INTEGRATED GREEN, ENVIRONMENT AND

ENERGY AUDIT FOR THE CY[1] 2019, 2020 AND 2021

IN LINE WITH NAAC REQUIREMENTS

Government Degree College, Chamba, Himachal Pradesh

03/02/2022
Version 01

By:
Energy and Green Audit Team,
Sustainability Solutions

[1] Calendar Year

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Principal's Message

Over the last 63 years, Government College Chamba has made remarkable progress and is acknowledged as one of the best institutions in Himachal Pradesh. Our experience taught us that educational institution have the accountability to sustain the growth of the nation. Our responsibility is not just limited to education; we inculcate principles and values as well.

Presently, human society is in the middle of Environmental, Social, and Economic challenges. The major ones are; climate change, the greenhouse effect, polluted air, water, soil, etc. The key question is, "How do we do it?" We apply the principles of Inclusivity, Materiality, and Responsiveness.

Our principles are our constant source of inspiration. As a government institution, we understand that sustainable development through higher education will play a pivotal role in building our nation. Our institution is committed to these values and tirelessly working on the youth to create better future. After graduation or post-graduation, the students become leaders of tomorrow and get dispersed from the world of education into their specific career. From the institution, they take with them the sustainable practices and approaches as a kit to solve the problems.

We are developing our students so that they are prepared to face global challenges and convert them into opportunities. We strive to put forth living examples for our students, society, peers, and other reasonable stakeholders by adopting environmentally friendly steps. We endeavor to hand over the future generation with a cleaner and safer, socially responsible, and economically prosperous world. With this purpose, this audit has been executed.

The purpose of this audit was an independent review of the practices followed in our campus w.r.t. the Sustainable Policies. We will take the learnings from this independent review as a 'value addition" to promote better environmental performance and continually improve the College Campus and Community. We will adhere to PDCA's proven principles (Plan, Do Check, and Act) to identify, prioritize, allocate resources, initiate action, monitor results, and implement corrective actions to attain Sustainability, encompassing Environmental, Social topics.

The term "Sustainable development" is widely used these days by the policymakers, industries, environmentalists, social organizations, and governments as well as various reasonable stakeholders. Sustainability is not only discussed for the sake of discussion, however, but it is also integrated into practice at various levels at industries, organizations, Institutions, etc. to optimize their resource utilization and establish a balance between the functions and associated impacts (positive and negative) on the triple bottom line of sustainability i.e., Economic, Environment, and Social.

Educational institutions are blessed as they are living examples of sustainability. We completely understand that sustainability is becoming an increasingly important issue for the nation, the role of higher education institutions about environmental sustainability is more prevalent as we are nurturing and shaping young minds. We are setting the living examples for our students, society, peers, and other reasonable stakeholders by adopting environmentally friendly steps. We endeavor to press our present generation "Into action mode and subsequently hand over the future generation cleaner and safer environment which is socially stable and economically prosperous".

To achieve this objective, there are many trails; the main challenge is "one should be able to identify the best path". I am pretty gland my Institution have engaged with the experts in the field of sustainability i.e., Sustainability Solutions lead by Mr. Thanekar and Ms. 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 expert Green Audit Team (Mr. Swapnil Thanekar, Ms. Bhakti Thanekar and Mr. Ashish Soni, and our institutional team led by IQAC (Dr. Mohinder Slariya, Dr. Hemant Pal, Dr. Manesh Verma, Dr. Santosh, Dr. Poonam Sabarbal, Ms. Sumit, Dr. Ashish Kumar, Dr. Suneel Kumar, Mrs. Nisha Kumari, Sh. Inder Singh, Sh. Hitesh Kumar) for taking sincere efforts and hard work for this green audit. I hope the report will be helpful to the college, staff, students, and all concerned in the Govt. College Chamba and will motivate for sustainable and green practices throughout.

Place: Chamba
Date: February 2, 2022

Dr. Shiv Dayal Sharma
Principal
Govt. College Chamba

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Message from IQAC Coordinator

The human society is now facing various types of environmental problems like; climate change, greenhouse effect, polluted air, water, soil etc. The problems are becoming severe with increasing population. It's the right time to protect the natural environment by doing precise efforts. If we do sustainable development through higher education, it will play a pivotal role in building of the nation. Youth has responsibility after completing their education to tackle these problems with the expertise they learnt. During their learning the green practices and approaches while studying in the college.

A 'Eco – friendly' campus mainly focuses on the efficient uses of energy and water; minimizing waste generation, and pollution which are mainly assessed in the process of 'Green Auditing' of educational institute. Our college, through "Eco Club", NSS, NCC and through other clubs and societies has already taken some steps like; planting the species of local and endemic plants, installing sanitary napkin incinerator, arranging special programmes such as; celebrating environmentally significant days for creating awareness among the students and staff.

Being a college of district headquarter, Govt. College, Chamba has responsibility to become role-reference for other similar institutions as well as for the society. We endeavor to set benchmarks for quality education; and we envisioned with responsibility towards making this world a better place to live in. Our Green Campus team is consistently brainstorming to reduce the energy consumption by mitigating the losses/wastage, introduction of green energy etc. Therefore, this integrated green audit is being initiated to assess the institutional practices as an essential requirement of NACC assessment to the college.

The Green Audit practically involves energy conservation, use of renewable sources, rain water harvesting, and efforts of reduction of carbon emissions, planting of trees, hazardous waste management and E- waste management. It is necessary to conduct green audit in college campus because students have to be aware of the green audit, its advantages to save the planet and thereby get motivated to become good citizens of the country. Green audit and sustainable development process help to reduce wastage and associated cost as well as increase the product quality. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more relevant.

We sought the expert help of Green Audit Team, who played key-role in this regard. We endeavor to set an example for the peer-institutions while adopting sustainable practices in the college.

As a part of our such practices, the sustainable impact of our institution is mapped by considering the United Nations SDG's as below:

3 GOOD HEALTH AND WELL-BEING	**Our Institution is actively engaged in:** • Awareness Camps • Blood Donation Programs • Health Check-up Camps
4 QUALITY EDUCATION	**Refer our SSR Report**

7 AFFORDABLE AND CLEAN ENERGY	We have installed Solar Pv plant of 25 kW in the hostel and are in advance stage of installing 25kW Solar Pv plant on the building of new campus.
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	• We are giving saplings to our guests in place of bouquet • We have banned single use of plastic in our campus • We serve the RO water in place of single use plastic bottle • We have planted lot of trees inside and outside the campus • Energy efficiency projects (Sensor Based Lighting) (Refer Annexure V)
13 CLIMATE ACTION	**We are promoting:** energy savings, reduction in water consumption, augmenting water harvesting, planning to induct renewable solar energy, energy - efficient lighting (CFL), and maximum use of daylight, and educating the society, plantation of trees outside the college campus, waste reduction, responsible waste disposal, and many more applicable programs.
15 LIFE ON LAND	**We have implemented the projects of:** • Plantation of trees • Rain water harvesting

By adopting above measures in our college by contributing towards the development of new concepts, technologies and various innovative ways to conserve energy, we are constantly taking action to align ourselves towards the UNFCCC's goal of limiting global temperature rise to well below 2°C and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels.

Green audit will help us all not only in understanding our environment in a scientific way but also in spreading the awareness to the remote areas through our students. By following the recommendations made by the report of the audit, we will be able to work for the sustainability of the environment in a more efficient way, and thus tread towards a better future. So, taking the green audit as a capacity building exercise for our institution.

I, on the behalf of my college, IQAC and entire institutional team of Green Audit (Dr. Hemant Pal, Dr. Manesh Verma, Dr. Santosh, Dr. Poonam Sabarbal, Ms. Sumit, Dr. Ashish Kumar, Dr. Suneel Kumar, Mrs. Nisha Kumari, Sh. Inder Singh, Sh. Hitesh Kumar) thankful to the ***Green Audit Team*** (Mr. Swapnil Thanekar, Mrs. Bhakti Thanekar, Mr. Ashish Soni) and members of "Quality Audit on Environment and Energy" committee of college along with NSS units for taking sincere efforts and hard work for this green audit. We are ascertained that the report will help society, staff, students, and all concerned in the college campus and will motivate for sustainable and green practices throughout.

Place: Chamba
Date: February 2, 2022

Dr. Mohinder Slariya
IQAC Coordinator

Acknowledgement

Green Audit Assessment Team thanks Govt. Degree College Chamba, Himachal Pradesh for assigning this important work of Green Audit. We appreciate the cooperation of our Team for completion of study. Our special thanks to:

Principal	Dr. Shiv Dayal
IQAC Coordinator	Dr. Mohinder Slariya
Asst. Professor	Dr. Ashish Kumar
Asst. Professor	Dr. Suneel Kumar
Asst. Professor	Dr. Santosh Kumar
Asst. Professor	Dr. Hemant Pal
Asst. Professor	Mr. Inder Singh
Asst. Professor	Ms. Nisha Kumari
Senior Lab. Attendant	Smt. Chandro Devi

All the members of College Development Committee, Govt. Degree College Chamba, Himachal Pradesh. 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

Mr. Swapnil Thanekar Certified Energy Auditor, M. Tech (Heat & Power Engineering), Expert Global Reporting Initiative, GHG Expert
Ms. Bhakti Thanekar Certified Energy Auditor, B. Tech (Chemical Engineering), Principal Consultant - Energy and Safety
Mr. Ashish Soni Graduate with 16 years' experience in Chemical Sector
Mr. Ajinkya Anjikar M. Tech, Chemical Engineering, IIT Hyderabad (Observer, Reviewer)
Mr. Sushant Deshkar Electrical Engineer, Assessment Team Member
Mr. Rushikesh Kohre Trainee, Assessment Team Member

DISCLAIMER

Green Audit Team has prepared this report for Govt. Degree College Chamba, Himachal Pradesh, based on input data submitted by the representatives of the 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.

Technical Review by:
Bhakti Thanekar
Bureau of Energy Efficiency Registration Number – EA-14451

Ashish V. Soni
Onsite Assessment Team Leader

Prepared by:
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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 HPSEBL norms) from HPSEBL 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 tCO_2 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 31st January 2022 to 03rd February 2022 for the CY 2019, CY 2020 and CY 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**
7.1.2 The Institution has facilities for alternate sources of energy and energy conservation measures:		
1. Solar energy	✓	Refer chapter 8 and Annexure –IX: Solar Panel Installations
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	✓	Annexure –XI: Solar Passive Structure
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		
7.1.3 Describe the facilities in the Institution for the management of the following types of degradable and non-degradable waste (within 500 words):		
1. Solid waste management	✓	
2. Liquid waste management	✓	Refer chapter 12 and Annexure –XIII: Waste Management
3. Biomedical waste management	*NA*	
4. E-waste management		
5. Waste recycling system		OFI Raised
6. Hazardous chemicals and radioactive waste management	*NA*	
7.1.4 Water conservation facilities available in the Institution:		
1. Rain water harvesting	✓	Refer chapter 06 and Annexure –XII: Water Management
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: **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		Annexure –XIII: Waste Management SoP: Green Initiatives by College
3. Pedestrian Friendly pathways	✓	Annexure –XIII: Waste Management
4. Ban on use of Plastic	✓	
5. Landscaping with trees and plants	✓	
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		
7.1.6 Quality audits on environment and energy are regularly undertaken by the institution: **7.1.6.1. The institutional environment and energy initiatives are confirmed through the following:**		Covered as part of this report. Please refer the contents of this report
1. Green audit	✓	Covered as part of this report under Chapter -11 and Annexure –XVIII
2. Energy audit	✓	
3. Environment audit	✓	Covered as part of this report under Chapter – 13 and Annexure –XVI
4. Clean and green campus recognitions/awards	✓	Annexure –XIV: Awareness / Posters
5. Beyond the campus environmental promotional activities	✓	
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		

Clean Campus[2]

Sr. No.	Aspect	Reference
1.	Cleanliness in and around the campus and waste minimization	➢ Chapter No. 1 & Annexure No. IV ➢ Chapter No. 1 & Annexure No. XIV
2.	Water conservation and management including ➢ Waste water management and reuse ➢ Rain water harvesting, etc.	➢ Chapter No. 12 & Annexure No. XIII ➢ Chapter No. 6 & Annexure No. XII
3.	Environment-friendly activities adopted and practiced by the campus	➢ 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	➢ Chapter No. 14 & Annexure No. XIV

Smart Campus[3]

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.).	➢ Digital library ➢ Digital leaves ➢ Digital Meetings ➢ Digital notes ➢ Digital Quiz ➢ Online conferences and classes ➢ 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
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	Our college uses Google forms, Google classroom, Great learning, Tech mint for online classes, conducting research assignment on-line etc. 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, Great learning, Tech mint. Through Google drive we can give access to limited students of particular class only. We provide the notes of different theory subject and practicals 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.

[2] http://www.aicte-india.org/csc2019
[3] http://www.aicte-india.org/csc2019

		➢ Installation of smart photo sensor to regulate the night lighting ➢ Digital notes ➢ Cloud is used for Admission process, data entry, TC and all administration process
3.	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 connects, though the cloud networking, so established should address concerns of environmental challenges including contribution to United Nations Sustainable Development Goals	To share the data among all the Teachers and students, we are using Google, official email ID. 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 WhatsApp 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/ Great learning, Tech mint for all classes of our college; we are sharing notes to the students in the form of PDF or in DOC format which ever possible in their Google class. College had organized e-Essay competition, e-Poster competition, e-cartoon competition and 16 National webinar 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 more than 50 International conference and 100 National and Local conferences during lock-down.

