditions or not. Light intensity is measured in terms of lumens per square foot (foot-candles) or lumens per square meter (lux). Measuring the amount of light that falls on a surface allows to evaluate if the particular space has sufficient light to perform the tasks.

A light meter (lux meter) is used to measure the amount of light in a space/on a particular work surface. The light meter consists of a sensor that measures the light falling on it and provides the user with a measurable illuminance reading. Light meters are an especially useful tool for measuring light for safety or over-illumination. The light intensity is usually measured by taking initial reading, where the lightings are turned off (Baseline measurement) and the final reading is taken by turning on the lights in the particular space (illuminated level). Subtracting the baseline measurement from illuminated level gives the light intensity of the particular room/ space.

Table 7: Light intensity measured at various locations of Yenepoya (Deemed to be University) Mangalore, Karnataka.

S.No	Location	Light Intensity (Lux)
1.	Canteen	435-500
2.	Classroom	300-350
3.	Computer lab	300-340
4.	Parking area	300- 340
5.	Open space	450- 500
6.	Faculty room	350-450

Reference set of values for LUX

Table: 8 Recommended level as per (ASHARE 62-2019) Iluminance (LUX)

Sl. No	Building	Type of Spaces	Illuminances (LUX)
1.	Places of Assembly	Libraries	500
		Auditorium	100
2.	Main Block	Computer Room	500
		Medical Centre	500
3.	Hotels	Lobbies	100
		Reception Rooms	300
4.	Office	Small office	300
		Conference	500
		Landscaped office	500
5.	Restaurants	Cafeterias Area	300
		Kitchens	500
6.	College	Classroom	300
		Corridors	100
		Faculty room	300

Roof Top Solar System and Transformers Energy Management in Yenepoya (Deemed to be University) Mangalore, Karnataka.

Energy Management and Conservation Activities in Yenepoya (Deemed to be University) Mangalore, Karnataka.

Ventilator, AC, Tube Lights and Fans in Yenepoya (Deemed to be University) Mangalore, Karnataka.

Sewage Treatment Plant, LED Bulbs, Sensor Based Energy Conservation and RO Water Facilities Available in Yenepoya (Deemed to be University) Mangalore, Karnataka.

12. Best Practices followed in the Organization

- Transformer, Generators and UPS are protected properly with fencing and kept awareness boards on ‘Dangers’ and ‘Warnings’.
- Most of places, sign board of ‘Switch ON’ and ‘Switch OFF’ are kept towards saving energy measures to the stakeholders.
- Electrical wires, switch boxes and stabilizers are properly covered without any damage which will cause any problems to the staff and student members.
- Installed roof top solar power plant.
- Installed automatic switches with sensors.
- HVLS Fans are fitted in the auditorium.
- Water level controllers are used.
- Power factor is maintained near to unity with APFC.
- STP is used for water recycling which is functioning well.
- Replaced old generation computers and TVs with LED monitors.
- Sewage treatment plants available in the campus.

Medical Room, Research Centre and Lab Facilities Available in Yenepoya (Deemed to be University) Mangalore, Karnataka.

- Promoting ECON awareness and practice among the stakeholders are being conducted periodical through Association, Clubs, Forums and Chapters.
- Usage energy efficient light-emitting diode (LED) bulbs instead of incandescent and CFL bulbs.
- Maintenance of appliances and replaced old appliances in all laboratories
- Value added / Non-formal / Certificate / Diploma course on 'Energy and Environment Management Audits' are being conducted for the benefit of students and research scholars to become a certified Lead Auditor.
- Establishment of a system of carpooling among the staff members and students to reduce the number of four wheelers coming to the College.
- Discouraging the students and research scholars using two wheelers for their commutation in the campus.
- Switching off the lights, fan, air conditioners, equipment and instruments when they are not in use.

