M.V.P.Samaj's Law College Nashik

Udaji Maratha boarding Campus, Gangapur Road, Nashik

(MAHARASHTRA)

Accredited By Bar Council of India, Affiliated with Savitribai Phule Pune University, Pune

ENERGY AUDIT REPORT 2022-23

PREPARED BY
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Eureka Environment Consultant

We Care Our Environment

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Energy Audit Certificate

This is to certify that the Eureka Environment Consultant conducted "Energy Audit" for "Maratha Vidya Prasarak Samaj's, Law College, at Udoji Maratha Boarding Campus, Gangapur Road, Nashik, 422013, (M.S.) India" for year 2022 to 2023. The audit focused on detailed Energy Audit of this college campus as per Guidelines laid down in National Assessment and Accreditation Council, Banglore and Energy Conservation /Act 2001. We appreciate the efforts of the college and issue the certificate of 'Energy Audit' for the year 2022-23.

Place: Nashik

Date: 25.09.2023

Eureka Environment Consultant, Nashik Certified Lead Auditor ISO 14001:2015 (Certification No. IN/14019/144785)

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1. INTRODUCTION OF THE ENERGY AUDIT

1.1 About Parent Institution:

Maratha Vidya Prasarak Samaj is 108 years old renowned educations institute in the state of Maharashtra, established in 1914. It was one of the greatest milestones in the pre-independence history of Nashik. The wellbeing in general and education in particular were considered the sole of human being.

The great visionaries of MVP Samaj rightly laid the "Wellbeing & happiness of masses" as the motto for the Samaj. The founders of the Samaj were inspired and driven by the great work of Mahatma Jyotiba Phule and Rajarhi Shahu Chhatrapati of Kolhapur.

The pioneers, devoted and dedicated team of MVP Samaj includes the names of great social workers and educationalists as Karmaveer Raosaheb Thorat, Bahusaheb Hiray, Annasaheb Murkute, Ganpatdada More, Kirtiwanrao Nimbalkar, D.R. Bhosale, Vithoba Patil Jadhav. They were the men who envisioned a culture and knowledge centric society.

M.V.P. Samaj manages more than 485 educational & professional institutions. The spectrum of educational institution encompasses Primary Schools, Secondary Schools, Graduate & Post graduate Colleges, Professional & Vocational Colleges. The total strength of students in is over 213598. Under the jurisdiction of University of Pune, Maharashtra University of Health Sciences, MSBTE, M.V.P. Samaj spearheading and propagating education from primary to upper crest management and professional stream like Medicine, Physiotherapy, Nursing, Pharmacy, Engineering, Polytechnic, Architecture and Computer Science etc. The Samaj has strived to create a niche for itself in the world of education, by uplifting the standard of education in the society.

The students & professionals produced by the institutions of MVP Samaj forum the real backbone of modern society.

1.2 About College:

M.V.P. Samaj established M.V.P. Samaj's Law College in June 2004 facilitating legal education for Students from the Nashik district. M.V.P.Samaj's Law College, Nashik was established in June 2004 with the approval letter No. NMV 2003/Law/(12/03) M.S. 3 Higher and Technical Education Dept. Dated 6 Nov. 2003 of the Government of Maharashtra to run different post graduate diploma and degree courses. The college is affiliated to Savitribai Phule

Pune University, Pune I.D. No (PU/NSL/LAW /80/2004. The college is approved by Bar Council of India. The college is in the process of NAAC accreditation.

The M.V.P.S Law College is located on the Gangapur Road. It is in the Heart of City of Nashik, at a distance of 20 minutes from Central Bus Station Nashik. It is a part of M.V.P. Samaj's Educational Complex on the sprawling 33 acres of area near the holy river-Godavari.

The college offers full-fledged degree programmes in law as LL.B 3 years course, B.A.LL.B 5 years integrated course and one year diploma courses as Diploma in taxation law (D.T.L.), Diploma in Labour Law and Labour welfare (D.L.L. & L.W.), Diploma in intellectual property rights law (D.I.P.R.L) and cyber law.



Figure 1. -College location and Photograph

1.2.1 Vision of College:

Empowering our students towards development in the legal era.

1.2.2 Mission of The Institute:

- 1. To cater to the education needs of all the communities including the students of rural background and socially disadvantaged groups of availing them an opportunity to participate in the mainstream of the society.
- 2. To create learning environment beneficial to satisfy to the students physical, intellectual, emotional, social and creative needs.

3. To avail affordable quality education to the students and shape them to be dynamic and committed professional and an honest citizen.

