



Indian Institute For Social Development And Research's



Rashtrapita Mahatma Gandhi College

Khed, Tal:Karjat, District: Ahamadnagar 414403

Affiliated to Savitribai Phule Pune University Pune

Established in 2001 Accredited by NAAC at B+ Grade (with 2.51 CGPA)

GREEN AUDIT REPORT

2021-22 & 2022-23

By

BIO-GEO CONSULTANCY

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Indian Institute For Social Development And Research's
Rashtrapita Mahatma Gandhi College



Our Vision

“To shape the youths from the rural areas to become responsible citizens who would act as catalytic agents for better future”.

Our mission

“Our mission is to serve the society to achieve progress and the poorest and poor through education. The young girls and boys learned in our college would be well equipped with academics as well as social consciousness so that they can be responsible citizens for future change”.

The institute has established the ‘Rural Development Centre’ on the premise of social upliftment of the under-privileged, downtrodden and drought affected people. Eventually, Khednagar has become a lead village in the tehsil demonstrating various projects based on local strengths of both natural and human resources. With a long experience of the work, the institute founded high school in 1984, Junior College in 2000 and Senior College in 2001. Thus our college is a vital part of national mission of poverty alleviation through rural development. In tune with this, our college is committed to overall development of our students. We believe that the young generation is full of energy and this energy and potential of youth should be utilized for the welfare of the society and the nation. The vision and mission of the college are rightly reflected in the activities of the college.

Our Motto:

“ Sa Vidya Samajotkarshaha”

“Education for Development of Society”

Introduction:

The concept of 'ENERGY AUDIT-2021-22 & 2022-23 was put forth by Hon'ble Dr. Kumar Saptarshi, President, Maharashtra Gandhi Smarak Nidhi, Gandhi Bhavan, Kothrud, Pune and President and Managing Trustee, IISDR. He is involved in tree plantation programmes for the last 50 years. Being visionary and committed to upliftment of weaker section of society he is always proactive for environmental conservation. He has demonstrated how eco-friendly campus can provide healthy and comfortable atmosphere for the school/college going children. It was his idea to carry out Energy audit for the campus of RMG College. We are happy to shoulder the responsibility.

Energy audit of a college campus aims at understanding the present environmental status and to find out ways to internalize environmental issues which are well felt externally. It is also an attempt to develop initiative of all the stakeholders, viz. management, Principal, staff, students and parents to develop campus which ensures clean and green environment for learners. We also hope that such kind of exercise can develop environmental awareness among the families of students and in turn villages. With this vision in mind attempt has been made to document the green status of the campus adopting proper tools and methodology. For this, aspects like landscaping and plantation, solid waste management, recycling of waste water, conservation of energy, water conservation, rainwater harvesting and minimum usage of paper, E-Waste collection, segregation of wet and dry waste, etc. have been considered for our observations.

We are happy to note that the college exhibits almost all the aspects of "Green Campus" with participation of stakeholders in true sense of the term. It is well reflected in the activities like tree plantation with good phyto-diversity, organic farming, vermin culture, rain harvesting, wastewater management, green building, etc.

Message by Dr. Kumar Saptarshi



It's my great pleasure that I could establish school and college on behalf of this Trust and other activities on a barren land in rural area. 26 acres land was purchased in year 1980 for developing educational institute after considering the need of rural students. There were no educational facilities available in earlier period in Khed village situated at the end corner of Ahmednagaer District. Students had to go nearby towns like Baramati or Karjat about 40 kilometers away from this village. Road and transport facilities were very poor. Very few students could afford to get higher education. Rich and Poor girl students left behind. There was a persisting demand of senior college for higher education. Indian Institute for Social Development and Research is registered Charitable trust. This Institute had established Rashtrapita Mahatma Gandhi Mahavidyalaya Khed in the year 2001 after establishing High school in 1984 and Junior College. The college is located at the bank of Bheema River. The activities of Rashtrapita Mahatma Gandhi Mahavidyalaya are conducted through its parent institute IISDR, Pune with an objective to provide quality education.