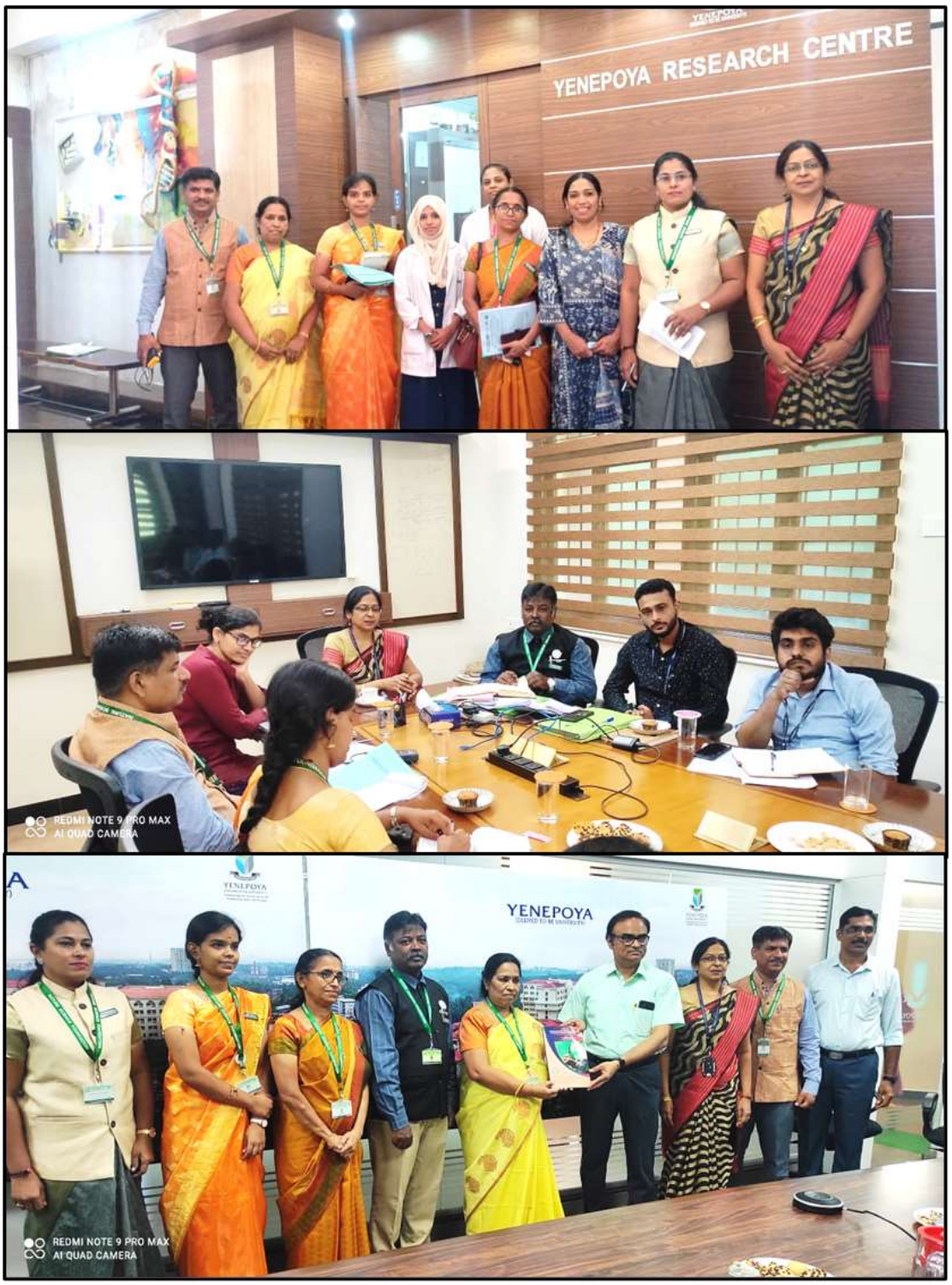
Best Practices Followed by the Institutions in Yenepoya (Deemed to be University) Mangalore, Karnataka.

13. Recommendations for improving the energy efficiency and energy Conservation in the Organization

The energy audit included suggestions for energy cost reduction, preventive maintenance, and quality control activities, all of which are critical for utility operation in the audit sites.

- Procurement of equipment with energy efficiency (4-5 star rated equipment) during replacement may be considered.
- Daylight sensors can be implemented in future.
- Star rated fan can be used in near future.
- DG set Automatic syne can be implemented

Windup Meeting with Audit Teem of Nature Science Foundation and Registrar and Management Representatives of Yenepoya (Deemed to be University) Mangalore, Karnataka.



- Optimal water usage and temperature settings may be used which are coming under automatic process towards energy savings.
- Continuous monitoring and analysis of energy consumption by dedicated team may be planned within the campus.
- Turn off electrical equipment when not in use
- Use computers and electronic equipment in power saving mode.

- Installation of Biogas plant for hostel kitchen as well canteen.
- Automatic switches with occupancy sensors in common areas
- Inclusion of on campus e-vehicle.
- Monthly use of electricity in the College may be reduced to a greater extent by means of undertaking a periodical energy audit.
- There are fans of older generation and non-energy efficient which can be phase out by replacing with new energy efficient fans.
- Regular monitoring of equipment in all laboratories and immediate rectification of any problems.
- Internal energy policy such as preventive maintenance and breakdown maintenance policy should be implemented.
- Separate representative for maintenance to be followed.
- Plan for diesel consumption need to be implemented
- Energy meter in each building to be implemented
- Automotive energy such as solar panel, solar water and wind mill can be implemented to meet 40% of diesel consumption
- IOT based projects such as water sprinkler, Automatic light, A.C turn off, Water flow to be implemented, disposal for E- waste to be implemented.

14. Recommendations on Carbon Footprint in the Organization

- Encourage students and staff members to use bicycles and battery-operated vehicles to reduce fuel consumption and carbon emission.
- Establish a more efficient cooking systems like biogas operated machineries to save fossil gas in hostel kitchen and canteen.
- More use of generators, inverters, and UPS every day should be discouraged which could save electrical energy.
- Large number of ventilation and exhaust systems may be placed in auditorium, seminar and conference halls to reduce the carbon dioxide level among the participating students, scholars and staff members.

