Vivekananda Satavarshiki Mahavidyalaya

PO-Manikpara, Jhargram

Pin-721513

ENERGY AUDIT REPORT

For the Year 2022-23

Contains

CERTIFICATE

PRESENTED TO

Vivekananda Satavarshiki Mahavidyalaya

Jhargram, Mednipore.

Has been assessed by the audit team for the comprehensive study of energy audit on Institutional working framework to fulfil the requirement of

ENERGY AUDIT

The energy saving initiatives has been taken by the Institution have been verified in the report submitted and were found to be satisfactory.

The effort taken by management and faculty towards all types of energy used in the Institution and sustainability are highly appreciated and noteworthy.

Date:28/03/2023

Mr. S. Kayal
Lead Auditor EMS & Energy (EnMS)
NBQP(QCI) registered Principal Auditor

SUPRIYO KAYAL - PRINCIPAL AUDITOR - DPARK KOLKATA-700104
REGD. NO. PA/QMS/2324/001

ACKNOWLEDGEMENT

We would like to thank the management of Vivekananda Satavarshiki Mahavidyalaya for assigning this important work of Energy Audit. We appreciate the co-operation to the teams for completion of assessment.

We would also like to thank **Dr. Uma Bhaumik *(Principal)***, for her continuous support and guidance, without which the completion of the project would not have been possible. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

We are also thankful to

Uma Bhaumik

Dr. Chittaranjan Das

Dr. Biplove Kumar

Ashok Mahata

We would like to thank **Dr. Uma Bhaumik – (Principal),** Vivekananda Satavarshiki Mahavidyalaya for giving us an opportunity to evaluate the performance of the campus.

DISCLAIMER

Energy Audit Team has prepared this Energy Audit Report for Vivekananda Satavarshiki Mahavidyalaya based on input data submitted by the representatives of college complemented with the best judgment capacity of the expert team.

While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the conclusions are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

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Supriyo Kayal
Lead Auditor EMS & Energy

ABBREVIATION

A	**Amps**
AC	**Air Conditioner**
AC	**Alternating Current**
AMET	**Academy of Maritime Education and Training**
CFL	**Compact fluorescent lamp**
CIP	**Comprehensive Inspection Programme**
DC	**Direct Current**
HSD	**High Speed Diesel**
Hz	**Hertz**
kg	**Kilogram**
kVA	**kilo-volt-ampere**
kW	**kilo Watts**
kWh	**kilowatt hour**
kWp	**Kilowatt peak**
LED	**Light Emitting Diode**
LPG	**Liquefied Petroleum Gas**
MMS	**Module mounting structure**
MPPT	**Maximum Power Point Tracker**
NAAC	**The National Assessment and Accreditation Council**
SEC	**Specific Energy Consumption**
TV	**Television**
V	**Volts**
W	**Watts**
W/m2	**watt per square metre**

SUPRIYO KAYAL - PRINCIPAL AUDITOR - DPARK KOLKATA-700104
REGD. NO. PA/QMS/2324/001

OVERVIEW OF THE COLLEGE

Vivekananda Satavarshiki Mahavidyalaya was established in the year 1964 in commemoration of birth centenary of Swami Vivekananda. It was an outcome of a tremendous moral and financial support and farsightedness of some of the most sincere and enlightened local people. The college is situated amidst quiet natural surroundings in a small town called Manikpara, located between Kharagpur and Jhargram. Starting its journey with approximately 50 students of arts stream, 5 teaching and 2 non-teaching staff members in two rooms of a local high school, it now has its own sprawling campus over 18. 86 acres of land acquired on lease from the State Government. Our college presently accommodates more than 1700 students enrolled in Arts, Science and Commerce streams, 51 teaching including full-time and SACTs (State Aided College Teacher), 15 non-teaching staff members and 1 Librarian, who strive together to ensure that Vivekananda Satavarshiki Mahavidyalaya emerges as one of the best performing colleges in this region. At present, the College offers degree courses in 13 honours subjects and 14 general subjects. Our college campus is surrounded by extensive greenery, providing the perfect ambience that is conducive for a healthy mind and body. It has been providing an opportunity for higher education in Arts, Science and Commerce streams to the first-generation learners of the extensive tribal belt of Jhargram district since many years. Some of our students have performed remarkably well at the University exams, S.S.C. exams and NET. We feel proud of the fact that some of them are engaged as state aided college teachers in our college, a tradition we would like to continue in future with sincerity and confidence.

