RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL's
INSTITUTE OF COMPUTER & MANAGEMENT RESEARCH
Gat No. 101-102, Moshi Alandi Road, Dudulgaon, Pune- 412 105
Phone: (020) 66998966 email: directoricmr@rediffmail.com

7.1.3

Quality audits on environment and energy regularly undertaken by the institute

DIRECTOR
RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S
INSTITUTE OF COMPUTER
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Dudulgaon, Pune-412 105

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Quality audits on environment and energy regularly undertaken by the institution

Sr. No.	Particulars	Year
1	Policy Document For Environment And Green Campus	2017-2023
2	Green Audit Report And Certificate	2017-2018
3	Green Audit Report And Certificate	2018-2019
4	Green Audit Report And Certificate	2019-2020
5	Green Audit Report And Certificate	2021-2022
6	Green Audit Report And Certificate	2022-2023
7	Environmental Audit Report And Certificate	2019-2020
9	Environmental Audit Report And Certificate	2021-2022
10	Environmental Audit Report And Certificate	2022-2023
11	Policy document for energy usage	2017-2023
12	Energy Green Audit Report And Certificate	2017-2018
13	Energy Green Audit Report And Certificate	2018-2019

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INSTITUTE OF COMPUTER & MANAGEMENT RESEARCH
Dudulgaon, Pune-412 105

14	Energy Green Audit Report And Certificate	2019-2020
15	Energy audit report and Certificate	2021-2022
16	Energy audit report and Certificate	2022-2023
17	Electrical safety and power quality audit	2020-2021
18	Action taken reports	
19	Clean and Green campus Initiatives	

DIRECTOR
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Dudulgaon, Pune-412 105

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Gat No. 101-102, Moshi Alandi Road, Dudulgaon, Pune- 412 105
Phone: (020) 66998966 email: directoricmr@rediffmail.com

Policy Document for Environmental and Green Campus Initiatives 2017-2023

DIRECTOR
RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S
INSTITUTE OF COMPUTER
& MANAGEMENT RESEARCH
Dudulgaon, Pune-412 105

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Phone: (020) 66998966 email: directoricmr@rediffmail.com

POLICIES FOR ENVIRONMENTAL AND GREEN CAMPUS INITIATIVES

Environmental and Green campus:

Rajmata Jijau Shikshan Prasarak Mandal's Institute of Computer and Management Research (RJSPM's ICMR) has taken initiatives to implement eco-friendly practices in the campus. A green campus is a concept where continuous efforts are taken to establish environmentally sustainable and eco-friendly practices. Rajmata Jijau Shikshan Prasarak Mandal's Institute of Computer and Management Research is regularly engaged in a variety of eco-friendly practices in our campus such as tree plantation, installation of solar energy panels etc. Efforts are being made to develop the campus on green concepts, particularly concentrating on water conservation, use of alternative and renewable sources of energy, use of different energy conservation methods, solid waste management, E-waste management etc.

Scope of the Policy:

The Green Campus, Energy and Environment Policies will develop exciting new practices that encourage students in creating positive change. Green campus is achieved by making significant progress in the campus in collaboration with community. The Institute has performed various protocols and programmes under green campus initiatives.

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Phone: (020) 66998966 email: directoricmr@rediffmail.com

Objectives of the green campus program:

- To protect and preserve ecological systems and natural resources within the campus.
- To incorporate environmental initiatives into policies, plans and programmes for social development and outreach activities.
- To continuously expand our contribution to climate protection and adaptation to climate change and to the conservation of comprehensive resources.
- Effective use of conventional sources of energies for daily power needs, appropriate disposal and handling of different types of wastes etc.
- Everyone at the RJSPM's ICMR will work together to encourage a beliefs of self-sustainability and make the whole campus environmental friendly.
- To constantly improve the effective use of all natural resources like energy, water etc.
- To decrease consumption and the amount of waste produced as well as encourage for recovering and recycling waste where possible.

Major points focused under policies are:

- Clean campus initiatives
- Restricted entry of automobiles in college campus
- Pedestrian –friendly pathways
- Availability of sufficient dustbins for collection of different types of garbage
- Organization of campus cleaning activities and programmes
- Environment promotional activities and programmes
- Landscaping with trees and plants

DIRECTOR
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INSTITUTE OF COMPUTER
& MANAGEMENT RESEARCH
Dudulgaon, Pune-412 105

- Water conservation system
- Availability of sanitary napkin disposal equipment
- Solid waste management processes
- E-waste management processes
- Environment-centric student societies and department activities
- Green Audit
- Energy Audit

RJSPM's ICMR actively coordinates cleanliness activities in the college campus. The entry of automobiles inside the campus is restricted to reduce environmental pollution of campus. We encourage our students and staff to use public transportation. Single–use plastic stuffs such as plastic bottles, bags, spoons, straws and cups are banned completely and awareness is created among all teaching, non-teaching staff and students.

The Municipal Corporation's water supply and bore well are the sources of water supply to the college campus. Our college is aware about the water conservation measures and problems associated with water shortage and therefore we follow the practices for water conservation and efficient use of available water. Water tanks are constructed in campus for proper storage of water. Water is pumped into storage tanks located at different places in the campus. Overhead storage tanks are also available. The water is distributed through pipe network in college campus. Maintenance of water bodies and distribution system is periodically carried out to avoid the loss of water by leakage. Some of the common solid wastes include daily garbage comprising of white used papers, card sheets and materials, rubber waste, plastics, cardboard materials, etc. These are collected in dustbins placed in the campus and disposed in eco-friendly manner on daily basis. Separate dustbins are kept in campus for dry and wet waste. The glassware waste is collected and disposed properly. For disposal of papers "Recyclers India Shredding Services" an agency in Pune is engaged for shredding services. We collect E-waste and dispose it properly with the help of agency "Kuldeep E-waste disposals".

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The college aims to regularly conduct a Green Audit of our college campus to assess our strengths and weaknesses and to further our goals of long-term sustainability. A green audit is a useful tool to determine how and where most energy or water or resources are being used. An Energy Audit is conducted and required to further reduce its carbon footprint. The importance of reducing energy consumption cannot be overstated. The energy audit, with its specialized tools will identify wastage of energy. Such an inspection often reveals several different flaws which cause a loss of significant amounts of energy which the college will not be able to detect.

DIRECTOR
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Green audit / Environment audit

DIRECTOR
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INSTITUTE OF COMPUTER
& MANAGEMENT RESEARCH
Dudulgaon, Pune-412 105

CERTIFICATION OF REGISTRATION

Rajamata Jijau Shikshan Prasarak Mandal's

EDUCATION CAMPUS

Institute of Computer & Management Research (MBA)
Institute of Pharmacy (D.Pharm), College of Pharmacy (B.Pharm)
School of Nursing (RGNM), Dnyanbhakti Junior College (ACS)
Dnyanbhakti International School

Gat No. 101/102, Moshi Alandi Road, Dudulgaon, PCMC,
Pune - 412 105.Maharahstra, India

GREEN EDUCATION CAMPUS

has been assessed by TQV as conforming to the requirements of TQV Green Education Campus Certification. The following Education Campus are fulfilling the requirements of TQV Green Education Campus Certification.

Scope of Registration

For Preventing Pollution, Conserving Natural Resources, and Complying Environmental Regulatory Requirements

Certificate No.	:	**171010912478**
Certificate Date	:	**12 April 2017**
Valid Until	:	**11 April 2020**
EAC Code	:	13, 33, 34, 37

DIRECTOR
TQV Certification Services Private Limited.

The Certificate of Registration remains the property of
TQV Certification Services Private Limited
and shall be returned immediately upon request. for more information
(For current validity of the certificate, visit our website : www.tqvcertification.com)
This registration is subject to the company maintaining a management system,
to the above standard, which will be monitored by **TQV Certification Services Pvt. Ltd.**

CERTIFICATE

Certificate No. : 171010912479

This is to Certify that the
Quality Management System Of

Rajamata Jijau Shikshan Prasarak Mandal's
EDUCATION CAMPUS
Institute of Computer & Management Research (MBA)
Institute of Pharmacy (D.Pharm), College of Pharmacy (B.Pharm)
School of Nursing (RGNM), Dnyanbhakti Junior College (ACS)
Dnyanbhakti International School

Gat No. 101/102, Moshi Alandi Road, Dudulgaon, PCMC, Pune - 412 105.
Maharahstra, India

has been independently assessed and is compliant
with the requirements of

ISO 9001:2015

For the following activities

PROVISION OF EDUCATIONAL SERVICES IN
MBA (SPPU), B.Pharm.(SPPU), D.Pharm (MSBTE), RGNM (INC/MNC) ,
XI ,XII Arts, Commerce & Science (HSC Board, Pune) , and
Pre-Primary, Primary & Secondary Education (SSC/CBSE)

12 April, 2017	Original Registered
12 April, 2017	Latest Issued
11 April, 2020	Valid Until
April, 2018	1st Surveillance Audit
April, 2019	2nd Surveillance Audit

DIRECTOR
TQV Certification Services Private Limited.

MANAGEMENT SYSTEM
ASCAB
QUALITY MANAGEMENT

The Certificate of Registration remains the property of
TQV Certification Services Private Limited
and shall be returned immediately upon request. for more information
(For current validity of the certificate, visit our website : www.tqvcertification.com)
This registration is subject to the company maintaining its system to the required standard, Which will be Monitored by TQV.

CERTIFICATE

Certificate No. : 171010912480

This is to Certify that the
Environmental Management System Of

Rajamata Jijau Shikshan Prasarak Mandal's
EDUCATION CAMPUS
Institute of Computer & Management Research (MBA)
Institute of Pharmacy (D.Pharm), College of Pharmacy (B.Pharm)
School of Nursing (RGNM), Dnyanbhakti Junior College (ACS)
Dnyanbhakti International School

Gat No. 101/102, Moshi Alandi Road, Dudulgaon, PCMC, Pune - 412 105.
Maharahstra, India

has been independently assessed and is compliant
with the requirements of

ISO 14001:2015

For the following activities

PROVISION OF EDUCATIONAL SERVICES IN
MBA (SPPU), B.Pharm.(SPPU), D.Pharm (MSBTE), RGNM (INC/MNC) ,
XI ,XII Arts, Commerce & Science (HSC Board, Pune) , and
Pre-Primary, Primary & Secondary Education (SSC/CBSE)

12 April, 2017	Original Registered
12 April, 2017	Latest Issued
11 April, 2020	Valid Until
April, 2018	1st Surveillance Audit
April, 2019	2nd Surveillance Audit

DIRECTOR
TQV Certification Services Private Limited.

MANAGEMENT SYSTEM
ASCAB
QUALITY MANAGEMENT

The Certificate of Registration remains the property of
TQV Certification Services Private Limited
and shall be returned immediately upon request. for more information
(For current validity of the certificate, visit our website : www.tqvcertification.com)
This registration is subject to the company maintaining its system to the required standard, Which will be Monitored by TQV.

Certificate of Registration

Rajmata Jijau Shikshan Prasarak Mandal's
EDUCATION CAMPUS

Institute of Computer & Management Research (MBA)
Institute of Pharmacy (D. Pharm), College of Pharmacy (B.Pharm)
School of Nursing (GNM), Dnyanbhakti Junior College (ACS)
Dnyanbhakti International School

Gat No. 101/102, Moshi Alandi Road, Dudulgaon,
PCMC, Pune- 412 105, Maharashtra, India.

GREEN EDUCATION CAMPUS

has been assessed by IPQC as conforming to the requirements of IPQC Green Education Campus Certification. The following Education Campus are fulfilling the requirements of IPQC Green Education Campus Certification

Scope of Registration
For Preventing Pollution, Conserving Natural Resources and Complying Environmental Regulatory Requirements.

Certificate Date : 08 October 2020 Valid Until : 07 October 2023

CERTIFICATE NO.: 1571552586

AUTHORISED SIGNATORY

IPQC Certification (info@ipqc.co.uk/www.ipqc.co.uk)
Corporate Office : 7, Merry Terrace Woking, London FU21 3EH, UK

Certificate of Registration

ISO 9001:2015

This is to Certify that
Quality Management System of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S EDUCATION CAMPUS

INSTITUTE OF COMPUTER & MANAGEMENT RESEARCH (MBA), COLLEGE OF PHARMACY (B. PHARM) INSTITUTE OF PHARMACY (D. PHARM), SCHOOL OF NURSING (GNM), DNYANBHAKTI JUNIOR COLLEGE (AC/S) DNYANBHAKTI INTERNATIONAL SCHOOL.

GAT NO. 101/102, MOSHI ALANDI ROAD, DUDULGAON, PUNE- 412105, MAHARASHTRA, INDIA.

has been assessed and found to conform to the requirements of

ISO 9001:2015

for the following scope :

PROVISION OF EDUCATIONAL SERVICES IN MBA (SPPU), B.PHARM.(SPPU), D.PHARM.(MSBTE), GNM (MSBNPE), XI, XII, ARTS, COMMERCE & SCIENCE (HSC BOARD, PUNE) AND PRE-PRIMARY, PRIMARY & SECONDARY EDUCATION (SSC/CBSE)

Certificate No	: **20IQFS37**		
Initial Registration Date	: 06/10/2020	Issuance Date	: 06/10/2020
Date of Expiry	: 05/10/2023		
1st Surve. Due	: 06/09/2021	2nd Surve. Due	: 06/09/2022

Director

IAS ACCREDITED Management Systems Certification Body MSCB-119

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

AQC MIDDLE EAST FZE.

Head Office: E1-1401 E Amber Gem Tower, Sheikh Khalifa Bin Zayed Road, 2, Ajman, UAE. e-mail: info@aqcworld.com,
Key Location: 403, Madhuban Building, 55, Nehru Place, New Delhi-110019, India.

**Validity of the Certificate is subject to successful completion of surveillance audit on or before of due date. In case surveillance audit is not allowed to be conducted, this certificate shall be suspended/withdrawn).*

Certificate Verification: Please Re-check the validity of certificate at http://www.aqcworld.com/certificates.aspx or www.aqcworld.com at Active Clients

Certificate of Registration

ISO 14001:2015

This is to Certify that
Environmental Management System of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S EDUCATION CAMPUS

INSTITUTE OF COMPUTER & MANAGEMENT RESEARCH (MBA), COLLEGE OF PHARMACY (B. PHARM) INSTITUTE OF PHARMACY (D. PHARM), SCHOOL OF NURSING (GNM), DNYANBHAKTI JUNIOR COLLEGE (ACS) DNYANBHAKTI INTERNATIONAL SCHOOL.

GAT NO. 101/102, MOSHI ALANDI ROAD, DUDULGAON, PUNE- 412105, MAHARASHTRA, INDIA.

has been assessed and found to conform to the requirements of

ISO 14001:2015

for the following scope :

PROVISION OF EDUCATIONAL SERVICES IN MBA (SPPU), B.PHARM.(SPPU), D.PHARM.(MSBTE), GNM (MSBNPE), XI, XII, ARTS, COMMERCE & SCIENCE (HSC BOARD, PUNE) AND PRE-PRIMARY, PRIMARY & SECONDARY EDUCATION (SSC/CBSE)

Certificate No	: **20IEFE45**		
Initial Registration Date	: 06/10/2020	Issuance Date	: 06/10/2020
Date of Expiry	: 05/10/2023		
1st Surve. Due	: 06/09/2021	2nd Surve. Due	: 06/09/2022

Director

IAS ACCREDITED Management Systems Certification Body MSCB-119

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

AQC MIDDLE EAST FZE.

Head Office: EI-1401 I Amber Gem Tower, Sheikh Khalifa Bin Zayed Road, 2, Ajman, UAE. e-mail: info@aqcworld.com,
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GREEN AUDIT REPORT

of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S

Educational Campus - Building B,

Dudulgaon, Pune 412 105

Year: 2017-18

Prepared by:

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,

Near Muktangan English School, Parvati, Pune 411009

Phone: 09890444795 Email: enrichcons@gmail.com

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(A Government of Maharashtra undertaking)
2nd Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006
Ph No: 020-26614393/266144403, Fax No: 020-26615031
Email: econ@mahaurja.com , Web: www.mahaurja.com

ECN/2017-18/CR-01/5726 30th November 2017

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with ***MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)*** under given category as "Energy Planner & Energy Auditor in Maharashtra under Save Energy Programme of MEDA.

Name and Address of the firm	:	Enrich Consultants Yashashree, Plot No. 26,Nirmal Baug Society,Parvati, Pune - 411009.
Registration Category	:	Empanelled *Consultant for Save Energy Programme.*
Registration Number	:	***MEDA/ECN/CR-01/2017-18/EA-37***

- The Save Energy Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid upto **3 year** from the date of registration, to carry out energy audits under the Save Energy Programme of MEDA.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

30/11

(Smita Kudarikar)
Manager (EC)

ENRICH CONSULTANTS * Pune *

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: enrichcons@gmail.com

Ref: EC/RJSPMICMR/17-18/02 Date: 10/8/2018

CERTIFICATE

This is to certify that we have conducted Green Audit at Rajmata Jijau Shikshan Prasarak Mandal's Educational Campus, Building-B, Dudulgaon in the year 2017-18.

The Institute has already adopted following practices for making the campus Green:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Rain Water Harvesting Project

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient and Green.

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

ENRICH CONSULTANTS * Pune *

INDEX

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of RJSPM's Educational Campus, Building-B, Dudulgaon for awarding us the assignment of Green Audit of their Building-B, Dudulgaon Campus for the Year: 2017-18.

We are thankful to:

- Prof. Yashwant Lembhe, In Charge Director

We are also thankful to various Head of Departments & other Staff members for helping us during the field study.

EXECUTIVE SUMMARY

After the Field Study & Analysis, we present herewith important observations made during the assignment of Green Audit.

1. RJSPM's Educational Campus, Building-B, Dudulgaon, Pune consumes Energy in the form of Electrical Energy used for various gadgets, Office & other facilities.

2. Present Energy Consumption:

No	Parameter/ Value	Total Energy Consumed, kWh	CO_2 Emissions, MT
1	Total	18866	15.09
2	Maximum	4783	3.83
3	Minimum	200	0.16
4	Average	1572.17	1.26

3. Usage of Renewable Energy:

RJSPM's Education Campus, Building-B is going to install Roof Top Solar PV Plant.

