

**INTEGRATED GREEN AND ENERGY AUDIT
FOR THE ASSESSMENT YEAR 2020-21
IN LINE WITH NAAC REQUIREMENTS**



**College of Management & Computer Science
(CMCS Yavatmal), Yavatmal**



**27/03/2021
Version 01**

**By:
Energy and Green Audit Team,
Sustainability Solutions**

From Secretary's Desk



Sustainable Development goal focuses on developing and expanding renewable energy resources such as sun, wind, hydropower, liquid and solid biofuels, biogas and geothermal. These renewable sources of energy don't emit greenhouse gasses to the atmosphere and therefore are ideal for the environment and human health. As such, sustainable development not only deals with environmental issues, but economic, social and cultural issues as well.

Given its primary role as knowledge producer, higher education can serve as a powerful means to help create a more sustainable future. Thus, the concept of 'education for sustainable development' has become, in recent years, one of the core educational initiatives to help address many of the problems associated with human development. Indeed, higher education's role in creating a sustainable future will presumably take on a greater importance as the world continues to become increasingly globalized and interdependent.

More specifically, it involves educating students on the necessity of sustainable development by integrating sustainable development issues into all aspects of teaching, research and service. This means reorienting the education system at all levels to help people think and behave in ways that foster a more sustainable planet (for example, global citizenship, recycling, climate change, biodiversity, renewable energy and social responsibility)

To achieve this objective there are many trails; the main challenge is "one should be able to identify the best path". I am pretty glad my Institutions have engaged with the experts in the field of Sustainability i.e. Sustainability Solutions lead by Mr. Thanekar and Mrs. Bhakti and "together" we identified material topics which are addressed "Step by Step", year on year and objective oriented.

During our journey, we learned that education is one of the key solutions to this situation. We have included various educational drives and programs to sensitize the topic. We are promoting energy savings, reduction in water consumption, augmenting water harvesting, inducting renewable solar energy, introduction of sensor-based lighting controls for night lights, energy-efficient lighting (CFL), maximum use of daylight, educating the society, mass plantation of trees outside the college campus, blood donation programs, waste reduction, responsible waste disposal, and many more applicable programs material to our type of institutions.

I am thankful to the entire Green Audit Team (Mr. Swapnil Thanekar, Mrs. Bhakti Thanekar, Mr. Ashish Soni, and Mr. Sushant Deshkar) for taking sincere efforts and hard work for this green audit. I hope the report will be helpful to society, staff, students, and all concerned in this College Campus and will motivate for sustainable and green practices throughout.

Secretary
College of Management and Computer Science,
Yavatmal

From Principal's Desk



The world in 21st century is facing many challenges related to environment. On one hand world is developing at alarming rate while on the other hand the destruction of natural resources is going on. Efforts to meet the needs of a growing population in an interconnected but unequal and human-dominated world are ignoring the earth's essential life-support systems. Today our society is facing severe environmental problems like climate change, energy crisis, depletion of natural resources, biodiversity loss, pollution of air, water, soil, etc. The ever increasing population and changing life styles are increasing the severity of the environmental problems. The time has come to protect the natural environment through precise efforts.

At the same time sustainable development through higher education plays important role in nations building. Sustainable development remains barely a significant social, economic or environmental challenge for any country. Though teaching and learning must begin to reflect environmental issues, there is an emerging consensus that institutions must also model sustainable practices. Such education contributes strongly to sustainable development by training and expanding young minds in researching solutions to the environmental challenges. After graduation the students become leaders of tomorrow and get dispersed from the world of higher education into their specific career. In doing so, they take with them the green practices and approaches they were involved with at their institution

The Green audit 2020-21 of our college was carried out to find out areas of strengths and weaknesses in environmental management within the institution.

Principal,
College of Management and Computer Science,
Yavatmal.

Acknowledgement



Green Audit Assessment Team thanks the management of College of Management & Computer Science (CMCS Yavatmal), Yavatmal for assigning this important work of Green Audit. We appreciate the cooperation of our Team for completion of study. Our special thanks to:

Secretary – Mr. Aashishji P. Jajoo

Principal – Mr. Ritesh D. Chandak

IQAC Coordinator – Dr. Atul K. Shingarwade

NSS Program Officer – Mr. Yogesh M. Patil

Asst. Professor – Mr. Shubham S. Kane

Asst. Professor – Miss. Minal P. Shende

Asst. Professor – Mr. Sudhir N. Velukar

Librarian – Mrs. Smita R. Ambadekar

Laboratory Technician – Mr. Neel V. Aaglave

Clerk – Mr. Rajendra B. Khond

All the members of College Development Committee, College of Management & Computer Science (CMCS Yavatmal), Yavatmal. Team of students as stated under Annexure-I

For giving us necessary inputs to carry out this very vital exercise of Green Audit. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

Profile of Audit Team Members and Independent Reviewers

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DISCLAIMER

Green Audit Team has prepared this report for College of Management & Computer Science (CMCS Yavatmal), Yavatmal, based on input data submitted by the representatives of College and after having complemented with the best judgment capacity of the expert team.

While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the calculations are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any director consequential loss arising from any use of the information, statements or forecasts in the report.



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Scope of Work

Topics to be covered as part of the assessment are:

✓ Solar Passive Architecture

- How the buildings are constructed to utilize the solar energy efficiently. This includes use of day light as lighting source and avoidance of GHG intensive technology example AC as source of cooling due to solar heat gains.

✓ Implementation of measures to reduce wastage of energy

- This includes effective and objective evidences to create awareness towards wastage of electric energy. Hoardings, placards, messages, posters etc. planted at key locations in college, hostels and cafeterias. PCRA (Petroleum Conservation Research Association, Govt. of India) and BEE (Bureau of Energy Efficiency) posters are exhibited.
- It can also be extended to include papers presented by the students on avoidance of electricity at college or day to day life.
- Appointment of joint committees of teachers and students to save electricity
- Controlling of Power Factor by installation of APFC and getting rebate (up to 5% or MSEDCL norms) from MSEDCL for maintaining unity Power factor

✓ Energy Efficient Procurement

- This includes evaluation of energy efficient procurement practices. This does not exactly mean that you need to buy the most efficient, but you need to buy the most efficient which is financially viable. Example AC with efficiency star ratings, Transformer etc.
- Replacement of lighting sources to CFL or LED
- Replacement of Copper Ballast with Electronic Ballast
- Centralized controls of lighting, auditorium etc. to avoid any misuse of electricity
- Procurement of LED monitors to phase-out CRT Monitors
- Shift to paperless regime wherever not required, example attendance muster replaced by biometrics, DG logbook replaced by computerized logbook, daily reports converted from paper to paperless, HoD meetings converted to paperless formats, and all such examples.
- Installation of Solar panels, Power Purchase Agreements with Solar Power Plant owners to buy environmentally friendly energy Source etc.
- Documentary evidences as feasible to calculate the above impacts and finally into the value of avoidance of tCO₂ emitted to atmosphere.

✓ Rain Water Harvesting

- This includes Calculation of Catchment Area (Terrace and ground) and evaluating rough amount of water that is recharged into the water recharge pits if applicable.

✓ Hazardous Waste Management and E-Waste Management

- There are various wastes that are generated within the organization. The report will give the list of the procedures for waste handling.

✓ Duration of the Green Audit

- The Green audit field observations data collection was carried from 16th March 2021 to 27th March 2021 for the session 2020-2021. The submitted data was monitored by the college throughout the year and assessed by Assessment Team during the visit.

Scorecard

NAAC Criteria	
Key Indicator - 7.1 Institutional Values and Social Responsibilities	
Environmental Consciousness and Sustainability	Audit Team Assessment
<i>The Institution has facilities for alternate sources of energy and energy conservation measures</i>	
1. Solar energy ✓	Evaluating Financial viability for the installation of solar systems
2. Biogas plant	
3. Wheeling to the Grid ✓	
4. Sensor-based energy conservation ✓	Annexure –V: Lighting Survey 2020 - 21
5. Use of LED bulbs/ power efficient equipment ✓	
Options: A. 4 or All of the above ✓ B. Any 3 of the above C. Any 2 of the above D. Any 1 of the above E. None of the above	Annexure –XI: Solar Passive Structure
<i>Describe the facilities in the Institution for the management of the following types of degradable and non-degradable waste (within 500 words)</i>	Refer chapter 12 and Annexure –XIII: Waste Management
1. Solid waste management ✓	
2. Liquid waste management ✓	
3. Biomedical waste management	
4. E-waste management ✓	
5. Waste recycling system	
6. Hazardous chemicals and radioactive waste management	
<i>Water conservation facilities available in the Institution:</i>	Refer chapter 06 and Annexure –XII: Water Management
1. Rain water harvesting ✓	
2. Bore well / Open well recharge ✓	
3. Construction of tanks and bunds ✓	
4. Waste water recycling NA	
5. Maintenance of water bodies and distribution system in the campus NA	

Green campus initiatives include (4)

7.1.5.1. The institutional initiatives for greening the campus are as follows:

- | | |
|--|---|
| 1. Restricted entry of automobiles | |
| 2. Use of Bicycles/ Battery powered vehicles | |
| 3. Pedestrian Friendly pathways | ✓ |
| 4. Ban on use of Plastic | ✓ |
| 5. Landscaping with trees and plants | ✓ |

Annexure –XIII: Waste Management
SoP : Green Initiatives by College

Options:

A. Any 4 or All of the above

B. Any 3 of the above ✓

C. Any 2 of the above

D. Any 1 of the above

E. None of the above

Chapter 13 and Annexure –XIII: Waste Management

Quality audits on environment and energy are regularly undertaken by the institution

Covered as part of this report. Please refer the contents of this report

7.1.6.1. The institutional environment and energy initiatives are confirmed through the following

- | | |
|---|---|
| 1. Green audit | ✓ |
| 2. Energy audit | ✓ |
| 3. Environment audit | ✓ |
| 4. Clean and green campus recognitions/awards | |
| 5. Beyond the campus environmental promotional activities | ✓ |

Covered as part of this report under Chapter -11 and Annexure –XVI

Covered as part of this report. Please refer the contents of this report

Options:

A. Any 4 or all of the above ✓

B. Any 3 of the above

C. Any 2 of the above

D. Any 1 of the above

E. None of the above

Please refer Annexure – XIV: List of Awareness Program Undertaken by College

Clean Campus¹

Sr. No.	Aspect	Reference
1.	Cleanliness in and around the campus and waste minimization	<ul style="list-style-type: none"> ➤ Chapter No. 1 & Annexure No. IV ➤ Chapter No. 1 & Annexure No. XIV
2.	Water conservation and management including <ul style="list-style-type: none"> ➤ Waste water management and reuse ➤ Rain water harvesting, etc 	<ul style="list-style-type: none"> ➤ Chapter No. 12 & Annexure No. XIII ➤ Chapter No. 6 & Annexure No. XII
3.	Environment-friendly activities adopted and practiced by the campus	<ul style="list-style-type: none"> ➤ Chapter No. 1 & Annexure No. IV ➤ Chapter No. 1 & Annexure No. XIV
4.	Greenery within the campus to provide pollution free air and carbon-sink	<ul style="list-style-type: none"> ➤ Chapter No. 13 & Annexure No. XIV

Smart Campus²

Sr. No.	Aspect	Reference
1.	Impact of deployment of digital technology in order for the students, faculty and management in the campus to reduce consumption of natural resources (such as paper, gas, energy etc).	<ul style="list-style-type: none"> ➤ Digital library ➤ Digital attendance ➤ Digital Meetings ➤ Digital notes ➤ Digital papers ➤ Online conference's and classes ➤ Double side printers ➤ Efficient electronic equipment's like LED screens, LED projectors. For details please refer annexure VIII ➤ Procurement of energy efficient equipment ➤ Techno commercial stages of the Solar PV ➤ Wi-Fi Campus
2.	Alignment of the latest digital trends like IoT, Big Data and Cloud Networking to achieve various aspects of sustainability in the campus, specifically to contribute to United Nations SDGs	<p>Our College uses Google forms, Google classroom, Zoom and Google Meet for online classes. This helps us to share data/ links to all students within fraction of second and result will be prepared in less time duration which saves our time, man power and paper work. In this Pandemic situation, we are conducting online classes through Google meet, Zoom app. Through Google drive we can give access to limited students of particular class only. We provide the notes of different theory subject and practical's to the students on Google classroom. These technologies help us to shares the data in short duration of time to all students and also help in saving papers.</p> <ul style="list-style-type: none"> ➤ Installation of smart photo sensor to regulate the night lighting ➤ Digital notes

¹ <http://www.aicte-india.org/csc2019>

² <http://www.aicte-india.org/csc2019>

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		<ul style="list-style-type: none"> ➤ Google Drive is used for uploading notes and saving notes.
<p>3.</p>	<p>Create an ecosystem to 'smartly' connect and share the information with each other at campus, institute and national level. Any international level connect will provide a distinct advantage. The smart connect, though the cloud networking, so established should address concerns of environmental challenges including contribution to United Nations Sustainable Development Goals.</p>	<p>To share the data among all the Teachers and students, we are using Google. Google Drive is a file storage and synchronization service developed by Google for sharing of information to all users or to specific users. Google drive and What'sApp helps to share Notes/ Notices/ University important notices by single click to specific group of students/ to all students/ to the teachers. Also we are conducting our regular online classes through Google meet/Zoom App for all classes of our college; we are sharing notes to the students in the form of PDF or in PPT format which ever possible in their Google class. College had organized e-Quiz competition, e-Photography competition and National webinar, Workshop during COVID lock down. We had connected peoples (Guest, Speakers and participants) from all over the India in one platform. We had taken online verbal feedback from participants and we also share E-Certificates to all the participants. This platform is helpful not only to connect the peoples but also it is useful in sharing the also saves paper and with less use of man power. We had collected all data in only soft format. Our faculty members had online attended International conference and National and local conferences during lock down.</p>

