

ENERGY AUDIT REPORT

2021-22

in compliance with the statutory requirements under the NAAC
accreditation procedures



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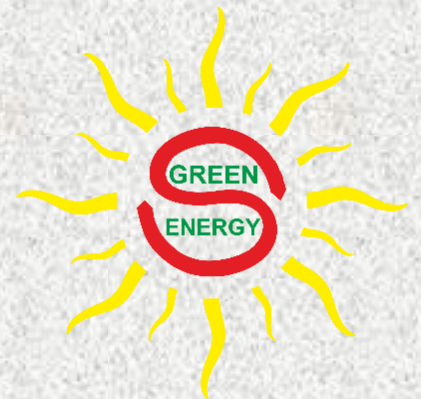
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ENERGY AUDIT REPORT

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ENERGY AUDIT REPORT

EXECUTIVE SUMMARY

Sr No	Observation*	Problems*	Resulting losses*	Remedial measures*	Capital*	Projected savings*	Category 7	
1	Power Consumpti	PF Penalty	Energy & revenue loss	Install Capacitor bank.	Rs.50,000 /- approximately	Avoided revenue penalty		
2	Solar Power	Suggest to install Solar Power to minimise use of energy during Offgrid times.						7.1.2
3	Occupancy sensor	Wastage of power	High	Occupancy sensor based switching	₹1500 per room	Resulted ROI of one year.	7.1.2	
4	Battery placement	Concealed enclosure. Battery shell in conductor loop	Low performance & self-discharge.	Design the stacking arrangements.	In house resources	25% of the cost of the batteries.	7.1.2, 7.1.6	
5	Battery regeneration.	Short life span	300% of the cost of the battery.	Subject all batteries to regeneration made.	Rs.20.00 Lacs or as per user agreement	300 %	7.1.2, 7.1.6	

Sr No	Observation*	Problems*	Resulting losses*	Remedial measures*	Capital*	Projected savings*	Category 7
6	Electrical	Old tube lights	High energy consumers	LED lights of appropriate ratings.	Rs.80/- to Rs.250/- per unit	Rs.175/- per tube per annum. ROI of 1 years.	7.1.6
7	Natural Lighting	Un cleaned windows and ventilators, forced switching on of tube lights	High energy bills	Clean the windowpanes and allow maximum natural light penetration.	Nil, part of routine, In house manpower.	Substantial cost of energy bills on lighting.	7.1.2, 7.1.6
8	Natural Ventilation	Permanently closed ventilators.	Creation of hot air pockets below the ceiling.	Open the Ventilators for easy exit of hot/warm air from the rooms.	Nil, In house manpower.	Eliminate use of Electrical Fans and Substantial cost of energy bills	7.1.2, 7.1.6

* For details, please follow the discussions in the report.

Objectives of auditors: Sunshubh Technovations (P) Ltd

Sunshubh Technovations Private Limited is registered in the year 2020 and has evolved from initial proprietary concern, Sunshubh Renewables & Research Centre. Sunshubh has been in operation since 2008. Sunshubh today is led by a team of well experienced Certified Energy Auditors and tech- savvy young engineers.

We believe in Identifying opportunities and executing solutions based on need with highest priority to Energy conservation over efficiency.

Since beginning, Sunshubh has been growing and today, we have wide range of clientele In the field of Industry : Tool room, Chemicals and refinery, Mining, Health, Hospitality, Food processing, Infrastructure and Educational institutions under NAAC compliance. Our approach has been very aggressive in equipping ourselves with the latest instruments. After decade of professional experience, we restructured ourselves and thus the formation of a Private Limited company on 22nd July 2020.

Today we have with us the technical team comprising three Certified Energy Auditors, One Certified Energy Manager and support team of young and enthusiastic engineers to comply to the client requirements.

POLICY MATTERS

Learning from our training in Germany and their policies, SUNSHUBH does not supply any energy saving equipment's or systems. However, we do stand up to support and execute the measures to prove our findings right. This is mandatory to assure the client that we do not market any self-centred product or orient the Audit assignment to sell any third party product. Meaning to say **we stand neutral to all methodologies in the interest of adopting best technologies.**

We strongly believe in sharing our knowledge and training inhouse manpower for continual improvement in energy flow.

We have set a policy not to hire the instruments from third party but to procure every small or big ones to do justice to our clients.

Criterion vii – Institutional values and best practices from energy audit perspective.

Key Indicator - 7.1 Institutional Values and Social Responsibilities

Metric No.	Description	Compliance	Initiatives required
7.1.1 QIM	Measures initiated by the Institution for the promotion of gender equity during the last five years. Annual gender sensitization action plan Specific facilities provided for women in terms of: Safety and security - Energy	Partly Complied	1. Placing sanitary pad incinerator and dispenser is required in all women rest rooms and waiting halls. 2. The concept of home energy management may be initiated for the women. The typical illustration is reproduced.

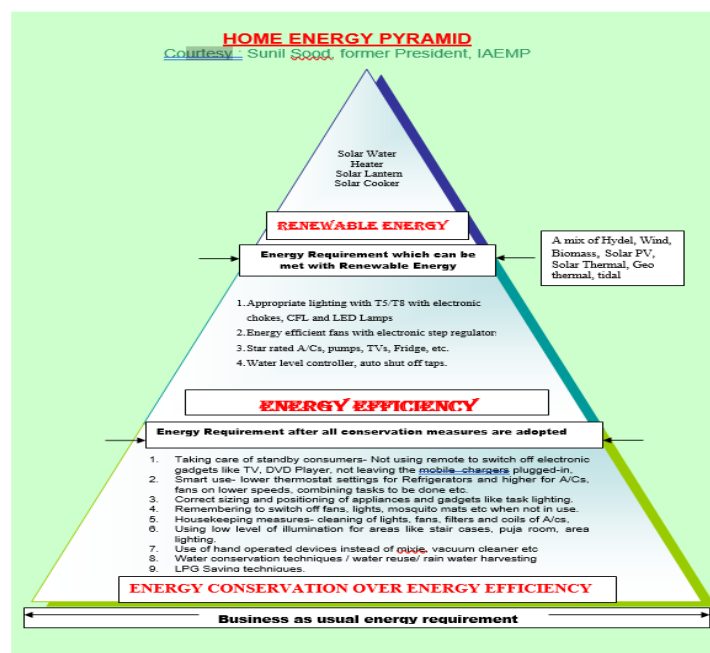


Figure 1 - Home energy pyramid

	Environmental Consciousness and Sustainability		Discuss on why the recent calamities keep occurring more often than before.
7.1.2 Q _n M	<p>The Institution has facilities for alternate sources of energy and energy conservation measures</p> <ul style="list-style-type: none"> • Solar energy • Biogas plant • Wheeling to the Grid • Sensor-based energy conservation • Use of LED bulbs/ power efficient equipment 	Complied through parent society.	<p>Considering the cost of energy use, serious consideration may be taken up for,</p> <p>Solar Biogas plant in Hostel mess.</p> <p>If solar is installed the power can be exported to grid on non-working hours. Sensor based control is a must for energy use optimization.</p> <p>Complete the ongoing work at faster pace.</p>
7.1.3 Q _i M	<p>Describe the facilities in the Institution for the management of the following types of degradable and non-degradable waste (within 500 words)</p> <p>Solid waste management Liquid waste management Biomedical waste management E-waste management Waste recycling system</p>	Complied partially wrt minimizing	<p>Energy consumption details need to be monitored and the benefits of avoided accumulated energy use and power demand should be established.</p>

	Hazardous chemicals and radioactive waste management		
7.1.4 Q _n M	Water conservation facilities available in the Institution: Rain water harvesting Borewell /Open well recharge Construction of tanks and bunds Waste water recycling Maintenance of water bodies and distribution system in the campus	Complied. Open ground percolation. Open well restoration Percolation pond near to open well	The institution should consider in measuring the energy and power demand at various ground water table to demonstrate the impact of increased water table by rainwater harvesting methods. Kindly refer to the article listed at the end of the table.
7.1.5 Q _n M	Green campus initiatives include (4) 7.1.5.1. The institutional initiatives for greening the campus are as follows: Restricted entry of automobiles Use of Bicycles/ Battery powered vehicles Pedestrian Friendly pathways Ban on use of Plastic landscaping with trees and plants.	Partially complied.	With disciplined vehicle parking the reduction in fuel consumption can be demonstrated in the college campus. The students can be given a task of conducting such practical on field and a competition should educate the society.
7.1.6 Q _n M	Quality audits on environment and energy	Complied.	The audit findings should be predominantly projected by action from

	<p>are regularly undertaken by the institution (5)</p> <p>7.1.6.1. The institutional environment and energy initiatives are confirmed through the following</p> <ol style="list-style-type: none"> 1.Green audit 2. Energy audit 3.Environment audit 4.Clean and green campus recognitions/awards 5. Beyond the campus environmental promotional activities 		<p>all stake holders of the institution.</p>
7.1.7 Q _n M	<p>The Institution has disabled-friendly, barrier free environment</p> <p>Built environment with ramps/lifts for easy access to classrooms.</p> <p>Disabled-friendly washrooms</p> <p>Signage including tactile path, lights, display boards and signposts</p> <p>Assistive technology and facilities for persons with disabilities (<i>Divyangjan</i>) accessible website, screen-reading software, mechanized equipment</p>	<p>The initiatives have been considered.</p>	<p>The demand for muscle power to climb the ramp may be considered as one such case and ideally establish the gradient of the ramp.</p>

	Provision for enquiry and information : Human assistance, reader, scribe, soft copies of reading material, screen reading		
7.1.9 Q _i M	Sensitization of students and employees of the Institution to the constitutional obligations: values, rights, duties and responsibilities of citizens Describe the various activities in the Institution for inculcating values for being responsible citizens as reflected in the Constitution of India within 500 words.	Need to explore.	The sensitization of switching off the non-required electrical appliances and devices should be encouraged. Like organizing the inhouse competition. Every student to table their energy bills in the previous year. The savings in the forth coming year should be recorded and an energy ambassador award be shouldered on the top students. This activity brings in the sense of responsibility, accountability and importantly knowing their energy use and abuse.
7.1.10 Q _n M	The Institution has a prescribed code of conduct for students, teachers, administrators and other staff and conducts periodic programs in this regard.	Partially Complied.	A range of activities can be brought in just as discussed in 7.1.9 above. The Code of Conduct is displayed on the website There is a committee to monitor adherence to the Code of Conduct

			<p>Institution organizes professional ethics programs for students, teachers, administrators and other staff</p> <p>Annual awareness programs on Code of Conduct are organized</p>
7.1.11 Q1M	<p>Institution celebrates / organizes national and international commemorative days, events and festivals</p> <p>Describe the efforts of the Institution in celebrating /organizing national and international commemorative days, events and festivals during the last five years within 500 words</p>	Complied	<p>In today's practices, the celebration has been formal.</p> <p>The actual celebration has to be yearlong. The theme for the year has to be laid and the activities should be conducted and on the day of celebration the selective activities be carried out. Just to illustrate,</p> <p>Consider the Republic Day.</p> <p>We celebrate the flag hoisting and with cultural activities. Consider the week-long program where in, students can discuss what is the Republic Day. How the final draft got to be written and who all are the members of the draft committee.</p>

			https://en.wikipedia.org/wiki/Constitution_of_India
7.2.1 Q ₁ M	Describe two best practices successfully implemented by the Institution as per NAAC format provided in the Manual.	Complied.	When the listed activities from 7.1.1 to 7.1.11 are complied, the institute can have many creative best practices and the achievements can really bring in the name, fame and the recognition and appreciation not just on records but on monetary contributions as well.

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fficiency

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इन लेखों में प्रकट विचार मूलतः लेखकों के हैं तथा यह आवश्यक नहीं है कि इरेडा या विनरॉक भी इन विचारों से सहमत हो ।

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FROM THE EDITOR-IN-CHIEF

The simple economics of water and energy security



It is estimated that the global annual use of commercial energy is about 400 Quads (quadrillion BTUs). The sun pours an additional 6 million Quads of radiant energy into the Earth's atmosphere each year. Thus in absolute terms, energy available is several orders of magnitude higher than demand. Yet, the world continues to struggle against an acute energy crisis. This leads one to believe that the problem is not merely of energy availability but rather a problem of affordability. Energy is a matter of pure economics, of demand and supply – at a cost.

A similar principle applies to water. Though roughly 80 percent of the Earth's surface is water, cheap potable and clean water is simply beyond the reach of millions across the world. Potable water sourcing, treatment, and distribution require considerable amounts of energy. Access to water is therefore closely linked to energy availability and affordability.

This close interdependence between energy and water needs to be clearly recognized and the nexus addressed suitably at the policy level. The first and foremost priority of any energy policy should be the wise, efficient use of whatever energy supplies are available. Similarly, priority should be given to the efficient use of whatever water supplies exist. Once the issue of efficient use has been tackled, focus can then be shifted on creating new energy and water supplies that meet sustainability and environmental requirements. And this may not be as difficult to achieve as it appears.

As in the case of energy use, the difficult part is reducing the quantum of water use while maintaining the level of benefits both for the customer and the utility. If this can be addressed, water utilities can save money as the reduced demand effectively creates more system capacity. With decreasing demand, the water utility effectively avoids additional investments in new facilities and equipment. Reduced volume of water flowing through the system has the attendant advantage of reduced frictional energy losses, thereby reducing the cost of pumping. This leads to a win-win situation for both the consumer and the utility, with the consumer benefiting through the reduced cost of delivery, diminished chances of water shortfalls, and the utility benefiting from decreased likelihood of major investment expenditures.

Needless to say that all this also saves energy. In rural areas, a large number of irrigation pump sets are either operated at highly subsidized electricity tariff from the power utilities or at no cost at all, encouraging the use of poorly designed inefficient pump sets which are over-rated and over-used. Replacing these pump sets with energy-efficient ones is one option, but who bears the cost? Another option is rainwater harvesting. For every one foot increase of the water table one achieves an approximate savings of 1 percent power.

Which means one gets more for the same energy use. That's simple economics.

Debashish Majumdar
Debashish Majumdar
Managing Director, IREDA

Water–Energy: two faces of a coin

There is a direct relationship between water and power. A reduced water table is directly proportional to the square of the increased electrical power consumption, says the author

We all presume that if the dams and reservoirs are full then electrical power could be available in plenty. However, we tend to ignore that the demand for electrical power has been growing at a much faster rate than what we can produce and, hence, any amount of rain and or electrical power generated is insufficient to meet our demand. Most thermal power plants are running low owing to a short supply of coal. So where are we?