1.2.3 Objectives of the leadership:

- To provide quality education to the students from various parts of the society, to make them academically and technically competent
- To improve existing infrastructural facilities of the college
- To create higher levels of intellectual abilities
- To create centres of excellence for research and development and for sharing knowledge and its application
- To lay emphasis on teaching, research and extension activities
- To inspire the students to remain uncorrupted and lead a dignified life
- To lay emphasis on character building by imbibing strong moral characters

1.3 Energy Conservation Committee:

Table 1Energy Conservation Committee

Sr. No.	Name of Member	Designation	Title in Committee
1.	Dr. Sandhya T. Gadakh	Principal	Chairman
2.	Dr. Kapil S. Shirsath	Physical Director	Coordinator
3.	Mr. Swapnil D. Pawar	Assistant Professor	Member
4.	Mrs. Geetanjali Endyat	Assistant Professor	Member
5.	Mr. Prashant Dawande	Office Supritendent	Member

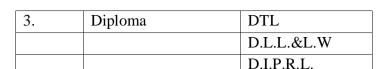
1.4 Function of Energy Conservation Committee:

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;

1.5 Courses Offered:

Sr.NO.	Name of Faculty	Name of Program
	Faculty of Law	LL.B
		B.A.LL.B



1.6 Total Population of Campus:

Table 2 Total Population of Campus

Sr.No.	Particulars	Total number
1	College Staff (Teaching and Non-Teaching	26
2	College Students (Girls and Boys)	869
3.	Residencial Students	10
4.	Floating Population	12
	Total	917

1.7 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;"

1.8 Objectives of Study:

The objective of an Energy Audit is to balance the total energy inputs with their use and to identify the energy conservation opportunities in the stream. Energy Audit also gives focused attention to energy cost and the cost involved in achieving higher performance with technical and financial analysis. The best alternative is selected on a financial analysis basis.

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

1.9 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 2 Energy Auditor from the Eureka Environment Consultant, Nashik were formed and assigned a particular area or application of Energy on the campus. The approach for doing an 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.

1.10 Steps in Energy 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

1.11 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 conducted based on the available data, samples, and information supplied by the MVP Samaj's, Law College, Nashik and recommendations for improving the efficient 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 2.2k Watt

Table 3 Basic Information of the College regarding Energy

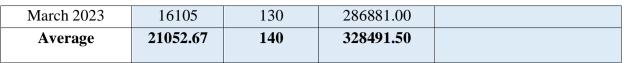
Sr.No.	Particulars	Inputs
1.	Name of College	M.V.P. Samaj M.V.P. Samaj's Law
1.	g	College
2.	Year of Establishment	2004
3.	Built up-Area	2180.48 sq meter
4.	Sanctioned Load (KVA):	500 kwatt
5.	Type of Supply: (1/3 phase)	3 PHASE
6.	Tariff Cat: (Commercial/Domestic)	Public Service
7.	Transformer Distance (in Mtr):	200 meter
8.	List ways that use energy in your College	Electricity, LPG Gas, Solar Panel
0.	(Electricity, Diesel, Firewood, etc)	Etc
9.	Alternative energy Sources:	Solar Roof Top System
10.	Energy Conservation and Efficiency	Use of LED Lights
10.	Implementation Measures:	Ose of LED Lights
11.	Year of Implementation:	2016
12.	Date of previous Energy Audit : (If any)	Nill

College is using Electricity, LPG Gas and Solar Panel as an energy source. College using LED Lights as a Energy Conservation and Efficiency Measures to reduce energy.

2.2 Electricity Bill Analysis of the College:

Table 4 Electricity Consumption and Bill Analysis

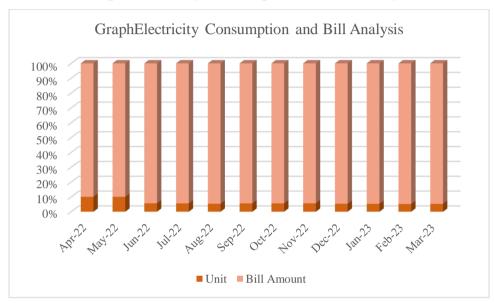
		Bill Demand		
Months	Unit	(KVA)	Amount(Rs.)	Unit Rate(Rs./kW)
April 2022	23404	140	209699.84	Residencial@Rs. 6.95
May 2022	24534	140	219824.64	Commercial@ 12.83
June 2022	23898	130	396825.00	Public Services@Rs 10.40
July 2022	22916	130	384584.00	
August 2022	21002	150	368463.00	
September 2022	22974	130	386712.00	
October 2022	23610	130	395494.00	
November 2022	25142	130	417181.00	
December 2022	17561	130	309181.00	
January 2023	16748	130	297512.00	
February 2023	14738	130	269540.00	