Contents

List of Annexure

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 Organizetion
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
HPSEBL	Himachal Pradesh State Electricity Board Limited
TR	Tons of Refrigeration
VTHD	Voltage Total Harmonic Distortion
HRTC	Himachal 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.usailighting.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/Roof%20Top%20Rain water%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.gcchamba.com/
18	https://www.hpseb.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

The Government Degree College Chamba is one of the oldest premier educational institutes established by the Government of Himachal Pradesh on 15th May, 1958 as a co-educational institute. The college is running graduation courses in B. A., B. Sc., B. Com, B. Voc., BBA, BCA and Post-graduation in English, History, Political Science, Economics, Hindi and PGDCA. The college is recognized as District Green Champion in Chamba District by the Mahatma Gandhi National Council of Rural Education, Ministry of Education, Government of India for the academic year 2020-21and also a participating institute in Unnat Bharat Abhiyan 2.0 of Ministry of Education. In recognition of its services the college is included in the Utkrisht Mahavidyalaya Scheme of Himachal Pradesh Government for the year 2021 to modernize the college.

The Govt. Degree College Chamba was accredited with Grade "B+" by NAAC in September, 2016. The college has creative team of 67 faculty members and 4052 students enrolled in undergraduate and post-graduation programs in the session 2020-21. Being a Govt. College, it is fully financed by the Government of Himachal Pradesh and is recognized by UGC, New Delhi under section 2(f) and 12B of UGC act 1956 and affiliated to Himachal Pradesh University, Shimla. The college provides WEBOPAC services with Software for University Library (SOUL) software, e- journals, N-list subscription and adequate reading space to its users. The college has functional IGNOU study center since 1991-92.

The career guidance and counselling cell of the college provides online coaching for competitive exams in collaboration with district administration and Vision IAS academy, New Delhi. The college has two units of NSS also has one active NCC unit. The college is running Red Ribbon Club also has a unit of Rover and the Parent-Teacher Association (PTA), Alumni Association and College Students Central Association (CSCA) are integral part of this institution.

With the motto "To Teach and to Touch the Brains Forever", it is our earnest endeavor to share our continuously growing knowledge and experience in different fields with the learners and infuse them with interest, curiosity and enthusiasm thereby changing lives and our future as society.

The college is having 2 Campuses 1. Old Campus and 2. New Campus and 1 Boys Hostel. In the old campus there are total 54 rooms, out of which 32 are governed by our college and rest 22 are governed by medical college.

https://www.gcchamba.com/

Objective of Green Audit

The Green Audit Team focused on Material[4] 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.

[4]Definition: as per Global Reporting Initiative: **GRI 101:** FOUNDATION2016
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?	Yes, it included stakeholders. The stakeholders include ➢ Management ➢ Teaching Faculties ➢ Non-Teaching Faculties ➢ Students ➢ Canteen Manager The Green Campus Committee is shared with the Audit Team. Refer Annexure III.
Does it meet regularly?	The Team meets twice in a year atleast. 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, Installation Solar System, 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?	No, 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.
Is the college encouraging sustainable behaviour via: o education campaigns? o posters, placards, messages o incentives? o contests? o awards?	College conducts various activities to create awareness amongst the students and society on environment safety and protection but due to pandemic and lockdown the college was unable conduct the same. ➢ Swachata Abhiyan was organized at college campus under Azadi Ka Amrit Mohotsav on 12th August 2021 in which 90 students participated. ➢ Poster Making Competition was organized on 05th October 2021 in which 60 students participated. ➢ Health Checkup Camp was organized for Staff & Students on 11th December 2021 in which 250 members were benefited. Please refer Annexure IV for details. **Community Based Initiative's by the college:** ➢ Plantation Drive was organized in the vicinity of the college on 04th March 2020 in which 60 students

	participated. Please refer Annexure XIV for details.
Is the college staff modelling sustainable behaviour for students, peers, and community?	**Teaching & Non-Teaching Staff:** There are 56 staff members in the college, out of which: ➢ 45% staff of the college commute by public transport. ➢ 23% staff of the college commute by walking. ➢ 21% staff of the college travel by 4 wheelers. ➢ 11% staff of the college travel by 2 wheelers. Please refer above assessments for additional details
Do students model sustainable behaviour for staff, peers, and community?	**Students:** Total 4566 students are enrolled for 2020-21 session. As due to lockdown only online classes are been conducted, no students are attending the college. According to the interviews last year: Approximately: ➢ 74% students of the college commute by public transport. ➢ 22% students of the college commute by walking. ➢ 3% students of the college commute by 2-wheeler. ➢ 1% students of the college commute by 4-wheeler. Students participate in activities conducted by college on environment and sustainable development. In addition, please refer above assessments.
Is the college sharing learning internally via • Posters, placards, messages? • assemblies? • classroom presentations? • training/professional development? • posters/bulletin boards? • newsletter? • website?	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.
Does the college offer energy conservation lessons?	Yes, College organizes lectures and motivates students for Energy and Environment conservation. Environment Conservation is also a part of the syllabus for B.A., B.Com., B.B.A., B.C.A. Part – II, B.B.A. – II (III rd Sem) & B. Voc. II Year.
Is the college sharing its learning externally via • Paper presentations? • newsletter? • website?	The students are encouraged to present projects on topic related to environmental aspects. The college is also going to make the Green Audit Report public so that learning's of college are shared.
Further Scope of Improvement:	

- 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.

Conclusion:

- 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.

2. Creation of Awareness

Are the objectives of green audit clearly understood by the institute	Yes To spread awareness amongst the students and the surrounding community about the environmental impact due to operations associated with their teaching institution. ➢ 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). ➢ Dr. Mohinder Slariya, IQAC Coordinator of the college delivers lectures in many countries on Environment, Climate Change, Food Security, Tribal Society, SDG, etc. ➢ The college has signed number of MoU's with various Institutes, Colleges, Hotel Industries, Retail Industries, etc. ➢ The college has received a District Green Champion award for the 2020-21 session.
Are there posters/guidance displayed to remind students and staff of good practices?	Yes
Are the students aware of energy sources?	There are 2 different campuses (Old Campus and New Campus) and 1 hostel of the college. Both the campuses are having different electricity meters of Grid Electricity whereas the hostel is having 2 sources of

	energy i.e., Grid Electricity and Solar Electricity. Students are aware of the sources of energy which is utilized by the college.
Is college tracking its electrical energy usage?	There are 2 different campuses (Old Campus and New Campus) and 1 hostel of the college. Both the campuses and hostel are having different electricity meters. The readings of electricity consumption are included as part of this report under chapter 11. **Recommendation:** **The college needs to keep proper records of the electricity bills of Old Campus and Hostel as they were missing and couldn't be evaluated.**
Is college offering energy conservation lessons and programs?	➢ College has created awareness among the faculty and students to reduce energy wastage. ➢ 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. Please refer Annexure V and VI for details.
Do students and staff know where their water comes from?	The source of water is Municipal Corporation water which is utilized for drinking (after purification) and in the wash rooms for cleaning purpose.
Is college encouraging responsible water use via: o posters, placards? o incentives? o contests? o awards?	Yes, by posters, placards, contests.
How is trash managed outside the campus?	The waste is given to the Municipal Corporation for disposal.
Further Scope of Improvement ➢ **The college needs to keep proper records of the electricity bills of Old Campus and Hostel as they were missing and couldn't be evaluated.** ➢ **College may calculate the water footprint to compare its performance with national and international consumption standards and communicate with its stakeholders.**	
Conclusion ➢ **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	The college timings are from 10.00 AM to 4.00 PM. Thus,

<table>
<tr><td>incandescent lights? Can they be replaced with compact fluorescents (energy saving bulbs)?</td><td>requirement of daytime lighting (powered by electricity) is limited. 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
<table>
<tr><th colspan="4">Table 8.1 Luminous Performance Characteristics of Commonly Used La</th></tr>
<tr><th rowspan="2">Type of Lamp</th><th colspan="2">Lumens / Watt</th><th rowspan="2">Colour Rendering Index</th><th rowspan="2">Typical Application</th></tr>
<tr><th>Range</th><th>Avg.</th></tr>
<tr><td>Incandescent</td><td>8-18</td><td>14</td><td>Excellent (100)</td><td>Homes, restaurants, general lighting, emergency lighting</td></tr>
<tr><td>Fluorescent lamps</td><td>46-60</td><td>50</td><td>Good w.r.t. cooling (67-77)</td><td>Offices, shops, hospitals, homes</td></tr>
<tr><td>Compact fluorescent lamps (CFL)</td><td>50-70</td><td>60</td><td>Very good (85)</td><td>Hotels, shops, homes, offices</td></tr>
<tr><td>High pressure mercury (HPMV)</td><td>44-57</td><td>50</td><td>Fair (45)</td><td>General lighting in factories, garages, car parking, flood lighting</td></tr>
<tr><td>LED lamps</td><td>30-50</td><td>40</td><td>Good (70)</td><td>Reading lights, desk lamps, night lights, spotlights, security lights, signage lighting, etc.</td></tr>
</table>
Thus, LEDs are considered for installation as night lights, security street lights by the college. The term reading light[5] 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.usailighting.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</td></tr>
<tr><td>Has the college evaluated existing lighting for opportunities to reduce lighting in over-lit areas?</td><td>The lighting arrangements are well balanced with arrangements to switch ON and OFF lights independently. There are therefore practically no over lit areas.</td></tr>
<tr><td>Are the light switched duly labelled to make more obvious which switches relate to which appliances?</td><td>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.</td></tr>
<tr><td>Are the lights switched off to make use of daylight? (e.g., lights parallel to windows or in corridors)</td><td>The college has sessions from June to March, and there are winter holidays form January to February every year. Other days of the year have sufficient natural illumination.
There is minimum or practically negligible use of artificial lights during day time as the building structure has possibility of daylight usage. The lux level in the classrooms was measured and found in between 215 - 250.
Note:
As Chamba City is situated in hilly region, it was winter season when the audit was conducted and there was snowfall in the vicinity so the lux levels were slightly on a lower side.</td></tr>
<tr><td>Is the college utilizing natural lighting when possible?</td><td>Yes, natural lighting is first preference.</td></tr>
</table>

[5] https://www.collinsdictionary.com/dictionary/english/reading-light

For the spaces like store rooms, toilets, kitchen areas, copying rooms, corridors etc. is their scope for automatic lighting controls?	Yes. The Solar Lights installed in the campus are sensor based.
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.
Is there mechanism in place to immediately report inoperable occupancy light sensors?	NA
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.

Conclusion

- **The students and employees were interviewed and no complaint was identified within respect to the sufficiency of lighting measures.**
- **Sufficient lux levels found in between 215 - 250 are common in class rooms and work-stations based on the survey of audit team.**
- **As Chamba City is situated in hilly region, it was winter season when the audit was conducted and there was snowfall in the vicinity so the lux levels were slightly on a lower side.**
- **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 AC?	The AC usage in Chamba, Himachal Pradesh is negligible as the temperature in summer reaches a maximum up to 38°C and for the rest of the year is below 25 °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-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) Himachal Pradesh is a sate having lower ambient temperature, the HVAC is more inclined towards heating compared to the cooling.
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 in summer. Blinds are available in office to control unnecessary heat in-grace during summer season.
Are all external doors and windows closed when air conditioning is on?	There are 2 number of ACs in college. Based on interviews, it is confirmed that they are hardly operated.

Is there a scenario where air conditioning is wasted in unused spaces, such as cupboards, corridors?	This checklist question is not applicable.
Are Efficient and energy labelled ACs utilized for cooling purposes?	There are 2 number of ACs in the college, both are 3-star, however the installed heaters are resistance based. Recommendation to induct heat pumps is issued. The heat pump are 2.5 to 3.5 times more efficient compared to resistance heater. The college management needs to perform cost benefit analysis post once COVID – 19 is under control.
Further Scope of Improvement ➢ **Electrical Heaters uses electric resistance heating is typically 100% efficient because all of the electrical energy used is converted into heat and there are no combustion losses and piping losses. Whereas the efficiency of the heat pump can reach as high as 350% depending on the temperature to be maintained. The college management needs to perform cost benefit analysis post once COVID – 19 is under control.**	

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 for the first time. 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 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 faucets, and/or faucet aerators?	**Recommendation:** **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.**
Has the college installed low-flow shower heads at Hostel?	NA
Has the college harvested rainwater?	Yes, the harvested rain water cannot be stored because Chamba is already a water excess area and there is no need to store water from rain and to construct the structure required to store the amount of water harvested in this campus is not feasible. . For details refer below calculations.
Is the college collecting the condensation from A/C units for onsite watering needs?	No. As the use of ACs is negligible.
Has the college optimized its irrigation system for gardening to • operate at night or early morning hours to minimize evaporation? • water the minimum time and frequency necessary for the applicable vegetation?	No. 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 drip-irrigation system for watering the plants.**
What is amount of rain water harvested?	**Potential of Rain Water Harvesting:** Total area of roof top of college building is 1385 m^2. The rainfall for Chamba City is approximately 1590.8 mm. Total rain water harvesting is 1982 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 get recharged in the ground. The area under the cement block is 1632 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 778 m^3. Total quantity of water harvested = 1982 + 778 = 2760 m^3 The harvested rain water cannot be stored because Chamba is already a water excess area and there is no need to store water from rain and to construct the structure required to store the amount of water harvested in this campus is not feasible. Please refer Annexure XII and XVIII for details.
Are there any community-based projects implemented by the college?	Yes, the college undertakes various activities, but due to the pandemic the college was unable to conduct community-based activities.
Is the college consuming 3rd Party Water?	The college procures water from Third Party but ae unable to keep the records of bills or meter the consumption. **Recommendation:** **College needs to maintain a proper record of the bills and amount of water consumed.**

Further Scope of Improvement:

Long Term Measure:

- **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 can undertake determination of water footprint and calibrate its specific water consumption with the established National and International Norms.**
- **College needs to install Drip Irrigation system for watering plants.**
- **College needs to maintain a proper record of the bills and amount of water consumed.**

Conclusion:

- **The college is having 1 Municipal Corporation water connection.**
- **Toilet urinals can be equipped with the push buttons.**

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. Water Testing is conducted by the college in its own labs. **Recommendation:** **Third Party Water Testing needs to be conducted by the college.**

Further Scope of Improvement:

- **Third Party Water Testing needs to be conducted by the college.**

Conclusion:

- **The students, staff members and guests have access to clean, safe and potable water with the RO system.**

8. Renewable Energy

Is the college having solar, wind, or other forms of renewable energy?	Yes. The college: • Has installed Solar System of 25 kW on the college hostel which is connected to the grid. • In advanced stages of installing Solar PV System of 25 kW on college building.
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:

- **The college has installed 25 kW Solar System on the college hostel.**
- **College is in advanced stages of installing Solar PV System of 25 kW on college building.**

9. Transportation

Is college encouraging transportation measures like bicycle, Bulk transport, walking?	**Students:** Total 4566 students are enrolled for 2020-21 session. Approximately: ➢ 74% students of the college commute by public transport. ➢ 22% students of the college commute by walking. ➢ 3% students of the college commute by 2-wheeler. ➢ 1% students of the college commute by 4-wheeler. **Teaching & Non-Teaching Staff:** There are 56 staff members in the college, out of which: ➢ 45% staff of the college commute by public transport. ➢ 23% staff of the college commute by walking. ➢ 21% staff of the college travel by 4 wheelers. ➢ 11% staff of the college travel by 2 wheelers. ➢ Please refer above assessments for additional details
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?	**"No Vehicle Day"** is observed on every First Saturday of the month.