VISION & MISSION

The role of education towards the advancement of a society is of supreme importance. Empowering the poor and academically backward people of Manikpara and adjoining areas was the sole aim and objective of founding this college. In spite of the fact that our college faced different obstacles like financial crunch, lack of permanent posts, difficult transport and communication, it could still become functional towards delivering quality education to students, irrespective of their caste, creed, religion, gender or financial status of the students.

As the digital age is undergoing a phenomenal change with new technologies making our lives easier and faster than ever before, education system has also been fundamentally altered due to rapid advancements in teaching and learning methods. While adopting with the glamour of technological advancements, we still try our best to address the challenges posed to our educational system by the ever-changing technology like ICT.

Our college has been trying its best to go ahead with the development projects with the limited resources it has. We are grateful for the financial aid and guidance from Vidyasagar University, Government of West Bengal, U.G.C. We acknowledge the untiring efforts of our predecessors and are committed to fulfil their mission of providing opportunities for higher education to the students of this backward region with our utmost zeal.

Energy Policies:

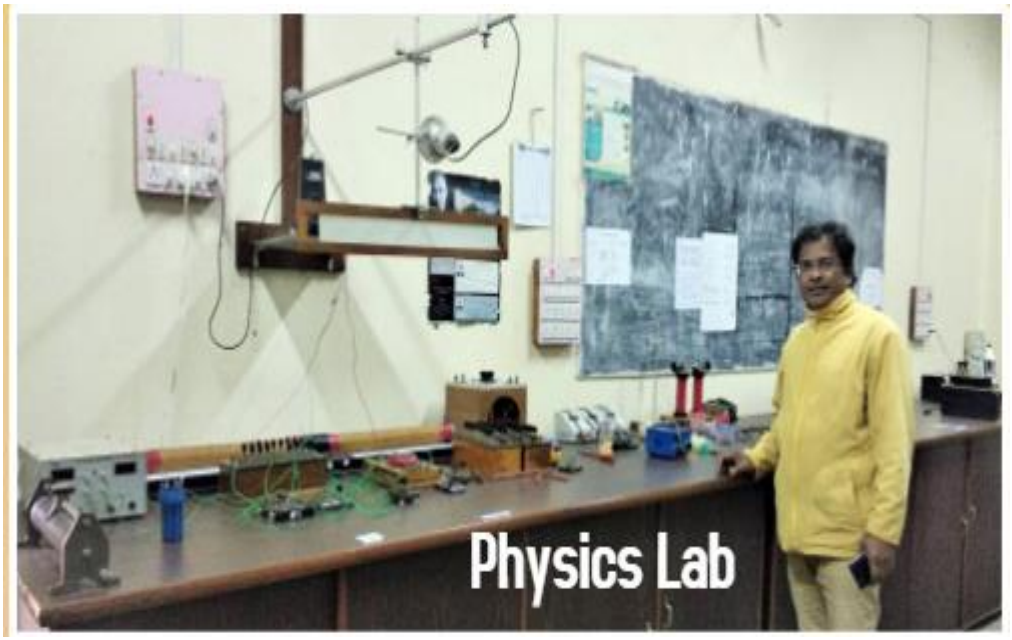
- Phased manner changing of normal conventional lights to energy efficient LED lights. All new lights procured will be LED lights only.
- Timely switching off and switching on of street lights.
- Optimum use of air conditioners. Switch on as and when required.
- Phased manner replacement of electrical appliances like ACs, Fridge, etc. with Energy efficient (Higher star rating) appliances.
- 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.
- Minimum use of ground water by reduced hours of pumping.
- Regular checking of leakage in water pipe lines and taps.
- Save water and save electricity stickers placed at prominent places.
- Conduct of different awareness campaign on "Save Water", "Save Trees" & Save Electricity through lectures/different competitions etc.
- Vermi composting is also in practice for disposing the wet waste from canteen and also other biodegradable wastes.
- Tree plantation in Campus.
- Ensuring ban on single use plastic bags in campus.
- Encourage use of public transport & Car-pooling (i.e. reduced vehicular use in the campus).
- Waste collection bins (i.e. burnable, non-burnable & recyclable) and their management.
- Ensuring proper e-waste management.
- Initiation for paperless (e-office) & e-documents for routine work.
- Increasing use of digital library.

