ENERGY AUDIT REPORT

FOR THE YEAR 2022-23

V.M.V.V.Sangha's Vijay Mahantesh Krupaposhit S.R.Vastrad Arts, Science & Vijay Shankarappa Bellihal Commerce College, Hungund - 587118

Principal Lead Auditor:

Mallikarjun A Kambalyal.

Regd India: CEA, EA-3485, ISO 50001, 14001 Lead Auditor.

Germany Energie Berator: Anbieter-Nr 1041388

Mauritius: REA-57

Audited by:

SUNBSHUBH TECHNOVATIONS PVT LTD.,

120-2, LGF, 'A' wing, IT Park,

Hubli – 580029. Karnataka. India.

Germany off: Neuer Weg 166, 47803 Krefeld, Dusseldorf. Germany

ENERGY AUDIT REPORT 2022-2023

CONTENTS

EXECUTIVE SUMMARY

Sr No	Observation*	Observation*	Issues*	Remedial measures*	Capital*	Projected savings*	Category 7
1	Energy use.	Multiple LT connections.		Merge into one or two	NIL	Reduced fixed charges	
2	Solar Power	Solar power for energy needs		Need to opt for Hybrid system.	Approximately ₹6.00 Lacs.	Net zero energy import.	7.1.
3	Battery placement	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
4	Battery regeneration.	Short life span.	300% of the cost of the battery.	Subject all batteries to regeneration made.	₹ 3,000/- per battery after every 3 to 4 years.	300 %	7.1.2 & 7.1.6
5	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
6	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
	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 energy bills	7.1.2 7.1.6

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

Estd : 1967 V.M.V.V.Sangha's
Vijay Mahantesh Krupaposhit
Post Box No. 3
S.R.Vastrad Arts,Science & Vijay Shankarappa Bellihal Commerce College, Hungund – 587118

Prof.Smt.S.K.Math M.Sc.
Principal

Affiliated
Ranichannamma Uni.Belagavi
College Code : 6217

Ph.No: 200244(08351)
Mobile No: 9845949989
Email ID: vmsrv_hnd@yahoo.com

No. VMCH/ /87 /2023-24 Date: 12/06/2023

To,
SUNSHUBH TECHNOVATIONS PVT LTD
#402, Hill View Apartment, Adarshnagar
2nd Cross, Opp Cricket coaching centre.,
Hubli - 580032 Karnataka. INDIA.

Sub: Green audit work of VMKSRV Arts, Science and VS Bellihal Commerce College, Hungund

Ref: Quotation through mail dated 28-04-2023

Sir,

With reference to the above subject, you are requested to undertake Green Auditing work of the college as per your quotation dated 28/04/2023.
Terms and conditions:

1) Completion of work and submission of reports within 40 days.
2) Deliverables: the green audit report shall outline the environment assessment including the following aspects:
   I. Baseline environmental status on aspects such as energy, wastewater, hazardous / chemical waste, e-waste, green inventory(floral and faunal status)
   II. Policy review and its impact on environment.
   III. Identification of scope for improvement in current practices.
   IV. Proposing technological solutions/recommendations for improving environmental condition related to energy, water, wastewater, hazardous / chemical waste, e-waste, green inventory.
   V. Action plan in terms of short term and long term technological intervention for improving environmental conditions.
3) Reports: One copy of draft report shall be provided to the college for comments and discussions. Two copies of the report shall be submitted at the end of the audit.

Place: Hungund
Date: 12/06/23

The Principal
Vijaya Mahantesh Krupaposhit
S.R.Vastrad Arts, Science & V.S.Bellihal Commerce College,Hungund-587118

ACKNOWLEDGEMENT:

SUNSHUBH TECHNOVATIONS PVT LTD is pleased to express its sincere gratitude to the management of V.M.V.V.Sangha's Vijay Mahantesh Krupaposhit S.R.Vastrad Arts, Science & Vijay Shankarappa Bellihal Commerce College, Hunagund 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 acknowledge the assignment with order reference number VMCH/87/2023-24. We also wish to thank Smt. Prof. S K Math, the principal, and Mr. M.S. Daragad. NAAC Audit Co-Ordinator and Dr. Parashuram C, Convener, Criterion VII, who have been constantly following with the Carbon Handprint initiatives and developments in the college. It was on their instance that we got to evaluate the initiatives undertaken. 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 Faculty Members,

Dr S R Golagond, Criterion 1 – Curricular Aspects

Shri A H Teli, Criterion II – Teaching, Learning & Evaluation.