	Please refer Annexure XIV for details. **Recommendation:** **College Management should encourage use of mass transport systems amongst faculties.**

Further Scope of Improvement:

- **College Management should encourage use of mass transport systems amongst faculties.**

Conclusion:

- **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, LED Screens, LED lights, Star rated AC, LED Projectors in smart classrooms, etc. There is culture of the two-sided printing. Paper is not wasted. Paper based records are achieved and sold to recycler under principal of circular economy by college.
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.

Further Scope of Improvement:

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:

- **One sided paper is utilized by college to avoid use of fresh papers**
- **Paper based records are achieved and sold to recycler under principal of circular economy by college.**

11. Energy and Carbon Footprint

Has the College undertaken energy audit?	Yes, the energy audit was undertaken and electrical measurements were undertaken at the college. Please refer the Annexure –XVII of this report. 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: ➢ Computers ➢ Lighting ➢ Air-Conditioning ➢ Fans ➢ Pumps ➢ Other Lab Equipment
What are the steps undertaken during the energy audit?	The Assessment Team undertook the analysis of the college premise: ➢ To study electricity bills ➢ Study of lighting system and its measurement. ➢ Identification of energy saving opportunity and energy conservation.
What methodology was adopted?	The energy assessment involved desk review and onsite measurements. Review of energy bill received from HPSEBL was undertaken. Review of lighting, HVAC (Heating System), fuel usage, pumping systems etc. was undertaken. Energy conservation and saving opportunities are identified and included below.
What are the suggested energy conservation measures?	The One Switch Concept is implemented for every single classroom and labs separately in the college. This avoids the unwanted operation and wastage of electricity. **Below energy conservation measures are suggested** ➢ 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 381 tubes of 40 W in college and library. After the replacement based on failure the energy savings will be approximately 10973 kWh/year. With average electricity cost of INR 4.70 /kVAh, the annual savings will be approximately INR 54864 per year. ➢ Electrical Heaters uses electric resistance heating is typically 100% efficient because all of the electrical energy used is converted into heat and there are no combustion losses and piping losses. Whereas the efficiency of the heat pump can reach as high as 350% depending on the temperature to be maintained. The college management needs to perform cost benefit analysis post once COVID – 19 is under control. ➢ All Class Rooms 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.
Has the college calculated its	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, buses and LPG usage in Labs.

<table>
<tr><td>carbon footprint?</td><td></td></tr>
<tr><td>How is college promoting zero emission transportation options?</td><td>Not applicable. There is no internal transportation within the college.</td></tr>
<tr><td>Are all the applicable emission sources calculated?</td><td>The emission source pertaining to grid-based electricity source is calculated. Scope-01 emission source data pertaining to DG, HSD consumption in DG, LPG consumption in labs is calculated, Scope 2 emission on account of electricity imported from grid is considered.

Scope-01 Emissions:
<table><tr><th>Year</th><th>HSD Consumption in DG</th><th>LPG consumption in Labs</th></tr><tr><td>Session</td><td>lit</td><td>kg</td></tr><tr><td>CY 2019</td><td>-</td><td>568</td></tr><tr><td>CY 2020</td><td>-</td><td>568</td></tr><tr><td>CY 2021</td><td>-</td><td>568</td></tr></table>
Equivalent Scope-01 Emissions are as below[6]:
<table><tr><th>Year</th><th>HSD Consumption in DG</th><th>LPG consumption in Labs</th><th>Total GHG Emission (Scope-1)</th></tr><tr><td>Session</td><td>tCO_2</td><td>tCO_2</td><td>tCO_2</td></tr><tr><td>CY 2019</td><td>-</td><td>2.09</td><td>2</td></tr><tr><td>CY 2020</td><td>-</td><td>2.09</td><td>2</td></tr><tr><td>CY 2021</td><td>-</td><td>2.09</td><td>2</td></tr></table>
Scope -2 Emissions are tabulated as follows[7]:
<table><tr><th>Year</th><th>Annual Electricity Consumption</th><th>Total GHG Emission (Scope-2)</th></tr><tr><td>Session</td><td>kWh</td><td>tCO_2</td></tr><tr><td>CY 2019</td><td>61729</td><td>62</td></tr><tr><td>CY 2020</td><td>51124</td><td>52</td></tr><tr><td>CY 2021</td><td>49135</td><td>50</td></tr></table></td></tr>
</table>

[6]With 10 % uncertainty
[7]With 10 % uncertainty

Total CO_2 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
CY 2019	2.09	61.73	64
CY 2020	2.09	51.12	54
CY 2021	2.09	49.14	52

Further Scope of Improvement:

- **The college should replace the Tube Lights should be by LED efficient lights at the end of their lifecycle.**
- Heater

Conclusion:

- The One Switch Concept is implemented for every single classroom and labs separately in the college.

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?	➢ The class room 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 initiates 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.
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 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. College needs to execute a MoU with a proper agency for disposal of E-waste.

Plant Waste:
The plant waste is given to Municipal Corporation. College needs to construct a Compost Pit in college campus to convert the plant waste in manure.

- **Sewage Waste:**
  The liquid waste from lavatories and other sources are flown into the 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.
- **Chemical Waste:**
  The soak pit in which the chemical is flown is dismantled for renovation and the work is under progress, the photograph of the renovation is attached under Annexure XIII.

Please refer Annexure XIII for details.

Recommendation:

- **College needs to execute a MoU with a proper agency for proper disposal of E-waste.**
- **College needs to construct a Compost Pit in college campus to convert the plant waste in manure.**

Further Scope of Improvement:

- **College needs to execute a MoU with a proper agency for disposal of E-waste.**
- **College needs to construct a Compost Pit in college campus to convert the plant waste in manure.**

Conclusion:

- **Sanitary napkins vending machine and incinerator machine are installed in girl's common room.**
- **Soak pit for chemical waste is under construction.**

13. Environment

Air Quality

The college is situated in a hilly area. The plantation around the college helps to improve ambient air quality. The assessment team has availed the monitoring result which are publically available and independently monitored and hence reliable and reproducible source. Air Quality was found satisfactory however it is variable and changes with season and anthropogenic activities.

Sound Measurements

The Audit Team undertook readings of sound at various locations in the college like Classroom, Lab, Office and Campus the readings were found within the limits. Although, the college was closed due to winter holidays. During next cycle of the audit, readings will be taken when the college is fully active.

Please refer Annexure XVI for further details

14. 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 153 fully grown trees as wells as shrubs and hedges in Herbal Garden, Botanical Garden and Campus of both the of the colleges.

Office of the Principal
Govt. College Chamba. Himachal Pradesh
Email: principalgcchamba@gmail.com
Website: www.gcchamba.com
Phone: 01899-222207

List of Plants in Campus

Sr. No.	Name of Plant	Number
1.	Cedrus Deodara	8
2.	Punica Granatum	21
3.	Jacaranda Mimosifolia	1
4.	Terminalia Chebula	10
5.	Ricinus Communis	4
6.	Hibiscus Mutabilis	1
7.	Erioobotrys Japonica	1
8.	Grevillea Robusta	3
9.	*Araucaria*	4
10.	*Magnolia Champaca*	1
11.	*Sida Acuta*	1
12.	*Psidium Guajava*	1
13.	*Prunus Americana*	2
14.	*Thuja Accidentalis*	7
15.	*Ficus Religiosa*	1
16.	*Lagerstroemia Speciosa*	2
17.	*Hibiscus Syriacus*	2
18.	*Cestrum Nocturnum*	1
19.	*Livistona*	4
20.	*Pyrus Pashia*	5
21.	*Rosa* Sps. (Shrub)	4
22.	Shrubs	8

3.2.2022
for Principal
Govt College Chamba
Distt. Chamba (H.P.)

23.	Climbers	2
24.	*Tecoma Capensis*	Hedge
25.	*Malvaviscus*	Hedge
	Total	**94**

Place: Chamba

Date: 2.2.2022

2.2.2022
Principal
Govt College Chamba
Distt. Chamna (H.P.)

List of trees in the campus

Office of the Principal
Govt. College Chamba, Himachal Pradesh
Email: principalgcchamba@gmail.com
Website: www.gcchamba.com
Phone: 01899-222207

List of Plants in Botanical Garden

Sr. No.	Name of Plant	Number
1.	Araucaria	2
2.	Magnolia Champaca	1
3.	Sida Acuta	1
4.	Psidium Guajava	1
5.	Cedrus Deodara	3
6.	Thuja Occidentalis	1
7.	Prunus Americana	1
	Total	**10**

Place: Chamba

Date: 2.2.2022

2.2.2022
Principal
Govt College Chamba
Distt Chamba (H.P.)

List of trees in Botanical Garden

Office of the Principal
Govt. College Chamba, Himachal Pradesh
Email: principalgcchamba@gmail.com
Website: www.gcchamba.com
Phone: 01899-222207

List of Plants in Herbal Garden

Sr. No.	Name of Plant	Number
1.	Cedrus Deodara	8
2.	Punica Granatum	21
3.	Jacaranda Mimosifolia	1
4.	Terminalia Chebula	10
5.	Ricinus Communis	4
6.	Hibiscus Mutabilis	1
7.	Eriobotrys Japonica	1
8.	Grevillea Robusta	3
	Total	49

Place: Chamba

Date: 2.2.2022

2.2.2022
Principal
Govt College Chamba
Distt. Chamna (H.P.)

List of trees in Herbal Garden

Annexure

Annexure – I: List of Interviewed College Staff / Students

Office of the Principal
Govt. College Chamba, Himachal Pradesh
Email: principalgcchamba@gmail.com
Website: www.gcchamba.com
Phone: 01899-222207

List of Teaching and Non-teaching staff were present during Green Audit on 2.2.2022

Sr. No.	Name	Designation	Signature
1.	Dr. Shiv Dayal	Principal	
2.	Dr. Mohinder Slariya	Associate Professor	
3.	Dr. Hemant Pal	Associate Professor	
4.	Dr. Manish Verma	Assistant Professor	
4.	Dr. Santosh Kumar	Assistant Professor	
5.	Dr. Poonam	Assistant Professor	
6.	Sumit	Assistant Professor	
7.	Nisha Kumari	Assistant Professor	
8.	Dr. Ashish Kumar	Assistant Professor	
9.	Dr. Suneet Kumar	Assistant Professor	
10.	Sh. Inder Singh	Superintendent	
11.	Sh. Hitesh Kumar	JOA (IT)	

Place: Chamba

Date: 2.2.2022

Principal
Govt College Chamba
Distt. Chamba (H.P.)

Office of the Principal
Govt. College Chamba, Himachal Pradesh
Email: principalgcchamba@gmail.com
Website: www.gcchamba.com
Phone: 01899-222207

List of the Students who were present during Green Audit on 2.2.2022

Sr. No.	Name of the Student	Class	Signature
1.	Aksanksha	BA-II	
2.	Yashu	BA-III	
3.	Meenakshi	BSc-III	
4.	Muskan	BA-I	
5.	Manish Kumar	BA-I	
6.	Kusum	BA-II	
7.	Priya	BSc-I	
8.	Vandu	BA-II	
9.	Hitesh Sharma	BA-III	
10	Abhishek Thakur	BA-III	

Place: Chamba
Date: 2.2.2022

Principal 2.2.2022
Govt College Chamba
Distt. Chamna (H.P.)

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 January 2019 to December 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.	Water Harvesting Survey undertaken by the Green Audit Team
15.	Waste Water Management Survey undertaken by the Green Audit Team

Annexure –III: Green Campus Committee

Office of the Principal
Govt. College Chamba, Himachal Pradesh
Email: principalgcchamba@gmail.com
Website: www.gcchamba.com
Phone: 01899-222207

Green Campus Committee: Vision and Mission

Green Campus Committee 2017 - 2021

Sr. No.	Name of the Member	Designation
1.	Dr. Shiv Dayal	President
2.	Dr. Mohinder Slariya	Secretary
3.	Dr. Hemant Pal	Member
4.	Dr. Manish Verma	Member
5.	Dr. Santosh Kumar	Member
6.	Dr. Sunil Kumar	Member
7.	Dr. Ashish Kumar	Member
8.	Dr. Poonam	Member
9.	Nisha Kumari	Member
10.	Avinash Kumar (Canteen Manager)	Member
11.	Aksanksha BA-II	Member
12.	Yashu BA-III	Member
13.	Meenakshi BSc-III	Member
14.	Muskan BA-I	Member
15.	Manish Kumar BA-I	Member

Green Campus

Vision

To create cleaner, safer campus by working together to improvelocal environmental quality

Mission

- To be more efficient in our energy consumption by taking concrete steps-tominimize waste.
- To create a positive effect on the local environment and community throughefficient use of natural resources and efficient management of wastes.
- To educate individuals about medicinal values of various plants.
- Build communities of people who adopt environmentally sustainable lifestyles.

Place: Chamba

Date: 2.2.2022

Principal
Govt College Chamba
Distt. Chamba (H.P.)