4.1 Solid Waste Management: The Waste is segregated at Source. Waste Collection Bins are kept at prominent places.

4.2 E-Waste Management: The internal communication is through email. Very little E-Waste is generated in the Institute.

5. Rain Water Harvesting: The Institute has implemented Rain Water Harvesting Project, wherein the Rain Water from the Terraces is collected and is used to increase the underground water level.

6. Green Practices:

- The Maintenance of Good Internal Road
- Maintenance of Good Internal Garden

7. Assumptions:

1. 1 Unit of Electrical Energy releases **0.8 Kg** of CO_2 into atmosphere

GREEN AUDIT REPORT

of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S

Educational Campus, Building-B,
Dudulgaon, Pune 412 105

Year: 2018-19

Prepared by:

Enrich Consultants
Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: enrichcons@gmail.com

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(A Government of Maharashtra undertaking)
2nd Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006
Ph No: 020-26614393/266144403, Fax No: 020-26615031
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30/11

(Smita Kudarikar)
Manager (EC)

ENRICH CONSULTANTS Pune

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: enrichcons@gmail.com

Ref: EC/RJSPMICMR/18-19/02 Date: 11/8/2019

CERTIFICATE

This is to certify that we have conducted Green Audit at Rajmata Jijau Shikshan Prasarak Mandal's Educational Campus, Building-B, Dudulgaon in the year 2018-19.

The Institute has already adopted following practices for making the campus Green:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Rain Water Harvesting Project

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient and Green.

For Enrich Consultants,

ENRICH CONSULTANTS * Pune *

A Y Mehendale,
Certified Energy Auditor
EA-8192

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ACKNOWLEDGEMENT

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EXECUTIVE SUMMARY

After the Field Study & Analysis, we present herewith important observations made during the assignment of Green Audit.

1. RJSPM's Educational Campus, Building-B, Dudulgaon, Pune consumes Energy in the form of Electrical Energy used for various gadgets, Office & other facilities.

2. Present Energy Consumption:

No	Parameter/ Value	Total Energy Consumed, kWh	CO_2 Emissions, MT
1	Total	20626	16.50
2	Maximum	2108	1.69
3	Minimum	1478	1.18
4	Average	1718.83	1.38

3. Usage of Renewable Energy:

The Institute is going to install Roof Top Solar PV Plant.

4. Waste Management:

4.1 Solid Waste Management: The Waste is segregated at Source. Waste Collection Bins are kept at prominent places.

4.2 E-Waste Management: The internal communication is through email. Very little E-Waste is generated in the Institute.

5. Rain Water Harvesting: The Institute has implemented Rain Water Harvesting Project, wherein the Rain Water from the Terraces is collected and is used to increase the underground water level.

6. Green Practices:

- The Maintenance of Good Internal Road
- Maintenance of Good Internal Garden

7. Assumptions:

1. 1 Unit of Electrical Energy releases **0.8 Kg** of CO_2 into atmosphere

ENRICH CONSULTANTS * Pune *

ABBREVIATIONS

LED	Light Emitting Diode
MSEDCL	Maharashtra State Electricity Distribution Company Ltd
kWp	Kilo Watt peak
kWh	kilo-Watt Hour
CO_2	Carbon Di Oxide
MT	Metric Ton
RJSPM	Rajmata Jijau Shikshan Prasarak Mandal
MBA	Master in Business Administration

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study the Connected Load
2. To study present level of Energy Consumption
3. To Study the present CO_2 emissions
4. To study Scope for usage of Renewable Energy
5. To study Waste Management
6. To study Rain Water Harvesting

1.3 General Details of Institute: Table No 1:

No	Head	Particulars
1	Name	RJSPM's Educational Campus, Building-B
2	Address	Dudulgaon, Pune 412 105
3	Affiliation	Savitribai Phule Pune University

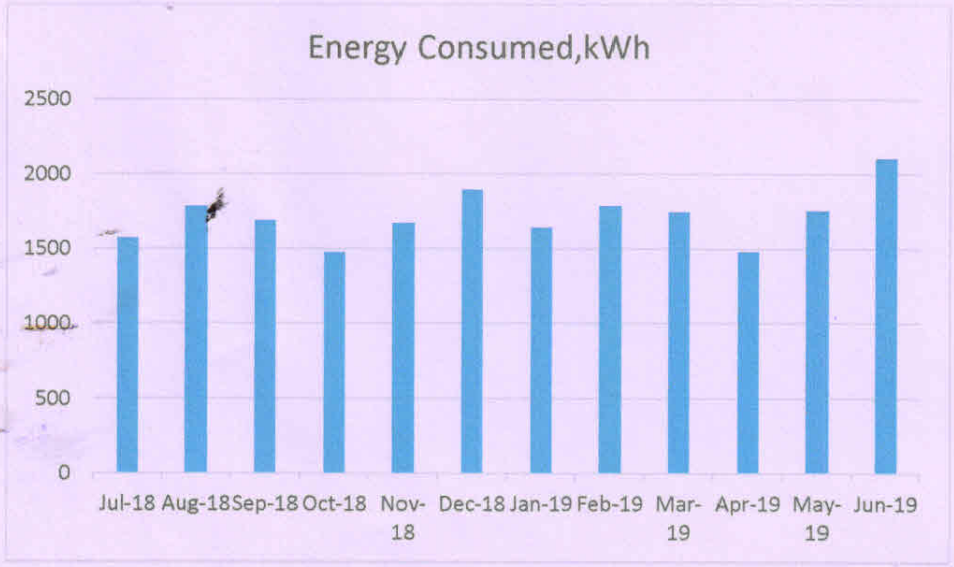
CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of last year Electricity Bills

Table No 2: Electrical Bill Analysis:2018-19

No	Month	Energy Consumed, kWh
1	Jul-18	1574
2	Aug-18	1785
3	Sep-18	1689
4	Oct-18	1478
5	Nov-18	1674
6	Dec-18	1896
7	Jan-19	1645
8	Feb-19	1789
9	Mar-19	1749
10	Apr-19	1483
11	May-19	1756
12	Jun-19	2108
13	Total	20626
14	Maximum	2108
15	Minimum	1478
16	Average	1718.83

To study the variation of Monthly Energy Consumption: Chart No 1:



Key Inference drawn:

From the above analysis, we present following important parameters:

Table No 3: Various Important Parameters:

No	Parameter/ Value	Total Energy Consumed, kWh
1	Total	20626
2	Maximum	2108
3	Minimum	1478
4	Average	1718.83

CHAPTER-III
CARBON FOOTPRINTING

3.1 A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the Institute for performing its day to day activities

The Institute uses Electrical Energy for various Electrical gadgets.

3.2 Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to LPG & Electrical Energy are as under

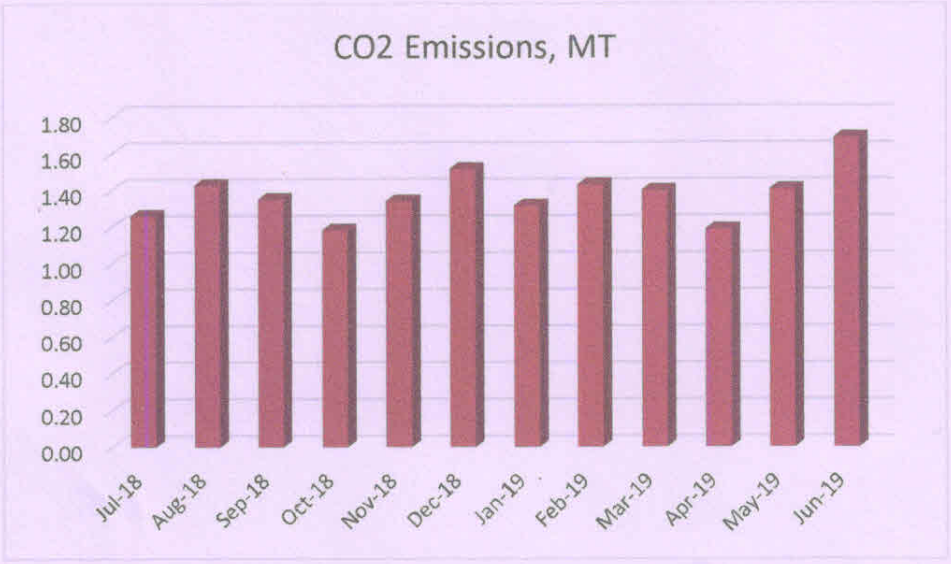
- 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the Institute due to its Day to Day operations

3.3 Table No 4: Month wise CO_2 Emissions:

No	Month	Energy Consumed, kWh	CO_2 Emissions, MT
1	Jul-18	1574	1.26
2	Aug-18	1785	1.43
3	Sep-18	1689	1.35
4	Oct-18	1478	1.18
5	Nov-18	1674	1.34
6	Dec-18	1896	1.52
7	Jan-19	1645	1.32
8	Feb-19	1789	1.43
9	Mar-19	1749	1.40
10	Apr-19	1483	1.19
11	May-19	1756	1.40
12	Jun-19	2108	1.69
13	Total	20626	16.50
14	Maximum	2108	1.69
15	Minimum	1478	1.18
16	Average	1718.83	1.38

Representation of Month wise CO_2 emissions: Chart No 2:



CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has decided to set up a Roof Top Solar PV Plant. Therefore, as on Date, the percentage of usage of Alternate Energy to Annual Energy Demand works out to be zero percent.

CHAPTER-V
STUDY OF WASTE MANAGEMENT

5.1 Solid Waste Management:

The Waste is segregated at source. At important locations, Waste collection Bins are placed, for waste collection.

5.2 E- Waste Management:

The internal communication is through Internet within the staff. Hence as far as the E-waste is concerned hardly any waste is generated during the day to day operations.

CHAPTER-VI
STUDY OF RAIN WATER HARVESTING

The Institute has already implemented the Rain Water Harvesting Project. The rain water falling on the terrace is collected through pipes and is used for increasing the underground water level.

Photograph of Rain Water Harvesting Pipe:

CHAPTER VII
STUDY OF GREEN PRACTICES

7.1 Pedestrian Friendly Roads:

The Institute has well defined pedestrian roads to facilitate the easy movement of the students within the campus.

Photograph of Internal Road:

7.2 Internal Garden & Tree Plantation: The College has well maintained Garden in the campus.

Photograph of Tree Plantation in the campus:

GREEN AUDIT REPORT

of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S

Educational Campus, Building-B, Dudulgaon, Pune 412 105

Year: 2019-20

Prepared by:

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: enrichcons@gmail.com

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(A Government of Maharashtra undertaking)
2nd Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006
Ph No: 020-26614393/266144403, Fax No: 020-26615031
Email: econ@mahaurja.com , Web: www.mahaurja.com

ECN/2017-18/CR-01/5726 30th November 2017

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with ***MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)*** under given category as "Energy Planner & Energy Auditor in Maharashtra under Save Energy Programme of MEDA.

Name and Address of the firm	:	Enrich Consultants Yashashree, Plot No. 26,Nirmal Baug Society,Parvati, Pune - 411009.
Registration Category	:	Empanelled *Consultant for Save Energy Programme.*
Registration Number	:	***MEDA/ECN/CR-01/2017-18/EA-37***

- The Save Energy Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid upto **3 year** from the date of registration, to carry out energy audits under the Save Energy Programme of MEDA.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

30/11

(Smita Kudarikar)
Manager (EC)

ENRICH CONSULTANTS Pune

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: enrichcons@gmail.com

Ref: EC/RJSPMICMR/19-20/02 Date: 11/8/2020

CERTIFICATE

This is to certify that we have conducted Green Audit at Rajmata Jijau Shikshan Prasarak Mandal's Educational Campus, Building-B, Dudulgaon in the year 2019-20.

The Institute has already adopted following practices for making the campus Green:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of **10 kWp** Roof Top Solar PV Plant
- Rain Water Harvesting Project

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient and Green.

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

INDEX

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of RJSPM's Educational Campus, Building-B, Dudulgaon for awarding us the assignment of Green Audit of their Building-B, Dudulgaon Campus for the Year: 2019-20.

We are thankful to:

- Prof. Yashwant Lembhe, In Charge Director

We are also thankful to various Head of Departments & other Staff members for helping us during the field study.

EXECUTIVE SUMMARY

After the Field Study & Analysis, we present herewith important observations made during the assignment of Green Audit.

1. RJSPM's Educational Campus, Building-B, Dudulgaon, Pune consumes Energy in the form of Electrical Energy used for various gadgets, Office & other facilities.

2. Present Energy Consumption:

No	Parameter/ Value	Total Energy Consumed, kWh	CO_2 Emissions, MT
1	Total	29104	23.28
2	Maximum	5238	4.19
3	Minimum	1208	0.97
4	Average	2425.33	1.94

3. Usage of Renewable Energy:

The Institute has installed **10 kWp** Roof Top Solar PV Plant. The Annual reduction in CO_2 Emission, due to Solar PV Plant is **4.8 MT**, in the Year: 2019-20.

4. Waste Management:

4.1 Solid Waste Management:

The Waste is segregated at Source. Waste Collection Bins are kept at prominent places.

4.2 E-Waste Management:

The internal communication is through email. Very little E-Waste is generated in the Institute.

5. Rain Water Harvesting:

The Institute has implemented Rain Water Harvesting Project, wherein the Rain Water from the Terraces is collected and is used to increase the underground water level.

6. Green Practices:

- The Maintenance of Good Internal Road
- Maintenance of Good Internal Garden

7. Assumptions:

1. 1 Unit of Electrical Energy releases **0.8 Kg** of CO_2 into atmosphere
2. Energy generated by **1 kWp** Solar Plant: **4 kWh** per day
3. Annual Solar Generation Days: **150 Nos** (Plant in stalled in January-2020)

ENRICH CONSULTANTS Pune

ABBREVIATIONS

LED	Light Emitting Diode
MSEDCL	Maharashtra State Electricity Distribution Company Ltd
kWp	Kilo Watt peak
kWh	kilo-Watt Hour
CO_2	Carbon Di Oxide
MT	Metric Ton
RJSPM	Rajmata Jijau Shikshan Prasarak Mandal
MBA	Master in Business Administration

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study the Connected Load
2. To study present level of Energy Consumption
3. To Study the present CO_2 emissions
4. To study Scope for usage of Renewable Energy
5. To study Waste Management
6. To study Rain Water Harvesting

1.3 General Details of Institute: Table No 1:

No	Head	Particulars
1	Name	RJSPM's Educational Campus, Building-B
2	Address	Dudulgaon, Pune 412 105
3	Affiliation	Savitribai Phule Pune University

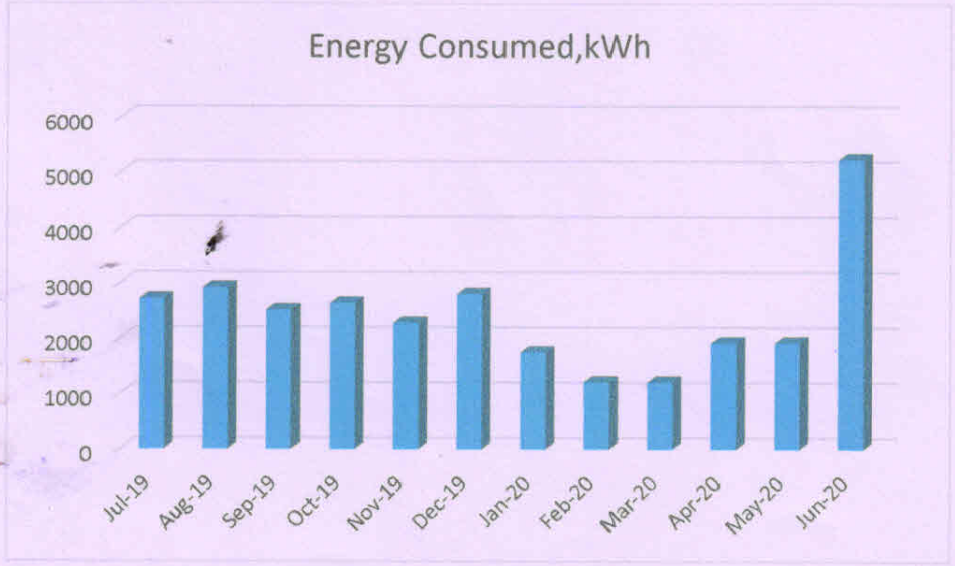
CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of last year Electricity Bills

Table No 2: Electrical Bill Analysis- 2019-20:

No	Month	Energy Consumed, kWh
1	Jul-19	2714
2	Aug-19	2915
3	Sep-19	2514
4	Oct-19	2639
5	Nov-19	2280
6	Dec-19	2801
7	Jan-20	1749
8	Feb-20	1208
9	Mar-20	1208
10	Apr-20	1919
11	May-20	1919
12	Jun-20	5238
13	Total	29104
14	Maximum	5238
15	Minimum	1208
16	Average	2425.33

To study the variation of Monthly Energy Consumption: Chart No 1:



Key Inference drawn:

From the above analysis, we present following important parameters:

Table No 3: Various Important Parameters:

No	Parameter/ Value	Total Energy Consumed, kWh
1	Total	29104
2	Maximum	5238
3	Minimum	1208
4	Average	2425.33

CHAPTER-III
CARBON FOOTPRINTING

3.1 A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the College for performing its day to day activities

The College uses Electrical Energy for various Electrical gadgets.

