

MARATHA VIDYA PRASARK SAMAJ'S, KARMAVEER SHANTARAMBAPU KONDAJI WAVARE ARTS, SCIENCE & COMMERCE COLLEGE, CIDCO, UTTAMNAGAR, NASHIK [MH]

कर्मवीर शातारामवाप्

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ENERGY AUDIT REPORT

PREPARED BY

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ENERGY AUDIT TEAM

A) EXTERNAL AUDIT TEAM:

External Audit Team

1. Dr. Pravin M. Nalawade Certification No.: IN/14019/144609 Green Cover Maping and Study of Biodiversity

2. Dr. Sambhaji R. Pagar Certification No.: IN/14019/144773 Solid Waste Audit

3. **Dr. Smt. Jagruti R. Chavan** Certification No.: IN/14019/144775 Water, Air and Noise Audit

B) INTERNAL AUDIT TEAM:

Internal Audit Team

- 1. Dr. Dnyaneshwar N. Pawar IQAC Coordinator Certification No.: IN/14019/144771 Green Cover Maping
- 2. Dr. Darshan M. Kokate Head, Department of Botany Coordinator, Green Audit
- 3. Dr. Mayura M. Patil Head, Department of Zoology Coordinator, NAAC Criterion 7

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4. **Dr. Sudeep Pagare** Coordinator, Energy Audit



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1. INTRODUCTION OF THE ENERGY AUDIT

1.1 About Parent Institution:

The Maratha Vidya Prasarak Samaj is one of the most prestigious centers of learning in the State of Maharashtra.It manages 477 educational institutes and it is one of the premier organizations in the jurisdiction of Savitribai Phule Pune University. At present total strength of student is around 2,00,000. The credit for the birth of M. V. P. Samaj goes to the young, enthusiastic and devoted team of social workers and educationists, Karmaveer Raosaheb Thorat, Bhausaheb Hire, Kakasaheb Wagh, Annasaheb Murkute & Ganpat Dada More who laid the foundation of the Samaj. Adv. B. G. Thakare, Adv. Vitthalrao Hande & Dr. Vasantrao Pawar are major contributor of Samaj. They were the devotees who envisioned a culture and knowledge centric society. The motto of the Samaj is "Bahujan Hitay Bahujan Sukhay", for the wellbeing and happiness of the masses to kindle the social cause.

1.2 About College:

"M.V.P. Samaj's Karmaveer Shantarambapu Kondaji Wavare Arts, Science and Commerce College, Uttamnagar, CIDCO, Nashik (Maharashtra) is committed to provide higher educational opportunities to socially under-privileged and financially weaker sections of the society.

The College offers 21 UG and 09 PG courses affiliated to the Savitribai Phule Pune University, Pune. For the effective implementation of the curricula, a meticulous action plan is developed and deployed. Teaching plans are prepared and followed according to the time table. For the better teaching practices, teachers participate in workshops on Curriculum Restructuring, Training Programmes and Special Guidance on ICT based Teaching Technology. Eminent scholars are invited to enlighten the faculty as well as students. Career Oriented/ Placement Activity is conducted to orient students towards employment market. The College has established MOU's, Linkages and Collaborations with Industries, Research Bodies and other Universities for good academic prospectus. A good number of faculty members are working on Editorial Boards of various International Journals. Experienced faculty members participate in the

procedure of curriculum design & development. Some faculty members are elected /nominated on BOS and other committees of S P Pune University, Pune.

1.2.1 Vision of The Institute:

To Empower Students with Innovative Life Skills and Social Values for Global Competency.

1.2.2 Mission of The Institute:

Upholding the motto of MVP Samaj, 'Bahujan Hitaya, Bahujan Sukhaya', i.e. welfare and happiness of the masses, the College is committed to provide higher educational opportunities to the socially under-privileged and financially weak sections of the society and create dignity of labour and importance of self-reliance.