The College currently provides graduate course in B.A. degree of Savitribai Phule Pune University. Along with Seven certificate courses like Fish farming, Nursery Technique, Mushroom cultivation etc. for making the students self employed and to Develop skilled manpower for industries and farming. The College achieved incredible progress in a very short span of time and today we have established our identity as one of the premier educational institute in rural area of Karjat Tehsil, Dist -Ahemadnagar. The college has excellent infrastructure and we keep on upgrading it. The College has lush green and eco-friendly campus. The College has excellent amenities like well-equipped central library, internet facility, auditorium, seminar hall, canteen for the students and hostel for needy students. The College always endeavours to meet the growing needs of higher education by adopting new technologies, providing resources by developing positive attitude. The College continuously strives to provide the fine environment for learning, research, innovation and character building.

I welcome students to this inspiring environment and appeal them to acquire this opportunity and to live their wonderful college life merrily. Our faculties ensure that students gain not only

technical knowledge but also holistic knowledge and skills that will equip them to face the realities of the world around. The College strongly believes in personality development through individual counselling and guidance. Faculty-members are keen to monitor student progress very closely as a friend, philosopher and guide. They always motivate students to participate in academic, research, sports and cultural pursuits. There is a close bond between the faculty and student community. The College emphasis that our faculty should continuously upgrade themselves to provide direction for future teaching-learning innovations. I wish grand success to both students and staff of Rashtrapita Mahatma Gandhi Mahavidyalaya, Khed.

The college has provided well-equipped infrastructural facilities for effective and efficient conduct of educational programs. Proper environment is provided for curricular, co-curricular and administrative activities. Our aim is to create student friendly ambiance so that they can adopt the environment of outside world and prove their mettle competitively.

I expect youths in our college should gain scientific knowledge and skills about environment friendly businesses so that they can be able to improve rural prosperity in near future and that too on sustainable basis. I hope the “Energy Audit Report 2021-22 & 2022-23 would help them to get directions.

On behalf of my colleagues I express my thanks to Dr. D. N. Patil and Dr. Jyotiram More for preparing the report.

Dr. Kumar Saptarshi
President, IISDR

Message by Principal



Dr. D. S. Nikumbh

Indian Institute For Social Development and Research has established Rashtrapita Mahatma Gandhi Mahavidyalaya in the year 2001 with the vision to shape the youths to become responsible citizens who would act as catalytic agents for better future. The college is affiliated to the Savitribai Phule Pune University, Pune Keeping in tune with our mission, to serve the society to achieve progress of the poorest of poor through education. The young girls and boys learned in our college would be equipped with academics as well as social consciousness so that they can be responsible citizens for future change. The college accommodates most of the students from farming background.

The college has provided well-equipped infrastructural facilities for effective and efficient conduct of educational programs. Proper environment is provided for curricular, co-curricular and administrative activities. Our aim is to create student friendly ambiance so that they can adopt the environment of globalized world and prove their mettle competitively.

I am pleased to offer my message on the occasion of the publication of Report of 'Green Audit'. RMG College is one of the unique spiritual educational campus. With quality education we are also aware about the environment. As per guidance of our President Dr. Kumar Saptarshi consider clean and green campus is prerequisite for academic and cultural development of our students.

Most importantly, environmental values inculcated in our students help to create environmental concern in the villages around the college. We also try to train our students to identify environmental opportunities with the activities like organic farming, fish farming, fodder development, optimal use of water for agriculture, etc.

Energy Audit is useful for all of us to understand environmental resources in scientific way. The report would be useful for us for future development. Efforts made by our institution for the protection of environment and biodiversity conservation have been well appreciated in the audit. It encourages us for further strengthening environment of our campus in particular and the areas around in general.

I express my heartfelt thanks to expert members of team carrying out Energy Audit of our campus.

Acknowledgements

We take this opportunity to express our gratitude towards the founder president of the Institute Hon'ble Dr. Kumar Saptarshi, his colleagues in the Board of Trustees, members of the Local Management Committee of the college for their valuable guidance, continuous encouragement, generous gift of time with constructive criticism and suggestion during the composition of work of entire 'Energy Audit Report-2021-22 & 2022-23'.

We express our deep sense of gratitude to former Incharge Principal **Dr. Dharmendra Salve, IQAC Coordinator Prof. Shivguru Vhandkar** and Prin. **Dr. D. S. Nikumbh** who inspired and encouraged us throughout the work. We gratefully acknowledge the help provided by them on several occasions. The assistance provided by staff and students proved to be valuable to make the report in proper shape.