15. Conclusions

Considering the fact that the organization is a well-established, long time run establishment with good reputation, there is significant scope for conserving energy and make the campus as self-sustained in it. The energy conservation initiatives taken up by the University are substantial. Energy efficient lighting schemes, awareness created among stakeholders and necessary power backups are being practiced by the institution. There are some best Practices followed on Energy Audit in the Organization like Transformers, Generators and UPS are protected properly with fencing and kept awareness boards on ‘Dangers’ and ‘Warnings’. It is observed that the most of places, sign board of ‘Switch ON’ and ‘Switch OFF’ are kept towards saving energy measures to the stakeholders. Electrical wires, switch boxes and stabilizers are properly covered without any damage which will cause any problems to the staff and student members. Few recommendations, in addition, can further improve the energy savings of the Organization. This may lead to the prosperous future in context of Energy Efficiency Campus and thus sustainable environment and community development to the stakeholders in coming years to come.

16. Acknowledgement

Nature Science Foundation, Coimbatore, Tamil Nadu, India is grateful to the Registrar, Management and Coordinator of Yenepoya (Deemed to be University) Mangalore, Karnataka for providing us necessary facilities and co-operation during the energy audit process. This helped us in making the audit a success. Further, we hope that the best practices on sustainability followed by the Organization and recommendations and suggestions given by the NSF will boost the new generations to take care of the Electrical energy conservation, Energy saving measures and sustainability incompliance with the applicable regulations, policies and standards in the College Campus.

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Certificates of
Nature Science Foundation,
Coimbatore, Tamil Nadu.

1.ISO Certificate (QMS 9001:2015)
2.ISO Certificate (EMS 14001:2015)
3.ISO Certificate (OHSMS 45001:2018)
4.ISO Certificate (EnMS 50001:2018)
5.MSME Certificate
6.NGO Darpan NITI Aayog
7.12A Certificate
8.80G Certificate
9.10AC Certificate

QUALITY MANAGEMENT SYSTEM

Certificate of Registration

ROHS

This is to Certify That The Quality Management System of

NSF

NATURE SCIENCE FOUNDATION

LIG II, GANDHIMAA NAGAR, PEELAMEDU, COIMBATORE - 641004, TAMILNADU, INDIA.

has been assessed and found to conform to the requirements of

ISO 9001:2015

for the following scope :

PROVIDING ENVIRONMENT, ENERGY, GREEN AND HYGIENE AUDITS TO ACADEMIC INSTITUTIONS AND ORGANISATIONS AS PER THE OWN CHECKLIST AND AWARDS TO MERITORIOUS CANDIDATES.

Certificate No	**20DQHY90**		
Initial Registration Date	: 08/01/2021	Issuance Date	: 08/01/2021
Date of Expiry*	: 07/01/2024		
1st Surve. Due	: 08/12/2021	2nd Surve. Due	: 08/12/2022

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

eiaCI Emirates International Accreditation Centre

035-CB-QMS

DIRECTOR

ROHS Certification Pvt. Ltd.

408, Madhukan Building, 35, Nehru Place, New Delhi - 110 019, India
phone : +91.11.41525522 | e-mail : info@rohscertification.co.in | website : www.rohscertification.co.in
*The Registration is not a Product Quality Certificate. *Subject to successful completion of surveillance audits; Visit for verification on: www.rohscertification.co.in*
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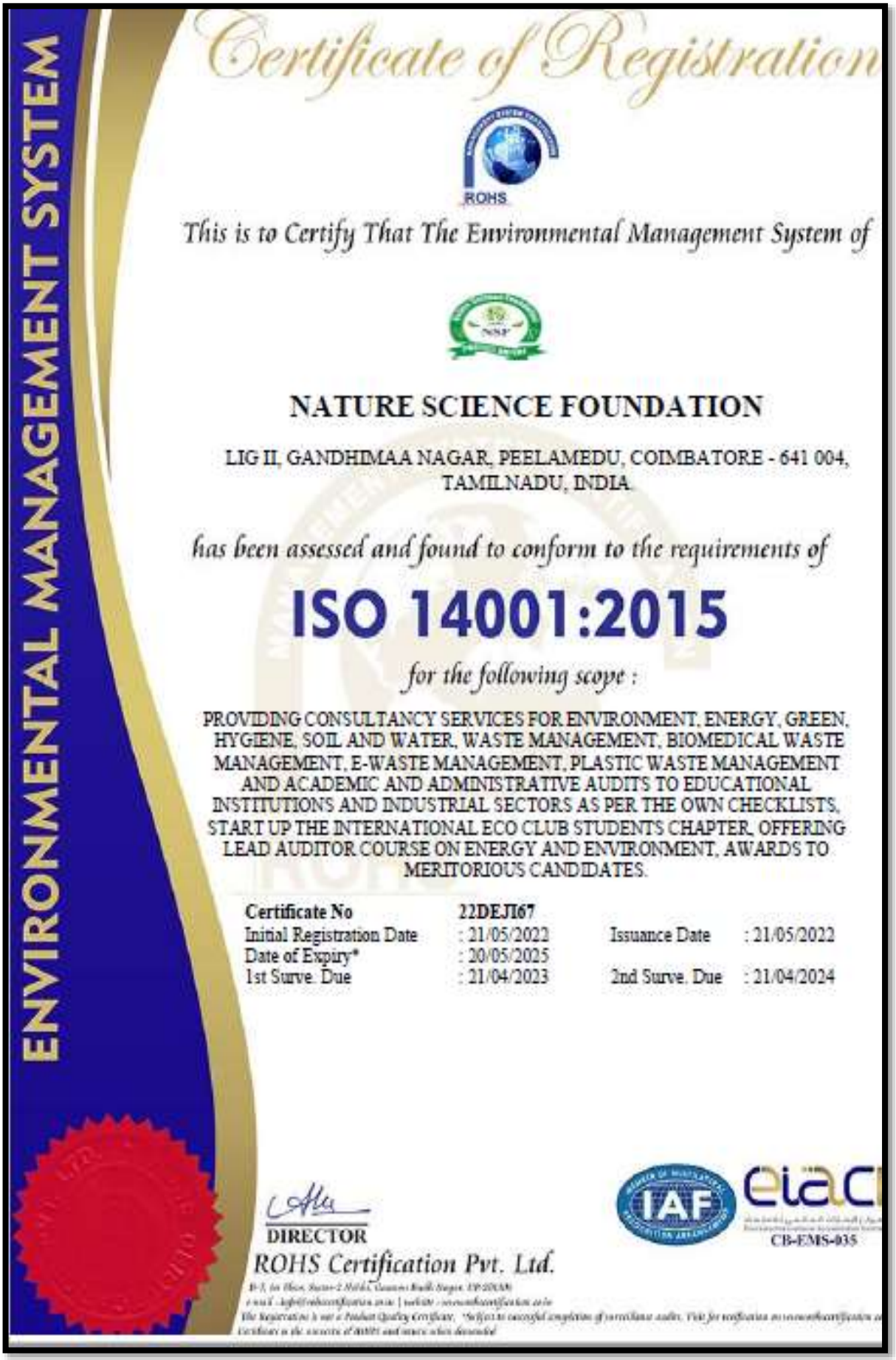