College Campus Layout

1.4 Energy Conservation Committee:

Table 1 Energy Conservation Committee

Sr	Name of Member	Designation	Title in
No.			Committee
1	Dr. Smt. M. S. Patil	Head and Asst. Prof. Chemistry	Coordinator
2	Dr. D. M. Kokate	Head and Asst. Prof. Zoolgy	Member
3	Dr. Suddep Pagare	Assistant Prof. EAPR	Member

1.5 Function of Energy Conservation Committee:

The following are among the various functions assigned to Bureau of Energy Efficiency:

- Creating awareness and proper dissemination of information on energy efficiency and conservation;
- Organising the training for the efficient use of Energy and its conservation, to the personnel associated.
- Promotion of the use of energy efficient processes, equipment, devices and systems in general domain;

1.6 Courses Offered:

Programme	Sr No	Programme Name				
Trogramme	51.110.	1 10gramme 1 vanie				
B.A.	1	Anthropology (Gen)				
	2	Economics				
	3	English				
	4	Geography				
	5	Hindi				
	6	History				
	7	Marathi				
	8	Politics				
	9	Psychology				
	10	Sociology				
B. Sc.	11	Botany				

Table 2 Course Offered

Programme	Sr. No.	Programme Name						
	12	Chemistry						
	13	Computer Science						
	14	Electronics (Gen)						
	15	Geography (Gen-FY)						
	16	Mathematics						
	17	Statistics (Gen)						
	18	Microbiology						
	19	Physics						
	20	Zoology						
B. Com	21	B.Com.						
B. Voc.	22	Food Processing Technology						
	23	Electrical Appliances Maintenance & Repairing						
	24	Yoga & Naturopathy						
M. A.	25	Economics						
	26	English						
	27	Hindi						
	28	Marathi						
M.A./M.Sc.	29	Geography						
M. Sc.	30	Botany						
	31	Chemistry (Organic Chemistry)						
	32	Computer Science						
	33	Physics						
	34	Zoology						
M.Com	35	M.Com.						
Ph. D.	36	Ph.D. Research Centre in Chemistry						
Diploma (B.Voc.)	37	Diploma Course in Yoga						
	38	Diploma Course in Sustainable Agriculture						
	39	Diploma Course in Medical Laboratory						
		Technology						
	40	Diploma Course in Sericulture						
	41	Diploma Course in English for Practical Purposes						
Certificate (B.Voc.)	42	Certificate Course in Web Designing						
Certificate	43	Certificate Course in Event Management						
SPPU	44	Certificate Course in Hindi						
Diploma SPPU	45	Diploma in Administrative Marathi						

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1.7 Total Population of Campus:

		unation of Campus
Sr.	Particulars	Total population of institute (incl.
No.		Students, Permanent, Temporary staff & visitors)
1.	College Staff (Teaching and Non-	
	Teaching	137
2.	College Students (Girls and Boys)	3186
3.	Residential Students	0
4.	Residential Staff	2
5.	Floating Population	20
Total		3345

Table 3 Total Population of Campus

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1.8 Introduction of Energy Audit:

The need for Energy has increased significantly as the economy has risen. Furthermore, the high energy intensity of several sectors is a source of worry. In such a setting, the efficient use of energy resources and their conservation become critical for reducing wasteful consumption and ensuring long-term development. Recognizing that efficient energy usage and conservation is the most cost-effective way to satisfy rising energy demand, the Indian government adopted the Energy Conservation Act, 2001 and formed the Bureau of Energy Efficiency in March 2002.

The Act establishes and strengthens the delivery system for energy efficiency services in the country and provides much-needed coordination among the various authorities. Energy conservation is a national cause. We must all join hands and make every effort to make India an Energy-efficient economy and society so that we can compete not only in our local market but also in the international market.