Dr Tippeswamy D S, Criterion III –Research, innovation & Extension.

Shri B A Kanti, Criterion IV –Infrastructure & Learning Resources.

Shri L N Kulkarni, Criterion V – Students Support and Progression.

Dr S R Nagannavar,Criterion VI – Governance, Leadership & Management.,

Dr Parashuram C, Criterion VII – Institutional Values and Best Practices

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 potential energy saving options 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.

ENERGY AUDIT COMPLETION CERTIFICATE

I, Mallikarjun A Kambalyal, endorse and confirm that the Energy Audit has been carried out on 13th June 2023 at V.M.V.V.Sangha's Vijay Mahantesh Krupaposhit S.R.Vastrad Arts, Science & Vijay Shankarappa Bellihal Commerce College, Hunagund under the instructions of Smt. Prof. S K Math, the principal, and Mr. M.S. Daragad. NAAC Audit Co-Ordinator, and Dr. Parashuram C, Convener, Criterion VII.

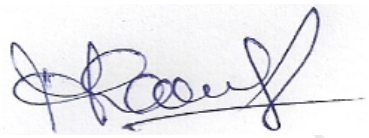
This report is generated based on the site visits and evidence collected from the site and this completion certificate is issued in compliance with *Criteria* 7.1.6.

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.

This report is tabled in two parts. The first forms the core discussions which are subject specific under the statutory requirements of the NAAC accreditation norms. The second section is general in nature.

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.

Date: 13th June 2023

Credentials attached 7.1.6

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 (*l*) 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			

Bureau of energy Efficiency Regd No: EA3485

Certificate of Successful Completion

Intertek

This is to Certify that

MALLIKARJUN A KAMBALYAL

has successfully completed the

Intertek

CQI & IRCA Certified ISO 14001:2015 Auditor Conversion Training Course

The Course includes the assessment and evaluation of Environmental Management Systems to conform to the requirements of ISO 14001:2015 and ISO 19011:2011

This course is certified by the Chartered Quality Institute (CQI) and the International Register of Certificated Auditors (IRCA)
– IRCA REFERENCE 18093 –

The course meets the training requirements for individuals seeking certification under the IRCA Auditor Certification Schemes

CQI | IRCA
APPROVED TRAINING PARTNER

Authorising Signature: Vyara Stoilova

Course Dates: 14th – 16th July 2017 *Certificate Number: 47730*

Membership Application To Be Made Within 3 Years From Last Day of Course

ISO Certified Lead Auditor. Certificate No: 47730

ISO Certified Lead Auditor. Certificate No: ENR-00253448

bsi.

By Royal Charter

BSI Training Academy

This is to certify that

Mallikarjun A. Kambalyal

has attended and passed

Energy Management Systems (ENMS) Auditor/Lead Auditor Training Course (ISO 50001:2011)

Premanand Ramakrishnan, Director of Training

Date: 14/04/2016 - 18/04/2016

Certificate Number: ENR-00253448

This certificate is valid for 3 years from the date above for the purpose of registering as an auditor with IRCA.

Course number A17583 certified by IRCA

...making excellence a habit.™

The British Standards Institution is incorporated by Royal Charter
BSI India, The Mira Corporate Suites (A-2), Plot 1 & 2 Ishwar Nagar Mathura Road, New Delhi 110065, India Tel: +91 11 2692 9000

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, energy 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: 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.

DAY's CARBON HANDPRINT 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 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 Chairperson

DAY's ENERGY USE PLEDGE

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: V.M.V.V.Sangha's Vijay Mahantesh Krupaposhit S.R.Vastrad Arts, Science & Vijay Shankarappa Bellihal Commerce College, Hunagund

Principal Chairperson

ABOUT THE COLLEGE

V.M.V.V.Sangha's Vijay Mahantesh Krupaposhit S.R.Vastrad Arts, Science & Vijay Shankarappa Bellihal Commerce College, Hunagund KARNATAKA is located in a small town educating the rural children of nearby villages.

The college has Arts Commerce and Science stream.

The upkeep of the campus speaks for their concern to the environment. With few corrective measures the college can consider to move towards being CARBON NEUTRAL.