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Abbreviations

AHU	Air Handling Unit
CFL	Compact Fluorescent Lamp
COP	Coefficient Of Performance
DG	Diesel Generator
ECRM	Energy Consumption Reduction Method
HVAC	Heating, Ventilation, And Air Conditioning
ISO	International Standardization Organization
ITHD	Current Voltage Total Harmonic Distortion
km	Kilometer
kV	Kilo Volt
kW	Kilo Watts
Lab	Laboratory
LED	Light-Emitting Diode
MNRE	Ministry of New and Renewable Energy
MSEDCL	Maharashtra State Electricity Distribution Co. Ltd.
MEDA	Maharashtra Energy Development Agency (MEDA)
TR	Tons of Refrigeration
VTHD	Voltage Total Harmonic Distortion
MSRTC	Maharashtra State Road Transport Corporation

Reference list of Websites

Sr. No.	Websites
1	IEEE 519 - http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=2227
2	http://mnre.gov.in/solar-energy/ch2.pdf
3	BEE - http://www.beeindia.in/
4	ECBC - http://beeindia.in/content.php?page=schemes/schemes.php?id=3
5	http://www.energymanagertraining.com/new_index.php
6	http://www.usalighting.com/stuff/contentmgr/files/1/92ffeb328de0f4878257999e7d46d6e4/misc/lighting_comparison_chart.pdf
7	https://www.bijlibachao.com/lights/use-energy-efficient-lights.html
8	http://www.imd.gov.in/section/climate/climateimp.pdf
9	http://www.bijlibachao.com/air-conditioners/air-conditioner-selection-understand-tonnage-eer-cop-and-star-rating.html
10	http://www.thehindubusinessline.com/opinion/time-to-focus-on-more-crop-per-drop/article9778971.ece
11	http://www.agri.mah.nic.in
12	http://www.indiawaterportal.org/sites/indiawaterportal.org/files/Room%20Top%20Rain%20Harvesting_Presentation_2006.pdf
13	http://www.imd.gov.in/section/climate/climateimp.pdf
14	http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver14.pdf
15	http://cdm.unfccc.int/
16	http://database.v-c-s.org/
17	https://www.cmcs.hjes.in/
18	https://www.mahadiscom.in/
19	https://www.mahaurja.com/meda/
20	https://offset.climateneutralnow.org/vchistory/details?orderId=15798
21	https://www.aicte-india.org/Initiatives/clean-green-campus

Introduction of the College

Today, Harikisan Jajoo Education Sanstha, Yavatmal is one of the fastest growing organization in the field of education. An organization devoted to the cause of propagation of education among all the sections of the society.

The Founders of the Sanstha aspire to create an enduring "College of Management and Computer Science" unique in its "Guiding Vision, Faculty, Curriculum and Students".

The founders, being leading businessmen and industrialists know the demands of the industry and have an urge to train the students as per the requirements of the industry. The founders believe in developing professionals who believe in themselves and are equipped with the latest state of the art in their respective fields; professionals who are confident and can compete in the challenging world.

Vision

- To give society a team of young and dynamic management and computer professionals.
- To run the institute for imparting knowledge and training in management and computer technology.
- To publish periodicals, journals, books and other literature in the respective fields.
- To collect information and set up a bureau regarding management and computer technology.
- To perform all acts, deeds or things that are necessary for the advancement and attainment of the foresaid objectives.

Mission

Position:

To be the leading and most sought after institute of education & research in emerging technology and management disciplines that attracts, retains and sustains gifted individuals of significant potential. Accomplishment To offer rewarding, relevant, knowledge driven learning and research experience and be the center of outstanding individual and institutional accomplishments that explores new horizons and creates challenging opportunities.

Values:

To be a socially responsible institution of visible values and high ethical practices that nurtures an environment of equity, enlightenment, freedom and enterprise and enriches the learning ethos of our people.

- College Of Management and Computer Science, Yavatmal, was started with the permission of the Government of Maharashtra and was established in the Year 2002, formally affiliated to S.G.B.Amravati University, Amravati.
- CMCS, Yavatmal is one of the few professionally run premier institute in this region. The College has been continuously striving for excellence in education, training, research and

consultancy in the fields of Management and Computer Science with a **Mission of Offering Best Education**

- Having the aspiration to groom future generation of business and IT leaders, the founders are committed to provide all the facilities and support for quality education and research to the students.
- The environment of CMCS nurtures creativity, innovativeness, professional approach, positive attitude, technical skills and motivates the students to excel in their endeavor.

Institutional Strength

- Own Building
- Experienced Faculty
- Excellent infrastructure & Adequate Resources
- Well-equipped Computer Lab(With Internet & Wi-Fi Facility)
- Transparency in Operating Processes
- Consistent Ranking of our Students in the University Topper List
- Big Library with a wide and varied collection of books
- Regular Curricular and Extracurricular Activities for the Skills Development of students
- All Statutory Committees/Cells in operation

Objective of Green Audit

The Green Audit Team focused on Material³ Issues pertaining to college which have the highest influence on the Green Attributes of the College. To evaluate steps taken by college management towards green campus below material issues are discussed chapter wise:

1. Organization Level Efforts
2. Creation of Awareness
3. Lighting
4. Cooling and Ventilation
5. Operation of Electronic Equipment's
6. Water Management
7. Water Quality
8. Renewable Energy
9. Transportation
10. Purchasing Practices
11. Carbon Footprint
12. Waste Management
13. Plantation Details

Considering the NAAC requirements, the Assessment Team has identified the Material issues which are related to the environmental performance of the college. The disclosures under this report are accordingly chosen so that the most appropriate, relevant and accurate information is made available. Checklist approach is adopted for transparent evaluation of the topics and increase readability for independent reader.

³Definition: as per Global Reporting Initiative: **GRI 101: FOUNDATION**2016

An organization is faced with a wide range of topics on which it can report. Relevant topics, which potentially merit inclusion in the report, are those that can reasonably be considered important for reflecting the organization's economic, environmental, and social impacts, or influencing the decisions of stakeholders. In this context, 'impact' refers to the effect an organization has on the economy, the environment, and/or society (positive or negative). A topic can be relevant – and so potentially material – based on only one of these dimensions.

1. Organizational Level Efforts

Is the college having campus green team?	Yes, the Green Campus Committee is already in place. This committee is highly active and meets twice in a year.
If yes, who are the stakeholders?	<p>Yes, it included stakeholders. The stakeholders include</p> <ul style="list-style-type: none"> ➤ Management ➤ Teaching Faculty ➤ Lab Technician ➤ Computer Operator ➤ Students <p>The Green Campus Committee is shared with the Audit Team. Refer Annexure III.</p>
Does it meet regularly?	The Team meets once in a semester. This was confirmed during site visit interviews and the review of the minutes of meeting.
Can the Green Campus Team suggest new environmental initiatives to College Management?	Suggestions on improvement of environmental performance are always welcomed by College Management. Tree plantation at various locations around the college etc. was also discussed as part of brain storming sessions within the meetings. These discussions were converted into live projects by the college management. The annexure to this report captures the live projects of the college.
Has the college established an environmental mission/vision for its campus?	The Management of College is persistent and resolved to make the campus eco-friendlier in due course of time. Various efforts are already initiated towards implementation sustainable initiatives, application of efficient technologies to save energy, plantation etc. There is no separate environmental mission/vision.
<p>Is the college encouraging sustainable behaviour via:</p> <ul style="list-style-type: none"> o education campaigns? o Posters, placards, messages o incentives? o contests? o awards? 	<p>College conducts various activities to create awareness amongst the students and society on environment safety and protection. College has established 'Green Campus Committee' which has conducted various Environmentally Friendly Activities / Trainings:</p> <ul style="list-style-type: none"> ➤ Online Quiz was organized on World Environment Day on 5th June 2020. ➤ Virtual Yoga Day celebrated on 21st June 2020. ➤ Workshop on Developing Professional Skill organized on 23rd & 24th October 2020. ➤ Sanvidhan Day celebrated on 26th November 2020. ➤ Online Quiz was organized on Aids Awareness at CMCS on 1st December 2020. ➤ Webinar on Revised NAAC Methodology organized on 04th December 2020.

	<ul style="list-style-type: none"> ➤ Tree Plantation Drive was organized at CMCS on 14th December 2020. ➤ Online Photography competition organized on 19th December 2020. ➤ Sant Gadge Baba Death Anniversary observed at CMCS 20th December 2020. ➤ Blood Donation Camp organized at CMCS on 04th January 2021. ➤ Exhibition on Best Out of Waste was organized at CMCS on 16th February 2021 <p>Please refer Annexure IV for details.</p> <p>Community Based Initiative's by college:</p> <ul style="list-style-type: none"> ➤ Corona Awareness Handbills were printed and distributed by the college ➤ Mask Making & Distribution by NSS Volunteer in COVID – 19 Pandemic on 07th May 2020. ➤ Mask Distribution at Orphanage House at Nilona on NSS Day Dam on 24th September 2020. ➤ Mask Distribution and Sanitization Program near college area on 17th October 2020. ➤ Mask Distribution and Sanitization Program in Adopted Village Waki (Road) on 21st October 2020. ➤ Street Drama Awareness on Blood Donation and COVID– 19 Awareness at Yavatmal on 01st January 2021. ➤ Street Drama Awareness on Blood Donation and COVID – 19 Awareness at Waki on 11th February 2021. <p>Please refer Annexure XIV for details.</p>
<p>Is the college staff modelling sustainable behaviour for students, peers, and community?</p>	<p>During interviews it was confirmed that There are 48 staff members in the college, out of which:</p> <p>Teaching & Non-Teaching Staff:</p> <ul style="list-style-type: none"> ➤ 69% staff of the college commute by their own 2 wheelers. ➤ 4% staff of the college travel by 4 wheelers. ➤ 15% staff use bicycle for commuting. ➤ 12% staff commute by bike sharing. <p>Please refer above assessments for additional details</p>
<p>Do students model sustainable behaviour for staff, peers, and community?</p>	<p>Total 833 students are enrolled for 2020-21 session. Approximately:</p>

	<ul style="list-style-type: none"> ➤ 33% students of the college commute by their college by their own 2 wheelers. ➤ 9% students of the college commute by bicycle. ➤ 18% students of the college commute by public transport (State Transport / Citybus) ➤ 13% students of the college commute by walking. ➤ 27% staff commute by bike sharing. <p>Please refer above assessments for additional details</p> <p>Students participate in activities conducted by college on environment and sustainable development. In addition, please refer above assessments.</p>
<p>Is the college sharing learning internally via</p> <ul style="list-style-type: none"> o Posters, placards, messages? o assemblies? o classroom presentations? o training/professional development? o posters/bulletin boards? o newsletter? o website? 	<p>Data is shared via posters, placards and messages. The assessment team is appraised that the awareness poster includes topics related to minimization of energy usage by avoiding wastage, improvements on energy efficiency, minimization of water wastages, proper disposal of wastes. Please refer Annexure XIII for details.</p>
<p>Does the college offer energy conservation lessons?</p>	<p>Yes, College organizes lectures and motivates students for Energy and Environment conservation.</p>
<p>Is the college sharing its learning externally via</p> <ul style="list-style-type: none"> o Paper presentations? o newsletter? o website? 	<p>The students are encouraged to present projects on topic related to environmental aspects.</p> <p>The college is also going to make the Green Audit Report public so that learning's of college are shared.</p>
<p>Further Scope of Improvement:</p> <ul style="list-style-type: none"> ➤ At organization level, the college needs to establish long term improvement objectives to further reduce energy consumption, water consumption and reflect the same in form of dedicated Environment Policy. 	
<p>Conclusion:</p> <ul style="list-style-type: none"> ➤ Active involvement of Organization is observed. ➤ Adequate awareness amongst the students and other stakeholders (faculty, other staffs, service providers, etc. is observed and reflected from their behavior. ➤ College has installed solar PV modules on the terrace to generate renewable electricity. 	

2. Creation of Awareness

<p>Are the objectives of green audit clearly understood by the institute</p>	<p>Yes</p> <p>To spread awareness amongst the students and the surrounding community about the environmental impact due to operations associated with their teaching institution.</p> <ul style="list-style-type: none"> ➤ To sensitize them how to address the situation at the local and personal level by conducting programs, camps and other means as feasible ➤ To reduce the negative environmental footprint ➤ To explore possibilities to use renewable energy sources to avoid GHG emissions and also reduce power cost ➤ To continue the use of efficient LED based lighting ➤ To introduce the automatic controls on the lighting systems ➤ To mitigate the carbon emission or offset them ➤ To increase the green cover ➤ To vigorously and responsibly position the institute for active contribution in Clean India Mission undertaken by the Governments. ➤ To identify ways and means to sustainably contribute and reduce gaps and become environment friendly ➤ To support community to combat various environmental and social issues as feasible. ➤ To align the college activities to be in line with the requirements of the Clean and Smart Campus Initiatives (https://www.aicte-india.org/Initiatives/clean-green-campus) <p>Key Recommendation by the Green Audit Team:</p> <ul style="list-style-type: none"> ➤ College should apply for the Clean and Smart Campus Initiatives award
<p>Are there posters/guidance displayed to remind students and staff of good practices?</p>	<p>Yes</p>
<p>Are the students aware of energy sources?</p>	<p>The major source of energy is Solar PV System, electricity (grid electricity) followed by usage of diesel in the DG as back in case of failure of grid electricity. Students are aware of these sources of energy which are utilized by the college.</p>
<p>Is college tracking its electrical energy usage?</p>	<p>There is 1 meter, which measure the electricity imported by the college. The readings of electricity consumption are included as part of this report under chapter 11.</p>
<p>Is college offering energy conservation lessons and programs?</p>	<ul style="list-style-type: none"> ➤ College has created awareness among the faculty and students to reduce energy wastage.

