Vena Lok Prabodhan Shikshan Sanstha Hinganghat's

SHRI SAIBABA LOK PRABODHAN ARTS COLLEGE, WADNER

Th-Hinganghat, Dist- Wardha

NAAC Accredited Grade'C' (CGPA-1.95)

(Affiliated to Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur)

Website: www.saibabaartscollege.edu.in Email: saicollege@rediffmail.com

7.1.3

Sr. No.	INDEX
1.	Policy Document on Environment
2.	Action Taken Report on Green Initiatives and Cleanliness Drive in Campus
3.	Action Taken Report on Green Initiatives and Cleanliness Drive Beyond the Campus
4.	Green Audit Report

IQAC Co-ordinator
Dr.Sanjay A.Diwekar
IQAC Co-ordinator
Shri Saibaba Lok Prabodhan Arts College
WADNER

Principal
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Shri Saibaba Lok Prabodhan
Arts College,Wadner

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POLICY DOCUMENT ON THE GREEN CAMPUS

Green Campus:

A green campus is a place where environmental friendly practices & education combine to promote sustainable & eco-friendly practices in the campus. The green campus concept offers an institution the opportunity to take the lead in redefining its environmental culture and developing new paradigms by creating sustainable solutions to environmental, socio-economic needs of the mankind.

Objectives of Go Green Program:

The first step of the Go Green Program involves establishing a viable Green Campus Committee within the organizational structure of the institute. Hence, to give this initiative more clarity and authenticity, we now roll out a POLICY DOCUMENT spelling out the strategies, plans, and other allied tasks to make this Program functional officially.

We believe that greening the campus is all about sweeping away wasteful inefficiencies and using unconventional sources of energies for its daily power needs, correct disposal handling, purchase of environment friendly supplies and effective recycling program. The administration of the institute believes that everyone has to work out the time bound strategies to implement green campus initiatives. These strategies need to be incorporated into the institutional planning and budgeting processes with the aim of developing a clean and green campus. Every individual of Shri Saibaba Lok Prabodhan Arts college campus will work, may he/she be a student, faculty and support staff to foster a culture or self sustainability and make the entire campus environment friendly. The green campus initiatives (GCI) will enable the institution to develop the campus as a living laboratory for innovations.

A-Composition of the Go Green Committee:

Sr	Office Bearers	Designations
1	Principal of the college	Chairman
2	IQAC Coordinator	Secretary
3	Faculty Representative nominated by principal	Head, Department of History (Member)
4	Student Representative	General Secretary of the College (Member)
5	Non-Teaching Staff Representative	Office Superintendent (Member)
6	Parent Representative	Secretary of the Parent Teacher Association (Member)
7	Industry Representative	Member of Alumni Association (Member)

B-Role of the Go Green Campus Program:

The impetus for a successful Green Campus must begin at the top and emanate throughout the rest of the campus. Without a strong message of commitment and involvement from both the chairperson and members of the committee, well intentioned initiatives may be too fragmented to allow for institute-wise participation. Thus, in view of this, the committee will plan and execute to:

1- Seek views of all the stakeholders to make the Go Green Campus initiative functional throughout the year.
2- Conduct the Campus environmental impact to identify the targets for improvement.
3- Establish Green Campus Environmental Ethic Awareness Campaign.
4- Set forth a Green Campus Mission and a Statement of Principles.
5- Link Green Campus activities to Academics in the institute.
6- Organize Awareness Programs for the students, faculty & society.
7- Chalk out yearly planner for the institute, local community and stakeholders.
8- Develop a strategic plan and create student teams to carry out specific tasks of the strategic plan. For instance, a plan to save energy at the institute level with time bound plan to install solar power station mandatorily either at the top of institute building or in open field. This will enable the institute to have 24x7 power supply.

9- Phase out the CFL and conventional light source such as bulbs & tube lights, halogen and mercury street/campus lights and get them replaced by the LEDs.

10- Conduct an Annual Green Environment & Energy Audit.

11- Purchase only Energy Efficient Computers viz 'ENERGY STAR' or any other equipment.

12- Establish public private partnership with personnel from federal, state, and local environmental energies, utilities, and business community.

13- Evaluate daily operations in terms of pollution prevention, waste stream management, and energy efficiency reducing, reusing, recycling and repairing wherever possible.

14- Secure a commitment up front from the people in charge that well-founded recommendations will be acted upon once audits are completed.

C-Promotion of 'Save Energy Tips' in & outside the institute:

- Activate power management features on your computer and monitor so that it will go into a low power 'sleep' mode when you are not working on it.
- Turn off your monitor when you leave your table.
- Activate power management features on your laser printer.
- Whenever possible, shut down rather than logging off.
- Turn off unnecessary lights and use daylight instead.
- Avoid the use of decorative lighting.
- Use LED or compact fluorescent bulbs.
- Keep lights off in conference rooms, classrooms, lecture halls when they are not in use.
- Use the fans only when they are needed.
- Unplug appliances not [plugged into power strips (like TVs, Refrigerators, ACs, tea/coffee pots, printers, faxes, and chargers etc.

D-Waste Water Management/Rainwater Harvesting:

The institute has to work in the direction of waste water management particularly in all lavatories. Water flow restrictors on bathroom faucets and showers, low water flow toilets should be used to cut down campus water use. The institute will take all necessary measures to implement waste water management/rain water harvesting.

E-Major Green Campus Initiatives:

- ISO Certification14001-2015
- Installation of solar power station
- Water waste management/rainwater harvesting
- Use of micro scale techniques
- Sensor based energy conservation
- Displayed poster on E-Waste Management
- Maintenance of water bodies and distribution system to the campus
- Take measures to make paperless administration
- Plastic free campus
- Tree Plantation Drive
- Cleanliness Drive
- Landscaping & gardens
- Use of LEDs
- Digital library/E-Learning Centre
- Organization of sensitization programs for the stakeholders
- Establishment of Environ-Club
- Green, Environment & Energy Audit conducted
- Restricted entry of automobiles

The institute will make all the necessary efforts to involve the students, faculty and staff in 'Green Campus Initiatives' by designating the volunteers of Environ-Club, NSS, Printing T-Shirts/Caps with green campus initiative slogans specially designed for the purpose.

For further details and enquiry, please feel free to write to us.

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" CLEAN AND GREEN CAMPUS INITIATIVES"

Action Taken Report

(Academic Year- 2022-23)

Sr. No.	Title of the activity	Date of the Implementation
1.	Plastic Eradication, Tree Conservation and Cleanliness Drive	23/09/2022
2.	Tree Plantation	24/09/2022
3.	Plastic eradication, Tree conservation and Cleanliness Drive	22/11/2022
4.	Sandalwood Tree Plantation in Campus	10/01/2023

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Shri Saibaba Lok Prabodhan Arts College, Wadner

Brief Report of Activity

Academic Year –2022 -2023

Name of Activity	Plastic Eradication, Tree Conservation and Cleanliness Drive
Date & Venue	23/09/2022, Shri SaibabaLokPrabodhan Arts College , Wander
Organizing Department/ Committee	Eco Club and NSS
Objectives	1) Convincing the importance of hygiene to the students. 2) To create awareness among the students about the harmful effects of plastic. 3) Motivating the students to keep the premises clean
No. of Beneficiaries	23

Brief Report

Nisarga Mitra Samiti (Eco- Club) and National Service Scheme Department of Shree Saibaba Lok Prabodhan Arts College Wadner organized a clean-up and plastic elimination activity in the college premises. National Service Scheme Coordinator Dr. Ganesh Bahade and Eco-Club Coordinator Dr. Pankaj Moon were present. On this occasion, students collected plastic and garbage from the college premise. Students like Sakshi Lohkare, Yogita Gurunule, Jayashree Deulkar, Anushka Patil, Bannu Lohkare, Komalzhode, Mayuri Dolskar, Sanjana Umate, Harsha Dhoble were present. Twenty three students participated in this activity.

Attachments Eg. Photos, Participants ,Feedback ,News, Etc

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Tree Plantation in Campus

On 24th September 2022 at Sri Saibaba Lok Prabodhan Arts College Wadner on behalf of National Service Scheme and Nisarga Mitra Committee, “Tree Plantation” was done. Indigenous trees like karanj, kadulimb and tamarind trees were planted in the college. On this occasion, Dr. Ganesh Bahade, Dr. Pankaj Moon, Vice Principal Dr. Sarika Chaudhary, Dr. Vinod Mude, Prof. Aarti Deshmukh, along with students like Ruchita Wele, Harshada Mahajan, Divya Bharati Avachat, Resham Kheeratkar, Achal Khirtkar. Sahildurge, Pranjali Nete, Achal Chaudhary, Sonal Dodke etc. students were present. In brief, twenty four students were present in this activity.

S

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Shri SaibabaLok Prabodhan Arts College, Wadner

Brief Report of Activity

Academic Year –2022 -2023

Name of Activity	Plastic eradication, Tree conservation and Cleanliness drive
Date & Venue	22th November 2022, Shri SaibabaLokPrabodhan Arts College , Wander
Organizing Department/ Committee	Nisarg Mitra Samiti (Eco- Club)
Objectives	1) Convincing the importance of hygiene to the students. 2) To create awareness among the students about the harmful effects of plastic.
Nature of the Activity (Eg.Lecturer/PPT/Quiz/exam.Etc)	Environment Consciousness
No. of Beneficiaries	36

Brief Report

Cleaning, plastic removal and tree conservation activities were organized on behalf of Nisarga Mitra Samiti Eco Club of Sri Saibaba Lok Prabodhan Arts College Wadner. On this occasion, students collected plastic and garbage from the college premises. And water was poured on the trees in the area. On the occasion of this activity, thirty six students were present.

Attachments Eg. Photos, Participants ,Feedback ,News, Etc

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Shri SaibabaLokPrabodhan Arts College,Wadner

Brief Report of Activity

Academic Year –**2022 -2023**

Name of Activity	Sandalwood Tree Plantation in Campus
Date & Venue	10th January 2023, Shri SaibabaLokPrabodhan Arts College , Wander
Organizing Department/ Committee	Eco Club (Nisarg Mitra Samiti)
Objectives	1. To convince the students about the importance of tree plantation. 2. To make students aware of the adverse effects of environment.
Nature of the Activity (Eg.Lecturer/PPT/Quiz/exam.Etc)	Environment Conservation
No. of Beneficiaries	25

Brief Report

"Sandalwood Tree Plantation" activity was organized in the college premises by Nisarga Mitra Samiti. Dr. Srinivas Khandewale, Dr. Sanjay Dhanwate, Dr. Huda, and the founding secretary of the organization - Prof. Diwakar Game were present. In this activity, National Service Scheme Coordinator Dr. Ganesh Bahade and Nisarga Mitra Committee Coordinator Dr. Pankaj Moon were present and teachers like Dr. Vitthal Ghinmine, Dr. Sarika Chaudhary, Dr. Vinod Mude, Dr. Naresh Bhoyer were also present. Students like Sakshi Lohkare, Yogita Gurunule, Jayashree Deulkar, Anushka Patil, Bannu Lohkare, Komalzhode were present.

Attachments Eg. Photos, Participants ,Feedback ,News, Etc

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Beyond the campus environmental promotions

Action Taken Report

(Academic Year- 2022-23)

Sr. No.	Title of the activity	Date of the Implementation
1.	Plastic Eradication, Tree Conservation and Cleanliness Drive at Rural Govt. Hospital Wadner	03/01/2023
2.	Cleanliness Drive in Gangapur Village	05/04/2023
3.	Watering Tree Plants in Gangapur Village	05/04/2023
4.	Cleanliness Drive at Dr. Babasaheb Ambedkar Statue , Wadner	13/04/2023

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Brief Report on Activity in Rural Hospital, Wadner

Academic Year –2022 -2023

Name of Activity	Plastic Eradication, Tree Conservation and Cleanliness Drive at Rural Govt. Hospital Wadner
Date & Venue	03rd January 2023, Rural Govt. Hospital Wadner
Organizing Department/ Committee	Eco Club (Nisarg Maitra Samiti)
Objectives	1) Convincing the importance of hygiene to the students. 2) To create awareness among the students about the harmful effects of plastic. 3) Motivating the students to keep the premises clean
Nature of the Activity (Lecturer/PPT/Quiz/exam.etc)	Environmental Activity
No. of Beneficiaries	36

Brief Report

Plastic removal, cleanliness campaign and tree plantation were organized at Rural Hospital Wadner by Nisarga Mitra Committee of Sri Saibaba Lok Prabodhan Arts College Wadner. Students of of the college took part in this event and they collected plastic and garbage from the area of the rural hospital and cleaned the area. Water was poured on the trees in the hospital. Thirty six students participated in it.

	Vena LokPrabodhanShikshanSanstha, Hinganghat's **Shri SaibabaLokPrabodhan Arts College, Wadner** **Tah. Hinganghat, Dist. Wardha (Maharashtra) - 442307** **(Affiliated to RashtrasantTukadojiMaharaj Nagpur University)** **NAAC Accredited with 'C' Grade**

Report on Activity: Academic Year: 2022 – 2023

Organizing Department/Committee:	Shri Saibaba Lok Prabodhan Arts College, Wadner
Name of Activity:	Cleanliness Drive in Gangapur Village
Topic:	Cleanliness Drive
Name of Guest	Dr. U.B. Parekar Shri Anbadasji Hate
Date & Venue	05/ 04/2023 Gangapur Village
Objectives	Cleanliness Drive in Gangapur Village
No. of Participats	33

Report on Cleanliness Drive in Gangapur Village

The village cleanliness initiative was organized under the joint association (MOU) between Sri SaibabaLokPrabodhan Kala MahavidyalayaWadner and Gram Panchayat Gangapur. Principal Dr. Uttam Parekar, Rupali Naitam and Shri. Ambadasji Hate a progressive farmer of Gangapur were present. Dr. Sanjay Diwekar, Dr. Vitthal Ghinmine, and former student Sachin Mahajan were present. The students of the college undertook the task of cleaning the village in Gangapur. In this work, students cleaned the roads and drains of the village Gangapur. The villagers cooperated for this activity. Thirty students were present in this activity.

Attachments: Photos, & Participants etc.

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...eanliness Drive program in Gangapur

Vena Lok Prabodhan Shikshan Sanstha, Hinganghat

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Ta. Hinganghat Dist. Wardha (Maharastra)- 442307

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Attendance Sheet of Participating Students & Teachers

Academic Year – 2022 - 2023

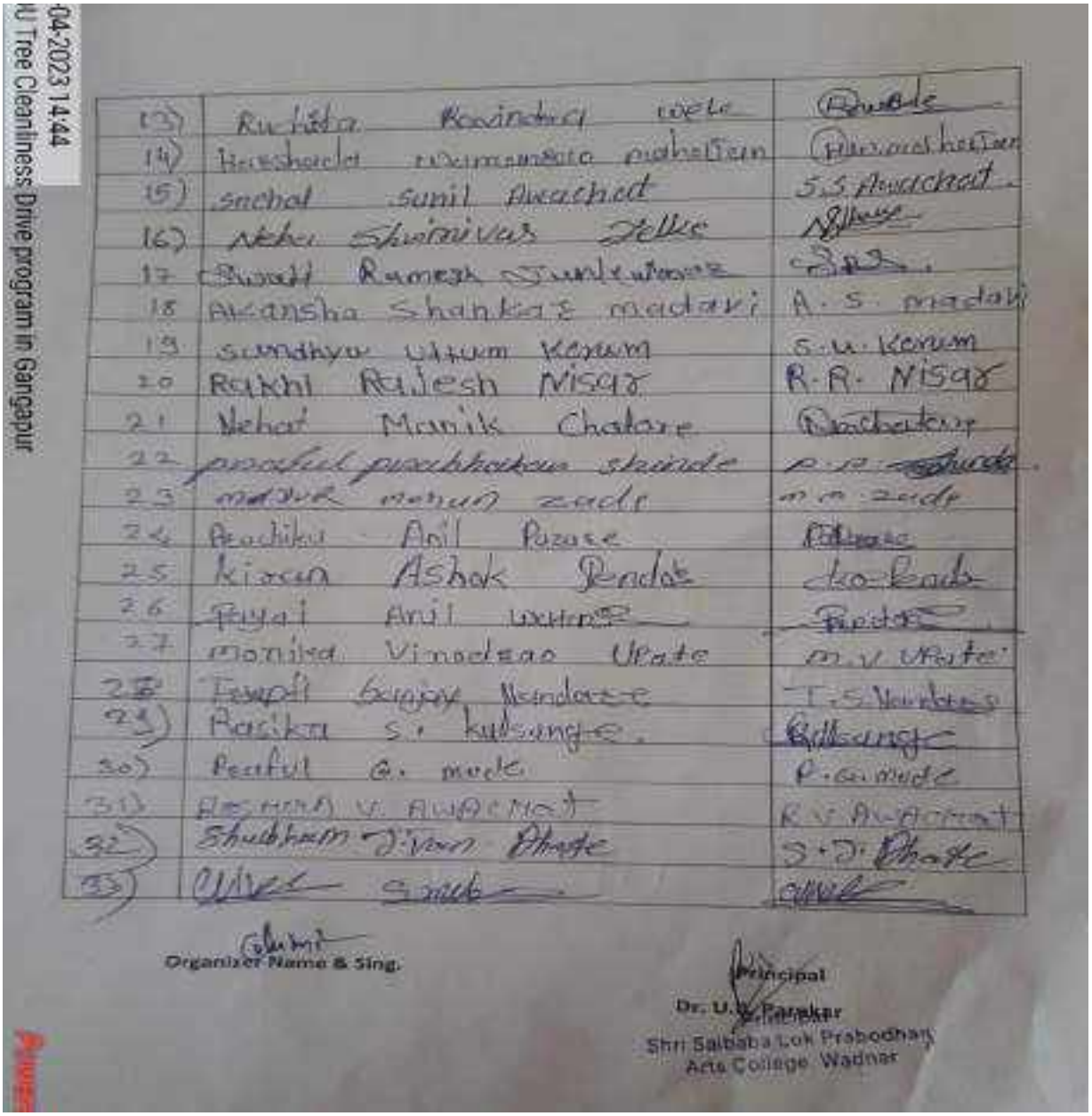
Name of Department: MoU with Gangapur (SSLP Arts College, Wadner)

Name of Activity: Cleanliness Drive in Gangapur Village

Subject: Cleanliness Drive

Name of Organizer: Dr. Vitthal Ghinmine Date: 05.04.2023

Sr. No.	Name of Participating Students & Teachers	Signature
1)	Achal Vilasrao Chaudhari	Chaudhari
2)	Sonal Vasudevrao Dadhe	S. Dadhe
3)	Tejasvi Devrao Rajurkar	T.D. Rajurkar
4)	Ranjali Arvind Nete	R.A. Nete
5)	Resham Khushal Khetkar	R.K. Khetkar
6)	Tana Bhairavji Nawade	T.B. Nawade
7)	Archana Vitthal Khistekar	A. Khistekar
8)	Samiksha Hanuman Mende	S.H. Mende
9)	Radhika Shrikant Gotefode	R. Gotefode
10)	Dnyaneshwari Devidasji Awachat	[illegible]
11)	Chetan Bhaskar Sathone	C.B. Sathone
12)	Pallavi Dilip Pimpalshende	P.D. Pimpalshende



Date: 05/ 04 /2023

Place: Wadner

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Report on Activity: Academic Year: 2022 – 2023

Organizing Department/Committee:	MOUwith Gram panchayat Gangapur & Shri Saibaba Lok Prabodhan Arts College, Wadner
Name of Activity:	Watering Plants in Gangapur Village
Topic:	Watering Plants
Name of Guest	Dr. U.B. Parekar Shri Anbadasji Hate
Date & Venue	05/ 04/2023 &Gangapur Village
Objectives	Watering Plants in Gangapur Village
No. of Participate	33

Report on Cleanliness Drive in Gangapur Village

Watering the trees was organized in Gangapur village. The students of the college undertook the task and participated in it. The villagers also cooperated for this. Thirty three students and college teachers participated in it. For the success of the program Ruchita Wele, Monica Upate, Tripti Nandare, Chetan Satone, Achal Chaudhary, Sonal Dodke, Sanjana Umate, Harsha Dhoble, Raksha Wate, Anushree Patil, Pooja Chaudhary, Paithani Satpute, Rasika Kulasange, Yogesh Doortakar took special efforts.