(Data Source: Electricity Bill Provided by College)

As per the above table, the average monthly Electricity Consumption is 21052.67 Units per month, and there are greater Electricity saving due to solar roof top system. It reduced monthly electricity bill up to minimum bill Rs.328491.50/-

Graph Electricity Consumption and Bill Analysis



2.3 Analysis of Connected Load List:

Table 5 Collected Load List

Sr. No	Floor	Area/Dept.	Room No	Light type FTL 40W	Light Type LED 18 W	Ceiling Fan (60 Watt	Exha ust Fan	computers	Printers / Scanner	Freez e	Xerox Machine	Projector
1	FF	Principal Cabin	F1	0	8	2	0	1	0	0	0	0
2	FF	Administrative Office	F2	0	10	4	0	7	6	0	2	0
3	FF	Legal Aid Clinic	F3	0	1	1	0	1	0	0	0	0
4	FF	Exam Hall	F3	0	3	1	0	1	1	0	1	0
5	FF	Corridor	-	0	7	0	0	0	0	0	0	0
6	FF	Class Room 1	F4	0	4	4	0	0	0	0	0	1
7	FF	Moot court	F5	0	7	7	0	0	0	0	0	1
8	FF	Class Room 2	F6	0	2	2	0	0	0	0	0	0
9	FF	Class Room 3	F7	0	4	2	0	0	0	0	0	0
10	FF	Class Room 4	F8	0	4	2	0	0	0	0	0	0
11	FF	Class Room 5	F9	0	4	2	0	0	0	0	0	0
12	FF	Class Room 6	F10	0	4	2	0	0	0	0	0	0
13	FF	Class Room 7	F11	0	3	2	0	0	0	0	0	0
14	FF	Class Room 8	F12	0	3	2	0	0	0	0	0	0
15	FF	Staff Room	F13	0	3	2	0	1	0	1	0	0
16	FF	Corridor 2	-	0	4	2	0	0	0	0	0	0

17	FF	Conference										
1 /		Room	F14	0	3	2	0	1	0	0	0	0
18	FF	Sports Room	F15	0	1	1	0	1	1	0	0	0
19	FF	Cabin 2	F16	0	1	1	0	1	0	0	0	0
20	FF	Cabin 3	F17	0	1	1	0	1	0	0	0	0
21	SF	Reading Room	S 1	0	7	5	0	0	0	0	0	0
22	SF	Library	S2	0	12	7	0	8	1	0	0	0
23	SF	Seminar Hall	S3	0	7	6	0	0	0	0	0	0
24	SF	Corridor 1	-	0	1	0	0	0	0	0	0	0
25	SF	Cabin 1	S4	0	1	1	0	1	0	0	0	0
26	SF	Cabin 2	S5	0	1	1	0	1	0	0	0	0
27	SF	Cabin 3	S 6	0	3	1	0	0	0	0	0	0
28	SF	Library 2	S 7	0	3	2	0	0	0	0	0	0
29	SF	Cap Room	S 8	0	4	4	0	0	0	0	0	0
30	SF	Boys Toilet	_	0	3	0	0	0	0	0	0	0
31	SF	Girls Toilet	-	2	2	0	0	0	0	0	0	0



- The Institute has about 121 LED lights, which is more Energy Efficient than fluorescent tube lights. All LED tube lights are fitted with electronic ballast.
- The Institute has about 2 FTL lights,
- The College has 68 fans in different Classrooms, offices etc. All fans are fitted with an electronic regulator

2.4 Analysis of Operating Hours:

Table 6 Analysis of Operating Hours

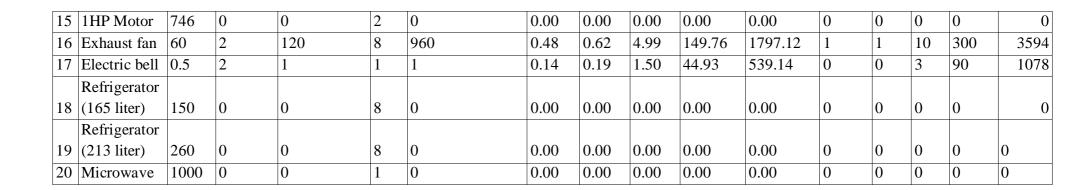
		Power		Power		Power
	Name of	Rati1ng		Consumption	Uses Per	Consumption/day
Sr.No	Appliances	Watt	Quantity	Watt	Day	(Watt)
1	FTL	40	2	80	8	640
2	Fan	68	68	4624	8	36992
3	PC	100	25	2500	8	20000
4	Printer: Standby mode:30-50w/	760	9	6840	4	27360
5	LED16W	16	0	0	8	0
6	LED18W	18	121	2178	8	17424
7	Xerox machine	2520	3	7560	4	30240
8	LCD Projector	282	2	564	4	2256
9	CCTV	29	10	290	24	6960
10	Water Cooler	1440	2	2880	8	23040
11	Water Purifier	18	2	36	8	288
12	TVLED	80	0	0	4	0
13	Loudspeaker	100	0	0	1	0
14	3HP Motor	37000	2	74000	2	148000
15	1HP Motor	746	0	0	2	0
16	Exhaust fan	60	2	120	8	960
17	Electric bell	0.5	2	1	1	1
18	Refrigerator (165 liter)	150	0	0	8	0
19	Refrigerator (213 liter)	260	0	0	8	0
20	Microwave	1000	0	0	1	0