The recent changes in temperature and erratic rainfall has a direct relationship with urbanization. With increased urbanization and industrialization, we have only created a greater need for energy. This energy is sourced primarily from fossil fuels such as coal and nuclear power plants. In the absence of rains, the only means of generating electrical power is by burning fossil fuels. The burning releases emissions into the atmosphere, resulting in increased CO₂ concentration in the troposphere, and subsequently the greenhouse effect. The disturbed rainfall pattern is a result of this global warming.

The demand for power can be classified into four areas: agricultural need-based; industrial need-based; commercial need-based; and domestic need-based.

Today, a number of agencies such as the Bureau of Energy Efficiency (BEE), Petroleum Conservation Research Association (PCRA), the National Productivity Council (NPC) and a host of voluntary organizations, are working at ensuring energy efficiency in industries. But while the commercial and domestic need-based sectors have the potential, little is being done in this area. These sectors need a lot of education, motivation and awareness.

The agricultural industry needs the greatest attention, mainly in irrigation pump-sets (IPs). Most IPs are being operated free or on highly subsidized electricity supply. But eventually they consume a lot of power.

For instance, there are 16,000 irrigation pumps reportedly being operated under the HESCOM (Hubli Electric Supply Company), a division in North Karnataka. If, on an average each 5 HP pump consumes 3.73 kW of power per hour (there are actually a greater number of 10 HP pumps), the total consumption is as below:

For 10 hours per day = 37.30 kWh
For 200 days of watering = 7,460 kWh (7.46 MWh/pumpset)
For 16,000 sets, it is 119,360 MWh which means, 358,080 MWh of power generation at the power plant.

To reduce this consumption, should the IP users be asked to change over to energy-efficient sets? The question is:

- can the users afford the change?
- are they willing to accept the new brands of sets imposed on them?
- can the sale of inefficient IP sets be controlled?

Or should measures be adopted where the users may not use the IPs at all? Or can power consumption be reduced?

One good method is to reduce power consumed by IP sets by increasing the water table. If the water table can be increased by, say, 13 ft, then for the same 150 LPM delivery we will need a 4 HP (2.984 kW), and the savings for 16,000 IP sets would be 23,872 MWh, which is 20 percent – approximately 1.5 percent power saving for every feet of increase in the water table. This increase in water table can be achieved by adopting rainwater harvesting – through either bunds or by natural

filtration tanks or by preventing pumping of water by making use of rainwater.

Now who meets the cost of these programs is one big question. Let us see how the electrical supply company benefits: If the organization spends around Rs 5,000 per IP set, we have Rs 800 crore as the capital investment on rainwater harvesting. For an annual savings of 23,872 MWh of electrical power, a savings of Rs 9.55 crore at the rate of Rs 4 per kWh for every feet increase in the water table.

It is always better not to use energy than try and save energy.

When a process industry utilizes water for its operations, then this water has to be demineralized or softened. To do this, it will need electrical power. Also due to dissolved solids and increased concentration, repeated breakdowns may happen, demanding periodic maintenance and scraping of industrial components, which means more energy consumption.

Now, greater the amount of rainwater harvested, lesser will be the dissolved solids, which means less breakdowns and increased fuel savings. Once the fuel consumption comes down, the release of CO₂ into the atmosphere is also reduced. Reduced CO₂ means lesser effect on global warming. This will then lead to stable weather conditions and predictable monsoons. Once the ecological cycle is renewed, achieving a balance between industrial, agricultural and environmental growth is easy.

Water is a renewable source of energy and must be conserved.

Courtesy: Mallikarjun A. Kambalyal,
President, Sunshubh Renewable
Energy Foundation
E-mail: mallu_solar@yahoo.co.uk

OVERVIEW OF ENERGY AUDIT

The main objective of the energy audit of educational institutions is to set an informative work schedule. Although Electrical Energy is considered to be clean, it is not so, at the point of generation. The impact assessment of electrical power used out in day today activities are highlighted and Pros and Cons are discussed 'off the class room session'.

Self-contribution to the one's well-being is what is intended to be discussed. Judicious use of Electrical energy, reduces power demand and energy consumption. Optimising electrical use is key aspects of the Energy Audit.

On reducing the electrical energy, the power demand reduces. Reduced power demand enables reduced power generation at the point of generation which in India is mainly by Coal firing. This means lower fuel consumption which again leads to lower smoke i.e., CO₂. If sourced from Solar, reduced power demand will call for reduced Solar power plant thus reducing CAPEX and smaller battery bank. At the end of it, both lead to lower emissions i.e., lower 'CARBON FOOTPRINT'.

The benefits would then be transacted into stabilised rainfall pattern.

CARBON FOOTPRINT AUDIT OBJECTIVES

Know Why? Where? What? When? How? about the Audit and its objectives.

Carbon Footprint Audit was initiated in the beginning of 1970's, with the motive of inspecting the work executed within an organization, whose exercises could cause risk to the health of inhabitants and the environment. It exposes the genuineness of the proclamation made by the organisation with the concern on health issues. As a consequence of their operations with respect to environmental pollution, it is the duty of the organisation to carry out the Carbon Footprint audit of the ongoing processes for various reasons, such as

- To make sure whether one is performing in accordance with the relevant rules and regulations,
- To improve the procedures and aptness of material in use,
- To analyse the potential duties and to determine a way which can lower the cost and to the revenue outflow.

Through Carbon Footprint Audit one gets adoration as to how to improve the condition of the environment. There are various factors that were forced upon and determine the growth of/or conduct of Carbon Footprint audit. Incidents like, decades old Bhopal gas tragedy, that has left its residual effect which still haunts us; Our buildings catching fire due to various reasons; Industries blowing off taking valuable human lives etc.; People going sick, feeling tired, after long hours of operations in the organization; Increased demand of generators due to inconsistent power supply, which has resulted or lead into recent floods and droughts; are some of the situations to ponder about?

To address various issues in context with human health, ENVIRONMENT audit is assigned to "Criteria 7" of NAAC (National assessment and accreditation council) accreditation. NAAC is a self-governing organization in India that declares the institutions as Grade "A", Grade "A+", or Grade "A++"..., according to the scores assigned at the time of accreditation.

The other intention of organising Carbon Footprint audit is to update the environment conditions in and around the institutions i.e., within the

compound and outside the compound. It is carried out with the aid of performing certain tasks like waste management, energy consumed, diesel burnt it performing the objective of the organization. Lastly to self-assess the net carbon footprint of the conduct of process in the organization.

The goals of Carbon Footprint audit

- The purpose of carrying out Carbon Footprint audit is securing the environment and cut down the threat posed to human health.
- To Make sure that rules and regulations are complied with.
- To avoid the environmental interruptions that are more difficult to handle and their corrections call for high cost.
- To suggest the best protocol for adding to sustainable development.
- To execute the process of the organisations utilising minimum natural resources and efficient use of those resources contributing to minimum waste generation.

How is the Carbon Footprint audit conducted?

- Pre-audit
- Planning
- selecting the team of auditors both internal and external
- schedule the audit facility
- acquire the background information
- visit areas under audit

On site conditions:

- Understand the scope of audit
 - Analyse the strengths and weaknesses of the internal controls
 - Conduct audit with end user comfort focused and making it easy to perform.
 - Collect necessary evidence so that the stakeholders stand to understand how and where they are going wrong in the process of their conduct.
 - Post audit draw the report based on the data collected.
-

- On confirmation of the preliminary report, draw a final report of the observations and inference with accuracy more near to implementable way.
- Discuss various remedial measures for alternatives if required.
- Prepare an action plan to overcome the shortcomings with continual observation on the action plan initiated.

ENERGY AUDIT REPORT

STEPS UNDER CARBON FOOTPRINT AUDIT

Energy audit: It deals with use of energy in carrying out the task. In the Audit process conservation prevails over efficiency. Conservation awareness and implementation plays a significant role. Awareness in conservation brings in Efficiency by itself. Hence, energy audit will always consider not to use the energy if necessary. At best it can be used judiciously. The final objective is to assess the extent of impact on the environment either Direct or Indirect. One such key tool is CARBON FOOTPRINT.

Carbon Footprint also considers various other components as discussed below.

Water audit: Water is one of the cheapest commodities next to the Air we breathe. Although we Indians, use less water in comparison to western countries. However, the extent of pollutants that we leave behind has polluted all the resources including the deep well.

Rainwater harvesting is one of the best techniques that can be adopted by harvesting the rainwater and using it at the time of scarcity. the audit team to observe and investigate the relevant methods that can be adopted and implemented and draw the balance of use of water.

Waste management audit: The point of generation of waste, the type of waste generated, i.e., hazardous, recyclable and organically compostable wastes and segregating method at the point of generation for easy and best way to handle the same. Evaluating such methods to minimise the use of resources in the process of their management.

Environmental quality audit: It analyses air quality, noise level and the programs undertaken by the institution for plantation creating awareness of trees around us and how nature provides us with remedial measures within its framework.

Health audit: In the process of use of resources and conduct of the activities, they can develop impact on human health, that might be off minutely harmful, cause permanent disorder or may even cause death. Occupational health hazards are discussed in detail and the

stakeholders are informed of the same and required necessary remedial measures indicated.

Renewable energy: To make in organisation net zero net zero carbon emission use of renewable resources including energy such as solar wind biogas geothermal energies are put into ooh utilisation.

Carbon handprint: The net impact All the above components of Carbon Footprint Audits are to make an organisation contribute zero emissions which are called bye bhai use of water generation of waste use of energy e environmental damage health damage and finally to explore if the campus or direction can go in in contributing to third-party emissions minimising

Benefits of Carbon Footprint audit: To draw home the benefits, the system has been separated out into various audits as listed above. In doing so, and if audit findings are effectively implemented there are many advantages that can be practiced in the process

- Recognise the cost saving methods through waste minimising and managing technologies.
- Point out the prevailing and forth coming complications.
- Authenticate conformity with the legal requirements.
- Empower the organisation to frame a better environmental performance.
- Portray a good image of the institution which helps build better relationships with the group's organisations, stakeholders in and around its operations

Enhance the alertness for environmental guidelines duties and conduct of preparedness for any eventualities due to environmental disasters.

CARBON FOOTPRINT - GREEN PLEDGE 7.1.6

DAY'S CARBON HANDPRINT PLEDGE (proposed)

(indicative templet for display at all prominent areas, classrooms, waiting rooms, canteen, library, relaxing areas in the campus.)

We, The Principal, staff and students, adopt responsible practices in our daily activities with due regard to the environment. We set and continually review objectives and targets for achieving our goal to protect our entire college premises from all pollutions primarily.

We seek to compile with safety and environmental regulations to implement inhouse standards to improve our environmental performance.

We commit ourselves to the safe operation of all our working habits, be it in classrooms, library, canteen, on road, off road, in-campus out-campus as well as at our place of stay.

We adhere to reduce environmental load by efficiently using resources, saving energy, reducing waste, encouraging material recycle, with special emphasize to minimising emissions of greenhouse gases, ozone depleting substance and particle matter. we endure to minimise environmental loads and adopt environmentally friendly technologies when ordering and purchasing necessary products and resources.

We endure to attend educational programs and promulgate our close friends and colleagues to follow suite

We endure to ensure that we recognize the essence of this Energy policy by actively and aggressively conducting workshops and training to all in environmental concepts.

We make wide ranging social contribution to close association with the students, teaching staff, administrative staff, housekeeping staff by disclosing environmental information and supporting environmental consumption.

Principal

DAY'S ENERGY USE PLEDGE

(Indicative templet for display at all prominent areas, classrooms, waiting rooms, canteen, library, relaxing areas in the campus.)

We, The Principal, staff and students, adopt responsible practices in our day's energy use with due regard to the environment. We pledge to avoid using electrical power where not needed. We also pledge to use judiciously the electrical power by using Energy efficient products. We shall practice to switch off all appliances when not in use.

We will educate one person a day on use of electrical energy.

PURPOSE:

To realistically and comprehensively reduce energy consumption, assure acceptable indoor air quality, and improve energy efficiency on campus through methods that are consistent with a safe, secure, and inviting campus community. As outlined in this policy, energy conservation will be accomplished by developing a proactive and progressive approach to providing energy efficient, responsible, and cost-effective operations on campus. This policy will be reviewed and updated periodically as public awareness, management techniques, and technologies change.

APPLIES TO: Faculty, staff, students, and visitors.

CAMPUS: AVVP Samithi's, Shri Annadaneshwar Arts, Science and Commerce College. Naregal,

ACKNOWLEDGEMENT:

SUNSHUBH TECHNOVATIONS PVT LTD., is pleased to express its sincere gratitude to the management of AVVP Samithi's, Shri Annadaneshwar Arts, Science and Commerce College. Naregal, Dist:Gadag, Karnataka, for entrusting SUNSHUBH TECHNOVATIONS PVT LTD., with the assignment on Green Earth practices based on Educate, Practice, Advocate & Manage the resources in their educational organization.

We also wish to thank the officials and the maintenance staff for the help rendered during the energy flow study.

We would fail if we neglect to appreciate the sincere efforts put in by the 7th Criteria Team lead by the able and motivating Principal Prof Prof. S G Keshannavar and the students who against all odds have kept the college premises clean to the possible limits. Without the crucial and significant support from the fellow teaching team the energy savings and carbon footprint reduction would not be a reality.

With the motivational support of the management, ground realistic support from teaching team and sincere efforts of the students in incorporating the change (habits) and instructions, the college could effectively declare the reduction in Carbon footprint and optimize the waste reductions.

We are not in a position to compute the carbon foot print at this point of time as the basic information from each of the students is yet to be collected; however, we will discuss the Carbon Foot print in the follow up compliance report.

Wishing the team, a great success we deeply express our gratitude and heartfelt "THANKYOU" for allowing us to assess the energy flow scenario there by the ENERGY STATUS.

We acknowledge the involvement of Criteria Coordinator and supporting team.

Name

Designation

Prof. S G Keshannavar	Principal
Prof Dr. M R SHivaram	IQAC Coordinator
Dr. R. R. Patil	Co-ordinator Criteria 7
Dr. D.L. Pawar	Co-ordinator Criteria 1
Prof R. G. Pawar	Co-ordinator Criteria 2
Prof G. G. Koti	Co-ordinator Criteria 3
Dr. Kallayya S. Hiremath	Co-ordinator Criteria 4
Prof Sandeepkumar B	Co-ordinator Criteria 5
Dr. Ravi C. S.	Co-ordinator Criteria 6

Mallikarjun A. Kambalyal. B.E.(E&C).