Facilities in the campus

1. **Library:** College Library is well-stocked. It has approximately 24000 Books covering almost all aspects of Arts, Commerce, Humanities, Science and even for Pleasure Reading and motivation.

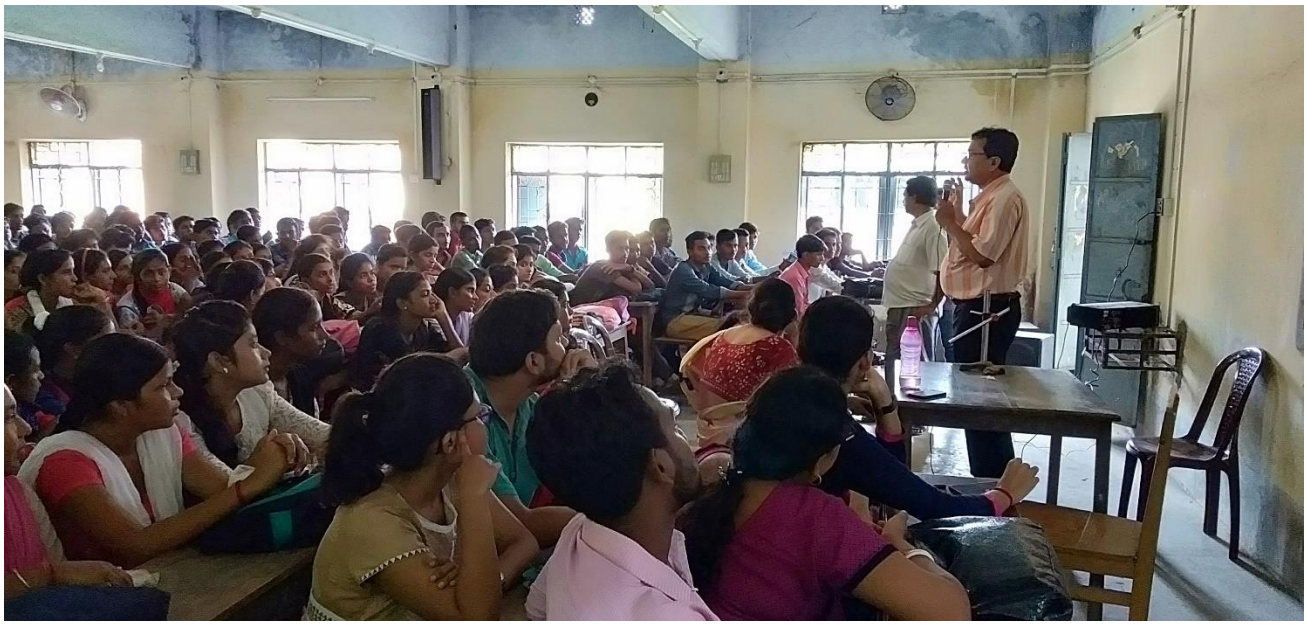
2. **Sports:** The college includes a large playground (Outdoor).