	<ul style="list-style-type: none"> ➤ The college has appropriately disabled the screen savers and programmed the computers for sleep mode operations. ➤ The usage policy of photocopiers, fax machines and other equipment users is "POWER ON" when in use and "POWER OFF" when not in use. There is no idle power consumption. <p>Please refer Annexure V and VI for details.</p>
Do students and staff know where their water comes from?	The source of water is bore well. Bore Well water is utilized for drinking (after purification), in the wash rooms and for cleaning purpose.
Is college encouraging responsible water use via: o posters, placards? o incentives? o contests? o awards?	Yes, by posters, placards, contests and winner of contest are awarded.
How is trash managed outside the campus?	The waste is given to the Nagar Parishad for disposal.
Further Scope of Improvement	
<ul style="list-style-type: none"> ➤ College may calculate the water footprint to compare its performance with national and international consumption standards and communicate with its stakeholders. ➤ College should apply for the Clean and Smart Campus Initiatives award. 	
Conclusion	
<ul style="list-style-type: none"> ➤ Visible communication on environmental issues. ➤ Effective use of notice boards and signs. ➤ Water footprint may be calculated in future. 	

3. Lighting

How college is utilizing daylight?	The college building is situated in such a manner that it is getting the full advantage of good airflow enabling good ventilation and sun light. It is a building having large windows and open space in all directions. During the day time, it is possible to carry out activities without air conditioners and air fans during operational days.
Is college utilizing any incandescent lights? Can they be replaced with compact fluorescents (energy saving bulbs)?	<p>The college timings are from 7.45 AM to 6:00 PM. Thus, requirement of daytime lighting (powered by electricity) is limited.</p> <p>Energy efficient lighting system is followed. the contemporary best practices will recommendations on lighting by Bureau of Energy Efficiency, Book-3, Chapter 8, table 8.1</p>

Table 8.1 Luminous Performance Characteristics of Commonly Used Lamps

Type of Lamp	Lumens / Watt		Colour Rendering Index	Typical Application
	Range	Avg.		
Incandescent	8-18	14	Excellent (100)	Homes, restaurants, general lighting, emergency lighting
Fluorescent lamps	46-60	50	Good w.r.t. colour (67-77)	Offices, shops, hospitals, homes
Compact fluorescent lamps (CFL)	40-70	60	Very good (85)	Hotels, shops, homes, offices
High pressure mercury (HPMV)	44-57	50	Fair (45)	General lighting in factories, garages, car parking, flood lighting
LED lamps	30-50	40	Good (70)	Reading lights, desk lamps, night lights, spotlights, security lights, signage lighting, etc.

Thus, LED's are considered for installation as night lights, security street lights by the college. The term reading light⁴ normally refers to lamps or lights which focus light dedicated for readings, thus LEDs were not considered for class room lightings initially. Fluorescent lamps were utilized for class rooms (as the same are stated to be suitable for office illumination level requirements). LED lights started replacing the conventional tube light as a replacement measure after failure. LED lighting survey was also undertaken by the Audit Team. Please refer below assessments in details.

During the onsite visit the Audit Team visited each department and physically counted the installed lights by their types (Fluorescent tube lamp, CFL and LED). It is confirmed that there is no incandescent light installed for lighting purpose.

As per the published article: http://www.usalighting.com/stuff/contentmgr/files/1/92ffeb328de0f4878257999e7d46d6e4/misc/lighting_comparison_chart.pdf

LED light has lumen/ watt in the range of 80-100 whereas CFL has lumen/ watt in the range of 70-90

Has the college evaluated existing lighting for opportunities to reduce lighting in over-lit areas?	The lighting arrangements are well balanced with arrangements to switch ON and OFF lights independently. There are therefore practically no over lit areas.
Are the light switched duly labelled to make more obvious which switches relate to which appliances?	Switch arrangements are lucid. The fan switches are adjacent to fan speed regulators. Light switches are arranged in order of lighting. The buttons are marked.
Are the lights switched off to make use of daylight? (e.g. lights parallel to windows or in corridors)	There is minimum or practically negligible use of lights during day time as the building structure has possibility of daylight usage. The lux level in the classrooms was measured and found approximately 250. The Library, Electronics' Lab. & Computer Lab are situated in the basement so the lux level measured there were found on a lower side The locations were pinned and college management confirmed to take subsequent corrective actions.
Is the college utilizing natural lighting when possible?	Yes, natural lighting is first preference.
For the spaces like store rooms, toilets, kitchen areas, copying rooms, corridors etc is	The college avails the sensor-based lighting arrangements to control the night illumination. The lighting sensors automatically switch on and switch off lights depending on

⁴<https://www.collinsdictionary.com/dictionary/english/reading-light>

there scope for automatic lighting controls?	the lux levels. Recommendation: The students and staff washrooms can be equipped with the proximity sensors to control the lighting arrangements.
Can main lighting ever be switched off and dedicated lighting be used?	As such there are no dedicated lamps which can replace overhead lighting. However, redundant lighting can be switched off when it is not required.
Are the light fittings clean?	The staff is responsible for day to day cleaning was interviewed during onsite visit. Cleanliness is well maintained. In-house light fittings are cleaned regularly some light fittings need cleaning. However, the installed fittings were not cleaned as Covid-19 Pandemic caused shortage of staff.
Do windows and skylights need cleaning to allow in more natural light?	The window and skylight were not clean as Covid-19 Pandemic caused shortage of staff.
Has the college installed lighting occupancy sensors?	No, lights are negligibly operated during day time. The lights are operated manually. The night lights are however operated based on the sensors which operate lights based on the illumination levels.
Is there mechanism in place to immediately report inoperable occupancy light sensors?	Yes, in case of failure of the existing sensor, the night lights will not operate.
What is the % contribution of the LED lighting?	We have evaluated the % LED installation at Passage and ground and all other floor. The value is determined and presented under Annexure V.
Further Scope of Improvement	
➤ The students and staff washrooms can be equipped with the proximity sensors to control the lighting arrangements.	
Conclusion	
➤ The students and employees were interviewed and no complains was identified within respect to the sufficiency of lighting measures.	
➤ Sufficient lux levels approximately 250 are common in class rooms and work-stations based on the survey of audit team.	
➤ Negligible lighting load is observed during day time as college makes good use of daylight.	

4. Cooling and Ventilation

How are the Air Conditioning Controls? For the local controls, how it is ensured that AC is working only ON when necessary. What is temperature setting of the	The AC usage is moderate as the temperature in Yavatmal district is (Max temperature is above 42°C ⁵) hottest day in Yavatmal was registered with temperature of 45.5°C). The AC temperature is set at 28°C. Awareness is created and measures are implemented in line with the recommendations of Ministry of Power (https://www.cseindia.org/a-step-in-the-right-
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⁵<http://www.imd.gov.in/section/climate/climateimp.pdf>

⁶<https://www.google.com/search?q=hottest+day+in+yavatmal+district&oq=hottest+day+in+yavatmal&aqs=chrome.3.69i57j33i160i395l2j33i160.21260j1j7&sourceid=chrome&ie=UTF-8>

AC?	direction-says-cse-of-power-ministry-s-move-to-fix-starting-temperature-of-room-air-conditioners-at-24oc-and-not-lower-to-save-energy-8814)
What is the mechanism of reducing heat in-grace? Are the closing blinds or fitting reflective film to windows installed to reduce solar gain?	The building is designed to make best use of day light and avoid the heat in-grace. Blinds are available in office to control unnecessary heat in-grace.
Are all external doors and windows closed when air conditioning is on?	There are 2 number of AC's in college. Based on interviews, it is confirmed that the practice of closing doors and windows is maintained when air conditioning is in operation.
Is there a scenario where air conditioning is wasted in unused spaces, such as cupboards, corridors?	There are no such instances observed. Arrangements are duly implemented to avoid losses.
Are Efficient and energy labelled AC's utilized for cooling purposes?	<p>There are 2 number of AC's in the college out which 1 is 2 star which runs for 4-5 hours during summer and rainy season and 1 is 5 star runs for 5-6 hours during all college days.</p> <p>Recommendation:</p> <p>It is recommended to replace the 2 star AC with more energy efficient AC (at least 3 Star ratings or above).</p> <p>Below guidelines can be considered by college in future while selecting between the AC and evaporative cooling.</p> <p>Evaporative Cooling System (for computer lab)</p> <p>The Assessment team has undertaken document review and analysis of the data for the assessment of the air conditioning system. Based on the same it was found that there exists scope for the use of evaporative based cooling which is energy effective compared to the reversed Bryon cycle i.e. Vapour Compression Cycle. The basic reason for the same installed system has COP of 1.5 kW/TR of refrigeration compared to evaporative cycle which draws 0.3-0.5 kW based on the size of installation.</p>
Further Scope of Improvement	
<ul style="list-style-type: none"> ➤ The 2 start AC is not the most economical AC. It is recommended to replace the AC with more energy efficient AC (at least 3 Star ratings or above). 	
Conclusion	
<ul style="list-style-type: none"> ➤ The 2 star AC need to be replaced by at least 3 Star AC or better at the end of their technical lifetime. ➤ Evaporative cooling is availed for computer lab. 	

5. Operation of Electronic Equipment

Are computers, printers, photocopiers and other equipment switched off at the end of the day?	Yes
Is there any mechanism by which the screens and other equipment be controlled during the day?	The college has availed the services of the Green Audit. The college has appropriately disabled the screen savers and programmed the computers for sleep mode operations. Please refer to Annexure VI.
Are the screen savers disabled?	Yes, please refer above assessment.
Are computers programmed to 'power down' mode?	Computers are programmed for the sleep operation.
Is the user entrusted with the rights to modify standby settings? (E.g. TVs, LCD projectors, printers etc.)	No, the college has the administrative rights. Such changes cannot be initiated by users.
What is status of the photocopiers, fax machines and other equipment? Are they programmed on 'Energy Saver' mode during the day?	The equipment like photocopiers, fax machines are shutdown when not in use, computers are turned to sleep mode whenever not in use.
Are the power management settings enabled on all the computers/ monitors/ all-in-one machines?	All machines are governed by the college. All are equipped by power management settings as already described above.
Conclusion:	
➤ The Electrical Equipment's are well operated. Redundant operations are avoided.	

6. Water Management

Are any water leaks identified?	The urinals are flushed periodically and manually. The urinals need to be equipped with push button taps. Please refer below recommendation.
Are taps left running? Are there any dripping taps? Do taps need maintenance?	No such instance was observed.
Are push button taps utilized?	Toilet washrooms are not equipped with the push buttons. Please refer below recommendation.
Is water escaping from overflows either inside or outside buildings?	No such instance was identified during onsite audit.
Has the college installed low-flow faucets, automatic	Recommendation: The college Management needs to consider dedicated flush

faucets, and/or faucet aerators?	at urinals (in place of periodic manual flushing), low-flow faucets, automatic faucets, and/or faucet aerators as the replacement for the existing conventional taps.
Has the college installed low-flow shower heads at Hostel?	NA
Has the college harvested rainwater?	Yes, the rain water is harvested over the college building.
Is the college collecting the condensation from A/C units for onsite watering needs?	Yes. The condensed water is gathered in buckets and the water used for watering plants.
Has the college optimized its irrigation system for gardening to o operate at night or early morning hours to minimize evaporation? o water the minimum time and frequency necessary for the applicable vegetation?	Yes. Drip irrigation system is installed in college. As per the latest publication from "The Hindu" drip irrigation is one of the most important measures to achieve "more crop per drop". Share of Agriculture consumption is approximately 83 per cent of India's water resources, thus approximately 17 per cent water resources are available for domestic and industrial use (http://www.thehindubusinessline.com/opinion/time-to-focus-on-more-crop-per-drop/article9778971.ece). Recommendation: College needs to install the metering arrangement to measure the water drawn from bore well.
What is amount of rain water harvested?	Total area of roof top of college building is 1131.17 m ² . The rainfall for Yavatmal Region is approximately 849.4 mm. Total rain water harvesting is 864 m ³ at the run off coefficient of 0.9. The college has also laid the cement blocks. This enables the rain water falling on the cement blocks to flow to the pits and get harvested. The area under the cement block is 1189.70 m ² . The run off coefficient is considered as 0.3 based on the Manual on Artificial Recharge of Ground Water, issued by Government of India, Ministry of Water Resources, Central Ground Water Board, September 2007. The water rain water harvested from the cement blocks is 303 m ³ . Total quantity of water harvested = 864 + 303 = 1167 m ³ Please refer Annexure XVIII for details.
Are there any community based projects implemented by the college?	Yes. Activities by NSS have been undertaken by the college. Refer Chapter 1 and Annexure XIV for details.
Further Scope of Improvement:	
Long Term Measure:	
<ul style="list-style-type: none"> ➤ The college Management needs to consider dedicated flush at urinals (in place of periodic manual flushing), low-flow faucets, automatic faucets, and/or faucet aerators as the replacement for the existing conventional taps. ➤ College needs to install the metering arrangement to measure the water drawn from bore well. ➤ College can undertake determination of water footprint and calibrate its specific water consumption with the established National and International Norms. 	
Conclusion:	
<ul style="list-style-type: none"> ➤ The college is having 01 no. of bore well. 	