3.2 Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to LPG & Electrical Energy are as under

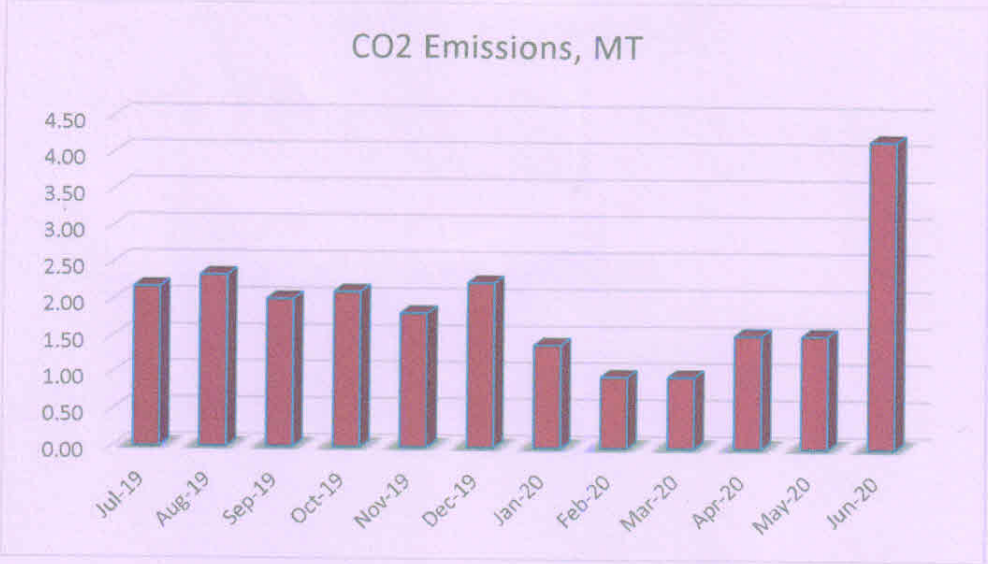
- 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the College due to its Day to Day operations

3.3 Table No 4: Month wise CO_2 Emissions:

No	Month	Energy Consumed, kWh	CO_2 Emissions, MT
1	Jul-19	2714	2.17
2	Aug-19	2915	2.33
3	Sep-19	2514	2.01
4	Oct-19	2639	2.11
5	Nov-19	2280	1.82
6	Dec-19	2801	2.24
7	Jan-20	1749	1.40
8	Feb-20	1208	0.97
9	Mar-20	1208	0.97
10	Apr-20	1919	1.54
11	May-20	1919	1.54
12	Jun-20	5238	4.19
13	Total	29104	23.28
14	Maximum	5238	4.19
15	Minimum	1208	0.97
16	Average	2425.33	1.94

Representation of Month wise CO_2 emissions: Chart No 2:



CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

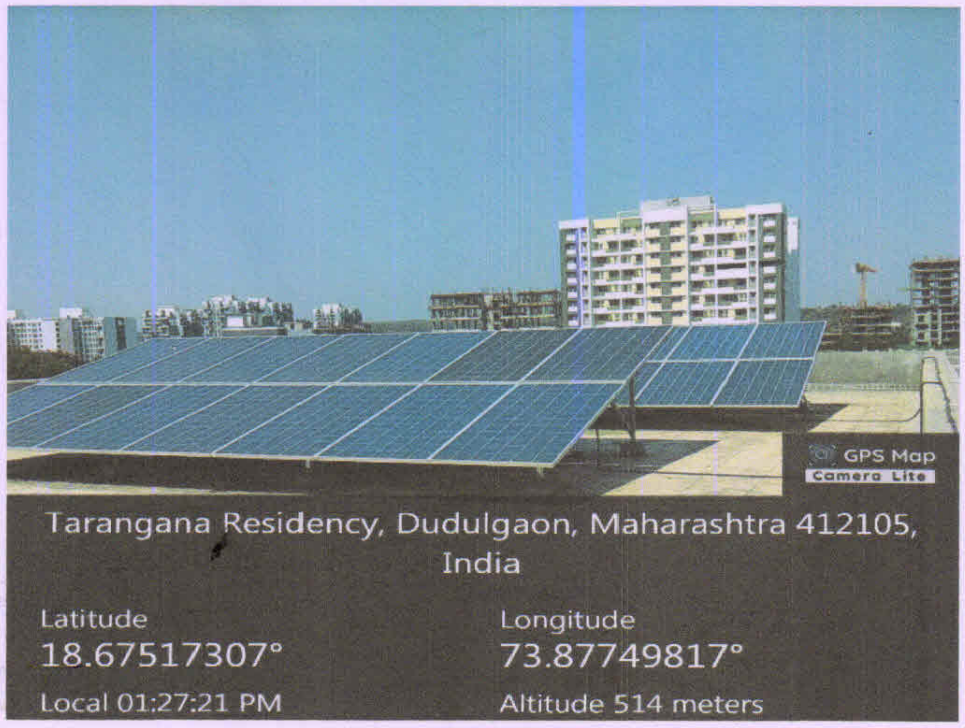
The Institute installed Roof Top **10 kWp** Roof Top Solar PV Plant, in the Month of January-2020. Therefore we consider the Generation days to be: 150 Nos, for calculation purpose.

In the following Table, we compute the Annual Energy requirement met by Alternate Energy.

Table No 5: Computation of Annual Reduction in CO_2 Emissions, MT:

No	Parameter	Value	Unit
1	Installed Solar PV Capacity	10	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Working Days	150	Nos
4	Annual Energy Generated	6000	kWh/Annum
5	1 kWh of Energy is equivalent to	**0.8**	Kg of CO_2
7	Annual Reduction in CO_2 Emissions = (4) * (5) / 1000	**4.8**	%

Photograph of 10 kWp Roof Top Solar PV Plant:



CHAPTER-V
STUDY OF WASTE MANAGEMENT

5.1 Solid Waste Management:

The Waste is segregated at source. At important locations, Waste collection Bins are placed, for waste collection.

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The internal communication is through Internet within the staff. Hence as far as the E-waste is concerned hardly any waste is generated during the day to day operations.

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Photograph of Rain Water Harvesting Pipe:

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7.1 Pedestrian Friendly Roads:

The Institute has well defined pedestrian roads to facilitate the easy movement of the students within the campus.

Photograph of Internal Road:

7.2 Internal Garden & Tree Plantation: The College has well maintained Garden in the campus.

Photograph of Tree Plantation in the campus:

GREEN AUDIT REPORT

of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S

Educational Campus, Building-B, Dudulgaon, Pune

Year: 2021-22

Prepared by:

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795, Email: engress123@gmail.com

ENGRESS SERVICES PUNE

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency

(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary,
Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
Email: eee@mahaurja.com, Web: www.mahaurja.com

ECN/2022-23/CR-43/1709 — 10th May, 2022

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with ***MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)*** under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm : M/s Engress Services
Yashshree, 26, Nirmal Bag Society,
Near Muktangan English School,
Parvati, Pune – 411 009.

Registration Category : *Empanelled Consultant for Energy Conservation Programme for Class 'A'*

Registration Number : ***MEDA/ECN/2022-23/Class A/EA-32.***

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **09th May, 2024** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

ENGRESS SERVICES PUNE

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: engress123@gmail.com

Ref: ES/RJSPMICMR/21-22/02 Date: 11/5/2022

CERTIFICATE

This is to certify that we have conducted Green Audit at Rajmata Jijau Shikshan Prasarak Mandal's Educational Campus, Building-B, Dudulgaon in the year 2021-22.

The Institute has adopted following practices for making the campus Green:

- Usage of Energy Efficient LED Fittings
- Installation of 10 kWp Roof Top Solar PV Plant
- Maximum usage of Day Lighting
- Segregation of Waste at source
- Rain Water Management Project
- Good internal Road
- Internal Tree Plantation

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient and Green.

For Engress Services,

ENGRESS SERVICES PUNE

A Y Mehendale,
Certified Energy Auditor
EA-8192

INDEX

ENGRESS SERVICES PUNE

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of RJSPM's Educational Campus, Building-B, Dudulgaon for awarding us the assignment of Green Audit of their Building-B, Dudulgaon Campus for the Year: 2021-22.

We are thankful to all Staff members for helping us during the field study.

EXECUTIVE SUMMARY

1. RJSPM's Educational Campus, Building-B, Dudulgaon, Pune consumes Energy in the form of Electrical Energy; used for various gadgets, Office & other facilities.

2. Present Energy Consumption & CO_2 Emission:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	18567	16.71
2	Maximum	13382	12.04
3	Minimum	0	0.00
4	Average	1547.25	1.39

3. Usage of Renewable Energy & CO_2 Emission Reduction:

- The Institute has installed a Roof Top Solar PV Plant of Capacity **10 kWp**.
- The Energy Generated by Roof Top Solar PV Plant in 21-22 is **12000 kWh.**
- The reduction in Annual CO_2 Emission in 21-22 is **10.8 MT.**

4. Waste Management:

4.1 Solid Waste Management:

The Waste is segregated at Source. Waste Collection Bins are kept at prominent places.

4.2 E-Waste Management:

It is recommended to dispose of the E Waste through Authorized Agency.

5. Rain Water Management:

The Institute has implemented Rain Water Management Project, wherein the Rain Water from the Terraces is collected and is used to increase the underground water level.

6. Green Practices:

- Good Internal Road
- Internal Tree Plantation

7. Assumptions:

- **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2 into atmosphere
- Average Energy generated by **1 kWp** Solar PV Plant : **4 kWh/Day**
- Annual Solar Energy Generation Days: **300 Nos**

8. References:

- For CO_2 Emissions: www.tatapower.com
- For Roof Top Solar Energy Generation: www.solarrooftop.gov.in

ABBREVIATIONS

LED	Light Emitting Diode
MSEDCL	Maharashtra State Electricity Distribution Company Ltd
kWp	Kilo Watt peak
kWh	kilo-Watt Hour
CO_2	Carbon Di Oxide
MT	Metric Ton
RJSPM	Rajmata Jijau Shikshan Prasarak Mandal
MBA	Master in Business Administration

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study the Connected Load
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1.3 General Details of Institute: Table No 1:

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1	Name	RJSPM's Educational Campus, Building-B
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CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of last year Electricity Bills

Table No 2: Electrical Bill Analysis- 2021-22:

No	Month	Energy Purchased, kWh
1	Feb-21	962
2	Mar-21	983
3	Apr-21	1090
4	May-21	1194
5	Jun-21	956
6	Jul-21	13382
7	Aug-21	0
8	Sep-21	0
9	Oct-21	0
10	Nov-21	0
11	Dec-21	0
12	Jan-22	0
13	Total	18567
14	Maximum	13382
15	Minimum	0
16	Average	1547.25

To study the variation of Monthly Energy Consumption: Chart No 1:

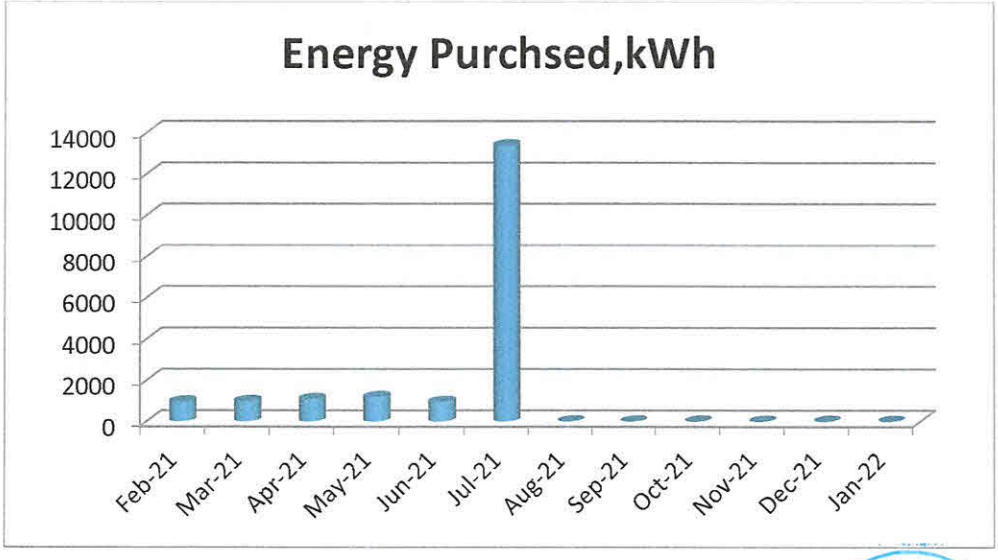


Table No 3: Various Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh
1	Total	18567
2	Maximum	13382
3	Minimum	0
4	Average	1547.25

CHAPTER-III
CARBON FOOTPRINTING

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the Institute for performing its day to day activities

The Institute uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is as under

- 1 Unit (kWh) of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the Institute due to its Day to Day operations

Table No 4: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Feb-21	962	0.87
2	Mar-21	983	0.88
3	Apr-21	1090	0.98
4	May-21	1194	1.07
5	Jun-21	956	0.86
6	Jul-21	13382	12.04
7	Aug-21	0	0.00
8	Sep-21	0	0.00
9	Oct-21	0	0.00
10	Nov-21	0	0.00
11	Dec-21	0	0.00
12	Jan-22	0	0.00
13	Total	18567	16.71
14	Maximum	13382	12.04
15	Minimum	0	0.00
16	Average	1547.25	1.39

ENGRESS SERVICES PUNE

Representation of Month wise CO_2 Emissions: Chart No 2:

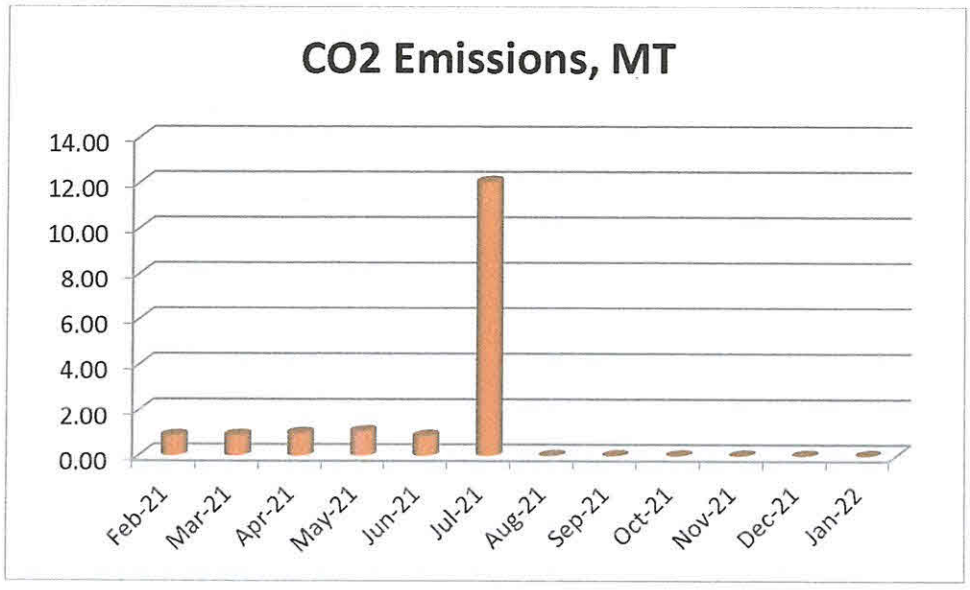


Table No 5: Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	18567	16.71
2	Maximum	13382	12.04
3	Minimum	0	0.00
4	Average	1547.25	1.39

CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has installed Roof Top **10 kWp** Roof Top Solar PV Plant.

In the following Table, we compute the Annual Energy requirement met by Alternate Energy.

Table No 6: Computation of Annual Reduction in CO_2 Emissions, MT:

No	Parameter	Value	Unit
1	Installed Solar PV Capacity	10	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Working Days	300	Nos
4	Annual Energy Generated	12000	kWh/Annum
5	1 kWh of Energy is equivalent to	0.9	Kg of CO_2
6	Annual Reduction in CO_2 Emissions = (4) * (5) / 1000	10.8	%

Photograph of Roof Top Solar PV Plant:

ENGRESS SERVICES PUNE

CHAPTER-V
STUDY OF WASTE MANAGEMENT

5.1 Solid Waste Management:

The Waste is segregated at source. At important locations, Waste collection Bins are placed, for waste collection.

5.2 E Waste Management:

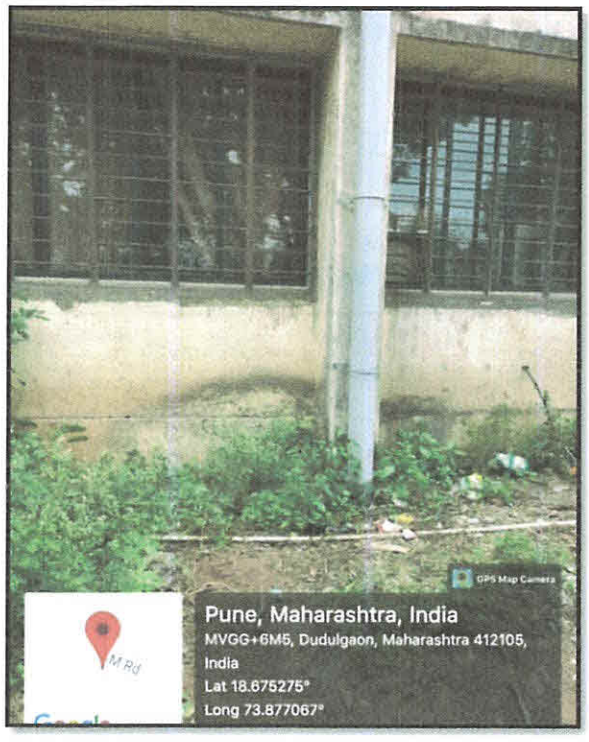
It is recommended to dispose of through Authorized Agency.

ENGRESS SERVICES PUNE

CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The Institute has implemented the Rain Water Management Project. The rain water falling on the terrace is collected through pipes and is used for increasing the underground water level.

Photograph of Rain Water Management Pipe:

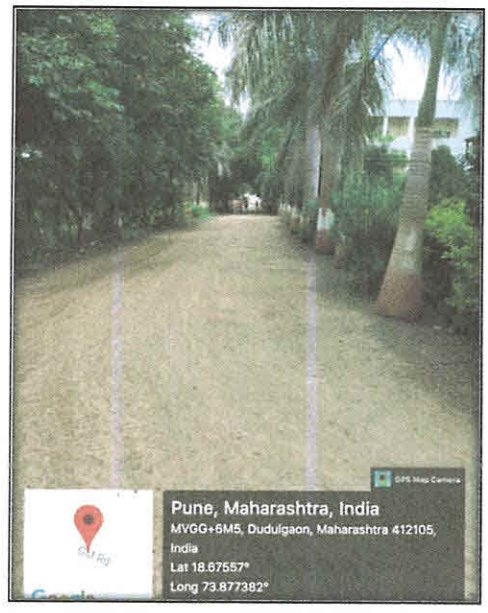


CHAPTER VII
STUDY OF GREEN PRACTICES

7.1 Pedestrian Friendly Road & Internal Tree Plantation:

The Institute has well defined pedestrian roads to facilitate the easy movement of the students within the campus.