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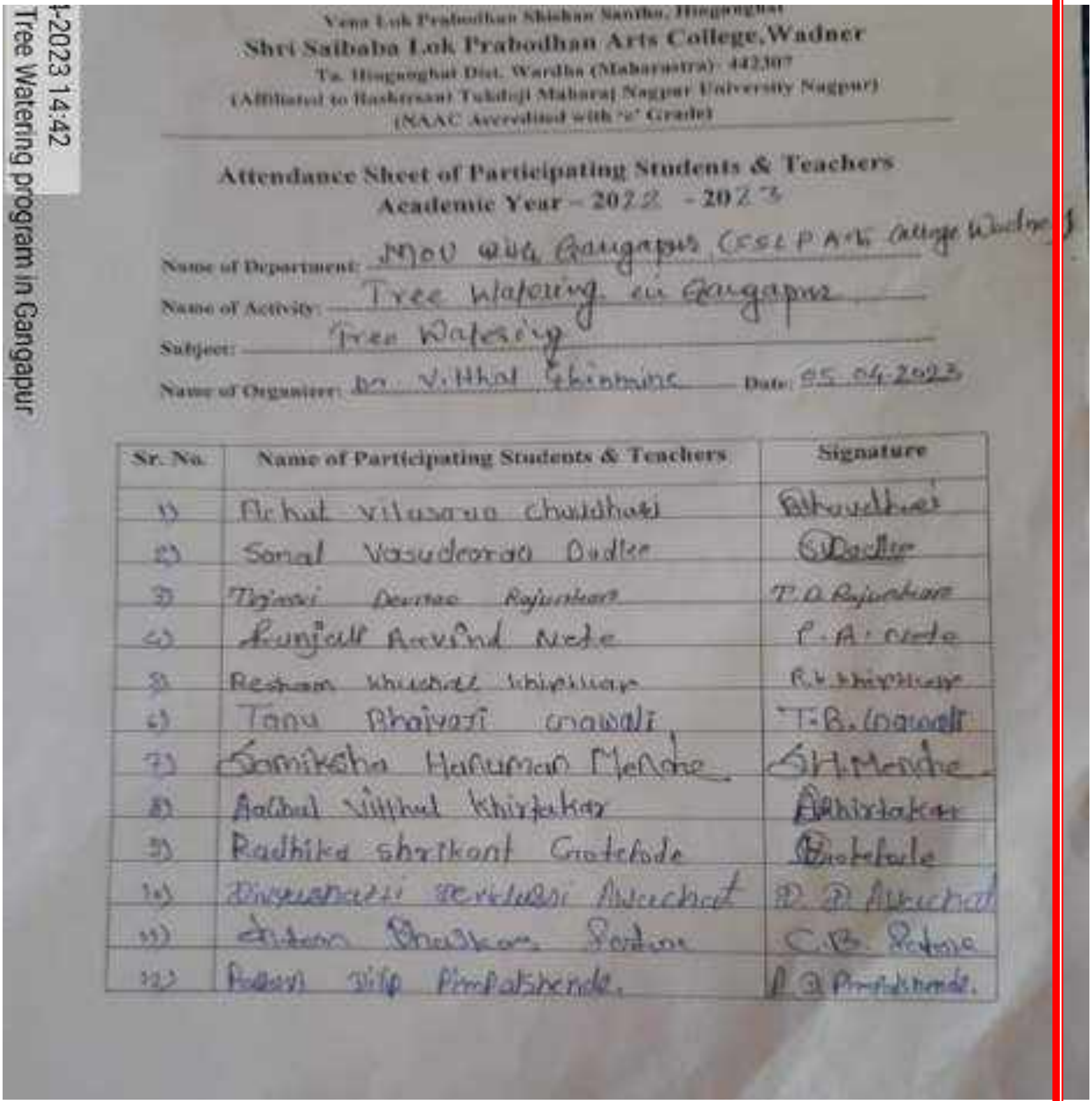

Vena Lok Prabodhan Shikshan Santha, Hinganghat

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Attendance Sheet of Participating Students & Teachers

Academic Year – 2022 – 2023

Name of Department: MoU with Gangapur (SSLP Arts College Wadner)

Name of Activity: Tree Watering in Gangapur

Subject: Tree Watering

Name of Organizer: Dr. Vitthal Ghinmine Date: 05.04.2023

Sr. No.	Name of Participating Students & Teachers	Signature
1)	Achal Vilasrao Chaudhari	Chaudhari
2)	Sonal Vasudeorao Dudhe	S Dudhe
3)	Tejaswi Devrao Rajurkar	T. D. Rajurkar
4)	Kunjali Aravind Nete	K. A. Nete
5)	Resham Khushal Khirsagar	R. K. Khirsagar
6)	Tanu Bhaiyaji Gawali	T. B. Gawali
7)	Samiksha Hanuman Mendhe	S. H. Mendhe
8)	Aachal Vitthal Khirtakar	A. Khirtakar
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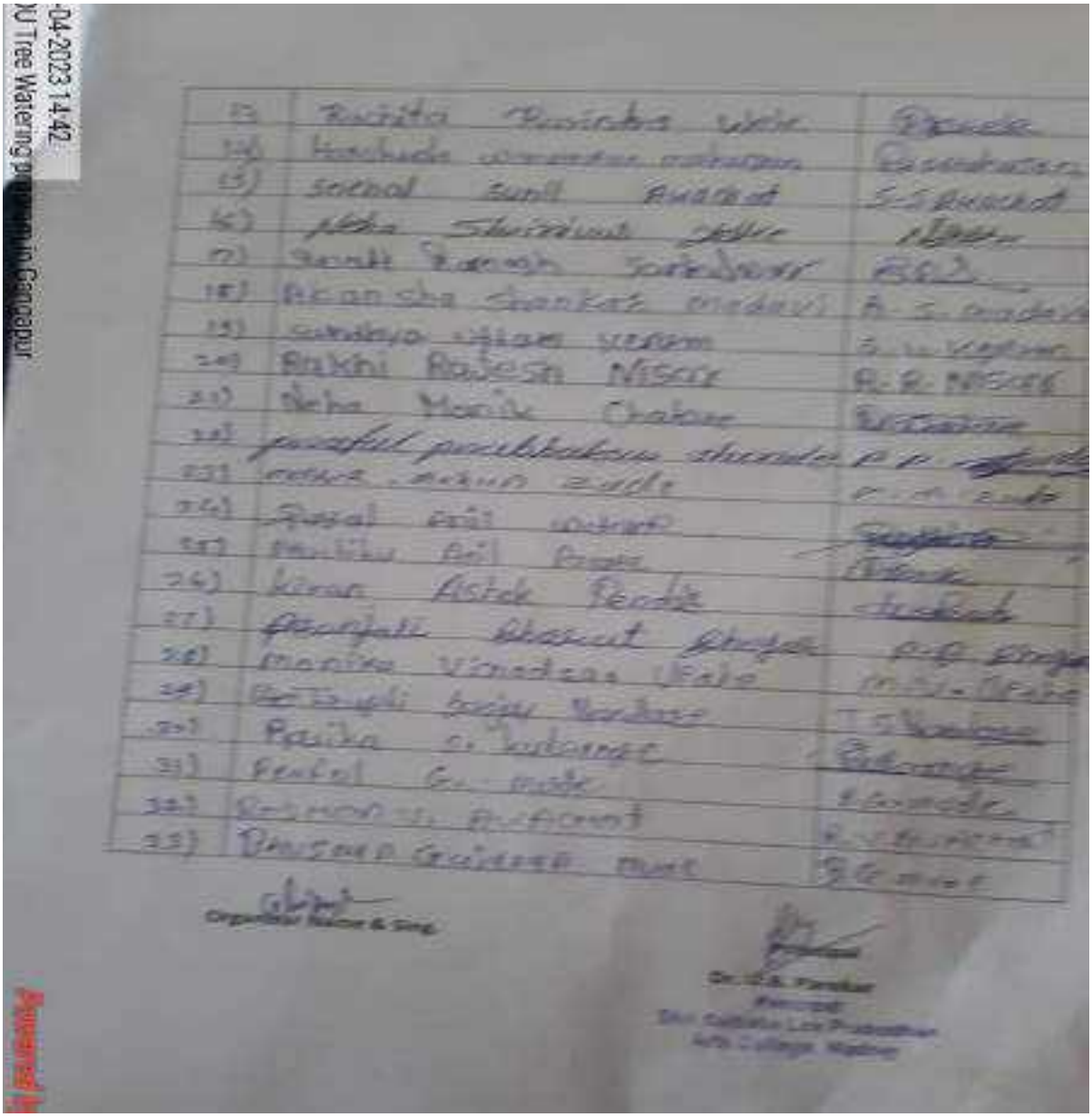

Date : 05/ 04 /2023

Place :Wadner

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Shri Saibaba Lok Prabodhan
Arts College, Wadner

	Vena LokPrabodhanShikshanSanstha, Hinganghat **Shri SaibabaLokPrabodhan Arts College, Wadner** Ta. Hinganghat, Dist - Wardha (Maharashtra)- 442307. **(Affiliated to RashtrsantTukadojiMaharaj Nagpur University, & NAAC Accredited with 'C' Grade)**

Brief Report on Activity : Academic Year - 2022 - 20223

Organizing Department/ Committee	**Environment Science & Nisrag Mitra Samiti**
Name of Activity	**Cleanliness Drive at Dr. Babasaheb Ambedkar Statue , Wadner**
Subject	**Cleanliness Drive**
Name of Guest	-
Date & Venue	13 /04/2023 at **Dr. Babasaheb Ambedkar Statue , Wadner**
Objectives	1) Convincing the importance of hygiene to the students. 2) To create awareness among the students about the harmful effects of plastic. 3) Motivating the students to keep the premises clean
Nature of the Activity(Lecturer / PPT / Quiz / exam. etc.)	स्वछताव प्लास्टिक निर्मूलन अभियान

Brief Report

Plastic elimination and cleanliness drive campaign was organized at Babasaheb Ambedkar's statue premises on 13/04/2024. Students of the college participated in it and the statue area was cleaned. They collected plastic and garbage cleaned the area. Coordinator of National Service Scheme Dr. Ganesh Bahade and Coordinator of Nisarg Mitra Samiti Dr. Pankaj Moon were present. Villagers like Dilip Javade, Gangadhar Bhagat, Bhushan Jaronde and sweepers from Gram Panchayat were present. The students collected all the garbage and plastic from the premises and swept and cleaned the entire premises. Students like Chetan Satone, Achal Badwaik, Jayashree Chaudhary, Monika Upate, Darshana Shivarkar, System Lichde, Komalzode, Sharda Gharat, Harshada Mahajan, Akanksha Ghodmare, Pallavi Kalode, Tripi Dhadre. Pratiksha Thul, Vishal Uike in this campaign.

Students like Resham Khirtkar, Achal Khirtkar, Radhika Gotephode participated in this activity.	
No. of Beneficiaries	**44**

Attachments: Photos, Participants,Feedback, News, Etc

Principal
Shri Saibaba Lok Prabodhan
Arts College, Wadner

ENERGY AUDIT REPORT

of

Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner Tah.Hinganghat Dist.Wardha- 442 307

Year: 2019-20

Prepared by:

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795, Email: enrichcons@gmail.com

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(A Government of Maharashtra undertaking)
2nd Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006.
Ph No: 020-26614393/26614403
Email: eec@mahaurja.com, Web: www.mahaurja.com

ECN/2018-19/CR-05/4174

19th September , 2018

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with *MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)* under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm	:	**Enrich Consultants** Yashashree, Plot No. 26, Nirmal Bag Society, Near Muktangan English School, Parvati, Pune - 411009.
Registration Category	:	Empanelled *Consultant for Energy Conservation Programme*
Registration Number	:	*MEDA/ECN/CR-05/2018-19/EA-03*

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **31st March 2021** from the date of registration, to carry out energy audits under the Energy Conservation Programme.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

19/9/18

(Smita Kularikar)
General Manager (EC)

ENRICH CONSULTANTS * Pune *

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: enrichcons@gmail.com

Ref: EC/SSLPKM/19-20/14

Date: 11/09/2020

CERTIFICATE

This is to certify that we have conducted Energy Audit at Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner in the Academic year 2019-20.

The College has adopted following Energy Efficient practices:

- Maximum usage of Day Lighting
- Usage of Energy Efficient LED fittings

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient.

For Enrich Consultants,

ENRICH CONSULTANTS * Pune *

A Y Mehendale,
Certified Energy Auditor
EA-8192

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4	Study of CO_2 Emission	12
5	Study of Usage of Alternate Energy	14
6	Study of Usage Of LED Lighting	15

ENRICH CONSULTANTS * Pune *

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner, for awarding us the assignment of Energy Audit of their Wadner campus for the Year: 2019-20.

We are thankful to all Staff members for helping us during the field study.

EXECUTIVE SUMMARY

1. Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner, consumes Energy in the form of Electrical Energy; used for various gadgets, office & other facilities

2. Present Energy Consumption & CO_2 Emission:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	4835	4.351
2	Maximum	777	0.699
3	Minimum	268	0.241
4	Average	402.916	0.362

3. Energy Conservation projects already installed:

- Usage of Energy Efficient LED fittings

4. Usage of Alternate Energy:

- As on today College has not installed solar rooftop power plant. It is recommended to install solar rooftop system on the college building as per availability of funds.

5. Usage of LED Lighting:

- The Total Lighting load of College is 1.5 kW.
- The LED Lighting Load is 0.38 kW.
- The % of LED Lighting to Total Lighting Load is 25.33 %.

6. Assumptions:

1. 1 kWh of Electrical Energy releases 0.9 Kg of CO_2 into atmosphere
2. Average Energy generated by 1 kWp Solar PV Plant : 4 kWh/Day
3. Annual Solar Energy Generation Days: 300 Nos

7. References:

- For CO_2 Emissions: www.tatapower.com
- For Roof Top Solar Energy generation: www.solarrooftop.gov.in

ENRICH CONSULTANTS * Pune *

ABBREVIATIONS

BEE	Bureau of Energy Efficiency
MSEDCL	Maharashtra Electricity Distribution Company Limited
kWh	Kilo Watt Hour
kWp	Kilo Watt Peak
Kg	Kilo Gram
MT	Metric Ton
CO_2	Carbon Di Oxide
LED	Light Emitting Diode

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study Connected Load
2. To study Present Energy Consumption
3. To compute the CO_2 emissions
4. To study usage of Alternate Energy
5. To study usage of LED Lighting

1.2 Table No 1: General Details of the College:

No	Head	Particulars
1	Name of the Institution	Shri Saibaba Lok Prabodhan Kala Mahavidyalaya,
2	Address	S.No.452/2 Pipri Road,Wadner,Hinganghat Dist.Wardha
5	Affiliation	Rashtra Sant Tukodoji Maharaj University, Nagpur

CHAPTER-II
STUDY OF CONNECTED LOAD

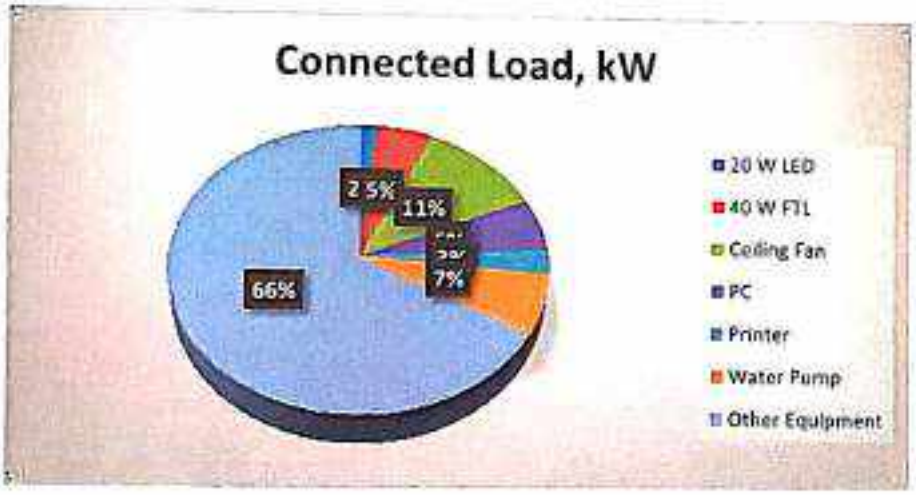
The major contributors to the connected load of the College are as under.

Table No 2: Equipment wise Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	20 W LED	19	20	0.38
2	40 W FTL	28	40	1.12
3	Ceiling Fan	40	65	2.6
4	PC	9	150	1.35
5	Printer	4	150	0.6
6	Water Pump	2	746	1.492
7	Other Equipment	100	150	15
8	**Total**			**23**

We present the above Data in a PIE Chart as under.

Chart No1: Connected Load:



CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Energy Consumption

Table No. 3: Study of Electrical Energy Consumption: 19-20:

No	Month	Energy Purchased, kWh
1	Apr-19	777
2	May-19	463
3	Jun-19	531
4	Jul-19	369
5	Aug-19	389
6	Sep-19	268
7	Oct-19	405
8	Nov-19	270
9	Dec-19	272
10	Jan-20	362
11	Feb-20	379
12	Mar-20	350
13	Total	4835
14	Maximum	777
15	Minimum	268
16	Average	402.916

Chart No 2: To study the variation of Monthly Electrical Energy Consumption:

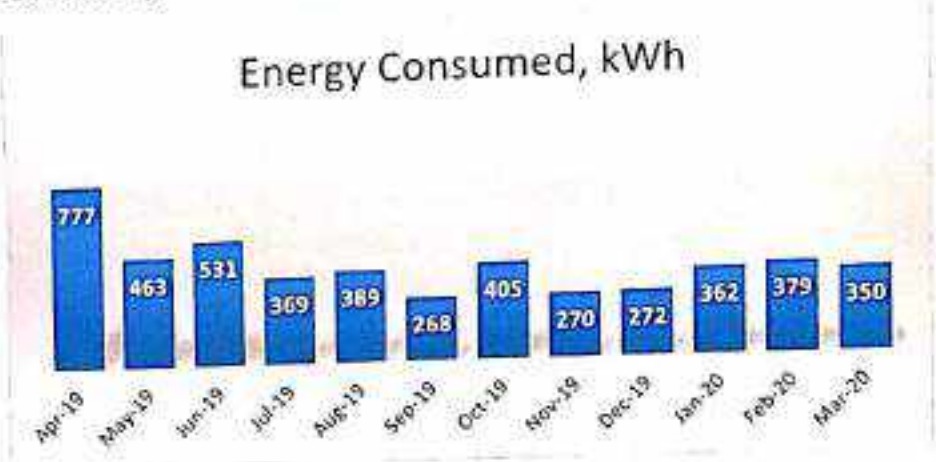


Table No 4: Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh
1	Total	4835
2	Maximum	777
3	Minimum	268
4	Average	402.91

CHAPTER-IV
STUDY OF CO_2 EMISSION

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the College for performing its day to day activities

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is as under

- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the College due to its Day to Day operations

Table No 5: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr-19	777	0.699
2	May-19	463	0.416
3	Jun-19	531	0.477
4	Jul-19	369	0.332
5	Aug-19	389	0.350
6	Sep-19	268	0.241
7	Oct-19	405	0.364
8	Nov-19	270	0.243
9	Dec-19	272	0.244
10	Jan-20	362	0.325
11	Feb-20	379	0.341
12	Mar-20	350	0.315
13	Total	4835	4.351
14	Maximum	777	0.699
15	Minimum	268	0.241
16	Average	402.916	0.362

Chart No 3: Representation of Month wise CO_2 Emissions:

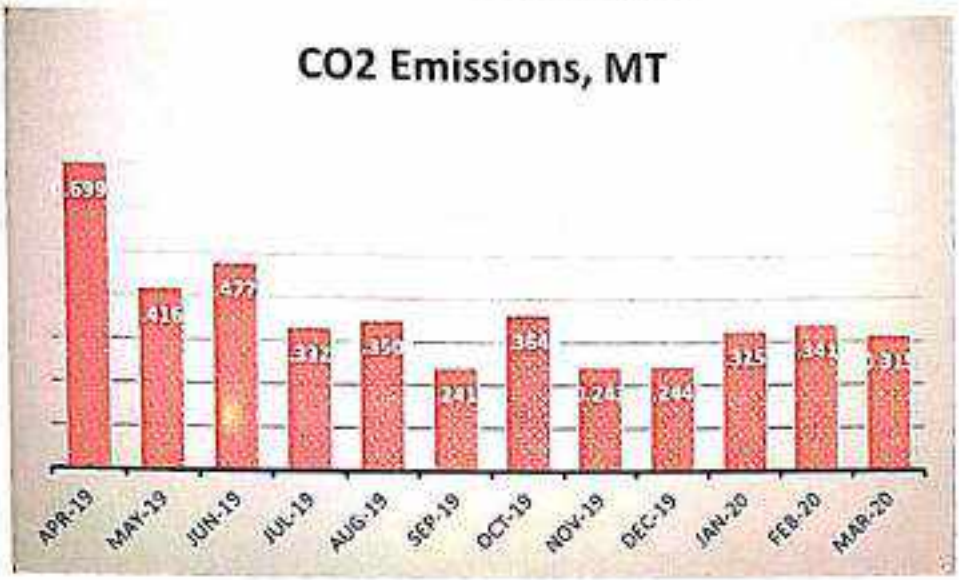


Table No 6: Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	4835	4.351
2	Maximum	777	0.699
3	Minimum	268	0.241
4	Average	402.916	0.362

CHAPTER-V
STUDY OF USAGE OF ALTERNATE ENERGY

As on today College has not install solar roof-top PV plant, solar thermal water heating plant; the percentages of uses of alternate energy to the annual energy demand work to be zero percent.

CHAPTER VI
STUDY OF USAGE OF LED LIGHTING

In this chapter, we compute the percentage of usage of LED Lighting to Total Lighting Load, as under.

Table No 8: Percentage of Usage of LED Lighting to Total Lighting Load:

No	Particulars	Value	Unit
1	No of 40 W FTL Fittings	28	Nos
2	Demand of 40 W FTL Fitting	40	W/Unit
3	Total Electrical Load of 40 W FTL Fittings	1.12	kW
4	No of 20 W LED Tube Lights	19	Nos
5	Demand of 20 W LED Tube Light	20	W/Unit
6	Total Electrical Load of 20 W LED Fittings	0.38	kW
7	Annual Total Lighting Load = 3+6	1.5	kWh
8	Annual LED Lighting Load = 6	0.38	kWh
9	**Annual Lighting Requirement met by LED= 8*100/7**	25.33	%

GREEN AUDIT REPORT

of

Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner

Tah.Hinganghat

Dist.Wardha- 442 307

Year: 2019-20

Prepared by:

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
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19/9/18

(Smita Kudarikar)
General Manager (EC)

ENRICH CONSULTANTS * Pune *

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Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: enrichcons@gmail.com

Ref: EC/SSLPKM/19-20/14

Date: 11/09/2020

CERTIFICATE

This is to certify that we have conducted Green Audit at Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner in the Academic year 2019-20.

The College has adopted following Green Initiatives:

- Usage of Energy Efficient LED Light Fitting
- Maximum Usage of Day Lighting
- Provision of Separate bins for Dry & Wet Waste
- The College has installed Septic Tank and is cleaned periodically.
- Implementation of Rain Water Management Project
- Maintenance of good Internal Road
- Tree Plantation in the campus
- Creation of awareness by Display of Posters on Resource Conservation

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Green.

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

ENRICH CONSULTANTS * Pune *

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ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner for awarding us the assignment of Green Audit of their Wadner Campus for the Academic Year: 2019-20.

We are thankful to all Staff members for helping us during the field study

EXECUTIVE SUMMARY

1. **Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner**, consumes Energy in the form of **Electrical Energy**; used for various gadgets, office & other facilities

2. **Present Energy Consumption & CO_2 Emission:**

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	4835	4.351
2	Maximum	777	0.699
3	Minimum	268	0.241
4	Average	402.916	0.362

3. **Energy Conservation projects already installed:**

- Usage of Energy Efficient LED fittings

4. **Usage of Renewable Energy:**

- It is recommended to install roof-top solar PV Plant on college building.

5. **Waste Management:**

5.1 Segregation of Waste at Source:

The Waste is segregated at source and the recyclable waste, like paper, plastic waste is handed over to Authorized waste collecting agent for further recycling.

5.2 Organic Waste Management:

The College has installed bio-composting pit, to convert bio-degradable waste into bio-fertilizer.

5.3 Liquid Waste Management:

The College has installed Septic and is cleaned periodically.

5.4 E-Waste Management:

The E-Waste is disposed of through Authorized E-Waste collecting agency.

5.5 Sanitary Waste Incinerator:

The College has not installed Sanitary Waste Incinerator. It is recommended to install the sanitary waste disposal.

6. Rain Water Management:

The College has installed the Rainwater management project, the rain water falling on the terrace is collected and is used for increasing the under the underground water level.

7. Green & Sustainable Practices:

- Good Internal Road
- Medicinal Plant Garden
- Provision of Ramp & Wheel Chair for Divyangajan
- Creation of Awareness on Resource Conservation, by Display of Posters

8. Assumptions:

- **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2 into atmosphere
- Average Energy generated by **1 kWp** Solar PV Plant : **4 kWh/Day**
- Annual Solar Energy Generation Days: **300 Nos**

9. References:

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ABBREVIATIONS

BEE	Bureau of Energy Efficiency
kWh	Kilo Watt Hour
kWp	Kilo Watt Peak
Kg	Kilo Gram
MT	Metric Ton
CO_2	Carbon Di Oxide
LPD	Liters per Day

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study present Energy Consumption
2. To Study CO_2 emissions
3. To study usage of Renewable Energy
4. Study of Waste Management
5. Study of Rain Water Management
6. Study of Green & Suslainable Practices

1.2 Table No 1: General Details of the College:

No	Head	Particulars
1	Name of the Institution	Shri Saibaba Lok Prabodhan Kala Mahavidyalaya,
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CHAPTER-II

STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Energy Consumption.