Certified Energy Auditors (EA-3485)

SUNSHUBH TECHNOVATIONS PVT LTD.,

ENERGY AUDIT REPORT

ENERGY AUDIT COMPLETION CERTIFICATE

I, Mallikarjun A Kambalyal, endorse and confirm that the Energy Audit has been carried out on 16th May 2022 under the instructions of Prof. Prof. S G Keshannavar Principal for AVVP Samithi's, Shri Annadaneshwar Arts, Science and Commerce College. Naregal, Dist:Gadag, Karnataka. This report is generated based on the site visits and evidence collected from the site.

All attempts have been made to evaluate the scope for development and inculcate green practices in the campus and extended throughout the campus. The focus is also laid to make positive impact on the society for a better living.

I also confirm and sign this certificate, in case the institution needs demonstration, my team of professionals shall be happy to do so.

We present this report to much more than the legal or mandatory compliances. This report is tabled in two parts. The first forms the core discussions which are general in nature. The second section is subject specific under the statutory requirements of the NAAC accreditation norms. They are Audit reports on, Green aspects, Energy aspects, Environment aspects, Health aspects and the discussions on net CARBON FOOTPRINT & the CARBON HANDPRINT initiatives.

Any modifications, changes, omissions after the site visit shall be exclusive.

Authorised Auditor.

Mallikarjun A. Kambalyal B.E (E&C)

Certified Energy Auditors EA-3485& ISO 50001:2011 & ISO14001:2015 Lead Auditor.



BUREAU OF ENERGY EFFICIENCY



Examination Registration No. : **EA-3485** Serial Number **2838**

Certificate Registration No. : **2838**

Certificate For Certified Energy Manager

This is to certify that Mr./Mrs./Ms. **Mallikarjun A Kambalyal** Son/Daughter of Mr./Mrs. **Andanappa V Kambalyal** who has passed the National Examination for certification of energy manager held in the month of **April 2006** 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 **2838** being maintained by the Bureau of Energy Efficiency under the aforesaid regulations.

Mr./Mrs./Ms. **Mallikarjun A Kambalyal** is deemed to have qualified for appointment or designation as energy manager under clause (I) 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**

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
28.01.2020			

Figure 2 - Bureau of energy Efficiency Regd No: EA3485



Figure 3 - ISO Certified Lead Auditor. Certificate No: 47730



Figure 4 - ISO Certified Lead Auditor. Certificate No: ENR-00253448



Teilnahmebescheinigung

Mr. Mallikarjun Andanappa Kambalyal

has successfully completed the

**Manager Training Programme
of the Federal Ministry of
Economics and Technology**

Germany, September 02 – 28, 2013

Energy Efficiency in Industrial Enterprises

Cologne, September 28th, 2013

Dr. Steffi Art
(Geschäftsführerin)

Hubert Smarowos
(Geschäftsführer)

TÜV Rheinland Akademie GmbH • Alboinstr. 56 • 12103 Berlin

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Figure 5 - Manager training programme, Germany



Figure 6 - Fit for partnership with Germany

ABOUT THE INSTITUTE.

AVVP Samithi's, Shri Annadaneshwar Arts, Science and Commerce College. Naregal, Dist:Gadag, Karnataka, is a centre for excellent learning, it is founded in the year 1966 with a vision to provide quality education for the empowerment of the rural youth and to promote human excellence.

The college is located in the rural area in Gadag District of Karnataka State. The campus is spread over black cotton soil in an area of 11.2 acres. Institute provides education in Arts, Science and Commerce stream.

ONGOING STATUS:

It's an optimistic & highly dedicated team effort lead by the Principal & the senior staff who have dedicated all their wits & free time to initiate Green Carpet the entire college premises. It is also a fact that there do exist few short comings which however is unintentional & on being trained & educated the campus should look for continued minimized waste generation. With all due appreciation to the management, staff involved & cooperation by the students, we have made few suggestions which on implementation, will reduce, demand for water & electrical power. It will also reduce the existing level of pollution to bear minimum.

NO WASTE – NO POLLUTION – NO HEALTH HAZARD.

WHY IS THIS AUDIT BEING CARRIED OUT?

Why it's important to have an Energy Audit

Whether you own or manage a small business, a large commercial facility, or a manufacturing operation, it's important to take advantage of any tips, programs and incentives that will help you save money on your energy bills. There are measures that will generate savings to positively impact your bottom line immediately, as well as longer-term strategic initiatives to assess your needs and stabilize your energy spend in the longer term – which is great news for your budget!

One such initiative is an energy audit. Energy audits reveal your usage patterns, identify waste, over-expenditure and, generally, make you fully cognizant of where your energy dollars are going. This knowledge will enable you to be more efficient with your energy use and be able to track and accelerate savings. Energy Audits may sound expensive or complicated, but they can be free and are easier than you think.

WHAT IS AN ENERGY AUDIT?

An energy audit is an analysis of a facility, indicating how and where that facility can reduce energy consumption and save energy costs. Its insight to energy efficiency and conservation can lead to significant savings on the company's utility bill.

WHY SHOULD YOU GET AN ENERGY AUDIT?

Energy costs are soaring and your business can be at considerable risk if you do not take the guesswork out of your energy usage and the budget you need to cover it. Energy audits identify where your business is wasting energy. Residential and commercial properties account for around 10% of carbon emissions in the US, according to the EPA, which means they are very inefficient and waste huge amounts of energy and... revenue. An energy audit helps by revealing just how and where energy is being

wasted. With thousands of commercial energy customers nationwide, we are well-qualified to advise you on which methods are best used for reducing energy waste and overall energy consumption. Let's start with a simple free evaluation of your bills and show you how we have been found to save between 5% and 35% for many of our customers.

In the case of energy, less is more. Lower energy consumption equals lower energy costs. And, of course, less energy consumption is obviously good for the environment.

As you can see, to be truly effective, energy management requires a strategy just like the other aspect of your operation and measures to curb costs can be simple and in some cases free. Gaining more control over your energy costs will improve the general health of your budget. Not only that but reducing your CARBON FOOTPRINT is great for the environment too!

ENERGY AUDIT REPORT

ENERGY AUDIT OBJECTIVES.

Energy Audit was initiated in the beginning of 1970's, with the motive of inspecting the work executed within an organization, whose exercises could cause risk to the health of inhabitants and the environment. It exposes the genuineness of the proclamation made by the organisation with the concern on health issues. As a consequence of their operations with respect to environmental pollution it is the duty of the organisation to carry out the green audit of the ongoing processes for various reasons, such as,

To make sure whether one is performing in accordance with the relevant rules and regulations,

To improve the procedures and aptness of material in use,

To analyse the potential duties and to determine a way which can lower the cost and to the revenue.

Through green audit one gets adoration as to how to improve the condition of the environment. There are various factors that were forced upon and determine the growth of/or conduct of green audit. Incidents like,

Decades old Bhopal gas tragedy, that has left its residual effect which still haunts us.

Our buildings catching fire due to various reasons,

Industries blowing off taking valuable human lives etc

People going sick, feeling tired, after long hours of operations in the organization,

Increased demand of generators due to inconsistent power supply, which has resulted or lead into recent floods and droughts, are some of the situations to ponder about!

To address various issues in context with human health, green audit is assigned to "Criteria 7" of NAAC (National assessment and accreditation council) accreditation. NAAC is a self-governing organization in India that declares the institutions as Grade "A++", "A+", "A", Grade "B", according to the scores assigned at the time of accreditation.

The other intention of organising green audit is to update the environment conditions in and around the institutions i.e., within the

compound and outside the compound. It is carried out with the aid of performing certain tasks like waste management, energy consumed, diesel burnt it performing the objective of the organization. Lastly to self-assess the net carbon footprint of the conduct of process in the organization.

THE GOALS OF AUDIT

The purpose of carrying out green audit is securing the environment and cut down the threat posed to human health.

To Make sure that rules and regulations are complied with.

To avoid the environmental interruptions that are more difficult to handle and their corrections call for high cost.

To suggest the best protocol for adding to sustainable development.

To execute the process of the organisation utilising minimum natural resources and efficient use of those resources contributing to minimum waste generation.

How is the green audit conducted?

Pre-audit

Planning

selecting the team of auditors both internal and external

schedule the audit facility

acquire the background information

visit areas under audit

On site conditions:

UNDERSTAND THE SCOPE OF AUDIT

Analyse the strengths and weaknesses of the internal controls

Conduct audit with end user comfort focused and making it easy to perform.

Collect necessary evidence so that the stakeholders stand to understand how and where they are going wrong in the process of their conduct.

Post audit draw the report based on the data collected.

On confirmation of the preliminary report, draw a final report of the observations and inference with accuracy more near to implementable way.

Discuss various remedial measures for alternatives if required.

Prepare an action plan to overcome the shortcomings with continual observation on the action plan initiated.

Steps under green audit

Water is one of the cheapest commodities next to the Air we breathe. Although we Indians, use less water in comparison to western countries. However, the extent of pollutants that we leave behind has polluted all the resources including the deep well.

Rainwater harvesting is one of the best techniques that can be adopted by harvesting the rainwater and using it at the time of scarcity. the audit team to observe and investigate the relevant methods that can be adopted and implemented and draw the balance of use of water.

The point of generation of waste, the type of waste generated, i.e., hazardous, recyclable and organically compostable wastes and segregating method at the point of generation for easy and best way to handle the same. Evaluating such methods to minimise the use of resources in the process of their management.

It deals with use of energy in the conduct of the process. The priority is topmost for conservation over efficiency; hence, energy auditor should always consider not to use the energy if necessary. At best it can be used judiciously.

It analyses air quality, noise level and the programs undertaken by the institution for plantation creating awareness of trees around us and how nature provides us with remedial measures within its framework.

In the process of use of resources and conduct of the activities, they can develop impact on human health, that might be off minutely harmful, cause permanent disorder or may even cause death. Occupational health hazards are discussed in detail and the stakeholders are informed of the same and required necessary remedial measures indicated.

To make in organisation net zero net zero carbon emission use of renewable resources including energy such as solar wind biogas geothermal energies are put into ooh utilisation.

The net impact All the above energy audits should be to make an organisation contribute zero emissions which are called bye bhai use of water generation of waste use of energy e environmental damage health damage and finally to explore if the campus or direction can go in in contributing to third-party emissions minimising

To draw home the benefits, the system has been separated out into various audits as listed above. In doing so, and if audit findings are effectively implemented there are many advantages that can be practised in the process

Recognise the cost saving methods through waste minimising and managing technologies.

Point out the prevailing and forth coming complications.

Authenticate conformity with the legal requirements.

Empower the organisation to frame a better environmental performance.

Portray a good image of the institution which helps build better relationships with the group's organisations, stakeholders in and around its operations

Enhance the alertness for environmental guidelines duties and conduct of preparedness for any eventualities due to environmental disasters.

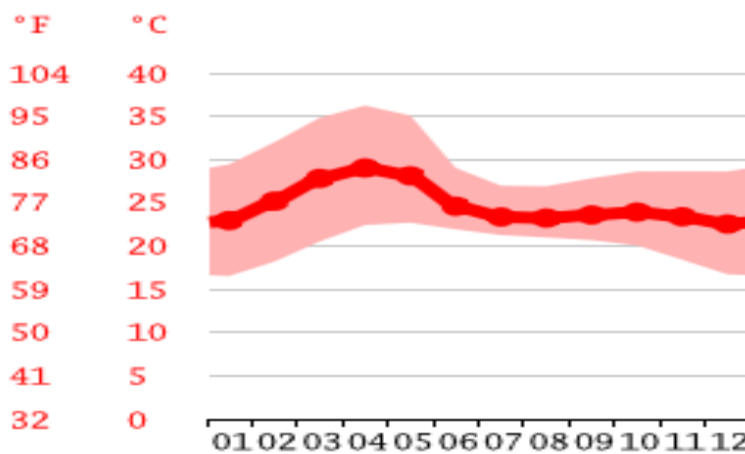
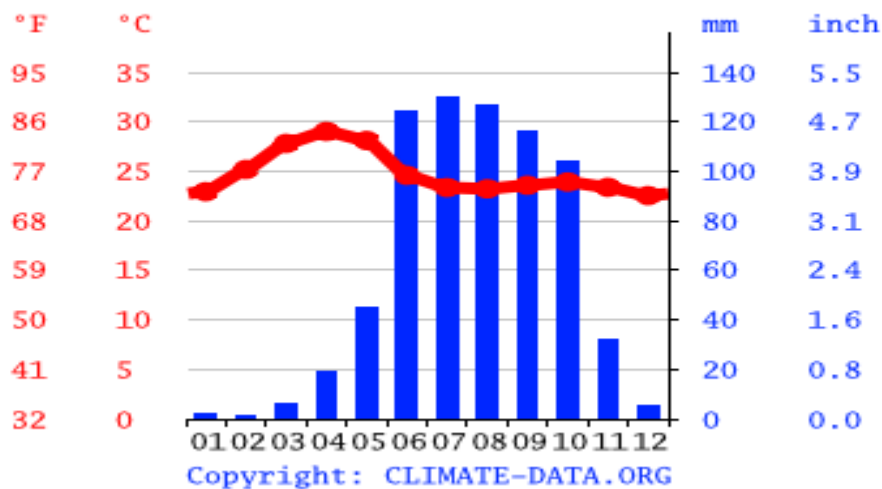
proposed)

Indicative templet for display at all prominent areas, classrooms, waiting rooms, canteen, library, relaxing areas in the campus.