Photograph of Internal Road and Tree Plantation:



ENGRESS SERVICES PUNE

GREEN AUDIT REPORT

of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S

Educational Campus, Building-B, Dudulgaon, Pune

Year: 2022-23

Prepared by:

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795, Email: engress123@gmail.com

ENGRESS SERVICES PUNE

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary,
Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
Email: eec@mahaurja.com, Web: www.mahaurja.com

ECN/2022-23/CR-43/1709 — 10th May, 2022

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with *MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)* under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm : M/s Engress Services
Yashshree, 26, Nirmal Bag Society,
Near Muktangan English School,
Parvati, Pune – 411 009.

Registration Category : *Empanelled Consultant for Energy Conservation Programme for Class 'A'*

Registration Number : *MEDA/ECN/2022-23/Class A/EA-32.*

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **09th May, 2024** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

ASSOCHAM
Ideate. Innovate. Impact

GEM Certificate

ASSOCHAM hereby certifies that

Mr. A Y Mehendale

has successfully passed the
Green and Eco-friendly Movement Certified Professional Test (GEM CP)
with
"Excellent Performance"
on
06 June, 2022

He/she is now eligible to execute the GEM Sustainability Certification Projects.
ASSOCHAM feels proud to award the GEM Certified Professional title to him/her.

Pankaj R. Dharkar
Chairman, GEM

GEM CP 22/788

Deepak Sood
Secretary General, ASSOCHAM

ENGRESS SERVICES PUNE

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: engress123@gmail.com

Ref: ES/RJSPMICMR/22-23/02 Date: 28/2/2023

CERTIFICATE

This is to certify that we have conducted Green Audit at Rajmata Jijau Shikshan Prasarak Mandal's Educational Campus, Building-B, Dudulgaon in the year 2022-23.

The Institute has adopted following Green Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 10 kWp Roof Top Solar PV Plant
- Segregation of Waste at source
- Sanitary Waste Incinerator for disposal of Sanitary Waste
- Rain Water Management Project
- Good Internal Road
- Internal Tree Plantation
- Provision of Ramp for Divyangajan

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient and Green.

For Engress Services,

A Y Mehendale,
Certified Energy Auditor, EA-8192
ASSOCHAM GEM Certified Professional: GEM: 22/788

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ENGRESS SERVICES PUNE

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of RJSPM's Educational Campus, Building-B, Dudulgaon for awarding us the assignment of Green Audit of their Building-B, Dudulgaon Campus for the Year: 2022-23.

We are thankful to all staff members for helping us during the field Study.

EXECUTIVE SUMMARY

1. RJSPM's Educational Campus, Building-B, Dudulgaon, Pune consumes Energy in the form of Electrical Energy; used for various gadgets, Office & other facilities.

2. Present Energy Consumption:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	7810	7.03
2	Maximum	2956	2.66
3	Minimum	0	0.00
4	Average	650.83	0.59

3. Usage of Renewable Energy & CO_2 Emission Reduction:

- The Institute has installed Roof Top Solar PV Plant of Capacity **10 kWp.**
- The Electrical Energy generated in 22-23 is **12000 kWh.**
- Reduction in CO_2 Emissions in 22-23 is **10.8 MT.**

4. Waste Management:

4.1 Segregation of Waste at Source:

The Waste is segregated at Source. Waste Collection Bins are kept at prominent places.

4.2 Sanitary Waste Management:

There is a Sanitary Waste Incinerator, to dispose of the Sanitary Waste in the campus.

4.3 E-Waste Management:

It is recommended to dispose of the E Waste through Authorized Agency.

5. Rain Water Management:

The Rain Water from the Terrace is used to increase the underground water level.

6. Green & Sustainable Practices:

- Good Internal Road
- Internal Tree Plantation
- Provision of Ramp for Divyangajan

7. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2into atmosphere
2. Average Energy generated by **1 kWp** Solar PV Plant : **4 kWh/Day**
3. Annual Solar Energy Generation Days: **300 Nos**

8. References:

- For CO_2 Emissions: www.tatapower.com
- For Roof Top Solar Energy generation: www.solarrooftop.gov.in

ABBREVIATIONS

LED	Light Emitting Diode
MSEDCL	Maharashtra State Electricity Distribution Company Ltd
kWp	Kilo Watt peak
kWh	kilo-Watt Hour
CO_2	Carbon Di Oxide
MT	Metric Ton
RJSPM	Rajmata Jijau Shikshan Prasarak Mandal
MBA	Master in Business Administration

CHAPTER-I
INTRODUCTION

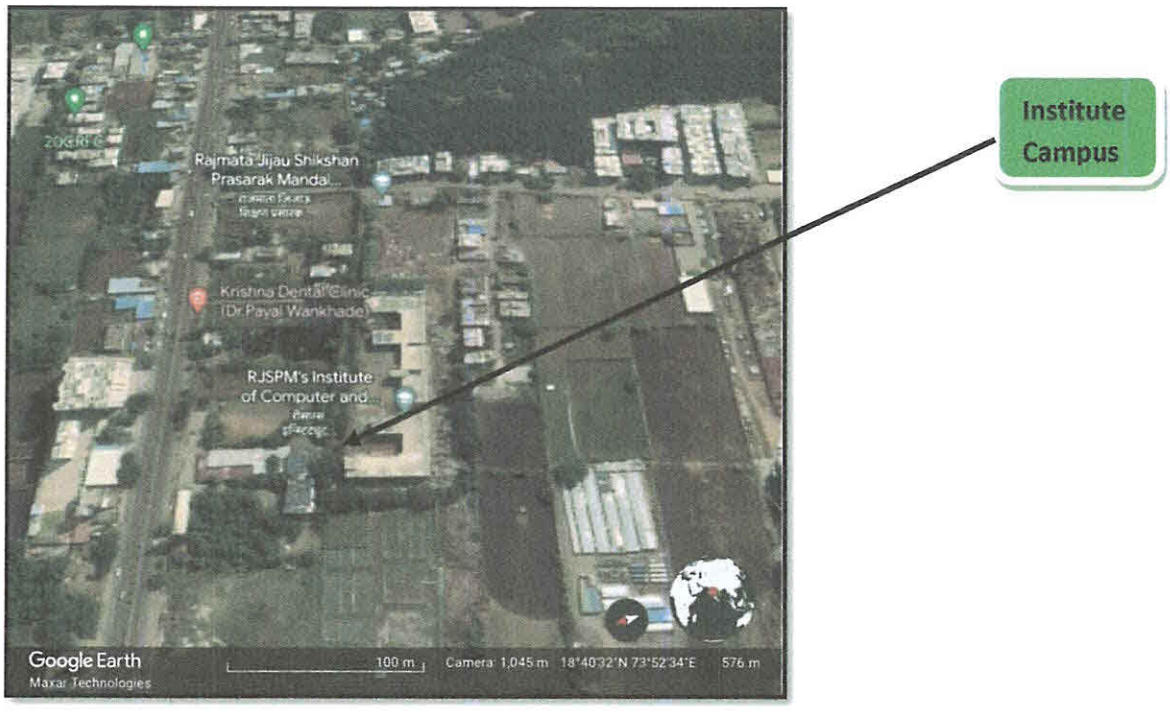
1.1 Objectives:

1. To study the Connected Load
2. To study present level of Energy Consumption
3. To Study the present CO_2 emissions
4. To study Scope for usage of Renewable Energy
5. To study Waste Management
6. To study Rain Water Management

1.3 General Details of Institute: Table No 1:

No	Head	Particulars
1	Name	RJSPM's Educational Campus, Building-B
2	Address	Dudulgaon, Pune 412 105
3	Affiliation	Savitribai Phule Pune University

1.3 Google Earth Image:



CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of last year Electricity Bills

Table No 2: Electrical Bill Analysis- 2022-23:

No	Month	Energy Purchased ,kWh
1	Feb-22	0
2	Mar-22	0
3	Apr-22	0
4	May-22	0
5	Jun-22	0
6	Jul-22	0
7	Aug-22	0
8	Sep-22	75
9	Oct-22	1590
10	Nov-22	1175
11	Dec-22	2014
12	Jan-23	2956
13	Total	7810
14	Maximum	2956
15	Minimum	0
16	Average	650.83

To study the variation of Monthly Energy Consumption: Chart No 1:

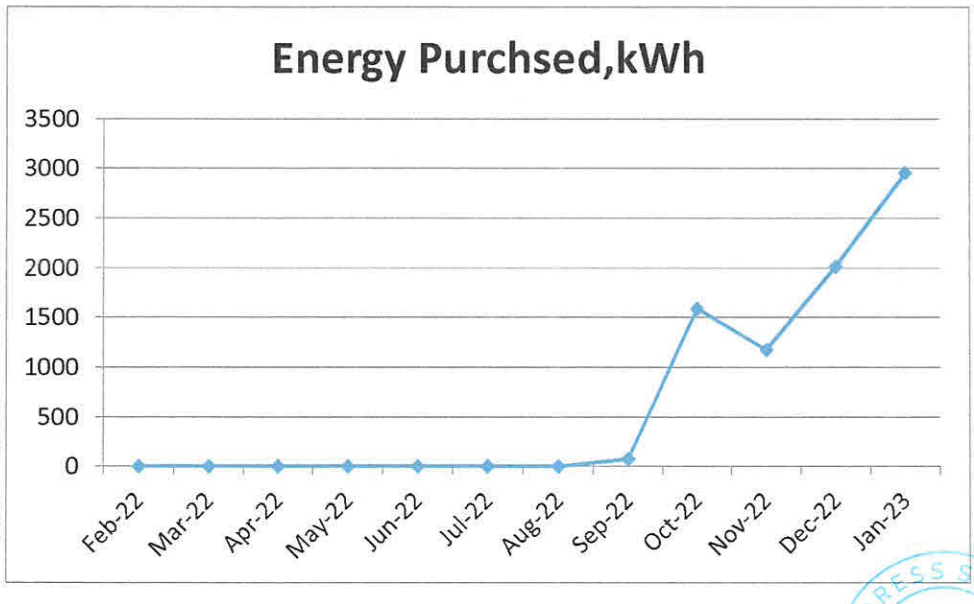


Table No 3: Various Important Parameters:

No	Parameter/ Value	Total Energy Consumed, kWh
1	Total	7810
2	Maximum	2956
3	Minimum	0
4	Average	650.83

CHAPTER-III
CARBON FOOT PRINTING

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the Institute for performing its day to day activities

The Institute uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy are as under

- 1 Unit (kWh) of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the Institute due to its Day to Day operations

Table No 4: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Feb-22	0	0
2	Mar-22	0	0
3	Apr-22	0	0
4	May-22	0	0
5	Jun-22	0	0
6	Jul-22	0	0
7	Aug-22	0	0
8	Sep-22	75	0.07
9	Oct-22	1590	1.43
10	Nov-22	1175	1.06
11	Dec-22	2014	1.81
12	Jan-23	2956	2.66
13	Total	7810	7.03
14	Maximum	2956	2.66
15	Minimum	0	0.00
16	Average	650.83	0.59

Chart No 2: Representation of Month wise CO_2 emissions:

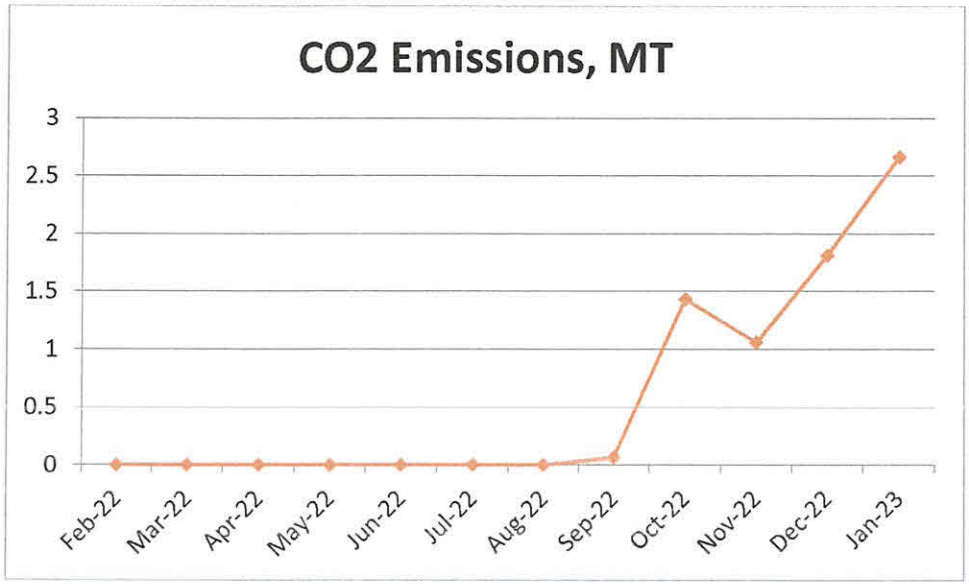


Table No 5: Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	7810	7.03
2	Maximum	2956	2.66
3	Minimum	0	0.00
4	Average	650.83	0.59

CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has installed Roof Top **10 kWp** Roof Top Solar PV Plant.

In the following Table, we compute the Annual Energy requirement met by Alternate Energy.

Table No 6: Computation of Annual Reduction in CO_2 Emissions:

No	Parameter	Value	Unit
1	Installed Solar PV Capacity	10	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Working Days	300	Nos
4	Annual Energy Generated	**12000**	kWh/Annum
5	1 kWh of Energy is equivalent to	**0.9**	Kg of CO_2
7	Annual Reduction in CO_2 Emissions = **(4) * (5) / 1000**	**10.8**	%

Photograph of 10 kWp Roof Top Solar PV Plant:

CHAPTER-V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

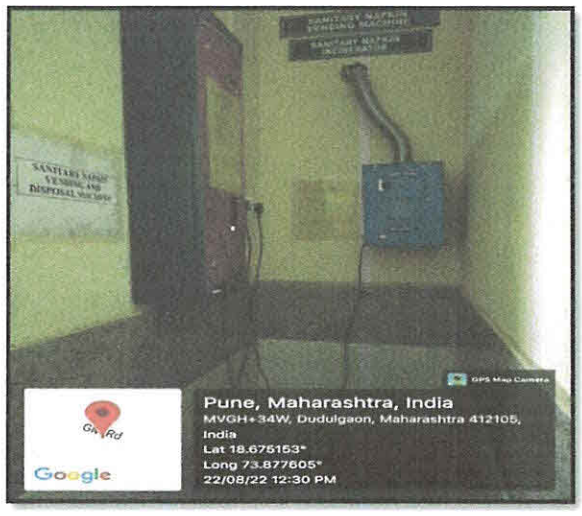
The Waste is segregated at source. At important locations, Waste collection Bins are placed, for waste collection.

Photograph of Waste Bins:

5.2 Sanitary Waste Management:

There is a Sanitary Waste Incinerator, to dispose of the Sanitary Waste in the campus.

Photograph of Sanitary Waste Incinerator:



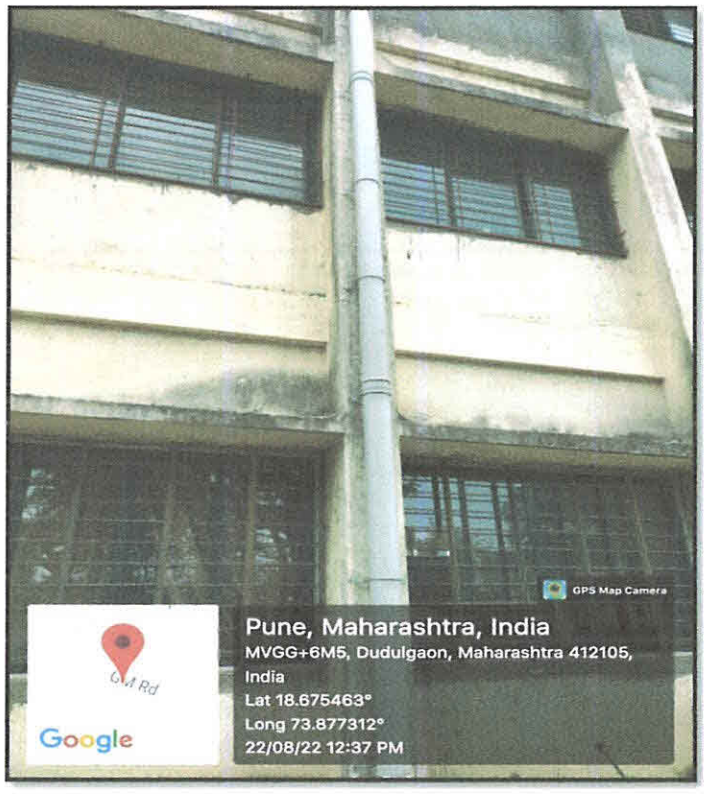
5.3 E Waste Management:

It is recommended to dispose of the E Waste through Authorized Agency.

CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The Institute has implemented the Rain Water Management Project. The rain water falling on the terrace is collected through pipes and is used for increasing the underground water level.

Photograph of Rain Water Management Pipe:

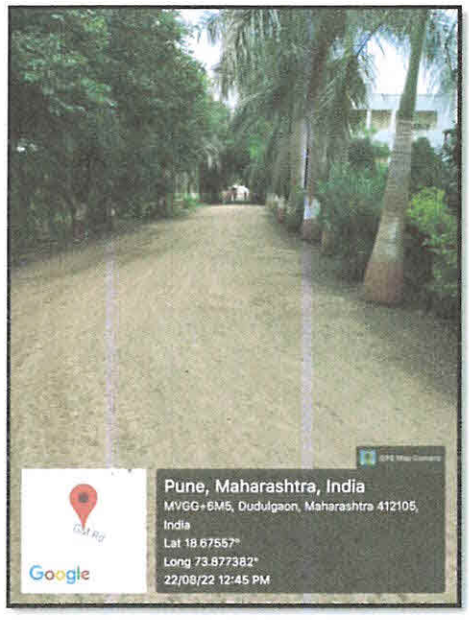


CHAPTER VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Road:

The Institute has well defined pedestrian roads to facilitate the easy movement of the students within the campus.