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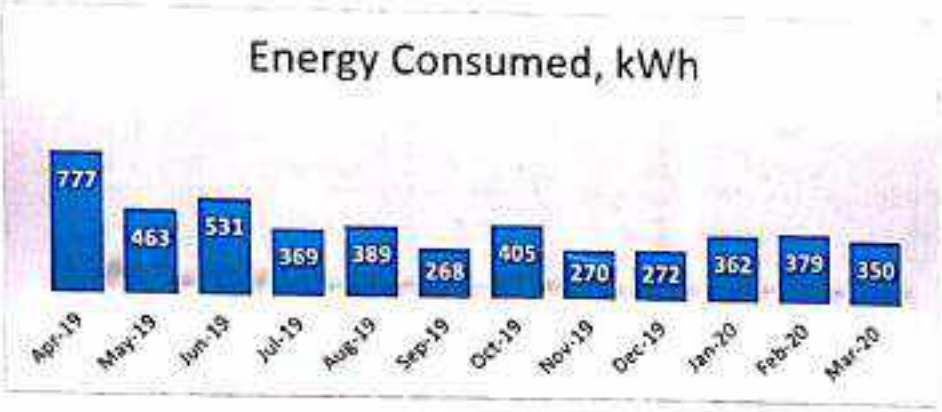

Table No 3: Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh
1	Total	4835
2	Maximum	777
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CHAPTER-III
STUDY OF CO_2 EMISSION

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the College for performing its day to day activities.

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is as under

- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the College due to its Day to Day operations

Table No 4: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
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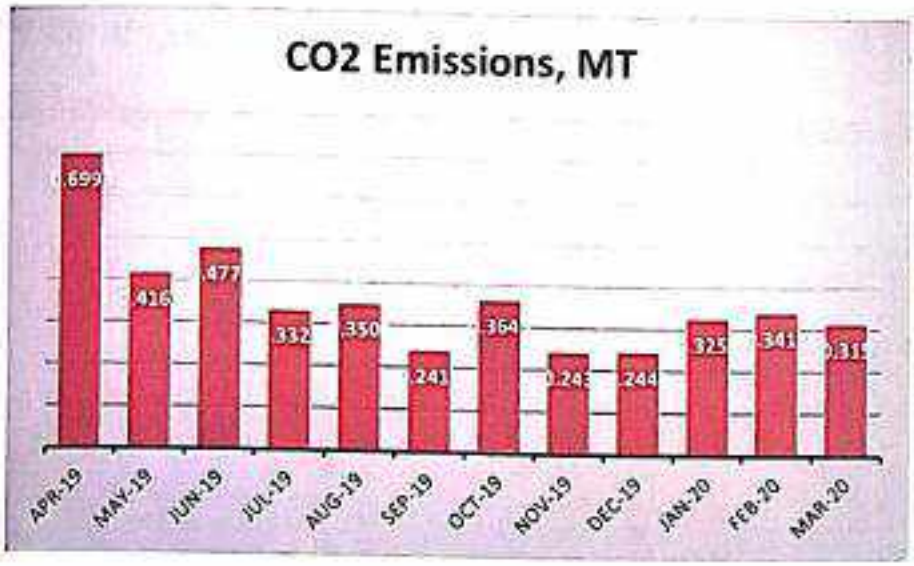

Table No 5: Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	4835	4.351
2	Maximum	777	0.699
3	Minimum	268	0.241
4	Average	402.916	0.362

CHAPTER-IV

STUDY OF USAGE OF RENEWABLE ENERGY

As on today College has not installed solar roof-top PV plant, solar thermal water heating plant, it is recommend to install solar rooftop plant on the College building.

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The solid waste is segregated at source. There are separate bins for collection at various points and is disposed of for further action.

Photograph of Waste Collection Bins:

5.2 Organic Waste Management:

The College has installed bio-composting pit, to convert bio-degradable waste into bio-fertilizer.

5.3 Liquid Waste Management:

The College has installed Septic tank and is cleaned periodically.

5.4 E-Waste Management:

The E-Waste is disposed of through Authorized Agency.

5.5 Sanitary Waste Incinerator:

The College has not installed Sanitary Waste Incinerator. It is recommended to installed sanitary waste disposal.

CHAPTER-VI

STUDY OF RAIN WATER MANAGEMENT

The College has implemented the Rain Water Management Project. The College has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used to increase the underground water table.

Photograph of Rain Water Management Pipe:

CHAPTER-VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Roads:

The College has well maintained internal road to facilitate the easy movement of the students within the campus.

Photograph of Internal Road:

7.2 Internal Tree Plantation:

The College has well maintained landscaped garden in the campus.

Photograph of Tree plantation:

7.3 Provision of Ramp for Divyangajan:

The College has made provision for Ramp for easy movement of Divyangajan. Also dedicated wash room and wheel chair are made available.

Photograph of Ramp:

7.3 Creation of Awareness on Plastic Ban:

The College has displayed Poster emphasizing on the Plastic Ban.

ANNEXURE-I
LIST OF TREES & PLANTS IN THE CAMPUS

No	Name of Trees	Number of Trees
1	Azadirachta Indica (Neem)	30
2	Cestrum nocturnum (Ratrani)	02
3	Betea monosperma (Palas)	05
4	Tectona Grandis (Sagwan)	02
5	Thuja (Vidya)	25
6	Delonix Regia (Gulmohar)	02
7	Madhuca longifolia (Mahau)	05
8	Millettia pinnata (Karanj)	8
9	Lawsonia inermis (Mehendi)	100
10	Santalum album (sandalwood)	23
11	Citrus limon (Lemon)	02
12	Citrus limetta (Mausambi)	02
13	Terminalia catappa (Almond)	01
14	Nyctanthes arbor-tristis (Parijat)	02
15	Murraya koenigii (Curry Leaves)	02
16	Ficus benghalensis (Banyan)	01
17	Aegle marmelos (Indian bael)	01

ENERGY AUDIT REPORT

of

Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner Tah.Hinganghat Dist.Wardha- 442 307

Year: 2020-21

Prepared by:

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MAHARASHTRA ENERGY DEVELOPMENT AGENCY

An ISO 9001 : 2008 Reg no. [illegible]

Maharashtra Energy Development Agency
(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary,
Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
Email: eee@mahurja.com, Web: www.mahaurja.com

ECN/2021-22/CR-14/1577 22nd April, 2021

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FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with *MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)* under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm	:	**M/s Enrich Consultants** Yashashree, Plot No. 26, Nirmal Bag Society, Near Muktangan English School, Parvati, Pune - 411009.
Registration Category	:	*Empanelled Consultant for Energy Conservation Programme for Class 'A'*
Registration Number	:	***MEDA/ECN/2021-22/Class A/EA-03***

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **21st April, 2023** from the date of registration, to carry out energy audits under the Energy Conservation Programme.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

ENRICH CONSULTANTS Pune

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: enrichcons@gmail.com

Ref: EC/SSLPKM/20-21/28

Date: 12/05/2021

CERTIFICATE

This is to certify that we have conducted Energy Audit at Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner in the Academic year 2020-21.

The College has adopted following Energy Efficient practices:

- Maximum usage of Day Lighting
- Usage of Energy Efficient LED fittings

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient.

For Enrich Consultants,

ENRICH CONSULTANTS * Pune *

A Y Mehendale,
Certified Energy Auditor
EA-8192

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3	Study of Present Energy Consumption	10
4	Study of CO_2 Emission	12
5	Study of Usage of Alternate Energy	14
6	Study of Usage Of LED Lighting	15

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner, for awarding us the assignment of Energy Audit of their Wadner campus for the Year: 2020-21.

We are thankful to all Staff members for helping us during the field study.

EXECUTIVE SUMMARY

1. **Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner**, consumes Energy in the form of **Electrical Energy**; used for various gadgets, office & other facilities

2. **Present Energy Consumption & CO_2 Emission:**

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	2725	2.452
2	Maximum	349	0.314
3	Minimum	150	0.135
4	Average	227.08	0.204

3. **Energy Conservation projects already installed:**

   - Usage of Energy Efficient LED fittings

4. **Usage of Alternate Energy:**

   - As on today College has not installed solar rooftop power plant. It is recommended to install solar rooftop system on the college building as per availability of funds.

5. **Usage of LED Lighting:**

   - The Total Lighting load of College is **1.5 kW.**
   - The LED Lighting Load is **0.38 kW.**
   - The % of LED Lighting to Total Lighting Load is **25.33 %.**

6. **Assumptions:**

   1. **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2 into atmosphere
   2. Average Energy generated by **1 kWp** Solar PV Plant : **4 kWh/Day**
   3. Annual Solar Energy Generation Days: **300 Nos**

7. **References:**

   - For CO_2 Emissions: www.tatapower.com
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ABBREVIATIONS

BEE .	Bureau of Energy Efficiency
MSEDCL	Maharashtra Electricity Distribution Company Limited
kWh	Kilo Watt Hour
kWp	Kilo Watt Peak
Kg	Kilo Gram
MT	Metric Ton
CO_2	Carbon Di Oxide
LED	Light Emitting Diode

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study Connected Load
2. To study Present Energy Consumption
3. To compute the CO_2 emissions
4. To study usage of Alternate Energy
5. To study usage of LED Lighting

1.2 Table No 1: General Details of the College:

No	Head	Particulars
1	Name of the Institution	Shri Saibaba Lok Prabodhan Kala Mahavidyalaya,
2	Address	S.No.452/2 Pipri Road,Wadner,Hinganghat Dist:Wardha
3	Latitude	20.25° N
4	Longitude	78.44° E
5	Affiliation	Rashtra Sant Tukodoji Maharaj University, Nagpur

CHAPTER-II
STUDY OF CONNECTED LOAD

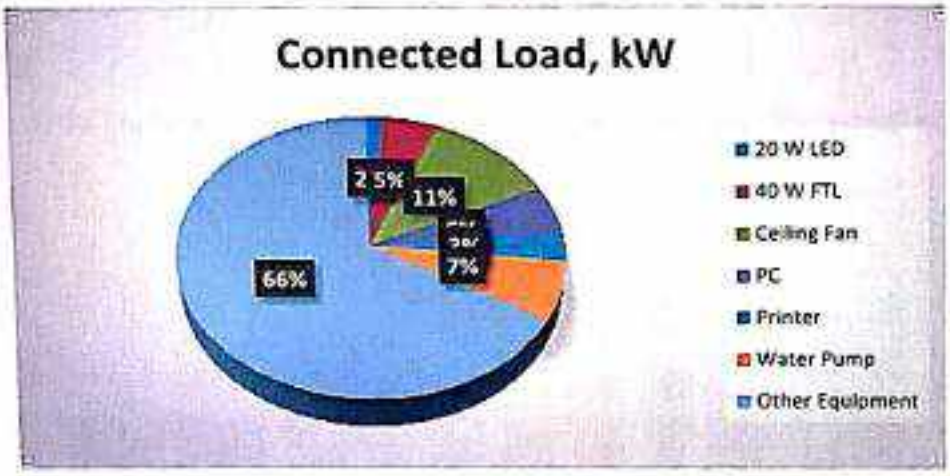
The major contributors to the connected load of the College are as under.

Table No 2: Equipment wise Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	20 W LED	19	20	0.38
2	40 W FTL	28	40	1.12
3	Ceiling Fan	40	65	2.6
4	PC	9	150	1.35
5	Printer	4	150	0.6
6	Water Pump	2	746	1.492
7	Other Equipment	100	150	15
8	Total			23

We present the above Data in a PIE Chart as under.

Chart No1: Connected Load:



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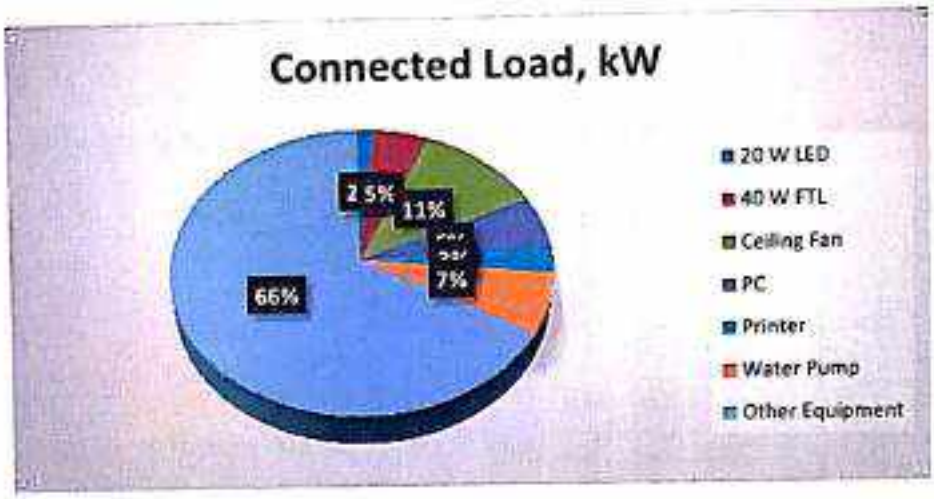

CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Energy Consumption

Table No. 3: Study of Electrical Energy Consumption: 20-21:

No	Month	Energy Purchased, kWh
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2	May-20	162
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4	Jul-20	154
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6	Sep-20	162
7	Oct-20	232
8	Nov-20	215
9	Dec-20	308
10	Jan-21	341
11	Feb-21	349
12	Mar-21	333
13	Total	2725
14	Maximum	349
15	Minimum	150
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Chart No 2: To study the variation of Monthly Electrical Energy Consumption:

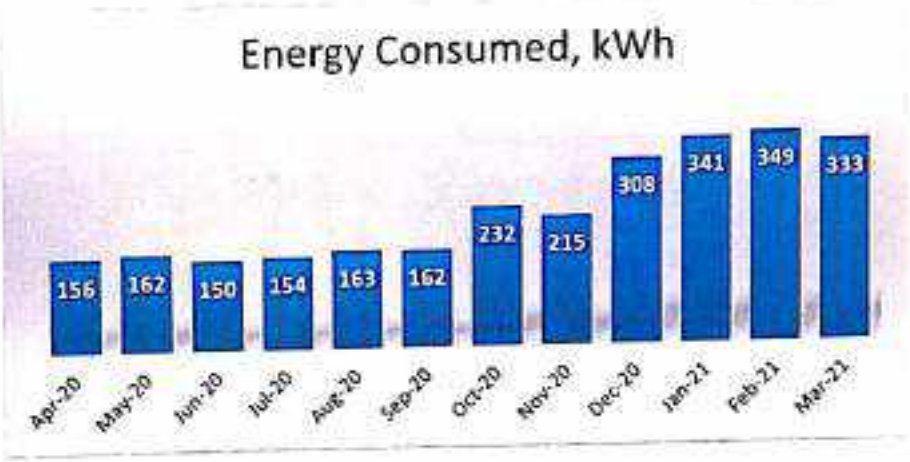

Table No 4: Important Parameters:

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CHAPTER-IV
STUDY OF CO_2 EMISSION

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the College for performing its day to day activities

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is as under

- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the College due to its Day to Day operations

Table No 5: Month wise CO_2 Emissions:

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Chart No 3: Representation of Month wise CO_2 Emissions:

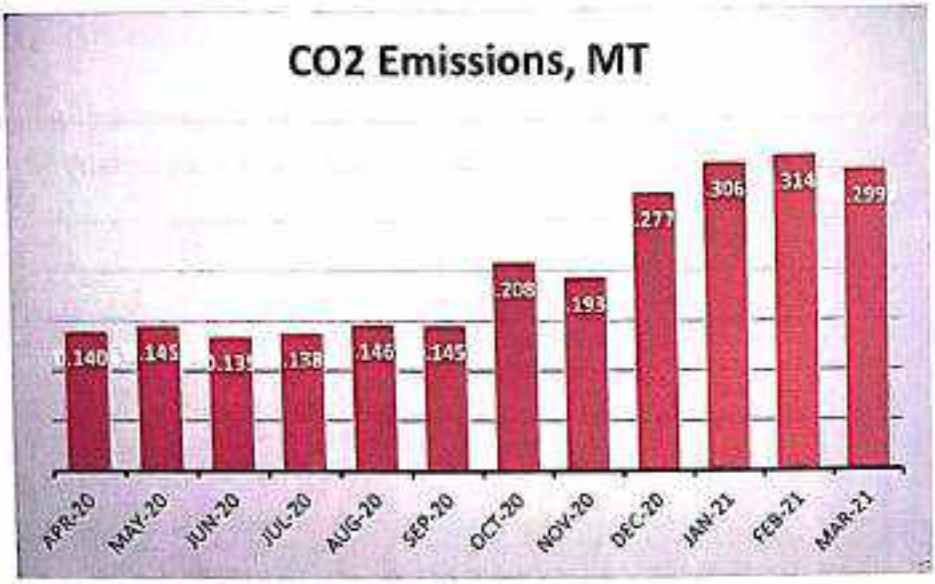

Table No 6: Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	2725	2.452
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4	Average	227.083	0.204

CHAPTER-V
STUDY OF USAGE OF ALTERNATE ENERGY

As on today College has not install solar roof-top PV plant, solar thermal water heating plant, the percentages of uses of alternate energy to the annual energy demand work to be zero percent.

CHAPTER VI
STUDY OF USAGE OF LED LIGHTING

In this chapter, we compute the percentage of usage of LED Lighting to Total Lighting Load, as under.

Table No 8: Percentage of Usage of LED Lighting to Total Lighting Load:

No	Particulars	Value	Unit
1	No of 40 W FTL Fittings	28	Nos
2	Demand of 40 W FTL Fitting	40	W/Unit
3	Total Electrical Load of 40 W FTL Fittings	1.12	kW
4	No of 20 W LED Tube Lights	19	Nos
5	Demand of 20 W LED Tube Light	20	W/Unit
6	Total Electrical Load of 20 W LED Fittings	0.38	kW
7	Annual Total Lighting Load = 3+6	1.5	kWh
8	Annual LED Lighting Load = 6	0.38	kWh
9	**Annual Lighting Requirement met by LED= 8*100/7**	25.33	%

GREEN AUDIT REPORT

of

Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner Tah.Hinganghat Dist.Wardha- 442 307

Year: 2020-21

Prepared by:

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795, Email: enrichcons@gmail.com

MAHARASHTRA ENERGY DEVELOPMENT AGENCY
An ISO 9001 : 2008 Reg. no. RQ 81 / 2462

Maharashtra Energy Development Agency
(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary,
Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
Email: eee@mahaurja.com, Web: www.mahaurja.com

ECN/2021-22/CR-14/1577 22nd April, 2021

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with *MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)* under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

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CERTIFICATE

This is to certify that we have conducted Green Audit at Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner in the Academic year 2020-21.

The College has adopted following Green Initiatives:

- Usage of Energy Efficient LED Light Fitting
- Maximum Usage of Day Lighting
- Provision of Separate bins for Dry & Wet Waste
- The College has installed Septic Tank and is cleaned periodically.
- Implementation of Rain Water Management Project
- Maintenance of good Internal Road
- Tree Plantation in the campus
- Creation of awareness by Display of Posters on Resource Conservation

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Green.

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

ENRICH CONSULTANTS • Pune •

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4	Study of Usage of Renewable Energy	14
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6	Study of Rain Water Management	17
7	Study of Green & Sustainable Practices	18
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4	Average	227.08	0.204

3. **Energy Conservation projects already installed:**

- Usage of Energy Efficient LED fittings

4. **Usage of Renewable Energy:**

- It is recommended to install roof-top solar PV Plant on college building.

5. **Waste Management:**

5.1 Segregation of Waste at Source:

The Waste is segregated at source and the recyclable waste, like paper, plastic waste is handed over to Authorized waste collecting agent for further recycling.

5.2 Organic Waste Management:

The College has installed bio-composting pit, to convert bio-degradable waste into bio-fertilizer.

5.3 Liquid Waste Management:

The College has installed Septic and is cleaned periodically.

5.4 E-Waste Management:

The E-Waste is disposed of through Authorized E-Waste collecting agency.

5.5 Sanitary Waste Incinerator:

The College has not installed Sanitary Waste Incinerator. It is recommended to install the sanitary waste disposal.

6. Rain Water Management:

The College has installed the Rainwater management project, the rain water falling on the terrace is collected and is used for increasing the under the underground water level.

7. Green & Sustainable Practices:

- Good Internal Road
- Medicinal Plant Garden
- Provision of Ramp & Wheel Chair for Divyangajan
- Creation of Awareness on Resource Conservation, by Display of Posters

8. Assumptions:

- **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2 into atmosphere
- Average Energy generated by **1 kWp** Solar PV Plant : **4 kWh/Day**
- Annual Solar Energy Generation Days: **300 Nos**

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ABBREVIATIONS

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kWh	Kilo Watt Hour
kWp	Kilo Watt Peak
Kg	Kilo Gram
MT	Metric Ton
CO_2	Carbon Di Oxide
LPD	Liters per Day

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study present Energy Consumption
2. To Study CO_2 emissions
3. To study usage of Renewable Energy
4. Study of Waste Management
5. Study of Rain Water Management
6. Study of Green & Sustainable Practices

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1	Name of the Institution	Shri Saibaba Lok Prabodhan Kala Mahavidyalaya,
2	Address	S.No.452/2 Pipri Road,Wadner,Hinganghat Dist:Wardha
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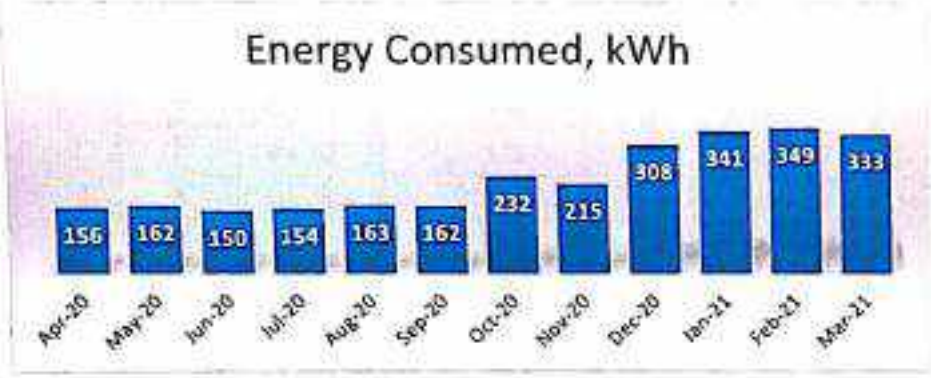

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A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

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The College uses Electrical Energy for various Electrical gadgets

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is as under

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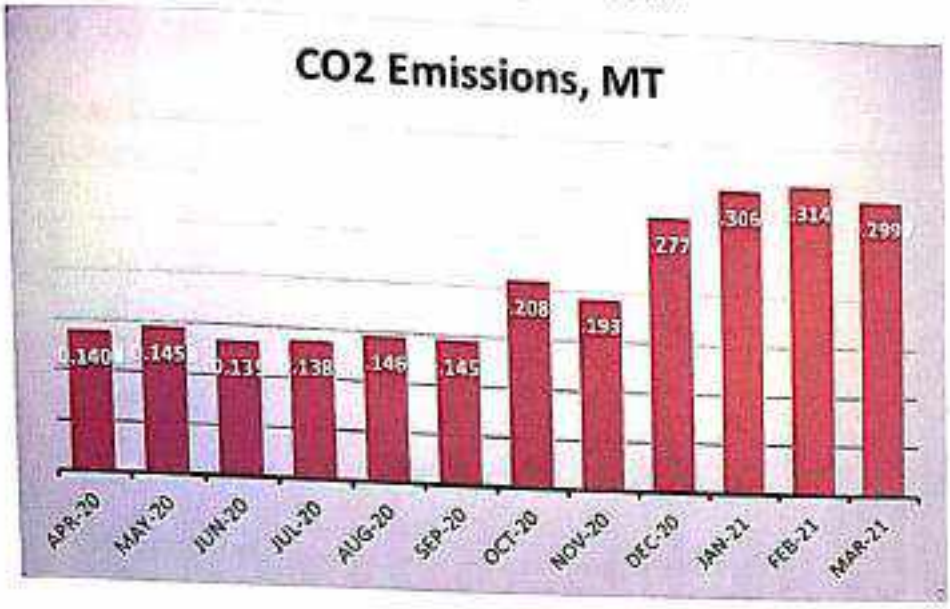

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CHAPTER-IV

STUDY OF USAGE OF RENEWABLE ENERGY

As on today College has not installed solar roof-top PV plant, solar thermal water heating plant, it is recommend to install solar rooftop plant on the College building

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The solid waste is segregated at source. There are separate bins for collection at various points and is disposed of for further action.