GEOGRAPHICAL CONSIDERATIONS:

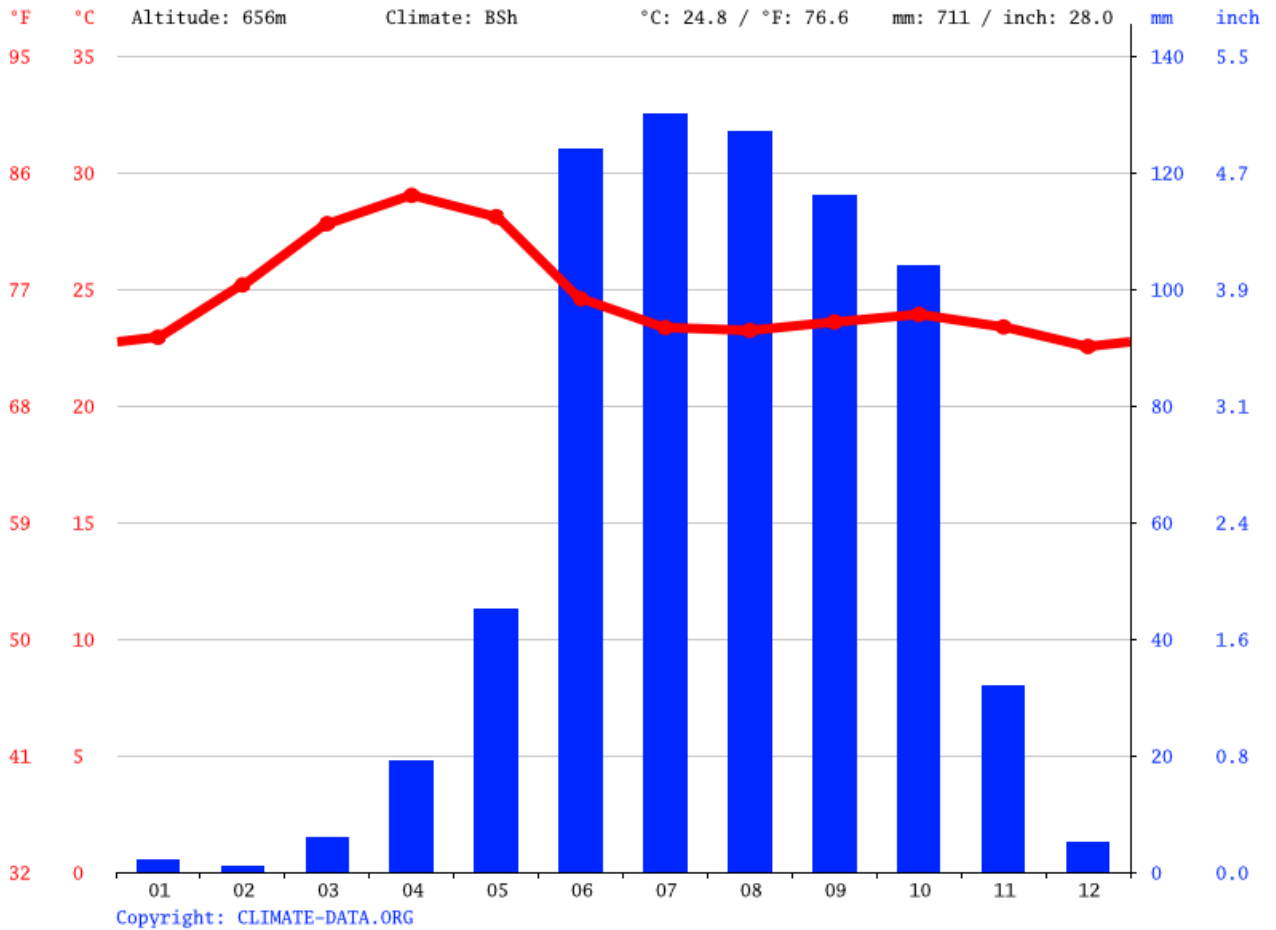
Before we present our report, the factors that are considered for positive impact recommendations are,

CLIMATE GADAG (INDIA)



Gadag's climate is a local steppe climate. There is little rainfall throughout the year. The Köppen-Geiger climate classification is BSh. The average annual temperature is 24.8 °C | 76.6 °F in Gadag. About 711 mm | 28.0 inch of precipitation falls annually.

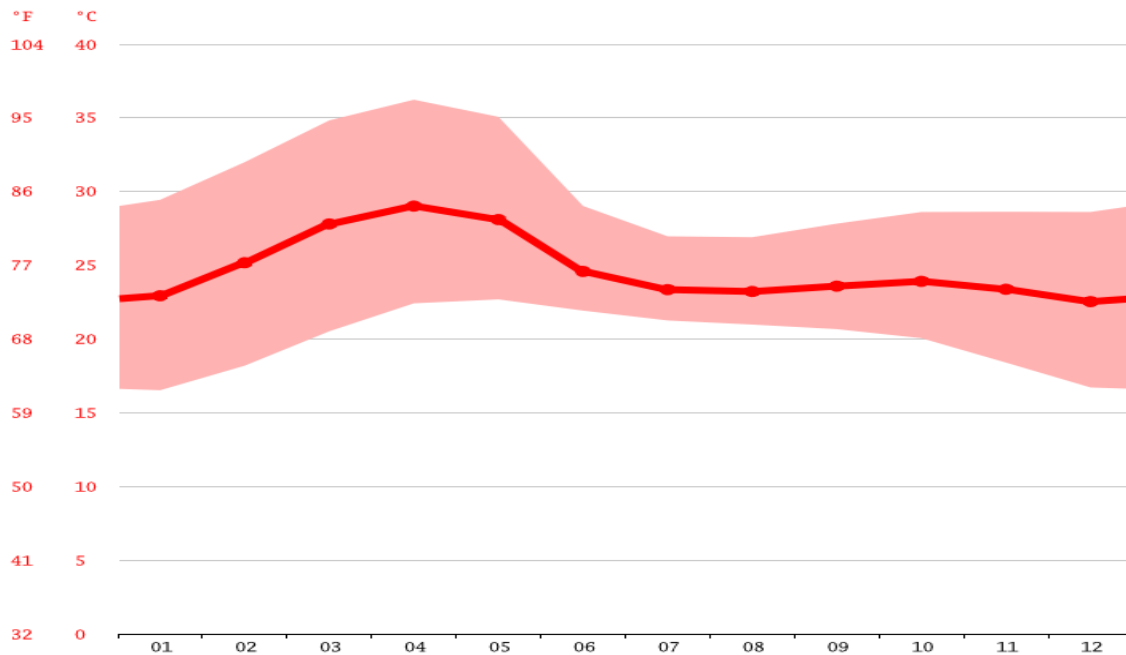
CLIMATE GRAPH // WEATHER BY MONTH GADAG



Precipitation is the lowest in February, with an average of 1 mm | 0.0 inch. The greatest amount of precipitation occurs in July, with an average of 130 mm | 5.1 inch.

ENERGYMALL

AVERAGE TEMPERATURE GADAG



At an average temperature of 29.0 °C | 84.2 °F, April is the hottest month of the year. The lowest average temperatures in the year occur in December, when it is around 22.5 °C | 72.6 °F.

WEATHER BY MONTH // WEATHER AVERAGES GADAG

	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Avg. Temp in °C	22.9	25.2	27.8	29.0	28.1	24.6	23.4	23.2	23.6	23.9	23.4	22.5
Min. Temp in °C	16.5	18.2	20.5	22.4	22.7	21.9	21.3	21.0	20.7	20.1	18.4	16.7
Max. Temp in °C	29.4	32.0	34.8	36.2	35.1	29.0	27.0	26.9	27.8	28.6	28.6	28.6
Precipitation / Rainfall in mm	2	1	6	19	45	124	130	127	116	104	32	5
Humidity(%)	44%	38%	36%	46%	57%	77%	82%	81%	79%	71%	58%	50%
Rainy days (d)	1	0	1	3	6	14	16	16	11	10	3	1
avg. Sun hours (hours)	9.8	10.3	10.7	11.0	10.5	7.1	6.3	6.0	6.7	8.1	8.7	9.1

Between the driest and wettest months, the difference in precipitation is 129 mm. The variation in temperatures throughout the year is 6.5 °C.

The month with the highest relative humidity is July (81.53 %). The month with the lowest relative humidity is March (35.89 %).

The month with the highest number of rainy days is July (21.73 days). The month with the lowest number of rainy days is February (0.40 days).

Gadag in the middle and the summers are that easy to define.

The best time to visit are January, February, March, June, July, August, September, October, November, December.

COURTESY : <https://en.climate-data.org/asia/india/karnataka/gadag-24177/>

The variation in the precipitation between the driest and wettest months is 536 mm | 21 inches

h. During the year, the average temperatures vary by 5.9 °C | 42.6 °F.

The temperature in Belagavi is, 5 months above 30(°C), 3 months above 29(°C) and 4 months below 29(°C). However, the minimum temperature has never exceeded 21°C. Indicating that the temperature has been very pleasant all over the year except reaching peak during the noon hours.

LIMITATIONS:

Our recommendations are in the interest of conservation of Electrical Energy and Green Culture i.e. the reduction in CARBON FOOTPRINT. The compliance to the recommendations will be subjected to meeting the safety and Environmental rules and guidelines.

DISCUSSIONS ON EXECUTIVE SUMMARY:**PART 2 -TECHNICAL**

Aerial View of the College Campus.



Figure 7 - Satellite view of the Academic block

It is also prominently exhibited in all prominent places. Aerial view indicates that the management has shown keen interest in providing the amenities and is focusing on keeping the campus green there by the cool environment within the boundaries of the college.

Image : courtesy, Google Earth Pro, 16.408037° 74.376359°



Figure 8 - Aerial view of campus

The observations are drawn from the site visits and aerial survey of the campus when the corrective measures are discussed.

POWER CONSUMPTION

Sr No	Observation*	Problems*	Resulting losses*	Remedial measures*	Capital*	Projected savings*	Category 7
1	Energy consumption	Use of T8 & T5 tube lights.	Excess energy use	Replace with LED Lamps	@ 300/- per Fixture	50% of the energy used in lighting systems.	

SUBDIVISION NAME: NaregalSection

ConnectionID: Customer Name:
 RRNO: Address:

LFNo	Tariff	Service Date	Sanc Load	Sanc HP	Meter Constant	Contract Demand	Avg Cons	Type Of Inst	Inst Status	DisCon Date	Reading Date	DueDate
2F-35	LT-2 (b)(i)-U	06/12/1972	10.00	0.00	1	0.00	292.00	Private	Active		10	24

BillNo	MonthYear	Meter Reading	Consumption	Slow Rtn%	Asrd Reading	ASSD Cons	SubMeter Consumption	SubMeter Reading	Reason	Revenue OB	Interest OB	Interest	Demand	RoundOff	Total	Collection	Adjustment Amount	Closing balance	Kvch Reading	Kvch Consumption	PFLag	BMD	NoOfDays	BillissueDate	ComplaintId	Gok
202205072104201	May-2022	51449	259.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	3341.25	-0.25	3341.00	3341.00	0.00	0.00	0	0.000	0.85	0.0000	30	11/05/2022	0	0.0
202204072104201	Apr-2022	51190	339.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	3868.34	-0.34	3868.00	3868.00	0.00	0.00	0	0.000	0.85	0.0000	30	12/04/2022	0	0.0
202203072104201	Mar-2022	50851	256.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	3099.34	-0.34	3099.00	3099.00	0.00	0.00	0	0.000	0.85	0.0000	30	14/03/2022	0	0.0
202202072104201	Feb-2022	50595	280.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	3321.70	0.30	3322.00	3322.00	0.00	0.00	0	0.000	0.85	0.0000	30	14/02/2022	0	0.0
202201072104201	Jan-2022	50315	345.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	3923.93	0.07	3924.00	3924.00	0.00	0.00	0	0.000	0.85	0.0000	30	12/01/2022	0	0.0
20211072104201	Dec-2021	49970	415.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	4543.43	-0.43	4543.00	4543.00	0.00	0.00	0	0.000	0.85	0.0000	30	11/12/2021	0	0.0
202111072104201	Nov-2021	49555	433.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	4910.61	0.39	4911.00	4911.00	0.00	0.00	0	0.000	0.85	0.0000	30	12/11/2021	0	0.0
202110072104201	Oct-2021	49122	322.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	3876.22	-0.22	3876.00	3876.00	0.00	0.00	0	0.000	0.85	0.0000	30	12/10/2021	0	0.0
202109072104201	Sep-2021	48800	412.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	4363.40	-0.40	4363.00	4363.00	0.00	0.00	0	0.000	0.85	0.0000	30	16/09/2021	0	0.0
202108072104201	Aug-2021	48388	265.000	0.00	0	0	0.000	0	Normal	-1419.00	0.00	0.00	3066.13	-0.13	1647.00	1647.00	0.00	0.00	0	0.000	0.85	0.0000	30	11/08/2021	0	0.0
202107072104201	Jul-2021	48123	162.000	0.00	0	0	0.000	0	Normal	1416.49	2.51	7.10	2208.93	-0.03	3635.00	3635.00	-1419.00	0.00	0.000	0.85	0.0000	30	13/07/2021	0	0.0	
202106072104201	Jun-2021	47961	474.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	1731.15	0.15	1733.81	1733.81	-514.81	0.00	0.000	0.85	0.0000	30	18/06/2021	0	0.0	
202105072104201	May-2021	0	0.000	0.00	348	0.000	0	DL	0.00	0.00	0.00	3763.79	0.21	3764.00	3764.00	0.00	0.00	0	0.000	0.85	0.0000	30	17/05/2021	0	0.0	
202104072104201	Apr-2021	47487	382.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	4075.09	-0.09	4075.00	4075.00	0.00	0.00	0	0.000	0.85	0.0000	30	15/04/2021	0	0.0
202103072104201	Mar-2021	47165	305.000	0.00	0	0	0.000	0	Normal	3851.00	0.00	16.69	3382.28	0.03	7250.00	3399.00	-3851.00	0.00	0.000	0.85	0.0000	30	12/03/2021	0	0.0	
202102072104201	Feb-2021	46800	356.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	3851.28	-0.28	3851.00	3851.00	0.00	0.000	0.85	0.0000	30	12/02/2021	0	0.0		
202101072104201	Jan-2021	46444	388.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	4145.55	0.45	4146.00	4146.00	0.00	0.000	0.85	0.0000	30	12/01/2021	0	0.0		
20201072104201	Dec-2020	46056	308.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	3416.03	-0.03	3416.00	3416.00	-440.00	0.00	0.000	0.85	0.0000	30	11/12/2020	0	0.0	
202011072104201	Nov-2020	45748	339.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	3435.45	-0.45	3435.00	3435.00	0.00	0.000	0.85	0.0000	30	10/11/2020	0	0.0		
202010072104201	Oct-2020	45409	360.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	3618.68	0.32	3619.00	3619.00	0.00	0.000	0.85	0.0000	30	12/10/2020	0	0.0		
202009072104201	Sep-2020	45049	311.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	3191.13	-0.13	3191.00	3191.00	0.00	0.000	0.85	0.0000	30	14/09/2020	0	0.0		
202008072104201	Aug-2020	44738	350.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	3531.43	-0.43	3531.00	3531.00	0.00	0.000	0.85	0.0000	30	14/08/2020	0	0.0		
202007072104201	Jul-2020	44388	410.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	4054.96	0.04	4055.00	4055.00	0.00	0.000	0.85	0.0000	30	15/07/2020	0	0.0		
202006072104201	Jun-2020	43978	470.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	4652.75	0.25	4653.00	4653.00	0.00	0.000	0.85	0.0000	30	13/06/2020	527673	0.0		
202005072104201	May-2020	43508	811.000	0.00	0	0	0.000	0	Normal	4262.00	0.00	22.73	3720.85	0.42	8006.00	8006.00	0.00	0.000	0.85	0.0000	30	11/05/2020	0	0.0		
202004072104201	Apr-2020	0	0.000	0.00	426	0.000	0	DL	0.00	0.00	0.00	4261.87	0.13	4262.00	4262.00	0.00	0.000	0.85	0.0000	30	10/04/2020	0	0.0			
202003072104201	Mar-2020	42697	431.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	4233.88	0.12	4234.00	4234.00	0.00	0.000	0.85	0.0000	30	11/03/2020	0	0.0		
202002072104201	Feb-2020	42266	450.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	4399.48	-0.48	4399.00	4399.00	0.00	0.000	0.85	0.0000	30	13/02/2020	0	0.0		
202001072104201	Jan-2020	41816	397.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	3937.55	0.45	3938.00	3938.00	0.00	0.000	0.85	0.0000	30	13/01/2020	0	0.0		
201806072104201	Jun-2018	32250	517.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	4965.78	0.20	4965.98	4965.98	-456.98	0.00	0.000	0.85	0.0000	30	13/06/2018	0	0.0	
201805072104201	May-2018	31733	585.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	5090.78	0.22	5091.00	5091.00	0.00	0.000	0.85	0.0000	30	11/05/2018	0	0.0		
201804072104201	Apr-2018	31148	616.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	489.34	-0.33	5350.00	5350.00	0.00	0.000	0.85	0.0000	30	11/04/2018	0	0.0		
201803072104201	Mar-2018	30532	552.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	4891.44	-0.44	4891.00	4891.00	0.00	0.000	0.85	0.0000	30	11/03/2018	0	0.0		
201802072104201	Feb-2018	29980	558.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	4941.51	0.49	4942.00	4942.00	0.00	0.000	0.85	0.0000	30	11/02/2018	0	0.0		
201801072104201	Jan-2018	29422	606.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	5342.07	-0.07	5342.00	5342.00	0.00	0.000	0.85	0.0000	30	11/01/2018	0	0.0		
201701072104201	Jan-2017	21235	638.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	5260.94	0.06	5261.00	4989.00	272.00	0.000	0.85	0.0000	30	11/01/2017	0	0.0		