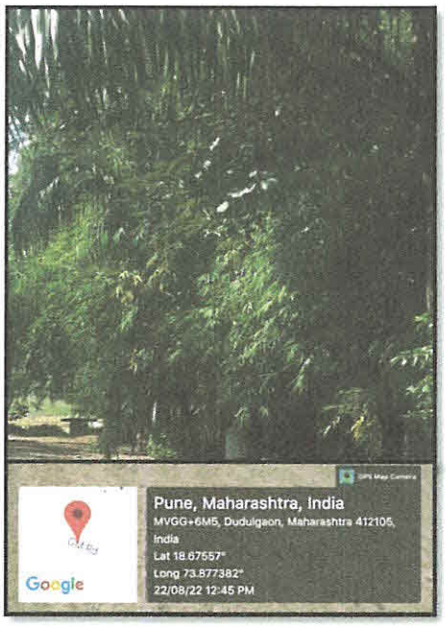
Photograph of Internal Road:

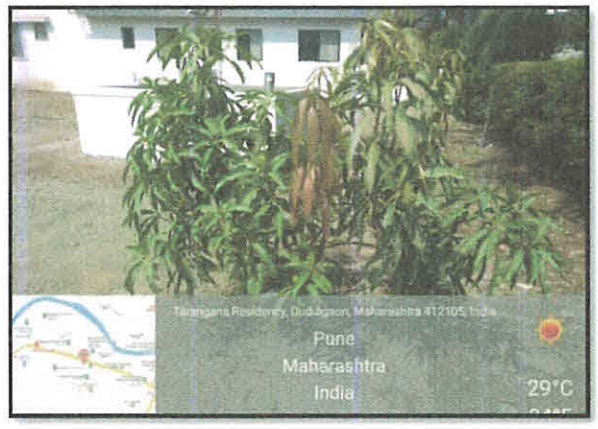


7.2 Internal Tree Plantation:

The Institute has done Tree Plantation in the campus.

Photograph of Tree Plantation in the campus:



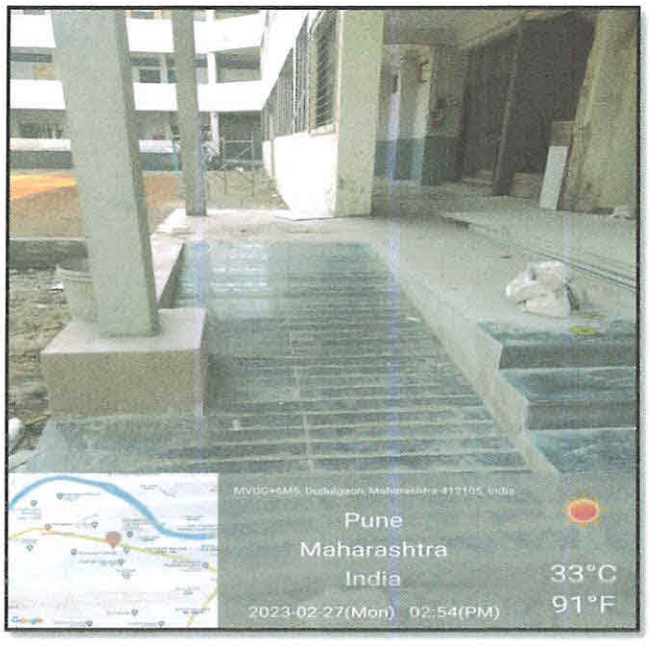


ENGRESS SERVICES PUNE

7.3 Ramp for Divyangajan:

The Institute has made provision of Ramp for Divyangajan.

Photograph of Ramp:



ANNEXURE-I
LIST OF TREES AND PLANTS

List of Plants and Trees:

No	Common Name of Tree/Plant
1	Royal Palm
2	Cactus
3	Bunny ears (Cactus)
4	Aloe
5	Tulsi
6	Datura
7	Turmeric
8	Guava
9	Lemon grass
10	Castor
11	Kokum
12	Hadjod
13	Heena
14	Senna
15	Lemon
16	Hibiscus
17	Narakya
18	Hibiscus
19	Sentry plant
20	Shatavari
21	Hirda
22	Mango
23	Amla
24	Guva
25	Lajalu
26	Jui
27	Vasaka
28	Vasaka
29	Narakya
30	Hibiscus

31	Beheda
32	Leather Fern
33	Narakya
34	Bael, Shriparni
35	Vinca
36	Vẹkhand
37	Annatto
38	Annatto
39	Shatavari
40	Jequerity bean
41	Gulvel
42	Money Plant
43	Nirgudi
44	White Vajradanti
45	Shalparni
46	Neem
47	Laghu patha
48	Punnay Tree
49	Jambul
50	Umber
51	Jambul
52	Custard apple
53	Cashew seed
54	Indian Jackfruit
55	Pomegranate
56	Christmas tree

ENVIRONMENTAL AUDIT REPORT

of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S

Educational Campus, Building-B, Dudulgaon, Pune 412 105

Year: 2019-20

Prepared by:

Enrich Consultants
Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: enrichcons@gmail.com

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(A Government of Maharashtra undertaking)
2nd Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006
Ph No: 020-26614393/266144403, Fax No: 020-26615031
Email: econ@mahaurja.com , Web: www.mahaurja.com

ECN/2017-18/CR-01/5726 30th November 2017

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with ***MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)*** under given category as "Energy Planner & Energy Auditor in Maharashtra under Save Energy Programme of MEDA.

Name and Address of the firm	:	Enrich Consultants Yashashree, Plot No. 26,Nirmal Baug Society,Parvati, Pune - 411009.
Registration Category	:	Empanelled *Consultant for Save Energy Programme.*
Registration Number	:	***MEDA/ECN/CR-01/2017-18/EA-37***

- The Save Energy Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid upto **3 year** from the date of registration, to carry out energy audits under the Save Energy Programme of MEDA.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

30/11

(Smita Kudarikar)
Manager (EC)

ENRICH CONSULTANTS Pune

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: enrichcons@gmail.com

Ref: EC/RJSPMICMR/19-20/03 Date: 10/8/2020

CERTIFICATE

This is to certify that we have conducted Environmental Audit at Rajmata Jijau Shikshan Prasarak Mandal's Educational Campus, Building-B, Dudulgaon in the year 2019-20.

The College has already adopted following practices for making the campus Green:

- Usage of Energy Efficient LED Fittings
- Installation of 10 kWp Roof Top Solar PV Plant.
- Maximum usage of Day Lighting
- Rain Water Harvesting Project

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient and Green.

For Enrich Consultants,

ENRICH CONSULTANTS Pune

A Y Mehendale,
Certified Energy Auditor
EA-8192

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ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of RJSPM's Educational Campus, Building-B, Dudulgaon for awarding us the assignment of Environmental Audit of their Building-B Dudulgaon Campus for the Year: 2019-20.

We are thankful to:

- Prof. Yashwant Lembhe, In Charge Director

We are also thankful to various Head of Departments & other Staff members for helping us during the field study.

EXECUTIVE SUMMARY

After the Field Study & Analysis, we present herewith important observations made during the assignment of Environmental Audit.

1. RJSPM's Educational Campus, Building-B, Dudulgaon, Pune consumes Energy in the form of Electrical Energy used for various gadgets, Office & other facilities.

2. Various Pollution due to College Activities:

- Air pollution: Mainly CO_2 on account of Electrical Energy Consumption
- Solid Waste: Bio degradable Garden Waste
- Liquid Waste: Human liquid waste

3. Present Energy Consumption:

No	Parameter/ Value	Total Energy Consumed, kWh	CO_2 Emissions, MT
1	Total	56239	44.99
2	Maximum	5262	4.21
3	Minimum	4481	3.58
4	Average	4686.58	3.75

4. The various projects already implemented for Environmental Conservation:

- Usage of Energy Efficient LED Lights
- Installation of **10 kWp** Roof Top Solar PV Plant
- Usage of Natural Day light in corridors
- Implementation of Rain Water Harvesting

5. Usage of Renewable Energy & CO_2 Mitigation:

The Institute has installed **10 kWp** Roof Top Solar PV Plant. The Annual reduction in CO_2 Emission, due to Solar PV Plant is **4.8 MT**, in the Year: 2019-20

6. Waste Management:

6.1 Solid Waste Management:

The Waste is segregated at Source. Waste Collection Bins are kept at prominent places.

6.2 E-Waste Management:

The internal communication is through email. Very little E-Waste is generated in the College.

7. Rain Water Harvesting:

The College has implemented Rain Water Harvesting Project, wherein the Rain Water from the Terraces is collected and is used to increase the underground water level.

8. Assumptions:

1. 1 Unit of Electrical Energy releases **0.8 Kg** of CO_2 into atmosphere
2. Solar Energy Generation: **1 kWp** generates **4 kWh** of Electrical Energy
3. Annual working Days for Solar PV Plant: **150 Nos**

ABBREVIATIONS

LED	Light Emitting Diode
MSEDCL	Maharashtra State Electricity Distribution Company Ltd
kWp	Kilo Watt peak
kWh	kilo-Watt Hour
CO_2	Carbon Di Oxide
MT	Metric Ton
RJSPM	Rajmata Jijau Shikshan Prasarak Mandal
MBA	Master in Business Administration

CHAPTER-I
INTRODUCTION

1.1 Important Definitions:

1.1.1 Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

1.1.2. Environmental Audit: Definition:

An audit which aims at verification and validation to ensure that various environmental laws are compiled with and adequate care has been taken towards environmental protection and preservation

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment

1.1.3. Environmental Pollutant: means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

1.1.4. Relevant Environmental Laws in India: Table No-1:

1927	The Indian Forest Act
1972	The Wildlife Protection Act
1974	The Water (Prevention and Control of Pollution) Act
1977	The Water (Prevention & Control of Pollution) Cess Act
1980	The Forest (Conservation) Act
1981	The Air (Prevention and Control of Pollution) Act
1986	The Environment Protection Act
1991	The Public Liability Insurance Act
2002	The Biological Diversity Act
2010	The National Green Tribunal Act

1.1.5. Some Important Environmental Rules in India: Table No-2:

1989	Hazardous Waste (Management and Handling) Rules
1989	Manufacture, Storage and Import of Hazardous Chemical Rules
2000	Municipal Solid Waste (Management and Handling) Rules
1998	The Biomedical Waste (Management and Handling) Rules
1999	The Environment (Siting for Industrial Projects) Rules
2000	Noise Pollution (Regulation and Control) Rules
2000	Ozone Depleting Substances (Regulation and Control) Rules
2011	E-waste (Management and Handling) Rules

2011	National Green Tribunal (Practices and Procedure) Rules
2011	Plastic Waste (Management and Handling) Rules

1.1.6 National Environmental Plans & Policy Documents: Table No-3:

1.	National Forest Policy, 1988
2.	National Water Policy, 2002
3.	National Environment Policy or NEP (2006)
4.	National Conservation Strategy and Policy Statement on Environment and Development, 1992
5.	Policy Statement for Abatement of Pollution (1992)
6.	National Action Plan on Climate Change
7.	Vision Statement on Environment and Human Health
8.	Technology Vision 2030 (The Energy Research Institute)
9.	Addressing Energy Security and Climate Change (MoEF and Bureau of Energy Efficiency
10	The Road to Copenhagen; India's Position on Climate Change Issues (MoEF)

1.2 Methodology:

1. To study present usage of Natural resources the College is consuming
2. To Study the present pollution sources
3. To study various measures to make the campus Self sustainable in respect of Natural resources
4. To study CO_2 Emission
5. To study CO_2 Emission Reduction
6. Study of Waste Management
7. Study of Rain Water Harvesting

1.3 General Details of Institute: Table No 1:

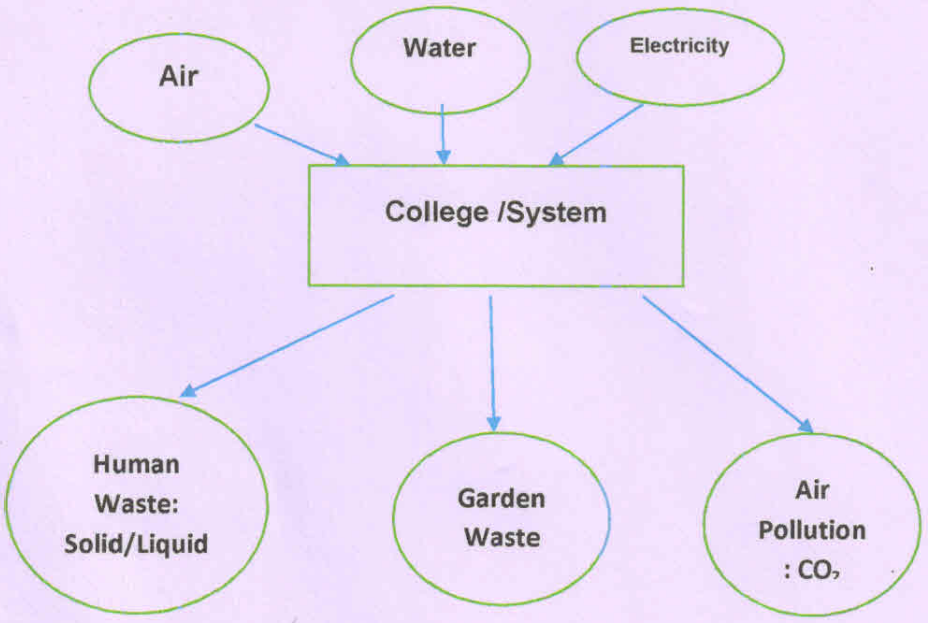
No	Head	Particulars
1	Name	RJSPM's Educational Campus, Building-B
2	Address	Dudulgaon, Pune 412 105
3	Affiliation	Savitribai Phule Pune University
4	Courses Offered	M B A Program

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

The Institute consumes following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the College System & Environment as under.



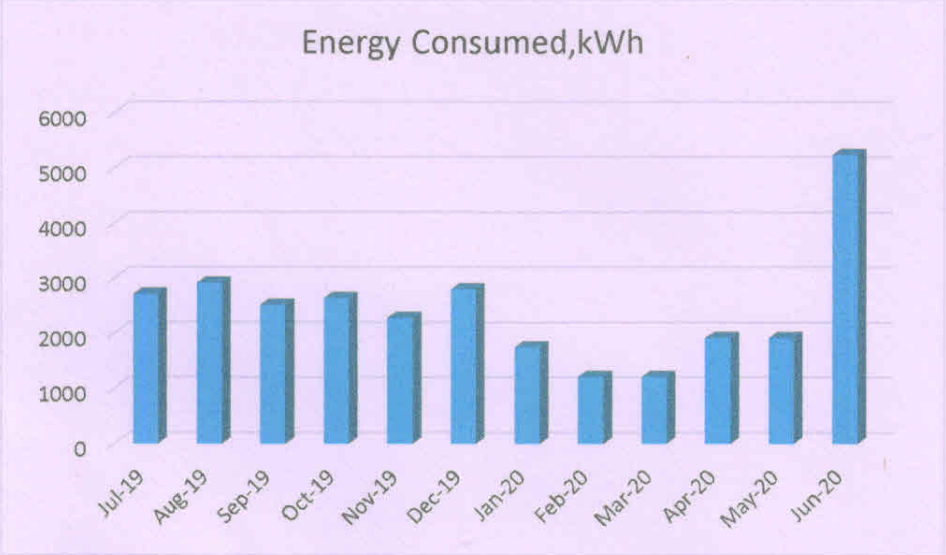
Now we compute the Generation of CO2 on account of consumption of Electrical Energy as under.

Table No 5: Electrical Bill Analysis- 2019-20:

No	Month	Energy Consumed, kWh
1	Jul-19	2714
2	Aug-19	2915
3	Sep-19	2514
4	Oct-19	2639
5	Nov-19	2280
6	Dec-19	2801
7	Jan-20	1749
8	Feb-20	1208
9	Mar-20	1208
10	Apr-20	1919
11	May-20	1919

12	Jun-20	5238
13	Total	29104
14	Maximum	5238
15	Minimum	1208
16	Average	2425.33

To study the variation of Monthly Energy Consumption: Chart No 1:



Key Inference drawn:
From the above analysis, we present following important parameters:

Table No 6: Various Important Parameters:

No	Parameter/ Value	Total Energy Consumed, kWh
1	Total	29104
2	Maximum	5238
3	Minimum	1208
4	Average	2425.33

CHAPTER-III
STUDY OF CO_2 EMISSION

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the College for performing its day to day activities

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to LPG & Electrical Energy are as under

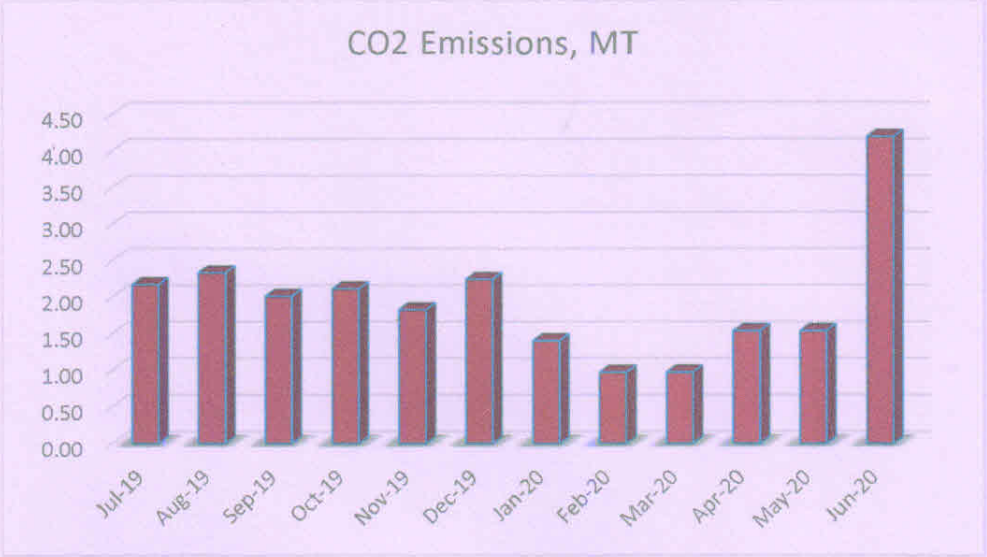
- 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the College due to its Day to Day operations

Table No 7: Month wise CO_2 Emissions:

No	Month	Energy Consumed, kWh	CO_2 Emissions, MT
1	Jul-19	2714	2.17
2	Aug-19	2915	2.33
3	Sep-19	2514	2.01
4	Oct-19	2639	2.11
5	Nov-19	2280	1.82
6	Dec-19	2801	2.24
7	Jan-20	1749	1.40
8	Feb-20	1208	0.97
9	Mar-20	1208	0.97
10	Apr-20	1919	1.54
11	May-20	1919	1.54
12	Jun-20	5238	4.19
13	Total	29104	23.28
14	Maximum	5238	4.19
15	Minimum	1208	0.97
16	Average	2425.33	1.94

Representation of Month wise CO_2 emissions: Chart No 2:



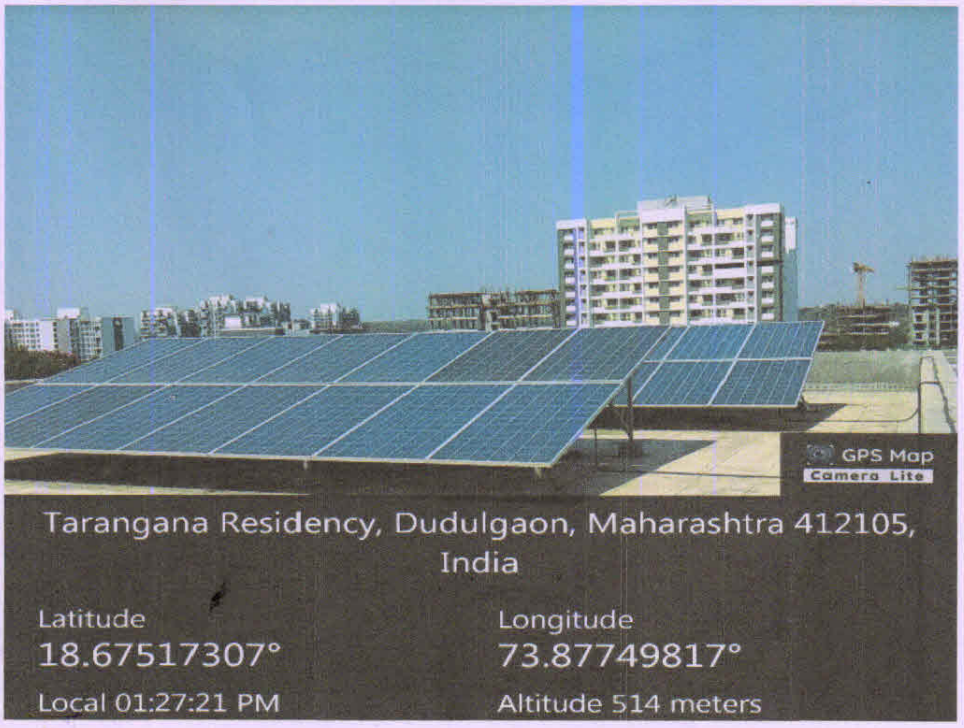
CHAPTER-IV
STUDY OF CO_2 EMISSION REDUCTION

The College has installed Roof Top **10 kWp** Solar PV Plant.
In the following Table, we compute the reduction in CO2 emission due to Solar PV Plant.