- Toilet urinals can be equipped with the push buttons.
- Drip irrigation system is installed the college.

7. Water Quality

Is the college campus maintained clean to minimize litter polluting water table?	The college premise is kept clean. Thus, the chances of litter polluting water table are negligible
Is the college monitoring drinking water quality regularly? If yes, what is the frequency?	Yes, Third Party Water testing is done by the college.
Conclusion:	
<ul style="list-style-type: none"> ➤ The students, staff members and guests have access to clean, safe and potable water with the RO system. ➤ Third Party Water testing is done by the college. 	

8. Renewable Energy

Is the college having solar, wind, or other forms of renewable energy?	Yes. The college has installed Solar PV System of 15 kW on the college roof.
Is the college purchasing renewable power from third party or renewable energy certificates for its electricity use?	No,
Is the college offering renewable energy lessons / programs?	This already assessed under chapter 01 of this report.
Conclusion:	
<ul style="list-style-type: none"> ➤ The college has installed Solar PV System. 	

9. Transportation

Is college encouraging transportation measures like bicycle, Bulk transport, walking?	<p>Students: Total 833 students are enrolled for 2020-21 session.</p> <p>Approximately:</p> <ul style="list-style-type: none"> ➤ 33% students of the college commute by their college by their own 2 wheelers. ➤ 9% students of the college commute by bicycle. ➤ 18% students of the college commute by public transport (State Transport / Citybus) ➤ 13% students of the college commute by walking.
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	<ul style="list-style-type: none"> ➤ 27% staff commute by bike sharing. <p>Students participate in activities conducted by college on environment and sustainable development. In addition, please refer above assessments.</p> <p>Faculties: During interviews it was confirmed that There are 48 staff members in the college, out of which:</p> <p>Teaching & Non-Teaching Staff:</p> <ul style="list-style-type: none"> ➤ 69% staff of the college commute by their own 2 wheelers. ➤ 4% staff of the college travel by 4 wheelers. ➤ 15% staff use bicycle for commuting. ➤ 12% staff commute by bike sharing. <p>Please refer above assessments for additional details</p>
Is the college providing eco-friendly or less GHG intensive transportation matching services? (Example carpools, college buses etc)	Refer above response.
What are the good practices pertaining to Transport?	<p>No vehicle is driven inside the campus every Saturday.</p> <p>Recommendation:</p> <p>College Management should encourage use of bi-cycle and mass transport systems amongst students and faculties.</p>
<p>Further Scope of Improvement:</p> <ul style="list-style-type: none"> ➤ College Management should encourage use of bi-cycle and mass transport systems amongst students and faculties. 	
<p>Conclusion:</p> <ul style="list-style-type: none"> ➤ The college management, its employees and the students observe satisfactory practices of transportation/ commutation. 	

10. Purchasing Practices

Describe the purchasing that confirms the better environmental performance?	Printers with duplex printing facility is installed at the computer lab and Library. There is culture of the two-sided printing. Paper is not wasted.
How does the college limit the purchase of single-serve bottles and containers?	The college has RO system; guests are served with water from RO system. Single serve bottles are not utilized unless requested by the guest.
Is the college having water fountains/stations to promote easy filling of reusable water bottles?	Yes, the water dispensers are connected to output of RO system. Clean and potable water is available to staff, student and guests.
<p>Further Scope of Improvement:</p>	

The college should further emphasize on the purchase of:

- no- to low-odor (VOC) markers
- no- to low-VOC paints? (via Facilities)
- paper/paper products with maximum recycled content
- refillable pens/pencils
- compostable bags for compost collection

Conclusion:

- Focus of the recommendation pertaining to the environmental preference of evaporative cooling over AC needs to be considered.
- One sided paper is utilized by college to avoid use of fresh papers
- Policy for the disposal of Archived paper Records needs to be formed by college

11. Energy and Carbon Footprint

<p>Has the College undertaken energy audit?</p>	<p>Yes, the energy audit was undertaken and electrical measurements were undertaken at the college. Please refer the Annexure –XVI of this report.</p> <p>Energy audit is an effective tool in identifying and perusing a comprehensive energy management program. Energy Audit highlights the areas of energy savings, thereby reducing the energy costs. The following are the major consumers of electricity in the facility:</p> <ul style="list-style-type: none"> ➤ Computers ➤ Lighting ➤ Air-Conditioning ➤ Fans ➤ Pumps ➤ Other Lab Equipment
<p>What are the steps undertaken during the energy audit?</p>	<p>The Assessment Team undertook the analysis of the college premise:</p> <ul style="list-style-type: none"> ➤ To study electricity bills ➤ Study of lighting system and its measurement. ➤ Air conditioner ➤ Identification of energy saving opportunity and energy conservation.
<p>What methodology was adopted?</p>	<p>The energy assessment involved desk review and onsite measurements. Review of energy bill received from MSEDCL was undertaken. Review of lighting, HVAC, fuel usage, pumping systems etc. was undertaken. Energy conservation and saving opportunities are identified and included below.</p>

<p>What are the suggested energy conservation measures?</p>	<p>Below energy conservation measures are suggested</p> <ul style="list-style-type: none"> ➤ The one switch for college concept should be implemented in the college. This will avoid unwanted operation and wastage of electricity. ➤ There are 40 W tube lights with copper chokes. As per replacement policy the LED tube-light should be installed. The T8 LED tube has wattage of 20 W, thus the energy saved is $40-20 = 20$ watt/fitting. As per study there are 70 tubes of 40 W in college and library. After the replacement based on failure the energy savings will be approximately 1990 kWh. Since the college has in house Solar PV Plant, the savings in kWh are not quantified into INR. However, the saved power can be utilized for other additional equipment's / futuristic expansion. ➤ Air conditioner shall be operated between temperature range of 24-28°C to maintain lower cooling load on compressor to save energy. ➤ The existing 2 star labelled AC at the end of its service life should be replaced by the 5-star AC. <table border="1" data-bbox="470 768 1422 1048"> <thead> <tr> <th></th> <th>0.75 ton</th> <th>1 ton</th> <th>1.5 ton</th> <th>2 ton</th> </tr> </thead> <tbody> <tr> <td>1 Star AC (mostly non Inverter)</td> <td>627</td> <td>843</td> <td>1246</td> <td>1648</td> </tr> <tr> <td>2 Star AC (mostly non Inverter)</td> <td>596</td> <td>800</td> <td>1184</td> <td>1626</td> </tr> <tr> <td>3 Star AC (mix of Inverter and non Inverter)</td> <td>542</td> <td>747</td> <td>1104</td> <td>1448</td> </tr> <tr> <td>4 Star (mostly Inverter)</td> <td>464</td> <td>645</td> <td>945</td> <td>1293</td> </tr> <tr> <td>5 Star (mostly Inverter)</td> <td>450</td> <td>554</td> <td>840</td> <td>1113</td> </tr> </tbody> </table> <p style="text-align: right; font-size: small;"><i>Annual Electricity Consumption (Units or kWh for 1600 hrs) based on data from BEE</i></p> <ul style="list-style-type: none"> ➤ .All Class Rooms and labs must sensitize students regarding optimum use of electrical appliances in the room like, lights, fans, and computers. ➤ Lights in toilet area may be kept OFF during day time. Additional sensors can be installed in washrooms to automatically regulate the light and exhaust fans. 		0.75 ton	1 ton	1.5 ton	2 ton	1 Star AC (mostly non Inverter)	627	843	1246	1648	2 Star AC (mostly non Inverter)	596	800	1184	1626	3 Star AC (mix of Inverter and non Inverter)	542	747	1104	1448	4 Star (mostly Inverter)	464	645	945	1293	5 Star (mostly Inverter)	450	554	840	1113
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5 Star (mostly Inverter)	450	554	840	1113																											
<p>Has the college calculated its carbon footprint?</p>	<p>For the first time college is calculating the carbon footprint. The data applicable to Scope-2 emission (electricity purchase from grid) is available. The emissions pertaining to Scope-01 are limited to HSD use in DG.</p> <p>Note: Consumption of LPG has been excluded from the calculations as LPG is used only in cafeteria (canteen) which is closed for the last 1 year due to Covid19 lockdown.</p>																														
<p>How is college promoting zero emission transportation options?</p>	<p>Not applicable. There is no internal transportation within the college.</p>																														

Are all the applicable emission sources calculated?

The emission source pertaining to grid-based electricity source is calculated. Scope-01 emission source data pertaining to DG, HSD consumption in DG, Scope 2 emission on account of electricity imported from grid is considered.

Scope-01 Emissions are tabulated as follows⁷:

Year	HSD Consumption in DG	Total GHG Emission (Scope-1)
Session	lit	tCO ₂
2020-21	1070	3.94

Scope -2 Emissions are tabulated as follows⁸:

Year	Annual Electricity Consumption	Total GHG Emission (Scope-2)
Session	kWh	tCO ₂
2020-21	1381	1.38

Total CO₂ emissions = Scope-01 + Scope-02

Year	Total GHG Emission (Scope-1)	Total GHG Emission (Scope-2)	Total GHG Emission (Scope-1+2)
Session	tCO ₂	tCO ₂	tCO ₂
2020-21	3.94	1.38	5.31

Web link of purchase of carbon credits: The college has tried to offset the scope 1 and scope 2 emission by purchase of equivalent offset from VERRA Registry. The cancellation certificate is available publicly on below web link.

From Vintage	To Vintage	Serial Number	Quantity of Credits	Credit Type	Project ID	Project Name	Project Type	Project Site State/Province	Project Country	Account Holder	Retirement Reason	Beneficial Owner	Retirement Reason Details	Date of Retirement
01/01/2018	31/12/2018	8521-28109954-28109960-VCS-VCU-291-VER-IN-1-784-01012010-31922018-0	7	VCU	784	1.6 MW Bundled Rice Husk Based Cogeneration Plant by M/s Milk food Limited (MFL) in Patiala (Punjab) & Moradabad (U.P.) Districts	Energy industries (renewable/non-renewable sources)	Punjab	India (IN)	EKI Energy Services Limited	Retirement for Person or Organization	College of Management and Computer Science, Yavatmal	Offsetting the Scope 1 and Scope 2 emissions.	23/03/2021

<https://registry.verra.org/myModule/rpt/myrpt.asp?r=206&h=117525>

The certificate is attached under Annexure XIV for ready reference.

⁷With 5 % uncertainty as all values are sourced from bills

⁸With 5 % uncertainty as all values are sourced from bills

12. Waste Management

How the college reduces its paper waste via:

- o encouraging digital reading, note-taking, and activities?

- o setting printers and computers to default to duplex (double-sided) printing?

- o reducing margins and white space on documents that must be printed?

- o printing multiple pages per sheet?

- o minimizing paper correspondence with families?

- o opting out of unwanted mail?

Is the college undertaking recycling collection for additional recyclable materials—like plastic bags, CFL (spiral) light bulbs, batteries, drink pouches, candy wrappers, and electronics?

- The class room and labs are well ventilated and spacious. This minimizes suffocation to students by improving air changes and hence the air quality.

- The college has adopted the duplex printers, which enables the complete usage of the paper areas.

- College has taken initiatives towards plastic free campus. The students are encouraged to use waste bins which are placed in the college.

- The internal correspondences and various functionalities are taken care by the electronic means like emails, sms etc.

- The recycling / disposal system adopted by the college is as below.

Different types are generated within campus which include. –

- **E-Waste:** The E-waste generally includes the tube-lights, CFL, LED, computer waste, etc. are stored into the scrap bin. As the amount of E-waste generated is less till date the college has not yet disposed it.

- **Plant Waste:** The plant waste is converted to manure in compost pit within the campus area.

- **Sewage Waste:**
The liquid waste from lavatories and other sources are flown into the sewage treatment unit, the water is reused for plants and the sludge is disposed through sewer line.

- **Cellulose and Paper Waste:**
Cellulose and paper waste is stored in a particular place and given to the agency for proper disposal. MOU of cellulose waste handling is executed.

Please refer Annexure XIII for details.

Further Scope of Improvement:

The college needs to sign a MOU for E-waste handling with an agency for its proper handling.

Conclusion:

- Satisfactory practices of waste handling are followed by college.

13. Plantation by College

The college campus has several varieties of trees.

Every year, plantation programme is carried out in the campus as well as outside the campus. Students are also involved in plantation programme in surrounding locality. In the current session, the Institution planted several trees in the vicinity.

There are 210 fully grown trees as wells as shrubs in the campus.



CMCS

Harikisan Jajoo Education Sanstha Yavatmal.
**COLLEGE OF MANAGEMENT AND
COMPUTER SCIENCE, YAVATMAL.**

(Affiliated to Santa Gadge Baba Amravati University, Amravati) College Code - 457 / MBA Code -1106

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cmcs457@sgbau.ac.in



94231-31946

Ref. No.