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

As per The Energy Conservation Act, 2001, Act No. 52 of 2001, "energy audit" means the verification, monitoring and analysis of the use of energy, including submission of a technical report containing recommendations for improving energy efficiency with cost-benefit analysis and an action plan to reduce energy consumption;"

1. 9 Objectives of Study :

The green audit's major goal is to encourage environmental management and conservation on the college campus. The audit's goal is to identify, measure, explain, and prioritise a framework for environmental sustainability that adheres to all applicable legislation, policies, and standards. The following are the major goals of a Green Audit:

The primary objectives of Energy Audits are

- To study the present level of Energy Consumption
- To assess the various equipment/facilities from the Energy efficiency aspect
- To study Scope for the usage of Renewable Energy
- To study various measures to reduce the Energy Consumption

1.10 Methodology:

The methodology adopted for this audit is

- Formation of audit Team for specific areas and end-use.
- Visual inspection and data collection
- Observations on the general condition of the facility and equipment and quantification
- Identification/verification of energy consumption and other parameters by Measurements
- Detailed calculations, analyses, and assumptions Validation
- Potential energy-saving opportunities
- Suggestions for Implementation
- As the first step in this regard, one team of 3 Energy Auditor from the KTHM College, Nashik, were formed and assigned a particular area or application of Energy on the campus. The activity was organized as per the request received from MVP Samaj's, Karmaveer Shantarambapu Kondaji Wavare Arts, Science & Commerce College, CIDCO, Uttamnagar, Nashik

The approach for doing a Energy audit comprised several instruments such as questionnaire development, physical inspection of the campus, observation and study of paperwork, interviewing key people, data analysis, measurements, and suggestions.

1. 11 Steps in Green Audit:

- 🖊 Pre-Audit
 - 1. Make a plan for the audit.
 - 2. Form an auditing team
 - 3. Schedule for an audit.
 - 4. Gather the necessary background information regarding institute and Energy Audit.
- ∔ On Site
 - 1. Understand the scope of audit
 - 2. Analyse the strengths and weaknesses of the internal controls
 - 3. Conduct the audit
 - 4. Evaluate the observations of audit program
 - 5. Prepare a report of the observations side by side
- 📥 Post-Audit
 - 1. Produce a draft report of the data collected
 - 2. Produce a final report of the observations and the inference with accuracy
 - 3. Distribute the final report to the management
 - 4. Prepare an action plan to overcome the flaws
 - 5. Keep a watch on the action plan

1.12 Scope of Work:

The following Environmental Issues were studied for the above-mentioned campus area.

- Present level of Energy Consumption Energy Audit.
- Assess the various equipment/facilities from the Energy efficiency aspect.
- Scope for the usage of Renewable Energy.
- Various measures to reduce the Energy Consumption.

This study has been prepated based on the available data, samples, and information supplied by *the Karmaveer Shantarambapu Kondaji Wavare Arts, Science* & *Commerce College, CIDCO, Uttamnagar, Nashik* and recommendations for improving the efficiaent use of Energy have been made by college officials.

2. Energy Consumption Analysis

2.1 Introduction:

The College using Electricity as a main Energy Source. Sectioned load for College is **BB** KV.

Electricity Bill Analysis of the College:

Months	Total Units	Amount (Rs.)	Unit Rate (Rs/U)	
June 21	2393	31049	12.97	
Jul-21	1926	25976	13.48	
Aug-21	1566	22370	14.28	
Sep-21	1720	23898	13.89	
Oct-21	1263	18784	14.87	
Nov-21	993	16091	16.2	
Dec-21	2020	27091	13.41	
Jan-22	1112	17296	15.55	
Feb-22	856	14665	17.13	
Mar-22	1513	21578	14.26	
April-22	2534	32560	12.84	
May 22	2787	37530	13.46	
Average	1723.58	24074	14.36	
	to Sources Floo	twighty Dill Drovidad h	v College)	

Table 4 Electricity Consumption and Bill Analysis

(Data Source: Electricity Bill Provided by College)

As per the above table, the average monthly Electricity Consumption is 1723 Units per month, and The Average Monthly Electricity Bill is Rs. **24074**. There are no major fluctuations in Electricity Consumption in the KSKW College, CIDCO, Uttamnagar, Nashik.



