



Maratha Vidya Prasarak Samaj's

ARTS, COMMERCE & SCIENCE COLLEGE, TAHARABAD

Tal. Baglan, Dist. Nashik, Maharashtra Pin: 423302

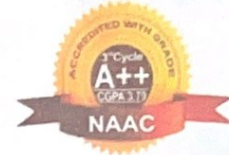


ENERGY AUDIT REPORT

PREPARED BY
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**MVP Samaj's
KRT Arts, BH Commerce and AM Science (KTHM)
College, Nashik**



NAAC Reaccredited 'A++' Grade with CGPA 3.79 , Status of College with Potential for Excellence by UGC,Delhi.,
UGC STRIDE Scheme , Awarded as Best College by S.P.Pune University

This to certify that,

Maratha Vidya Prasarak Samaj's, Arts, Commerce and Science College, Taharabad, Tal: Baglan, Dist: Nashik

has Carried out detailed Energy Audit of their College Campus as per guidelines laid down by the National Assessment and Accreditation Council (NAAC), Bangalore and Energy Conservation Act, 2001 on of 27th April 2024. The audit was conducted by KRT Arts, BH Commerce and AM Science (K.T.H.M.) College, Nashik


(Dr.Sambhaji Pagar)

Certified Lead Auditor

ISO 14001: 2015

(Certification No. in/14019/144609)


(Dr.S. S. Kale)

Principal

KTHM College, Nashik



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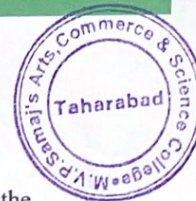
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1. INTRODUCTION OF THE ENERGY AUDIT



1.1 About Parent Institution:

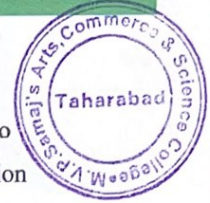
The Maratha Vidya Prasarak Samaj is one of the most prestigious centers of learning in the State of Maharashtra. It manages 477 educational institutes and it is one of the premier organizations in the jurisdiction of Savitribai Phule Pune University. At present total strength of student is around 2,00,000. 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. Vasant Rao Pawar are major contributors 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 well being and happiness of the masses to kindle the social cause.

1.2 About College:

The College is affiliated to the Savitribai Phule, Pune University; Pune has been established in 1997 as an Arts College. The Commerce faculty started in 2003. The Science faculty started in 2020. Our College is situated on Mosam River straight in the north of Taharabad. The importance of the college lays in providing the higher education to the rural and tribal students in the area. Today more than five hundred students are availing this facility of higher education. Maratha Vidya Prasarak Samaj, Nashik has been a pioneering institution which imparts the quality education right from pre-primary level (KG) to post-graduate (PG), Medical, Engineering, Law in the North Maharashtra. Recently, Maratha Vidya Prasarak Samaj, Nashik has celebrated its Century in the year 2014 (100 Years of glorious achievements).

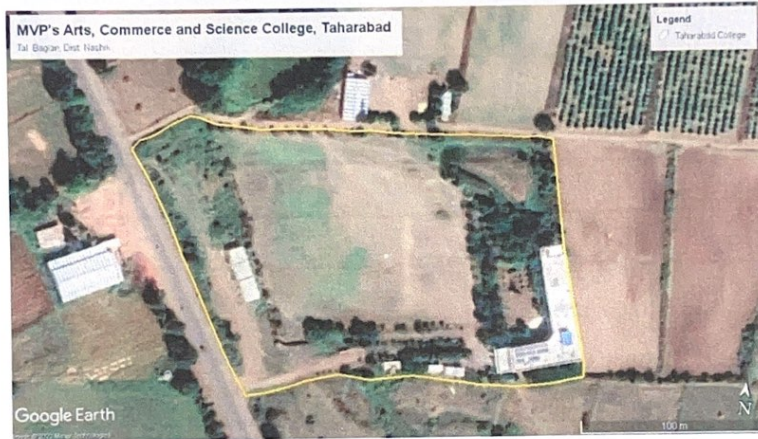
After some year the college is settled in the new building which located at Satana Nandurbar Road Taharabad. The college has been accredited by NAAC with 'B+' Grade in the year 2023. The college has excellent, highly qualified and dedicated faculties with good infrastructure, disciplines and competent administration with the track of good results in all the disciplines. The college has been offering add-on courses to increase the employability of the students.