ABOUT ENERGY AUDIT

V.M.V.V.Sangha's Vijay Mahantesh Krupaposhit S.R.Vastrad Arts, Science & Vijay Shankarappa Bellihal Commerce College, Hunagund, Karnataka has asked SUNSHUBH TECHNOVATIONS PVT LTD, Hubli, to conduct the Energy Audit for their Institution.

In this context, the management of the Institute represented by Smt. Prof. S K Math, the principal, Principal, entrusted us the task of conducting the feasibility study to reduce energy consumption and adopt green habits.

SUNSHUBH TECHNOVATIONS PVT LTD, Hubli, represented by Mr. Mallikarjun A Kambalyal made a detailed study and readings of various appliances were taken and carried out the ENERGY audit along with the safety parameters.

We hope the points presented will be self-explanatory, if there is need for any clarification, we are open for discussions.

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:

Energy Audit.

Aerial View of the College Campus

The campus is spread over scenic, elevated terrain. The Rocky structure makes things great for beatification with local flora and fauna. The campus has good opportunity to nurture the knowledge among the students from Biology, Physics and Geology.

Energy use

Hunagund college						
RR No.	69900		40635		55337	
Connected load	5 KW		4 KW		3.46 KW	12.46 KW
	Monthly units consumed RR No. wise.					Total
April	32		413		31	476
May	32		463		27	522
June	51		267		20	338
July	54		367		53	474
August	47		387		56	490
September	37		504		57	598
October	32		505		42	579
November	20		423		38	481
December	41		447		51	539
January	29		491		48	568
February	35		549		46	630
March	28		537		25	590
Total	438		5353		494	6285

Green Power on Grid	Category 7.1.2
The institute has the space to install Grid tied Solar power on/off net metering basis.	Need to install and establish a basic demo to educate and train the students.

The institute in addition has OFF grid UPS system to meet the energy consumed by the college.

To impress upon the judicious technology to use Solar systems in the campus, the following description impresses on why Hybrid systems make sense in semiurban areas where power required is primarily for tasks and illuminating the area is secondary.

A brief note on Why Hybrid solar and not Online/Offline solar system.

ALTERNATE SOLUTION

What is a hybrid solar system? How does it work?

Going solar doesn't just mean installing solar panels — hybrid solar systems include battery storage so you can save the power your panels generate during the day and use it later, when the sun isn't shining.

A hybrid solar system is a renewable energy system that is grid-tied and includes battery storage. The system uses solar panels to produce energy during the day, while the batteries store excess energy for use later at night when there is no sunlight.

Hybrid solar systems are efficient, reliable, and a great investment for homeowners looking to go solar.

What is a hybrid solar system?

A hybrid solar system is a solar power system that uses solar panels, a hybrid inverter and a battery bank. The solar panels convert sunlight into electricity, while the batteries store energy for later use.

Hybrid solar systems have both on-grid and off-grid capabilities, allowing you to continue running on solar power even if the grid goes dark.

How does a hybrid solar system work?

A solar hybrid system is a renewable energy system that uses solar photovoltaic (PV) panels to generate clean energy to power your home. A hybrid solar system intelligently switches between using solar power, battery storage and grid power. It allows you to avoid using grid power at peak prices leading to bill savings.

The system stores renewable energy produced by its rooftop solar panels. During a storm or power outage, the system seamlessly kicks in and powers all of your home's essential loads. Keeping your lights on, refrigerator running, and phones and tablets charged.

The benefits of a hybrid solar system

A hybrid solar system is a great option if your priority is to keep your home running on backup solar power during an outage or whose utility company has time of use rates, demand charges, or does not offer a net metering policy, where they compensate you for the excess energy sent back to the grid.

The hybrid solar system has the flexibility to manage the time of use electricity rates for maximum solar savings on monthly electric bills.

1. Cost-Effectiveness

A hybrid solar system allows you to lock in low energy rates for years to come and shields you from future rate hikes. It also allows you to manage the time of use electricity rates for maximum solar savings on electric bills.

2. Flexibility and Scalability

A hybrid system can be designed to meet the specific needs and is scalable for future energy needs.

For example, a customer may want to have a backup power source for essential loads, such as medical equipment, lights, tv, refrigerator, and computers. In this case, the battery bank would be sized to meet the critical load requirements and would be used as needed. A hybrid PV system can offer flexibility and scalability that are not possible with other types of PV systems.