Place: Khednagar
Date: September 5, 2023

Dr. Jyotiram More

CHAPTER NO – 1

Introduction

1.1 Introduction:

Energy crisis is one of major problem in exiting world where demand of energy is increasing rapidly. Energy is prime focus due to rapid growth and development of technology. Proper utilization of Energy is one of the major aspects of any developing country. Today the need of energy has increased greatly in order to meet the demand of ever increasing consumption of it. This energy crisis problem will be solved through Energy conservation and use of energy efficient equipment.

1.2 Objective of Energy Audit

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 centers of operations.
- Relating energy inputs and production output.
- Identifying potential areas of thermal and electrical energy economy.
- Highlighting wastage's in major areas.
- Fixing of energy saving potential targets for individual cost centers.
- Implementation of measures for energy conservation & realization of savings.
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The energy audit provides the vital information base for overall energy conservation Programme covering essentially energy utilization analysis and evaluation of energy conservation measures.

1.3 Need for Energy Audit

- The primary objective of Energy Audit is to determine ways to reduce energy consumption per unit of product output or to lower operating costs.
- To minimize the cost of energy
- To minimize the operational cost
- To minimize the cost for repair & reconstruction
- To increase the quality of environment that contribute to increased work productivity
- Preventive measure for energy wastage
- Maintenance and quality control programmes
- Helps to understand more about the ways energy and fuel are used in any industry.
- Help in identifying the areas where waste can occur & where scope for improvement exists.
- Positive orientation to cost reduction.
- Preventive maintenance & quality control programs
- Check the variation of energy cost.
- Reliability of energy supply
- Identify energy conservation techniques.
- Finding the feasible solution for energy wastage
- Energy auditing provide 'benchmark' for managing energy in the organization

1.4 Present Scenario of College Campus

The college has three storied building on a piece of 26 acres of land. There is a beautiful garden in the front area. The college has 6 classrooms. The college has computer labs for science. In addition to this Gymkhana hall, Girls common room, Boys common room, Auditorium for various function, well-furnished office, Principal's Room, Library with reading room. Every head of department have separate cabin.

1.5 General Information:

Bio-Geo Consultancy conducted the Energy Audit at Indian Institute For Social Development and Research has established Rashtrapita Mahatma Gandhi Mahavidyalaya in August 2023. The purpose of the energy audit was to address the status of the Electrical systems, Energy uses, performance assessment of various facilities like A.C. system, Fans, lighting system, Printers, Pumps etc.

General Information about the Yashvantrao Chavan Arts, commerce & Science College		
Sr. No.	Items	Details
1	Location	Rashtrapita Mahatma Gandhi Mahavidyalaya, Khednagar, Tal Karjat, Dist Ahmednagar
2	Establishment Year	2001
3	Campus Size	26Acre
4	Affiliation	Savitribai Phule Pune University, Pune
5	Departments	09
6	Faculties	11
7	No. of Courses	---
8	Mode of Education	Co-Education
9	Official Website	http://www.rmgcollege.in/

Bio-Geo Consultancy has observed certain shortcomings in energy systems and their uses. Some of the techno-commercially implementable solutions to improve system efficiency, performance of different equipment and safety level are purposed in this report.

CHAPTER NO - 2

Energy Audit Methodology and Scope

2.1 What is Energy Audit?

Energy today has become a key factor in deciding the product cost at micro level as well as in dictating the inflation and the debt burden at the macro level. Energy cost is a significant factor in economic activity at par with factors of production like capital, land and labor. Same is the case for educational institutes. More importantly, colleges and schools in the rural areas face the challenges of power cut and frequently interrupted power supply causing lack of internet facilities in turn putting obstacles in on-line classes, disturbing prompt communication with university and schedule of laboratory work. At times even smooth conduct of exams becomes trouble some. Any educational institute cannot be held responsible for the issues of shortage of power in the country, particularly, in rural areas. However, it becomes the responsibility of a good institute to find the ways and means to address these externalities. The college has decided to do so and hence the present audit is meaningful for strategizing conservation of electricity on one hand and improving the share of green energy on the other. Energy conservation measures essentially mean using less energy for the same level of activity. Energy Audit attempts to balance the total energy inputs with its use and serves to identify all the energy streams in the systems and quantifies energy consumption according to its discrete function. Energy Audit helps in energy cost optimization, pollution control and safety. It also suggests the appropriate methods to improve the operating & maintenance practices of the system. It is instrumental in coping with the situation of variation in energy cost, availability, reliability of energy supply, decision on appropriate energy mix, decision for using improved energy efficient equipment, instrumentations and technology.