List of Plants in College Campus

Date :- 17-03-2021

Sr. No.	Name Of Plant	Quantity
1.	Green Ficus	49
2.	Gulmohar	20
3.	Karanji	05
4.	Mango	19
5.	Vidya (Thuja)	28
6.	Ashoka Tree	01
7.	Awala (Indian Gooseberry)	01
8.	Jambhul (Java Plum)	01
9.	Sagwan (Teak)	10
10.	Kadulimb (Neem Tree)	02
11.	Cheri	03
12.	Badam (Almond)	02
13.	Umbar (Cluster Fig)	01
14.	Rose Tree	02
15.	Tulas (Basil)	02
16.	Palm Tree	40
17.	Aloe Vera	05
18.	Christmas	01
	Total	210



Shankar
Principal
College Of Management And
Computer Science, Yavatmal

List of trees in the campus

Annexure

Annexure – I: List of Interviewed College Staff / Students



Harikisan Jajoo Education Sanstha Yavatmal.
**COLLEGE OF MANAGEMENT AND
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(Affiliated to Santa Gadge Baba Amravati University, Amravati) College Code - 457 / MBA Code -1106

Address :- 13/4 (A), Behind Naringe Nagar, Dhamangaon Road, Yavatmal - 445001 (M.S.)

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94231-31946

Ref. No.

Date :- 17-03-2021

List of Teaching and Non-teaching Staff were present for Green Audit

Sr. No.	Name	Class	Signature
1	Mr. Ritesh D. Chandak	Principal	
2	Dr. Atul K. Shingarwade	Asst. Prof.	
3	Mr. Yogesh M. Patil	Asst. Prof.	
4	Mr. Amol B. Payghan	Asst. Prof.	
5	Mr. Umesh R. Kantode	Asst. Prof.	
6	Mr. Sudhir N. Velukar	Asst. Prof.	
7	Mr. Shubham S. Kane	Asst. Prof.	
8	Mr. Husain A. Bharmal	Asst. Prof.	
9	M.s. Minal P. Shende	Asst. Prof.	
10	Mr. Rajendra B. Khond	Head Clerk	
11	Mrs. Savita M. Yekundwar	Cashier	
12	Mr. Dipak Ajankar	Peon	



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List of Teaching & Non – Teaching Staff present during Green Audit



Harikisan Jajoo Education Sanstha Yavatmal.
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Ref. No.

Date :- 17-03-2021

List of Students who were present for Green Audit

Sr. No.	Name	Class	Signature
1	Mr. Pratik P. Magar	M.Sc. II Year	
2	Ms. Saloni Chaudhari	MBA I Year	
3	Ms. Vinita Sukhani	MBA I Year	
4	Mr. Saurabh V. Kesharwani	BBA III Year	
5	Mr. Prajwal S. Buddhe	BCA II Year	
6	Mr. Mayur S. Pachkate	BCA II Year	
7	Ms. Isha S. Barde	BCA III Year	
8	Ms. Nisha S. Barde	BCA III Year	
9	Ms. Rupali Bhagat	BCA II Year	
10	Ms. Rani Dahifale	BCA III Year	
11	Ms. Shivani Kadu	BCA III Year	
12	Ms. Gayatri Penshanwar	BCA III Year	



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List of Students present during Green Audit

Annexure – II: Reference Documents / Surveys

Sr. No	Reference Documents / Surveys pertaining to
1.	Functionality of RO water plant
2.	Roof top area by College
3.	Setup for rain Water Harvesting
4.	Information regarding Garden Waste Management
5.	Information regarding Liquid Waste Management
6.	Measures for maintaining Cleanliness in Campus.
7.	Measures for Garbage Collection and disposal
8.	Plantation Measures
9.	Electricity Bills for duration of April 2020 to February 2021
10.	Nature Conservation Club Composition
11.	Declaration on Operational Controls of System Department with Respect to IT Management & Other Electronic Equipment's.
12.	Roll of Staff, Students & Management to Save Electricity In Campus.
13.	Lighting Survey undertaken by the Green Audit Team
14.	AC Survey undertaken by the Green Audit Team
15.	Water Harvesting Survey undertaken by the Green Audit Team
16.	Waste Water Management Survey undertaken by the Green Audit Team

Annexure –III: Green Campus Committee



Harikisan Jajoo Education Sanstha Yavatmal.
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Ref. No.


Date :- 17-03-2021

Green Campus Committee, It's Vision & Mission

Green Campus Committee 2020-2021

Sr. No.	Name	Designation
1	Mr. Ritesh D. Chandak (Principal)	Chairman
2	Mr. Yogesh M. Patil	Secretary
3	M s. Minal P. Shende	Member
4	Dr. Atul K. Shingarwade	Member
5	Mr. Amol B. Payghan	Member
6	Mr. Shuhbam S. Kane	Member
7	Mr. Husain A. Bharmal	Member
8	Mr. Rajendra B. Khond	Member
9	Mr. Prajwal Buddhe	Student
10	Ms. Saloni Chaudhari	Student
11	Ms. Vinita Sukhani	Student




Principal
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Harikisan Jajoo Education Sanstha Yavatmal.
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Ref. No.

Date :- 17-03-2021

Green Campus

Vision

To operate in a sustainable manner by being more sensible & wise with the use of energy & other natural resources & try to provide a contribution to global environment & sustainability.

Mission

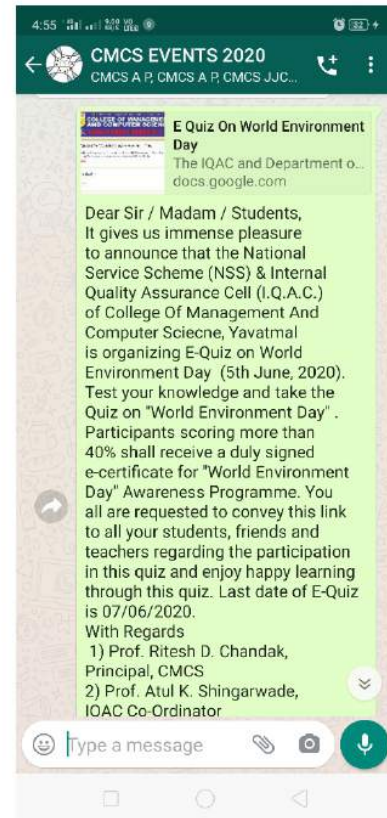
- To improve infrastructure & policy on campus to save energy & water in campus.
- To educate campus community about sustainability.
- To be more efficient in the energy consumption (including electronics & other energy forms) and make efficient management of waste.
- To create positive effect on local environment & community through efficient use of natural resources & efficient management of water.




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Computer Science, Yavatmal

Green Campus Committee 2020 – 21

Annexure – IV: List of Awareness Program Undertaken By College

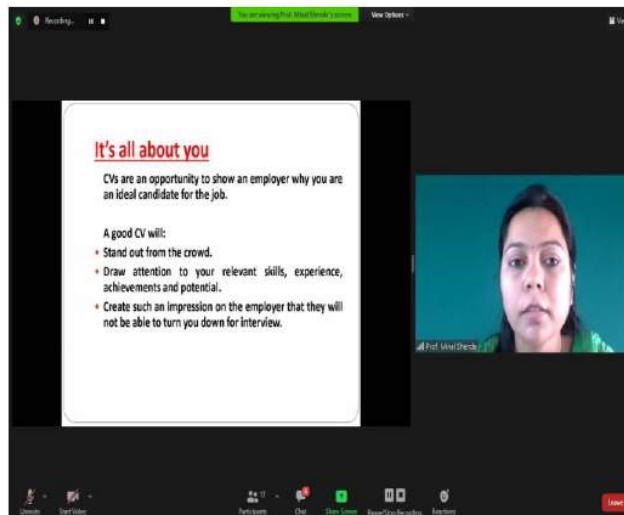
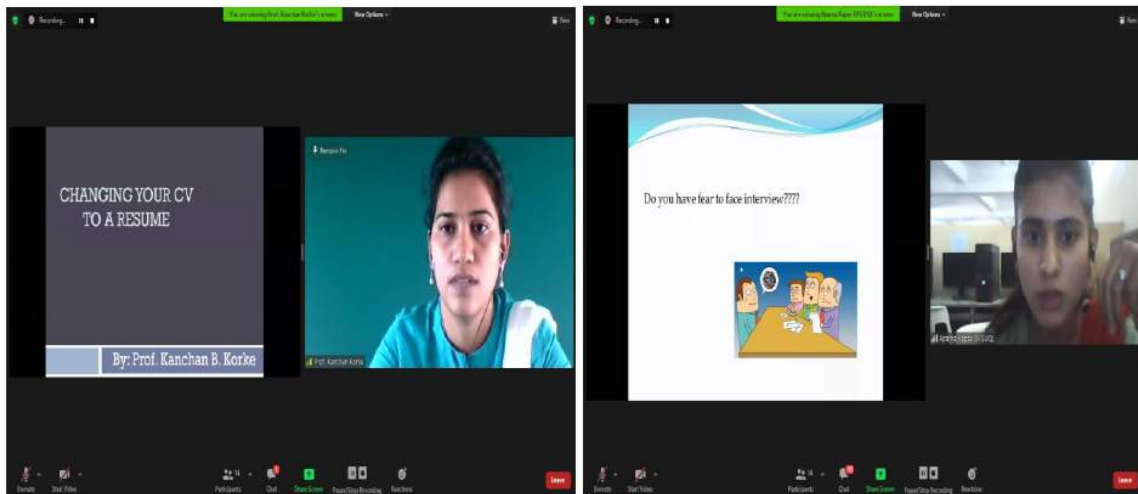


Online Quiz was organized on World Environment Day on 5th June 2020



Virtual Yoga Day celebrated on 21st June 2020

Integrated Energy and Green Audit: College of Management & Computer Science (CMCS Yavatmal), Yavatmal

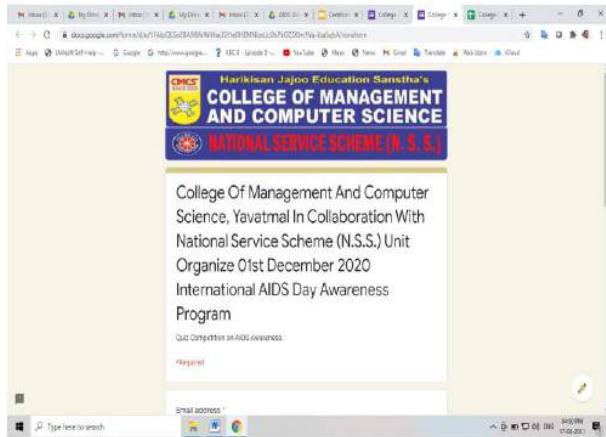


Workshop on Developing Professional Skill was organized on 23rd & 24th October 2020



Sanvidhan Day celebrated on 26th November 2020

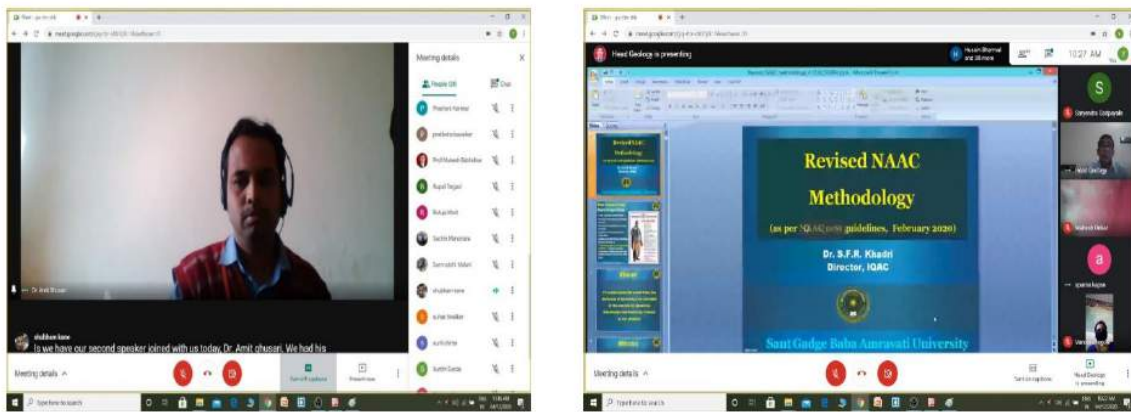
Integrated Energy and Green Audit: College of Management & Computer Science (CMCS Yavatmal), Yavatmal