Graph. Electricity Consumption and Bill Analysis

(Source: Monthly Electricity Bill)



2.2 Analysis of Connected Load List:

Table 5 Collected Load List

Sr	Floo	Area/Dept	Roo	Type of	Light Type	Ceilin	Comput	Printers/Scan	Photo	A.	Other
N	r		m No	Fittig	LED 18W	g Fan	er	ner	copy	C	
0			INU						ne		
1	G	Pricipal office		C	15 (40 watt)	1	1	1		1	1 AC, 1 Freeze,
2	OB G	IQAC		C	4(40 watt)	1	2	2			
3	G	Staff room	2	С	3	3					1 Chilled Water
4	G	Administrati on office		C	13	10	11	9	1		1 Photo copy machine
5	G	porch		С	8	1					
6	G	I.T		С	4	1	21	1		1	
7	G	P.G Lab	1	C	2	1				1	
8	G	chemistry	6	C	4	2					
9	G	botany & zoology	7	C	9	2					
10	G	Y.C.M	5	C	2	1	1	2			
11	1st	physic lab 2	10	С	6	4	1				
12	1st	commrece	9	С	8	3	4	1			
13	1st	porch		C	3						
14	1st	class	11	C	3	5					
15	1st	class	12	C	3						
16	1st	class	13	С	3	1					
17	1st	class	14	C	1	1					

18	1st	class	15	C	3	1					
19	1st	class	16	C	3	2					
20	2nd	class	17	C	6	2					
21	2nd	class	18	С	2	0					
22	2nd	class	19	С	2	1					
23	2nd	class	20	C	4						
24	2nd	class	21	C	1	1					
25	2nd	class	22	C	5	1					
26	2nd	class	23	C	5	1					
27	2nd	class	24	C	2	1					
28	2nd	class	25	C	1	1					
29	2nd	class	26	C	1	1					
30	2nd	class	27	C	2	1					
31	2nd	class	28	C	2	0					
32	2nd	class	29	C	0	0					
33	2nd	class	30	C	2	1					
34	2nd	NSS		C	1	1					
35	2nd	staff room	24	C	2	1					
36	G	GYM		C	10	5	2	1			
37	FNB	hindi &		C	2	1	1	1			1 Pedestal Fan
		Political									
20	CN	science		0	1	1	1	1			
38	GN R	sociology		C	1	1	1	1			
39	1st	computer	4	С	9	9	32	3		4	
	150	science			,		52			'	
40	1st	exam		С	7	4	3	2	3		1 Pedestal Fan, 3 Photo copy
		section									machine

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41	1st	chemistry	6	C	11	9			2 Exhaust Fan, 1 Freeze
42	1st	economics	7	С	4	2	1	1	
43	1st	psychology	3	С	11	7			
44	2nd	vice		С	3	2	1		1 Pedestal Fan
		principal							
		office							
45	2nd	class	8	C	5	4			
46	2nd	class	9	C	5	4			
47	2nd	class	10	C	6	4			
48	2nd	class	11	C	9	4			
49	2nd	porch		C	8				
50	2nd	toilet		С	2				
51	3rd	Botany	12	С	9	6	2	1	1 Freeze
52	3rd	zoology	13	C	8	9	2	1	1 Freeze
53	3rd	maths	15	С	4	2	2	1	
54	3rd	english	15	C	4	2	3	1	
55	3rd	marathi	14	С	1	1	1	1	
56	3rd	class	16	С	6	4			
57	3rd	class	17	С	5	4			
58	3rd	class	18	C	6	4			
59	3rd	class	19	C	8	4			
60	3rd	porch		C	11				
61	4th	toilet		C	2				
62	4th	class	25	C	6	4			
63	4th	class	26	C	5	3			
64	4th	class	27	C	8	4			
65	4th	porch		C	11				

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66	4th	surveying		C	3	2				
		lab								
67	4th	geoinformati		С	1	1	2	1		
		c lab								
68	4th	geography	20	С	3	2	1			
		class								
69	4th	microbiolog	21	С	7	9	2	1		2 Freeze
		y								
70	4th	history	22	C	1	1	1	1		
71	4th	Food	23	С	8	4	1	1		2 Freeze
		procesing								
		Technology								
72	4th	Electrcal	24	С	4	4	1	1		1 Pedestal Fan, Heaters
		appliance								
		maintenance								
		&repairing								
73	GN	seminar hall		С	34+(6.50	17				
	OI (Seminar man		Ũ	watt led)	1,				
74	GN	store room		C	1					
75	GN	library		C	10	4	6	3		
76	GN	girls reading		С	4	4				
		room								
77	GN	reading		С	10	3			1 1	
	,	room				-				
1		100111		1	1	1	1			



Observations:

- The Institute has about 372 LED lights, which is more Energy Efficient than fluorescent tube lights. All LED tube lights are fitted with electronic ballast.
- The College has 207 fans in different Classrooms, departments, Workshops, labs and offices. All fans are fitted with an electronic regulator.