ENVIRONMENTAL MANAGEMENT SYSTEM

Certificate of Registration

ROHS

This is to Certify That The Environmental Management System of

NATURE SCIENCE FOUNDATION

LIG II, GANDHIMAA NAGAR, PEELAMEDU, COIMBATORE - 641 004, TAMILNADU, INDIA.

has been assessed and found to conform to the requirements of

ISO 14001:2015

for the following scope :

PROVIDING CONSULTANCY SERVICES FOR ENVIRONMENT, ENERGY, GREEN, HYGIENE, SOIL AND WATER, WASTE MANAGEMENT, BIOMEDICAL WASTE MANAGEMENT, E-WASTE MANAGEMENT, PLASTIC WASTE MANAGEMENT AND ACADEMIC AND ADMINISTRATIVE AUDITS TO EDUCATIONAL INSTITUTIONS AND INDUSTRIAL SECTORS AS PER THE OWN CHECKLISTS, START UP THE INTERNATIONAL ECO CLUB STUDENTS CHAPTER, OFFERING LEAD AUDITOR COURSE ON ENERGY AND ENVIRONMENT, AWARDS TO MERITORIOUS CANDIDATES.

Certificate No	**22DEJI67**		
Initial Registration Date	: 21/05/2022	Issuance Date	: 21/05/2022
Date of Expiry*	: 20/05/2025		
1st Surve. Due	: 21/04/2023	2nd Surve. Due	: 21/04/2024

DIRECTOR

ROHS Certification Pvt. Ltd.

IAF

eiaCB

CB-EMS-035

QCS MANAGEMENT PVT. LTD.

MANAGEMENT SYSTEMS CERTIFICATION

Certificate of Registration

ISO 45001:2018 (Occupational Health & Safety Management System)

NATURE SCIENCE FOUNDATION

ADDRESS: NO. 2669, LIG-II, GANDHI MANAGAR PEELAMEDU COIMBATORE - 641 004 TAMIL NADU, INDIA.

Scope of Certification:

PROVIDING TRAINING AND AUDITING SERVICES IN THE FIELD OF GREEN CAMPUS, ENVIRONMENT, ENERGY, OCCUPATIONAL HEALTH AND SAFETY, HYGIENE AND WASTE MANAGEMENT AT EDUCATIONAL INSTITUTES AND INDUSTRIAL SECTOR.

Certificate Number : QCS/EUAS/OHS/002

		1ST Surveillance Audit Within	: 02/07/2023
Issue Date	: 03/08/2022	2nd Surveillance Audit Within	: 02/07/2024
Expiration Date	: 02/08/2023	Re-certification Due Date	: 02/08/2025

Partha Bagchi
(Managing Director)

Validity of this Certificate is subject to Surveillance Audits to be conducted before scheduled due dates of surveillance audits as mentioned on the certificate, failing which the certificate will stand to be withdrawn and need to be treated as an initial certification process to reactivate its continuity on the register of EUAS and QCS . This Certificate is valid when confirmed by data listed on the (Euro Universal Accreditation Systems) EUAS" www.euas-ac.org. The authenticity & validity of this certificate may be re-affirmed by referring to our company website - www.qcspl.com . Lack of fulfillment of conditions as set out on the 'Certification Contract' (Annex 13) may render this certificate invalid. Any alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of law. This certificate remains the property of QCS and to be returned on request.