2.2 Energy Audit Methodologies

A. Data Collection

Data collection is very important step in energy audit. Data collection includes,

1. Relevant data like electricity bills for the year 2021-22 & 2022-23.
2. List of lighting load, fan, computer and air conditioner for each department.
3. Voltage, Current and Power are measured at each feeder.

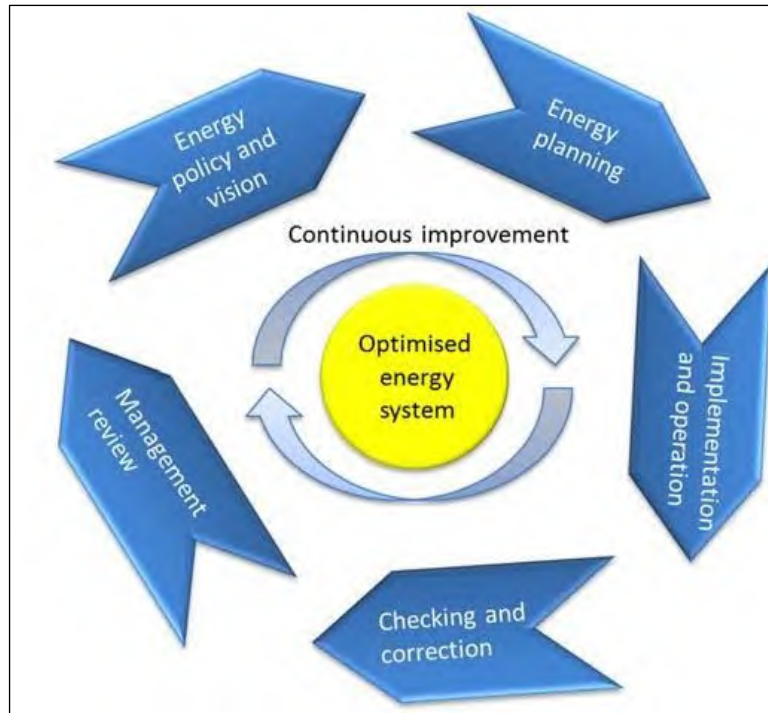
B. Data Analysis

Data analysis is next important step after data collection. The areas for implementation and energy conservation opportunities are identified.

C. Action Taken

Action taken report must be critically examined. It involves implementation of strategies based on measurement of actual energy consumption. In this methodology different areas of energy consumption are identified.

2.3 Energy Management Cycle Diagram:



2.4 Methodology

Board guidelines indicating the methodology for such an energy audit is given below. Possible stages for interaction/conference are also indicated.

Phase-I

1. Collections of data on operational parameters, energy consumption both normal and electrical, coal and power quality etc., through a questionnaire.
2. Study the existing plant capacities and their performance to assess plant operations.
3. Study of the specific energy consumption (both thermal and electrical) department-wise and plant as a whole.
4. Study of the power sources, distribution system and drive controls, load factor and efficiency of large motors (above 10 kW), process automations, plant illuminations etc.
5. Collection of requisite data and analysis and identification of specific areas with potential for conservation of thermal and electrical energy.

6. Field measurements of operational parameters and carrying out heat and mass balance.
7. Study of limitations, if any, in the optimal use of thermal and electrical energy.
8. Formulation of specific recommendations along with broad system concept for conservation of thermal and electrical energy.
9. Preparation of capital cost estimates and establishing techno-economic feasibility for recommended measures.
10. No investment and/or marginal investment for system improvements and optimization of operations.
11. Major investment due to incorporation of modern energy efficient equipment and up gradation of existing equipment.
12. Formulating tentative time schedule for implementation of the recommendation.
13. Undertaking broad cost benefit analysis in terms of savings in energy consumption per unit of production and pay-back period.

Phase-II

Follow-up with the industry on periodic basis to ascertain the level of implementation of recommendation and assist, if required, in implementation of the measures to achieve energy efficiency.

2.5 Types of Energy Audit

A. Preliminary Energy Audit

The Preliminary Energy Audit focuses on the major energy suppliers and demands usually accounting for approximately 70% of total energy. It is essentially a preliminary data gathering and analysis effort. It uses only available data and is completed with limited diagnostic instruments. The PEA is conducted in a very short time frame i.e. 1-3 days during which the energy auditor relies on his experience together with all the relevant written, oral visual information that can lead to a quick diagnosis of the plant energy situation. The PEA focuses on the identification of obvious sources of energy wastage's. The typical out put of a PEA is a set of recommendations and immediate low cost action that can be taken up by the department head.