2.3 Analysis of Operating Hours:

Sr. No	Floor	Area/Dept	Room No	Type of Fitting	Light Type LED 18W	Operaating hours
1	G	Pricipal office		С	15 (40 watt)	6
2	OBG	IQAC		С	4(40 watt)	6
3	G	Staff room	2	С	3	6
4	G	Administration office		С	13	6
5	G	porch		С	8	6
6	G	I.T		С	4	6
7	G	P.G Lab	1	С	2	6
8	G	chemistry	6	С	4	6
9	G	botany & zoology	7	С	9	6
10	G	Y.C.M.O.U.	5	С	2	6
11	1st	Physic lab 2	10	С	6	6
12	1st	Commrece	9	С	8	6
13	1st	Porch		С	3	6
14	1st	Class	11	С	3	6
15	1st	Class	12	С	3	6
16	1st	Class	13	С	3	6
17	1st	Class	14	С	1	6
18	1st	Class	15	С	3	6
19	1st	Class	16	С	3	6
20	2nd	Class	17	С	6	6
21	2nd	Class	18	С	2	6
22	2nd	Class	19	С	2	6
23	2nd	Class	20	С	4	6
24	2nd	Class	21	С	1	6
25	2nd	Class	22	С	5	6
26	2nd	Class	23	С	5	6
27	2nd	Class	24	С	2	6
28	2nd	Class	25	С	1	6
29	2nd	Class	26	С	1	6
30	2nd	Class	27	С	2	6
31	2nd	Class	28	С	2	6
32	2nd	Class	29	С	0	6
33	2nd	Class	30	С	2	6
34	2nd	NSS		С	1	4
35	2nd	Staff room	24	С	2	6
36	G	GYM		С	10	6

Table 6 Analysis of Operating Hours

37	FNB	Hindi & Political Science		С	2	6
38	GNB	Sociology		C	1	6
39	1st	Computer Science	4	C	9	6
40	1st	Exam section		C	7	6
41	1st	Chemistry	6	С	11	6
42	1st	Economics	7	С	4	6
43	1st	Psychology	3	С	11	6
44	2nd	Vice principal office		С	3	6
45	2nd	Class	8	С	5	6
46	2nd	Class	9	С	5	6
47	2nd	Class	10	С	6	6
48	2nd	Class	11	С	9	6
49	2nd	Porch		С	8	6
50	2nd	Toilet		С	2	6
51	3rd	Botany	12	С	9	6
52	3rd	Zoology	13	С	8	6
53	3rd	Maths	15	С	4	6
54	3rd	English	15	С	4	6
55	3rd	Marathi	14	С	1	6
56	3rd	Class	16	С	6	6
57	3rd	Class	17	С	5	6
58	3rd	Class	18	С	6	6
59	3rd	Class	19	С	8	6
60	3rd	Porch		С	11	6
61	4th	Toilet		С	2	6
62	4th	Class	25	С	6	6
63	4th	Class	26	C	5	6
64	4th	Class	27	С	8	6
65	4th	Porch		С	11	6
66	4th	Surveying lab		С	3	6
67	4th	Geoinformatic lab		C	1	6
68	4th	Geography class	20	C	3	6
69	4th	Microbiology	21	C	7	6
70	4th	History	22	С	1	6
71	4th	Food procesing Technology	23	С	8	6
72	4th	Electrcal appliance maintenance & repairing	24	С	4	6
73	GN	seminar hall		С	34+ (6,50 watt LED)	6
74	GN	Store room		С	1	6
75	GN	library		С	10	6
76	GN	Girls reading room		С	4	6
77	GN	Reading room		С	10	6

Observation:

- Objectives for reducing energy, Water and Fuel consumption are sufficient.
- Energy-efficient equipment's are being used to replace the old non-energy efficient LED Lights.
- Regular monitoring of Equipment and immediate rectification of any problems is being done.