REGISTERED OFFICE: 37E/1(310) 2ND STREET, MODERN PARK, GREENAGE APARTMENT - 2ND FLOOR, SANTOSHPUR, KOLKATA - 700075, WEST BENGAL, INDIA.
Email: info@qcspl.com, Call: +91 8697724963,+91 8902447427. Website: www.qcspl.com

QRO
QUALITY RESEARCH ORGANIZATION

Certificate of Registration

This is to certify that

NATURE SCIENCE FOUNDATION

LIG II, GANDHIMAA NAGAR, PEELAMEDU, COIMBATORE - 641 004, TAMILNADU, INDIA.

has been independently assessed by QRO
and is compliant with the requirement of:

ISO 50001:2018

Energy Management Systems

For the following scope of activities:

PROVIDING CONSULTANCY SERVICES FOR ENVIRONMENT, ENERGY, GREEN, HYGIENE, SOIL AND WATER, WASTE MANAGEMENT, BIOMEDICAL WASTE MANAGEMENT, E-WASTE MANAGEMENT, PLASTIC WASTE MANAGEMENT AND ACADEMIC AND ADMINISTRATIVE AUDITS TO EDUCATIONAL INSTITUTIONS AND INDUSTRIAL SECTORS AS PER THE OWN CHECKLISTS, START UP THE INTERNATIONAL ECO CLUB STUDENTS CHAPTER, OFFERING LEAD AUDITOR COURSE ON ENERGY AND ENVIRONMENT, AWARDS TO MERITORIOUS CANDIDATES.

Date of Certification: 9th August 2022
1st Surveillance Audit Due: 8th August 2023
2nd Surveillance Audit Due: 8th August 2024
Certificate Expiry: 8th August 2025

Certificate Number: 305022080903EN

EGAC
CAB # 119005

IAF
MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT

Head of Certification

Validity of this certificate is subject to annual surveillance audits to be done successfully on or before 365 days from date of the audit.
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The Validity of this certificate can be verified at www.qrocert.org
This certificate of registration remains the property of QRO Certification LLP, and shall be returned immediately upon request.

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Website : www.qrocert.org, E-mail : info@qrocert.org

भारत सरकार
Government of India
सूक्ष्म, लघु एवं मध्यम उद्यम मंत्रालय
Ministry of Micro, Small and Medium Enterprises

MSME
सूक्ष्म, लघु एवं मध्यम उद्यम
MICRO, SMALL & MEDIUM ENTERPRISES

UDYAM
REGISTRATION CERTIFICATE

UDYAM REGISTRATION NUMBER	UDYAM-TN-03-0073706
NAME OF ENTERPRISE	M/S NATURE SCIENCE FOUNDATION
TYPE OF ENTERPRISE *	MICRO
MAJOR ACTIVITY	SERVICES
SOCIAL CATEGORY OF ENTREPRENEUR	GENERAL

NAME OF UNIT(S)

S.No.	Name of Unit(s)
1	Green Campus, Energy and Environment Management Audits

OFFICAL ADDRESS OF ENTERPRISE

Flat/Door/Block No.	LIG-II,2669	Name of Premises/ Building	GANDHIMAA NAGAR
Village/Town	Gandhimaanagar S.O	Block	LIG-II
Road/Street/Lane	Podamedu	City	Coimbatore South
State	TAMIL NADU	District	COIMBATORE , Pin 641004
Mobile	9566777255	Email:	chairmanssf@gmail.com

DATE OF INCORPORATION / REGISTRATION OF ENTERPRISE	28/11/2017
DATE OF COMMENCEMENT OF PRODUCTION/BUSINESS	12/03/2020

NATIONAL INDUSTRY CLASSIFICATION CODE(S)

SNo.	NIC 2 Digit	NIC 4 Digit	NIC 5 Digit	Activity
1	69 - Legal and accounting activities	6920 - Accounting, bookkeeping and auditing activities; tax consultancy	69201 - Accounting, bookkeeping and auditing activities	Services
2	85 - Education	8542 - Cultural education	85420 - Cultural education	Services
3	85 - Education	8549 - Other education n.e.c.	85499 - Other educational services n.e.c.	Services

DATE OF UDYAM REGISTRATION	26/02/2022

* In case of graduation (upward/reverse) of status of an enterprise, the benefit of the Government Schemes will be availed as per the provisions of Notification No. S.O. 2119(E) dated 26.06.2020 issued by the M/o MSME.

Disclaimer: This is computer generated statement, no signature required. Printed from https://udyamregistration.gov.in & Date of printing - 26/02/2022

For any assistance, you may contact:

1. District Industries Centre: COIMBATORE (TAMIL NADU)

2. MSME-DI: CHENNAI (TAMIL NADU)

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BE A CHAMPION with the Ministry of MSME

Please Update Your Profile

Welcome, Nature Science Foundation

Your Unique Id: TN/2018/0187711

PROCEEDINGS OF THE COMMISSIONER OF INCOMETAX (EXEMPTIONS),
III FLOOR, ANNEXE BLDG, NO.121, MAHATMA GANDHI SALAI, CHENNAI-34

Present : G.M.DOSS, I.R.S
Commissioner of Income Tax (Exemptions)

** URNo. AACTN7857J/05/18-19/T-1105 Dated:03/09/2018

Sub: Registration u/s. 12AA of the Income tax Act 1961 - in the case of

"Nature Science Foundation"
LIG-II, 2669, Gandhimaa Nagar, Peelamedu, Coimbatore – 641 004.