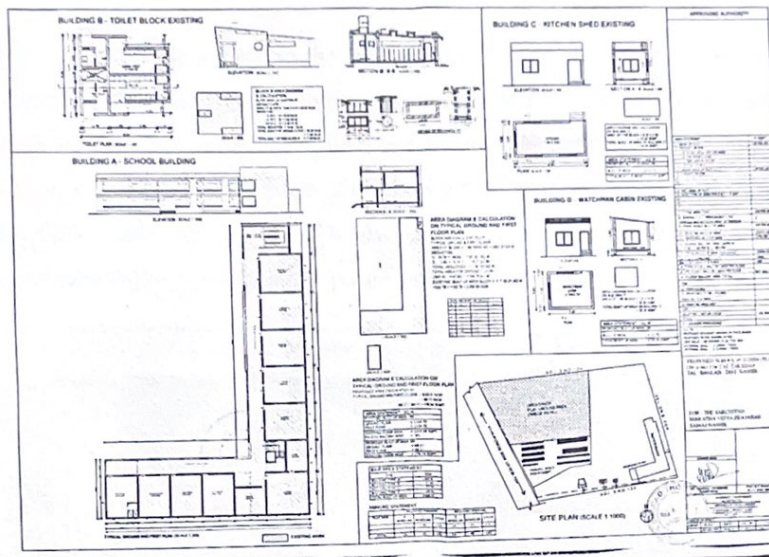
The college is implementing the healthy and innovative practices like Parents Association, Alumni Association, Earn and Learn scheme, Career Guidance and Counselling Cell, Competitive Examination Cell(MPSC/UPSC) Remedial Teaching ,etc. for the development to students personality in all aspects. The NSS unit of the College develops a sense of civilization among the students. Felicitation of meritorious students is a special feature of the College. With the help of Parent institute and grants from the UGC, the College has developed differen t labs such asComputer Labs, and Commerce lab, which have certainly resulted to increase the techno-skills among the students and staff.



The peace and harmony in an educational surrounding can only be maintained by means of proper environment. The environmental changes have a different kind of impact on students, therefore educational institutions are expected to maintain environment free of health hazards. It can only be possible by having greenery and clean campus. Arts, Commerce and Science College, Taharabad have been trying to maintain this sort of conducive environment for the all-round personality development of the students. It is from the establishment itself the authorities of the college are keen in the provision of better surrounding for the overall growth of the students.

The authorities are cautious of fact that college much to do regarding the maintenance of energy in campus. It is through this audit by the proper authorities the college intends to judge its strength and the future approach to keep and enhance the surrounding by means of proper steps in the direction of maintenance of electricity throughout the college campus. Energy Audit mainly focuses on the basis of twelve indicators; it is through these indicators the college intends to judge its strength at the present stage.





1.4 Energy Conservation Committee:

Table 1 Energy Conservation Committee

Sr.No.	Name of Member	Designation	Title in Committee
1.	Dr. V.B. Kale	Principal	Chairman
2.	Ms. S.B. Ahire	HOD, Physics	Co-ordinator
3.	Ms. S.B. Deore	Assistant Professor	Member
4.	Mrs. S.S. Bhamare	Assistant Professor	Member
5.	Mrs. S.V. Khonde	Assistant Professor	Member
6.	Ms. A.S. Boraste	Assistant Professor	Member
7.	Mrs. V.S. Raundal	Assistant Professor	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;

- Organizing 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:

Table 2 Courses offered by College

Sr. No.	Name of Faculty	Name of Program	Name of Subject
1.	Faculty of Arts	BA	English, Marathi, Hindi, History, Geography, Economics, Political Science
2.	Faculty of Commerce	B.Com	English, Marathi, Hindi, Business Communication, Corporate Accounting, Business Economics, Elements of Company Law, Business Management, Marketing Management
3.	Faculty of Science	B.Sc.	Physics, Chemistry, Botany, Mathematics, Zoology

Table 3 Total Population of Campus

Sr. No.	Particulars	Total population of institute (incl. Students, Permanent, Temporary staff & visitors)
1.	College Staff (Teaching and Non-Teaching)	38
2.	College Students (Girls and Boys)	565
3.	Residential Students	0
4.	Residential Staff	0
5.	Floating Population	50
	Total	653

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 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 energy audit's major goal is to encourage energy management and conservation in the college campus. The audit's goal is to identify, measure, explain, and prioritize a framework for environmental sustainability that adheres to all applicable legislation, policies, and standards. The following are the major goals of a Energy 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 2 Energy Auditor from the K.T.H.M. 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 SSR of Arts, Commerce & Science College, Taharabad.