Sl. No.	Timestamp	Email address	Score	Name Of Students	Class	Are you N.S.S. Volunteer	Mobile No.	Date
1	01/12/2020 14:21:45	yashkumar178@gmail.com	5	Yashkumar Vijay Datta	BCA II	No	8097720989	December 1
2	01/12/2020 14:32:38	shubham14@gmail.com	6	Shubham Chaitanya Wani	BCA I	No	8088423236	December 1
3	01/12/2020 14:33:19	pranavkumar14@gmail.com	7	Pranav M. Sengul	M.Sc. II	Yes	8378839991	December 1
4	01/12/2020 14:34:41	pranavkumar14@gmail.com	8	Pranav Sumanthar Wani	BCA I	No	9493191423	December 1
5	01/12/2020 14:34:58	shubham14@gmail.com	4	Shubham	BCA I	Yes	7350014881	December 1
6	01/12/2020 14:34:58	shubham14@gmail.com	8	Shubham Vijay Kulkarni	BBA II	Yes	8888219691	December 1
7	01/12/2020 14:34:58	shubham14@gmail.com	10	Shubham	BCA II	No	9594999992	December 1
8	01/12/2020 14:35:57	shubham14@gmail.com	8	Shubham	BCA I	No	7735558888	December 1
9	01/12/2020 14:35:58	shubham14@gmail.com	8	Shubham	BCA II	Yes	9395353315	December 1
10	01/12/2020 14:37:10	yashkumar178@gmail.com	5	Yashkumar	BCA I	No	9499939916	December 1
11	01/12/2020 14:38:58	shubham14@gmail.com	6	Shubham Raju Kulkarni	BBA II	Yes	9399423888	December 1
12	01/12/2020 14:39:25	shubham14@gmail.com	5	Yashkumar	BBA I	No	8421432399	December 1
13	01/12/2020 14:40:11	shubham14@gmail.com	8	Shubham	BBA II	No	8796563314	December 1
14	01/12/2020 14:41:34	shubham14@gmail.com	6	Shubham	BCA II	No	9036118839	December 1
15	01/12/2020 14:42:23	pranavkumar14@gmail.com	8	Pranav Raju Wani	BCA II	Yes	8421977244	December 1
16	01/12/2020 14:42:53	shubham14@gmail.com	7	Neha Thorat	BCA II	Yes	7770989999	December 1
17	01/12/2020 14:44:58	pranavkumar14@gmail.com	9	Pranav Wani	BCA I	No	9035333333	December 1
18	01/12/2020 14:45:57	yashkumar178@gmail.com	8	Saima Jeyaraj	BBA I	No	8439332319	December 1
19	01/12/2020 14:46:57	pranavkumar14@gmail.com	9	Pranav Raju Wani	BCA II	Yes	702927392	December 1

Online Quiz was organized on Aids Awareness at CMCS on 1st December 2020

Integrated Energy and Green Audit: College of Management & Computer Science (CMCS Yavatmal), Yavatmal



Webinar on Revised NAAC Methodology organized on 04th December 2020



Tree Plantation Drive was organized at CMCS on 14th December 2020



Online Photography competition organized on 19th December 2020

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Sant Gadge Baba Death Anniversary observed at CMCS 20th December 2020



Blood Donation Camp organized at CMCS on 04th January 2021



Exhibition on Best out of Waste was organized at CMCS on 16th February 2021

Annexure –V: Lighting Survey (2020 – 21)

List of Assumptions:

- During the survey specific hours for each class room, wash room, office space was assessed and accordingly average daily hours were considered
- The kW ratings of the installed lights is taken from the College data
- The calculations cover the two approaches
 - Approach: Calculation of LED contribution based on the total lighting load energy consumption.

Note: The Lumen/Watt for 28 W tube light is up to 110; which is almost same as LED is: 110-120⁹

- The Green Audit Team acknowledges the criteria for introduction of LED lights as LED lights do not have disposal problems. Tube lights face problem of mercury contamination.
- Conversely the college also faces the problem of disposal of existing tube lights. The sudden disposal of tube lights on large scale and within their service life will lead to huge amount of e-waste which has critical impact on environment. The college management is thus looking for the replacement policy and lighting (tube light, CFL) will be upgraded to eco-friendly LED after failure of existing lighting system.

Lux Levels observed at working place - Above 250

Calculated Contribution of various lighting arrangements: Calculated for 237 working days

Light Sources	Daily Wh Consumption
Tube light	15400
LED	23600
CFL	192

Light Sources	% Contribution
Tube light	39%
LED	60%
CFL	1%

Light Sources	Number
Tube light	70
LED	73
CFL	3

Light Sources	% Contribution
Tube light	48%
LED	50%
CFL	2%

⁹<https://www.google.co.in/amp/s/www.bijlibachao.com/lights/comparing-led-lights-with-fluorescent-lights.html%3fisamp=1>

Lighting Survey 2020 – 21

Sr. No	Room Name/no.	Tube light	Watts	Daily average hrs.	W.hr	LED	Watts	Daily average hrs.	W.hr	CFL	Watts	Daily average hrs.	W.hr
1	IQAC Room	-	-	-	-	2	20	7	280	-	-	-	-
2	Computer Lab	4	40	7	1120	10	20	7	1400	-	-	-	-
3	Electronics Lab	4	40	7	1120	-	-	-	-	-	-	-	-
4	Library	8	40	7	2240	-	-	-	-	-	-	-	-
5	Server Room	1	40	7	280	-	-	-	-	-	-	-	-
6	Stair Case	3	40	4	480	-	-	-	-	-	-	-	-
7	Store Room	1	40	3	120	-	-	-	-	-	-	-	-
8	Girls Common Room	-	-	-	-	3	20	7	420	-	-	-	-
9	Room No. 1 (Store Room)	2	40	3	240	-	-	-	-	-	-	-	-
10	Room No. 2 (Class Room)	2	40	6	480	-	-	-	-	-	-	-	-
11	Room No. 3 (Class Room)	2	40	6	480	-	-	-	-	-	-	-	-
12	Room No. 4 (Class Room)	4	40	6	960	-	-	-	-	-	-	-	-
13	Room No. 5 (Class Room)	4	40	6	960	-	-	-	-	-	-	-	-
14	Room No. 6 (Class Room)	4	40	6	960	-	-	-	-	-	-	-	-
15	Room No. 7 (Class Room)	2	40	6	480	-	-	-	-	-	-	-	-
16	Boys Toilet	1	40	2	80	-	-	-	-	-	-	-	-
17	Rest Room	2	40	3	240	-	-	-	-	-	-	-	-
18	Reception	-	-	-	-	3	20	7	420	-	-	-	-
19	Admin Office	-	-	-	-	13	20	7	1820	-	-	-	-
20	Principal Cabin	-	-	-	-	5	20	7	700	-	-	-	-
21	Management Cabin	-	-	-	-	1	10	2	20	3	32	2	192
22	Corridor (Ground Floor)	-	-	-	-	7	20	7	980	-	-	-	-
23	Room No. 8 (Class Room)	2	40	6	480	-	-	-	-	-	-	-	-
24	Room No. 9 (Class Room)	2	40	6	480	-	-	-	-	-	-	-	-

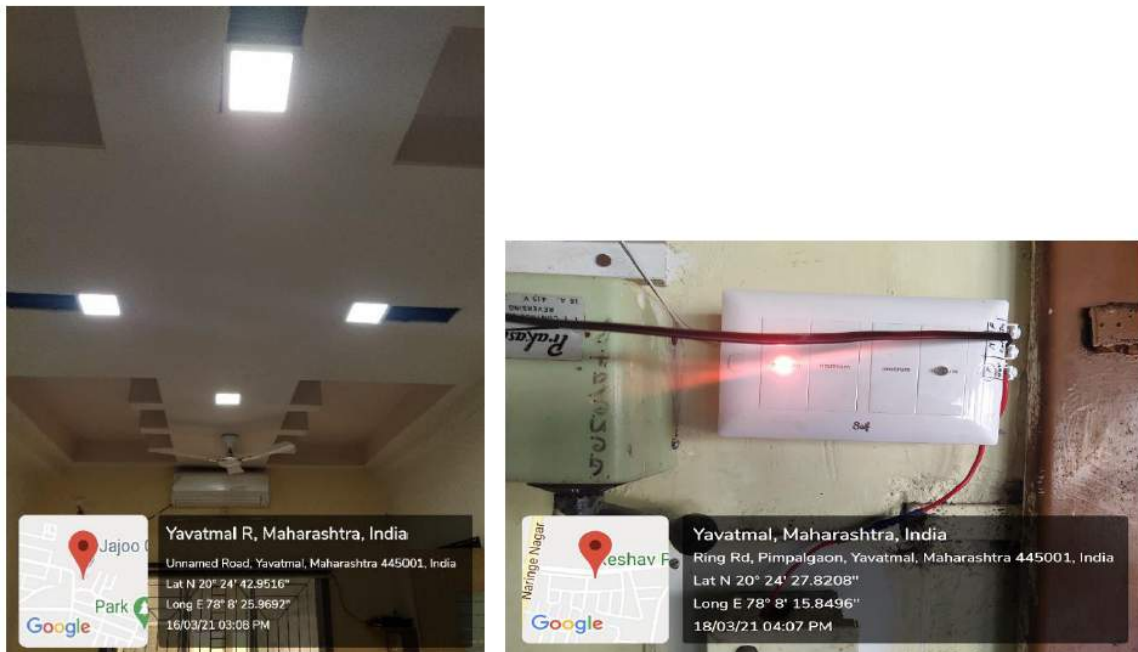
Integrated Energy and Green Audit: College of Management & Computer Science (CMCS Yavatmal), Yavatmal

25	Room No. 10 (Class Room)	2	40	6	480	-	-	-	-	-	-	-	-
26	Room No. 11 (Class Room)	2	40	6	480	-	-	-	-	-	-	-	-
27	Room No. 12 (Class Room)	2	40	6	480	-	-	-	-	-	-	-	-
28	Room No. 13 (Class Room)	2	40	6	480	-	-	-	-	-	-	-	-
29	Room No. 14 (Class Room)	2	40	6	480	-	-	-	-	-	-	-	-
30	Room No. 15 (Class Room)	2	40	6	480	-	-	-	-	-	-	-	-
31	HOD Cabin	2	40	6	480	-	-	-	-	-	-	-	-
32	Seminar Hall	-	-	-	-	5	20	2	200	-	-	-	-
		-	-	-	-	8	100	2	1600	-	-	-	-
33	NSS Room	1	40	6	240	2	10	6	120	-	-	-	-
34	Corridor (First Floor)	6	40	2	480	1	20	2	40	-	-	-	-
35	Campus	1	40	3	120	13	400	3	15600	-	-	-	-
	Total	70	1080	144	15400	73	700	66	23600	3	32	2	192

Integrated Energy and Green Audit: College of Management & Computer Science (CMCS Yavatmal), Yavatmal



On & off culture practiced in college



Use of LED lights in college

Sensor based lighting installed in college

Annexure –VI: Undertaking by the System Department regarding control of Electronic Equipment's



Harikisan Jajoo Education Sanstha Yavatmal.
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Date :- 17-03-2021

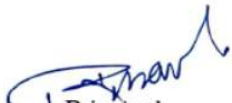
Certificate

The administrative Rights of computer settings are with the administrative department of the College.

As part of the sustainable and eco-friendly setting, the system department has initiated below setting in the computer of all the users.

1. All the computer screen savers are disabled.
2. The computers are turned to sleep mode if they are Ideal.
3. The computer setting cannot change as the administrative rights are with the department.
4. With regards to the uses policy of photocopier and other equipment user "POWER ON" when in used and "POWER OFF" when not in use.
5. The statement is issued in response to the query raised during the green audit.




Principal
College Of Management And
Computer Science, Yavatmal

Undertaking of Operation of Electronic Equipment's

Annexure –VII: Water Quality Reports

महाराष्ट्र राज्य सार्वजनिक आरोग्य सेवा

जिल्हा आरोग्य प्रयोगशाळा, यवतमाळ

पाणी नमुन्याचा सुक्ष्मजीवीय अहवाल

E-mail-dphlyyt@gmail.com

दुरध्वनी क्र. २४२९४६

प्रति,

पाठविणाऱ्यांचे पत्र क्रमांक व दिनांक
प्रयोगशाळा संदर्भ क्रमांक

:- हरीश्विन जानु एज्युकेशन संस्था,
यवतमाळ.
:- 24.3.2021.
:- 597

नमुना घेतल्याचा दिनांक

:- 24.3.2021

नमुना पोहचल्याची दिनांक

:-

परिक्षण सुरु केल्याची दिनांक

:-

अ. क्र.	नमुन्याचे विवरण.	परीक्षणाचे निष्कर्ष		इतर अभिप्राय
		प्रति १०० मि.लि. नमुन्यातील संभाव्य सूक्ष्मजंतुची संख्या	धरमोटॉलरट केलिफॉर्मस	
		कोलीफॉर्मस	धरमोटॉलरट केलिफॉर्मस	
1)	कोमरनेळ, हरीश्विन जानु एज्युकेशन संस्था यवतमाळ.	००	-	पिण्यास योग्य.

अभिप्राय : पिण्यास अयोग्य पाण्यावर योग्य प्रमाणात प्रमाण क्लोरिनची प्रक्रिया केल्यानंतर व सुक्ष्मजीवीय पुनर्तपासीनंतर पिण्यास योग्य असल्याची खात्री झाल्यानंतरच ते पाणी पिण्यासाठी वापरता येईल.

जा.क्र. :- 882 दिनांक :- 26.3.2021.

अहवाल ईमेलने कळविल्याचा दिनांक:

प्रत सादर :

- १ शल्य चिकित्सक, जिल्हा रुग्णालय, जिल्हा यवतमाळ
- २ जिल्हा आरोग्य अधिकारी, जि.प. यवतमाळ.....
- ३ गटविकास अधिकारी, पंचायत समिती.....
- ४ तालुका वैद्यकीय अधिकारी, तालुका.....

मुख्य अणुजीव शास्त्रज्ञ
जिल्हा आरोग्य प्रयोगशाळा
यवतमाळ

District Public Health Laboratory, Yavatmal.