Ref : Application in form 10 A filed on 28/03/2018

ORDER UNDER SECTION 12AA OF THE INCOME TAX ACT 1961.

1. The above **Trust/Society/Association/ Company/ others/,** bearing PAN AACTN7857J was constituted by **Trust Deed / Memorandum of Association** dated 29/11/2017 registered with **Sub-Registrar's Office/ Registrar of Societies/**Registrar of Companies/others on 29/11/2017.

2. ~~The Trust Deed / Memorandum of Association has subsequently been amended / modified / altered by a Codicil / Supplementary Deed / Amendment Deed / Alteration to Memorandum of Association/others dated XX/XX duly registered on XX/XX.~~

3. The above TRUST filed an application seeking Registration u/s 12 AA of the Income tax Act, 1961.

4. On going through the objects of the TRUST and its proposed activities as enumerated in the **Trust Deed / Memorandum of Association,** I am satisfied about the genuineness of the TRUST as on date.

5. The application has been entered at Sl.No.1105 maintained in this office. The above Trust is accordingly registered as a PUBLIC CHARITABLE TRUST u/s 12 AA of the Income Tax Act, 1961 with effect from 29/11/2017.

6. It is hereby clarified that the Registration so given to the **Trust/Institution** is not absolute. Subsequently, if it is found that the activities of the **Trust/Institution** are not genuine or are not being carried out in accordance with the objects and clauses of the **Trust Deed / Memorandum of Association** submitted at the time of registration or modified with the approval of the **Commissioner of Income-tax (Exemptions), Chennai** or there is a violation of the provisions of Section – 13, **the** Registration so granted shall be cancelled as provided u/s 12 AA (3) or 12AA(4) of the Income Tax Act. Further, this approval is also subject to the **Trust/Society/Association/Company/ Others/** complying to the provisions of the proviso to sec 2(15) of the Income Tax Act 1961.

7. **Granting of Registration u/s 12AA** does not confer any automatic exemption of income from taxation. The **Trust/Institution** should conform to the parameters laid down in Sections 11, 12, 13 and 115 BBC of the I.T. Act, 1961, to claim exemption of its income on year to year basis before the Assessing Officer.

** This Unique Registration No. URNo. **AACTN7857J/05/18-19/T-1105** Should be mentioned in all your future correspondence.

Sd/-
(G.M.DOSS, I.R.S)
Commissioner of Income-tax(Exemptions), Chennai.

Copy to:
1. The Assessee.
2. The ACIT(Exemptions), Coimbatore Circle.
3. Office Copy.

//CERTIFIED TRUE COPY//

(N SRINIVASA RAO)
Asst. Commissioner of Income-tax (H.Qrs)(Exemptions),
Chennai.

F.2984

GOVERNMENT OF INDIA
INCOMETAX DEPARTMENT
OFFICE OF THE COMMISSIONER OF INCOME TAX (EXEMPTIONS)
Aayakar Bhawan, Annexe III Floor, 121 M.G. Road, Chennai 600 034

URNo. AACTN7857J/05/18-19/T-1105/80G

Date: 10.04.2019

Name of the Trust/~~Society~~ /~~Company~~/~~Institution~~	:	NATURE SCIENCE FOUNDATION
Address	:	LIG II 2669, GANDHIMAA NAGAR, PEELAMEDU, COIMBATORE - 641 004
PAN	:	AACTN7857J
Date of Application	:	12.11.2018

Received
Rajes. S. Ponnuswamy
17/07/19
17/07/2019

APPROVAL UNDER SECTION 80G(5)(vi) OF THE INCOME TAX ACT, 1961

The aforesaid Trust/~~Society~~/~~Company~~/~~Institution~~ has been registered u/s.12AA of the Income Tax Act with effect from **29.11.2017** vide **AACTN7857J/05/18-19/T-1105** dated **03.09.2018.** It is certified that donation made to **NATURE SCIENCE FOUNDATION** at **LIG II 2669, GANDHIMAA NAGAR, PEELAMEDU,COIMBATORE - 641 004** shall qualify for deduction u/s 80G(5)(vi) of the Income Tax Act, 1961, subject to the fulfillment of conditions laid down in clauses [i] to [v] of sub-section (5) of section 80G of the I.T Act, 1961.

2. This approval shall be valid in perpetuity with effect from **A.Y. 2019-20** unless specifically withdrawn. **The details and validity of the certificate is available @ office.incometaxindia.gov.in**

3. The Return of Income along with the Income & Expenditure Account, Receipts and Payments Account and Balance Sheet should be submitted annually **to** the Assessing Officer having jurisdiction over the case.

4. No change in the Trust Deed/~~Memorandum of Association~~ shall be effected without the prior approval of the undersigned i.e. **Commissioner of Income Tax (Exemptions), Chennai**.

5. Every receipt issued to a donor shall bear the **Unique Registration Number** i.e. **URNo. AACTN7857J/05/18-19/T-1105/80G** and date of this order i.e. **10.04.2019.**

6. Under the provisions of section 80G(5)(i)(a), the institution/fund registered u/s.12A, u/s.12AA(1)(b) or approved u/s.10(23C), 10(23C)(vi)(via), etc., shall have to maintain separate books of accounts in respect of any business activity carried on and shall intimate this office within one month about commencement of such activity.