Photograph of Waste Collection Bins:

5.2 Organic Waste Management:

The College has installed bio-composting pit, to convert bio-degradable waste into bio-fertilizer.

5.3 Liquid Waste Management:

The College has installed Septic tank and is cleaned periodically.

5.4 E-Waste Management:

The E-Waste is disposed of through Authorized Agency.

5.5 Sanitary Waste Incinerator:

The College has not installed Sanitary Waste Incinerator. It is recommended to installed sanitary waste disposal.

CHAPTER-VI

STUDY OF RAIN WATER MANAGEMENT

The College has implemented the Rain Water Management Project. The College has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used to increase the underground water table.

Photograph of Rain Water Management Pipe :

CHAPTER-VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Roads:

The College has well maintained internal road to facilitate the easy movement of the students within the campus.

Photograph of Internal Road:

7.2 Internal Tree Plantation:

The College has well maintained landscaped garden in the campus.

Photograph of Tree plantation:

7.3 Provision of Ramp for Divyangajan:

The College has made provision for Ramp for easy movement of Divyangajan. Also dedicated wash room and wheel chair are made available.

Photograph of Ramp:

7.3 Creation of Awareness on Plastic Ban:

The College has displayed Poster emphasizing on the Plastic Ban.

7.4 Best Practices and Initiative for Social Awareness:

The College has taken initiative for different social awareness program, about water and forest conservation, trees plantations, society cleanness etc under National Service Scheme.

Photograph of Best Practices and Initiative:

ANNEXURE-I
LIST OF TREES & PLANTS IN THE CAMPUS

No	Name of Trees	Number of Trees
1	Azadirachta Indica (Neem)	30
2	Cestrum nocturnum (Ratrani)	02
3	Betea monosperma (Palas)	05
4	Tectona Grandis (Sagwan)	02
5	Thuja (Vidya)	25
6	Delonix Regia (Gulmohar)	02
7	Madhuca longifolia (Mahau)	05
8	Millettia pinnata (Karanj)	8
9	Lawsonia inermis (Mehendi)	100
10	Santalum album (sandalwood)	23
11	Citrus limon (Lemon)	02
12	Citrus limetta (Mausambi)	02
13	Terminalia catappa (Almond)	01
14	Nyctanthes arbor-tristis (Parijat)	02
15	Murraya koenigii (Curry Leaves)	02
16	Ficus benghalensis (Banyan)	01
17	Aegle marmelos (Indian bael)	01

ENVIRONMENTAL AUDIT REPORT
Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner
Tah.Hinganghat
Dist.Wardha- 442 307

Year: 2020-21

Prepared by

Enrich Consultants
Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795, Email: enrichcons@gmail.com

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary,
Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
Email: eee@mahaurja.com, Web: www.mahaurja.com

ECN/2021-22/CR-14/1577

22nd April, 2021

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with *MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)* under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm : **M/s Enrich Consultants**
Yashashree, Plot No. 26, Nirmal Bag Society,
Near Muktangan English School, Parvati,
Pune - 411009.

Registration Category : *Empanelled Consultant for Energy Conservation Programme for Class 'A'*

Registration Number : ***MEDA/ECN/2021-22/Class A/EA-03***

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **21st April, 2023** from the date of registration, to carry out energy audits under the Energy Conservation Programme.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

ENRICH CONSULTANTS Pune

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: enrichcons@gmail.com

Ref: EC/SSLPKM/20-21/28

Date: 12/05/2021

CERTIFICATE

This is to certify that we have conducted Environmental Audit at Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner in the Academic year 2020-21.

The College has adopted following Environment Friendly Practices:

- Usage of Energy Efficient LED Light Fitting
- Maximum Usage of Day Lighting
- Provision of Separate bins for Dry & Wet Waste
- The College has installed septic tanks and cleans periodically.
- Implementation of Rain Water Management Project
- Tree Plantation in the campus
- Creation of awareness by Display of Posters on Resource Conservation

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Green.

For Enrich Consultants,

ENRICH CONSULTANTS * Pune *

A Y Mehendale,
Certified Energy Auditor, EA-8192
ASSOCHAM GEM Certified Professional: GEM: 22/788

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ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner, for awarding us the assignment of Environmental Audit of their Wadner campus for the Year: 2020-21

We are thankful to all Staff members for helping us during the field study.

EXECUTIVE SUMMARY

1. **Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner,** consumes Energy in the form of **Electrical Energy;** used for various gadgets, office & other facilities

2. **Pollution caused due to College Activities:**

   - **Air pollution:** Mainly CO_2 on account of Electricity & LPG Consumption.
   - **Solid Waste:** Bio degradable Waste, Garden Waste, Recyclable Waste and Human Waste.
   - **Liquid Waste:** Human liquid Waste.

3. **Present Energy Consumption & CO_2 Emission:**

No	Parameter/ Value	Electrical Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	2725	2.452
2	Maximum	349	0.314
3	Minimum	150	0.135
4	Average	227.08	0.204

4. **Various initiatives taken for Energy Conservation:**

   - Usage of Energy Efficient LED Lighting
   - Maximum Usage of Day Lighting

5. **Usage of Renewable Energy& Reduction in CO_2 Emission:**

   - It is recommended to install roof-top solar PV Plant on college building as per availability of funds.

6. **Indoor Air Quality Parameters:**

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	93	61	76
2	Minimum	81	42	57

7. **Indoor Comfort Conditions:**

No	Parameter/Value	Temperature, °C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	38.5	25	240	41
2	Minimum	37	22	210	30

8. **Waste Management:**

8.1 Segregation of Waste at Source:

The Waste is segregated at source and the recyclable waste, like paper, plastic waste is handed over to Authorized waste collecting agent for further recycling.

8.2 Organic Waste Management:

The College has installed bio-composting pit, to convert bio-degradable waste into bio-fertilizer.

8.3 Liquid Waste Management:

The College has installed Septic and is cleaned periodically.

8.4 E-Waste Management:

The E-Waste is disposed of through Authorized E-Waste collecting agency.

9. Rain Water Management:

The College has installed the Rainwater management project, the rain water falling on the terrace is collected and is used for increasing the under the underground water level.

10. Environment Friendly Initiatives:

- Tree Plantation in the campus.
- Display of Posters on Resource Conservation

11. Assumptions:

- **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2 into atmosphere
- Average Energy generated by **1 kWp** Solar PV Plant : **4 kWh/Day**
- Annual Solar Energy Generation Days: **300 Nos**

12. References:

- For CO_2 Emissions: www.tatapower.com
- For Roof Top Solar Energy Generation: www.solarrooftop.gov.in
- For Various Indoor Air Parameters: www.ishrae.com
- For AQI & Water Quality Standards: www.cpcb.com

ABBREVIATIONS

MSEDCL	:	Maharashtra State Distribution Company Limited
MT	:	Metric Ton
kWh	:	kilo-Watt Hour
KLPD	:	Kilo Litres per Day
LED	:	Light Emitting Diode
AQI	:	Air Quality Index
PM-2.5	:	Particulate Matter of Size 2.5 Micron
PM-10	:	Particulate Matter of Size 10 Micron
CPCB	:	Central Pollution Control Board

CHAPTER-I
INTRODUCTION

1.1Important Definitions:

1.1.1Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

1.1.2. Environmental Audit: Definition:

An audit which aims at verification and validation to ensure that various environmental laws are compiled with and adequate care has been taken towards environmental protection and preservation

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment

1.1.3. Environmental Pollutant: means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

1.1.4. Relevant Environmental Laws in India: Table No-1:

1927	The Indian Forest Act
1972	The Wildlife Protection Act
1974	The Water (Prevention and Control of Pollution) Act
1977	The Water (Prevention & Control of Pollution) Cess Act
1980	The Forest (Conservation) Act
1981	The Air (Prevention and Control of Pollution) Act
1986	The Environment Protection Act
1991	The Public Liability Insurance Act
2002	The Biological Diversity Act
2010	The National Green Tribunal Act

1.1.5. Some Important Environmental Rules in India: Table No-2:

1989	Hazardous Waste (Management and Handling) Rules
1989	Manufacture, Storage and Import of Hazardous Chemical Rules
2000	Municipal Solid Waste (Management and Handling) Rules
1998	The Biomedical Waste (Management and Handling) Rules
1999	The Environment (Siting for Industrial Projects) Rules
2000	Noise Pollution (Regulation and Control) Rules
2000	Ozone Depleting Substances (Regulation and Control) Rules
2011	E-waste (Management and Handling) Rules
2011	National Green Tribunal (Practices and Procedure) Rules
2011	Plastic Waste (Management and Handling) Rules

1.1.6 National Environmental Plans & Policy Documents: Table No-3:

1.	National Forest Policy, 1988
2.	National Water Policy, 2002
3.	National Environment Policy or NEP (2006)
4.	National Conservation Strategy and Policy Statement on Environment and Development, 1992
5.	Policy Statement for Abatement of Pollution (1992)
6.	National Action Plan on Climate Change
7.	Vision Statement on Environment and Human Health
8.	Technology Vision 2030 (The Energy Research College)
9.	Addressing Energy Security and Climate Change (MoEF and Bureau of Energy Efficiency
10	The Road to Copenhagen; India's Position on Climate Change Issues (MoEF)

1.2 Audit Methodology:

1. To study Resource Consumption & CO_2 Emissions
2. To Study CO_2 Emission Reduction
3. To study Indoor Air Quality Parameters
4. To Study Waste Management
5. To Study Rain Water Harvesting
6. To Study Environment Friendly Initiatives

1.3 General Details of College: Table No: 4

No	Head	Particulars
1	Name of the Institution	Shri Saibaba Lok Prabodhan Kala Mahavidyalaya,
2	Address	S.No.452/2 Pipri Road,Wadner,Hinganghat Dist:Wardha
3	Latitude	20.25° N
4	Longitude	78.44° E
5	Affiliation	Rashtra Sant Tukodoji Maharaj University, Nagpur

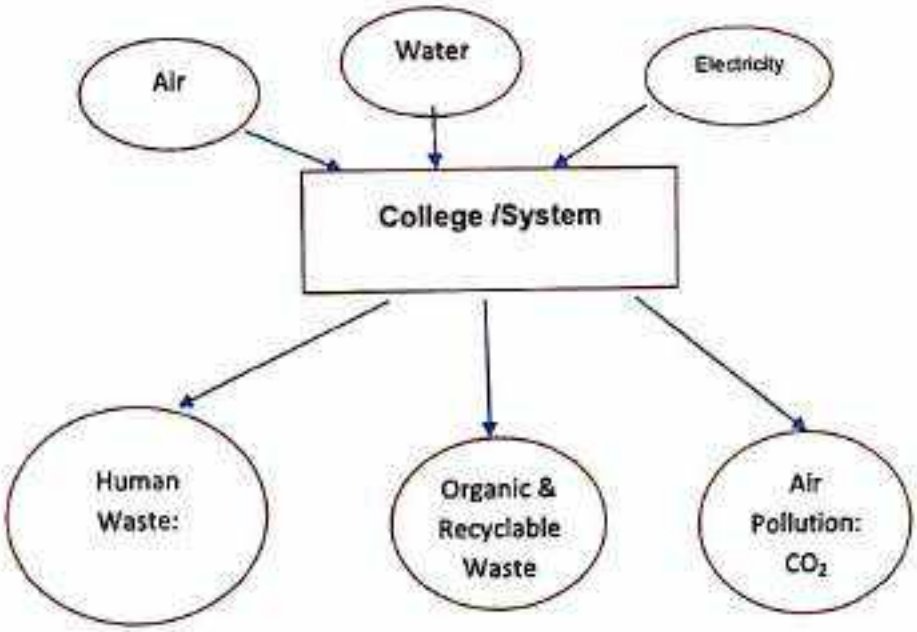
CHAPTER-II
STUDY OF RESOURCE CONSUMPTION & CO_2 EMISSION

The College consumes following Natural/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the College System & Environment as under.

Chart No 1: Representation of College as System:



Now we compute the Generation of CO_2 on account of consumption of Electrical Energy. The basis of Calculation for CO_2 emissions due to Electrical Energy is as under

- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Table No 5: Study of Consumption of Energy & CO_2 Emissions: 20-21:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr-20	156	0.140
2	May-20	162	0.145
3	Jun-20	150	0.135
4	Jul-20	154	0.138
5	Aug-20	163	0.146
6	Sep-20	162	0.145
7	Oct-20	232	0.208

8	Nov-20	215	0.193
9	Dec-20	308	0.277
10	Jan-21	341	0.306
11	Feb-21	349	0.314
12	Mar-21	333	0.299
13	Total	2725	2.452
14	Maximum	349	0.314
15	Minimum	150	0.135
16	Average	227.083	0.204

Chart No 2: Study of CO_2 Emission:

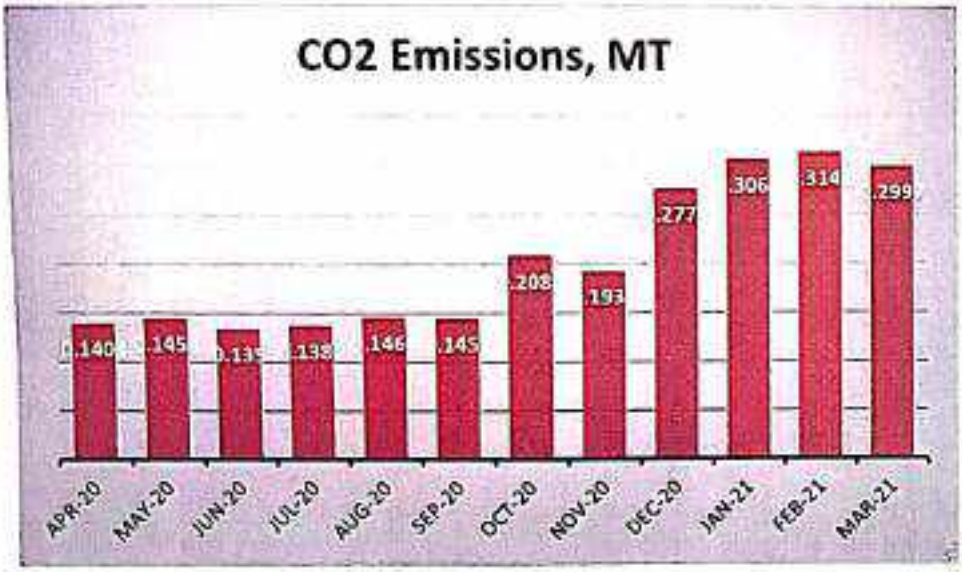


Table No 6: Various Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	2725	2.452
2	Maximum	349	0.314
3	Minimum	150	0.135
4	Average	227.083	0.204

CHAPTER III
STUDY OF CO_2 EMISSION REDUCTION

As on today College has not installed solar roof-top PV plant, solar thermal water heating plant, it is recommend to install solar rooftop plant on the College building.

CHAPTER IV
STUDY OF INDOOR AIR QUALITY

4.1 Importance of Air Quality:

Air: **The common name given to the atmospheric gases used in breathing and photosynthesis.**

By volume, Dry Air contains 78.09% Nitrogen, 20.95% Oxygen, 0.93% Argon, 0.039% carbon dioxide, and small amounts of other gases.

On average, a person inhales about **14,000 litres** of air every day. Therefore, poor air quality may affect the quality of life now and for future generations by affecting the health, the environment, the economy and the city's liveability.

Rapid urbanization and industrialization has added other elements/compounds to the pure air and thus caused the increase in pollution. In order to prevent, control and abate air pollution, the Air (Prevention and Control of Pollution) Act was enacted in 1981.

Air quality is a measure of the suitability of air for breathing by people, plants and animals.

According to Section 2(b) of Air (Prevention and control of pollution) Act, 1981 '**air pollution**' has been defined as '**the presence in the atmosphere of any air pollutant.**'

As per Section 2(a) of Air (Prevention and control of pollution) Act, 1981 '**air pollutant**' has been defined as '**any solid, liquid or gaseous substance [(including noise)] present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment**'

4.2 Air Quality Index:

An **Air Quality Index (AQI)** is a number used by government agencies to measure the air pollution levels and communicate it to the population. As the AQI increases, it means that a large percentage of the population will experience severe adverse health effects. The measurement of the AQI requires an **air monitor** and an **air pollutant** concentration over a specified **averaging period**.

We present herewith following important Parameters.

1. AQI- Air Quality Index
2. PM-2.5- Particulate Matter of Size 2.5 micron
3. PM-10- Particulate Matter of Size 10micron

Table No 8: Indoor Air Quality Parameters:

No	Location	AQI	PM-2.5	PM-10
1	Office	88	48	58
2	Principal Cabin	81	43	57
3	Library	82	42	63
4	Seminar Hall	89	50	60

5	Staff Room	91	59	62
6	Home Economics Dept.	92	61	66
7	Class Room 1	91	52	66
8	Class Room 2	92	53	60
9	Class Room 3	93	53	60
10	Class Room 4	92	51	62
	Maximum	**93**	**61**	**76**
	Minimum	**81**	**42**	**57**

CHAPTER V
STUDY OF INDOOR COMFORT CONDITION PARAMETERS

In this Chapter, we present the various Indoor Comfort Parameters measured during the Audit.

The Parameters include:

1. Temperature
2. Humidity
3. Lux Level
4. Noise Level.

Table No9: Study of Indoor Comfort Condition Parameters:

No	Locations	Temperature (°C)	Humidity (%)	Lux Level	Noise Level (dB)
1	Office	39	22	230	38
2	Principal Cabin	38	25	240	36
3	Library	38	25	235	30
4	Seminar Hall	38.1	22	240	41
5	Staff Room	38	22	220	40
6	Home Economics Dept.	37	25	210	30
7	Class Room 1	38.5	25	210	41
8	Class Room 2	38.5	25	225	39
9	Class Room 3	38	25	240	39
10	Class Room 4	38	25	252	39
	Maximum	**38.5**	**25**	**240**	**41**
	Minimum	**37**	**22**	**210**	**30**

CHAPTER VI
STUDY OF WASTE MANAGEMENT

6.1 Segregation of Waste at Source:

The solid waste is segregated at source. There are separate bins for collection at various points and is disposed of for further action.

Photograph of Waste Collection Bins:

6.2 Organic Waste Management:

The College has installed bio-composting pit, to convert bio-degradable waste into bio-fertilizer.

6.3 Liquid Waste Management:

The College has installed Septic tank and is cleaned periodically.

6.4 E-Waste Management:

The E-Waste is disposed of through Authorized E-Waste collecting agency.

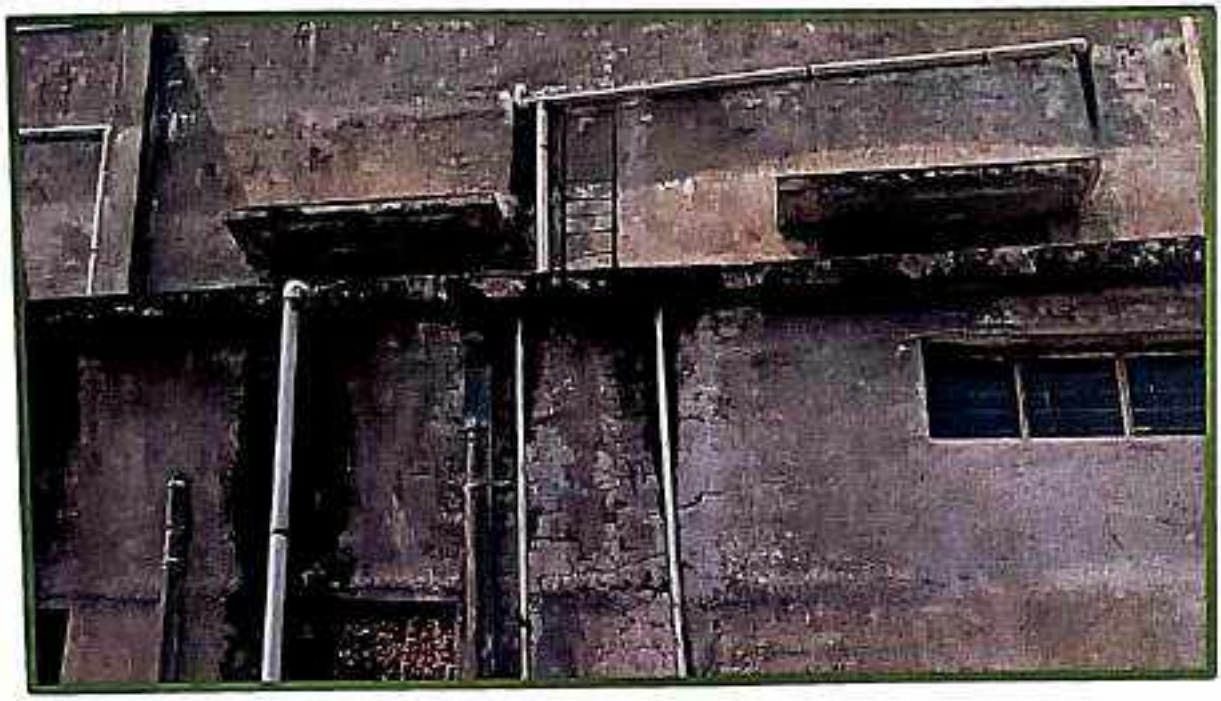
6.5 Sanitary Waste Incinerator:

The College has not installed Sanitary Waste Incinerator. It is recommended to installed sanitary waste disposal.

CHAPTER-VII
STUDY OF RAIN WATER MANAGEMENT

The College has implemented the Rain Water Management Project. The College has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used to increase the underground water table.

Photograph of Rain Water Management Pipe:



CHAPTER-VIII
STUDY OF ENVIRONMENTAL FRIENDLY PRACTICES

7.1 Internal Tree Plantation:

The College has internal Tree Plantation.