E-mail ID: dphlyvt@gmail.com

Phone :07232-242946

REPORT ON CHEMICAL EXAMINATION OF WATER FOR DRINKING PURPOSES

Dt. of Collection:-24/03/2021 Dt. of Receipt:-24/03/2021 -Dt. of Exam:- 24/03/2021 onwards

(All the Analytical Results are in mgs. / liter except pH & Turbidity)

SR.NO	TEST PARAMETER	① B/CO Harikisan Jaiu Education society	BIS Specifications 10500 : 2012(Edn.2.2) Normal Values	
			Desirable Limits	Permissible Limits
1	Physical Appearance	clear	--	--
2	Odour	odourless	Unobjectionable	--
3	Turbidity (N.T.U.)	0.32	1	5
4	pH Value	7.1	6.5 to 8.5	No Relaxation
5	Fluoride (as F)	0.41	1	1.5
6	Nitrates (as NO ₃)	14.0	45	No Relaxation
7	Total Dissolved Solids	460	500	2000
8	Iron (as Fe)	0.15	0.3	No Relaxation
9	Chlorides (as Cl)	80	250	1000
10	Total Hardness (as CaCO ₃)	160	200	600
11	Alkalinity (as CaCO ₃)	60	200	600
12	Permanent Hardness(As CaCO ₃)	100	-	-

- This Report is restricted only for the sample/s submitted to this laboratory.
- It is presumed that the representative sample from the source is sent for analysis.

REMARKS

- ✓ A) Water Sample No. (1) is chemically fit/potable for drinking purposes on the basis of analyzed parameters only. However, this/these water source(s) can be used for drinking purposes only after proper disinfection and ascertaining it's bacteriological quality.
- ✗ B) Sample No.....Contain/s..... is/ are more than the Desirable limit as per BIS specifications. However, it can be used for drinking purposes only in the absence of alternate source and only after proper treatment & disinfection and ascertaining it's bacteriological quality.
- ✗ C) Sample No..... Contains /s.....is/are more than the Permissible limit as per BIS specifications. Hence this / these water source(s) is / are Unfit for drinking purposes.

HEALTH SERVICES

LR. No - 193 / 881 / 2021

Date: - 26-3-21

Forwarded With Compliments To:- Harikisan Jaiu
Education society
With reference to letter no.....Dated - yavatmal


Dist. Public Health Laboratory
Yavatmal.

Annexure– VIII: List of Electronic Equipment's in College



Harikisan Jajoo Education Sanstha Yavatmal.
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cmcs457@sgbau.ac.in

94231-31946

Ref. No.

Date :- 17-03-2021

Details of number of Computer, Printer, Scanner, etc

Academic Year 2020-2021

Sr. No.	Item	Office	Computer Lab	Staff Cabin	Library	Total
1	Number of Computer		120		01	
2	Number of Printer	5	17	1	1	
3	Number of Scanner	1	1			
4	Number of Projectors		15			
5	Number of Laptops	11	1	5	1	
6	Number of LED Board	1				



Principal
College Of Management And
Computer Science, Yavatmal

List of Electronic Equipment's in college.

Annexure –IX: Solar Panel Installations



Solar PV System installed in college

Annexure –X: Water Distribution Data

The water is drawn from 01 no. of bore well. The water drawn is not measured. Recommendation to monitor the water drawn is raised under chapter 6 of this report.

Annexure –XI: Solar Passive Structure / Drip Irrigation



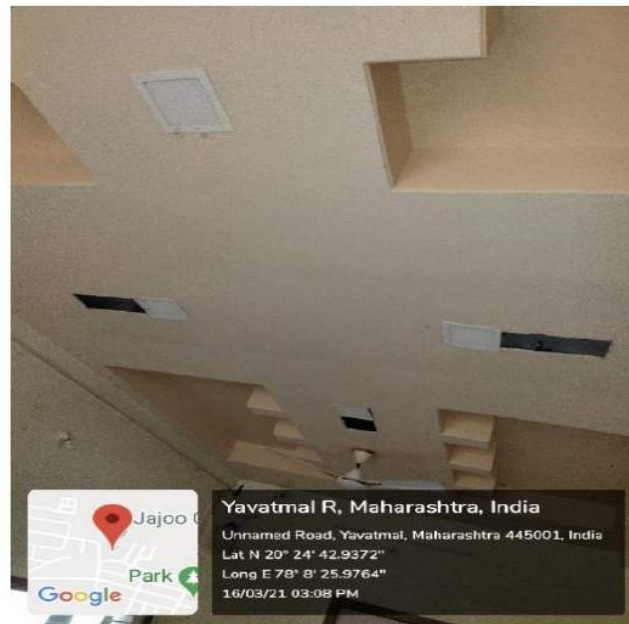
Adequate light in classrooms without using electrical lighting



Adequate light in labs without using electrical lighting



Drip Irrigation system installed in college



Use of false ceiling to reduce air-conditioned volume and reducing AC load



Use of blinds for windows to reduce heat



AC Condenser in shade



AC Condenser directly exposed to sunlight

Annexure –XII: Water Management



Pipeline of Water Harvesting System



Catchment Area for Water Harvesting

Integrated Energy and Green Audit: College of Management & Computer Science (CMCS Yavatmal), Yavatmal



Harvested Rain Water used for recharging bore well.



RO water used for drinking purpose



Bore well in college



Taps to be replaced by Faucets



Flush to be replaced by Push Buttons

Annexure –XIII: Waste Management



AC condensed water collected



Ban on single use plastic in college campus



Dustbins used to collect waste

Integrated Energy and Green Audit: College of Management & Computer Science (CMCS Yavatmal), Yavatmal



Solid waste given to Nagar Parishad for disposal



Dustbins used in Labs



Dustbins used in Classrooms



Incinerator machine and Vending machine installed in girls washroom



Compost Pit



RO machine waste water collected in drums and given to plants

Integrated Energy and Green Audit: College of Management & Computer Science (CMCS Yavatmal), Yavatmal



Sewage Treatment Plant in college



Tanks constructed in college



Harikisan Jajoo Education Sanstha Yavatmal.
**COLLEGE OF MANAGEMENT AND
COMPUTER SCIENCE, YAVATMAL.**

(Affiliated to Santa Gadge Baba Amravati University, Amravati) College Code - 457 / MBA Code -1106

Address :- 13/4 (A), Behind Naringe Nagar, Dhamangaon Road, Yavatmal - 445001 (M.S.)



www.cmcs.hjes.in



cmcs457@sgbau.ac.in



94231-31946

Ref. No.

Date :- 08-03-2019

AGREEMENT FOR DISPOSAL OF PAPER & CELLULOSE WASTE

This indenture of agreement is made on 08 March 2019 between **Principal, College Of Management And Computer Science, Yavatmal** (Hereafter Party No. 1) and **Sahir Traders, Yavatmal**, sole proprietor through, **Mr. Md. Ahtesham Sahir** (Hereafter Party No.2).

Whereas the Party No. 1, is running BBA, BCA, M.Sc. and MBA College, Naringe Nagar, Dhamangaon Road, Yavatmal. The College is Affiliated by Sant Gadge Baba Amravati University, Amravati and recognized by All India Council of Technical Education, and Approved by Government of Maharashtra.

AND

Whereas the Party No. 1, College Of Management And Computer Science(CMCS), Yavatmal Students are imparted with Theory and Practical.

AND

Whereas Students of CMCS undergoes various practical's and record them in practical file.

AND

Whereas Students undergoes two sessional exam in a year.

AND

Whereas the disposal of such paper and cellulose waste creates problem of disposal as per prevailing environmental laws.

AND

Whereas Party No. 2 is a authorized disposable agency and ready to dispose/reuse/recycle the waste provided to them.

This agreement witness as under

- 1) The Party No. 1 shall provide all the paper and cellulose waste generated in the college to Party No. 2.
- 2) That Party No. 2 agrees to reuse/recycle/dispose the paper and cellulose waste provided by Party No. 1 as per prevailing environmental law.
- 3) That this agreement is valid for a period from 08 March 2019 to 31 March 2024. In witness thereof signed by Party No. 1 and Party No. 2.

Party No. 2

Sahir Traders, Yavatmal

SAHIR TRADERS


Proprietor


Party No. 1

Principal
PRINCIPAL

College of Management And
Computer Science, Yavatmal



Witness

- 1) Mr. Yogesh M. Patil (Assist. Prof.)
- 2) Mr. Husain A. Bharmal (Assist. Prof.)


Signature

MOU for Cellulose Waste Handling

SAHIR TRADERS

Iron Field, Near Royal Palace, Pandharkawda Road, Yavatmal, (MH) 445001.

Mo No: - 9922203255, 9881817155, 9922815555.

Date: - 10-03-2021

CERTIFICATE OF PAPER AND CELLULAR WASTE DISPOSAL

This is to certify that the Paper and Cellular Waste received from College Of Management And Computer Science, Yavatmal during the period from 08/04/2020 to 10/03/2021 has been disposed off in environment friendly manner.

Date :- 10-03-2021

SAHIR TRADERS

Proprietor
S. W. S.

Cellulose waste handling certificate for 2020-21

Annexure –XIV: Awareness / Posters



Corona Awareness Handbills were printed and distributed by the college



Mask Making & Distribution by NSS Volunteer in COVID – 19 Pandemic on 07th May 2020



Mask Distribution at Orphanage House at Nilona on NSS Day Dam on 24th September 2020

Integrated Energy and Green Audit: College of Management & Computer Science (CMCS Yavatmal), Yavatmal



Mask Distribution and Sanitization Program near college area on 17th October 2020



Mask Distribution and Sanitization Program in Adopted Village Waki (Road) on 21st October 2020



Street Drama Awareness on Blood Donation and COVID – 19 Awareness at Yavatmal on 01st January 2021

Integrated Energy and Green Audit: College of Management & Computer Science (CMCS Yavatmal), Yavatmal



Street Drama Awareness on Blood Donation and COVID – 19 Awareness at Waki on 11th February 2021



Green Campus Posters displayed in college



Fully grown trees in the college campus

Integrated Energy and Green Audit: College of Management & Computer Science (CMCS Yavatmal), Yavatmal



Trees in the college campus



Pedestrian friendly pathways



Diesel Generator in college



Green Audit Team in discussion with the Principal



Green Audit Team interviewing the staff members



Green Audit Team interviewing the students



Fire Fighting System and Fire Extinguishers installed in college



Certificate of Verified Carbon Unit (VCU) Retirement

Verra, in its capacity as administrator of the Verra Registry, does hereby certify that on 23 Mar 2021, 7 Verified Carbon Units (VCUs) were retired on behalf of:

College of Management and Computer Science, Yavatmal

Project name:

1.6 MW Bundled Rice Husk Based Cogeneration Plant by M/s Milk food Limited (MFL) in Patiala (Punjab) & Moradabad (U.P) Districts

VCU serial number:

8521-28109954-28109960-VCS-VCU-291-VER-IN-1-784-01012018-31122018-0

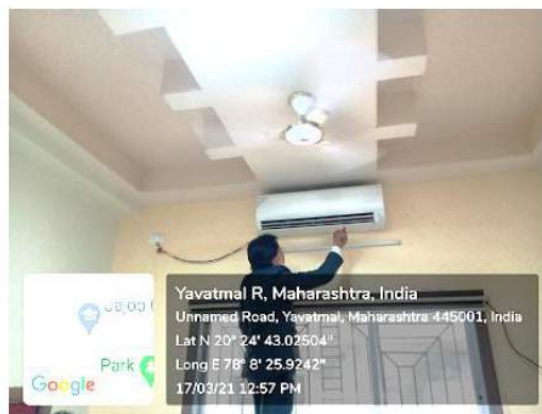
Additional Certifications:

Additional details on this retirement can be found on the Verra Registry.



GHG Offsetting Certificate

Annexure –XV: Onsite Measurements (Sample Pictures)



Onsite measurements taken by Green Audit Team



Lux Meter readings

Integrated Energy and Green Audit: College of Management & Computer Science (CMCS Yavatmal), Yavatmal



Energy Audit Readings

Annexure –XVI: Energy Audit Report

Description of Energy Audit

An energy audit is an inspection, survey and analysis of energy flows, for energy conservation in a building, process and system to reduce the amount of energy input into the system without affecting the output(s). An energy audit is the first step in identifying opportunities to reduce energy expenses and carbon footprints.

The term energy audit is commonly used to describe a broad spectrum of energy studies ranging from a quick walk-through of a facility to identify major problem areas to a comprehensive analysis of the implications of alternative energy efficiency measures sufficient to satisfy the financial criteria of sophisticated investors.

The process of energy audit:-

- The analysis of building and utility data, including study of the installed equipment and analysis of energy bills.
- The survey of the real operating conditions.
- The understanding of the building behavior and of the interactions with weather, occupancy and operating schedules.
- The selection and the evaluation of energy conservation measures.
- The estimation of energy saving potential.
- The identification of customer concerns and needs.

Generally, four levels of analysis can be outlined

Level 0: Benchmarking:

Breakout of electric and fuel consumptions into end-use components (space heating, fan energy, lighting consumption, etc.) Comparison of the building's consumptions to other buildings of typical size, use and geographic location.

Level- I: Walk-through audit:

Preliminary analysis made to assess building energy efficiency to identify not only simple and low-cost improvements but also a list of energy conservation measures to orient the future detailed audit. This inspection is based on visual verifications, study of installed equipment and operating data and detailed analysis of recorded energy consumption collected during the benchmarking phase.