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 Energy Audit:

+ Pre-Audit

1. Make a plan for the audit.
2. Forman 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. Analyze 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 Energy Consumption 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 prepared based on the available data, samples, and information supplied by the MVP Samaj's, Arts, Commerce & Science College, Taharabad 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 67148WTT

Table 4 Basic Information of the College regarding Energy

Sr. No.	Particulars	Inputs
1	Year of Establishment:	1997
2	Total No of Student:	565
3	Total No Staff:	36
5	Builtup -Area(sq.ft):	4.27
6	Sanctioned Load(KVA):	
7	Power Factor/Load Factor:	
8	Type of Supply :(1/3 phase)	3Phase
9	Tariff Cat:(Commercial/Domestic)	
10	Transformer Distance(in Meter):	300 m
11	List ways that use energy in your College (Electricity, Diesel, Firewood, etc)	Electricity
12	Alternative energy Sources:	Solar Panel
13	Energy Conservation and Efficiency Implementation Measures:	Solar Panels are used in our college
14	Year of Implementation:	
15	Date of previous Energy Audit:(If any)	No

College is using Electricity, LPG Gas and Solar Panel as an energy source .College is using LED Lights as an Energy Conservation and Efficiency Measure stored energy.



2.2 Electricity Bill Analysis of the College:

Table 5 Electricity Consumption and Bill Analysis

Months	Consumption Bill
Apr-23	0
May-23	0
Jun-23	0
Jul-23	0
Aug-23	0
Sep-23	0
Oct-23	0
Nov-23	0
Dec-23	0
Jan-24	0
Feb-24	0
Mar-24	0
Average	0

(Data Source : Electricity Bill Provided by College)



2.3 Analysis of Connected Load List:

Table 6 Collected Load List

Sr. No.	Floor	Area/Dept	Light type LED 18w	Ceiling Fan	Exhaust Fan	computers	Printers	Scanner	Routers	Inverter	MusicSystem	CCTV	Xerox/Machine	Other
1	1	Office	6	5		6	6		1	1		1		Bio Metric Machine
2	1	Principal Cabin	4	2		1	1							Bell, LED TV, AC, Digital Watch
3	1	Library	4	2		1	1	1				1	1	
4	1	Staff Room	5	2								1		Refrigerator
5	1	Chem Lab	7	4	1	2	1							
6	1	Computer Lab	3	1		7				1		1		
7	1	Seminar	5	4		1					1	1	1	Projector
9	2	Exam Dept.	4	3		2	2	1						
10	2	Hindi Dept.	2	1		1	1							
11	2	Physics Department	4	3		1	1							
12	2	Botany/ Zoology dept	4	3		2								
13	2	Geo. Dept	4	3		1	1							



14	2	Eco. Dept	1	1	1	1	1	1	1	1	1	1	1	1
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15	2	Political Science	1	1						1								
16	2	Marathi	1	1						1								
17	2	English	2	2						1								Projector
18	2	Classroom1	3	2														
19	2	Classroom2	3	2														
20	2	Classroom3	3	2														
21	2	Classroom4	3	2														
22	2	Commerce dept	4	3						1								
23	1	GYM Khana	4	3						1								Weight machine
24		Corridors	16													6		
25	1	Mathematics	1													1		
26	1	History	1															
27	1	Washroom	3	1														
28	1																	Water RO



Observations:

- The Institute has about 70 LED lights, which is more Energy Efficient than fluorescent tubelights. All LED tubelights are fitted with electronic ballast.
- The College has 49 fans in different Classrooms, departments, labs and offices. All fans are fitted with an electronic regulator.

2.4 Analysis of Operating Hours:

Table 7 Analysis of Operating Hours

Location	Floor/Area	Type(LED/Conventional)	Quantity	Wattage	Op. Hr
Office	1	LED	6	24	8
Principal Cabin	1	LED	4	24	8
Library	1	LED	4	24	8
Staff Room	1	LED	5	24	9
Chemistry Lab	1	LED	7	24	5
Computer lab	1	LED	3	24	9
NAAC Room	1	LED	2	24	9
Seminar	1	LED	5	24	2
Exam Dept.	2	LED	4	24	9
Hindi Dept.	2	LED	2	24	5
Phy Department	2	LED	3	24	5
Botany/ Zoology	2	LED	4	24	5
Geo. Dept	2	LED	4	24	5
Eco. Dept	2	LED	1	24	5
Political science	2	LED	1	24	5
Marathi	2	LED	1	24	5
English	2	LED	2	24	5
Classroom 1	2	LED	3	24	8
Classroom 2	2	LED	3	24	8
Classroom 3	2	LED	3	24	8
Classroom 4	2	LED	3	24	8
Commerce dept	2	LED	6	24	5
GYM Khana	1	LED	2	24	5

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.



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
- 5) sufficient.
- 6) Energy-efficient equipment is being used to replace the old non-energy efficient LED Lights.
- 7) 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 Tubelight 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 tubelights. As per our data collection, the campus has ,in total ,Fluorescent Tubelights. If LEDs replace these tubelights, 18Watts 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 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.