Photograph of Internal Tree Plantation:

7.2 Creation of Awareness on Save Energy:

The College has displayed Poster emphasizing on the Save Energy.

Photograph of Poster on Plastic Ban:

ANNEXURE-I:
INDOOR AIR QUALITY & WATER QUALITY STANDARDS:

1. Category Wise Air Quality Index Values & Concentration of PM 2.5 & PM10:

No	Category	AQI Value	Concentration Range, PM 2.5	Concentration Range, PM 10
1	Good	0 to 50	0 to 30	0 to 50
2	Satisfactory	51 to 100	31 to 60	51 to 100
3	Moderately Polluted	101 to 200	61 to 90	101 to 250
4	Poor	201 to 300	91 to 120	251 to 350
5	Very Poor	301 to 400	121 to 250	351 to 430
6	Severe	401 to 500	250 +	430 +

2. Recommended Water Quality Standards:

No	Designated Best Use	Criteria
1	Drinking Water Source without conventional Treatment but after disinfection	pH between 6.5 to 8.5 Dissolved Oxygen 6 mg/l or more
2	Drinking water source after conventional treatment and disinfection	pH between 6 to 9 Dissolved Oxygen 4 mg/l or more
3	Outdoor Bathing (Organized)	pH between 6.5 to 8.5 Dissolved Oxygen 5 mg/l or more
4	Controlled Waste Disposal	pH between 6 to 8.5

ENERGY AUDIT REPORT

of

Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner

Tah.Hinganghat

Dist.Wardha- 442 307

Year: 2021-22

Prepared by:

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795, Email: engress123@gmail.com

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandry,
Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
Email: eee@mahaurja.com, Web: www.mahaurja.com

ECN/2022-23/CR-43/1709

10th May, 2022

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with ***MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)*** under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm : M/s Engress Services
Yashshree, 26, Nirmal Bag Society,
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Parvati, Pune – 411 009.

Registration Category : *Empanelled Consultant for Energy Conservation Programme for Class 'A'*

Registration Number : ***MEDA/ECN/2022-23/Class A/EA-32.***

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **09th May, 2024** from the date of registration, to carry out energy audits under the Energy Conservation Programme.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (I/C)

ENGRESS SERVICES PUNE

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: engress123@gmail.com

Ref: ES/SSLPKM/21-22/17

Date: 10/06/2022

CERTIFICATE

This is to certify that we have conducted Energy Audit at Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner in the Year 2021-22.

The College has adopted following Energy Efficient practices:

- Maximum usage of Day Lighting
- Usage of Energy Efficient LED fittings

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Green.

For Engress Services,

A Y Mehendale,
Certified Energy Auditor
EA-8192

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3	Study of Present Energy Consumption	10
4	Study of CO_2 Emission	12
5	Study of Usage of Alternate Energy	14
6	Study of Usage Of LED Lighting	15

ENGRESS SERVICES PUNE

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner, for awarding us the assignment of Energy Audit of their Wadner campus for the Year: 2021-22.

We are thankful to all Staff members for helping us during the field study.

EXECUTIVE SUMMARY

1. **Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner,** consumes Energy in the form of **Electrical Energy;** used for various gadgets, office & other facilities

2. **Present Energy Consumption & CO_2 Emission:**

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	3932	3.538
2	Maximum	871	0.783
3	Minimum	103	0.092
4	Average	327.66	0.294

3. **Energy Conservation projects already installed:**

- Usage of Energy Efficient LED fittings

4. **Usage of Alternate Energy:**

- As on today College has not installed solar rooftop power plant. It is recommended to install solar rooftop system on the college building as per availability of funds.

5. **Usage of LED Lighting:**

- The Total Lighting load of College is **1.5 kW.**
- The LED Lighting Load is **0.38 kW.**
- The % of LED Lighting to Total Lighting Load is **25.33 %.**

6. **Assumptions:**

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2into atmosphere
2. Average Energy generated by **1 kWp** Solar PV Plant : **4 kWh/Day**
3. Annual Solar Energy Generation Days: **300 Nos**

7. **References:**

- For CO_2 Emissions: www.tatapower.com
- For Roof Top Solar Energy generation: www.solarrooftop.gov.in

ABBREVIATIONS

BEE	Bureau of Energy Efficiency
MSEDCL	Maharashtra Electricity Distribution Company Limited
kWh	Kilo Watt Hour
kWp	Kilo Watt Peak
Kg	Kilo Gram
MT	Metric Ton
CO_2	Carbon Di Oxide
LED	Light Emitting Diode

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study Connected Load
2. To study Present Energy Consumption
3. To compute the CO_2 emissions
4. To study usage of Alternate Energy
5. To study usage of LED Lighting

1.2 Table No 1: General Details of the College:

No	Head	Particulars
1	Name of the Institution	Shri Saibaba Lok Prabodhan Kala Mahavidyalaya,
2	Address	S.No.452/2 Pipri Road,Wadner,Hinganghat Dist:Wardha
3	Latitude	20.25° N
4	Longitude	78.44° E
5	Affiliation	Rashtra Sant Tukodoji Maharaj University, Nagpur

CHAPTER-II
STUDY OF CONNECTED LOAD

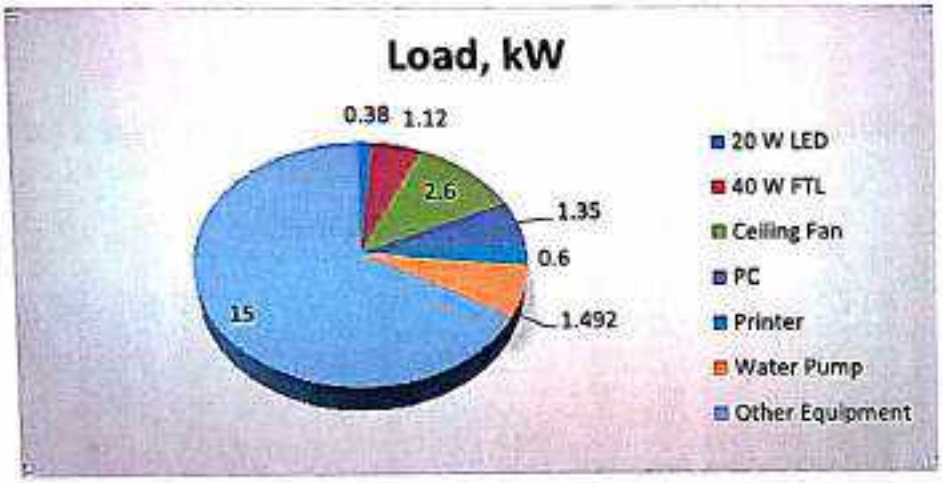
The major contributors to the connected load of the College are as under.

Table No 2: Equipment wise Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	20 W LED	19	20	0.38
2	40 W FTL	28	40	1.12
3	Ceiling Fan	40	65	2.6
4	PC	9	150	1.35
5	Printer	4	150	0.6
6	Water Pump	2	746	1.492
7	Other Equipment	100	150	15
8	**Total**			**23**

We present the above Data in a PIE Chart as under.

Chart No1: Connected Load:



CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Energy Consumption

Table No. 3: Study of Electrical Energy Consumption: 21-22:

No	Month	Energy Purchased, kWh
1	Apr-21	871
2	May-21	333
3	Jun-21	214
4	Jul-21	181
5	Aug-21	253
6	Sep-21	258
7	Oct-21	235
8	Nov-21	186
9	Dec-21	103
10	Jan-22	223
11	Feb-22	714
12	Mar-22	361
13	Total	3932
14	Maximum	871
15	Minimum	103
16	Average	327.66

Chart No 2: To study the variation of Monthly Electrical Energy Consumption:

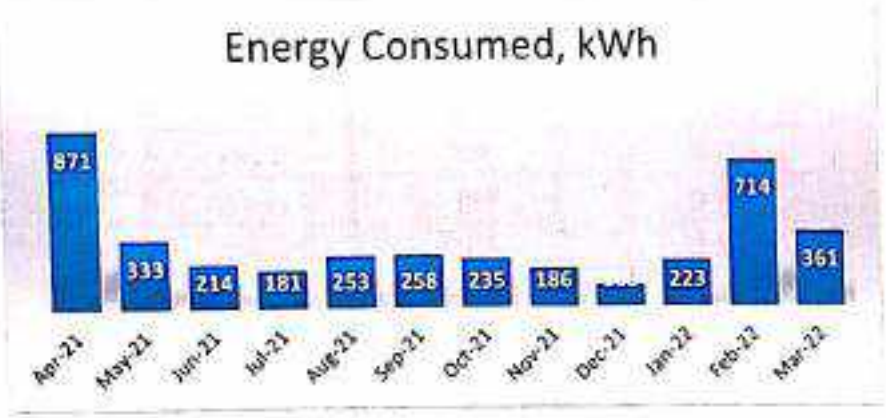


Table No 4: Important Parameters:

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CHAPTER-IV
STUDY OF CO_2 EMISSION

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the College for performing its day to day activities

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is as under

- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the College due to its Day to Day operations

Table No 5: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr-21	871	0.78
2	May-21	333	0.29
3	Jun-21	214	0.19
4	Jul-21	181	0.16
5	Aug-21	253	0.22
6	Sep-21	258	0.23
7	Oct-21	235	0.21
8	Nov-21	186	0.16
9	Dec-21	103	0.09
10	Jan-22	223	0.20
11	Feb-22	714	0.64
12	Mar-22	361	0.32
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Chart No 3: Representation of Month wise CO_2 Emissions:

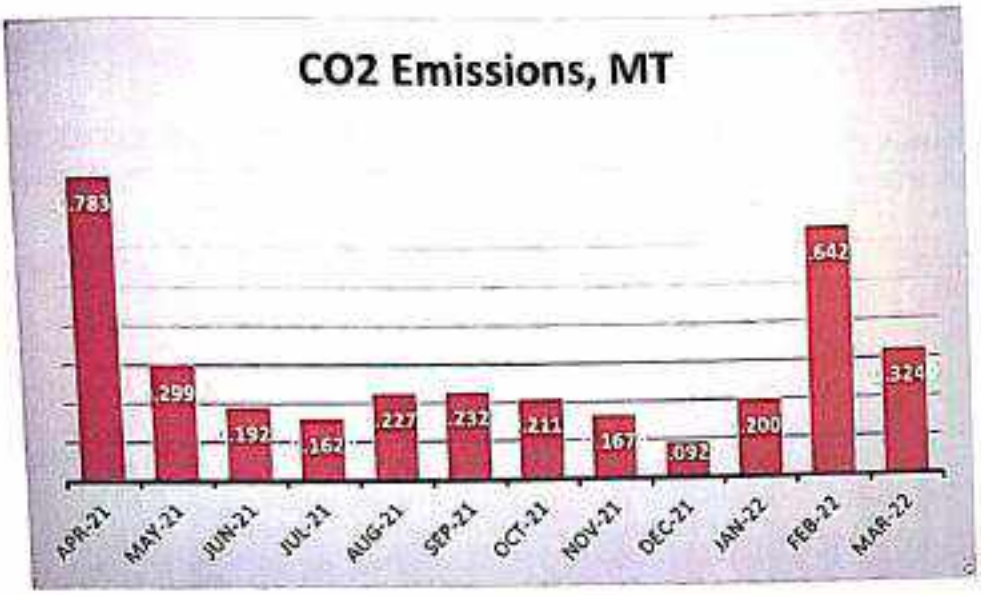

Table No 6: Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	3932	3.53
2	Maximum	871	0.78
3	Minimum	103	0.09
4	Average	327.66	0.29

CHAPTER-V

STUDY OF USAGE OF ALTERNATE ENERGY

As on today College has not install solar roof top PV plant, solar thermal water heating plant the percentages of uses of alternate energy in the annual energy demand work is be zero percent.

CHAPTER VI
STUDY OF USAGE OF LED LIGHTING

In this chapter, we compute the percentage of usage of LED Lighting to Total Lighting Load, as under.

Table No 8: Percentage of Usage of LED Lighting to Total Lighting Load:

No	Particulars	Value	Unit
1	No of 40 W FTL Fittings	28	Nos
2	Demand of 40 W FTL Fitting	40	W/Unit
3	Total Electrical Load of 40 W FTL Fittings	1.12	kW
4	No of 20 W LED Tube Lights	19	Nos
5	Demand of 20 W LED Tube Light	20	W/Unit
6	Total Electrical Load of 20 W LED Fittings	0.38	kW
7	Annual Total Lighting Load = 3+6	1.5	kWh
8	Annual LED Lighting Load = 6	0.38	kWh
9	**Annual Lighting Requirement met by LED= 8*100/7**	25.33	%

GREEN AUDIT REPORT

of

Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner

Tah.Hinganghat

Dist.Wardha- 442 307

Year: 2021-22

Prepared by:

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795, Email: engress123@gmail.com

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency

(Government of Maharashtra Institution)

Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandry

Aundh, Pune, Maharashtra 411067

Ph.No. 020-29800470

Email: ceo@mahaurja.com, Web: www.mahaurja.com

EEN/2022-23/CE-43/1309 10th May, 2022

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with ***MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)*** under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm M/s Engress Services
Vaishalee, 26, Nirmal Bag Society,
Near Mahatmagan English School,
Paud Road, Pune - 411 009.

Registration Category *Empanelled Consultant for Energy Conservation Programme for Class 'A'*

Registration Number *MEDA/EEN/2022-23/Class A/CA-32.*

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and cancelling the registration, if the information is found incorrect.
- This empanelment is valid till **09th May, 2024** from the date of registration, to carry out energy audits under the Energy Conservation Programme.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

ASSOCHAM

GEM Certificate

ASSOCHAM hereby certifies that

Mr. A Y Mehendale

has successfully passed the

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

with

"Excellent Performance"

on

06 June, 2022

He/She is now eligible to receive the GEM Sustainability Certification Papers.
ASSOCHAM feels proud to award the GEM Certified Professional title to him/her.

Pankaj R. Chankar
Chairman, GEM

GEM CP 22705

Deepak Sood
Secretary General, ASSOCHAM

ENGRESS SERVICES * PUNE *

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: engress123@gmail.com

Ref: ES/SSLPKM/21-22/19

Date: 10/06/2022

CERTIFICATE

This is to certify that we have conducted Green Audit at Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner in the Year 2021-22.

The College has adopted following Energy Efficient and Green Practices:

- Usage of Energy Efficient LED Light Fitting
- Maximum Usage of Day Lighting
- Provision of Separate bins for Dry & Wet Waste
- The College has installed Septic Tank and is cleaned periodically.
- Implementation of Rain Water Management Project
- Maintenance of good Internal Road
- Tree Plantation in the campus
- Creation of awareness by Display of Posters on Resource Conservation

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Green.

For Engress Services,

ENGRESS SERVICES * PUNE *

A Y Mehendale,
Certified Energy Auditor, EA-8192
ASSOCHAM GEM Certified Professional: GEM: 22/788

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4	Study of Usage of Renewable Energy	14
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ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner for awarding us the assignment of Green Audit of their Wadner Campus for the Academic Year 2021-22.

We are thankful to all Staff members for helping us during the field study.

EXECUTIVE SUMMARY

1. **Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner,** consumes Energy in the form of Electrical Energy; used for various gadgets, office & other facilities

2. **Present Energy Consumption & CO_2 Emission:**

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	3932	3.538
2	Maximum	871	0.783
3	Minimum	103	0.092
4	Average	327.66	0.294

3. **Energy Conservation projects already installed:**

- Usage of Energy Efficient LED fittings

4. **Usage of Renewable Energy:**

- It is recommended to install roof-top solar PV Plant on college building.

5. **Waste Management:**

5.1 Segregation of Waste at Source:

The Waste is segregated at source and the recyclable waste, like paper, plastic waste is handed over to Authorized waste collecting agent for further recycling.

5.2 Organic Waste Management:

The College has installed bio-composting pit, to convert bio-degradable waste into bio-fertilizer.

5.3 Liquid Waste Management:

The College has installed Septic and is cleaned periodically.

5.4 E-Waste Management:

The E-Waste is disposed of through Authorized E-Waste collecting agency.

5.5 Sanitary Waste Incinerator:

The College has not installed Sanitary Waste Incinerator. It is recommended to install the sanitary waste disposal.

6. Rain Water Management:

The College has installed the Rainwater management project, the rain water falling on the terrace is collected and is used for increasing the under the underground water level.

7. Green & Sustainable Practices:

- Good Internal Road
- Medicinal Plant Garden
- Provision of Ramp & Wheel Chair for Divyangajan
- Creation of Awareness on Resource Conservation, by Display of Posters

8. Assumptions:

- **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2 into atmosphere
- Average Energy generated by **1 kWp** Solar PV Plant : **4 kWh/Day**
- Annual Solar Energy Generation Days: **300 Nos**

9. References:

- For CO_2 Emissions: www.tatapower.com
- For Roof Top Solar Energy Generation: www.solarrooftop.gov.in

ABBREVIATIONS

BEE	Bureau of Energy Efficiency
kWh	Kilo Watt Hour
kWp	Kilo Watt Peak
Kg	Kilo Gram
MT	Metric Ton
CO_2	Carbon Di Oxide
LPD	Liters per Day

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study present Energy Consumption
2. To Study CO_2 emissions
3. To study usage of Renewable Energy
4. Study of Waste Management
5. Study of Rain Water Management
6. Study of Green & Sustainable Practices

1.2 Table No 1: General Details of the College:

No	Head	Particulars
1	Name of the Institution	Shri Saibaba Lok Prabodhan Kala Mahavidyalaya,
2	Address	S.No.452/2 Pipri Road,Wadner,Hinganghat Dist:Wardha
3	Latitude	20.25° N
4	Longitude	78.44° E
5	Affiliation	Rashtra Sant Tukodoji Maharaj University, Nagpur

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Energy Consumption.

Table No 2: Study of Electrical Energy Consumption: 21-22:

No	Month	Energy Purchased, kWh
1	Apr-21	871
2	May-21	333
3	Jun-21	214
4	Jul-21	181
5	Aug-21	253
6	Sep-21	258
7	Oct-21	235
8	Nov-21	186
9	Dec-21	103
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11	Feb-22	714
12	Mar-22	361
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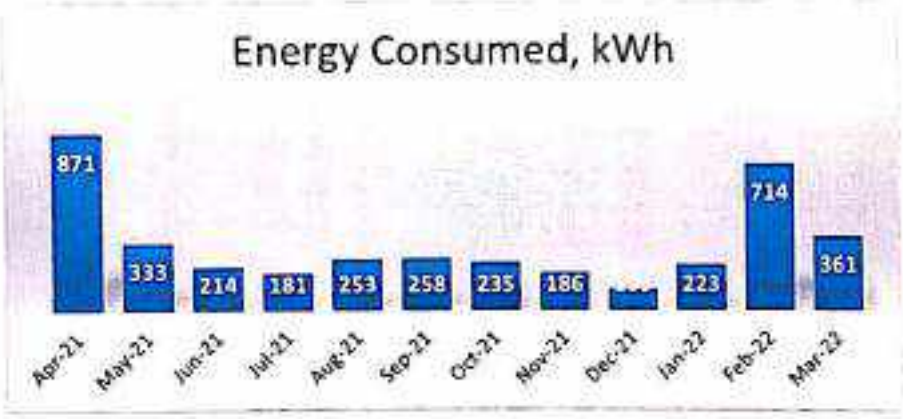

Table No 3: Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh
1	Total	3932
2	Maximum	871
3	Minimum	103
4	Average	327.66

CHAPTER-III
STUDY OF CO_2 EMISSION

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the College for performing its day to day activities

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is as under

- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the College due to its Day to Day operations

Table No 4: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr-21	871	0.78
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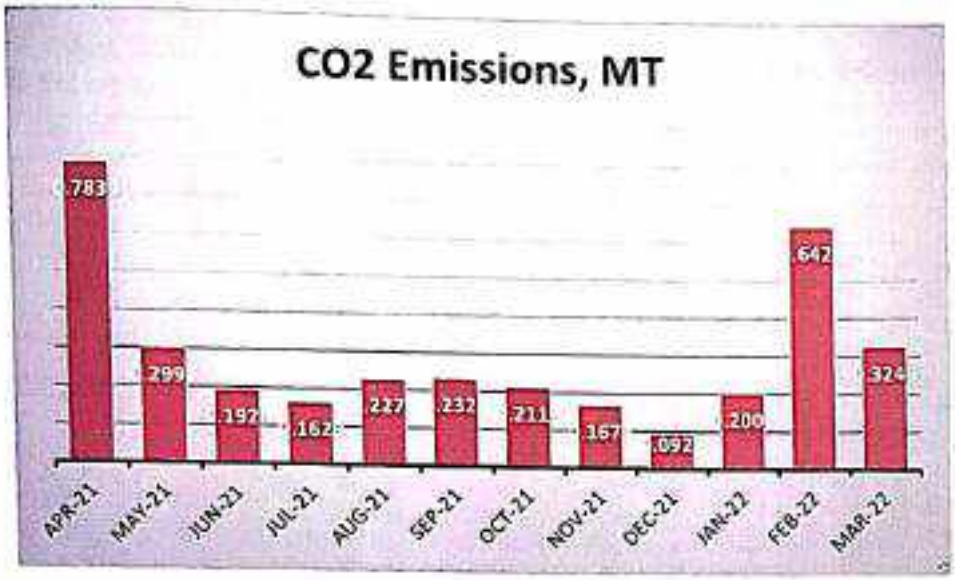

Table No 5: Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	3932	3.53
2	Maximum	871	0.78
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4	Average	327.66	0.29

CHAPTER-IV

STUDY OF USAGE OF RENEWABLE ENERGY

As on today College has not installed solar roof-top PV plant, solar thermal water heating plant, it is recommend to install solar rooftop plant on the College building.

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The solid waste is segregated at source. There are separate bins for collection at various points and is disposed of for further action.

Photograph of Waste Collection Bins:

5.2 Organic Waste Management:

The College has installed bio-composting pit, to convert bio-degradable waste into bio-fertilizer.

5.3 Liquid Waste Management:

The College has installed Septic tank and is cleaned periodically.

5.4 E-Waste Management:

The E-Waste is disposed of through Authorized Agency.

5.5 Sanitary Waste Incinerator:

The College has not installed Sanitary Waste Incinerator. It is recommended to installed sanitary waste disposal.

CHAPTER-VI

STUDY OF RAIN WATER MANAGEMENT

The College has implemented the Rain Water Management Project. The College has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used to increase the underground water table.

Photograph of Rain Water Management Pipe & Bore-Well Charging:

CHAPTER-VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Roads:

The College has well maintained internal road to facilitate the easy movement of the students within the campus.

Photograph of Internal Road:

7.2 Internal Tree Plantation:

The College has well maintained landscaped garden in the campus.

Photograph of Tree plantation:

7.3 Provision of Ramp for Divyangajan:

The College has made provision for Ramp for easy movement of Divyangajan. Also dedicated wash room and wheel chair are made available.

Photograph of Ramp:

7.3 Creation of Awareness on Save Energy:

The College has displayed Poster emphasizing on the Save Energy.