3. Environmental Sustainability

Solar panels are increasingly popular as people look for ways to reduce their carbon footprint. A hybrid solar system is a great option for those who want to do their part for the environment.

4. Reduce the Risk of Outages

A hybrid solar system is designed to provide power during grid outages. The main benefit of a hybrid solar system is that when the grid goes down due to technical errors or harsh weather conditions, the system ensures you have electricity at your property even when the grid cannot provide power.

Conclusion

In conclusion, a hybrid solar system is a great option for end consumers who are not only looking to go solar to lower their electricity bill, but to ensure your property is powered during a power outage. If you are interested in installing a hybrid solar system, be sure to do your research and find a reputable solar panel installer.

Financial implication.

Having suggested on installation of Grid power. Few considerations need to be accounted.

- Use of UPS systems for emergency power requirements.
- Frequency of power interruptions.

Hungund is small town and is more likely to see power interruptions. In order to avoid duplication, we suggest that the Hybrid solar system be considered.

Hybrid system works in both online mode and offline mode. While online mode works when supply is live, offline performs with the backing from battery, it converts DC power into AC power and meets

While Hybrid inverter demands the need for battery backup, they can be added at a later date.

The installation of Hybrid system will need a CAPEX of ₹7.00 Lacs.

For details, The institute can contact Mr.Muralidhara. sushanthienterprises@gmail.com. The institute can also contact local vendors if they are capable of supplying the required services based on detailed energy monitoring.

Placing of Batteries

Category 7.1.1, 7.1.2, 7.1.3 and 7.1.5

BATTERY PLACEMENT:

The batteries should be placed on an insulated platform not touching any of the metal frames.

Need cross ventilation for favourable breathing.

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

In absence of the above placement conditions,

The batteries will discharge faster.

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

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.

For more information on battery management, Contact: SUNSHUBH TECHNOVATIONS PVT LTD., Hubli

ceo@sunshubhrenewables.com

Batteries stacked without ventilation.

Electrical Power Usage:

It is important to understand the significance of the Energy use implication. The use of electrical power has been observed to be unnecessary. The administration should initiate to keep all unwanted and unused appliances switched off.

It is observed that the lights are left switched ON at majority of places and 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 LED luminaries or The Induction Light systems in lieu of normal tube lights., it is advised to install 40W Induction lamps in all classrooms to avoid glare.

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.

Light Intensity & Occupancy sensor

NATURAL LIGHTING:

Category 7.1.1, 7.1.2, 7.1.3 & 7.1.5

It is seen that the patches of bright light hit the board. This causes strain on the eyes.

Solution: Keep the windows closed and with opaque glass so as to avoid direct rays. Opaque glass allows diffused lighting and does not glare the vision.

The placing of LED lights above the display area, mainly the Blackboard and projector screen, has a straining effect on the eyes. It is against the interest of good practice. Placing the light fixtures should always be from behind or from the top .

Clean windows.

For natural light it is important that we have clean translucent windows.

Use of LED lights.	Category 7.1.6
The institute is seen to use T8 Tube lights at various locations. The need to replace all such fixtures with LED lights is important from all aspects suchg as CAPEX, Energy savings, Energy conservation, reduction in energy bills. The Return On Investment is very lucrative and should be executed on priority. It is also importantant from the fact that the institute has set its main objective as Knowledge sharing.	
Electrical safety. All control gear should be treated with due concern and caution. Keep all flammable items away from area. Handle with safety gadgets.	Category 7.1.1, 7.1.2, 7.1.3 & 7.1.5 
Solution: Remove all dumped items and keep area clean and ready for access. Label the room as Electrical room. Put a danger sign indicating people to keep away from the area.	

Natural Ventilation	Category 7.1.2, 7.1.6
Ventilators which are permanently closed should be opened and a mesh be provided to prevent birds entry. This helps cooling effect and avoided/minimal use of fans.	

Asset management.

The assets weather in use or to be disposed should be placed in appropriate location.

Label the assets as deemed fit.

Fuel Management.

The cylinders should be placed outside the room and at an elevated platform and in well-ventilated room.

Generator exhaust.

The generator exhaust opens lower than the top slab.