Sd/-
(G.M.DOSS, I.R.S)
Commissioner of Income Tax (Exemptions)
Chennai.

Copy to:
1. The applicant
2. Guard File
3. The DCIT(Exemptions) Coimbatore Circle.

//Certified True Copy//

(N. SRINIVASA RAO)
Assistant Commissioner of Income-tax (Hqrs)
(Exemptions), Chennai.

FORM NO. 10AC

(See rule 17A/11AA/2C)

Order for registration

1	PAN	AACTN7857J
2	Name	NATURE SCIENCE FOUNDATION
2a	Address	
	Flat/Door/Building	LIG-II, 2669
	Name of premises/Building/Village	GANDHIMAA NAGAR
	Road/Street/Post Office	Coimbatore South
	Area/Locality	COIMBATORE
	Town/City/District	Gandhimaanagar S.O
	State	Tamil Nadu
	Country	INDIA
	Pin Code/Zip Code	641004
3	Document Identification Number	AACTN7857JE2021501
4	Application Number	739995830271021
5	Unique Registration Number	AACTN7857JE20215
6	Section/sub-section/clause/sub-clause/proviso in which registration is being granted	01-Sub clause (i) of clause (ac) of sub -section (1) of section 12A
7	Date of registration	03-11-2021
8	Assessment year or years for which the trust or institution is registered	From AY 2022-23 to AY 2026-2027
9	Order for registration:	
	a. After considering the application of the applicant and the material available on record, the applicant is hereby granted registration with effect from the assessment year mentioned at serial no 8 above subject to the conditions mentioned in row number 10.	
	b. The taxability, or otherwise, of the income of the applicant would be separately considered as per the provisions of the Income Tax Act, 1961.	
	c. This order is liable to be withdrawn by the prescribed authority if it is subsequently found that the activities of the applicant are not genuine or if they are not carried out in accordance with all or any of the conditions subject to which it is granted, if it is found that the applicant has obtained the registration by fraud or misrepresentation of facts or it is found that the assessee has violated any condition prescribed in the Income Tax Act, 1961.	
10	Conditions subject to which registration is being granted	
	The registration is granted subject to the following conditions:-	

	o. This certificate cannot be used as a basis for claiming non-deduction of tax at source in respect of investments etc. relating to the Trust/ Institution.	
	p. All the Public Money so received including for Corpus or any contribution shall be routed through a Bank Account whose number shall be communicated to Office of the Jurisdictional Commissioner of Income Tax.	
	q. The applicant shall comply with the provisions of the Income Tax Act, 1961 read with the Income Tax Rules, 1962.	
	r. The registration and the Unique registration number has been instantly granted and if, at any point of time, it is noticed that form for registration has not been duly filled in by not providing, fully or partly, or by providing false or incorrect information or documents required to be provided under sub-rule (1) or (2) of rule 17A or by not complying with the requirements of sub- rule (3) or (4) of the said rule, the registration and Unique Registration Number (URN), shall be cancelled and the registration and URN shall be deemed to have never been granted or issued.	
	Name and Designation of the Registration Granting Authority	Principal Commissioner of Income Tax/ Commissioner of Income Tax (Digitally signed)

Digitally Signed by SIBICHEN K MATHEW
Date: 2021.01.03 15:52:36 IST

INCOME TAX DEPARTMENT

Certificates of Energy Auditors

1. ISO Environment Management System (14001:2015) of Mrs. S. Rajalakshmi, Founder & Chairman of NSF.

2. Indian Green Building Council (IGBC AP) Accredited Professional of Dr. B. Mythili Gnanamangai, Vice-Chairman of NSF.

3. Associated Chambers of Commerce and Industry of India (ASSOCHAM), of Dr. B. Mythili Gnanamangai, and Board of Directors (North Zone) of NSF.

4. Bureau of Energy Efficiency (BEE), LEED AP and GRIHA Certificates of Er. D. Dinesh Kumar, Energy Auditor of NSF.

5. ISO Energy Management System (50001:2018) of Dr. D. Vinoth Kumar, Joint Director of NSF

Exemplar Global

Certificate of Training

TNV hereby certifies that

S. Rajalakshmi

has successfully completed the 5 days

Auditor / Lead Auditor Training Course which meets the training requirements of the Exemplar Global and has been declared as competent in the following competency units

- EM: Environmental Management System
- AU: Management Systems Auditing
- TL: Leading Management Systems Audit Teams

ISO 14001:2015

Issue Date: 17th Jun. 2021
Training Date : 20th to 24th May. 2021
Certificate Number : 2106170721010105

Authorised Signatory
(Pragyesh Singh)

This course is certified by Exemplar Global vide registration number TN00

Note: The course conforms to the principles and practice
for compliance with standards. This certificate
certificate is recognized by Exemplar Global
please write to Mail: info@isoindi

IGBC

Confederation of Indian Industry

The Indian Green Building Council

hereby certifies that

B Mythili Gnanamangai

has successfully demonstrated knowledge on the Green Building Design & Construction, Building Standards & Codes, IGBC Resources & Processes and Green Design Strategies & their Impacts, required to be awarded the title of

IGBC Accredited Professional

K S Venkatagiri
Executive Director
CII-Godrej GBC

V Suresh
Chairman
Indian Green Building Council

Gurmit Singh Arora
Vice-Chairman
Indian Green Building Council

210122

17 April 2021

ASSOCHAM

GEM Certificate

ASSOCHAM hereby certifies that

Dr. B. Mythili Gnanamangai

has successfully passed the

Green and Eco-friendly Movement Certified Professional Test (GEM CP)

with

"Excellent Performance"

on

16 July, 2021

He/she is now eligible to execute the GEM Sustainability Certification Projects.
ASSOCHAM feels proud to award the GEM Certified Professional title to him/her.