Computation of CO_2 Emission Reduction by Usage of Alternate Energy: Table No 8:

No	Parameter	Value	Unit
1	Installed Solar PV Capacity	10	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Working Days	150	Nos
4	Annual Energy Generated	6000	kWh/Annum
5	Reduction in 1 kWh of Electrical Energy reduces CO_2 Emissions by	0.8	Kg of CO_2
6	Amount of CO_2 Emission Reduction by 10 kWp Solar Plant =4*5/1000	**4.8**	MT of CO_2

Photograph of 10 kWp Roof Top Solar PV Plant:



CHAPTER-V
STUDY OF WASTE MANAGEMENT

5.1 Solid Waste Management:

The Waste is segregated at source. At important locations, Waste collection Bins are placed, for waste collection.

5.2 E- Waste Management:

The internal communication is through Internet within the staff. Hence as far as the E-waste is concerned hardly any waste is generated during the day to day operations.

CHAPTER-VI
STUDY OF RAIN WATER HARVESTING

The Institute has already implemented the Rain Water Harvesting Project. The rain water falling on the terrace is collected through pipes and is used for increasing the underground water level.

Photograph of Rain Water Harvesting Pipe:

ENVIRONMENTAL AUDIT REPORT

of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S

Educational Campus, Building B, Dudulgaon, Pune 412 105

Year: 2021-22

Prepared by:

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: engress123@gmail.com

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency

(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary,
Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
Email: eee@mahaurja.com, Web: www.mahaurja.com

ECN/2022-23/CR-43/1709 — 10th May, 2022

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with *MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)* under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm : M/s Engress Services
Yashshree, 26, Nirmal Bag Society,
Near Muktangan English School,
Parvati, Pune – 411 009.

Registration Category : *Empanelled Consultant for Energy Conservation Programme for Class 'A'*

Registration Number : *MEDA/ECN/2022-23/Class A/EA-32.*

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **09th May, 2024** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

ENGRESS SERVICES PUNE

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: engress123@gmail.com

Ref: EC/RJSPMICMR/21-22/03 Date: 11/5/2022

CERTIFICATE

This is to certify that we have conducted Environmental Audit at Rajmata Jijau Shikshan Prasarak Mandal's Educational Campus, Building B, Dudulgaon, Pune in the year 2021-22.

The Institute has adopted following practices for making the campus Environment Friendly:

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting
- Installation of 10 kWp Roof Top Solar PV Plant
- Segregation of Waste at source
- Rain Water Management Project
- Internal Tree Plantation

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient and Green.

For Engress Services,

A Y Mehendale,
Certified Energy Auditor
EA-8192

INDEX

ENGRESS SERVICES PUNE

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of RJSPM's Educational Campus, Dudulgaon, Pune for awarding us the assignment of Environmental Audit of their RJSPM's Educational Campus-Building B, Dudulgaon, Pune for the Year: 2021-22.

We are thankful to all staff members for helping us during the field study.

EXECUTIVE SUMMARY

1. RJSPM's Educational Campus Building B, Dudulgaon, Pune consumes Energy in the form of Electrical Energy used for various gadgets, Office & other facilities.

2. Pollution caused due to Institute Activities:

- **Air pollution:** Mainly CO_2 on account of Electrical Energy Consumption
- **Solid Waste:** Bio degradable Garden Waste
- **Liquid Waste:** Human liquid waste

3. Present Energy Consumption & CO_2 Emission:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	18567	16.71
2	Maximum	13382	12.04
3	Minimum	0	0.00
4	Average	1547.25	1.39

4. The various projects already implemented for Environmental Conservation:

- Usage of Energy Efficient LED Lights
- Installation of **10 kWp** Roof Top Solar PV Plant.
- Implementation of Rain Water Management Project

5. Usage of Renewable Energy & CO_2Mitigation:

- The Institute has installed **10 kWp** Roof top Solar PV Plant.
- The Energy generated by 10 kWp Roof Top Solar Plant is **12000 kWh.**
- Reduction in CO2 Emissions in 21-22 is **10.8 MT.**

6. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	111	65	84
2	Minimum	106	62	81

7. Waste Management:

7.1 Solid Waste Management:

The Waste is segregated at source. There are separate Dry and Wet Collection bins, to collect the Waste, for further disposal.

ENGRESS SERVICE PUNE

7.2 E Waste Management:

It is recommended to dispose of the E Waste through Authorized Agency.

8. Environment Friendly Initiative:

- Internal Tree Plantation

9. Assumptions:

- **1 kWh** of Electrical Energy releases **0.9 Kg** of **CO_2** into atmosphere
- Average Energy generated by **1 kWp** Solar PV Plant : **4 kWh/Day**
- Annual Solar Energy Generation Days: **300 Nos**

10. References:

- For CO_2 Emissions: www.tatapower.com
- For Solar PV Energy Generated: www.solarrffotop.gov.in
- For AQI &Water Quality Standards: www.cpcb.com

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ABBREVIATIONS

LED	Light Emitting Diode
MSEDCL	Maharashtra State Electricity Distribution Company Ltd
kWp	Kilo Watt peak
kWh	kilo-Watt Hour
CO_2	Carbon Di Oxide
MT	Metric Ton
RJSPM	Rajmata Jijau Shikshan Prasarak Mandal
AQI	Air Quality Index
PM-2.5	Particulate Matter of Size 2.5 Micron
PM-10	Particulate Matter of Size 10 Micron
CPCB	Central Pollution Control Board

CHAPTER-I
INTRODUCTION

1.1Important Definitions:

1.1.1 Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

1.1.2. Environmental Audit: Definition:

An audit which aims at verification and validation to ensure that various environmental laws are compiled with and adequate care has been taken towards environmental protection and preservation

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment

1.1.3. Environmental Pollutant: means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

1.1.4. Relevant Environmental Laws in India: Table No-1:

1927	The Indian Forest Act
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1986	The Environment Protection Act
1991	The Public Liability Insurance Act
2002	The Biological Diversity Act
2010	The National Green Tribunal Act

1.1.5. Some Important Environmental Rules in India: Table No-2:

1989	Hazardous Waste (Management and Handling) Rules
1989	Manufacture, Storage and Import of Hazardous Chemical Rules
2000	Municipal Solid Waste (Management and Handling) Rules
1998	The Biomedical Waste (Management and Handling) Rules
1999	The Environment (Sitting for Industrial Projects) Rules
2000	Noise Pollution (Regulation and Control) Rules
2000	Ozone Depleting Substances (Regulation and Control) Rules
2011	E-waste (Management and Handling) Rules

2011	National Green Tribunal (Practices and Procedure) Rules
2011	Plastic Waste (Management and Handling) Rules

1.1.6 National Environmental Plans & Policy Documents: Table No-3:

1.	National Forest Policy, 1988
2.	National Water Policy, 2002
3.	National Environment Policy or NEP (2006)
4.	National Conservation Strategy and Policy Statement on Environment and Development, 1992
5.	Policy Statement for Abatement of Pollution (1992)
6.	National Action Plan on Climate Change
7.	Vision Statement on Environment and Human Health
8.	Technology Vision 2030 (The Energy Research Institute)
9.	Addressing Energy Security and Climate Change (MoEF and Bureau of Energy Efficiency
10	The Road to Copenhagen; India's Position on Climate Change Issues (MoEF)

1.2 Objectives:

1. To study Resource Consumption & CO_2 Emissions
2. To Study CO_2 Emission Reduction
3. To study Indoor Air Quality Parameters
4. To Study Waste Management
5. To Study Rain Water Management
6. To Study Environment Friendly Initiatives

1.3 Table No 4: General Details of Institute:

No	Head	Particulars
1	Name	RJSPM's Educational Campus, Building B, Dudulgaon
2	Address	Dudulgaon, Pune 412 105
3	Year of Establishment	2007
4	Affiliation	Savitribai Phule Pune University

ENGRESS SERVICES PUNE

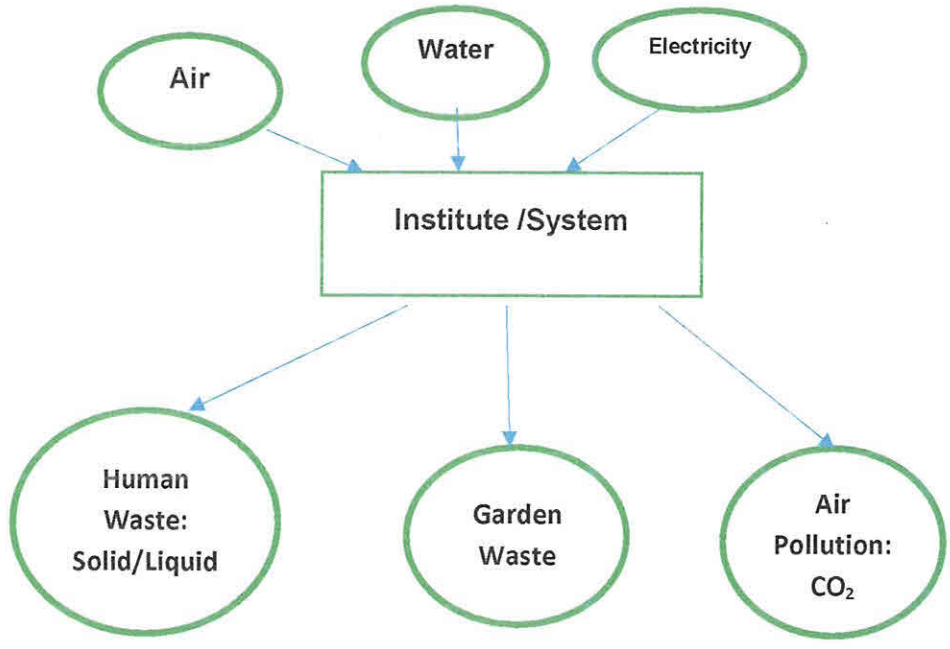
CHAPTER-II
STUDY OF RESOURCE CONSUMPTION & CO_2 EMISSION

The Institute consumes following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the RJSPM's Educational Campus-Building B, Dudulgaon, Pune System & Environment as under.

Chart No 1: Study of Institute as System:



Now we compute the Generation of CO_2 on account of consumption of Electrical Energy. The basis of Calculation for CO_2 emissions due to Electrical Energy is as under

- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Table No 5: Study of Consumption of Electrical Energy & CO_2 Emissions: 21-22:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Feb-21	962	0.87
2	Mar-21	983	0.88
3	Apr-21	1090	0.98
4	May-21	1194	1.07
5	Jun-21	956	0.86
6	Jul-21	13382	12.04

7	Aug-21	0	0.00
8	Sep-21	0	0.00
9	Oct-21	0	0.00
10	Nov-21	0	0.00
11	Dec-21	0	0.00
12	Jan-22	0	0.00
13	Total	18567	16.71
14	Maximum	13382	12.04
15	Minimum	0	0.00
16	Average	1547.25	1.39

Chart No 2: To study the variation of Monthly Energy Consumption:

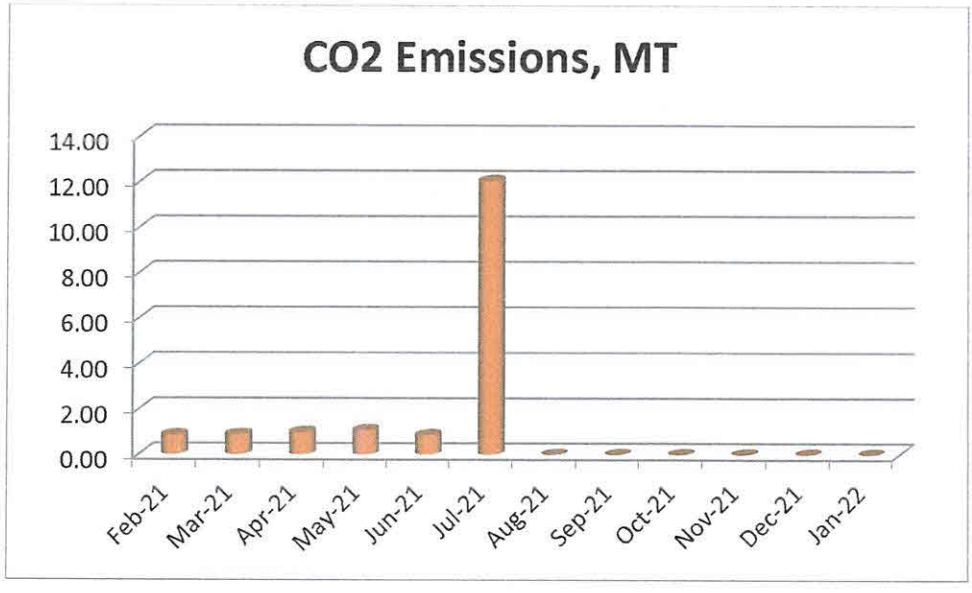


Table No 6: Various Important Parameters:

No	Parameter/ Value	Total Energy Consumed, kWh	CO_2 Emissions, MT
1	Total	18567	16.71
2	Maximum	13382	12.04
3	Minimum	0	0.00
4	Average	1547.25	1.39

CHAPTER III
STUDY OF CO_2 EMISSION REDUCTION

In the following Table, we compute the Annual Energy requirement met by Alternate Energy.

Table No 7: Computation of Annual Reduction in CO_2 Emissions, MT:

No	Parameter	Value	Unit
1	Installed Solar PV Capacity	10	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Working Days	300	Nos
4	Annual Energy Generated	12000	kWh/Annum
5	1 kWh of Energy is equivalent to	**0.9**	Kg of CO_2
6	Annual Reduction in CO_2 Emissions = (4) * (5) / 1000	**10.8**	%

Photograph of 10 kWp Roof top Solar PV Plant:

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CHAPTER IV
STUDY OF INDOOR AIR QUALITY

4.1 Importance of Air Quality:

Air: The common name given to the atmospheric gases used in breathing and photosynthesis.

By volume, Dry Air contains 78.09% Nitrogen, 20.95% Oxygen, 0.93% Argon, 0.039% carbon dioxide, and small amounts of other gases.

On average, a person inhales about **14,000 liters** of air every day. Therefore, poor air quality may affect the quality of life now and for future generations by affecting the health, the environment, the economy and the city's livability.

Air quality is a measure of the suitability of air for breathing by people, plants and animals.

As per Section 2(a) of Air (Prevention and control of pollution) Act, 1981 '**air pollutant**' has been defined as **'any solid, liquid or gaseous substance [(including noise)] present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment**

4.2 Air Quality Index:

An **Air Quality Index (AQI)** is a number used by government agencies to measure the **air pollution** levels and communicate it to the population. As the AQI increases, it means that a large percentage of the population will experience severe adverse health effects. The measurement of the **AQI** requires an **air monitor** and an **air pollutant** concentration over a specified **averaging period**.

We present herewith following important Parameters.

1. AQI- Air Quality Index
2. PM-2.5- Particulate Matter of Size 2.5 micron
3. PM-10- Particulate Matter of Size 10micron

Table No 8: Indoor Air Quality Parameters:

No	Location	AQI	PM 2.5	PM 10
	Ground Floor			
1	Reading Room	106	62	81
2	Tutorial Room	110	63	84
3	Class Room	109	64	83
4	Admin Office	111	65	84
	First Floor			
5	Seminar Hall	108	63	82
	Maximum	111	65	84
	Minimum	106	62	81

CHAPTER-V
STUDY OF WASTE MANAGEMENT

5.1 Solid Waste Management:

The Waste is segregated at source. At important locations, Waste collection Bins are placed, for waste collection.