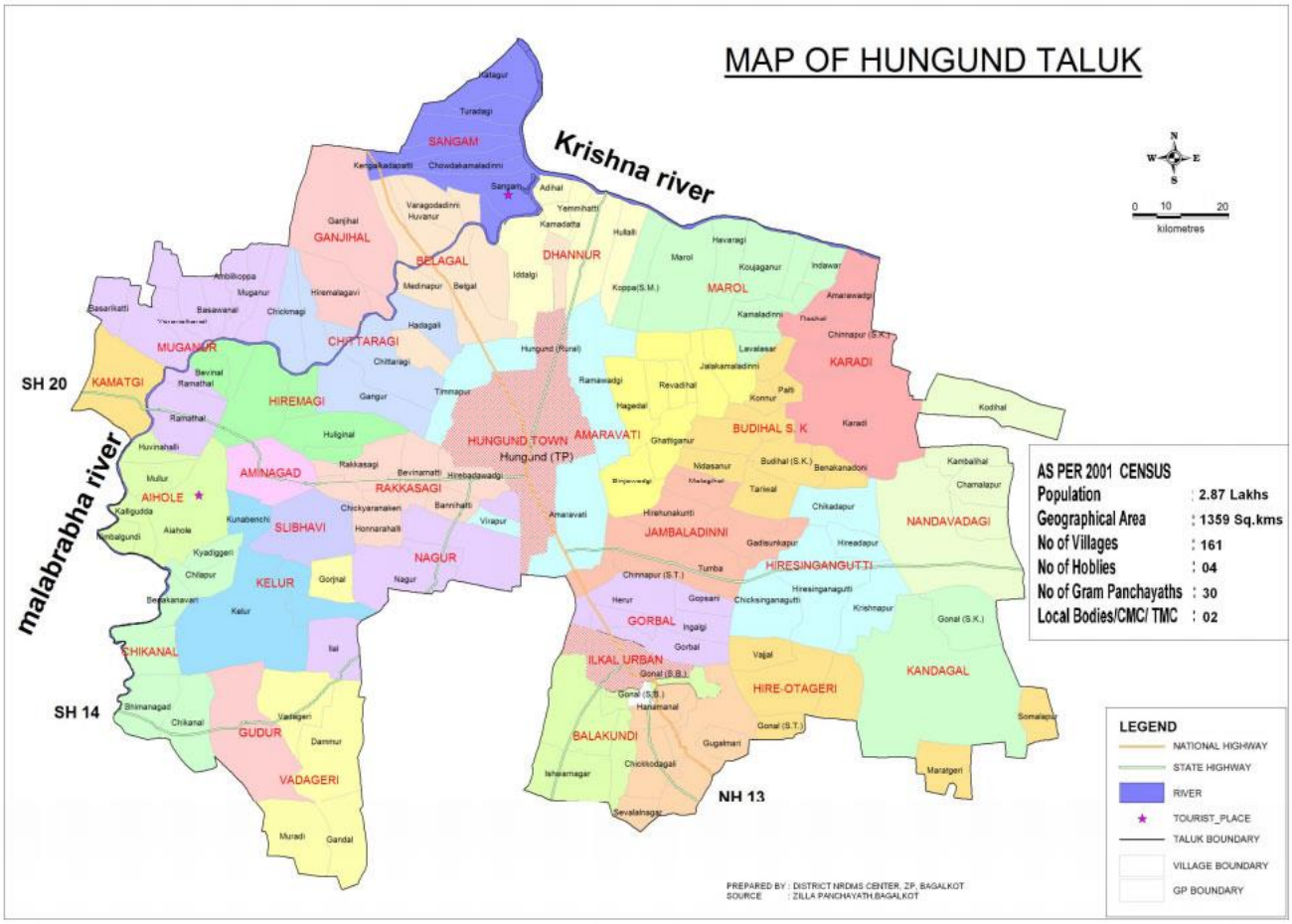
The exhaust pipe should be extended till the top most slab to prevent suffocation/inhaling hazardous gases by people moving/sitting above.

FACTORS CONSIDERED.

GEOGRAPHICAL PARAMETERS

Source : https://en.wikipedia.org /wiki/Bagalkot district.

Hungund or Hunagunda is a taluk in the northern district of Bagalkot in Karnataka, India. Major towns in the taluk are Amingad, Hunagunda. Kudalasangama, where the social reformist Basavanna died, is located in the taluk. Hunagunda Taluk also contains Aihole and Pattadkal which were once under the rule of Chalukyas of Badami. Amingad is known for Amingad karadantu, a sweet dish.