CUSTOMER HISTORY

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SUBDIVISION NAME: NaregalSection

ConnectionID: Customer Name:
 RRNO: Address:

LFNo	Tariff	Service Date	Sanc Load	Sanc HP	Meter Constant	Contract Demand	Avg Cons	Type Of Inst	Inst Status	DisCon Date	Reading Date	DueDate
2F-35	LT-2 (b)(i)-U	19/05/1999	2.00	0.00	1	0.00	53.00	Private	Active		10	24

BillNo	MonthYear	Meter Reading	Consumption	Slow Rtn%	Asrd Reading	ASSD Cons	SubMeter Consumption	SubMeter Reading	Reason	Revenue OB	Interest OB	Interest	Demand	RoundOff	Total	Collection	Adjustment Amount	Closing balance	Kvch Reading	Kvch Consumption	PFLag	BMD	NoOfDays	BillissueDate	ComplaintId	Gok
202205072104001	May-2022	6061	12.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	405.48	-0.48	405.00	405.00	0.00	0.000	0.85	0.0000	30	11/05/2022	0	0.0		
202204072104001	Apr-2022	6049	41.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	594.00	0.00	594.00	594.00	0.00	0.000	0.85	0.0000	30	12/04/2022	0	0.0		
202203072104001	Mar-2022	6008	55.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	704.64	0.36	705.00	705.00	0.00	0.000	0.85	0.0000	30	14/03/2022	0	0.0		
202202072104001	Feb-2022	5953	62.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	759.96	0.04	760.00	760.00	0.00	0.000	0.85	0.0000	30	14/02/2022	0	0.0		
202201072104001	Jan-2022	5891	40.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	586.10	-0.10	586.00	586.00	0.00	0.000	0.85	0.0000	30	12/01/2022	0	0.0		
20211072104001	Dec-2021	5851	64.000	0.00	0	0	0.000	0	Normal	0.00	0.00	0.00	771.28	-0.28	771.00	771.00	0.00	0.000	0.85	0.0000	30	11/12/2021	0	0.0		
202111072104001	Nov-2021	5787	32.000	0.00	0	0	0.000	0	Normal																	

CUSTOMER HISTORY

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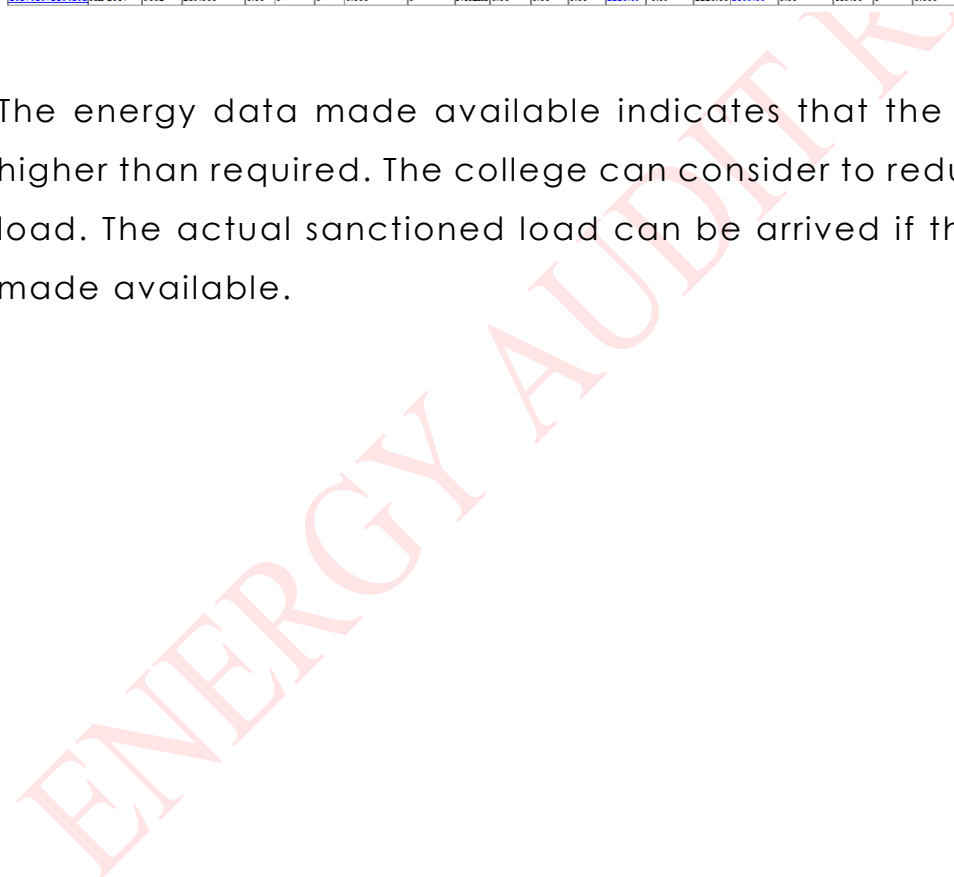
SUBDIVISION NAME: NaregalACSection

ConnectionID: 721041 Customer Name: PRINSHIPAL S A COLLEGE
 RRNO: KDKMP2 Address: KODIKOPPA NAREGAL 582119

LFN	Tariff	Service Date	San Load	San HP	Meter Constant	Contract Demand	Avg Cos	Type Of Inst	Inst Status	DisCon Date	Reading Date	DueDate
TF-35	LT-2 (b)(c)-U	01/08/1987	4.00	0.00	1	0.00	218.00	Private	Active		10	24

BillNo	MonthYear	Meter Reading	Consumption	Slow Run%	Acid Reading	ASSD Cost	SubMeter Consumption	SubMeter Reading	Reason	Revenue OB	Interest OB	Demand	RoundOff	Total	Collection	Adjustment Amount	Closing balance	Kvnh Reading	Kvnh Consumption	PFLag	BMD	NoOfDays	BillinDate	ComplainId	GetBalance	Test Reading	
202206072104101	May-2022	7016	162.000	0.00	0	0.000	0	0	Normal	0.00	0.00	1769.03	-0.03	1769.00	1769.00	0.00	0.00	0	0.000	0.85	0.0000	30	11/05/2022	0	0.00	0	
202204072104101	Apr-2022	6854	228.000	0.00	0	0.000	0	0	Normal	0.00	0.00	2239.92	0.08	2240.00	2240.00	0.00	0.00	0	0.000	0.85	0.0000	30	12/04/2022	0	0.00	0	
202203072104101	Mar-2022	6626	208.000	0.00	0	0.000	0	0	Normal	0.00	0.00	2054.62	0.38	2055.00	2055.00	0.00	0.00	0	0.000	0.85	0.0000	30	14/03/2022	0	0.00	0	
202202072104101	Feb-2022	6418	218.000	0.00	0	0.000	0	0	Normal	0.00	0.00	2147.27	-0.27	2147.00	2147.00	0.00	0.00	0	0.000	0.85	0.0000	30	14/02/2022	0	0.00	0	
202201072104101	Jan-2022	6200	237.000	0.00	0	0.000	0	0	Normal	0.00	0.00	2323.31	-0.31	2323.00	2323.00	0.00	0.00	0	0.000	0.85	0.0000	30	12/01/2022	0	0.00	0	
202112072104101	Dec-2021	5963	265.000	0.00	0	0.000	0	0	Normal	0.00	0.00	2564.18	-0.18	2564.00	2564.00	0.00	0.00	0	0.000	0.85	0.0000	30	11/12/2021	0	0.00	0	
202111072104101	Nov-2021	5698	173.000	0.00	0	0.000	0	0	Normal	0.00	0.00	1838.24	-0.24	1838.00	1838.00	0.00	0.00	0	0.000	0.85	0.0000	30	12/11/2021	0	0.00	0	
202110072104101	Oct-2021	5525	171.000	0.00	0	0.000	0	0	Normal	0.00	0.00	1816.03	-0.03	1816.00	1816.00	0.00	0.00	0	0.000	0.85	0.0000	30	12/10/2021	0	0.00	0	
202109072104101	Sep-2021	5354	203.000	0.00	0	0.000	0	0	Normal	0.00	0.00	1918.98	0.02	1919.00	1919.00	0.00	0.00	0	0.000	0.85	0.0000	30	16/09/2021	0	0.00	0	
202108072104101	Aug-2021	5151	274.000	0.00	0	0.000	0	0	Normal	1949.00	0.00	2545.55	0.45	2545.00	2545.00	0.00	0.00	0	0.000	0.85	0.0000	30	11/08/2021	0	0.00	0	
202107072104101	Jul-2021	4877	0.000	0.00	0	0.000	0	0	Normal	1947.97	1.03	9.75	400.00	0.25	2359.00	4308.00	0.00	-1949.00	0.000	0.85	0.0000	30	13/07/2021	0	0.00	0	
202106072104101	Jun-2021	4877	213.000	0.00	0	0.000	0	0	Normal	0.00	0.00	2017.73	-0.38	2018.00	2018.00	0.00	1949.00	0.000	0.85	0.0000	30	18/06/2021	0	0.00	0		
202105072104101	May-2021	4664	153.000	0.00	0	0.000	0	0	Normal	0.00	0.00	1524.41	0.41	1524.00	1524.00	0.00	0.00	0	0.000	0.85	0.0000	30	17/05/2021	0	0.00	0	
202104072104101	Apr-2021	4511	389.000	0.00	0	0.000	0	0	Normal	0.00	0.00	1629.18	-0.18	1629.00	1629.00	0.00	0.00	0	0.000	0.85	0.0000	30	15/04/2021	0	0.00	0	
202103072104101	Mar-2021	4122	314.000	0.00	0	0.000	0	0	Normal	0.00	0.00	2955.04	-0.04	2955.00	2955.00	0.00	0.00	0	0.000	0.85	0.0000	30	12/03/2021	0	0.00	0	
202102072104101	Feb-2021	3808	258.000	0.00	0	0.000	0	0	Normal	0.00	0.00	2715.95	0.05	2716.00	2716.00	0.00	0.00	0	0.000	0.85	0.0000	30	12/02/2021	0	0.00	0	
202101072104101	Jan-2021	3520	245.000	0.00	0	0.000	0	0	Normal	0.00	0.00	2330.52	0.48	2321.00	2321.00	0.00	0.00	0	0.000	0.85	0.0000	30	12/01/2021	0	0.00	0	
202012072104101	Dec-2020	3275	154.000	0.00	0	0.000	0	0	Normal	0.00	0.00	1549.44	-0.44	1549.00	1549.00	-97.00	0.00	0	0.000	0.85	0.0000	30	11/12/2020	0	0.00	0	
202011072104101	Nov-2020	3121	167.000	0.00	0	0.000	0	0	Normal	0.00	0.00	1529.62	0.38	1530.00	1530.00	0.00	0.00	0	0.000	0.85	0.0000	30	10/11/2020	0	0.00	0	
202010072104101	Oct-2020	2954	209.000	0.00	0	0.000	0	0	Normal	0.00	0.00	1851.13	-0.13	1851.00	1851.00	0.00	0.00	0	0.000	0.85	0.0000	30	12/10/2020	0	0.00	0	
202009072104101	Sep-2020	2745	231.000	0.00	0	0.000	0	0	Normal	0.00	0.00	2043.00	-0.09	2043.00	2043.00	0.00	0.00	0	0.000	0.85	0.0000	30	14/09/2020	0	0.00	0	
202008072104101	Aug-2020	2514	104.000	0.00	0	0.000	0	0	Normal	0.00	0.00	1065.75	0.25	1066.00	1066.00	0.00	0.00	0	0.000	0.85	0.0000	30	14/08/2020	0	0.00	0	
202007072104101	Jul-2020	2410	129.000	0.00	0	0.000	0	0	Normal	0.00	0.00	1249.83	0.17	1250.00	1250.00	0.00	0.00	0	0.000	0.85	0.0000	30	15/07/2020	0	0.00	0	
202006072104101	Jun-2020	2281	201.000	0.00	0	0.000	0	0	Normal	0.00	0.00	5302.27	-0.27	5302.00	5302.00	0.00	0.00	0	0.000	0.85	0.0000	30	13/06/2020	0	0.00	0	
202005072104101	May-2020	2080	347.000	0.00	0	0.000	0	0	Normal	3554.00	0.00	18.95	420.11	0.16	3153.00	3153.00	0.00	0.00	0	0.000	0.85	0.0000	30	11/05/2020	0	0.00	0
202004072104101	Apr-2020	0	0.000	0.00	0	397	0.000	0	DL	0.00	0.00	3554.25	-0.25	3554.00	0.00	0.00	3554.00	0.000	0.85	0.0000	30	10/04/2020	0	0.00	0		
202003072104101	Mar-2020	1733	372.000	0.00	0	0.000	0	0	Normal	0.00	0.00	3269.67	0.33	3270.00	3270.00	0.00	0.00	0	0.000	0.85	0.0000	30	11/03/2020	0	0.00	0	
202002072104101	Feb-2020	1361	499.000	0.00	0	0.000	0	0	Normal	0.00	0.00	4376.54	-0.46	4377.00	4377.00	0.00	0.00	0	0.000	0.85	0.0000	30	13/02/2020	0	0.00	0	
202001072104101	Jan-2020	862	319.000	0.00	0	0.000	0	0	Normal	0.00	0.00	2807.75	0.25	2808.00	2808.00	0.00	0.00	0	0.000	0.85	0.0000	30	13/01/2020	0	0.00	0	
201806072104101	Jun-2018	9166	145.000	0.00	0	0.000	0	0	Normal	0.00	0.00	1349.53	0.20	1349.71	1249.00	-100.71	0.00	0	0.000	0.85	0.0000	30	13/06/2018	0	0.00	0	
201805072104101	May-2018	9021	93.000	0.00	0	0.000	0	0	Normal	0.00	0.00	860.77	0.23	861.00	861.00	0.00	0.00	0	0.000	0.85	0.0000	30	11/05/2018	0	0.00	0	
201804072104101	Apr-2018	8928	273.000	0.00	0	0.000	0	0	Normal	0.00	0.00	177	2197.70	-0.47	2199.00	2199.00	0.00	0.00	0	0.000	0.85	0.0000	30	11/04/2018	0	0.00	0
201803072104101	Mar-2018	8655	217.000	0.00	0	0.000	0	0	Normal	0.00	0.00	1765.87	0.13	1766.00	1766.00	0.00	0.00	0	0.000	0.85	0.0000	30	11/03/2018	0	0.00	0	
201802072104101	Feb-2018	8438	192.000	0.00	0	0.000	0	0	Normal	0.00	0.00	1567.84	0.16	1568.00	1568.00	0.00	0.00	0	0.000	0.85	0.0000	30	11/02/2018	0	0.00	0	
201801072104101	Jan-2018	8246	131.000	0.00	0	0.000	0	0	Normal	0.00	0.00	1139.62	0.38	1140.00	1140.00	0.00	0.00	0	0.000	0.85	0.0000	30	11/01/2018	0	0.00	0	
201701072104101	Jan-2017	5002	289.000	0.00	0	0.000	0	0	Normal	0.00	0.00	2220.09	-0.09	2220.00	2105.00	0.00	115.00	0	0.000	0.85	0.0000	30	11/01/2017	0	0.00	0	