Pankaj R. Dharkar
Chairman, GEM

GEM CP 20/649

Deepak Sood
Secretary General, ASSOCHAM

BUREAU OF ENERGY EFFICIENCY

Examination Registration No. : EA-14056 Serial Number: 9176

Certificate Registration No. : 9176

Certificate For Certified Energy Manager

This is to certify that Mr./Mrs./Ms. Dinesh Kumar D Son/Daughter of Mr./Mrs. R M Dhanasekaran who has passed the National Examination for certification of energy manager held in the month of October 2011 is qualified as certified energy manager subject to the provisions of Bureau of Energy Efficiency (Certification Procedures for Energy Managers) Regulations, 2010.

This certificate shall be valid for five years with effect from the date of award of this certificate and shall be renewable subject to attending the prescribed refresher training course once in every five years.

His /Her name has been entered in the Register of certified energy manager at Serial Number 9176 being maintained by the Bureau of Energy Efficiency under the aforesaid regulations.

Mr./Mrs./Ms. Dinesh Kumar D is deemed to have qualified for appointment or designation as energy manager under clause (/) of Section 14 of the Energy Conservation Act, 2001 (Act No.52 of 2001).

Given under the seal of the Bureau of Energy Efficiency, this 7th day of February, 2013

Digitally Signed: RAKESH KUMAR RAI
Sun Mar 01 10:58:55 IST 2020
Secretary, BEE New Delhi

Secretary
Bureau of Energy Efficiency
New Delhi

Dates of attending the refresher course	Secretary's Signature	Dates of attending the refresher course	Secretary's Signature
22.12.2019			

GRIHA

GREEN RATING FOR INTEGRATED HABITAT ASSESSMENT

GRIHA CERTIFIED PROFESSIONAL CERTIFICATE

This is to certify that

Dinesh Kumar Dhanasekaran

has qualified as a **GRIHA** Certified Professional For V. 2015

Date of issue: 19th June 2020

Note : This certification is valid only for GRIHA version 2015.

Chief Executive Officer
GRIHA Council

LEED AP BD+C

GREEN BUSINESS CERTIFICATION INC. CERTIFIES THAT

DINESH KUMAR D

HAS ATTAINED THE DESIGNATION OF

LEED AP® Building Design + Construction

by demonstrating the knowledge and understanding of green building practices and principles needed to support the use of the LEED® green building program.

10531234-AP-BD+C

26 DEC 2016

25 DEC 2022

ऊर्जा दक्षता ब्यूरो

BUREAU OF ENERGY EFFICIENCY

विद्युत मंत्रालय, भारत सरकार

MINISTRY OF POWER, GOVERNMENT OF INDIA

प्रमाणित किया जाता है कि

श्री/श्रीमती दिनेश कुमार ने ऊर्जा संरक्षण भवन निर्माण संहिता

के लिए 7 दिसंबर '16 से 8 दिसंबर '16 तक एमएनआईटी / सीईपीटी /आईआईआईटी

द्वारा आयोजित मास्टर ट्रेनर सर्टिफिकेट कार्यक्रम को सफलता पूर्वक सम्पन्न कर लिया है।

This is to certify that

Shri/Smt. Dinesh Kumar has successfully

completed the Master Trainer Certificate Programme conducted by ~~MNIT~~ / ~~CEPT~~ / IIIT

from 7 December '16 to 8 December '16 for the Energy Conservation Building Code.

नई दिल्ली

New Delhi

महानिदेशक

Director General

CII

Confederation of Indian Industry

GreenCo

CERTIFICATE

This is to Certify that

A K Srivastava

Is a "CII-Certified Facilitator on GreenCo Rating System",
upon successful completion of
"3rd Edition of Facilitator Development Workshop on GreenCo Rating System"
during 27 - 29 October 2021.

L S Ganapati
CHAIRMAN
CII GREENCO ASSESSOR PANEL

K S Venkatagiri
EXECUTIVE DIRECTOR
CII GODREJ GBC

Certificate No: CII/GCRF/002/2021; Issued date : 5 Nov 2021; Valid till: 5 Nov 2024

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This is to certify that

DR. D. VINOTH KUMAR

HAS SUCCESSFULLY COMPLETED THE FIVE DAYS (40 HOURS)

LEAD AUDITOR COURSE

BY PASSING THE WRITTEN EXAMINATION BASED ON

ISO 50001:2018

ENERGY MANAGEMENT SYSTEMS

Examination Date: 15/07/2022
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Certificate registration number: QCS/TR/C/0056
Total Course duration: 40 hours CPD Credits Earned: 32

Remarks: Roughly one hour of study time equals to 1 CPD Credit.

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