Hungund is located at 16.07°N 76.05°E.[1] It has an average elevation of 531 metres (1742 feet). The soil found in the area is usually black or red and the soil is very fertile.

Tourism Places around Hunagund.

Aihole, Pattadakal, Badami, Banashankari, Kudalasangama, Bijapur,

Demographics

As of the 2001 Indian census, Hunagunda had a population of 18,035. Males constituted 51% of the population and females 49%. Hunagunda had an average literacy rate of 64%, higher than the national average of 59.5%: male literacy was 75%, and female literacy was 53%. In Hunagunda, 13% of the population was under 6 years of age. Kannada is the most widely spoken language in the taluk.

Education

Hunagunda and Ilkal have some noted educational institutions in the region. Vijaya Mahantesh High School in Hunagunda was established in 1915 as Anglo Vernacular School. Hunagunda also has a Rural Polytechnic college.

Economy

Agriculture is the largest employer in Hunagunda. The chief crops cultivated are ragi and jowar, as well as groundnut, gram, tuvar daal and moong daal. Ilkal is famous for Ilkal saree and Red Granite.

Ilkal is a City in Bagalkot district in the Indian state of Karnataka. The town is located in a valley that lies in south-east corner of Bagalkot district and is quite close to the borders of Kushtagi taluk of the Koppal district. Now Ilkal city is taluka head quarter. It lies at a distance of about 12 km (7.5 mi) south of Hunagund. Between these two towns, Ilkal is an important center of trade, commerce, education, and industry.

LIST OF INSTRUMENTS:

During the process of the Audit, the following list of instruments were (considered for) use (wherever applicable).

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 (Contact) Temperature & Humidity Meter.	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.
15	Ultrasonic flow meter		Measure liquid flow.
16	Portable Vibration Meter.	METRAVI	Structural Stability
17	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	PTs for Transformer audits.	KALPA	On field auditing of transformer loading and imbalance evaluation.

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.

MODE OF ACTION:

The process of ENERGY AUDIT & 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.

NOTES:

Notes:

GLOSSARY: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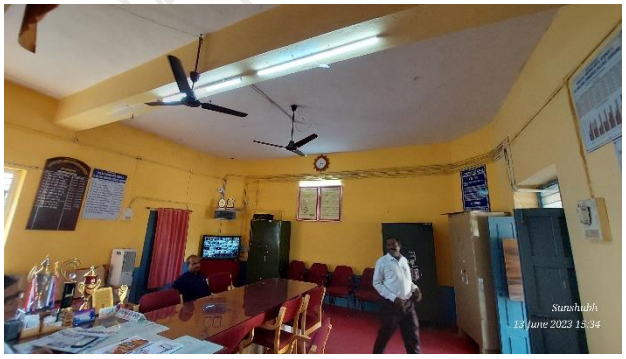
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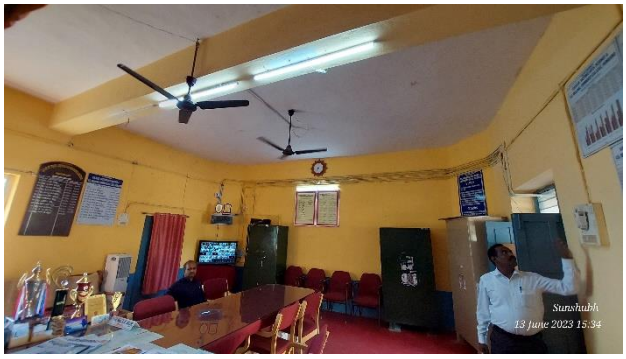
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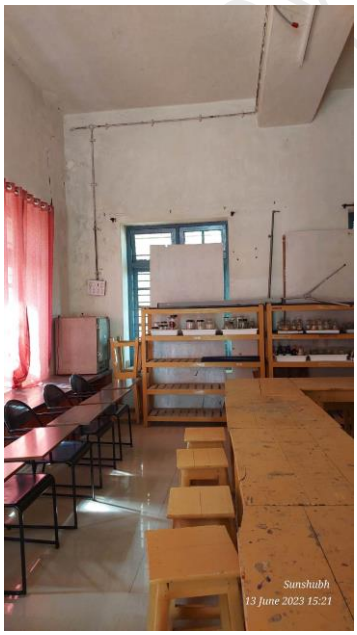
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