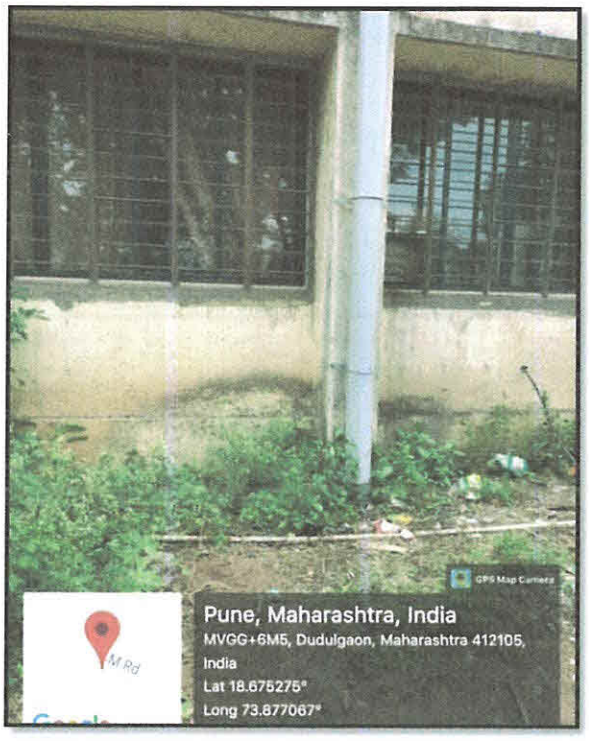
5.2 E Waste Management:

It is recommended to dispose of through Authorized Agency.

CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The Institute has implemented the Rain Water Management Project. The rain water falling on the terrace is collected through pipes and is used for increasing the underground water level.

Photograph of Rain Water Management Pipe:

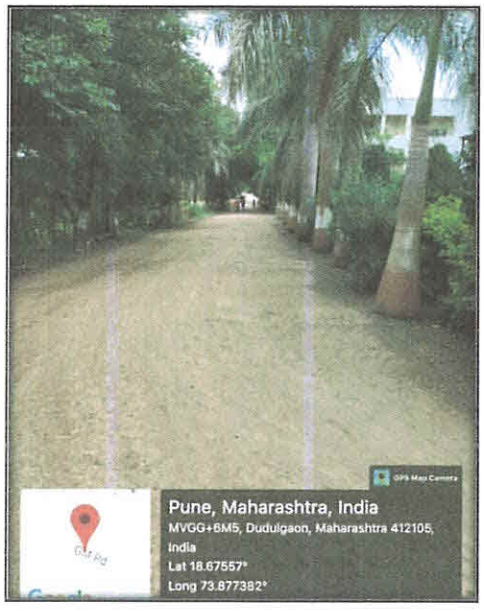


CHAPTER VII
STUDY OF ENVIRONMENT FRIENDLY INITIATIIVES

7.1 Internal Tree Plantation:

The Institute has well defined pedestrian roads to facilitate the easy movement of the students within the campus.

Photograph of Internal Tree Plantation:



ANNEXURE-I:
VARIOUS AIR QUALITY, WATER QUALITY STANDARDS:

1. Category Wise Air Quality Index Values & Concentration of PM 2.5 & PM10:

No	Category	AQI Value	Concentration Range, PM 2.5	Concentration Range, PM 10
1	Good	0 to 50	0 to 30	0 to 50
2	Satisfactory	51 to 100	31 to 60	51 to 100
3	Moderately Polluted	101 to 200	61 to 90	101 to 250
4	Poor	201 to 300	91 to 120	251 to 350
5	Very Poor	301 to 400	121 to 250	351 to 430
6	Severe	401 to 500	250 +	430 +

2. Recommended Water Quality Standards:

No	Designated Best Use	Criteria
1	Drinking Water Source without conventional Treatment but after disinfection	pH between **6.5 to 7.4** Dissolved Oxygen **6 mg/l or more**
2	Drinking water source after conventional treatment and disinfection	pH between **6 to 9** Dissolved Oxygen **4 mg/l or more**
3	Outdoor Bathing (Organized)	pH between **6.5 to 7.4** Dissolved Oxygen **5 mg/l or more**
4	Controlled Waste Disposal	pH between **6 to 7.4**

ENGRESS SERVICES PUNE

ENVIRONMENTAL AUDIT REPORT

of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S

Educational Campus, Building-B, Dudulgaon, Pune

Year: 2022-23

Prepared by:

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
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ENGRESS SERVICES PUNE

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary, Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
Email: eec@mahaurja.com, Web: www.mahaurja.com

ECN/2022-23/CR-43/1709 — 10th May, 2022

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with *MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)* under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm : M/s Engress Services
Yashshree, 26, Nirmal Bag Society,
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- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

ASSOCHAM
Ideate Innovate Impact

GEM Certificate

ASSOCHAM hereby certifies that

Mr. A Y Mehendale

has successfully passed the
Green and Eco-friendly Movement Certified Professional Test (GEM CP)
with
"Excellent Performance"
on
06 June, 2022

He/She is now eligible to execute the GEM Sustainability Certification Projects.
ASSOCHAM feels proud to award the GEM Certified Professional title to him/her.

Pankaj R. Dharkar
Chairman, GEM

GEM CP 22/788

Deepak Sood
Secretary General, ASSOCHAM

ENGRESS SERVICES PUNE

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
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Tel: 09890444795 Email: engress123@gmail.com

Ref: ES/RJSPMICMR/22-23/03 Date: 28/2/2023

CERTIFICATE

This is to certify that we have conducted Environmental Audit at Rajmata Jijau Shikshan Prasarak Mandal's Educational Campus, Building-B, Dudulgaon in the year 2022-23.

The Institute has adopted following Environment Friendly Practices:

- Usage of Energy Efficient LED Fittings
- Maximum Usage of Day Lighting
- Installation of 10 kWp Roof Top Solar PV Plant
- Segregation of Waste at source
- Sanitary Waste Incinerator, for disposal of Sanitary Waste
- Rain Water Management Project
- Internal Tree Plantation

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient and Green.

For Engress Services,

ENGRESS SERVICES PUNE

A Y Mehendale,
Certified Energy Auditor, EA-8192
ASSOCHAM GEM Certified Professional: GEM: 22/788

INDEX

ENGRESS SERVICES PUNE

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of RJSPM's Educational Campus, Building-B, Dudulgaon for awarding us the assignment of Environmental Audit of their Building-B Dudulgaon Campus for the Year: 2022-23.

We are thankful to all staff members for helping us during the field Study.

EXECUTIVE SUMMARY

1. RJSPM's Educational Campus, Building-B, Dudulgaon, Pune consumes Energy in the form of Electrical Energy; used for various gadgets, Office & other facilities.

2. Pollution due to Institute Activities:

- Air pollution: Mainly CO_2 on account of Electrical Energy Consumption
- Solid Waste: Bio degradable Garden Waste
- Liquid Waste: Human liquid waste

3. Present Energy Consumption:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	7810	7.03
2	Maximum	2956	2.66
3	Minimum	0	0.00
4	Average	650.83	0.59

4. The various projects already implemented for Environmental Conservation:

- Usage of Energy Efficient LED Lights
- Installation of **10 kWp** Roof Top Solar PV Plant
- Usage of Natural Day light in corridors
- Implementation of Rain Water Management

5. Usage of Renewable Energy& CO_2 Mitigation:

- The Institute has installed Roof Top Solar PV Plant of Capacity **10 kWp.**
- The Electrical Energy generated in 22-23 is **12000 kWh.**
- Reduction in CO_2 Emissions in 22-23 is **10.8 MT.**

6. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	93	55	70
2	Minimum	90	52	64

7. Indoor Comfort Conditions:

No	Parameter/Value	Temperature, ^0C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	27.2	41	198	45
2	Minimum	26.8	40	145	40

8. Waste Management:

8.1 Segregation of Waste at Source:

The Waste is segregated at Source. Waste Collection Bins are kept at prominent places.

8.2 Sanitary Waste Management:

There is a Sanitary Waste Incinerator, to dispose of the Sanitary Waste in the campus.

8.3 E-Waste Management:

It is recommended to dispose of the E Waste through Authorized Agency.

9. Rain Water Management:

The Institute has implemented Rain Water Management Project, wherein the Rain Water from the Terraces is collected and is used to increase the underground water level.

10. Assumptions:

- **1 kWh** of Electrical Energy releases **0.9 Kg** of **CO_2** into atmosphere
- Average Energy generated by **1 kWp** Solar PV Plant : **4 kWh/Day**
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- For Roof Top Solar Energy Generation: www.solarrooftop.gov.in
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- For AQI & Water Quality Standards: www.cpcb.com

ENGRESS SERVICES PUNE

ABBREVIATIONS

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MSEDCL	Maharashtra State Electricity Distribution Company Ltd
kWp	Kilo Watt peak
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2000	Municipal Solid Waste (Management and Handling) Rules
1998	The Biomedical Waste (Management and Handling) Rules
1999	The Environment (Siting for Industrial Projects) Rules
2000	Noise Pollution (Regulation and Control) Rules
2000	Ozone Depleting Substances (Regulation and Control) Rules
2011	E-waste (Management and Handling) Rules

2011	National Green Tribunal (Practices and Procedure) Rules
2011	Plastic Waste (Management and Handling) Rules

1.1.6 National Environmental Plans & Policy Documents: Table No-3:

1.	National Forest Policy, 1988
2.	National Water Policy, 2002
3.	National Environment Policy or NEP (2006)
4.	National Conservation Strategy and Policy Statement on Environment and Development, 1992
5.	Policy Statement for Abatement of Pollution (1992)
6.	National Action Plan on Climate Change
7.	Vision Statement on Environment and Human Health
8.	Technology Vision 2030 (The Energy Research Institute)
9.	Addressing Energy Security and Climate Change (MoEF and Bureau of Energy Efficiency
10	The Road to Copenhagen; India's Position on Climate Change Issues (MoEF)

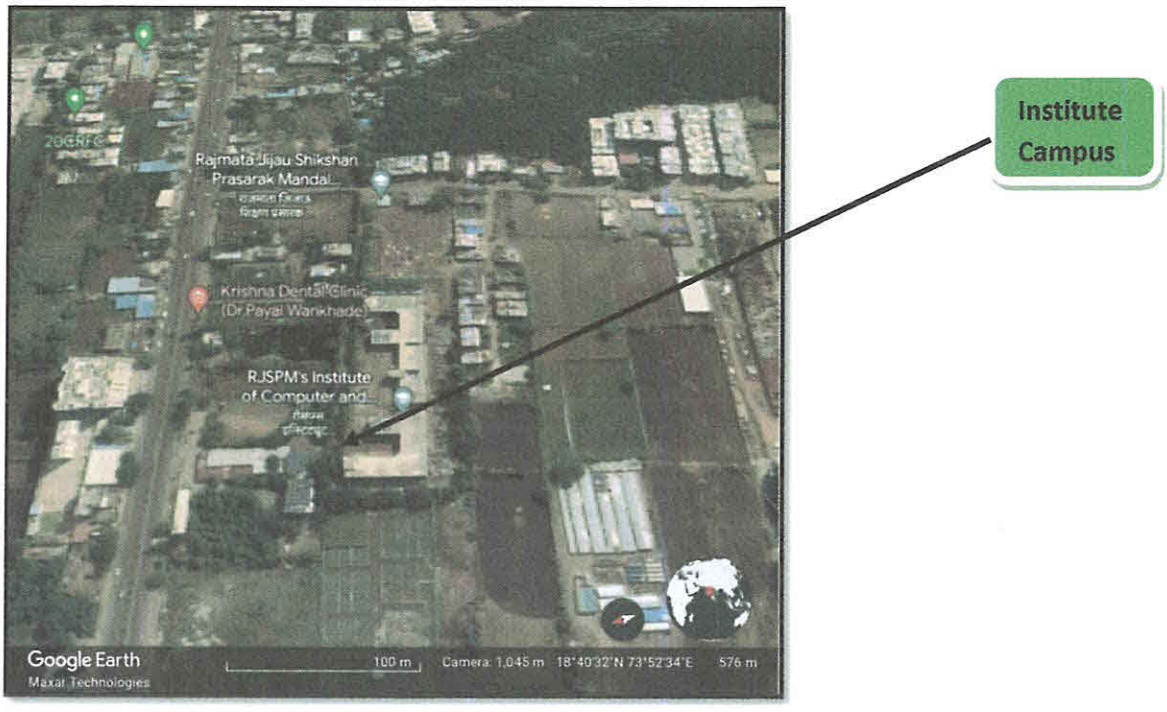
1.2 Methodology:

1. To study present usage of Natural resources the Institute is consuming
2. To Study the present pollution sources
3. To study various measures to make the campus Self sustainable in respect of Natural resources
4. To study CO_2 Emission
5. To study CO_2 Emission Reduction
6. Study of Indoor Air Quality and Indoor Comfort Parameters
7. Study of Waste Management
8. Study of Rain Water Management
9. Study of Eco Friendly Initiatives

1.3 General Details of Institute: Table No 4:

No	Head	Particulars
1	Name	RJSPM's Educational Campus, Building-B
2	Address	Dudulgaon, Pune 412 105
3	Affiliation	Savitribai Phule Pune University

1.4 Google Earth Image:

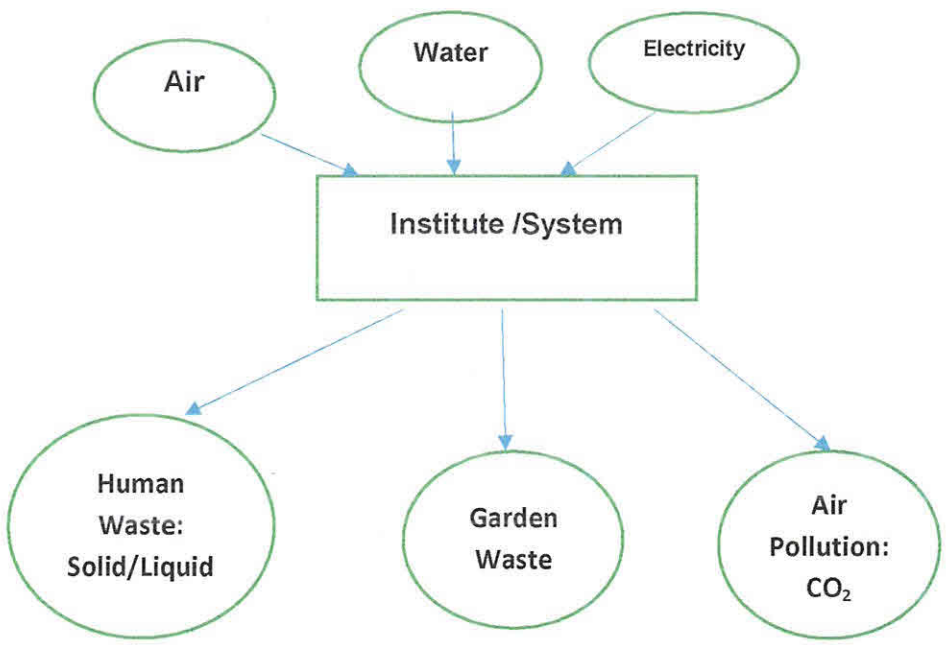


CHAPTER-II
STUDY OF RESOURCE CONSUMPTION & CO_2 EMISSION

The Institute consumes following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the Institute System & Environment as under.
Chart No:1



Now we compute the Generation of CO_2 on account of consumption of Electrical Energy. The basis of Calculation for CO_2 emissions due to Electrical Energy is as under

- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Table No 5: Study of Consumption of Electrical Energy & CO_2 Emissions: 21-22:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Feb-22	0	0
2	Mar-22	0	0
3	Apr-22	0	0
4	May-22	0	0
5	Jun-22	0	0
6	Jul-22	0	0

7	Aug-22	0	0
8	Sep-22	75	0.07
9	Oct-22	1590	1.43
10	Nov-22	1175	1.06
11	Dec-22	2014	1.81
12	Jan-23	2956	2.66
13	Total	7810	7.03
14	Maximum	2956	2.66
15	Minimum	0	0.00
16	Average	650.83	0.59

Chart No 2: To study the variation of Monthly Energy Consumption:

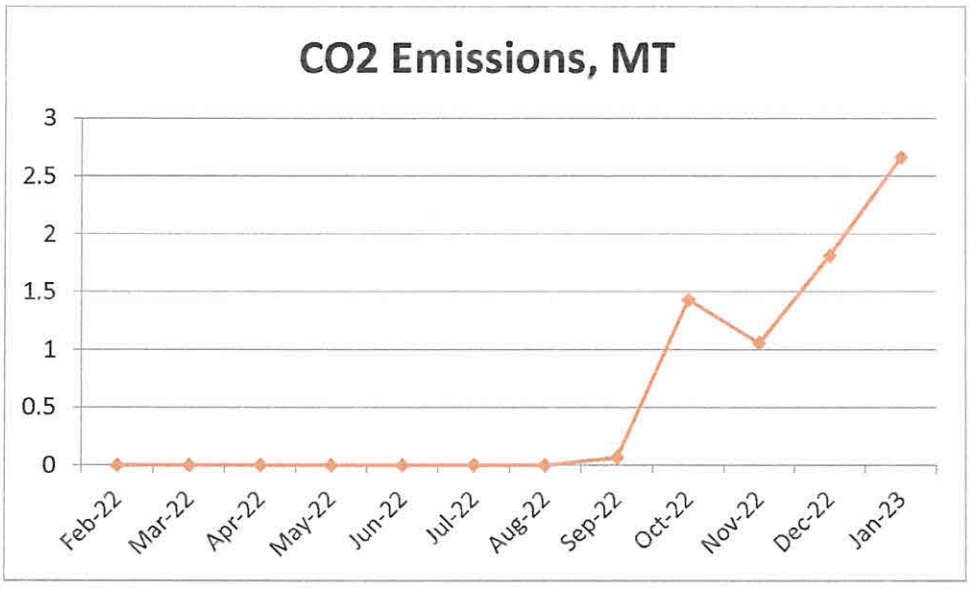


Table No 6: Various Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	7810	7.03
2	Maximum	2956	2.66
3	Minimum	0	0.00
4	Average	650.83	0.59

CHAPTER-IV
STUDY OF CO_2EMISSION REDUCTION

The Institute has installed Roof Top **10 kWp** Solar PV Plant.
In the following Table, we compute the reduction in CO_2 emission due to Solar PV Plant.