The energy data made available indicates that the sanctioned load is higher than required. The college can consider to reduce the sanctioned load. The actual sanctioned load can be arrived if the monthly bills are made available.



RENEWABLE ENERGY

Sr No	Observation*	Problems*	Resulting losses*	Remedial measures*	Capital*	Projected savings*	Category 7
2	Solar Power	Suggest to install Solar Power to minimise use of energy during Off grid times.					7.1.2



The institute is currently using Solar power as stand by source. The institute may consider use of Solar power as primary source of power. Reason being, Naregal is a semi-urban area and power supply is likely to be interrupted more often than Urban areas.

Town also comes under dry zone with scanty or low rainy days. Hence clear sun days are available for use.

Institute has good space to explore rooftop Solar power to meet the energy requirement of the institute. The initiative can take the institute to net zero energy.

SENSOR TECHNOLOGY

Sr No	Observation*	Problems*	Resulting losses*	Remedial measures*	Capital*	Projected savings*	Category 7
3	Occupancy sensor	Wastage of power	High	Occupancy sensor based switching	₹1500 per room	Resulted ROI of one year.	7.1.2

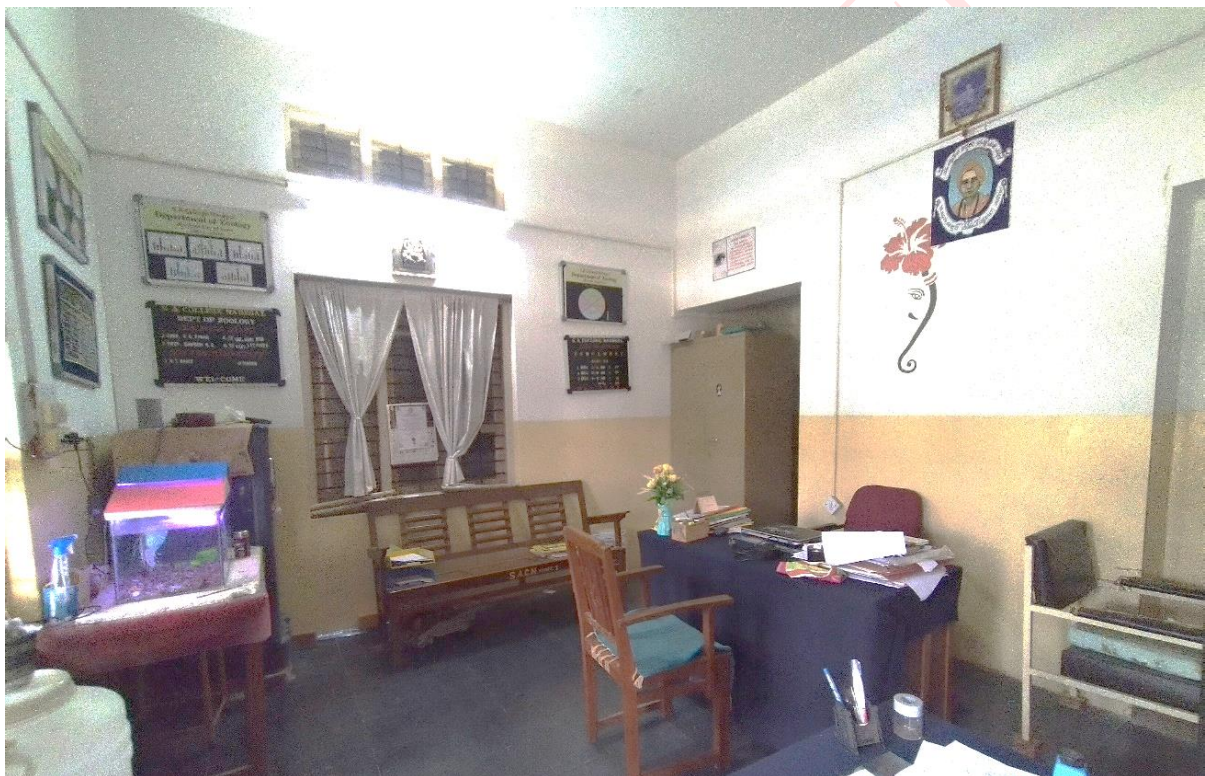


Figure 10- Lighting need for sensor

It is also observed that the lights are left switched ON at majority of places during daylight, thus calling for wastage of electrical power. Thus causing financial losses to the management and energy loss to the country.

Solution:

It is therefore required to install Light Intensity Sensors in all the rooms. Lighting improvements should be carried out by using T5/LED or The Induction Light systems in lieu of normal tube lights. If the finance department permits, it is advised to install 40W Induction lamps in all classrooms.

Source : Can be locally procured, However the load-based selection is key aspect in its installation. To set the visibility, the intensity of natural light is much stronger and hence LUX based setting doesn't work. Hence the technical supervision is key aspect.

We suggest to allocate this to the Physics stream of students to understand the science and application of technology. Need based light energy utilisation should be imparted to the children so as to take it forward to the society.

The other aspect to the light energy is the task based lighting. I.e., Task – normal or critical.

General lighting ie open larea or living room lighting.

External lighting ie yard lighting for security reasons.

We find use of T8 & T12 tube lights. It is wise to replace the same with LED tube lights on immediate basis. Considering the energy savings, the wait for there failure may not be justified.



Figure 9- Need for occupancy sensor

NATURAL LIGHTING

Category 7.1.1, 7.1.2, 7.1.3 and 7.1.5

LIGHT INTENSITY SENSOR REQUIREMENT.

	Observation*	Problems*	Resulting losses*	Remedial measures*	Capital*	Projected savings*	Category 7
5	Electrical	Old tube lights	High energy consumers	LED lights of appropriate ratings.	Rs.80/- to Rs.250/- per	Rs.175/- per tube per annum. ROI of 1 years	7.1.6
6	Natural Lighting	Un cleaned windows and	High energy bills	Clean the windowpanes and allow	Nil, part of routine, in	Substantial cost of energy bills on lighting	7.1.2, 7.1.6





Figure 10 - T5 & T8 tube lights with Electromagnetic choke

We also suggest to make best use of natural lighting

In the above roof, it may be considered to replace couple of the Galvalume sheets with green tinted Translucent (frp) sheets as below.

It may be seen that the Light is illuminated. However, the brightness The shadow indicates natural light coming from the windows is brighter. Natural light is more predominant than the tube light. Hence tube light being switched off has no adverse effect. It would save on the energy consumption and contribute to green practices.



Figure 11 - Lighting, use of natural lighting

The Book racks and cupboards may be placed vertical to the windows to allow the natural light to illuminate the task area.

BATTERY MANAGEMENT.

Sr No	Observation*	Problems*	Resulting losses*	Remedial measures*	Capital*	Projected savings*	Category 7
3	Battery placement	Battery shell in conductor loop	Low performance & self-	Design the stacking arrangements	In house re sources	25% of the cost of the batteries.	7.1.3

Criteria 7.1.1, 7.1.2, 7.1.3 and 7.1.5

BATTERY PLACEMENT:

The batteries should be placed on an

Batteries should be placed on an insulated platform not touching any of the metal frames with top clearance of 6" for ease of handling and breathing.

Need cross ventilation for favourable breathing.

Provision for periodical checking and maintenance should be made possible without major obstacles.



Figure 12 - Galvanic reaction causing damage to battery life.



Figure 13 - Battery placement, Need cross ventilation.

In absence of the above placement conditions,

The batteries will discharge faster. Loss of energy

The charging time and current will increase as there is the return path for self-discharge. Increased Energy Demand.

A well-maintained battery is known to serve for more than 7 years.

The presence of oxidation marks at the point of contact should not develop over the time.

We strongly advice for regenerating the batteries once every 3 to 4 years so that they serve over 15 years in lieu of 5 years under present conditions. A well-maintained battery will draw less charging power, i.e., saves on energy consumption, delivers more energy per charge thus resulting in better serviced life.

Batteries should be placed well ventilated and avoid dumping of any material on the breathers provided.

For more information on battery regeneration, Contact

Sunshubh Technovations Pvt Ltd, Hubli ceo@sunshubhrenewables.com.

BATTERY REGENERATION

Battery regeneration is very popular. 80% of the batteries breaking down and losing capacity are sulphated, but can be restored with the right equipment. Battery regenerator successfully replaces sulphation by active material thanks to an electrical high-frequency pulsation process. This process restores the battery capacity, giving you the ability to reuse old and sulphated batteries. You can also use the battery regenerator for annual maintenance to considerably prolong the lifespan of your batteries. The battery regenerator can be used in every lead-acid-based battery: starter batteries, stationary batteries, traction & semi-traction batteries, Ni-Cad batteries ... Since the college uses BATTERIES in large numbers, the management can consider to procure one unit at the centralised station in the college campus.

Sr No	Observation*	Problems*	Resulting losses*	Remedial measures*	Capital*	Projected savings*	Category 7
4	Battery regeneration.	Short life span	300% of the cost of the battery.	Subject all batteries to regeneration made	Rs.20.00 Lacs or as per user agreement	300 %	7.1.2, 7.1.6

NECESSITY AND ISSUES

It is customary in the present energy scenario to use Batteries either in our office or working environment. In continuation, The old week batteries are a nuisance as they need to be discarded in to the environment for further process. Which is a costly option both in terms of Health and pollution issues. Let us review our use of application and consider if we can improve our battery use methods. A brief note, before we consider to take corrective step.

Lead-acid batteries are widely used as important power supply devices that include automotive, uninterruptible power supply (UPS), telecommunication systems and various traction duties.

Lead-acid batteries are the workhorse of the rechargeable battery systems for its reliability, low cost, and good operational life. Predictably, approximately million tons waste batteries are generated every year and the production of lead-acid batteries will continue to rise even more sharply with sustained and rapid development of economy. The lead-acid battery is a complex industrial product, constituted by several different materials, the consequence was very serious which often caused much property loss, casualties and environment pollution once accidents happen

Based on "Technical Guidelines for Environmental Risk Assessment on Projects" and in consideration of the characteristics of the chemical compositions and contents, a framework of environmental risk assessment framework on lead-acid batteries was established. The work procedure included risk identification, sources analysis, pollution forecast, and defensive measures. By analysing the environmental risk assessment of lead-acid batteries, the study opined for directions both for the preventive measures and safe use, according to the forecast results of lead-acid batteries.

RISK IDENTIFICATION OF LEAD-ACID BATTERIES

Lead-acid batteries generally consist of four parts, which are electrolyte, lead and lead alloy grid, lead paste, and organics and plastics, which included lots of toxic, hazardous, flammable, explosive substances that can easily create potential risk sources. The materials contained in lead-acid batteries may bring about lots of pollution accidents such as fires, explosions, poisoning and leaks, contaminating environment and damaging ecosystem. The main chemical compositions and contents of spent lead-acid batteries are listed below.