Observation:

- 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.
- Care should be taken to keep lights in the classroom off and keep them ON whenever necessary.



					<i>y</i>	m variation.	Energy	Cost	Cost			Energy	Cost	Cost	Cost	Cost Per
		Power		Power	Uses	Power	Per	Per	Per	Cost Per		Per	Per	Per	Per	Year
Sr.	Name of	Rating		Consumption	Per	Consumption/day	Day	Hour	Day	Month	Cost Per	Day	Hour	Day	Month	(Rs.)
No	Appliances	Watt	Quantity	Watt	Day	(Watt)	(kWh)	(Rs)	(Rs.)	(Rs.)	Year (Rs.)	(kWh)	(Rs)	(Rs.)	(Rs.)	(2131)
1	FTL	40	2	80	8	640	0.32	0.42	3.33	99.84	1198.08	1	1	7	200	2396
2	Fan	68	68	4624	8	36992	0.54	0.71	5.66	169.73	2036.74	37	48	385	11542	138498
3	PC	100	25	2500	8	20000	0.80	1.04	8.32	249.60	2995.20	20	26	208	6240	74880
	Printer:															
	Standby															
	mode:30-															
4	50w/	760	9	6840	4	27360	3.04	7.90	31.62	948.48	11381.76	27	71	285	8536	102436
5	LED16W	16	0	0	8	0	0.14	0.19	1.50	44.93	539.14	0	0	0	0	0
6	LED18W	18	121	2178	8	17424	0.14	0.19	1.50	44.93	539.14	17	23	181	5436	65236
	Xerox															
7	machine	2520	3	7560	4	30240	10.08	26.21	104.83	3144.96	37739.52	30	79	314	9435	113219
	LCD															
8	Projector	282	2	564	4	2256	1.13	2.93	11.73	351.94	4226.23	2	6	23	704	8452
9	CCTV	29	10	290	24	6960	0.70	0.30	7.24	217.15	2605.82	7	3	72	2172	26058
	Water															
10	Cooler	1440	2	2880	8	23040	11.52	14.98	119.81	3594.24	43130.88	23	30	240	7188	86262
	Water															
11	Purifier	18	2	36	8	288	0.14	0.19	1.50	44.93	539.14	0	0	3	90	1078
12	TVLED	80	0	0	4	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0
13	Loudspeaker	100	0	0	1	0	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0
14	3HP Motor	37000	2	74000	2	148000	74.00	384.80	769.60	23088.00	277056.00	148	770	1539	46176	554112



2.6 Energy Efficiency Improvement

Table 7 Energy Efficiency Improvement

Sr. No.	Recommendations	Annual Saving Potential (Rs.)	Estimated Investment (Rs.)	Pay Back Period (Years)	Remarks (Feasibly)
1.	Solar On-Grid Roof top System	15 kw	900000/-	4.5 or 5yrs	Mid Term

2.7 Other Energy Sources than Electricity

Sr.No	Department	Kitchen	Connected Electrical Load (kW)	LPG Usage per day (kg)
				500 GM Par
1	Kitchen	T Club	10*2	Day

2.8 Electric Pumping System

Serial			Flow rates in m3 /
no	Motor capacity	Electrical loading	hour
1	3 Phase 5HP	10.45 Amp (3.7 kWatt)	156
2	3 Phase 5HP	10.45 Amp (3.7 kWatt)	156
3	1 Phase 1 HP	4Amp (0.73Kwatt)	52

Observations:

Try to get the benefit of the TOD time slot i.e. 01.50 rate at night in addition to the actual rate per unit consumption for electric motor pumping

3. 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:

3.1 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.

3. 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 air-conditions 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 LED 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 no Fluorescent Tube lights. If LEDs replace these tube lights, 18 Watts of power can be saved.

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 Washrooms:

Washrooms 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 Washrooms.

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.

8. 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.