B. Detailed Energy Audit

The detailed audit goes beyond quantitative estimates of costs and savings. It includes engineering recommendations and well-defined project, giving due priorities. Approximately 95% of all energy is accounted for during the detailed audit. The detailed energy audit is conducted after the preliminary energy audit. Sophisticated instrumentation including flow meter, flue gas analyzer and scanner are use of compute energy efficiency.

1. Review of Electricity Bills, Contract Demand and Power Factor: For the last one year, in which possibility will be explored for further reduction of contract demand and improvement of power factor
2. Electrical System Network: It would include detailed study of all the Transformer operations of various Ratings / Capacities, their operational pattern, Loading, No Load Losses, Power Factor Measurement on the Main Power Distribution Boards and scope for improvement if any. The study would also cover possible improvements in energy metering systems for better control and monitoring.
3. Study of Motors and Pumps Loading: Study of motors (above 10 kW) in terms of measurement of voltage (V), Current (I), Power (kW) and power factor and thereby suggesting measures for energy saving like reduction in size of motors or installation of energy saving device in the existing motors. Study of Pumps and their flow, thereby suggesting measures for energy saving like reduction in size of Motors and Pumps or installation of energy saving device in the existing motors / optimization of pumps.
4. Study of Air conditioning plant: w.r.t measurement of Specific Energy consumption i.e kW/TR of refrigeration, study of Refrigerant Compressors, Chilling Units, etc. Further, various measures would be suggested to improve its performance.
5. Cooling Tower: This would include detailed study of the operational performance of the cooling towers through measurements of temperature differential, air/water flow rate, to enable evaluate specific performance parameters like approach, effectiveness etc.
6. Performance Evaluation of Boilers: This includes detailed study of boiler efficiency, Thermal insulation survey and flue gas analysis.
7. Performance Evaluation of Turbines: This includes detailed study of Turbine efficiency, Waste heat recovery.
8. Performance Evaluation of Air Compressor: This includes detailed study of Air compressor system for finding its performance and specific energy consumption
9. Evaluation of Condenser performance: This includes detailed study of condenser performance and opportunities for waste heat recovery.
10. Performance Evaluation of Burners: This includes detailed study on performance of Furnace / Burner, thermal insulation survey for finding its efficiency
11. Windows / Split Air Conditioners: Performance shall be evaluated as regards, their input power vis-a-vis TR capacity and performance will be compared to improve to the best in the category
12. Illumination: Study of the illumination system, LUX level in various areas, area lighting etc. and suggest measures for improvements and energy conservation opportunity wherever feasible.

13. DG Set: Study the operations of DG sets to evaluate their average cost of Power Generation, Specific Energy Generation and subsequently identify areas wherein energy savings could be achieved after analysing the operational practices etc. of the DG sets.

14. The entire recommendations would be backed up with techno-economic calculations including the estimated investments required for implementation of the suggested measures and simple payback period. Measurement would be made using appropriate instrumentation support for time lapse and continuous recording of the operational parameters.

15. Completion Period: We usually start the field data collection at site with in one and half months' time, from the date of receipt of work order and the draft energy audit report is submitted thereafter in 1 month time. Finalization of energy audit report is normally completed within 3 months. (After completion of the audit study, the findings and recommendations are discussed with the technical head and the final report with recommendations is submitted.

2.6 List of Energy Audit Instruments

Sr. No	Name of the Instrument	Intended Use
1	Three Phase & Single Phase Power Analyser	Used to measure, record real time Power Consumption, analysis of electrical load, demand control, harmonics and transient. It is done without interrupting the connections.
2	Luxmeter	Used for measurement of illumination level
3	Digital Multimeter	Used for measurement of voltage. Current and resistance.
4	Non-Contact Tachometer	Used for measurement of speed of rotation equipment.
5	Thermo-hygrometer	Used for measurement of air velocity & humidification, ventilation, Air-conditioning and refrigeration systems etc. Also used for calculation of dew point to find out the heat being carried away by outgoing gases in industries. Where product drying requires hot air.
6	Anemometer	Used for measuring the flow and speed of Air in air conditioning
7	Digital Temperature & Humidity monitor	Used for measurement and monitoring of temperature and humidity
8	Digital Manometer	Used for measurement of differential pressure.