Green Campus Committee 2017 – 21

Annexure – IV: List of Awareness Program Undertaken by College

Swachata Abhiyan at college campus under Azadi ka Amrit Mohotsav on 12th August 2021

Poster Making Competition on 05th October 2021

Health Checkup Camp for Staff & Students on 11th December 2021

Annexure –V: Lighting Survey (2021 – 22)

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 are 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: 110-120[8]

  - 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 – In between 215 – 250 (As the college is situated in hilly area and it was winter season during the Audit, the lux levels were slightly on a lower side)

Calculated Contribution of various lighting arrangements: Calculated for 240 working days

Light Sources	Daily Wh Consumption
Tube light	77100
LED	11360
CFL	20822

Light Sources	% Contribution
Tube light	71 %
LED	10 %
CFL	29 %

Light Sources	Number
Tube light	381
LED	155
CFL	325

Light Sources	% Contribution
Tube light	44 %
LED	18 %
CFL	38 %

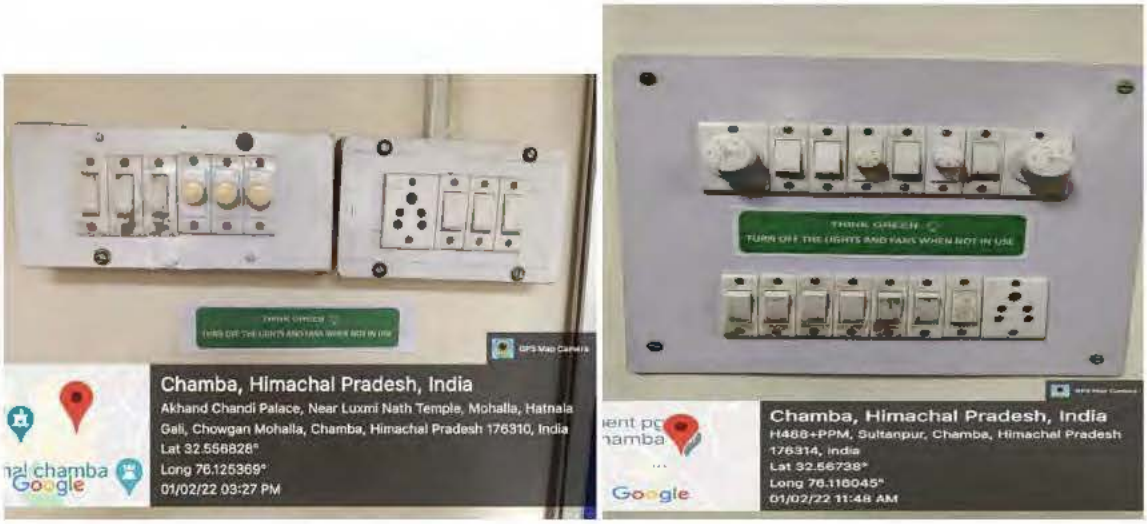
[8] https://www.google.co.in/amp/s/www.bijlibachao.com/lights/comparing-led-lights-with-fluorescent-lights.html%3fisamp=1

Lighting Survey 2021 – 22

Room Name/no.	TL	Watts	DAH	W.hr	LED	Watts	DAH	W.hr	CFL	Watts	DAH	W.hr	Fan	Watts	DAH	W.hr
Lab 1	6	40	6	1440	-	-	-	-	2	20	6	240	6	80	3	1440
Lab 2	6	40	6	1440	-	-	-	-	-	-	-	-	6	80	3	1440
Lab 3	6	40	6	1440	-	-	-	-	-	-	-	-	6	80	3	1440
Room No. 1	8	40	6	1920	-	-	-	-	-	-	-	-	7	80	3	1680
NCC Room	4	40	6	960	-	-	-	-	-	-	-	-	2	80	3	480
Physical Education Room	4	40	6	960	-	-	-	-	-	-	-	-	2	80	3	480
Gymnasium	4	40	6	960	-	-	-	-	-	-	-	-	2	80	2	320
Room No. 2	4	40	6	960	-	-	-	-	-	-	-	-	2	80	3	480
Girls Washrooms	2	40	2	160	-	-	-	-	7	30	2	420	2	80	2	320
Boys Washrooms	3	40	2	240	-	-	-	-	7	30	2	420	2	80	2	320
Corridor	16	40	2	1280	4	20	2	160	16	30	2	960	8	80	1	640
Stair Case	-	-	-	-	4	20	2	160	-	-	-	-	-	-	-	-
Porch	-	-	-	-	-	-	-	-	24	30	2	1440	-	-	-	-
Corridor	-	-	-	-	14	20	2	560	18	30	2	1080	-	-	-	-
Boys Washrooms	4	40	2	320	-	-	-	-	14	15	2	420	4	80	2	640
Principal Office	4	40	6	960	4	20	6	480	1	10	2	20	6	80	3	1440
Admin Office	-	-	-	-	4	20	6	480	-	-	-	-	2	80	3	480
Confidential Room	2	40	6	480				-	-	-	-	-	-	-	-	-
Admin Room	-	-	-	-	5	20	6	600	-	-	-	-	2	80	3	480
Physics Lab	18	40	6	4320	-	-	-	-	3	15	6	270	16	80	3	3840
Room No. 101	8	40	6	1920	-	-	-	-	-	-	-	-	7	80	3	1680
Room No. 102	8	40	6	1920	-	-	-	-	-	-	-	-	7	80	3	1680
Room No. 103	8	40	6	1920	-	-	-	-	-	-	-	-	7	80	3	1680
Girls Common Room	4	40	3	480	-	-	-	-	-	-	-	-	2	80	3	480
Room No. 104	8	40	6	1920	-	-	-	-	-	-	-	-	7	80	3	1680
Room No. 105	8	40	6	1920	-	-	-	-	-	-	-	-	7	80	3	1680
NSS Room	4	40	6	960	-	-	-	-	-	-	-	-	2	80	3	480
Stair Case	-	-	-	-	2	20	2	80	-	-	-	-	-	-	-	-

Canteen	13	40	6	3120	2	20	6	240	8	15	6	720	12	80	3	2880
Geology	6	40	4	960	-	-	-	-	-	-	-	-		-	-	-
Zoology	13	40	4	2080	-	-	-	-	-	-	-	-	13	80	2	2080
Library	17	40	6	4080	-	-	-	-	2	15	6	180	8	80	6	3840
Reading Room	-	-	-	-	2	20	6	240	10	50	6	3000	4	80	2	640
Corridor	2	40	1	80	2	20	1	40	36	30	1	1080	-	-	-	-
Room No. 202	8	40	6	1920	-	-	-	-	-	-	-	-	8	80	3	1920
Room No. 203	4	40	6	960	-	-	-	-	-	-	-	-	2	80	3	480
Room No. 204	4	40	6	960	-	-	-	-	-	-	-	-	2	80	3	480
Room No. 205	9	40	6	2160	-	-	-	-	-	-	-	-	7	80	3	1680
Room No. 206	9	40	6	2160	-	-	-	-	-	-	-	-	7	80	3	1680
Evaluation Room	4	40	0.5	80	-	-	-	-	-	-	-	-	2	80	0.5	80
Girls Washrooms	6	40	2	480	8	20	2	320	3	15	2	90	-	-	-	-
Boys Washrooms	6	40	2	480	-	-	-	-	9	15	2	270	-	-	-	-
Staff Room	12	40	6	2880	-	-	-	-	-	-	-	-	6	80	3	1440
Room No. 301	7	40	6	1680	1	20	6	120	-	-	-	-	7	80	3	1680
Room No. 302	8	40	6	1920	-	-	-	-	-	-	-	-	7	80	3	1680
Room No. 303	4	40	6	960	-	-	-	-	-	-	-	-	2	80	3	480
Room No. 304	2	40	6	480	-	-	-	-	-	-	-	-	2	80	3	480
Room No. 305	7	40	6	1680	2	40	6	480	-	-	-	-	5	80	3	1200
Room No. 306	9	40	6	2160	-	-	-	-	-	-	-	-	5	80	3	1200
Girls Washrooms	2	40	2	160	-	-	-	-	3	15	2	90	1	80	2	160
Boys Washrooms	2	40	2	160	-	-	-	-	3	15	2	90	1	80	2	160
Stair Case	-	-	-	-	2	40	1	80	2	30	1	60	-	-	-	-
Geography Lab	7	40	6	1680	-	-	-	-	-	-	-	-	6	80	3	1440
Computer Lab	9	40	6	2160	1	20	6	120	-	-	-	-	14	80	3	3360
Botany Lab	11	40	6	2640	2	20	6	240	-	-	-	-	15	80	3	3600
Staff Toilet (Gents)	2	40	2	160	-	-	-	-	3	30	2	180	1	80	2	160
Staff Toilet (Ladies)	2	40	2	160	-	-	-	-	3	30	2	180	1	80	2	160
Corridor	2	40	1	80	-	-	-	-	28	30	1	840	-	-	-	-

M.P. Hall	-	-	-	-	-	-	-	-	56	30	0.5	840	33	80	0.5	1320
Room No. 401	4	40	6	960	4	20	6	480	-	-	-	-	8	80	3	1920
Conference Hall	7	40	0.5	140	-	-	-	-	-	-	-	-	8	80	0.5	320
Girls Washrooms	2	40	2	160	-	-	-	-	3	15	2	90	1	80	2	160
Boys Washrooms	2	40	2	160	-	-	-	-	3	15	2	90	1	80	2	160
Corridor	-	-	-	-	-	-	-	-	20	30	1	600	-	-	-	-
Staff Room	2	40	6	480	4	10	6	240	-	-	-	-	-	-	-	-
BBA	2	40	6	480	2	10	6	120	-	-	-	-	3	80	3	720
Office BBA	2	40	6	480	2	10	6	120	-	-	-	-	3	80	3	720
PGDCA	6	40	6	1440	10	10	-	-	-	-	-	-	3	80	3	720
Lab	7	40	6	1680	1	10	6	60	-	-	-	-	3	80	3	720
IGNOU	10	40	6	2400	1	10	6	60	-	-	-	-	3	80	3	720
B Voc	-	-	-	-	1	20	6	120	6	12	6	432	5	80	3	1200
BCA	3	40	6	720	2	20	6	240	10	12	6	720	10	80	3	2400
Hostel	8	10	8	640	69	10	8	5520	25	30	8	6000	26	80	4	8320
Total	**381**			**77100**	**155**			**11360**	**325**			**20822**	**359**			**77640**



On & off culture practiced in college

Use of LED lights in college

One Switch Concept

Sensor Based Lighting System

Annexure –VI: Undertaking by the System Department Regarding Control of Electronic Equipment's

Office of the Principal
Govt. College Chamba, Himachal Pradesh
Email: principalgcchamba@gmail.com
Website: www.gcchamba.com
Phone: 01899-222207

Operation of Electronic Equipment

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 copters 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.

Place: Chamba

Date: 2.2.2022

Principal 2.2.2022
Govt College Chamba
Distt. Chamna (H.P.)

Annexure –VII: Water Quality Reports

Office of the Principal
Govt. College Chamba, Himachal Pradesh
Email: principalgcchamba@gmail.com
Website: www.gcchamba.com
Phone: 01899-222207

Water Analysis Report for The Year 2019

Source - RO Water

Dated: 04-08-2019

S.No	Parameters	Result
1	Colour	Colourless
2	pH	7.6
3	Conductivity	0.511 S/cm
4	Turbidity	3NTU
5	Alkalnity	126 mg/L
6	Total Hardness	210 mg/L
7	DO	3 mg/L
8	BOD	2.1 mg/L
9	Sulphate	158 mg/L
10	Total Dissolved Solid	624 mg/L
11	Nitrogen	28 mg/L
12	Residual Chlorine	1.4 mg/L
13	Chloride	42.28 mg/L

Principal 2.2.2022
Govt College Chamba
Distt. Chamba (H.P.)

Water Testing Reports 2019

Office of the Principal
Govt. College Chamba, Himachal Pradesh
Email: principalgcchamba@gmail.com
Website: www.gcchamba.com
Phone: 01899-222207

Water Analysis Report for The Year 2020

Source - RO Water

Dated: 04-11-2020

S.No	Parameters	Result
1	Colour	Colourless
2	pH	7.4
3	Conductivity	0.611 µS/cm
4	Turbidity	4NTU
5	Alkalnity	134 mg/L
6	Total Hardness	234 mg/L
7	DO	2 mg/L
8	BOD	2.2 mg/L
9	Sulphate	168 mg/L
10	Total Dissolved Solid	636 mg/L
11	Nitrogen	23 mg/L
12	Residual Chlorine	1.2 mg/L
13	Chloride	40.12 mg/L

Principal 2.2.2022
Govt College Chamba
Distt. Chamna (H.P.)

Water Testing Reports 2020

Office of the Principal
Govt. College Chamba, Himachal Pradesh
Email: principalgcchamba@gmail.com
Website: www.gcchamba.com
Phone: 01899-222207

Water Analysis Report for The Year 2021

Source - RO Water

Dated: 13-09-2021

S.No	Parameters	Result
1	Colour	Colourless
2	pH	7.5
3	Conductivity	0.712 µS/cm
4	Turbidity	2NTU
5	Alkalnity	112 mg/L
6	Total Hardness	224 mg/L
7	DO	2 mg/L
8	BOD	3.1 mg/L
9	Sulphate	178 mg/L
10	Total Dissolved Solid	578 mg/L
11	Nitrogen	34 mg/L
12	Residual Chlorine	2.4 mg/L
13	Chloride	38.67 mg/L

2.2.2022
Principal
Govt College Chamba
Distt. Chamna (H.P.)

Water Testing Reports 2021

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

Office of the Principal
Govt. College Chamba, Himachal Pradesh
Email: principalgcchamba@gmail.com
Website: www.gcchamba.com
Phone: 01899-222207

Detail of Number of Computers, Printers, Scanners etc. in the College

Sr. No.	Item	Office	Labs	Computer Lab	Staff Cabins/Room	Library	Total
1.	Number of Computer	07	14	95	01	03	120
2.	Number of Printers	04	06	03	01	01	15
3.	Number of Scanner	04	06	03	01	01	15

Place: Chamba

Date: 2.2.2022

2.2.2022
Principal
Govt College Chamba
Distt. Chamna (H.P.)

Annexure –IX: Solar Panel Installations

Solar Panels installed over College Hostel

(H.P.GOVT. ENERGY DEV. AGENCY)
(Chamba, Distt. Chamba (H.P.)