Level- II: Detailed/General energy audit:

Based on the results of the pre-audit, this type of energy audit consists in energy use survey in order to provide a comprehensive analysis of the studied installation.

Level- III: Investment-Grade audit:

Detailed Analysis of Capital-Intensive Modifications focusing on potential costly ECOs requiring rigorous engineering study.

Description of Process and Measurements

Instrument Used for the Study:-

1. Power Analyzer – ALM 30 Krykard

The 3 phase power analyzer and data logger were used to measure and log the electrical parameters data for the various load centers in the facility. Most of the loads have variation in power requirement and therefore logging helps to observe the variations as well as the average electrical consumption of the load centers.

Using the logger, all major electrical parameters of voltage, current, power, power factor, apparent power, harmonics etc. are recorded at fixed intervals of time.

The variation of parameters like power are plotted and shown with time on X axis and parameter on Y axis. Observations are made on the basis of these measurements.

Some Basic terms:

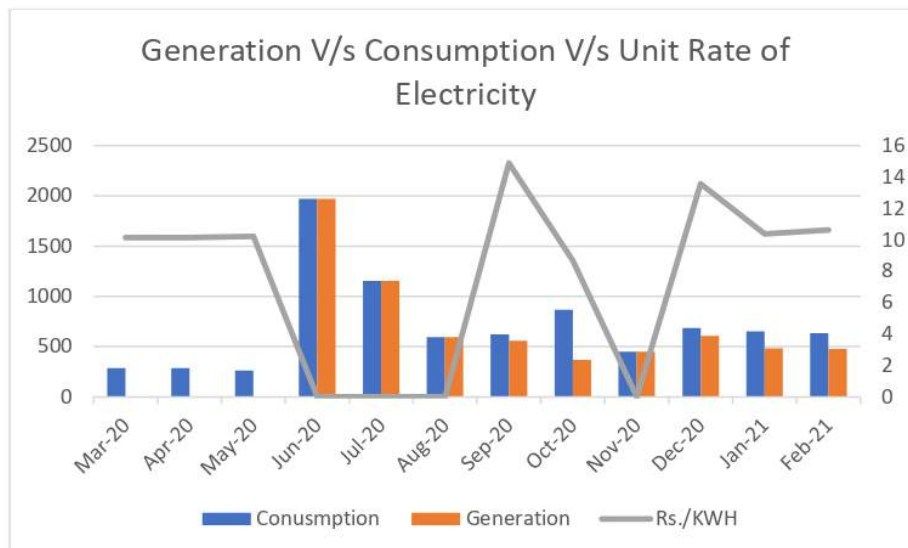
1. Power – kilowatt (kW) – It is the power consumed by the equipment. This value is varying as per load requirements.
2. Energy – kilowatt hour (kWh) – It is the energy (electrical units) consumed by the equipment. If average power for an electrical load is 2 kW, it means that it consumes 2 kWh units per hour.
3. Apparent power kilo Volt Ampere (kVA) – It is a measure of demand Power / power factor.

Electricity Bill Analysis

The college has power supply form Maharashtra State Electricity Distribution Company Limited. Electricity bill analysis are considered for a period of 12 months i.e. from March -20 to February 2021.

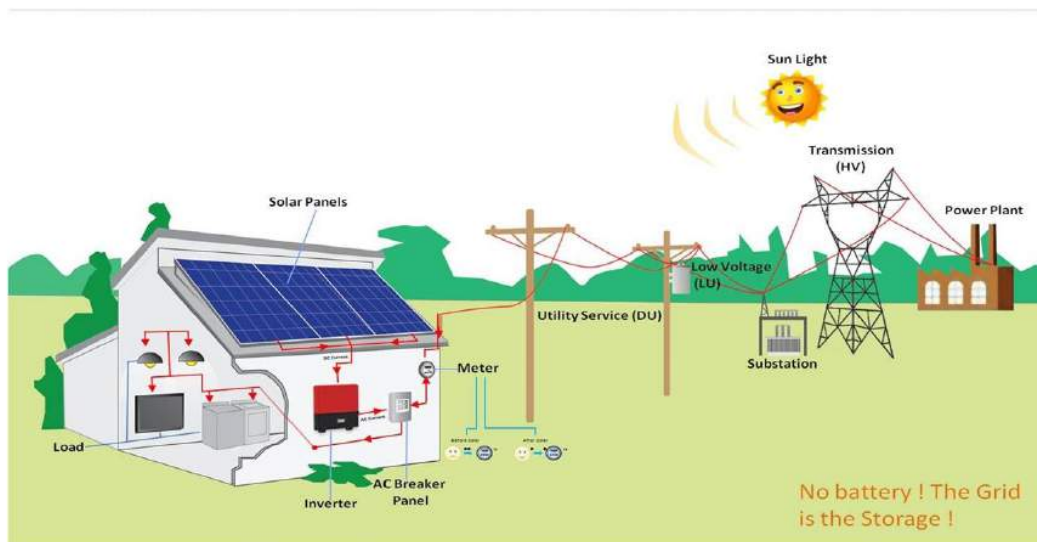
Consumer Name The President Harikisan Jaju Education
 Consumer no 370010535311
 Contract Demand 10.6kW
 Tariff 73/LT-VII(B) I (0-20 kW Public Services Other)

Sr. No.	Month	Electricity Consumption	Solar Generation	Unit Diff.	Amount	Rs./kWh
1	Feb-21	633	477	156	1658	10.6
2	Jan-21	653	482	171	1776	10.38
3	Dec-20	684	608	76	1032	13.57
4	Nov-20	450	450	0	362	0
5	Oct-20	868	368	500	4350	8.7
6	Sep-20	621	559	62	923	14.88
7	Aug-20	595	595	0	362	0
8	Jul-20	1154	1154	0	362	0
9	Jun-20	1972	1972	0	362	0
10	May-20	262	0	262	2676	10.21
11	Apr-20	286	0	286	2901	10.14
12	Mar-20	286	0	286	2901	10.143



The college has average cost of electricity of Rs. 10.50/kWh. The average consumption of college is around 700 kWh while the average solar generation done by college is 740 kWh. The cost of electricity (Rs./kWh) wherever reflects in the above table has a meaning "units generated by solar PV systems and units consumed for that month are equal". Only fixed charges are applicable to the consumer due to NET metering.

The college has taken great initiative and installed Solar Grid Tied of 10 kW at its college rooftop. Based on requirement and available area in college, a grid tied three phase solar system has been installed. A grid tied solar system generates output in synchronization with the electricity supplied from the utility (Mahadiscom).



1.1 Operation Details of Installed system

- The generated solar power is used for local consumption decreasing the demand of electricity from the grid.
- As long as the captive power requirement is more than the output of solar, the excess power required is feed by the grid.
- If the captive power requirement is lower than the output of solar, the electricity is exported to grid.
- Whenever there is no power supply from the grid, the solar PV system goes in standby mode and its output cannot be used.

Advantages and benefits

- The life of solar system is 25 years with 25 years' linear power output warranty from the manufacturer of solar module.
- Dynamic system with no moving parts, hence no wear and tear of systems.
- With no batteries connected, maintenance is limited to cleaning of solar modules once in 15 days.
- Inverter output and grid power are on same bus, there is no effect of load fluctuations on the system.
- Generation of renewable energy results in reduction of carbon footprints.
- The effective cost of power generated from solar energy is as lower as Rs. 3/kWh. Thus any investment in solar system now gives healthy returns over next 25 years.

Environmental Consciousness

Concern:

The environment issue has become a world –wide concern in the past decade being the focus of dimension in variety of forums both at national and international levels. Because environmental problems are rooted in economics and social policies, they occur at all levels from local to global, and success requires action by many players over long periods of time. The government is responsible for dealing with these problems and working towards solutions. Accordingly, the government is trying to address this over the years by creating various policies, programs enacting environmental legislation and through interaction institutions and treaties laws and regulations and expenditures.

Environment is mutual responsibility of everybody for society. In order to mitigate the risks associated with medical waste, it is important that management should always try to identify and evaluate the nature of the risks involved and then try to devise ways and means of managing those risks. Currently, there have not been any attempts to identify the risks posed by medical waste, a fact which contributes to it being not given the attention it deserves.

College Responsibilities and Performance

Environment conscious can be seen over all the above activities that the college carries out. Environment balance is maintained with Plants, Water and Waste management. These factors are well balanced in the facility.

Action Plan:

1. Energy Saving Awareness-

Many programs have already been conducted in the college for energy saving awareness. This should be continued and as part of social concern. The college should take initiative and conduct such events amongst different schools and colleges, societies and at various other places. Installation of sign boards to switch off the utilities when not in use like this will increase the awareness about energy conservation.

2. Carbon Emission reduction:

- Entry should be restricted for unauthorized, unnecessary vehicles in the campus, which will help to maintain the carbon neutrality of campus.
- Burning in open should also be avoided.
- Plantation: Planting and then maintaining trees help in reducing pollution, reduces erosion of soil, surrounding improves with green ambience, temperature of the area is maintained to lower values and helps in reduction in carbon percentage.

3. Water Sustainability:

- Water sustainability is fulfilling the present needs of the water without affecting the future supplies and availability. Water is very basic and utmost important need in society. Hence water security can be achieved with water sustainability.

- Not only water but water quality is also an issue of growing importance. Due to land and water pollution done by us the quality of water is getting deteriorated. The surface water is polluted with the sewage and other polluted water sources. Hence, there is requirement of the water treatment processes to make ground water healthier and safe.
- The entire rain water flowing in the campus should be directed through the water lines to the small storage tank. This water can be utilized for outdoor water usages as gardening, vehicles washing, etc.
- With sewage treatment plant the water can be treated and increased in biological and chemical oxygen which can be used as outdoor water usage as vehicle cleaning, gardening, flushing in the toilets. This will also reduce the load on the raw water intake.

4. Waste Management:

- **Biological Waste:** Waste management is gradually becoming a serious concern entire worldwide due to limited sorting at source and improper storage, collection, transportation, treatment and final disposal. Handling the waste correctly at first time will reduce the waste disposal cost and energy to segregate the waste. When segregated, each waste has its cost value by recycling. There are recycling plants of much kind of wastes. It adds to the value of the waste and also provides the employment
- **E-waste:** This is an emerging issue raised due to the excessive use of the electronic goods and their short life span. The electronic goods are creating considerable waste problems as their disposal is difficult to achieve. The hazardous contents in the e-waste make it critical to dispose immediately and safely.

Annexure –XVII: Snapshot of Annual Rainfall Data, Grid Emission Factor

Table 3: Rainfall Data of Yavatmal District (2002 - 2010) In mm

Taluka	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Avg.
Yavatmal	1110.4	563.8	661.85	828.4	1288.3	865.86	684	540.2	1106	845.2	849.4
Babulgaon	761	762	462	612	897.3	772	456.54	438.5	1031	750.1	692.44
Kalamb	1212	1218	388.12	844	1336	888.1	483	338.4	841	5783	812.69
Darwah	1063	594	423.66	522	1161.4	803.52	569.72	456.8	1209.5	701.4	750.5
Digras	986.3	472	462	656	1253	790	528.11	738.7	1246	864	799.61
Arni	939	408	282.05	402	736.6	468.05	495	342.1	708.5	497.4	527.87
Ner	424	345	329	361	1051.4	697	568.2	481.2	1109	911	627.68
Pusad	1325.1	734.8	477.74	687	1177.8	673.68	885.4	618.1	1335.8	818	873.34
Umarkhed	647.4	816.3	357.22	512	916.5	686	570.62	667.3	792.5	865	683.08
Mohagaon	1132.9	1081	463.48	1131	1051.5	932.5	690.61	638	1137	89.4	909.74
Wani	658	632.9	592.25	697.4	1173.9	958.5	850.8	566	1537	793	845.97
Maregaon	570	496	327.04	412.3	1257	1197	1207.18	631	1638	1062	879.75
Jhari Jamni	573	336	323.51	387	748.8	525.6	584.4	389.7	879	539	528.6
Kelapur	1053	742	830	624	1029.9	1007.02	631.13	725.5	1187	839.3	866.88
Ghatanji	1114	1130	438	712	1402	1027	853	547.2	541	774	853.82
Ralegaon	1044	113	438	712	1263.1	1108	997.2	829.2	1472	860	985.35
District Avg.	913.3	716.36	453.5	631.3	1109	837.5	690.9	559.2	1109.5	783.59	780.41

Web link:

<http://environmentclearance.nic.in/writereaddata/District/surveyreport/1108201836IQTKJSDistrictSurveyReport.pdf>

CEA Database Version-13

Emission Factors (tCO ₂ /MWh) (incl. Imports)	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Weighted Average Emission Rate (2)	0.78	0.83	0.82	0.82	0.82	0.82
Simple Operating Margin (1) (2)	0.97	0.99	1.00	0.99	0.97	0.96
Build Margin (not adjusted for imports)	0.92	0.97	0.95	0.93	0.91	0.87
Combined Margin (1) (2)	0.95	0.98	0.98	0.96	0.94	0.92

Notes:

Coordinates:

Swapnil Thanekar
Sustainability |Energy |Water
(Certified Energy Auditor – EA4416)

Plot Number 09, Shivaji Nagar,
Opposite LAD college Ground,
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Phone - 0091- 8149190608, 8975664570
Email: swanil_thanekar@yahoo.co.in

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Dangat Patil Nagar, Shivne,
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Pin 411023- Pune