Photograph of Poster on Save Energy:

7.4 Best Practices and Initiative for Social Awareness:

The College has taken initiative for different social awareness program, about water and forest conservation, trees plantations, society cleanness etc under National Service Scheme.

Photograph of Best Practices and Initiative:

ANNEXURE-I

LIST OF TREES & PLANTS IN THE CAMPUS

No	Name of Trees	Number of Trees
1	Azadirachta Indica (Neem)	30
2	Cestrum nocturnum (Ratrani)	02
3	Betea monosperma (Palas)	05
4	Tectona Grandis (Sagwan)	02
5	Thuja (Vidya)	25
6	Delonix Regia (Gulmohar)	02
7	Madhuca longifolia (Mahau)	05
8	Millettia pinnata (Karanj)	8
9	Lawsonia inermis (Mehendi)	100
10	Santalum album (sandalwood)	23
11	Citrus limon (Lemon)	02
12	Citrus limetta (Mausambi)	02
13	Terminalia catappa (Almond)	01
14	Nyctanthes arbor-tristis (Parijat)	02
15	Murraya koenigii (Curry Leaves)	02
16	Ficus benghalensis (Banyan)	01
17	Aegle marmelos (Indian bael)	01

ENVIRONMENTAL AUDIT REPORT
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Dist.Wardha- 442 307

Year: 2021-22

Prepared by

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Ph No: 020-[illegible]

Email: [illegible] Web: www.mahaurja.com

MEDA/EC(N)/2022-23/CR-43/1709 30th May, 2022

CERTIFICATE OF REGISTRATION

FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with *MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)* under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

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Vaishalee, 2/6, Nirmal Bag Society
Near Mukteshwar English School
Paud, Pune - 411 029

Registration Category : *Empanelled Consultant for Energy Conservation Programme for Class 'A'*

Registration Number : *MEDA/EC(N)/2022-23/Class-A/E-4-12*

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General Manager (EC)

ASSOCHAM

GEM Certificate

ASSOCHAM hereby certifies that

Mr. A V Mehendale

has successfully passed the

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with

"Excellent Performance"

on

05 June, 2022

He/she is also eligible to pursue the GEM Sustainability Consultant Program.

ASSOCHAM feels proud to extend the GEM Certified Professional title to him/her.

Pankaj K. Ghadiok
Director, GEM

GEM CP 22758

Deepak Sood
Secretary General, ASSOCHAM

ENGRESS SERVICES PUNE

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
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Tel: 09890444795 Email: engress123@gmail.com

Ref: ES/SSLPKM/21-22/18

Date: 10/06/2022

CERTIFICATE

This is to certify that we have conducted Environmental Audit at Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner in the Year 2021-22.

The College has adopted following Environment Friendly Practices:

- Usage of Energy Efficient LED Light Fitting
- Maximum Usage of Day Lighting
- Provision of Separate bins for Dry & Wet Waste
- The College has installed septic tanks and cleans periodically.
- Implementation of Rain Water Management Project
- Tree Plantation in the campus
- Creation of awareness by Display of Posters on Resource Conservation

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Green.

ENGRESS SERVICES * PUNE *

For Engress Services,

A Y Mehendale,
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ASSOCHAM GEM Certified Professional: GEM: 22/788

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ENGRESS SERVICES PUNE

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EXECUTIVE SUMMARY

1. **Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner,** consumes Energy in the form of **Electrical Energy;** used for various gadgets, office & other facilities

2. **Pollution caused due to College Activities:**

   - **Air pollution:** Mainly CO_2 on account of Electricity & LPG Consumption.
   - **Solid Waste:** Bio degradable Waste, Garden Waste, Recyclable Waste and Human Waste.
   - **Liquid Waste:** Human liquid Waste.

3. **Present Energy Consumption & CO_2 Emission:**

No	Parameter/ Value	Electrical Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	3932	3.538
2	Maximum	871	0.783
3	Minimum	103	0.092
4	Average	327.66	0.294

4. **Various initiatives taken for Energy Conservation:**

   - Usage of Energy Efficient LED Lighting
   - Maximum Usage of Day Lighting

5. **Usage of Renewable Energy& Reduction in CO_2 Emission:**

   - It is recommended to install roof-top solar PV Plant on college building as per availability of funds.

6. **Indoor Air Quality Parameters:**

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	100	67	78
2	Minimum	80	49	60

7. **Indoor Comfort Conditions:**

No	Parameter/Value	Temperature, ^0C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	34	44	285	47
2	Minimum	33	41	192	32

8. **Waste Management:**

8.1 Segregation of Waste at Source:

The Waste is segregated at source and the recyclable waste, like paper, plastic waste is handed over to Authorized waste collecting agent for further recycling.

8.2 Organic Waste Management:

The College has installed bio-composting pit, to convert bio-degradable waste into bio-fertilizer.

8.3 Liquid Waste Management:

The College has installed Septic and is cleaned periodically.

8.4 E-Waste Management:

The E-Waste is disposed of through Authorized E-Waste collecting agency.

9. Rain Water Management:

The College has installed the Rainwater management project, the rain water falling on the terrace is collected and is used for increasing the under the underground water level.

10. Environment Friendly Initiatives:

- Tree Plantation in the campus.
- Display of Posters on Resource Conservation

11. Assumptions:

- **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2 into atmosphere
- Average Energy generated by **1 kWp** Solar PV Plant : **4 kWh/Day**
- Annual Solar Energy Generation Days: **300 Nos**

12. References:

- For CO_2 Emissions: www.tatapower.com
- For Roof Top Solar Energy Generation: www.solarrooftop.gov.in
- For Various Indoor Air Parameters: www.ishrae.com
- For AQI & Water Quality Standards: www.cpcb.com

ABBREVIATIONS

MSEDCL	:	Maharashtra State Distribution Company Limited
MT	:	Metric Ton
kWh	:	kilo-Watt Hour
KLPD	:	Kilo Litres per Day
LED	:	Light Emitting Diode
AQI	:	Air Quality Index
PM-2.5	:	Particulate Matter of Size 2.5 Micron
PM-10	:	Particulate Matter of Size 10 Micron
CPCB	:	Central Pollution Control Board

CHAPTER-I
INTRODUCTION

1.1Important Definitions:

1.1.1Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

1.1.2. Environmental Audit: Definition:

An audit which aims at verification and validation to ensure that various environmental laws are compiled with and adequate care has been taken towards environmental protection and preservation

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment

1.1.3. Environmental Pollutant: means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

1.1.4. Relevant Environmental Laws in India: Table No-1:

1927	The Indian Forest Act
1972	The Wildlife Protection Act
1974	The Water (Prevention and Control of Pollution) Act
1977	The Water (Prevention & Control of Pollution) Cess Act
1980	The Forest (Conservation) Act
1981	The Air (Prevention and Control of Pollution) Act
1986	The Environment Protection Act
1991	The Public Liability Insurance Act
2002	The Biological Diversity Act
2010	The National Green Tribunal Act

1.1.5. Some Important Environmental Rules in India: Table No-2:

1989	Hazardous Waste (Management and Handling) Rules
1989	Manufacture, Storage and Import of Hazardous Chemical Rules
2000	Municipal Solid Waste (Management and Handling) Rules
1998	The Biomedical Waste (Management and Handling) Rules
1999	The Environment (Siting for Industrial Projects) Rules
2000	Noise Pollution (Regulation and Control) Rules
2000	Ozone Depleting Substances (Regulation and Control) Rules
2011	E-waste (Management and Handling) Rules
2011	National Green Tribunal (Practices and Procedure) Rules
2011	Plastic Waste (Management and Handling) Rules

1.1.6 National Environmental Plans & Policy Documents: Table No-3:

1.	National Forest Policy, 1988
2.	National Water Policy, 2002
3.	National Environment Policy or NEP (2006)
4.	National Conservation Strategy and Policy Statement on Environment and Development, 1992
5.	Policy Statement for Abatement of Pollution (1992)
6.	National Action Plan on Climate Change
7.	Vision Statement on Environment and Human Health
8.	Technology Vision 2030 (The Energy Research College)
9.	Addressing Energy Security and Climate Change (MoEF and Bureau of Energy Efficiency
10	The Road to Copenhagen; India's Position on Climate Change Issues (MoEF)

1.2 Audit Methodology:

1. To study Resource Consumption & CO_2 Emissions
2. To Study CO_2 Emission Reduction
3. To study Indoor Air Quality Parameters
4. To Study Waste Management
5. To Study Rain Water Harvesting
6. To Study Environment Friendly Initiatives

1.3 General Details of College: Table No: 4

No	Head	Particulars
1	Name of the Institution	Shri Saibaba Lok Prabodhan Kala Mahavidyalaya,
2	Address	S.No.452/2 Pipri Road,Wadner,Hinganghat Dist:Wardha
3	Latitude	20.25° N
4	Longitude	78.44° E
5	Affiliation	Rashtra Sant Tukodoji Maharaj University, Nagpur

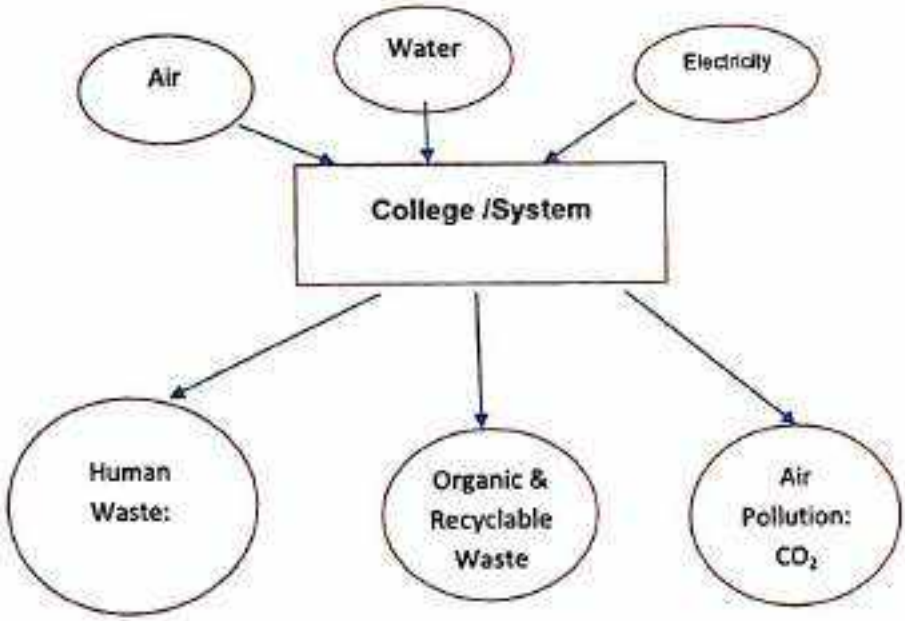
CHAPTER-II
STUDY OF RESOURCE CONSUMPTION & CO_2 EMISSION

The College consumes following Natural/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the College System & Environment as under.

Chart No 1: Representation of College as System:



Now we compute the Generation of CO_2 on account of consumption of Electrical Energy. The basis of Calculation for CO_2 emissions due to Electrical Energy is as under

- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Table No 5: Study of Consumption of Energy & CO_2 Emissions: 21-22:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr-21	871	0.78
2	May-21	333	0.29
3	Jun-21	214	0.19
4	Jul-21	181	0.16
5	Aug-21	253	0.22
6	Sep-21	258	0.23
7	Oct-21	235	0.21
8	Nov-21	186	0.16
9	Dec-21	103	0.09

10	Jan-22	223	0.20
11	Feb-22	714	0.64
12	Mar-22	361	0.32
13	Total	3932	3.53
14	Maximum	871	0.78
15	Minimum	103	0.09
16	Average	327.66	0.29

Chart No 2: Study of CO_2 Emission:

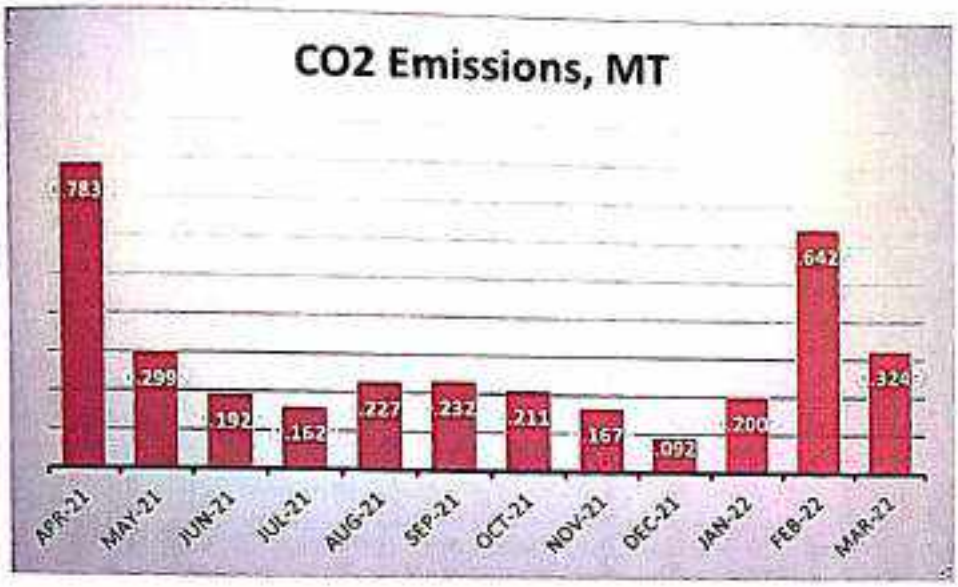


Table No 6: Various Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	3932	3.53
2	Maximum	871	0.78
3	Minimum	103	0.09
4	Average	327.66	0.29

CHAPTER III
STUDY OF CO_2 EMISSION REDUCTION

As on today College has not installed solar roof-top PV plant, solar thermal water heating plant, it is recommend to install solar rooftop plant on the College building.

CHAPTER IV
STUDY OF INDOOR AIR QUALITY

4.1 Importance of Air Quality:

Air: The common name given to the atmospheric gases used in breathing and photosynthesis.

By volume, Dry Air contains 78.09% Nitrogen, 20.95% Oxygen, 0.93% Argon, 0.039% carbon dioxide, and small amounts of other gases.

On average, a person inhales about **14,000 litres** of air every day. Therefore, poor air quality may affect the quality of life now and for future generations by affecting the health, the environment, the economy and the city's liveability.

Rapid urbanization and industrialization has added other elements/compounds to the pure air and thus caused the increase in pollution. In order to prevent, control and abate air pollution, the Air (Prevention and Control of Pollution) Act was enacted in 1981.

Air quality is a measure of the suitability of air for breathing by people, plants and animals.

According to Section 2(b) of Air (Prevention and control of pollution) Act, 1981 **'air pollution'** has been defined as **'the presence in the atmosphere of any air pollutant.'**

As per Section 2(a) of Air (Prevention and control of pollution) Act, 1981 **'air pollutant'** has been defined as **'any solid, liquid or gaseous substance [(including noise)] present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment**

4.2 Air Quality Index:

An **Air Quality Index (AQI)** is a number used by government agencies to measure the air pollution levels and communicate it to the population. As the AQI increases, it means that a large percentage of the population will experience severe adverse health effects. The measurement of the **AQI** requires an **air monitor** and an **air pollutant** concentration over a specified **averaging period**.

We present herewith following important Parameters.

1. AQI- Air Quality Index
2. PM-2.5- Particulate Matter of Size 2.5 micron
3. PM-10- Particulate Matter of Size 10micron

Table No 8: Indoor Air Quality Parameters:

No	Location	AQI	PM-2.5	PM-10
1	Office	93	55	68
2	Principal Cabin	80	49	60
3	Library	98	58	74
4	Seminar Hall	90	51	63

ENGRESS SERVICES PUNE

5	Staff Room	99	60	67
6	Home Economics Dept.	100	67	78
7	Class Room 1	93	53	71
8	Class Room 2	92	54	70
9	Class Room 3	91	55	69
10	Class Room 4	92	56	69
	Maximum	**100**	**67**	**78**
	Minimum	**80**	**49**	**60**

CHAPTER V
STUDY OF INDOOR COMFORT CONDITION PARAMETERS

In this Chapter, we present the various Indoor Comfort Parameters measured during the Audit.

The Parameters include:

1. Temperature
2. Humidity
3. Lux Level
4. Noise Level.

Table No9: Study of Indoor Comfort Condition Parameters:

No	Locations	Temperature (°C)	Humidity (%)	Lux Level	Noise Level (dB)
1	Office	33.5	41	200	45
2	Principal Cabin	33.5	44	210	41
3	Library	34	45	195	32
4	Seminar Hall	34	42	194	47
5	Staff Room	33.8	42	192	41
6	Home Economics Dept.	33.2	41	210	33
7	Class Room 1	33	44	210	45
8	Class Room 2	33	42	225	47
9	Class Room 3	33.5	42	241	41
10	Class Room 4	33	42	251	42
	Maximum	**34**	**44**	**285**	**47**
	Minimum	**33**	**41**	**192**	**32**

CHAPTER VI
STUDY OF WASTE MANAGEMENT

6.1 Segregation of Waste at Source:

The solid waste is segregated at source. There are separate bins for collection at various points and is disposed of for further action.

Photograph of Waste Collection Bins:

6.2 Organic Waste Management:

The College has installed bio-composting pit, to convert bio-degradable waste into bio-fertilizer.

6.3 Liquid Waste Management:

The College has installed Septic tank and is cleaned periodically.

6.4 E-Waste Management:

The E-Waste is disposed of through Authorized Agency.

6.5 Sanitary Waste Incinerator:

The College has not installed Sanitary Waste Incinerator. It is recommended to installed sanitary waste disposal.

CHAPTER-VII
STUDY OF RAIN WATER MANAGEMENT

The College has implemented the Rain Water Management Project. The College has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used to increase the underground water table.

Photograph of Rain Water Management Pipe & Bore-Well Charging:

CHAPTER-VIII
STUDY OF ENVIRONMENTAL FRIENDLY PRACTICES

7.1 Internal Tree Plantation:

The College has internal Tree Plantation.

Photograph of Internal Tree Plantation:

7.2 Creation of Awareness on Save Energy:

The College has displayed Poster emphasizing on the Save Energy.

Photograph of Poster on Save Energy:

ANNEXURE-I:
INDOOR AIR QUALITY & WATER QUALITY STANDARDS:

1. Category Wise Air Quality Index Values & Concentration of PM 2.5 & PM10:

No	Category	AQI Value	Concentration Range, PM 2.5	Concentration Range, PM 10
1	Good	0 to 50	0 to 30	0 to 50
2	Satisfactory	51 to 100	31 to 60	51 to 100
3	Moderately Polluted	101 to 200	61 to 90	101 to 250
4	Poor	201 to 300	91 to 120	251 to 350
5	Very Poor	301 to 400	121 to 250	351 to 430
6	Severe	401 to 500	250 +	430 +

2 Recommended Water Quality Standards:

Designated Best Use	Criteria
Drinking Water Source without conventional Treatment but after disinfection	pH between 6.5 to 8.5 Dissolved Oxygen 6 mg/l or more
Drinking water source after conventional treatment and disinfection	pH between 6 to 9 Dissolved Oxygen 4 mg/l or more
Outdoor Bathing (Organized)	pH between 6.5 to 8.5 Dissolved Oxygen 5 mg/l or more
Controlled Waste Disposal	pH between 6 to 8.5

ENERGY AUDIT REPORT

of

Shri Saibaba Lok Prabodhan Kala Mahavidyalaya

Wadner Tah.Hinganghat Dist.Wardha- 442 307

Year: 2022-23

Prepared by:

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: engress123@gmail.com

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ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society, Near Muktangan English School, Parvati, Pune 411 009
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MEDA Registration No: ECN/2022-23/CR-43/1709
ISO: 9001-2015 Certified (Cert No: 23EQKC13),
ISO: 14001-2015 Certified (Cert No: 23EEKW20)

ENERGY AUDIT CERTIFICATE

Certificate No: ES/SSLPKM/22-23/01

Date: 28/09/2023

This is to certify that we have conducted an Energy Audit at Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner, in the Year 2022-23.

.The Institute has adopted following Energy Efficient practices:

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient.

For Engress Services,

ENGRESS SERVICES * PUNE *

A Y Mehendale,
B E-Mechanical, M Tech- Energy
BEE Certified Energy Auditor, EA-8192

REGISTRATION CERTIFICATES

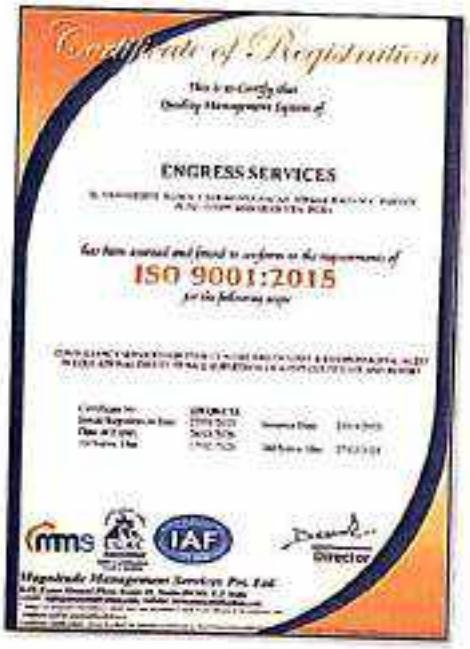
National Productivity Council
(National Certifying Agency)
PROVISIONAL CERTIFICATE

AUDITOR CERTIFICATE

Maharashtra Energy Development Agency

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

MEDA Registration Certificate



Certificate of Registration

This is to Certify that
Quality Management System of

ENGRESS SERVICES

has been audited and found to conform to the requirements of
ISO 9001:2015
for the following scope

Director

ISO: 9001-2015 Certificate

Certificate of Registration

This is to Certify that
Environment Management System of

ENGRESS SERVICES

has been audited and found to conform to the requirements of
ISO 14001:2015
for the following scope

Director

ISO: 14001-2015 Certificate

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ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner for awarding us the assignment of Energy Audit of their Campus for the Year: 2022-23.

We are thankful to all the staff members for helping us during the field study.

EXECUTIVE SUMMARY

1. Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner consumes Energy in the form of Electrical Energy used for various Electrical Equipment, office & other facilities.