No. Himurja/CBA/76/GCRTP/2021-22- 507 Dated:- 02-02-2022

To

The Principal
Govt. Collage Chamba
Distt. Chamba (H.P.)

Sub **Regarding providing the estimate & performa bill for the installation for Grid Connected Power Plant in r/o Govt. Collage Chamba.**

Sir

In reference to your letter no.EDN-CHM-GCC(MISC)2021-22-825 dated 01-02-2022 on the above referred subject in this context the estimate/performa bill for installation of Grid Connected Roof Top Power Plant at Govt. Collage Chamba for 25KWp is as under :-

Sr. no	Particular	Capacity	Rate per Kwp	Amt.(Rs.)	Dep. Charges (Rs.)	Total Amount (Rs.)
1	Providing, installation and commissioning of roof top Grid connected power plant complete in all respect	25 Kwp	[redacted]	[redacted]	[redacted]	[redacted]
	Grand Total					[redacted]

Further action in the matter can only be initiated only after receipt/transfer of funds sanctioned by the funding agency/organization for the execution of various works through NEFT/RTGS in favour of **Project Officer, Himurja Chamba** Following by subsequence conformation of same. The account detail for transfer of funds is as under :-

1. **Name of account holder**:
2. **Bank** :
3. **Branch** :
4. **Account No.** :
5. **IFSC** :

Yours Faithfully

Project Officer
Himurja Chamba
Distt.Chamba(H.P.)

Quotation for 25 kW Solar Pv System

Annexure –X: Water Distribution Data

Note: College needs to maintain a proper record of the bills and amount of water consumed.

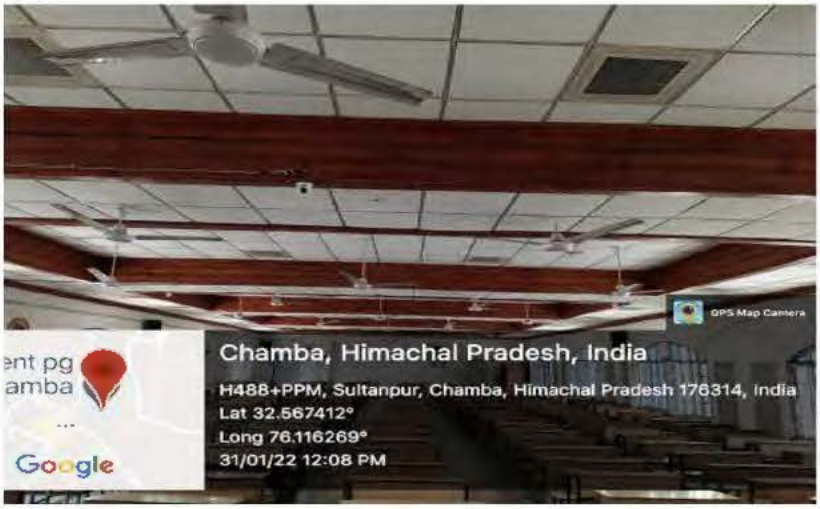
Annexure –XI: Solar Passive Structure / Drip Irrigation

Note: No Drip Irrigation System Installed in College

Adequate light in classrooms without using electrical lighting

Adequate light in labs without using electrical lighting

Use of blinds for windows to reduce heat



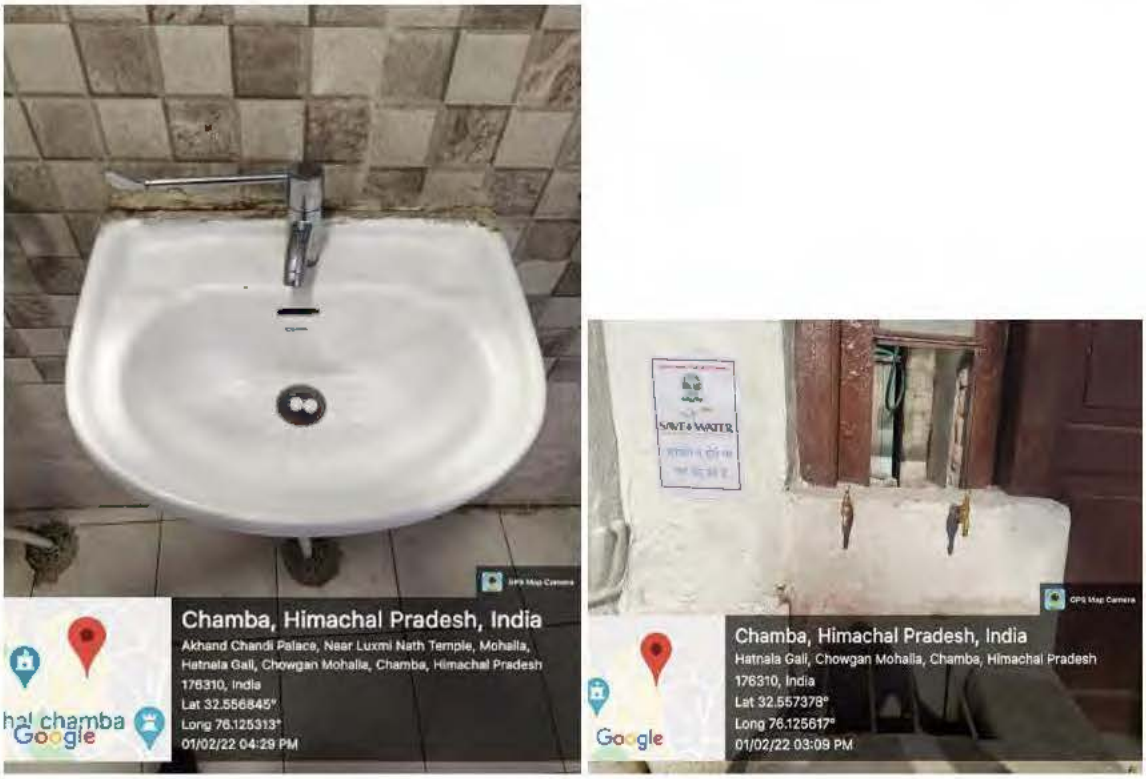
Use of False Ceiling

AC Condensers in shade

Passive Architecture to indent sunlight

Annexure –XII: Water Management

Pipeline of Water Harvesting System



Taps to be replaced by Push Buttons / Faucets

Cocks to be replaced by push buttons

RO Unit in college

Tank in college to collect harvested water

Cement Blocks for Rain Water Harvesting

Annexure –XIII: Waste Management

Ban on single use plastic in college campus

Dustbins in corridors

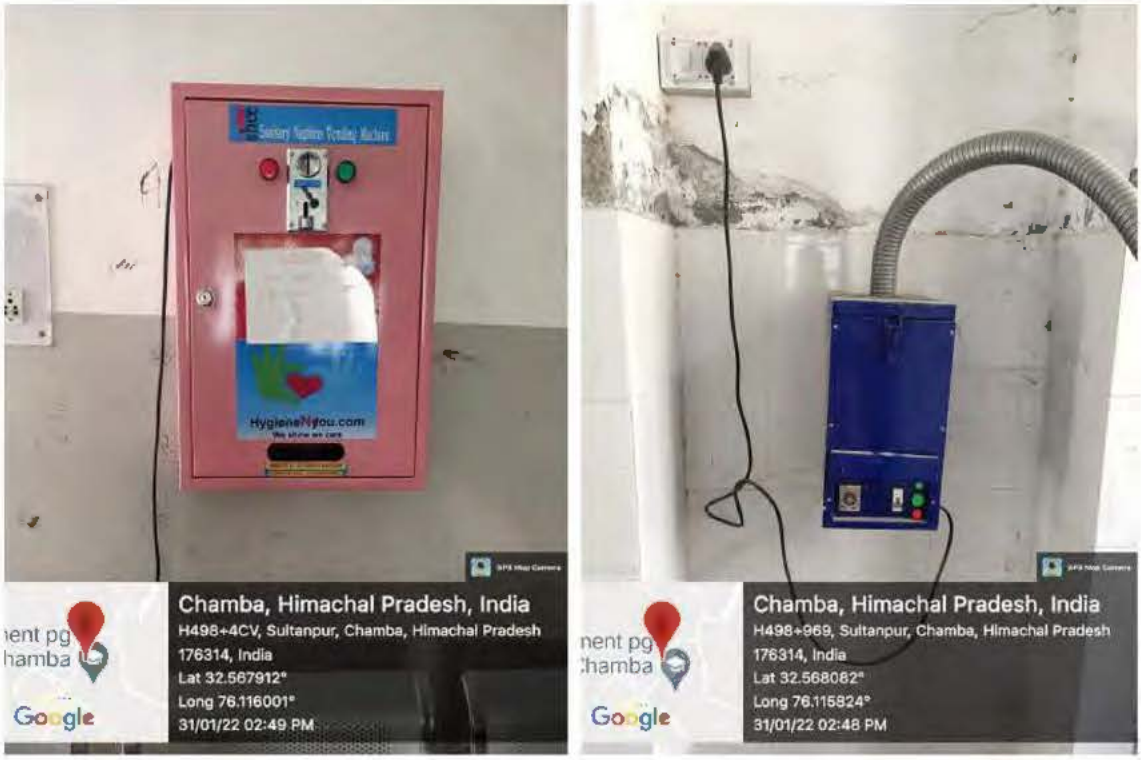
Dustbins in class

Dustbins in labs

Dustbins in office

Soak pit for Chemical Waste under construction

Dustbins in Campus



Vending Machine and Incinerator Machine in Girl's Common Room

Office of the Principal
Govt. College Chamba, Himachal Pradesh
Email: principalgcchamba@gmail.com
Website: www.gcchamba.com
Phone: 01899-222207

Agreement for Disposal of Paper & Cellulose Waste.

This indenture of agreement is made on 1 January 2017 between Principal, Govt. College Chamba HP (Hereafter Party No. 1) and M/S Satpal Singh & Bros. Mohalla Sultanpur Near Fishery Deptt., Chamba (HP) (Hereafter Party No. 2.)

Whereas the Party No 1, is running Govt. owned college at Sulatanpur Chamba HP. The college is affiliated to HP University Shimla and being regulated as per rules and regulations of Govt. of Himachal Pradesh and UGC.

and

Whereas the Party No.1, Govt. College Chamba are imparting teaching to the students theory and practical in different departments.

and

Whereas Students of Govt. College Chamba undergoes various practical and record them in practical notebook

and

Whereas students undergo three sessional exams in a year

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

And

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

This agreement witnesses as under:

1) That Party No. 1 shall provide all the paper and cellulose waste generated in the college to Party No.2 free of Cost

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 of 5 Years from 1 July 2017 to 31December 2021 witness thereof signed by Party No. 1 & Party No. 2

Party No. 1

Dr. Mohinder Slariya

Witness Dr. Ashish Kumar

Party No. 2

Mr. Satpal Singh

Witness Dr. Suneel Kumar

MoU of Cellulose Waste Management

GST No. 02AVUPS0692PZZ0 | धन-धन बाबा श्री चन्द जी महाराज | 94180-38747, 98058-74444, 82196-51002

MIS. SATPAL SINGH & BROS.

Deals in : Iron, Scrab, Bajri, Brick, Sand & General Order Suppliers

Mohalla Sultanpur Near Fishery Deptt. Chamba (H.P.)

Dated.....

CERTIFICATE OF PAPER AND CELLULAR WASTE DISPOSAL

This is certify that the paper and cellular waste received from Govt. College Chamba Himachal Pradesh, during the Period from 01/01/2017 to 31/12/2021 has been disposed off in environment friendly manner.

Vide Certificate No 101 waste solid 2000 Kg

Date: 5.1.2022

Authorized signature

SATPAL SINGH & BROS.

Prop.

Certificate for Cellulose Waste Collection

OFFICE OF THE EXECUTIVE OFFICER MUNICIPAL COUNCIL CHAMBA H.P.

No/ 3336 / MCC dated Chamba the 01st February, 2022.

CERTIFICATE.

Certified that Municipal Council, Chamba collects dry waste from Govt Collage Chamba on regular basis.

Executive Officer,
Municipal Council, Chamba.

Waste collection letter from Municipal Corporation

Office of the Principal
Govt. College Chamba, Himachal Pradesh
Email: principalgcchamba@gmail.com
Website: www.gcchamba.com
Phone: 01899-222207

Notice

SINGLE USE PLASTIC

IS

BANNED IN THIS CAMPUS

PRINCIPAL

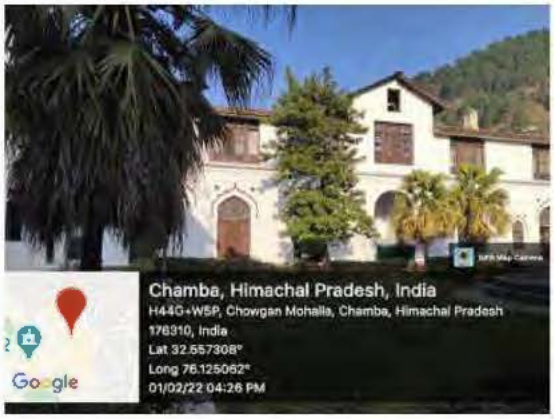
GOVT. COLLEGE CHAMBA

Ban on Single Use Plastic Notice

Annexure –XIV: Awareness / Posters

Plantation Drive in the vicinity of the college on 04th March 2020

Posters in college



Landscaping of trees

Green Audit Team in discussion with the Principal

Green Audit Team interviewing the staff members

Green Audit Team interviewing the student

Fire Extinguishers in college

Pedestrain Friendly Pathways

भारत सरकार / Government of India
महात्मा गांधी राष्ट्रीय ग्रामीण शिक्षा परिषद / Mahatma Gandhi National Council of Rural Education
उच्च शिक्षा विभाग/Department of Higher Education
शिक्षा मंत्रालय / Ministry of Education

सत्यमेव जयते

District Green Champion Certificate

This is to certify that **Government College Chamba, Himachal Pradesh** is hereby recognized as **District Green Champion** for **Chamba** District for the Academic Year 2020-21. The Institution has successfully set up the Swachhta Action Plan Committee, adopted and implemented best practices in the areas of Sanitation, Hygiene, Waste Management, Water Management, Energy Management and Greenery Management.