Chapter No. 3

Energy Use Profile

3.1 Executive Summary:

The objective of the audit was to study the energy consumption pattern of the facility, identify the areas where potential for energy/cost saving exists and prepare proposals for energy/cost saving along with investment and payback periods.

The salient observations and recommendations are given below.

1. Rashtrapita Mahatma Gandhi Mahavidyalaya, Khednagar, Tal Karjat, Dist Ahmednagar uses energy in the following forms:

a. From MSEDCL

b. Electricity SOLAR Grid connected solar plant (11kw)

c. High Speed Diesel Generator (HSDG)

Electrical energy is used for various applications, like: Computers, Lighting, Air-Conditioning, Fans Other Laboratory Equipment, Printers, Refrigerators, Xerox machines, CCTV, UPS, LCD Projector, Router system, Flood light, and Pumping motor etc.

2. The Specific Energy Consumption (SEC) is the ratio of energy required per square meter.

In this case the SEC is evaluated as electrical units consumed per square meter of area. It is calculated as under for (Electricity): **0.21504 kWh/Sq.m.**

3. After the measurement and analysis, we propose herewith following Energy Efficiency Improvement measures.

Apart from the above suggestions, as a renewable energy and sustainability initiative, it is recommended to install 3kW roof top solar PV power plant which can save the 25% of annual electricity consumption of the college. Also, following suggestions are made for energy saving purpose: All computers have to be set for power save mode for switching offscreen if not used for 05 minutes and hibernate if not used for morethan 60 minute. Students may be educated towards saving of electricity by displaying messages in the classroom and common public area for switching off lights, fans and computers when not required. Fans should be used only in the hot summer climate

and has to be replaced by 5 STAR rated energy efficient fans to reduce consumption

3.2 Summary Details:

From the above mentioned Electrical Energy Consumption Analysis, some options of energy saving or low energy consuming devices may be suggested. The college has accepted the suggestions made by the experts. Comparative analysis has proved that this initiative has saved power consumption.

Chapter No. 4

Conclusion and Action Plan

4.1 Conclusion:

The Power Factor is the ratio of electrical power consumed by various components used by the college to the same supplied by AC grid. If there is good efficient transportation and use of power through pumps, tubes, laboratory equipment, computers, backup systems, etc. PF would be 100%. However, any activity cannot be 100% efficient. By and large it ranges from 70 to 80%. It is useful calculation to understand whether loss of power is beyond the limit and immediate measures are warranted. Most utility bills are influenced by KVAR usage. A good Power Factor provides a better voltage, reducing the pressure on electrical distribution network, reducing cable heating, cable over loading and cable losses, reducing over loadings of control gears and switch-gears etc.

Whenever the average power factor over a billing cycle or a month, whichever is lower, of a High Tension consumer is below 90%, Penal charges shall be levied to the consumer at the rate of 2% (two %) of the amount of monthly energy bill (excluding of Demand Charges, FOCA, Electricity Duty and Regulatory Liability Charge etc.) For power factor of 0.99, the effective incentive will amount to 5% (five percent) reduction in the energy bill and for unity power factor the effective incentive will amount to 7% (seven percent) reduction in the energy bill. Here in case of the college under scrutiny PF is good enough and no penal charges have been levied in the year 2021-22. This is plus point observed in the audit process.

4.2 Energy Conservation Action Plan:

Following are the energy conservation action plan is possible as per the detailed energy audit. These energy conservation opportunities are of the type of minimum cost investment.

- Water management system must be in place. Reduction in water consumption by addressing leakages of taps and other miscellaneous utilities.
- As per the survey of connected load in the campus approved electrical demand is too large. It is suggested to reduce maximum demand, if possible.
- Rainwater harvesting can be implemented for reducing pumping hours and ultimately for saves in electrical energy.
- Replacement of simple tubes & bulbs monitors with LED.
- Display Sign boards at different eminent locations in the building to create awareness amongst staff and students
- Install solar street lights in the institute.

- Small wind mills can be placed on institute and surrounding as institute location is away from population and sufficient wind velocity available.
- Electric distribution must be renovated and all safety features are required to consider. It is suggested to have firefighting system to be installed in the distribution room.