2.4 Analysis of Light Intensity in Classrooms, Offices and Workshops: Table 7 Analysis of Light Intensity in Classrooms, Offices and Workshop

Sr. No	Floor	Area/Dept	Room No	Type of Fitting	Light Type LED 18W	Lux with light	Lux without light
1	G	Pricipal office		С	15 (40 watt)	140	10
2	OBG	IQAC		С	4(40 watt)	186	8
3	G	Staff room	2	С	3	108	10
4	G	Administration office		С	13	82	4
5	G	porch		С	8	21	5
6	G	I.T		С	4	94	2
7	G	P.G Lab	1	С	2	94	3
8	G	chemistry	6	С	4	118	11
9	G	botany & zoology	7	С	9	46	4
10	G	Y.C.M	5	С	2	90	0
11	1st	Physic lab 2	10	С	6	298	266
12	1st	Commrece	9	С	8	107	39
13	1st	Porch		С	3	30	10
14	1st	Class	11	С	3	280	70
15	1st	Class	12	С	3	82	60
16	1st	Class	13	С	3	183	82
17	1st	Class	14	С	1	156	78
18	1st	Class	15	С	3	137	82
19	1st	Class	16	С	3	30	50
20	2nd	Class	17	С	6	136	51
21	2nd	Class	18	С	2	100	68
22	2nd	Class	19	С	2	240	60
23	2nd	Class	20	С	4	125	330
24	2nd	Class	21	С	1	23	5
25	2nd	Class	22	С	5	91	13
26	2nd	Class	23	С	5	81	32
27	2nd	Class	24	С	2	91	13
28	2nd	Class	25	С	1	101	14
29	2nd	Class	26	С	1	215	73
30	2nd	Class	27	С	2	180	40
31	2nd	Class	28	С	2	182	40
32	2nd	Class	29	С	0	18	18
33	2nd	Class	30	С	2	23	5
34	2nd	NSS		С	1	45	10
35	2nd	Staff room	24	С	2	91	13
36	G	GYM		С	10	123	6
37	FNB	Hindi & Political Science		С	2	80	0
38	GNB	Sociology		C	1	42	5
39	1st	Computer Science	4	С	9	186	95
40	1st	Exam section		С	7	60	13
41	1st	Chemistry	6	С	11	180	49
42	1st	Economics	7	С	4	251	138
43	1st	Psychology	3	С	11	190	98
44	2nd	Vice principal office		С	3	174	92

45	2nd	Class	8	С	5	146	34
46	2nd	Class	9	С	5	160	100
47	2nd	Class	10	С	6	162	104
48	2nd	Class	11	С	9	130	99
49	2nd	Porch		С	8	160	135
50	2nd	Toilet		С	2	10	48
51	3rd	Botany	12	С	9	410	395
52	3rd	Zoology	13	С	8	287	260
53	3rd	Maths	15	С	4	320	270
54	3rd	English	15	С	4	66	29
55	3rd	Marathi	14	С	1	311	280
56	3rd	Class	16	С	6	187	86
57	3rd	Class	17	С	5	178	93
58	3rd	Class	18	С	6	160	86
59	3rd	Class	19	С	8	280	240
60	3rd	Porch		С	11	352	320
61	4th	Toilet		С	2	63	52
62	4th	Class	25	С	6	277	32
63	4th	Class	26	С	5	302	117
64	4th	Class	27	С	8	305	281
65	4th	Porch		С	11	352	315
66	4th	Surveying lab		С	3	360	340
67	4th	Geoinformatic lab		С	1	162	152
68	4th	Geography class	20	C	3	36	12
69	4th	Microbiology	21	С	7	280	257
70	4th	History	22	С	1	309	280
71	4th	Food procesing Technology	23	С	8	193	42
72	4th	Electrcal appliance maintenance &repairing	24	С	4	209	26
73	GN	seminar hall		С	34+(6,50 watt led)	135	20
74	GN	Store room		С	1	64	2
75	GN	library		С	10	73	14
76	GN	Girls reading room		С	4	108	15
77	GN	Reading room		С	10	116	5

Observations:

1. Lux light level is sufficient in the Campus, where students spend most of their time and focus on learning.

2. Homogeneous lighting achieved with LED lighting systems reduces shadows and improves visibility.

3. College installed LED lighting systems which is a good option for Energy Consumption. These systems provide energy-efficient lighting and reduce maintenance costs to a minimum.