This certificate is given in the presence of **Shri. D C Rana, Deputy Commissioner, Chamba, Himachal Pradesh**

August 2021

Dr W G Prasanna Kumar
Chairman
MGNCRE, Ministry of Education
Government of India

Green Champion Award

Office of the Principal
Govt. College Chamba, Himachal Pradesh
Email: principalgcchamba@gmail.com
Website: www.gcchamba.com
Phone: 01899-222207

Notice

FIRST STATURDAY OF EVERY MONTH WILL BE OBSERVED AS NO-VEHICLE DAY

PRINCIPAL
GOVT. COLLEGE CHAMBA

No Vehicle Day Notice

Memorandum of Understanding
as Collaborators

between

The Grassroots Institute (Canada)

and

Department of Sociology, Government College Chamba (India)

To build the capacities of researchers, students, practitioners and scholars, The Grassroots Institute has conceptualized, evolved and developed a "**Summer Field School [Online] on Mountain Ecosystems and Resource Management**" proposed to be organized from **19 to 28 September 2021** in ***Ukraine's Carpathian Mountains***. This program will be conducted for international participants in the English language covering the contemporary current topics on the following broad areas: (1) Mountain Ecosystems; (2) Freshwater Ecosystems; (3) Forest Ecology; (4) Grassland Ecosystems; (5) Biodiversity Conservation; (6) Wildlife Management; (7) Ecotourism; (8) Park-People Interface; (9) Participatory Resource Management; (10) Watershed Management; (11) Sustainable Agriculture & Organic Farming; (12) Agro-Biodiversity; (13) Transhumance & Pastoralism; (14) Livestock Production; (15) Mountain Livelihoods; (16) Mountain-based Conventions; (17) SDGs & Mountains; (18) Contemporary Issues in Mountain Sustainability. Tentatively, a session plan is prepared along with the proposed names of Faculties and tentative topics under each broader subject is available on website www.grassrootsglobal.net/mer2020.

In order to organize and conduct the above described Summer Field School (hereinafter called as "program"), the partners will dispose of the following functions and responsibilities:

The Grassroots Institute will:

1. design, develop and coordinate the program's technical aspects as well as its execution;
2. prepare a curriculum, coordinate lessons preparation, evolve methodologies, and perform other necessary technical preparations;
3. invite, fix and coordinate with potential lecturers and faculty members;
4. invite and develop varied types of partnership with institutions and organizations across the world;
5. identify, fix and coordinate with one organizing (logistic) partner for planned logistic arrangements, and avail the necessary funds to that particular partner for making all arrangements;
6. prepare, communicate and coordinate the program management advice to the organizing (logistic) partner;
7. develop the contents of announcements and publicity materials, and release the announcements and publicity material for worldwide advertising of the program;
8. develop the content of and announce on a separate website (already in place at the URL www.grassrootsgobal.net/mer2020);

9. coordinate, receive and handle the queries, applications and fees from the potential applicants;
10. with the help of all organizing partners, constitute an Organizing Committee (one member from each organizer organization/institution) having role of supervising the program;
11. contact, network and liaise with various potential sponsors, donors and supporters to raise financial resources through different means for subsisting the program costs and financing the scholarships;
12. develop, issue and delegate the content for media visibility over the pre-program, during the program and post-program phases;
13. deliver various other functions, not listed above, aimed at making the program successful with active participation and contribution of variety of partner institutions.

The Collaborating Partner [Department of Sociology, Government College Chamba] will:

1. identify, nominate and provide the name of one senior person who will supervise, coordinate and manage the activities designated under Collaboration in the program;
2. nominate an expert or specialist (optional) to conduct a technical session, if willing to do so;
3. take part (through email conversations) in improving the course contents, helping prepare lessons, helping improve methodologies, and strengthening the technical parts of the program;
4. help develop the contents of announcements and publicity materials, and help undertake publicity of the program worldwide by using own website, email communications, newsletter or news, advertisement in your journals or bulletins, information to your partners or collaborators, messaging in email databases, and so on;
5. suggest and advise the content of the designated website for this program;
6. suggest and recommend potential sponsors, donors and supporters to raise financial resources to sponsor the scholarships.

The benefits of participating as Collaborator will be gained many folds. The Grassroots Institute will be liable for financial implications concerning this program. Among the **tangible and intangible benefits to the Collaborating Partner**, there are some as follows:

1. Visibility and publicity of the institution/organization worldwide, as massive advertising, publicity, emailing, web posting, social media posting, and publishing will be done across the world in order to mobilize the potential participants for this program;
2. Potential students from different countries will come to know the Collaborator and may seek admission in an academic program of their choice;
3. Large numbers of world's universities, institutions, government organizations, donor agencies, UN agencies, corporations, NGOs, web portals, CSR organizations, individuals, scholars, researchers and students will get to know the Collaborator, and some of them may contact in near future for one purpose or the other;
4. The Collaborators may develop new relations and linkages with variety of institutions and organizations world over, while identifying and suggesting potential sponsors and supporters of scholarships for this program;

5. Academic, research, teaching or training partnership will strengthen between The Grassroots Institute and the Collaborator and between the Collaborator and other partners of this initiative;
6. Exchange and cooperation may be pursued in future between various partners and collaborators related to joint research funding, conference or colloquium;
7. There may be many other unseen and unconceived benefits that the Collaborator will have in the near future.

This MOU shall be in force from the date of the last signing till the end of 2022 and is subject to revision or modification by mutual agreement. It is also understood that this MOU may serve as the basis for specific agreements to be developed at a later date. It is further understood that this MOU is not legally-binding and either of the two institutions may terminate the MOU at any time, although such action will only be taken after mutual consultation in order to avoid any possible inconvenience to either party.

This MOU is effective when the representatives from each institution have affixed their signatures to it.

Dr. Hasrat Arjjumend
Founder President
The Grassroots Institute

THE GRASSROOTS INSTITUTE Non-Profit Federal Incorporation No. 1097857-4 CANADA

16 June 2021
Date & Seal

Dr. Mohinder Slariya
Head
Department of Sociology,
Government College Chamba
Himachal Pradesh-176314

18 June 2021
Dr. Mohinder Slariya
H.P.E.S-1
Associate Professor,
Govt. P.G. College, Chamba (H.P.)
Date & Seal

Jeju
ASIA CLIMATE CHANGE EDUCATION CENTER

Memorandum of Understanding
on Academic Cooperation
between

Asia Climate Change Education Center, Jeju South Korea
and

Department of Sociology, Govt. College Chamba, Himachal Pradesh, India

The Parties;

Asia Climate Change Education Center, Jeju South Korea (hereinafter "ACCEC"); and Department of Sociology, Govt. College Chamba, Himachal Pradesh, India, (hereinafter "GCC") recognizing the benefits to their respective college/department from the establishment of collaborative links, conclude this Memorandum of Understanding (hereinafter "MoU") as follows:

1 The purpose of this MoU is to develop academic and educational cooperation and to promote mutual understanding between the two Parties.

2. Each Party agrees to develop the following collaborative activities in the academic areas of mutual interest, on a basis of equality and reciprocity

2.1) Exchange of academic and administrative staff
2.2) Conducting collaborative research projects
2.3) Conducting lectures and organizing symposia (On-line and off line)
2.4) Exchange of academic information and materials
2.5) Promoting collaboration in fields of mutual interest
2.6) Promoting other academic cooperation as mutually agreed

3. The development and implementation of specific activities based on this MoU will be separately negotiated and agreed between the college/departments which carry out the specific projects and will be subject to a separate written agreement. Each Party agrees to carry out these activities in accordance with the laws and regulations of the respective countries/state after full consultation and approval.

4. It is understood that the implementation of any of the types of co-operation stated in Clause 2 shall depend upon the availability of resources and financial support of the Parties concerned.

5. Both Parties agree that prior written approval is required before using the other Party's name, logo, or other Intellectual Property rights in any advertising or associated publicity

6. Should the collaborative research activities under this MoU result in any potential for intellectual property, each Party shall seek an equitable and fair agreement as to ownership and other property interests that may arise.

7 This MoU may only be amended or modified by a written agreement signed by the representatives of each Party

8. This MoU is valid for a period of five years from the date of signing by the authorized signatories of each Party Each Party shall review the status of the MoU at least three months before the end of the five-year period to determine whether it wishes the MoU to continue and, if so, any modifications that might be necessary The period of validity of this MoU may only be extended by the mutual written consent of both Parties.

9. This MoU may, at any time during its period of validity, be terminated by one of the Parties upon prior notice to the other in writing not later than six months before the termination date.

10. The Parties may disclose certain confidential information to the other in relation to any future proposal made under this MoU Each Party therefore agrees that the contents of this MoU and the negotiations in relation to any future proposal remain strictly confidential and each Party hereby undertakes not to disclose the same to any third Party, save for its professional advisers, without the prior written consent of the other Party except where such disclosure is required by law (including, without limitation, under applicable freedom of information legislation).

Signed for and on behalf of Asia Climate Change Education Center, Jeju South Korea
by:

Name: **Prof. Dai-Yeun Jeong**
Position: Director
Asia Climate Change Education Center,
226 Songi-Gil, Jeju-Si, Jeju Special Self-Governing Province 63330 South Korea
Email: jeongdy@jejunu.ac.kr
Website: http://www.jeju-accec.com

Date: June 21, 2021

Official Seal:

Signed for and on behalf of Department of Sociology, Govt. College Chamba
by:

Name: **Dr. Shiv Dayal**
Position: Principal
Govt. College Chamba, HP- India
Email: principalgcchamba@gmail.com
Website: www.gcchamba.com
Date: June 21, 2021
Official Seal:

Principal
Govt. College Chamba
District Chamba (H.P.)

- 2 -

MoU with Asia Climate Change Education Center, South Korea

Government College Chamba, Himachal Pradesh
&
Agrawal Kanya Mahavidyalaya, Gangapur City, Rajasthan

Memorandum of Understanding
on Academic Cooperation
between
Department of Sociology, Govt. College Chamba, Himachal Pradesh, India
and
Agrawal Kanya Mahavidyalaya, Jaipur Rd., Idgah Mod, Gangapur City 322201 Dist. Sawai Madhopur, Rajasthan, India

The Parties;

Department of Sociology, Govt. College Chamba, Himachal Pradesh, India, **(hereinafter "GCC")**; and Agrawal Kanya Mahavidyalaya, Jaipur Rd., Idgah Mod, Gangapur City 322201 Dist. Sawai Madhopur, Rajasthan, India, **(hereinafter "AKM")** recognizing the benefits to their respective college/ department/ NGO from the establishment of collaborative links, conclude this Memorandum of Understanding (hereinafter: "MoU") as follows:

1. The purpose of this MoU is to develop academic and educational cooperation at grass root level along with action research, and to promote mutual understanding between the two Parties.
2. Each Party agrees to develop the following collaborative activities in the academic areas of mutual interest, on a basis of equality and reciprocity:
   - 2.1 Exchange of academic and administrative staff
   - 2.2 Exchange of students and/or volunteers
   - 2.3 Conducting collaborative research projects
   - 2.4 Conducting lectures and organizing refresher courses/ FDPs/ trainings/ workshops/ webinars/ symposia (On-line and off line) in concerned subject fields
   - 2.5 Exchange of academic information and materials
   - 2.6 Developing and executing the short-term certificate courses on skill development of student/ staff/ common mass of adopted target sites
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   - 2.8 Promoting other academic cooperation as mutually agreed
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Government College Chamba, Himachal Pradesh
&
Agrawal Kanya Mahavidyalaya, Gangapur City, Rajasthan

8. This MoU is valid for a period of five years from the date of signing by the authorized signatories of each Party. Each Party shall review the status of the MoU at least three months before the end of the five-year period to determine whether it wishes the MoU to continue and, if so, any modifications that might be necessary. The period of validity of this MoU may only be extended by the mutual written consent of both Parties.

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Signed for and on behalf of

Agrawal Kanya Mahavidyalaya, Jaipur Rd., Idgah Mod, Gangapur City 322201 Dist. Sawai Madhopur, Rajasthan, India by:

Name: **Dr. Satya Prakash Mehra**

Position: Principal

Agrawal Kanya Mahavidyalaya, Gangapur City, District Sawai Madhopur, Rajasthan, India

Date: 18 June 2021

Official Seal :

Signed for and on behalf of

Department of Sociology, Govt. College Chamba by:

.....

Name: **Dr. Shiv Dayal**

Position: Principal

Govt. College Chamba, HP

Date: 19 June 2021

Official Seal:

Principal
Govt. College Chamba
District Chamba (H.P.)

MoU With Agarwal Kanya Mahavidyalaya, Rajasthan

Government College Chamba, Himachal Pradesh

International Consortium for Nature Conservation (ICNC)

Memorandum of Understanding
on Academic Cooperation
between
Department of Bio-sciences (Zoology & Botany), Govt. College Chamba, Himachal Pradesh, India
and
International Consortium for Nature Conservation (ICNC), C/o Rajputana's Shakuntalam, Village Ramnagar, P.O. Malah, Bharatpur 321001 Rajasthan, India

The Parties;

Department of Bio-sciences (Zoology & Botany), Govt. College Chamba, Himachal Pradesh, India, **(hereinafter "GCC"); and** International Consortium for Nature Conservation, C/o Rajputana's Shakuntalam, Village Ramnagar, P.O. Malah, Bharatpur 321001 Rajasthan, India, **(hereinafter "ICNC") recognizing the benefits to their respective college/ department/ NGO from the establishment of collaborative links, conclude this Memorandum of Understanding (hereinafter: "MoU") as follows:**

1. The purpose of this MoU is to develop academic and educational cooperation at grass root level along with action research, and to promote mutual understanding between the two Parties.
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Government College Chamba, Himachal Pradesh

International Consortium for Nature Conservation (ICNC)

8. This MoU is valid for a period of five years from the date of signing by the authorized signatories of each Party. Each Party shall review the status of the MoU at least three months before the end of the five-year period to determine whether it wishes the MoU to continue and, if so, any modifications that might be necessary. The period of validity of this MoU may only be extended by the mutual written consent of both Parties.