4.3 Department wise load consumption:

1) Principal Office/Cabin:

Sr. No.	Name of Appliance	Power Rating (Watt)	Quantity	Power Consumption (Watt)	Usage per Day Hr.	Power Consumption/day (Watt)
A	B	C	D	E = C X D	F	G = E X F
1	FTL	40	04	160	03	480
2	Fan	60	03	180	06	1080
3	PC	12	01	12	01	12
4	LED	33	01	33	05	165
5	Printer	200	01	200	01	200
6	CCTV	5	01	05	24	120
7	AC	55	No	00	00	00
8	Refrigerator	250	01	250	00	250
9	Inverter	10	01	10	24	240
10	Xerox	80	No	00	00	00

2) Administration Office

Sr. No.	Name of Appliance	Power Rating (Watt)	Quantity	Power Consumption (Watt)	Usage per Day Hr.	Power Consumption/day (Watt)
A	B	C	D	E = C X D	F	G = E X F
1	FTL	40	05	200	06	1200
2	Fan	60	05	300	06	1800
3	PC	12	07	84	06	504
4	LED	33	No	00	00	00
5	Printer	200	05	1000	04	4000
6	CCTV	5	02	10	24	240
7	AC	55	No	00	00	00
8	Refrigerator	250	No	00	00	00
9	Inverter	10	01	10	24	240
10	Xerox	80	01	80	02	160

3. IQAC

Sr. No.	Name of Appliance	Power Rating (Watt)	Quantity	Power Consumption (Watt)	Usage per Day Hr.	Power Consumption/day (Watt)
A	B	C	D	E = C X D	F	G = E X F
1	FTL	40	02	80	02	160
2	Fan	60	01	60	02	120
3	PC	12	01	12	02	24
4	LED	33	00	00	00	00
5	Printer	200	01	200	½	100
6	CCTV	5	01	05	24	120
7	AC	55	00	00	00	00
8	Refrigerator	250	00	00	00	00
9	Inverter	10	00	00	00	00
10	Xerox	80	00	00	00	00

4. Passage

Sr. No.	Name of Appliance	Power Rating (Watt)	Quantity	Power Consumption (Watt)	Usage per Day Hr.	Power Consumption/day (Watt)
A	B	C	D	E = C X D	F	G = E X F
1	FTL	40	06	240	05	1200
2	Fan	60	01	60	03	180
3	PC	12	No	00	00	00
4	LED	33	No	00	00	00
5	Printer	200	00	00	00	00
6	CCTV	5	03	15	24	36
7	AC	55	No	00	00	00
8	Refrigerator	250	00	00	00	00
9	Inverter	10	00	00	00	00
10	Submersible Pump	3728.5	01	3728.5	01	3728.5

5. Gym

Sr. No.	Name of Appliance	Power Rating (Watt)	Quantity	Power Consumption (Watt)	Usage per Day Hr.	Power Consumption/day (Watt)
A	B	C	D	E = C X D	F	G = E X F
1	FTL	40	03	120	03	360
2	Fan	60	03	180	03	540
3	PC	12	01	12	½	06
4	LED	33	01	00	00	00
5	Printer	200	01	200	½	100
6	CCTV	5	00	00	00	00
7	AC	55	00	00	00	00
8	Refrigerator	250	00	00	00	00
9	Inverter	10	00	00	00	00
10	Xerox	80	00	00	00	00

6. Department of Marathi

Sr. No.	Name of Appliance	Power Rating (Watt)	Quantity	Power Consumption (Watt)	Usage per Day Hr.	Power Consumption/day (Watt)
A	B	C	D	E = C X D	F	G = E X F
1	FTL	40	01	40	02	80
2	Fan	60	01	60	02	120
3	PC	12	01	12	½	06
4	LED	33	00	00	00	00
5	Printer	200	00	00	00	00
6	CCTV	5	00	00	00	00
7	AC	55	00	00	00	00
8	Refrigerator	250	00	00	00	00
9	Inverter	10	00	00	00	00
10	Xerox	80	00	00	00	00

7. Department of English

Sr. No.	Name of Appliance	Power Rating (Watt)	Quantity	Power Consumption (Watt)	Usage per Day Hr.	Power Consumption/day (Watt)
A	B	C	D	E = C X D	F	G = E X F
1	FTL	40	01	40	02	80
2	Fan	60	01	60	02	120
3	PC	12	01	12	½	06
4	LED	33	00	00	00	00
5	Printer	200	01	200	½	100
6	CCTV	5	00	00	00	00
7	AC	55	00	00	00	00
8	Refrigerator	250	00	00	00	00
9	Inverter	10	00	00	00	00
10	Xerox	80	00	00	00	00