4. Natural lighting is considered for corridors.

2. 5 Analysis of Water Pump:

The water supply to the College is taken from the NMC (Nashik Municipal Corporation) lines that pass just outside the campus.

There are Eight Overhead water tanks that store water coming from the NMC lines.

Sr. No.	Tank	UGT capacity in litre	No. of times filled	Water storage/ usage (m3/day)
1	New Building terrace water tank	5,000.00	1	90
2	Second flour new building aqua plant	100	2	40
3	Old building terrace water tank	15,000.00	2	270
4	Aqua plant for staff in staff room	100	2	40
5	RCC water tank	20000	2	360
6	Ground area gents toilet water tank	2500	2	100
7	Ground area ladies toilet water tank	2500	2	100
8	Ground area ladies toilet water tank	2500	2	100

Table 8 Capacity of water storage tanks

Table 9 Water Pump Capacity

Sr.No	Motor Capacity	Eletrical loading
1	1.0 hp	746watt 2 hrs/day

4 Audit Findings and Recommendation:

Based on the analysis of Power Consumption data, Certain steps have been recommended to improve the campus's energy efficiency. Complete cost analysis of the implementation of the recommended measure has been performed wherever necessary. Also, the general measure of energy efficiency has been listed. Described below are some crucial recommendations for better energy efficiency:

4.1 Consolidation of Audit Findings:

1) The communication process for awareness concerning energy conservation is found adequate.

2) Average Power factor is maintained.

3) The monthly use of Electricity in the College is not very high.

4) Objectives for reducing energy, Water and Fuel consumption are sufficient.

5) Energy-efficient equipment is being used to replace the old non-energy efficient LED Lights.

6) Regular monitoring of Equipment and immediate rectification of any problems.

4. 2 Recommendations:

1. Housekeeping:

- **Curtains**: Always keep curtains on windows to prevent direct sunlight inside the room to avoid heating cooled air.
- **Proper insulation:** Good Quality insulation must be maintained in the airconditions rooms by keeping all doors and windows closed adequately to prevent cool air from going out and Hot air.
- **Operating**: The AC should be switched on 15 minutes before actual use and should be switched off before leaving the room.

2. Replacing Florescent Tube light to LET lights:

LED lighting systems are a good option for College. These systems provide energy-efficient lighting and reduce maintenance costs to a minimum. The College suggests that the College use LED lights instead of fluorescent tube lights. Dominants' light sources at most places on the campus are traditional 36 Watt Florescent tube lights. As per our data collection, the campus has, in total, Fluorescent Tube lights. If LEDs replace these tube lights, 18 Watts of power can be saved.

3. Replacing LED Monitors with LCD Monitors

LCD monitors consume 150 W, while LED monitors consume only 50W. The saving of 25 W per monitor is considerable, but the LED monitor is also costlier by Rs. 2000. (approx.)

4. Use of Master Switch outside each room.

Installation of a Master switch outside a room can make it easy for a person to switch off all the room's applications in case someone forgets to switch off while leaving the room. This can help improve energy efficiency.

5. Use of Motion sensors in Toilets:

Toilets have a large potential for saving energy by using automated tools. Motion sensors can be used to switch on the lights when there is no movement automatically. This can gradually be reducing the total load in the toilets.

6. Hibernating

Utilizing Hibernating feature to power down computers outside of class/work hours will reduce the current wasted Energy associated with keeping computers powered on when the building is unoccupied.

7. Conduct more save energy awareness programs for students and staff.

Conduct more save energy awareness programs for students and staff.

7. Energy Substitutions:

As in the Campus, there is a huge consumption of Electrical Energy, which is not economical. Instead of using electrical energy, switch to an alternative energy source, solar power.