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Signed for and on behalf of

International Consortium for Nature Conservation (ICNC), C/o Rajputana's Shakuntalam, Village Ramnagar, P.O. Malah, Bharatpur 321001 Rajasthan, India by:

Name: **Dr. Satya Prakash Mehra**

Position: Gen Secretary cum Coordinator

International Consortium for Nature Conservation (ICNC), C/o Rajputana's Shakuntalam, Village Ramnagar, Bharatpur, Rajasthan, India

Date: 18 June 2021

Official Seal: NA

Signed for and on behalf of

Department of Bio-sciences (Zoology & Botany), Govt. College Chamba by:

.....

Name: **Dr. Shiv Dayal**

Position: Principal Govt. College Chamba, HP

Date:

Official Seal:

Principal
Govt. College Chamba
District Chamba (H.P.)

Government College Chamba, Himachal Pradesh
&
Rajputana Society of Natural History, Rajasthan

Memorandum of Understanding
on Academic Cooperation
between
Department of Sociology, Govt. College Chamba, Himachal Pradesh, India
and
Rajputana Society of Natural History, Rajptana's Shakuntalam, Village Ramnagar, P.O. Malah, Bharatpur 321001 Rajasthan, India

The Parties:

Department of Sociology, Govt. College Chamba, Himachal Pradesh, India, **(hereinafter "GCC"); and** Rajputana Society of Natural History, (Admin. Office: Rajputana's Shakuntalam, Village Ramnagar, P.O. Malah, Bharatpur 321001 Rajasthan, India), **(hereinafter "RSNH") recognizing the benefits to their respective college/ department/ NGO from the establishment of collaborative links, conclude this Memorandum of Understanding (hereinafter: "MoU") as follows:**

1. The purpose of this MoU is to develop academic and educational cooperation at grass root level along with action research, and to promote mutual understanding between the two Parties.
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   - 2.7 Promoting collaboration in fields of mutual interest
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Government College Chamba, Himachal Pradesh
&
Rajputana Society of Natural History, Rajasthan

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Signed for and on behalf of Rajputana Society of Natural History, Rajasthan by:

Name: **Dr. Sarita Mehra**
Position: SG & CEO
Rajputana Society of Natural History, Rajputana's Shakuntalam, Village Ramnagar, P. O. Malah, Bharatpur 321001 Rajasthan, India
Date: 18 June 2021
Official Seal:

Rajputana Society of Natural History

Signed for and on behalf of Department of Sociology, Govt. College Chamba by:

Name: **Dr. Shiv Dayal**
Position: Principal
Govt. College Chamba, HP

Date: 19 June 2021
Official Seal:

Principal
Govt. College Chamba
District Chamba (H.P.)

MoU With Rajputana Society of Natural History, Rajasthan

Annexure –XV: Onsite Measurements (Sample Pictures)

Onsite Measurements taken by Green Audit Team

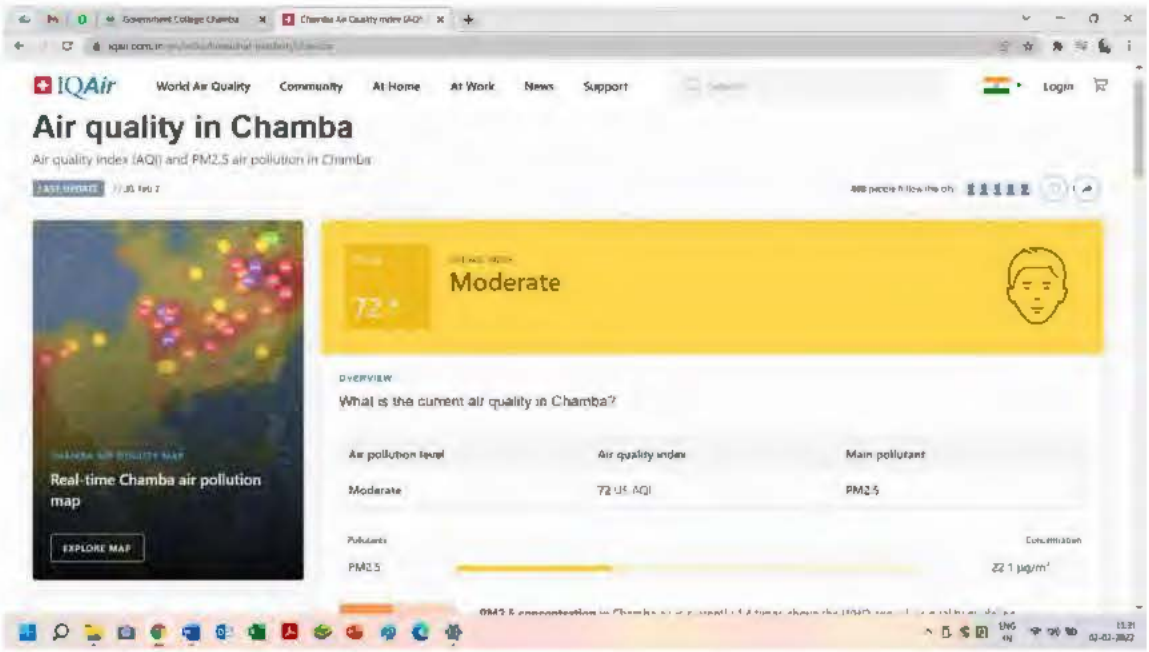
Onsite Readings taken by Green Audit Team

Annexure –XVI: Sound and Air Quality Readings

WHO/ CPCB Guidelines for Noise[9]

Specific Environment	Time Base (hours)	Standard limits as per WHO guidelines	
		LAeq [dB]	LAmax, Fast [dB]
School class rooms and pre-schools, indoors	During class	35	-
School, playground outdoor	During play	55	-
Ceremonies, festivals and entertainment events	4	100	110
Public addresses, indoors and outdoors	1	85	110

The noise levels were registered at various locations. Sample evidence in form of readings is captured in next page.



Air Quality Index[10]

The Air Quality is independently monitored and sourced from publically available, reliable and reproducible source. Air Quality was found satisfactory however it is variable and changes with season and anthropogenic activities.

[9] https://cpcb.nic.in/who-guidelines-for-noise-quality/,http://cpcbenvis.nic.in/noisepollution/noise_rules_2000.pdf , https://www.mpcb.gov.in/sites/default/files/noise-pollution/archives/noise-monitoring/Metro_city_Noise_Monitoring_Report_Final.pdf

[10] https://www.iqair.com/in-en/india/himachal-pradesh/chamba

Campus

Class Room

Lab

Office

Readings of sound at various locations in college

Description of Energy Audit

An energy audit is an inspection, survey and analysis of energy flows, for energy conservation in a building, process & 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 expense 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.

Major 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.

Chapter 1 – Description of Process and Measurements

Instrument Used for the Study: -

1. 3 Phase power Data Logger – Fluke 1735 model

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 based on 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.

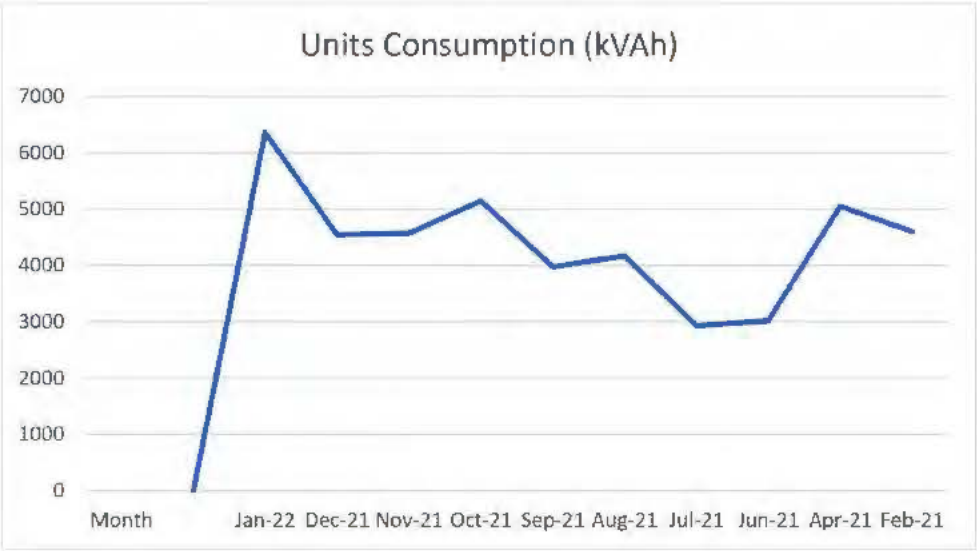
Performance Assessment of Monthly Electricity Bills

Electricity bill is evaluated based on last 10-month bills. The table produced below indicates maximum demand, billed demand, unit consumption, power factor, and all charges, etc.

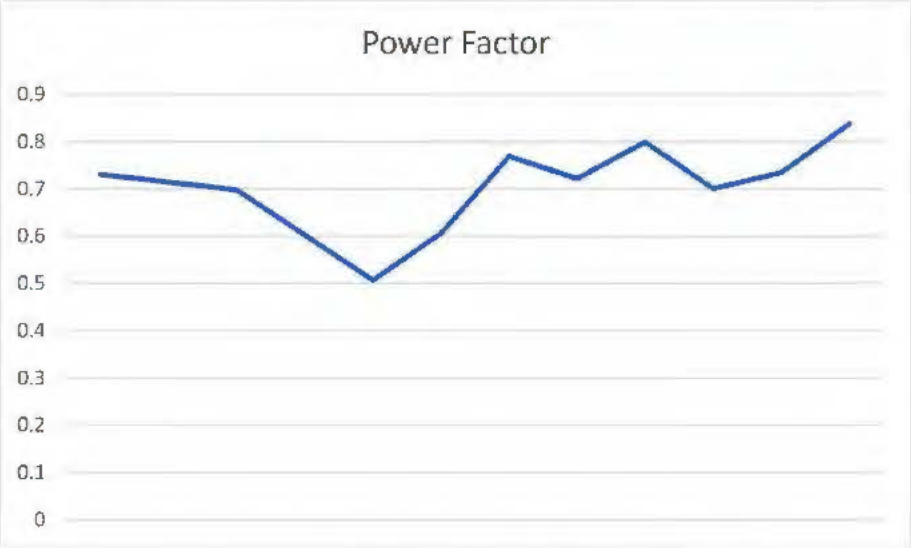
Electricity Consumer Name	The Principal, Government College, Chamba										
Consumer Number	100008001165										
Connected Load	256.26 kW										
Contact Demand	Aug-21 to Jan-22	70 kAV									
Contract Demand	Feb-21 to Jul-21	285 kVA									
Month	Recorded Demand	Max Demand	Monthly Consumption		PF	Energy Charges		90% of Cont. Demand	Demand Charges	Total Electricity Bill	Unit Rate
	kVA	kVA	kWh	kVAh		Peak	Normal Off	Rs.	Rs.	Rs.	Rs/kVAh
Jan-22	30.0	63	5330	6360	0.838	2536	27356	63	8820	39325	6.18
Dec-21	22.0	63	3336	4540	0.735	2411	18927	63	8820	30754	6.77
Nov-21	20.2	63	3273	4570	0.701	2301	19651	63	8820	31368	6.86
Oct-21	23.4	63	4112	5145	0.799	2233	21947	63	8220	33600	6.53
Sep-21	22.8	63	2867	3973	0.722	2296	16377	63	8820	28083	7.07
Aug-21	15.3	63	3210	4172	0.769	2110	17500	63	8820	28980	6.95
Jul-21	16.2	256.5	1775	2930	0.606	1927	11844	256.5	35910	50231	17.14
Jun-21	5.7	256.5	1530	3017	0.507	2040	12140	256.5	35910	50670	16.79
Apr-21	21.8	256.5	3524	5047	0.698	2498	21221	256.5	35910	60229	11.93
Feb-21	13.4	256.5	3362	4599	0.731	2663	18953	256.5	35910	58992	12.83
Average	19.0	140.4	3232	4435	0.711	2301	18592	140.4	19596	41223	9.906751

Below graph shows demand required in last 11 months

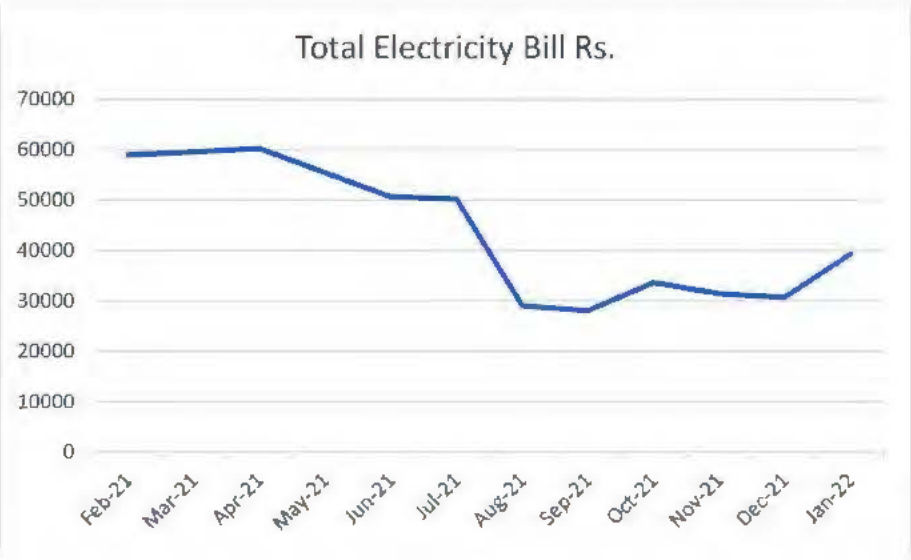
Below graph shows units consumption (kVAh) required in last 11 months



Below graph shows Power Factor in last 11 months



Below graph shows total electricity bill Rs. of last 11 months



Electricity Bills Observations

Sr. No.	Parameter	Observations	Remarks
1	Contract demand	Contract demand from Feb-21 to Jul-21 was 285 kVA and from Aug-21 onwards it is 70 kVA	No action required Already contract demand is reduced
2	Connected load	Connected load is 256.26 kW	No action required
3	Maximum demand (MD)	Maximum demand recorded is 30 kVA in the month of Jan 2022	Maximum demand recorded is less than contract demand of the plant. No action required
		Avg. maximum demand is 19 kVA	No action required
4	Billed demand	Avg. billed demand is 19 kVA	No action required
5	Unit consumption	Maximum unit consumption recorded is 6360 kVAh in the month of Jan 2022	No action required
		Avg. unit consumption is 4435 kVAh	No action required
6	Power factor	Avg. power factor maintained is 0.711	Existing power factor is at lower side and can be improved further to unity (i.e.1). So line losses will be minimize
7	Total bill	Monthly avg. electricity bill is 32,018 Rs./month after changing the contract demand	No action required

Reference Techno Commercial Proposal for Grid Tied Solar PV

Background

The College has undertaken initiative towards sourcing its electricity from Renewable source way back in 2019 by implementing Rooftop Solar Capacity of 25kWp in Capacity.
Now the College is planning in expanding the capacity by adding another 25kWp on its available rooftop.