8. Department of Hindi

Sr. No.	Name of Appliance	Power Rating (Watt)	Quantity	Power Consumption (Watt)	Usage per Day Hr.	Power Consumption/day (Watt)
A	B	C	D	E = C X D	F	G = E X F
1	FTL	40	01	40	02	80
2	Fan	60	01	60	02	120
3	PC	12	01	12	½	06
4	LED	33	00	00	00	00
5	Printer	200	01	200	½	100
6	CCTV	5	00	00	00	00
7	AC	55	00	00	00	00
8	Refrigerator	250	00	00	00	00
9	Inverter	10	00	00	00	00
10	Xerox	80	00	00	00	00

9. Department of Economics

Sr. No.	Name of Appliance	Power Rating (Watt)	Quantity	Power Consumption (Watt)	Usage per Day Hr.	Power Consumption/day (Watt)
A	B	C	D	E = C X D	F	G = E X F
1	FTL	40	01	40	02	80
2	Fan	60	01	60	02	120
3	PC	12	01	12	½	06
4	LED	33	00	00	00	00
5	Printer	200	01	200	½	100
6	CCTV	5	00	00	00	00
7	AC	55	00	00	00	00
8	Refrigerator	250	00	00	00	00
9	Inverter	10	00	00	00	00
10	Xerox	80	00	00	00	00

10. Department of Geography

Sr. No.	Name of Appliance	Power Rating (Watt)	Quantity	Power Consumption (Watt)	Usage per Day Hr.	Power Consumption/day (Watt)
A	B	C	D	E = C X D	F	G = E X F
1	FTL	40	06	240	02	480
2	Fan	60	02	120	02	240
3	PC	12	01	12	½	06
4	LED	33	00	00	00	00
5	Printer	200	01	200	½	100
6	CCTV	5	00	00	00	00
7	AC	55	00	00	00	00
8	Refrigerator	250	00	00	00	00
9	Inverter	10	00	00	00	00
10	Xerox	80	00	00	00	00

11. Department of History

Sr. No.	Name of Appliance	Power Rating (Watt)	Quantity	Power Consumption (Watt)	Usage per Day Hr.	Power Consumption/day (Watt)
A	B	C	D	E = C X D	F	G = E X F
1	FTL	40	01	40	02	80
2	Fan	60	01	60	02	120
3	PC	12	01	12	½	06
4	LED	33	00	00	00	00
5	Printer	200	01	200	½	100
6	CCTV	5	00	00	00	00
7	AC	55	00	00	00	00
8	Refrigerator	250	00	00	00	00
9	Inverter	10	00	00	00	00
10	Xerox	80	00	00	00	00

4.4 Abbreviations:

AVR	: Automatic Voltage Regulator (electricity)
CFL	: Compact Fluorescent Lamp
FTL	: Fluorescent Tube Lamp
kVA	: kilo Volt Ampere
kVAr	: kilo Volt Ampere reactive
kW	: kilo Watt
kWp	:kilo Watt peak
kWh	: kilo Watt hour (Unit of Electricity)
LED	: Light Emitting Diode
LT	: Low Tension
PF	: Power Factor
MEDA	: Maharashtra Energy Development Agency
MSSEDCL	: Maharashtra State Electricity Distribution Company Limited
Solar PV	: Solar Photo Voltaic



Registration Certificate

This is to certify that

RASHTRAPITA MAHATMA GANDHI MAHAVIDYALAYA

AT/POST : KHED, TAL . KARJAT DIST. AHMEDNAGAR – 414403
(MAHARASHTRA), INDIA.

has been assessed by RAPL and found to comply with the requirements of

ISO 9001 : 2015 Quality Management Systems

For the following activities:

PROVIDING THE EDUCATION OF GRADUATION AND POST GRADUATION
LEVEL FOR THE STREAMS OF COMMERCE, ARTS AND SCIENCE.

Certificate Number: E2023094294
Date of certification: 02/09/2023
Ist Surveillance on or before: 01/09/2024
IInd Surveillance on or before: 01/09/2025
Certification Valid Until: 01/09/2026



Director (Certification)
Royal Assessments Pvt. Ltd.

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