Environmental effects of lead can end up in water and soils through corrosion of leaded pipelines in a water transporting system and through corrosion

The main chemical compositions and contents of spent lead-acid batteries

Compositions	Contents (wt.%)
Electrolyte	11–30%
Lead and lead alloy grid	24–30%
Lead paste	30–40%
Organics and plastics	22–30%

The recognition & scope of lead-acid batteries, mainly focused on the pollutants involved in the process of centralized recovery, Storage areas and transport. Based on “Technical Guidelines for Environmental Risk Assessment on Projects” and “Identification of hazard installations for dangerous chemicals

With change in times, new solutions keep coming up. One such option is to Regenerate the dead or non-usable batteries. Energic Plus battery regenerator successfully removes sulphating due to an electrical high-frequency pulsation process.

This process restores the battery capacity, giving you the ability to reuse old and sulphated batteries.

Concealed batteries in operation or used batteries should be properly named and placed in proper order. The used batteries should be

considered for REGENERATION for the second and subsequent cycles and prolong the disposal as the chemicals cause high level of damage to the environment.

We will discuss the regenerative system of used and week batteries to enhance the life. It is important to know few points on handling of batteries.

BU-703: Health Concerns with Batteries.

Become familiar with the do's and don't's when handling batteries. Batteries are safe, but caution is necessary when touching damaged cells and when handling lead acid systems that have access to lead and sulfuric acid. Several countries label lead acid as hazardous material, and rightly so. Lead can be a health hazard if not properly handled.

LEAD

Lead is a toxic metal that can enter the body by inhalation of lead dust or ingestion when touching the mouth with lead-contaminated hands. If leaked onto the ground, acid and lead particles contaminate the soil and become airborne when dry. Children and foetuses of pregnant women are most vulnerable to lead exposure because their bodies are developing. Excessive levels of lead can affect a child's growth, cause brain damage, harm kidneys, impair hearing and induce behavioural problems. In adults, lead can cause memory loss and lower the ability to concentrate, as well as harm the reproductive system. Lead is also known to cause high blood pressure, nerve disorders, and muscle and joint pain. Researchers speculate that Ludwig van Beethoven became ill and died because of lead poisoning. By 2017, members of the International Lead Association (ILA) want to keep the lead blood level of workers in mining, smelting, refining and recycling below 30 micrograms per decilitre (30µg/dl). In 2014, the average participating employee checked in at 15.6µg/dl, but 4.8 percent were above 30µg/dl. (Source Batteries & Energy Storage Technology, Summer 2015.)

In 2019, the University of Southern California published the detection of lead in teeth of children living near the Exide Technologies battery recycling plant in Vernon, California.

Lead occurs naturally in soil at 15–40mg/kg level. This level can increase multi-fold near lead battery manufacturing and recycling plants. Soil levels in developing countries, including on the continent of Africa, recorded lead contamination levels of 40–140,000mg/kg.

SULFURIC ACID

The sulfuric acid in a lead acid battery is highly corrosive and is more harmful than acids used in most other battery systems. Contact with eye can cause permanent blindness; swallowing damages internal organs that can lead to death. First aid treatment calls for flushing the skin for 10–15 minutes with large amounts of water to cool the affected tissue and to prevent secondary damage. Immediately remove contaminated clothing and thoroughly wash the underlying skin. Always wear protective equipment when handling sulfuric acid.

CADMIUM

Cadmium used in nickel-cadmium batteries is considered more harmful than lead if ingested. Workers at NiCd manufacturing plants in Japan have been experiencing health problems from prolonged exposure to the metal, and governments have banned disposal of nickel-cadmium batteries in landfills. The soft, whitish metal that occurs naturally in the soil can damage kidneys. Cadmium can be absorbed through the skin by touching a spilled battery. Since most NiCd batteries are sealed, there are no health risks in handling intact cells; caution is required when working with an open battery.

Nickel-metal-hydride is considered non-toxic and the only concern is the electrolyte. Although toxic to plants, nickel is not harmful to humans.

Lithium-ion is also benign — the battery contains little toxic material. Nevertheless, caution is required when working with a damaged battery. When handling a spilled battery, do not touch your mouth, nose or eyes. Wash your hands thoroughly.

Keep small batteries out of children's reach. Children younger than four are the most likely to swallow batteries, and the most common types that are ingested are button cells. Each year in the United States alone, more than 2,800 children are treated in emergency rooms for swallowing button batteries. According to a 2015 report, serious injuries and deaths from swallowing batteries have increased nine-fold in the last decade.

The battery often gets stuck in the oesophagus (the tube that passes food). Water or saliva creates an electrical current that can trigger a chemical reaction producing hydroxide, a caustic ion that causes serious burns to the surrounding tissue. Doctors often misdiagnose the symptoms, which can reveal themselves as fever, vomiting, poor appetite and weariness. Batteries that make it through the oesophagus often move through the digestive tract with little or no lasting damage. The advice to a parent is to choose safe toys and to keep small batteries away from young children.

SAFETY TIPS

Keep button batteries out of sight and reach of children. Remote controls, singing greeting cards, watches, hearing aids, thermometers, toys and electric keys may contain these batteries.

Similar to pharmaceutical products, keep loose batteries locked away to prevent access by small children.

Communicate the danger of swallowing button batteries with your children, as well as caregivers, friends, family members and babysitters. If you suspect your child has ingested a battery, go to the hospital immediately. Wait for a medical assessment before allowing the child to eat and drink.

VENTILATION

Charging batteries in living quarters should be safe, and this also applies to lead acid. Ventilate the area regularly as you would a kitchen when cooking. Lead acid produces some hydrogen gas but the amount is minimal when charged correctly. Hydrogen gas becomes explosive at a concentration of 4 percent. This would only be achieved if large lead acid batteries were charged in a sealed room.

Over-charging a lead acid battery can produce hydrogen sulphide. The gas is colourless, very poisonous, flammable and has the odour of rotten eggs. Hydrogen sulphide also occurs naturally during the breakdown of organic matter in swamps and sewers; it is present in volcanic gases, natural gas and some well waters. Being heavier than air, the gas accumulates at the bottom of poorly ventilated spaces. Although noticeable at first, the sense of smell deadens the sensation with time and potential victims may be unaware of its presence.

As a simple guideline, hydrogen sulphide becomes harmful to human life if the odour is noticeable. Turn off the charger, vent the facility and stay outside until the odour disappears. Other gases that can develop during charging and the operations of lead acid batteries are arsine (arsenic hydride, AsH_3) and (antimony hydride, SbH_3). Although the levels of these metal hydrides stay well below the occupational exposure limits, they are a reminder to provide adequate ventilation.

Regeneration of week batteries for the second lease of life.

NATURAL VENTILATION.

Sr No	Observation*	Problems*	Resulting losses*	Remedial measures*	Capital*	Projected savings*	Category 7
7	Natural Ventilation	Permanently closed ventilators.	Creation of hot air pockets below the ceiling.	Open the Ventilators for easy exit of hot/warm air from the rooms.	Nil, In house manpower.	Eliminates use of Electrical Fans and Substantial cost of	7.1.2, 7.1.6



The natural ventilators are provided. This makes the room cooler and results in reduced fresh air intake. In some of the rooms the ventilators are closed. It is best practice to keep them open. Keeping the ventilators open calls for free movement of rodents. Hence a protective Stainless steel mesh should be provided.



We also suggest to use BLDC fans in Liew of normal ceiling fans which are energy intensive.

WHY SUPER ENERGY EFFICIENT CEILING FANS?

Regular old ceiling fans

Ceiling fans escape one's mind when thinking about reducing electricity cost. This forgotten appliance contributes significantly to electricity consumption due to its numbers and hours of usage. The following estimation supports this claim. A regular ceiling fan (1200 mm span) consumes about 75 W at the highest speed. There are over 400 million regular ceiling fans in India and each of them creates an electricity demand about 39W* (consumption at medium speed).



1. Metal Fan Body
2. Metal Fan Blade.
3. Double Bearings.
4. External Controller.
5. Brushless DC Motor.
6. Pure Copper Winding.
7. Five Levels Remote Control.
8. DC12V Input Fan.
9. DC6V-24V Operating.
10. 36W Power Consumption.
11. 380RPM Super High Speed.
12. 10+ Years Life Time Motor.

Super energy efficient ceiling fans

At present Brushless Direct Current (BLDC) ceiling fan is the popular choice of [super energy efficient ceiling fans](#) in India. There are two premier BLDC ceiling fan brands in India – [Superfan](#) (Versa Drives Private Limited) and Gorilla fans (Atomberg Technologies)**. These ceiling fans (1200mm span) consume 35W at the highest speed so they save over 50% of electricity consumption.

The higher efficiency comes with no compromise in air delivery. Now consider replacing all the ceiling fans in India with [best energy saving ceiling fan](#). The reduction in electricity demand created by ceiling fans will be:

Please contact M/s VERSA DRIVES PRIVATE LIMITED
38 B, Vadakku Thottam Part, Idikarai, Coimbatore. Tamil Nadu, India
641022

☎ Tel: 0422-2972798 / 2972799 / 2972800

Reference to the audit report may be made to avail educational-additional discount.

SAFETY.

Sr No	Observation*	Problems*	Resulting losses*	Remedial measures*	Capital*	Projected savings*	Category 7
8	Electrical safety	Failure of electrical equipment	Loss of valuable data and assets.	Proper earthing and periodical maintenance with measurement.	Nil, In house manpower.	Eliminates electrical hazards and threat to life. Substantial cost of energy bills	7.1.2, 7.1.6

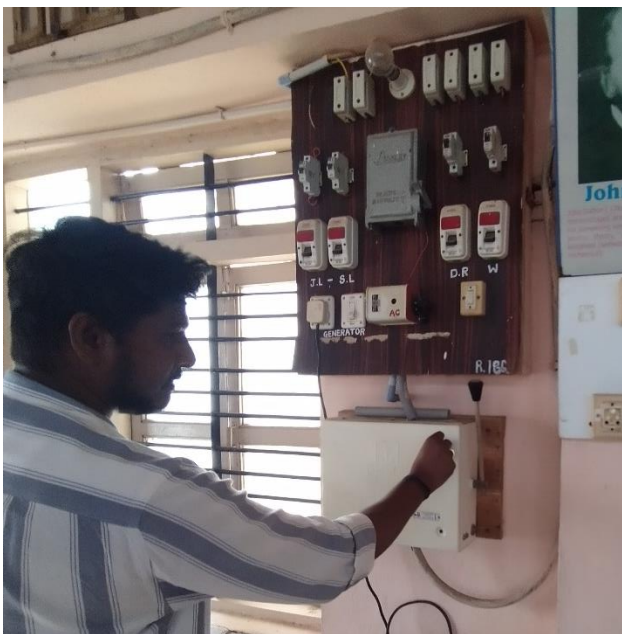


Figure 15 - Safety, electrical earthing compliance



Figure 14 - Safety, electrical earthing compliance

Name plate : Cumpster room.

Earth pit connected to : xxxx system.

Date of inspection : dd/mm/yyyy

Measured values.

Required values.

Resistance: xx Ω

Resistance: < 5 Ω

Leakage current : xx Amps.

Leakage current : < 3.5mA

Date of next inspection : dd/(mm+6)/yyyy

Why International Days are Observed

Criteria 7.1.11

As per the United Nations Organisation, international days are occasions to educate the general public on issues of concern, to mobilize political will and resources to address global problems, and to celebrate and reinforce achievements of humanity. Educational institutes are the best platforms to achieve this Nobel thought.

International Days and Weeks play a vital role in our global society, serving as platforms to raise awareness, foster solidarity, and promote action on crucial issues. These dedicated observances enable us to focus our attention on specific topics, mobilizing individuals, organizations, and governments worldwide. By designating particular days or weeks, we create opportunities to educate, advocate, and celebrate milestones in various areas.

Several international organisations designate international days and weeks. The United Nations is one such organisation which designates most number of days and also for varied purposes. World Health Organisation designates days related to health issues. Food and Agricultural Organisation, International Labour Organisation and other organisations formed for specific purposes also designate days to focus on international contemporary issues.

Following is list of important days in India. Some of them only celebrated in World and some in India only as different country have different days for that event.

The list discusses the days in close proximity to Energy and factors in its immediate affiliate.

The institutional vision and creativity in relating the days to energy conservation and energy efficiency, establishes the best practices.

Day & Month	Celebration.	Reason for celebration
12-Jan	National Youth Day.	National Youth Day, also known as Vivekananda Jayanti, is celebrated on 12 January, being the birthday of a Hindu monk, Swami Vivekananda. In 1984, the Government of India declared this day as National Youth Day and since 1985 the event is celebrated in India every year
11-Feb	International Day of Women and Girls in Science	The International Day of Women and Girls in Science is an annual observance adopted by the United Nations General Assembly to promote the full and equal access and participation of women in Science, Technology, Engineering and Mathematics (STEM) fields. ^[1] The United Nations General Assembly passed resolution 70/212 on 22 December 2015, ^[2] which proclaimed the 11th day of February as the annual commemoration of the observance. ^[3] A theme is selected annually to highlight a particular focus and area of discussion around a focus point for gender equality in science. The International Day of Women and Girls in Science is implemented annually by UNESCO in collaboration with UN Women. ^[4] Both organisations work with national governments, intergovernmental organisations, civil society partners, universities and corporations in order to achieve the shared goal of promoting the role of women and girls in scientific fields and celebrate those already successful in the field.
28-Feb	National Science Day.	National Science Day is celebrated in India on February 28 each year to mark the discovery of the Raman effect by Indian physicist Sir C. V. Raman on 28 February 1928. For his discovery, Sir C.V. Raman was awarded the Nobel Prize in Physics in 1930
6-March	World Energy Efficiency Day	March 6 th is World Energy Efficiency Day, which raises awareness of the need to reduce energy consumption and promote sustainable energy use. Finding ways to avoid energy waste - electricity, gas, water - is critical in the fight against climate change as it contributes to emitting less carbon and methane into the atmosphere. As an example, electricity is generated by fossil fuels, like natural gas and coal, but also nuclear energy. Yet, there are simple actions one can take all year long to promote energy efficiency! For example, using daylight hours for tasks that require lighting, turning off lights and electrical devices when not in use, using LEDs, replacing old appliances with class A ones, and prioritizing public transport or cycling!Energy