A 25 kWp rooftop Solar Photo Voltaic System is proposed to be installed at your college premises at Government Degree college, Chamba.
This proposal is based for reference and following points considered for estimating Solar Power requirement to reduce energy bills.

- You have a three phase HT connection from Himachal Pradesh State Board Limited with contract demand of 285 kVA.
- Considering Average electricity consumption is about 4435 kVAh per month. (Average consumption from Feb-21 to Jan-22)
- Present average electricity tariff is Rs. 9.90/unit.
- Space required is 25000 sq. Ft. facing south direction with clear rooftop available.

1.1 Proposed System

Based on your requirement, a grid tied three phase solar system is proposed to be installed on your space available.

A grid tied solar system generates output in synchronization with the electricity supplied from the utility.

1.2 Operation Details of proposed 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.

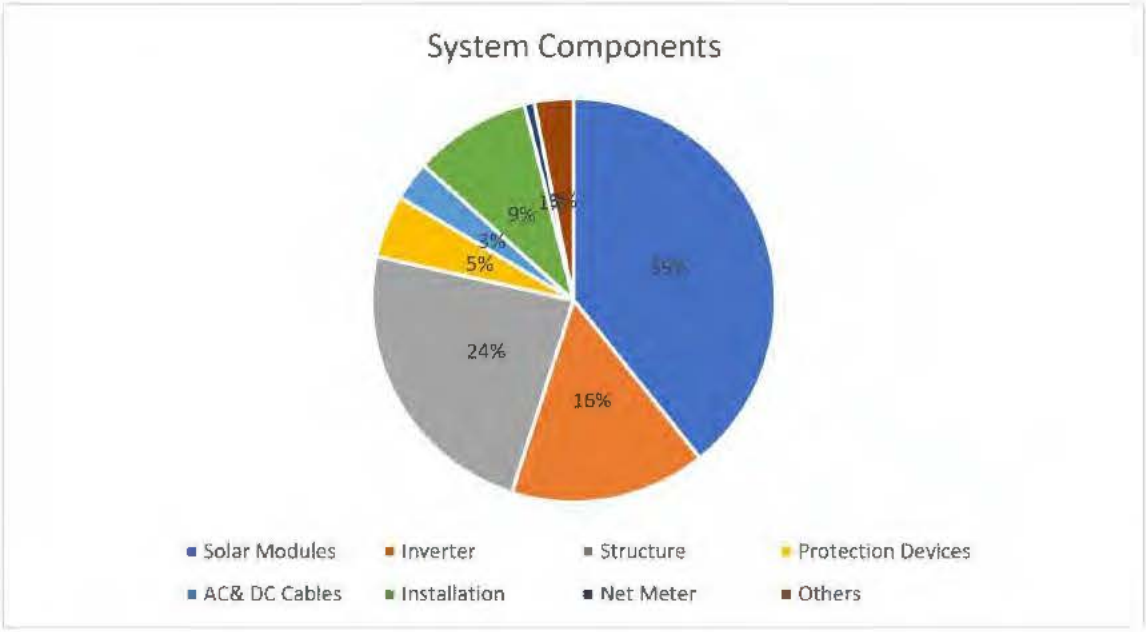
- Whenever there is no power supply from the grid, the solar PV system goes in standby mode and its output cannot be used.

1.3 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.

1.4 Technical Details

SR.NO	DESCRIPTION	Details	MAKE / MODEL
1	Solar PV Module	25 kWp	Vikram/Warree/others
2	Grid Tied Inverter	25 KVA	Growatt/Delta/Polycab /Other
3	Module Structures	M S Galvanized	Own
4	DC Distribution Box	As required	Own
5	AC Distribution Box	As required	Own
	Surge Protection	Type 2 for AC and DC	Mersen/Dehn/Equivalent
6	DC Cables	As required	Polycab / Siechem/ others
7	AC Cables	As required	Polycab / Siechem/ others
8	Lightning Arrestor	As required	ISI Complaint
9	Earthing	As required	ISI Complaint
10	Net Meter	Approved by Discom	Secure



1.5 Scope of Work

Scope of work includes Supply Design, Engineering, Procurement, Supervision, Installation, Testing & Commissioning and one-year warranty on installed Solar PV system.

- Documentations and approvals
    a. Application and approval from Discom for Net metering/Gross Metering purpose.
- Design & Engineering.
    a. System design.
    b. Engineering drawings.
    c. Detailed Bill of Materials & Project Report.
- Procurement and supply of material.
    a. Solar PV Modules
    b. Solar Grid Inverter
    c. Solar Module Mounting Structure
    d. Solar Grade, UV protected DC Cable
    e. AC Cable
    f. DC and AC Distribution Box
    g. Earthing & Lightning Arrestor
    h. All other related accessories.
    i. Net Meter
- Civil Installation Work.
    a. Module mounting structure installation.
        i. The structure will be installed on pillars above terrace and on available terrace space will elevation such that a person can easily walk and use terrace.
    b. Civil work for module mounting structure.
- Electrical Works.
    a. Wiring of Modules.
    b. Cabling from modules to DC distribution box.
    c. Cabling from DC distribution box to Inverter.
    d. Cabling from Inverter to AC Distribution box.
    e. Earthing and Lightning Protection.
- Testing & Commissioning.
- Net Metering.

Exclusion

- Construction Power and Water.
- All other activities, documentation, services, etc. which are not specifically mentioned in this offer.

2. Estimated Output & Returns

- Detailed estimation of output of solar PV system is done considering location of installation, proposed direction of solar panels, data of solar irradiance at the location, system losses, and other related data.

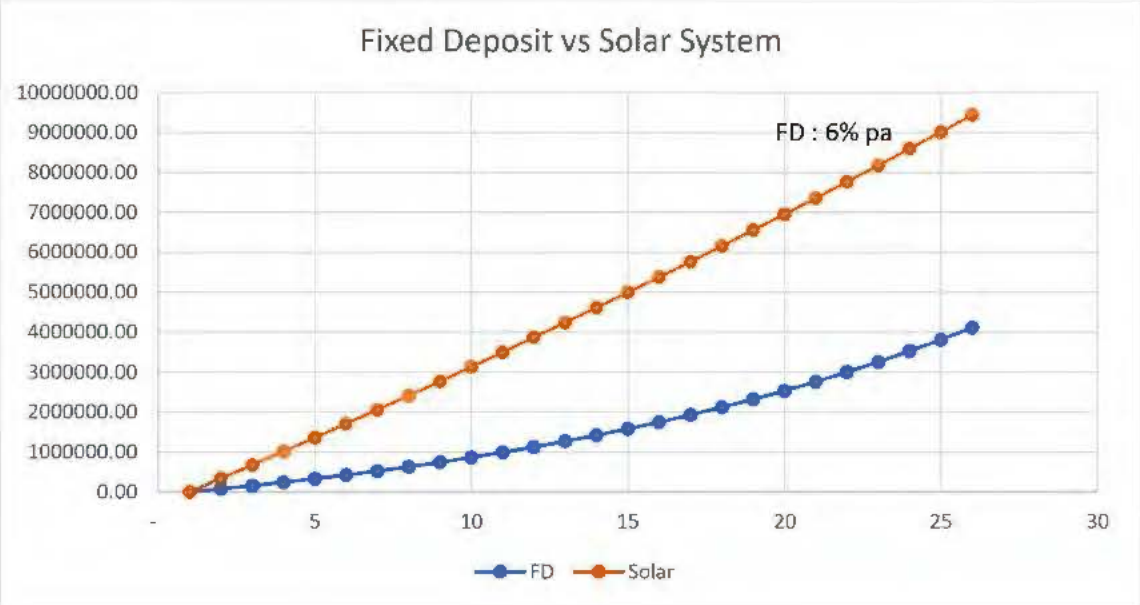
2.1 Basis of estimation

- Solar PV Capacity: 25 kWp
- Location: Govt. Degree College, Chamba.
- The solar panels are expected to be free of shadow.
- Generation is based on radiation of 1000W/m2 and grid availability.
- Assumed clear sunny 330 days/year.
- Space required is 25000 sq. facing south direction with clear rooftop available.
- Assumption for Cost of Electricity is Rs. 9/unit including energy charges and Taxes.

2.2 Estimated output

- Daily generation from solar: 4.5 kWh/kWp/day
- Monthly generation: 3375 kWh/month
- Total Annual output: 37125 kWh/annum
- Specific Production: 1485 kWh/kWp/annum

2.3 2.3 Comparison with Bank Fixed Deposit:



3. Commercial Offer

3.1 Cost of System

Description	Amount (INR)
Supply, Design, Installation, Testing and Commissioning of 25 kWp Grid Tied Solar PV System	Rs. 12,50,000.00
GST	Extra at Actual
Any other taxes and duties	Nil at present

3.2 Returns

The Solar system gives excellent result as shown below

- Estimated savings of **Rs.3,30,00,000** from first year.
- Return on investment: **26 % pa.**
- **Payback/ Breakeven** time of **4 years** out of operating life of 25 years.

No	Capital Cost	Savings in Electricity bills	Net Cash Flow	Cumulative cash flow
Year 1	1250000	334125.00	-915875.00	-915875.00
Year 2		337466.25	337466.25	-578408.75
Year 3		340840.91	340840.91	-237567.84
Year 4		344249.32	3,44,249.32	106681.48
Year 5		347691.81	3,47,691.81	454373.30
Year 6-25	Savings in Electricity of Rs. 3.5Lacs /Annum			

Assumptions:

- Increase in tariff rate assumed at 1% pa.
- Above pricing is for indicative purpose only and may vary depending upon specific location, plant load factor, operation and maintenance cost, location based, extra supporting structure for solar module, civil work, etc.

Site Photographs Indicating Electrical Incomer

Standard Wire code is not provided for Incomer

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

Table 3: Rainfall Data of Himachal Pradesh in mm

DISTRICT	JUNE		JULY		AUGUST		SEPTEMBER		MONSOON		ANNUAL	
	MEAN	CV	MEAN	CV	MEAN	CV	MEAN	CV	MEAN	CV	MEAN	CV
BILASPUR	100.5	287	257.6	36	327.8	88	147.1	80	833.0	74	**1096.2**	**90**
CHAMBA	121.5	177	290.4	51	310.8	93	140.3	160	863.0	63	**1590.8**	**66**
KANGRA	177.7	58	508.2	28	589.0	31	204.8	47	1479.8	22	**1860.4**	**21**
KINNAUR	35.0	124	51.1	65	52.7	67	49.8	74	188.6	45	**611.3**	**41**
KULU	85.8	239	173.5	44	167.6	49	93.5	75	520.3	60	**1016.5**	**40**
LAHUL AND SPITI	49.7	540	97.4	298	105.7	115	91.8	238	344.7	140	**855.5**	**80**
MANDI	169.4	51	382.0	28	400.0	34	160.0	40	1111.3	21	**1460.9**	**20**
HAMIRPUR	123.9	237	352.3	27	419.6	33	153.5	67	1049.3	52	**1345.2**	**67**
SIMLA	111.5	190	211.5	43	205.6	37	122.1	62	650.8	51	**1049.0**	**39**
SIRMUR	167.7	140	415.2	37	383.8	34	193.4	64	1160.1	41	**1446.2**	**37**
SOLAN	139.1	58	287.5	42	282.4	42	151.6	61	860.5	23	**1156.3**	**20**
UNA	110.2	193	337.2	92	373.4	35	158.0	146	978.8	67	**1221.4**	**66**

Web link: https://imdpune.gov.in/hydrology/rainfall%20variability%20page/himachal_final.pdf

CEA Database Version-16

Weighted average emission factor, simple operating margin (OM), build margin (BM) and combined margin (CM) of the Indian Grid for FY 2019-20 (adjusted for cross-border electricity transfers), in t CO_2/MWh

Average	OM	BM	CM
0.79	0.96	0.87	0.91

Average is the average emission of all stations in the grid, weighted by net generation.
OM is the average emission from all stations excluding the low cost/must run sources.
BM is the average emission of the 20% (by net generation) most recent capacity addition in the grid.
CM is a weighted average of the OM and BM (here weighted 50: 50).

Notes:

Co-ordinates:

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

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