2. Present Connected Load & Annual Energy Consumption:

No	Particulars	Value	Unit
1	Total Connected Load	23	kW
2	Annual Energy Consumption	4223	kWh
3	Annual CO_2 Emissions	3.80	MT

3. Energy Performance Index:

No	Particulars	Value	Unit
1	Total Annual Energy Consumed	4223	kWh
2	Total Built up area of Institute	980	m^2
3	Energy Performance Index =(1) / (2)	4.30	kWh/m^2

4. Study of Lighting Power Density & % of LED Lighting:

No	Particulars	Value	Unit
1	Lighting Power density	0.53	W/m^2
2	% of Usage of LED Lighting to Total Lighting Load	25.33	%

5. Renewable Energy & Energy Efficiency Projects:

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting

6. Assumption:

1. 1 kWhof Electrical Energy releases 0.9 Kg of CO_2into atmosphere

7. References:

- Audit Methodology: www.mahauria.com
- Energy Conservation Building Code: ECBC-2017: www.beeindia.gov.in
- For CO_2 Emissions: www.tatapower.com

ABBREVIATIONS

LED	:	Light Emitting Diode
MSEDCL	:	Maharashtra State Electricity Distribution Company Limited
BEE	:	Bureau of Energy Efficiency
ECBC	:	Energy Conservation Building Code
MEDA	:	Maharashtra Energy Development Agency
PV	:	Photo Voltaic
Kg	:	Kilo Gram
kWh	:	kilo-Watt Hour
CO_2	:	Carbon Di Oxide
MT	:	Metric Ton

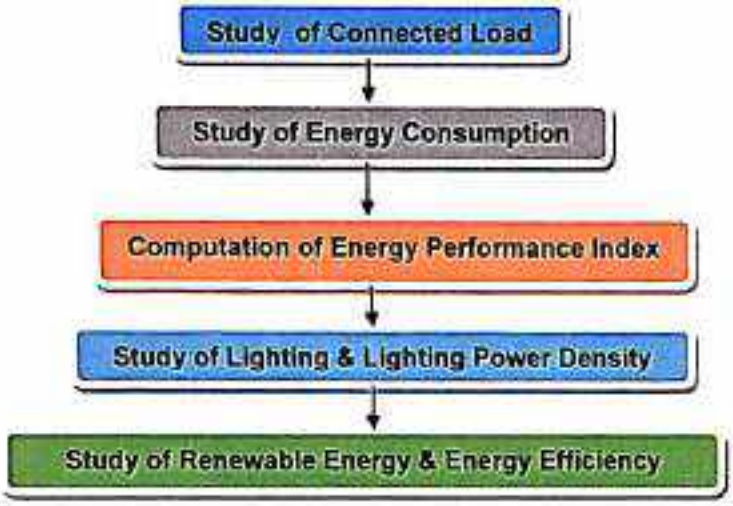
CHAPTER-I
INTRODUCTION

1.1 Introduction:

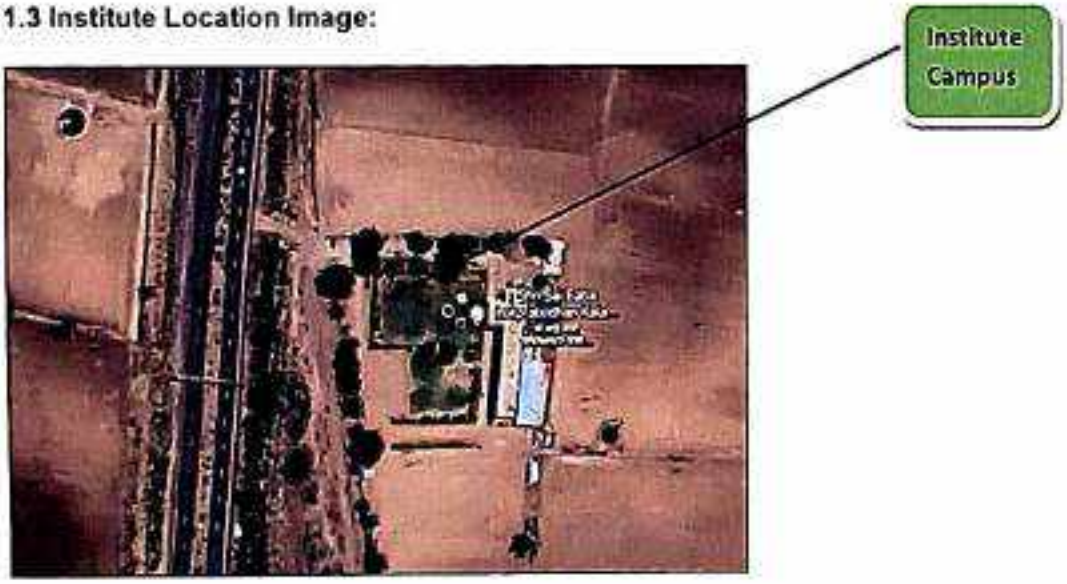
An Energy Audit is conducted at Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner. The guidelines followed for conducting the Energy Audit are:

- BEE India's Energy Conservation Building Code: ECBC-2017
- Maharashtra Energy Development Agency (www.mahaurja.com)
- Tata Power: www.tatapower.com

1.2Audit Procedural Steps:



1.3 Institute Location Image:



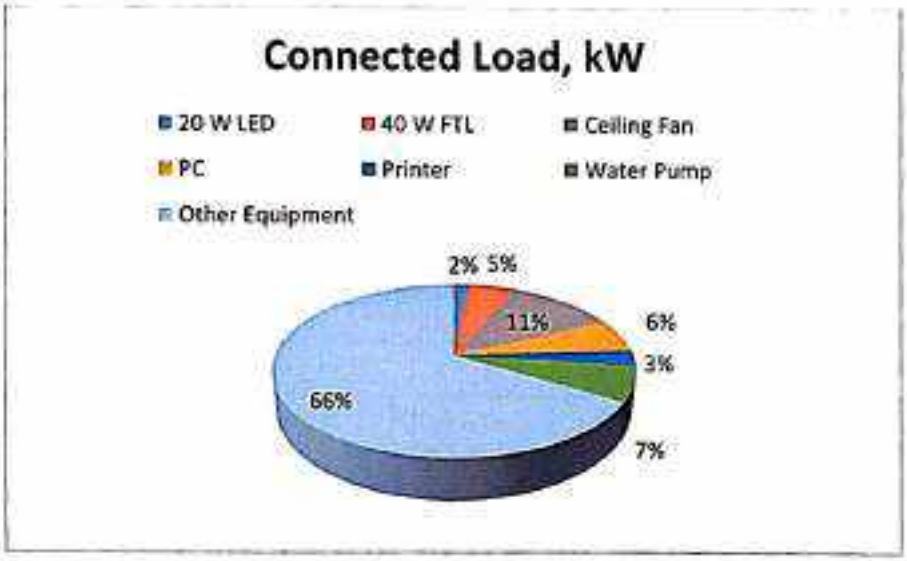
CHAPTER-II
STUDY OF CONNECTED LOAD

The major contributors to the connected load of the Institute include:

Table No 1: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	20 W LED	19	20	0.38
2	40 W FTL	28	40	1.12
3	Ceiling Fan	40	65	2.6
4	PC	9	150	1.35
5	Printer	4	150	0.6
6	Water Pump	2	746	1.492
7	Other Equipment	100	150	15
8	Total			23

Chart No 1: Study of Connected Load:



CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Electrical Energy Consumption.

Table No 2: Electrical Bill Analysis- 2022-23:

No	Month	Energy Consumed, kWh	CO_2 Emissions, MT
1	Apr-22	536	0.482
2	May-22	358	0.322
3	Jun-22	263	0.236
4	Jul-22	244	0.219
5	Aug-22	287	0.258
6	Sep-22	339	0.305
7	Oct-22	318	0.286
8	Nov-22	328	0.295
9	Dec-22	344	0.309
10	Jan-23	391	0.351
11	Feb-23	440	0.396
12	Mar-23	375	0.337
13	Total	4223	3.800
14	Maximum	536	0.482
15	Minimum	244	0.219
16	Average	351.91	0.316

Chart No 2: Variation in Monthly Energy Consumption:

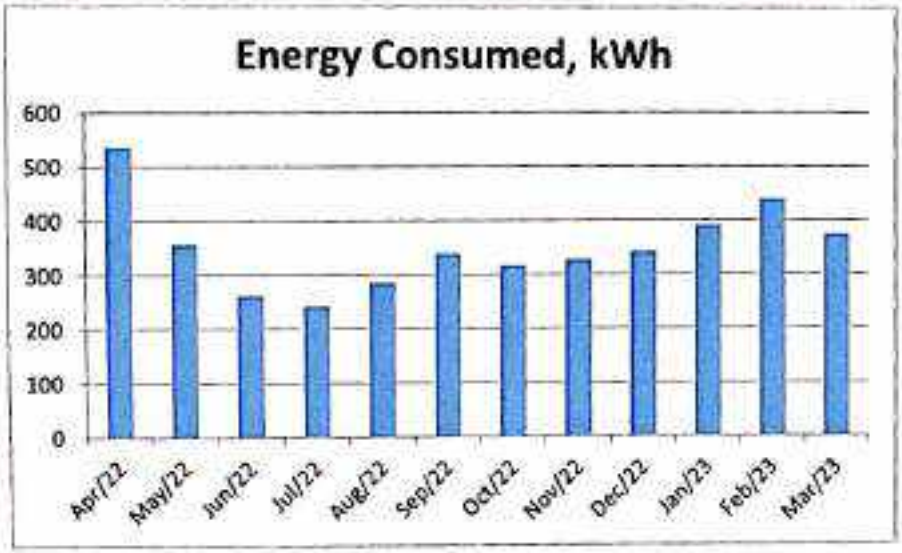


Table No 3: Important Parameters:

No	Parameter/ Variation	Energy Consumed, kWh	CO_2 Emissions, MT
1	Total	4223	3.800
2	Maximum	536	0.482
3	Minimum	244	0.219
4	Average	351.91	0.316

CHAPTER-IV
STUDY OF ENERGY PERFORMANCE INDEX

Energy Performance Index: Energy Performance Index of a Building is its Annual Energy Consumption in Kilo Watt Hours per square meter of the Building

It is determined by:

$$EPI = \frac{\text{(Annual Energy Consumption in kWh)}}{\text{(Total Built-up area in m}^2\text{)}}$$

Now we compute the EPI for the Institute as under:

Table No4: Computation of Energy Performance Index:

No	Particulars	Value	Unit
1	Total Annual Energy Consumed	4223	kWh
2	Total Built up area of Institute	980	m^2
3	Energy Performance Index =(1) / (2)	4.30	kWh/m^2

CHAPTER V
STUDY OF LIGHTING

Terminology:

1. Lumen is a unit of light flow or luminous flux. The lumen rating of a lamp is a measure of the total light output of the lamp. The most common measurement of light output (or luminous flux) is the lumen. Light sources are labeled with an output rating in lumens.

2. Lux is the metric unit of measure for illuminance of a surface. One lux is equal to one lumen per square meter.

3. Circuit Watts is the total power drawn by lamps and ballasts in a lighting circuit under assessment.

4. Installed Load Efficacy is the average maintained illuminance provided on a horizontal working plane per circuit watt with general lighting of an interior. Unit: lux per watt per square metre (lux/W/m²)

5. Lamp Circuit Efficacy is the amount of light (lumens) emitted by a lamp for each watt of power consumed by the lamp circuit, i.e. including control gear losses. This is a more meaningful measure for those lamps that require control gear. Unit: lumens per circuit watt (lm/W)

6. Installed Power Density. The installed power density per 100 lux is the power needed per square metre of floor area to achieve 100 lux of average maintained illuminance on a horizontal working plane with general lighting of an interior
Unit: watts per square metre per 100 lux (W/m²/100 lux) 100 Installed power density (W/m²/100 lux)

7. Lighting Power Density: It is defined as Total Lighting Load in a room divided by the Area of that Room in square meters.

In this Chapter we compute: Lighting Power Density of a Class Room. We also compute the percentage usage of LED Lighting to total Lighting Load of the Institute.

Table No 5: Computation of Lighting Power Density:

No	Particulars	Value	Unit
1	No of 20 W LED Tube Lights in Class Room	4	Nos
2	Demand of 20 LED Tube Light	20	W/Unit
3	Total Lighting Load in the Class Room= (1) * (2)	80	W
4	Area of Class Room	149.57	m²
5	Lighting Power Density = (3)/ (4)	0.53	W/m²

Now, we compute the usage of LED Lighting to Total Lighting Load, as under.

Table No 6: Percentage Usage of LED Lighting to Annual Lighting Load:

No	Particulars	Value	Unit
1	No of 40 W FTL Fittings	28	Nos
2	Demand of 40 W FTL Fitting	40	W/Unit
3	Total Electrical Load of 40 W FTL Fittings	**1.12**	kW
4	No of 20 W LED Tube Lights	19	Nos
5	Demand of 20 W LED Tube Light	20	W/Unit
6	Total Electrical Load of 20 W LED Fittings	**0.38**	kW
7	Annual Total Lighting Load = 3+6	**1.5**	kWh
8	Annual LED Lighting Load = 6	**0.38**	kWh
9	**Annual Lighting Requirement met by LED= 8*100/7**	**25.33**	%

CHAPTER-VI
STUDY OF RENEWABLE ENERGY& ENERGY EFFICIENCY

6.1 Usage of Renewable Energy:

As on today College has not install solar roof-top PV plant, Solar thermal water heating plant; the percentages of uses of alternate energy to the annual energy demand work to be zero percent.

6.2 Energy Efficiency Measures Adopted:

- The Institute has adopted Energy Efficient LED Lighting.

GREEN AUDIT REPORT

of

Shri Saibaba Lok Prabodhan Kala Mahavidyalaya

Wadner Tah.Hinganghat Dist.Wardha- 442 307

Year: 2022-23

Prepared by:

ENGRESS SERVICES

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Near Muktangan English School, Parvati, Pune 411009
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ISO: 14001-2015 Certified (Cert No: 23EEKW20)

GREEN AUDIT CERTIFICATE

Certificate No: ES/SSLPKM/22-23/02 **Date: 28/09/2023**

This is to certify that we have conducted Green Audit at Shri Saibaba Lok Prabodhan Kala Mahavidyalaya Wadner, in the Year 2022-23.

The Institute has adopted followingEnergy Efficient& GreenPractices:

- Usage of Energy Efficient LED Light Fitting
- Segregation of Waste at Source
- Installation of Bio Composting Pit
- College has installed septic tanks and it cleans periodically
- Installation of Rain Water Harvesting Project
- Maintenance of good Internal Road
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan
- Creation of awareness by display of Posters on Resource Conservation

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Green.

For Engress Services,

A Y Mehendale,
B E- Mech, M Tech-Energy, Certified Energy Auditor, EA-8192
ASSOCHAM GEM Certified Professional: GEM: 22/788

ENGRESS SERVICES * PUNE *

REGISTRATION CERTIFICATES

Maharashtra Energy Development Agency

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

MEDA Registration Certificate

GEM Certificate

ASSOCHAM hereby certifies that

Mr. A V Mehendale

has successfully passed the

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

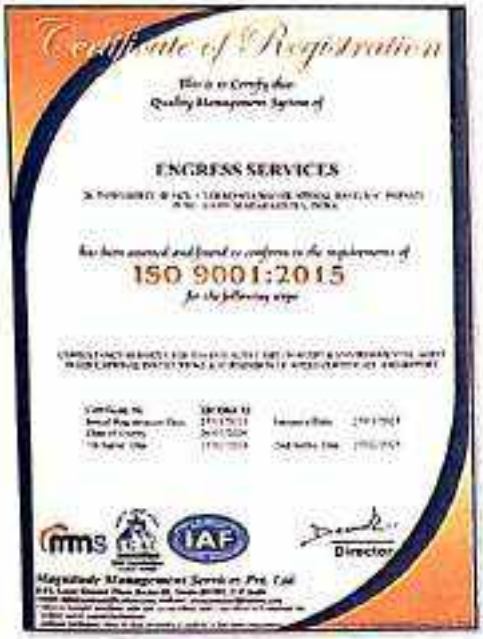
with

"Excellent Performance"

on

06 June, 2022

GEM Certified Professional Certificate



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2. Present Energy Consumption& CO_2 Emission:

No	Particulars	Value	Unit
1	Annual Energy Consumption	4223	kWh
2	Annual CO_2 Emissions	3.80	MT

3. Renewable Energy & Energy Efficiency Projects:

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting

4. Waste Management:

5.1 Segregation of Waste at Source:

The Waste is segregated at source in separate Waste Bins & is handed over for further action.

5.2 Bio Composting Pit:

The Institute has a Bio Composting Pit, to convert the Leafy Waste into Bio Compost

5.3 Liquid Waste Management:

The Institute has installed Septic Tank and it cleans periodically.

5.4Sanitary Waste Management:

It is recommended to install Sanitary Waste Incinerator, for disposal of the Sanitary Waste.

5.5 E-Waste Management:

It is recommended to dispose of the E Waste through Authorized Agency.

6. Rain Water Management:

The Institute has installed the Rainwater Management project; the rain water falling on the terrace is collected through pipes and is used for recharging the land water table.

7. Green & Sustainable Practices:

- Maintenance of good Internal Road
- Provision of Ramp for Divyangajan
- Creation of awareness on Resource Conservation Display of Posters

8. Assumption:

1. 1 kWh of Electrical Energy releases 0.9 Kg of CO_2 into atmosphere

9. Reference:

- For CO_2 Emissions: www.tatapower.com

ABBREVIATIONS

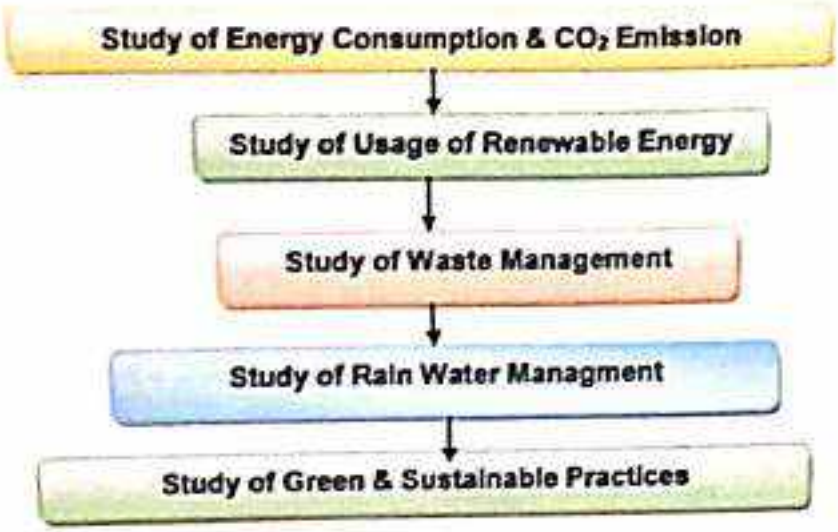
BEE	Bureau of Energy Efficiency
kWh	Kilo Watt Hour
LPD	Liters Per Day
Kg	Kilo Gram
MT	Metric Ton
CO_2	Carbon Di Oxide
Qty	Quantity

CHAPTER-I
INTRODUCTION

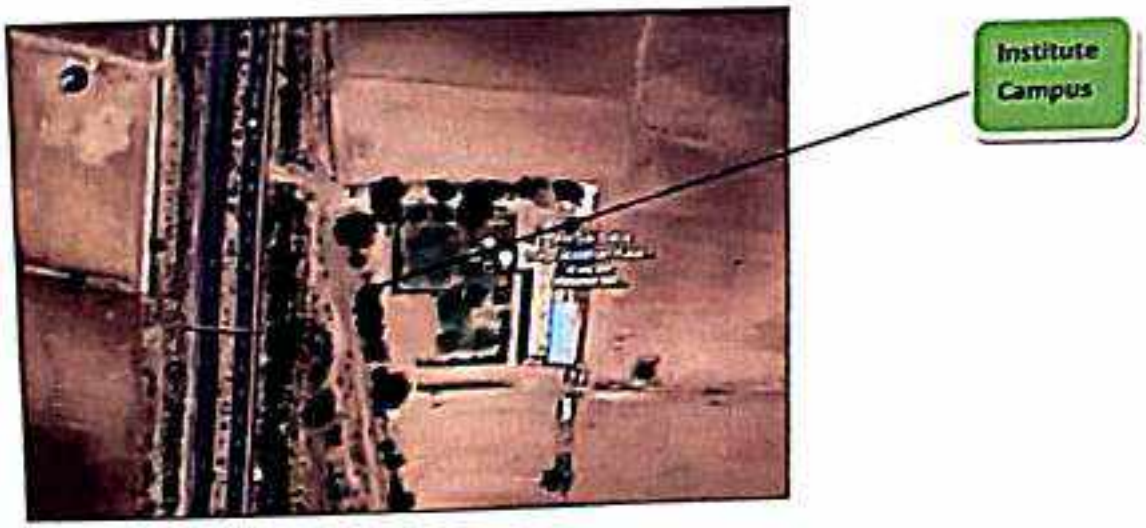
1.1 Introduction:

A Green Audit is conducted at Shri Saibaba Lok Prabodhan Kala Mahavidyalaya Wadner.

1.2 Audit Procedural Steps:



1.3 Institute Location Image:



CHAPTER-II
STUDY OF ENERGY CONSUMPTION& CO_2 EMISSION

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the Institute for performing its day to day activities

The Institute uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is as under

- **1 kWh of Electrical Energy releases 0.9 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the Institute due to its Day to Day operations

Table No1: Month wise CO_2 Emissions:

No	Month	Energy Consumed, kWh	CO_2 Emissions, MT
1	Apr-22	536	0.482
2	May-22	358	0.322
3	Jun-22	263	0.236
4	Jul-22	244	0.219
5	Aug-22	287	0.258
6	Sep-22	339	0.305
7	Oct-22	318	0.286
8	Nov-22	328	0.295
9	Dec-22	344	0.309
10	Jan-23	391	0.351
11	Feb-23	440	0.396
12	Mar-23	375	0.337
13	Total	4223	3.800
14	Maximum	536	0.482
15	Minimum	244	0.219
16	Average	351.91	0.316

Chart No 1: Month wise CO_2 Emissions:

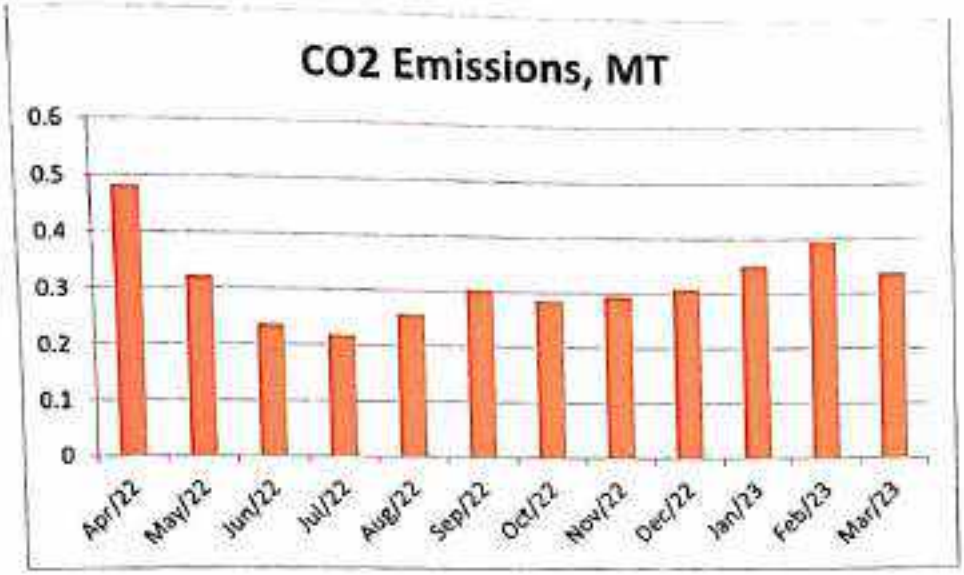


Table No2: Important Parameters:

No	Parameter/ Value	Energy Consumed, kWh	CO_2 Emissions, MT
1	Total	4223	3.800
2	Maximum	536	0.482
3	Minimum	244	0.219
4	Average	351.91	0.316

CHAPTER III
STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has not installed Roof Top Solar PV Plant. It is recommended to install Roof Top Solar PV Plant.