Day & Month	Celebration.	Reason for celebration
8-Mar	International Women's Day.	International Women's Day is a global holiday celebrated annually on March 8 as a focal point in the women's rights movement, bringing attention to issues such as gender equality, reproductive rights, and violence and abuse against women
21-Mar	World Forestry Day.	The International Day of Forests was established on the 21st day of March, by resolution of the United Nations General Assembly on November 28, 2013
22-March	World Water Day	<p>World Water Day is an annual United Nations (UN) observance day held on 22 March that highlights the importance of fresh water. The day is used to advocate for the sustainable management of freshwater resources.^[1] The theme of each year focuses on topics relevant to clean water, sanitation and hygiene (WASH), which is in line with the targets of Sustainable Development Goal 6.^[2] The UN World Water Development Report (WWDR) is released each year around World Water Day.</p> <p>UN-Water is the convener for World Water Day and selects the theme for each year in consultation with UN organizations that share an interest in that year's focus.^[1] The theme for 2021 was "Valuing Water" and the public campaign invited people to join a global conversation on social media to "tell us your stories, thoughts and feelings about water".</p>
22-Apr	Earth Day.	Earth Day is an annual event on April 22 to demonstrate support for environmental protection. First held on April 22, 1970, it now includes a wide range of events coordinated globally by EARTHDAY.ORG including 1 billion people in more than 193 countries. The official theme for 2023 is Invest In Our Planet.
11-May	National Technology Day.	<p>The Pokhran-II tests were a series of five nuclear bomb test explosions conducted by India at the Indian Army's Pokhran Test Range in May 1998.^[3] It was the second instance of nuclear testing conducted by India; the first test, code-named <i>Smiling Buddha</i>, was conducted in May 1974.^[4]</p> <p>The tests achieved their main objective of giving India the capability to build fission and thermonuclear weapons with yields up to 200 kilotons.^[1] The then-Chairman of the Indian Atomic Energy Commission described each one of the explosions of <i>Pokhran-II</i> to be "equivalent to several tests carried out by other nuclear weapon states over decades".^[5] Subsequently, India established computer simulation capability to predict the yields of nuclear explosives whose designs are related to the designs of explosives used in this test.</p>

Day & Month	Celebration.	Reason for celebration
17-May	World Telecommunication Day.	World Telecommunication and Information Society Day is an international day proclaimed in November 2006 by the International Telecommunication Union Plenipotentiary Conference in Antalya, Turkey, to be celebrated annually on 17 May.
5-Jun	World Environment Day.	World Environment Day (WED) is celebrated annually on 5 June and encourages awareness and action for the protection of the environment. It is supported by many non-governmental organizations, businesses, government entities, and represents the primary United Nations outreach day supporting the environment. ^{[1][2]} First held in 1973, it has been a platform for raising awareness on environmental issues as marine pollution, overpopulation, global warming, sustainable development and wildlife crime. ^[3] World Environment Day is a global platform for public outreach, with participation from over 143 countries annually. Each year, the program has provided a theme and forum for businesses, non government organizations, communities, governments and celebrities to advocate environmental causes.
5-Sep	Teachers' Day.	Teacher's Day is a special day for the appreciation of teachers, and may include celebrations to honor them for their special contributions in a particular field area, or the community tone in education. This is the primary reason why countries celebrate this day on different dates, unlike many other International Days. For example, Argentina has commemorated Domingo Faustino Sarmiento's death on 11 September as Teachers' Day since 1915. ^[1] In India the birthday of the second president Sarvepalli Radhakrishnan, 5 September, is celebrated as Teacher's Day since 1962, ^[2] while Guru Purnima has been traditionally observed as a day to worship teachers/gurus by Hindus.
8-Sep	World Literacy Day.	International Literacy Day is an international observance, celebrated each year on 8 September, that was declared by UNESCO on 26 October 1966 at the 14th session of UNESCO's General Conference. It was celebrated for the first time in 1967. Its aim is to highlight the importance of literacy to individuals, communities and societies. Celebrations take place in several countries.
16-Sep	World Ozone Day.	International Day for the Preservation of the Ozone Layer (informally and simply called Ozone Day) is celebrated on September 16 designed by the United Nations General Assembly. ^[1] This designation had been made on December 19, 2000, in commemoration of the date, in 1987, on which nations signed the Montreal Protocol on Substances

Day & Month	Celebration.	Reason for celebration
		that Deplete the Ozone Layer. ^[2] In 1994, the UN General Assembly proclaimed 16 September the International Day for the Preservation of the Ozone Layer, commemorating the date of the signing, in 1987, of the Montreal Protocol on Substances that Deplete the Ozone Layer. ^[3] The closure of the hole in the ozone layer was observed 30 years after the protocol was signed. ^[4] Due to the nature of the gases responsible for ozone depletion their chemical effects are expected to continue for between 50 and 100 years.
13-Oct	UN International Day for National disaster reduction.	International Day for Disaster Risk Reduction (IDDRR) is an international day that encourages every citizen and government to take part in building more disaster-resilient communities and nations. The United Nations General Assembly designated October 13 as International Day for Natural Disaster Reduction as part of its proclamation of International Decade for Natural Disaster Reduction. ^[1] In 2002, by a further resolution, the General Assembly decided to maintain the annual observance as a vehicle to promote a global culture of natural disaster reduction, including prevention, mitigation, and preparedness. ^[2] In 2009, the UN General Assembly decided to designate October 13 as the official date for this day, and also changed the name to International Day for Disaster Reduction. ^[3] The word <i>risk</i> was added to the name later.
14-Oct	World Standards Day.	World Standards Day (or International Standards Day) is an international day celebrated internationally each year on 14 October. ^[1] The day honours the efforts of the thousands of experts who develop voluntary standards within standards development organizations such as the American Society of Mechanical Engineers (ASME), ^[2] International Electrotechnical Commission (IEC), International Ethics Standards Board for Accountants (IESBA), International Organization for Standardization (ISO), International Telecommunication Union (ITU), Institute of Electrical and Electronics Engineers (IEEE) and Internet Engineering Task Force (IETF). The aim of World Standards Day is to raise awareness among regulators, industry and consumers as to the importance of standardization to the global economy. 14 October was specifically chosen to mark the date, in 1946, when delegates from 25 countries first gathered in London and decided to create an international organization focused on facilitating standardization. ^[3] Even though ISO was

Day & Month	Celebration.	Reason for celebration
		<p>formed one year later, it wasn't until 1970 that the first World Standards Day was celebrated. Around the globe, various activities are chosen by national standards bodies and intergovernmental organizations to commemorate the date.</p> <p>The Standards Council of Canada (SCC), Canada's national accreditation body, celebrates World Standards Day together with the international community by observing the day near the dates of the international observance. In 2012 SCC celebrated World Standards Day on Friday, 12 October.</p> <p>The World Trade Organization, for the celebration of World Standards Day, 14 October 2020, discussed the TBT Committee's Six Principles for the development of international standards^[4]</p> <p>The United States holds an annual U.S. Celebration of World Standards Day ^{[5][6]}</p>
24-Oct UN Day,	World development information Day.	<p>In 1972, the United Nations General Assembly decided to institute a World Development Information Day coinciding with United Nations Day on October 24. The General Assembly had the object of drawing the attention of world public opinion each year to development problems and the necessity of strengthening international co-operation to solve them.^[1]</p> <p>The day was further recognized as the date on which the International Development Strategy for the Second Nations Development Decade was adopted in 1970.</p> <p>On May 17, 1972, the UN Conference on Trade and Development (UNCTAD) proposed measures for information dissemination and for the mobilization of public opinion relative to trade and development problems. These became known as resolution 3038 (XXVII), which the UN General Assembly passed on December 19, 1972. This resolution called for introducing World Development Information Day to help draw the attention of people worldwide to development problems. A further aim of the event is to explain to the general public why it is necessary to strengthen international cooperation to find ways to solve these problems. The assembly also decided that the day should coincide with United Nations Day to stress the central role of development in the UN's work. World Development Information Day was first held on October 24, 1973, and has been held on this date each year since then.</p> <p>In recent years many events have interpreted the title of the day slightly differently. These have concentrated on the role that modern information-</p>

Day & Month	Celebration.	Reason for celebration
		technologies, such as the Internet and mobile telephones free from digital divide can play in alerting people and finding solutions to problems of trade and development. One of the specific aims of World Development Information Day was to inform and motivate young people and this change may help to further this aim.
30-Oct	World Thrift Day.	<p>World Thrift Day is celebrated annually on 31st October worldwide. In India, the day is celebrated on 30th October. The day was established with the intent of raising awareness among people all around the world about the idea of saving their money in a bank rather than keeping it under their mattress or at home. This promotes savings and financial security for not only the individuals but for the nation as a whole. In this article, we will know about the day, its history and its significance.</p> <p>As UPSC surprises aspirants with questions linked with what usually is assumed to be trivia; it is advisable that one must scroll through the facts about World Thrift Day to get the basic information. The topic, if at all asked in the UPSC Prelims, will form the part of the current affairs.</p> <p>About the World Thrift Day</p> <p>World Thrift Day, also called World Savings Day, underscores the importance of savings in every individual's life. Savings means 'economising' or 'reserving' a part of our regular income to be able to use it to make a bright future. Saving secure ones' future and also preserves resources by avoiding wastage.</p> <p>World Thrift Day is an event to raise awareness about the importance of savings for individuals and as a responsible contributor to the country's development, saving money is important for the country's economic growth as well.</p> <p>People save money for their old age, retirement, children's education and marriage or to achieve an unfulfilled dream in their lives.</p> <p>The day gained prominence only after the Second World War when people evolved and started taking good care of their resources. Today, World Thrift Day has taken on a more significant role with commercial participation across the globe.</p> <p>The theme for World Thrift Day 2021 was 'Understanding the importance of savings'. This day has gained effectiveness over the years as every person today is encouraged to think about capital savings.</p>
14- dec	Energy conservation day	National Energy Conservation Day aims to generate awareness among the masses in India about the importance of saving energy. People are also kept in the loop on new courses of action and plans that

Day & Month	Celebration.	Reason for celebration
		<p>are being formulated. Information is given on minimizing energy waste and how the public can do their part in conserving resources. Essentially, the main objective of the day is to reduce the use of energy and to encourage people to use it efficiently.</p> <p>Formed under the Union Ministry of Power, the Bureau of Energy Efficiency – BEE, has been leading the celebrations of National Energy Conservation Day annually on December 14 since 1991. A constitutional body that falls under the Government of India, the Bureau of Energy Efficiency assists in the development and implementation of strategies and policies to reduce excessive consumption of energy. The committee also executed 'The Energy Conservation Act' in 2001.</p> <p>As part of its awareness campaign, awards are distributed annually on this day in 56 sub-sectors of the country to recognize achievements in energy efficiency. The National Energy Conservation Awards Programme commends the efforts of the industry, institutions, and establishments ranging from power plants to hotels to shopping malls. Prizes are also awarded by the BEE to winners of the National Painting Competition centered on the theme of energy conservation.</p> <p>India's development sectors are flourishing, which leads to an increase in the demand for energy. It is expected that India's resource requirements will double by the year 2030. The BEE strategizes and develops policies that will help decrease this demand by advocating the adoption of efficient measures for energy use.</p>
23-Dec	Kisan Divas Farmer's Day.	<p>The National Farmers Day in India is also known as Kisan Divas in Hindi.^[7] Farmer's Day is celebrated every year on 23 December,^[8] on the birthday of the 5th Prime Minister of India, Choudhary Charan Singh, also a farmer's leader, who introduced many policies to improve the lives of the Indian farmers.^[9] It is celebrated by organising various programs, debates, seminars, quiz competitions, discussions, workshops, exhibitions, essays writing competitions and functions.^[7]</p>

LIST OF INSTRUMENTS:

During the process of the Audit, the following lists of instruments were used.

Sr No.	INSTRUMENT	MAKE	APPLICATION
1	Digital Power Analyser (PC Interfaced)	SCHIVAN ARNOX	Electrical Machinery.
2	Accessories -3000 Amps	ARNOX	Higher load UPTO 3000 Amps,
3	Accessories -200 Amps	ARNOX	UPTO 200 Amps,
4	Thermal Imager	FLIR	Identify loose contacts and bearing losses
5	Power Analyser (Manual)	MECO	Electrical Machinery.
6	Infrared Thermometer	METRAVI	Thermal (Fuel) Energy.
7	Digital Temperature & Humidity Meter. (Contact)	METRAVI	Electrical Machinery. (A/C's And Cooling Towers)
8	Digital Tachometer	METRAVI	Electrical Machinery.(A/C's And Cooling Towers)
9	Lux Meter	METRAVI	General & Task Lighting.
10	Sound Level Meter	METRAVI	Electrical Machinery. Generator Sound Proofing
11	Digital Anemometer	METRAVI	Electrical Machinery.(A/C's And Cooling Towers)
12	Digital KW Meter	METRAVI	Electrical Machinery.
13	Digital Power Factor Meter	METRAVI	Electrical Machinery.
14	Lap Top Computer	HP	To Interface The Instruments For More Accurate -Sophisticated Readings In Sensitive Equipments.
15	Ultrasonic flow meter		Measure liquid flow.
16	Portable Vibration Meter.	METRAVI	Effect Of Filtration - Sewing System. Structural Stability
17	Live cable detector probe	-	Detect hidden cables for safety audit.
18	Power Analyser – EMM 5	Beluk	For remote communication and detailed audit.
19	Power Analyser – ELITE PRO	Beluk	Power Analyser.
20	ETV meter, KWh & PF meters for site recording.	Secure	
21	PT's for Transformer audits.	KALPA	On field auditing of transformer loading and imbalance evaluation.

Only appropriate instruments will used wherever necessary.

ACTION PLAN SUMMARY:

Earmark the action plan.

Invite subject experts for Tec talks,

Organize in person panel discussions and interaction to propagate the knowledge and mitigate the problems in practicing the same.

Prioritize the initiatives and execute.

Observe the benefits and shortcomings.

Workout further improvement by involving the staff and students.

ENERGY AUDIT REPORT

MODE OF ACTION:

The process of ENERGY CONSERVATION should be carried out in three steps.

Good housekeeping practices using available manpower.

Minor alterations using in house work culture with minimum investments on accessories as discussed.

Capital investments, which may be required for installation of new methodologies may be taken up on phased manner.

We will be happy to assist you for any further advice/consultancy if required either on Rainwater management or on any of the measures discussed in the report.

We hope the measures are implemented in good spirit and to human convenience and comfort.

For SUNSHUBH TECHNOVATIONS PVT LTD.,

Mallikarjun A. Kambalyal. B.E. (E&C)

Certified Energy Auditors EA-3485

NOTES:

ENERGY AUDIT REPORT

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