3. **Physics and Chemistry labs:** The College provides a well-equipped laboratory for students to carry out their innovative and scientific experiments. There are four labs within the college with computers, and Internet facilities for the students and teachers.

4. 

5. 

5. **Seminar Rooms:** college has 2 seminar rooms. This can accommodate up to 50-60 students and 150 students. Both are frequently used for seminars, talks and lectures by external professionals. It has an LCD projector and is also used for screening film shows by the Film Society of the college and for culture activities.



6. **Smart Classes**: There are 25 classrooms ICT enabled with projectors for enabling the use of audio-visual mediums of teaching.

7. Location:

AUDIT PARTICIPANTS

On behalf of college

Name	Designation
Dr. Uma Bhaumik	
Tapas Kumar Das	
Suvendu Kar	
Ashok Mahata	
Dr. Tapas Kumar Hait	
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SUPRIYO KAYAL - PRINCIPAL AUDITOR - DPARK KOLKATA-700104
REGD. NO. PA/QMS/2324/001

On behalf of Auditor Services

Name	Position	Qualifications
Mr. Supriyo Kayal	Lead Auditor	*M.Sc., DIPC.* *Energy Management System Auditor*

EXECUTIVE SUMMARY

The purpose of this Energy Audit was to seek opportunities to improve the energy efficiency of the Vivekananda Satavarshiki Mahavidyalaya. Reducing the energy consumption despite improving the human comfort, health and safety were of primary concern.

Beyond just identifying the energy consumption pattern, this audit sought to detect and categorize the most energy efficient appliances. Additionally, some daily practices relating common appliances have been shared which may help reducing the energy consumption. Data collection for energy audit of the campus was carried out by the Auditor Team. The Energy Audit Report accounts for the energy consumption patterns of the institution on actual survey and detailed analysis during the audit.

The work comprehends the area wise consumption traced using suitable equipment. The analysis was carried out by our team with the support of the staff members from Vivekananda Satavarshiki Mahavidyalaya. The report provides a list of possible actions to preserve and efficiently access the available source, resources and their saving potential was also identified. We look forward towards optimization that the authorities, students and staff members would follow the recommendations in the best possible way. The report is based on certain generalizations including the approximations wherever necessary. The views conveyed may not reveal the general opinion. They merely represent the opinion of the team guided by the interviews of clients. We are happy to submit this Energy audit report to the Vivekananda Satavarshiki Mahavidyalaya.

Objectives of Energy Auditing

The energy audit provides the vital information base for overall energy conservation program covering essentially energy utilization analysis and evaluation of energy conservation measures. It aims at:

- Identifying the quality and cost of various energy inputs.
- Assessing present pattern of energy consumption in different cost centres of operations.
- Relating energy inputs and production output.
- Identifying potential areas thermal and electrical energy economy.
- Highlighting wastages in major areas.
- Fixing of energy saving potential targets for individual cost centres.
- Implementation of measures for energy conservation & realization of savings

Methodology:

- Methodology adopted for achieving the desired objectives viz.: Assessment of the current operational status and energy savings include the following:
- Discussions with the concerned officials for identification of major areas of focus and other related systems.
- Team of engineers visited the site and had discussions with the concerned officials to collected data / information on the operations and load distribution within the plant and same for the overall premises. The data was analysed to arrive at a base line energy consumption pattern.
- Measurements and monitoring with the help of appropriate instruments including continuous and / or time-lapse recording, as appropriate and visual observations were made to identify the energy usage pattern and losses in the system.
- Trend analysis of costs and consumptions.
- Capacity and efficiency test of major utility equipment's, wherever applicable.
- Estimation of various losses
- Computation and in-depth analysis of the collected data, including utilization of computerized analysis and other techniques as appropriate

were done to draw inferences and to evolve suitable energy conservation plan/s for improvements/ reduction in specific energy consumption.