CHAPTER IV
STUDY OF WASTE MANAGEMENT

4.1 Segregation of Waste at Source:

The Waste is segregated at source in separate Waste Bins & is handed over for further action

Photograph of Waste Collection Bins:

4.2 Bio Composting Pit:

The Institute has a Bio Composting Pit, to convert the Leafy Waste into Bio Compost

Photograph of Bio Composting Pit:

4.3 Liquid Waste Management:
The Institute has installed Septic Tanks it cleans periodically

4.4 Sanitary Waste Management:
It is recommended to install Sanitary Waste Incinerator, for disposal of the Sanitary Waste

4.5 E Waste Management:
It is recommended to dispose of the E Waste through Authorized Agency

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STUDY OF RAIN WATER MANAGEMENT

The Institute has implemented the Rain Water Management Project. The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used for recharging the land water table and gardening purpose.

Photograph of Rain Water Management & Pipe Section:

CHAPTER VI
STUDY OF GREEN & SUSTAINABLE PRACTICES

6.1 Internal Pedestrian:

The College has well maintained internal Pedestrian to facilitate the easy movement of the students within the campus.

Photograph of Internal Pedestrian:

6.2 Internal Tree Plantation:

The College has well maintained landscaped garden in the campus.

Photograph of Tree plantation:

6.3 Provision of Ramp for Divyangajan:

For easy movement of Divyangajan, the Institute has made provision of Ramp.

Photograph of Ramp:

6.3 Creation of Awareness about Energy Conservation:

The Institute has displayed posters emphasizing on importance of Energy Conservation.

Photograph of Poster on Energy Conservation:

ANNEXURE-I
LIST OF TREES & PLANTS IN THE CAMPUS

No	Name of Trees	Number of Trees
1	Azadirachta Indica (Neem)	30
2	Cestrum nocturnum (Ratrani)	02
3	Betea monosperma (Palas)	05
4	Tectona Grandis (Sagwan)	02
5	Thuja (Vidya)	25
6	Delonix Regia (Gulmohar)	02
7	Madhuca longifolia (Mahau)	05
8	Millettia pinnata (Karanj)	8
9	Lawsonia inermis (Mehendi)	100
10	Santalum album (sandalwood)	23
11	Citrus limon (Lemon)	02
12	Citrus limetta (Mausambi)	02
13	Terminalia catappa (Almond)	01
14	Nyctanthes arbor-tristis (Parijat)	02
15	Murraya koenigii (Curry Leaves)	02
16	Ficus benghalensis (Banyan)	01
17	Aegle marmelos (Indian bael)	01

ENVIRONMENTAL AUDIT REPORT

of

Shri Saibaba Lok Prabodhan Kala Mahavidyalaya

Wadner Tah.Hinganghat Dist.Wardha- 442 307

Year: 2022-23

Prepared by:

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795Email: engress123@gmail.com

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society, Near Muktangan English School,
Parvati, Pune 411 009Tel: 09890444795 Email: engress123@gmail.com
MEDA Registration No: ECN/2022-23/CR-43/1709
ISO: 9001-2015 Certified (Cert No: 23EQKC13),
ISO: 14001-2015 Certified (Cert No: 23EEKW20)

ENVIRONMENTAL AUDIT CERTIFICATE

Certificate No: ES/SSLPKM/22-23/03 **Date: 28/09/2023**

This is to certify that we have conducted Environmental Audit at Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner, in the Year 2022-23.

The Institute has adopted following Energy Efficient& Green Practices:

- Usage of Energy Efficient LED Light Fitting
- Segregation of Waste at Source
- Installation of Bio Composting Pit
- College has installed septic tanks and it cleans periodically
- Installation of Rain Water Harvesting Project
- Maintenance of good Internal Road
- Tree Plantation in the Campus
- Creation of awareness by display of Posters on Resource Conservation

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the Eco Friendly.

For Engress Services,

A Mehendale

A Y Mehendale,
B E- Mech, M Tech-Energy, Certified Energy Auditor, EA-8192
ASSOCHAM GEM Certified Professional: GEM: 22/788

REGISTRATION CERTIFICATES

Maharashtra Energy Development Agency

CERTIFICATE OF REGISTRATION FOR CLASS 'A'

MEDA Registration Certificate

GEM Certificate

ASSOCHAM hereby certifies that

Mr. A Y Mehendale

has successfully passed the

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

with

"Excellent Performance"

on

06 June 2022

GEM Certified Professional Certificate

Certificate of Registration

This is to certify that Quality Management System of

ENGRESS SERVICES

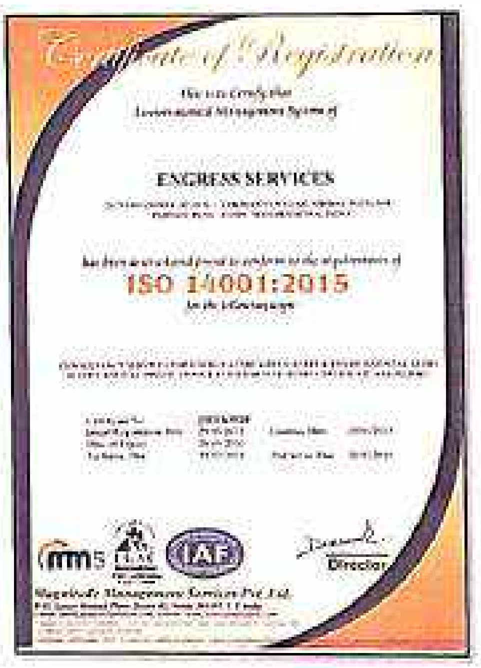
has been assessed and found to conform to the requirements of

ISO 9001:2015

for the following scope

Director

ISO: 9001-2015 Certificate



Certificate of Registration

ENGRESS SERVICES

ISO 14001:2015

Director

ISO: 14001-2015 Certificate

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ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Shri Saibaba Lok Prabodhan Kala Mahavidyalaya, Wadner for awarding us the assignment of Environmental Audit of their Campus for the Year: 2022-23.

We are thankful to all the staff members for helping us during the field study.

EXECUTIVE SUMMARY

1. Shri Saibaba Lok Prabodhan Kala Mahavidyalaya Wadner consumes Energy in the form of Electrical Energy used for various Electrical Equipment, office & other facilities.

2. Pollution due to Institute Activities:

- Air pollution:Mainly CO_2 on account of Electricity Consumption
- Solid Waste:Bio degradable Garden Waste
- Liquid Waste:Human liquid waste

3. Present Energy Consumption& CO_2 Emission:

No	Particulars	Value	Unit
1	Annual Energy Consumption	4223	kWh
2	Annual CO_2 Emissions	3.80	MT

4. Various initiatives taken for Environmental Conservation:

- Usage of Energy Efficient LED fittings
- Bio Composting Pit Installation

5. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	50	31	42
2	Minimum	35	21	32

6. Indoor Comfort Conditions:

No	Parameter/Value	Temperature, ^0C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	31	46	310	41
2	Minimum	29	42	210	37

7. Waste Management:

7.1 Segregation of Waste at Source:

The Waste is segregated at source in separate Waste Bins & is handed over for further action.

7.2 Bio Composting Pit:

The Institute has a Bio Composting Pit, to convert the Leafy Waste into Bio Compost.

7.3 Liquid Waste Management:

The Institute has installed Septic Tank and it cleans periodically.

7.4 Sanitary Waste Management:

It is recommended to install Sanitary Waste Incinerator, for disposal of the Sanitary Waste.

7.5 E Waste Management:

It is recommended to dispose of the E Waste through Authorized Agency.

8. Rain Water Management:

The Institute has installed the Rainwater Management project; the rain water falling on the terrace is collected through pipes and is used for recharging the land water table and gardening purpose.

9. Environment Friendly Initiatives:

- Display of Posters on Resource Conservation
- Tree Plantation drive NSS Cell.

10. Assumption:

1. 1 kWh of Electrical Energy releases 0.9 Kg of CO_2 into atmosphere

11. References:

- For CO_2 Emissions: www.tatapower.com
- For Various Indoor Air Parameters: www.ishrae.com
- For AQI &Water Quality Standards: www.cpcb.com

ABBREVIATIONS

Kg	:	Kilo Gram
MSEDCL	:	Maharashtra State Distribution Company Limited
MT	:	Metric Ton
kWh	:	kilo-Watt Hour
LPD	:	Liters per Day
LED	:	Light Emitting Diode
AQI	:	Air Quality Index
PM-2.5	:	Particulate Matter of Size 2.5 Micron
PM-10	:	Particulate Matter of Size 10 Micron
CPCB	:	Central Pollution Control Board
ISHRAE	:	The Indian Society of Heating & Refrigerating & Air Conditioning Engineers

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CHAPTER-I
INTRODUCTION

1. Important Definitions:

1.1. Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

1.2. Environmental Audit: Definition:

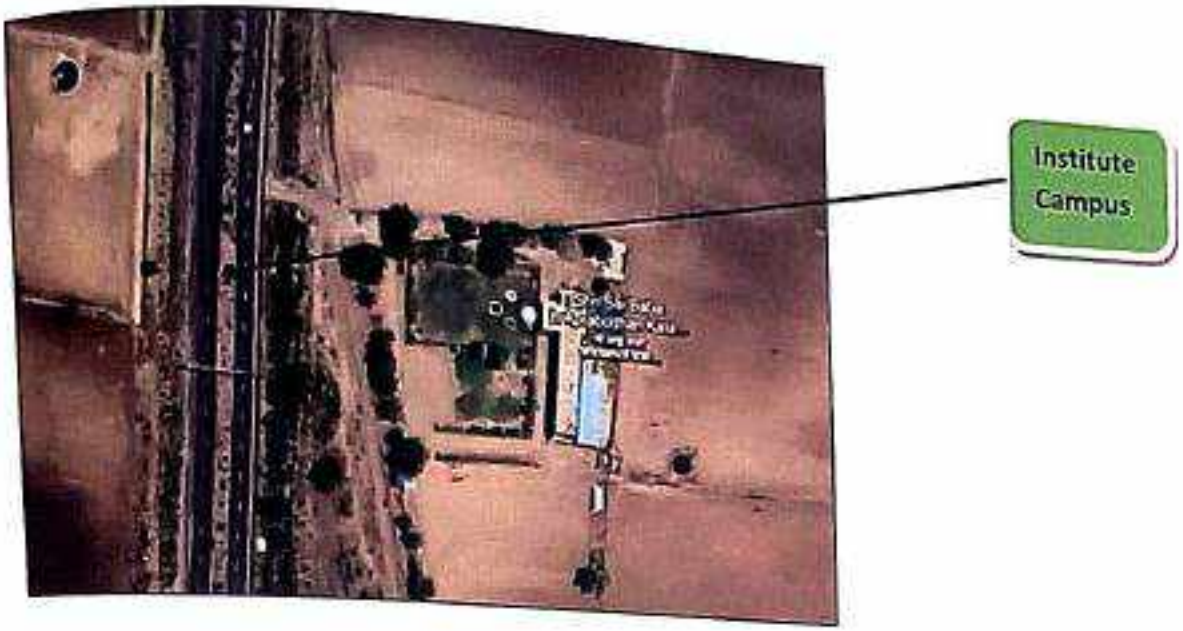
An audit which aims at verification and validation to ensure that various environmental laws are compiled with and adequate care has been taken towards environmental protection and preservation

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment

1.3. Environmental Pollutant: means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

1.4 Audit Procedural Steps:

1.5 Institute Location Image:



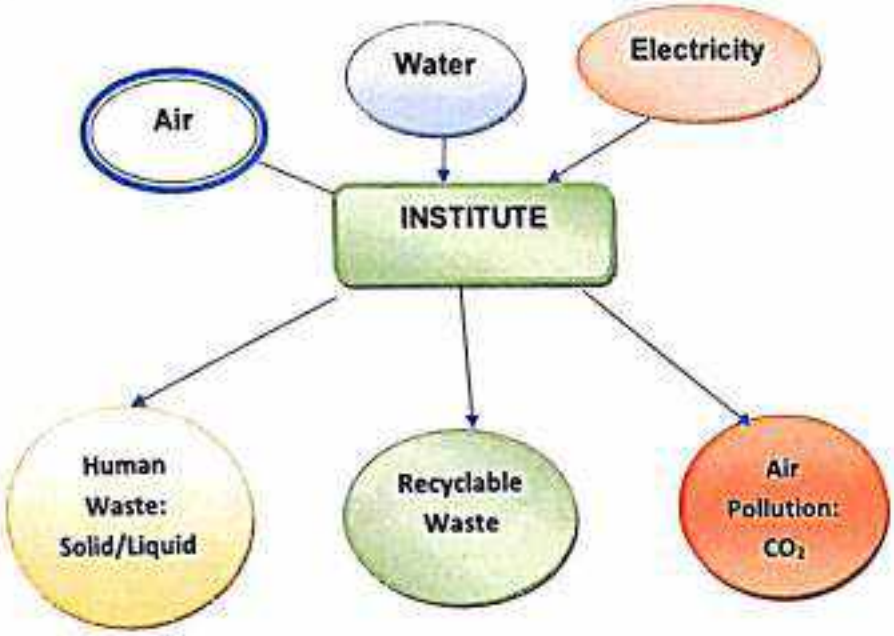
CHAPTER-II
STUDY OF RESOURCE CONSUMPTION& CO_2 EMISSION

The Institute consumes following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the Institute System & Environment as under.

Chart No 1: Representation of Institute as System & Study of Resources & Waste



Now we compute the Generation of CO_2 on account of consumption of Electrical Energy.
The basis of Calculation for CO_2 emissions due to Electrical Energy is as under.

- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Table No 5: Study of Consumption of Electrical Energy & CO_2 Emissions: 22-23:

No	Month	Energy Consumed, kWh	CO_2 Emissions, MT
1	Apr-22	536	0.482
2	May-22	358	0.322
3	Jun-22	263	0.236
4	Jul-22	244	0.219
5	Aug-22	287	0.258
6	Sep-22	339	0.305
7	Oct-22	318	0.286
8	Nov-22	328	0.295

9	Dec-22	344	0.309
10	Jan-23	391	0.351
11	Feb-23	440	0.396
12	Mar-23	375	0.337
13	Total	4223	3.800
14	Maximum	536	0.482
15	Minimum	244	0.219
16	Average	351.91	0.316

Chart No 2: Month wise CO_2Emissions:

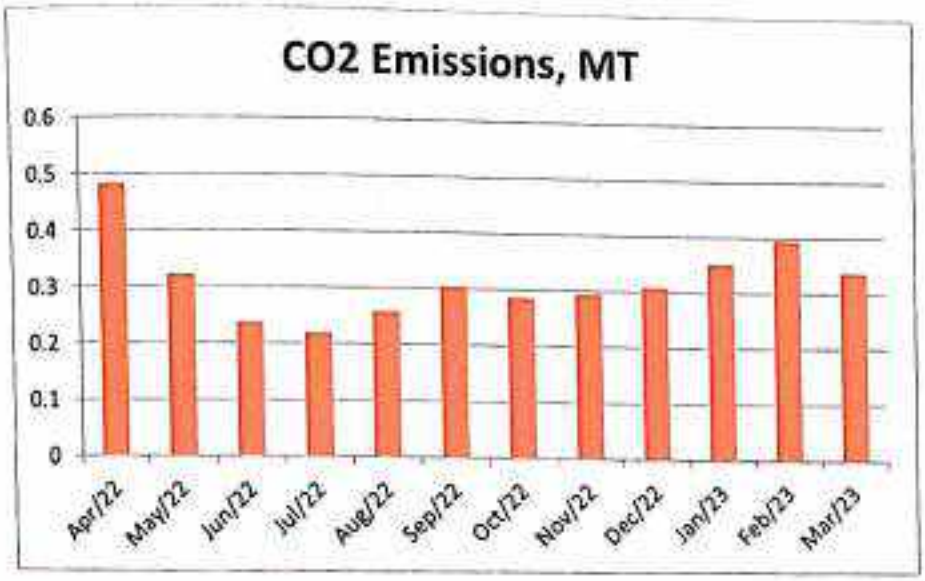


Table No 6: Important Parameters:

No	Parameter/ Value	Net Energy Consumption (kWh)	CO2 Emissions MT
1	Total	4223	3.800
2	Maximum	536	0.482
3	Minimum	244	0.219
4	Average	351.91	0.316

CHAPTER III
STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has not installed Roof Top Solar PV Plant. It is recommended to install Roof Top Solar PV Plant.

CHAPTER IV
STUDY OF INDOOR AIR QUALITY

4.1 Importance of Air Quality:

Air: The common name given to the atmospheric gases used in breathing and photosynthesis.

By volume, Dry Air contains 78.09% Nitrogen, 20.95% Oxygen, 0.93% Argon, 0.039% carbon dioxide, and small amounts of other gases.

On average, a person inhales about **14,000 liters** of air every day. Therefore, poor air quality may affect the quality of life now and for future generations by affecting the health, the environment, the economy and the city's livability.

Air quality is a measure of the suitability of air for breathing by people, plants and animals.

4.2 Air Quality Index:

An **Air Quality Index (AQI)** is a number used by government agencies to measure the **air pollution** levels and communicate it to the population. As the AQI increases, it means that a large percentage of the population will experience severe adverse health effects. The measurement of the **AQI** requires an **air monitor** and an **air pollutant** concentration over a specified **averaging period**.

We present herewith following important Parameters.

1. AQI- Air Quality Index
2. PM-2.5- Particulate Matter of Size 2.5 micron
3. PM-10- Particulate Matter of Size 10micron

Table No7: Indoor Air Quality Parameters:

No	Location	AQI	PM-2.5	PM-10
1	Office	46	30	32
2	Principal Cabin	46	27	42
3	Library	50	30	42
4	Seminar Hall	46	28	42
5	Staff Room	35	21	26
6	Home Economics Dept.	45	23	37
7	Class Room 1	45	23	37
8	Class Room 2	46	30	32
9	Class Room 3	50	31	42
10	Class Room 4	35	21	27
11	**Maximum**	**50**	**31**	**42**
12	**Minimum**	**35**	**21**	**32**

CHAPTER V
STUDY OF INDOOR COMFORT CONDITION PARAMETERS

In this Chapter, we present the various Indoor Comfort Parameters measured during the Audit.The Parameters include:

1. Temperature
2. Humidity
3. Lux Level
4. Noise Level.

Table No 8: Study of Indoor Comfort Condition Parameters:

No	Location	Temperature, °C	Humidity, %	Lux Level	Noise Level, dB
1	Office	31	42	220	37
2	Principal Cabin	30.1	44	240	39.2
3	Library	30.1	44	210	37
4	Seminar Hall	30.2	44	230	40
5	Staff Room	29.8	45	245	39.2
6	Home Economics Dept.	29.6	44	244	38.2
7	Class Room 1	29	44	310	38
8	Class Room 2	30.1	45	305	41
9	Class Room 3	30	46	289	42
10	Class Room 4	30	46	250	41
11	**Maximum**	**31**	**46**	**310**	**41**
12	**Minimum**	**29**	**42**	**210**	**37**

CHAPTER VI
STUDY OF WASTE MANAGEMENT

6.1 Segregation of Waste at Source:

The Waste is segregated at source in separate Waste Bins & is handed over for further action.

Photograph of Waste Collection Bins:

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ENGRESS SERVICES PUNE

CHAPTER-VII
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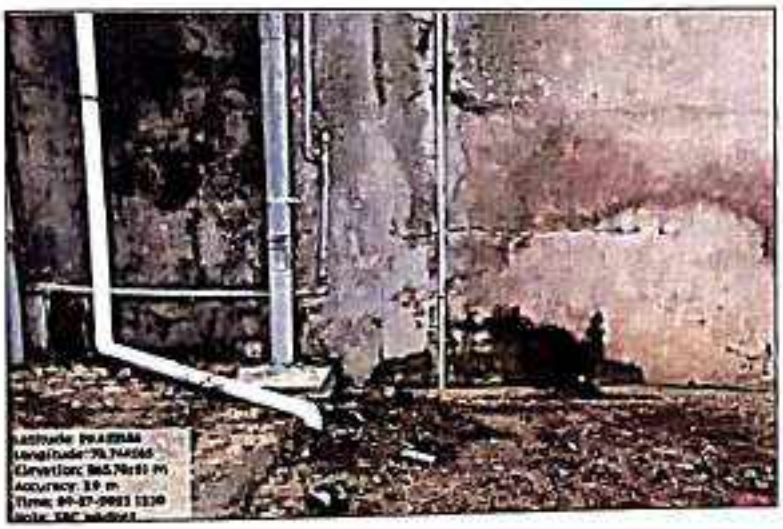
The Institute has implemented the Rain Water Management Project. The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used for recharging the land water table and gardening purpose.

Photograph of Rain Water Management & Pipe Section:



CHAPTER-VIII
STUDY OF ECO FRIENDLY INITIATIVES

8.1 7.1 Internal Tree Plantation:

The College has internal Tree Plantation.

Photograph of Internal Tree Plantation:

8.2 Creation of Awareness about Energy Conservation:

The Institute has displayed posters emphasizing on importance of Energy Conservation.

Photograph of Poster on Energy Conservation:

ANNEXURE-I:
VARIOUS AIR QUALITY, WATER QUALITY, NOISE & INDOOR COMFORT STANDARDS:

1. Category Wise Air Quality Index Values & Concentration of PM 2.5 & PM10:

No	Category	AQI Value	Concentration Range, PM 2.5	Concentration Range, PM 10
1	Good	0 to 50	0 to 30	0 to 50
2	Satisfactory	51 to 100	31 to 60	51 to 100
3	Moderately Polluted	101 to 200	61 to 90	101 to 250
4	Poor	201 to 300	91 to 120	251 to 350
5	Very Poor	301 to 400	121 to 250	351 to 430
6	Severe	401 to 500	250 +	430 +

2. Recommended Water Quality Standards:

No	Designated Best Use	Criteria
1	Drinking Water Source without conventional Treatment but after disinfection	pH between 6.5 to 8.5 Dissolved Oxygen 6 mg/l or more
2	Drinking water source after conventionaltreatment and disinfection	pH between 6 to 9 Dissolved Oxygen 4 mg/l or more
3	Outdoor Bathing (Organized)	pH between 6.5 to 8.5 Dissolved Oxygen 5 mg/l or more
4	Controlled Waste Disposal	pH between 6 to 8.5

3. Recommended Noise Level Standards:

No	Location	Noise Level dB
1	Auditoriums	20-25
2	Outdoor Playground	55
3	Occupied Class Room	40-45
4	Un occupied Class Room	35
5	Apartment, Homes	35-40
6	Offices	45-50
7	Libraries	35-40
8	Restaurants	50-55

4. Thermal Comfort Conditions: For Non-conditioned Buildings:

No	Parameter	Value
1	Temperature	Less Than 33°C
2	Humidity	Less Than 70%