ENERGY AUDIT - ANALYSIS

1. ENERGY CONSUMPTION

To understand the Energy Consumption trends and for analysing the average monthly consumption we have collected electricity energy bills from July 2021 to June 2022

The details of **"Meter Connection"** at **"Vivekananda Satavarshiki Mahavidyalaya"** are as follows-

Name - The Principal Vivekananda Satavarshiki Mahavidyalaya

CA No. -

1.1 Summary of Monthly Electricity Consumption and Total Bill Amount

To understand the Energy consumption trend and for developing the baseline parameter we have collected monthly energy bill for the 12 months i.e. from July 2021 to June 2022

Electrical Instruments:

Particulars Quantity
Bulb 90
Tube light 123
Fan 223
AC 01
Refrigerator 03
Micro Oven 02
Xerox 01
Computer, Printer 46
TOTAL 489

Particulars of Electric consumption in Rupees

Apr to June 2021 47,857
July to Sept 2021 10,620

Oct to Dec 2021	13,752
Jan to Mar 2022	16,291

Particulars of Electric consumption in rupees

Apr to June 2022	25,272
July to Sept 2022	39,136
Oct to Dec 2022	26,642
Jan to Mar 2023	24,390

2. DIESEL CONSUMPTION

Below is the diesel consumption details in litres from July 2021 to June 2022.

Period	Diesel consumption (in Rs.)
fuel used in DG set for 2022-23	17,892
fuel used in DG set for 2021-22	5,678

Electrical Instruments:

Particulars	Quantity
Bulb (LED & P LAIN)	90
Tubelight	123
Fan	223
AC	01
Refrigerator	03
Micro Oven	02
Xerox	01
Computer, Printer	46
TOTAL	489

Particulars of Electric consumption	RS
Apr to June 2021	47,857
July to Sept 2021	10,620
Oct to Dec 2021	13,752
Jan to Mar 2022	16,291
fuel used in DG set for 2021-22	5,678

Particulars of Electric consumption	RS
Apr to June 2022	25,272
July to Sept 2022	39,136
Oct to Dec 2022	26,642
Jan to Mar 2023	24,390
fuel used in DG set for 2022-23 IN RS	17,892

`* Electricity measured as Units and

** Fuel used for DG set measured in Litre

ANALYSIS

There should be regular maintenance schedule of equipment like pumps, exhaust fans and IT equipment. Electronics such as computers, printers, scanners, etc. more

than 3 year or 5 years (as per their life) should be replaced with new computers/laptops. Ideal Temperature should be maintained for all electronic appliances.

AREAS FOR IMPROVEMENT

Lighting System:

- All "conventional FTL (46 Watt) should be replaced by energy efficient LED Tube Light fixture (20 Watt). **It's Appreciable**
- Installation of **"Timer control on street lighting"** in college campus recommended for energy saving in the campus.

Ceiling Fan and Exhaust Fan:

- Replacement of "conventional ceiling fan 80 Watt" by energy efficient star rated fan or BLDC based energy efficient fan (20 to 25 Watt) in "admin building, class rooms, Auditorium Hall laboratories and faculties cabin" have great potential for energy saving.

Air Conditioning System:

- It is recommended "Fall Ceiling "in air conditioning area. It will be reduced air conditioning load of AC and unit consumption**.**
- Reduced the infiltration from door and window in air conditioning area

Energy Management Workshop and Training:

- Develop energy management policies for college. Establish a procurement policy that is energy saving and eco-friendly.

- Conduct awareness and training programs for faculty, student and non-teaching staffs. Conduct seminars, workshops and exhibitions on energy management education.
- This policy will be communicated to students, teaching and nonteaching staff through internal communication channels and will be made available to public through college website.

Mr. S. Kayal

Lead Auditor EMS & Energy (EnMS)

NBQP(QCI) registered Principal Auditor

***** **END OF THE REPORT** ******