Table No 7: Computation of CO_2 Emission Reduction by Usage of Alternate Energy:

No	Parameter	Value	Unit
1	Installed Solar PV Capacity	10	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Working Days	300	Nos
4	Annual Energy Generated	12000	kWh/Annum
5	Reduction in 1 kWh of Electrical Energy reduces CO_2 Emissions by	0.9	Kg of CO_2
6	Amount of CO_2 Emission Reduction by 10 kWp Solar Plant =4*5/1000	**10.8**	MT of CO_2

Photograph of 10 kWp Roof Top Solar PV Plant:

ENGRESS SERVICES PUNE

CHAPTER IV
STUDY OF INDOOR AIR QUALITY

4.1 Importance of Air Quality:

Air: The common name given to the atmospheric gases used in breathing and photosynthesis.

By volume, Dry Air contains 78.09% Nitrogen, 20.95% Oxygen, 0.93% Argon, 0.039% carbon dioxide, and small amounts of other gases.

On average, a person inhales about **14,000 liters** of air every day. Therefore, poor air quality may affect the quality of life now and for future generations by affecting the health, the environment, the economy and the city's livability.

Air quality is a measure of the suitability of air for breathing by people, plants and animals.

According to Section 2(b) of Air (Prevention and control of pollution) Act, 1981 '**air pollution**' has been defined as **'the presence in the atmosphere of any air pollutant.'**

As per Section 2(a) of Air (Prevention and control of pollution) Act, 1981 '**air pollutant**' has been defined as **'any solid, liquid or gaseous substance [(including noise)] present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment**

4.2 Air Quality Index:

An **Air Quality Index (AQI)** is a number used by government agencies to measure the **air pollution** levels and communicate it to the population. As the AQI increases, it means that a large percentage of the population will experience severe adverse health effects. The measurement of the **AQI** requires an **air monitor** and an **air pollutant** concentration over a specified **averaging period**.

We present herewith following important Parameters.

1. AQI- Air Quality Index
2. PM-2.5- Particulate Matter of Size 2.5 micron
3. PM-10- Particulate Matter of Size 10micron

Table No 8: Indoor Air Quality Parameters:

No	Location	AQI	PM 2.5	PM 10
	Ground Floor			
1	Reading Room	93	55	68
2	Tutorial Room	90	55	70
3	Class Room	90	52	64
4	Class Room	91	54	68

5	Class Room	92	55	67
6	Computer Lab	93	55	68
7	Store Room	90	54	69
8	Admin Office	90	54	67
	First Floor			
9	Seminar Hall	92	55	67
	Maximum	93	55	70
	Minimum	90	52	64

CHAPTER V
STUDY OF INDOOR COMFORT CONDITION PARAMETERS

In this Chapter, we present the various Indoor Comfort Parameters measured during the Audit.

The Parameters include:

1. Temperature
2. Humidity
3. Lux Level
4. Noise Level.

Table No 9: Study of Indoor Comfort Condition Parameters:

No	Location	Temperature, ^0C	Humidity, %	Lux Level	Noise Level, dB
	Ground Floor				
1	Reading Room	27.1	40	198	44.2
2	Tutorial Room	27.2	41	157	43.2
3	Class Room	27.1	41	145	44.1
4	Class Room	27	41	187	45
5	Class Room	27	40	147	45
6	Computer Lab	27.1	41	196	44.6
7	Store Room	27.1	40	164	44.3
8	Admin Office	27	40	147	43.9
	First Floor				
9	Seminar Hall	26.8	41	156	40
	Maximum	**27.2**	**41**	**198**	**45**
	Minimum	**26.8**	**40**	**145**	**40**

CHAPTER-VI
STUDY OF WASTE MANAGEMENT

6.1 Segregation of Waste at Source:

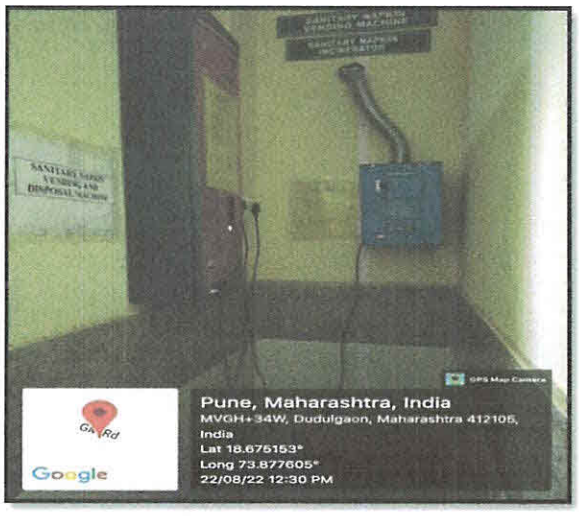
The Waste is segregated at source. At important locations, Waste collection Bins are placed, for waste collection.

Photograph of Waste Bins:

6.2 Sanitary Waste Management:

There is a Sanitary Waste Incinerator, to dispose of the Sanitary Waste in the campus.

Photograph of Sanitary Waste Incinerator:



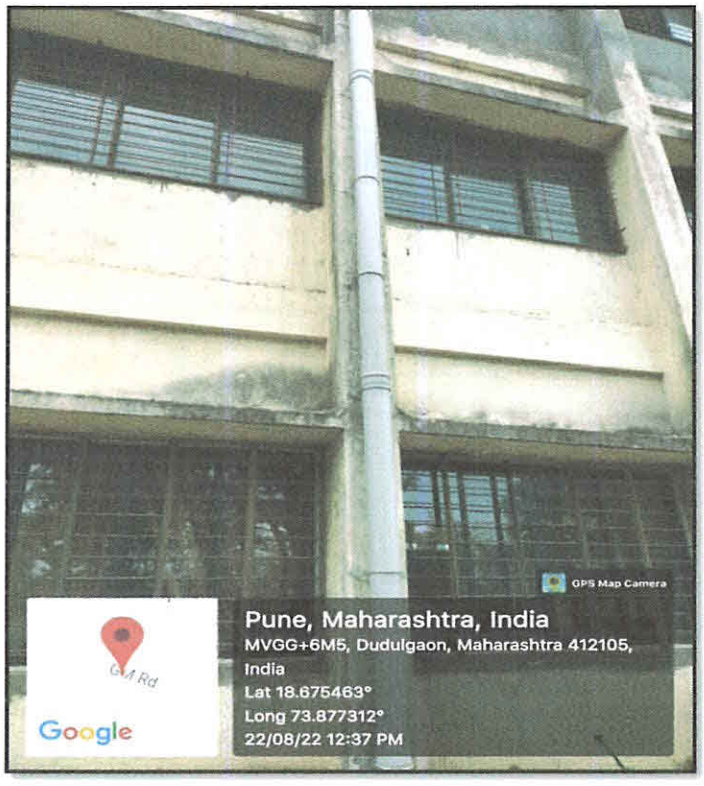
6.3 E Waste Management:

It is recommended to dispose of the E Waste through Authorized Agency.

CHAPTER-VII
STUDY OF RAIN WATER MANAGMENT

The Institute has implemented the Rain Water Management Project. The rain water falling on the terrace is collected through pipes and is used for increasing the underground water level.

Photograph of Rain Water Management Pipe:

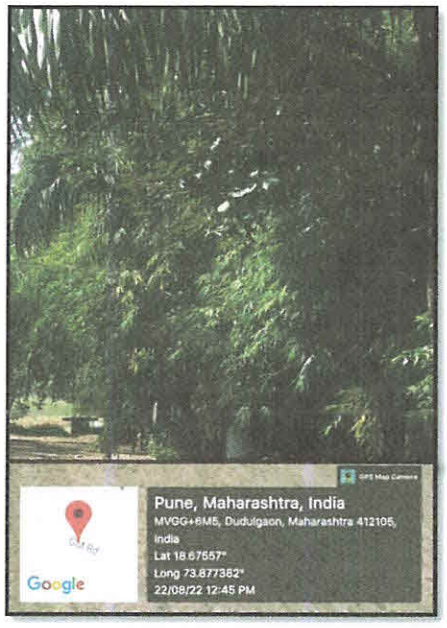


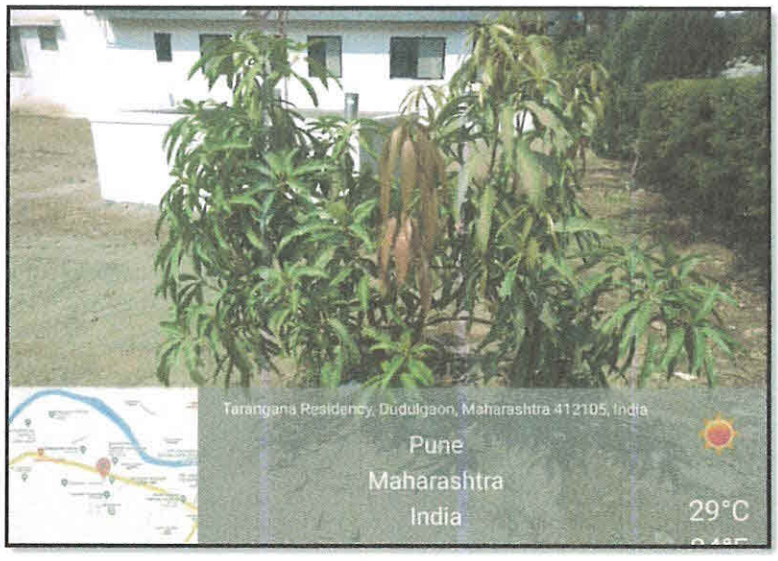
CHAPTER-VIII
STUDY OF ENVIRONMENTAL FRIENDLY PRACTICES

8.1 Internal Tree Plantation:

The Institute has done Tree Plantation in the campus.

Photograph of Tree Plantation in the campus:





ANNEXURE-I:
VARIOUS AIR QUALITY, WATER QUALITY, NOISE & INDOOR COMFORT STANDARDS:

1. Category Wise Air Quality Index Values & Concentration of PM 2.5 & PM10:

No	Category	AQI Value	Concentration Range, PM 2.5	Concentration Range, PM 10
1	Good	0 to 50	0 to 30	0 to 50
2	Satisfactory	51 to 100	31 to 60	51 to 100
3	Moderately Polluted	101 to 200	61 to 90	101 to 250
4	Poor	201 to 300	91 to 120	251 to 350
5	Very Poor	301 to 400	121 to 250	351 to 430
6	Severe	401 to 500	250 +	430 +

2. Recommended Water Quality Standards:

No	Designated Best Use	Criteria
1	Drinking Water Source without conventional Treatment but after disinfection	pH between **6.5 to 7.4** Dissolved Oxygen **6 mg/l or more**
2	Drinking water source after conventional treatment and disinfection	pH between **6 to 9** Dissolved Oxygen **4 mg/l or more**
3	Outdoor Bathing (Organized)	pH between **6.5 to 7.4** Dissolved Oxygen **5 mg/l or more**
4	Controlled Waste Disposal	pH between **6 to 7.4**

3. Recommended Noise Level Standards:

No	Location	Noise Level dB
1	Auditoriums	20-25
2	Outdoor Playground	55
3	Occupied Class Room	40-45
4	Un occupied Class Room	35
5	Apartment, Homes	35-40
6	Offices	45-50
7	Libraries	35-40
8	Restaurants	50-55

4. Thermal Comfort Conditions: For Non-conditioned Buildings:

No	Parameter	Value
1	Temperature	Less Than 33^0C
2	Humidity	Less Than 70%

ENGRESS SERVICES PUNE

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL's
INSTITUTE OF COMPUTER & MANAGEMENT RESEARCH
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Phone: (020) 66998966 email: directoricmr@rediffmail.com

Policy document for Energy usage

DIRECTOR
RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S
INSTITUTE OF COMPUTER
& MANAGEMENT RESEARCH
Dudulgaon, Pune-412 105

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POLICY DOCUMENT FOR ENERGY USAGE

Rajmata Jijau Shikshan Prasarak Mandal's Institute of Computer and Management Research (RJSPM's ICMR) follows energy usage policy which is designed for systematic energy management to minimise its impact on the environment. The policy implies to identify alternative natural renewable energy resources to reduce the burden of cost as well as pollution and to find out answer to the impending energy crisis. The college believes in reducing the consumption of electricity produced by non-renewable resources by switching to renewable energy sources like solar energy for purpose of electricity requirement of the campus. We commit to install and use environment-friendly electrical appliances that help to save energy. The college uses power saving equipment's such as LED lighting, energy efficient equipment's and electronic appliances like CCTVs, Computers etc.

Natural renewable energy sources like solar energy have remarkably reduced the electricity bills of the campus to the negative side.

Policies:

- To install energy efficient energy lights LED's in entire campus, to lower energy consumption, decrease maintenance costs and to save the energy and expenses.
- To prefer regular use of energy efficient equipment's over conventional equipment's.
- To conduct regular energy audits and follow the instructions and advices given by auditing agency.
- RJSPM's Institute of Computer and Management Research has installed 3 phase solar rooftop power plant of capacity 10 KWP.

DIRECTOR
RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S
INSTITUTE OF COMPUTER
& MANAGEMENT RESEARCH
Dudulgaon, Pune-412 105

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Phone: (020) 66998966 email: directoricmr@rediffmail.com

- To reduce air pollution in college campus we promote use of bicycles, public transportation and pedestrian-friendly roadways and also we restrict entry of automobiles in college campus.
- To take more initiatives for continuous decrease in energy usage.
- To promote use of recent advanced technology to decrease energy consumption.
- To ensure the accessibility of required resources to accomplish our objectives.
- To actively work with the local organizations in the areas of energy efficiency as well as environment protection. These organizations include Government agencies, Municipal Corporation and affiliated University.
- To give information and guidance opportunities on energy conservation measures.
- To encourage and provide opportunities to employees and students to connect with initiatives for environmental protection.
- To promote promotional activities and knowledge or environment protection among our students by displaying boards and hoardings in the campus for energy conservation.
- To utilize daylight at its maximum extent and turn off unnecessary lights.

DIRECTOR
RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S
INSTITUTE OF COMPUTER
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Dudulgaon, Pune-412 105

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Energy audit

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL's
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Gat No. 101-102, Moshi Alandi Road, Dudulgaon, Pune- 412 105
Phone: (020) 66998966 email: directoricmr@rediffmail.com

Action taken report

After detailed green, environment and energy audits, the following recommendations were made by auditing agency and also the action taken by the institute is as follows,

Sr. No	Audit name and year	Recommendations	Action taken by institute
01	Energy audit report 2017-18 and Energy audit report 2018-19	Auditing agency recommended to install roof top solar system	Institute has installed 10 KWP roof top solar system

DIRECTOR
RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S
INSTITUTE OF COMPUTER
& MANAGEMENT RESEARCH
Dudulgaon, Pune-412 105.

ENERGY AUDIT REPORT

of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S
Educational Campus - Building B,
Dudulgaon, Pune 412 105

Year: 2017-18

Prepared by:

Enrich Consultants
Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: enrichcons@gmail.com

ENRICH CONSULTANTS Pune

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(A Government of Maharashtra undertaking)
2nd Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006
Ph No: 020-26614393/266144403, Fax No: 020-26615031
Email: econ@mahaurja.com , Web: www.mahaurja.com

ECN/2017-18/CR-01/5726 30th November 2017

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with ***MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)*** under given category as "Energy Planner & Energy Auditor in Maharashtra under Save Energy Programme of MEDA.

Name and Address of the firm	:	Enrich Consultants Yashashree, Plot No. 26,Nirmal Baug Society,Parvati, Pune - 411009.
Registration Category	:	Empanelled *Consultant for Save Energy Programme.*
Registration Number	:	***MEDA/ECN/CR-01/2017-18/EA-37***

- The Save Energy Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid upto **3 year** from the date of registration, to carry out energy audits under the Save Energy Programme of MEDA.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

30/11

(Smita Kudarikar)
Manager (EC)

ENRICH CONSULTANTS * Pune *

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: enrichcons@gmail.com

Ref: EC/RJSPMICMR/17-18/01 Date: 16/8/2018

CERTIFICATE

This is to certify that we have conducted Energy Audit at Rajmata Jijau Shikshan Prasarak Mandal's Educational Campus, Building-B, Dudulgaon, Pune in the year 2017-18.

The Institute has already adopted **Energy Efficient** practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient.

For Enrich Consultants,

ENRICH CONSULTANTS Pune

A Y Mehendale,
Certified Energy Auditor
EA-8192

INDEX

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of RJSPM's Educational Campus, Building-B, Dudulgaon, Pune for awarding us the assignment of Energy Audit of their Building-B, Dudulgaon Campus for the Year: 2017-18.

We are thankful to:

- Prof. Yashwant Lembhe, In Charge Director

We are also thankful to various Head of Departments & other Staff members for helping us during the field Study.

EXECUTIVE SUMMARY

After the Field Study & Analysis, we present herewith important observations made during the assignment of Energy Audit.

1. RJSPM's Educational Campus, Building-B, Dudulgaon, Pune consumes Energy in the form of Electrical Energy used for various gadgets, Office & other facilities.

2. Present Energy Consumption:

No	Parameter/ Value	Total Energy Consumed, kWh	CO_2 Emissions, MT
1	Total	18866	15.09
2	Maximum	4783	3.83
3	Minimum	200	0.16
4	Average	1572.17	1.26

3. Usage of Alternate Energy:

The Institute is in a process of installation of Roof Top Solar PV Plant of 10 kWp Capacity. As on today, the % of usage of Alternate Energy to Annual Energy Demand is zero percent.

4. Usage of LED Lighting:

The Total Annual Lighting Energy Demand is **5796 kWh**. The Lighting demand of LED Lighting is **168 kWh.** The % of total Annual Lighting Demand met by LED Lighting is **2.90 %.**

5. Assumptions:

1. 1 Unit of Electrical Energy releases **0.8 Kg** of CO_2 into atmosphere
2. Daily working hours-**7 Nos**
3. Annual working Days-**280 Nos**

ENRICH CONSULTANTS Pune

ABBREVIATIONS

LED	Light Emitting Diode
MSEDCL	Maharashtra State Electricity Distribution Company Ltd
kWp	Kilo Watt peak
kWh	kilo-Watt Hour
CO_2	Carbon Di Oxide
MT	Metric Ton
RJSPM	Rajmata Jijau Shikshan Prasarak Mandal
M B A	Master in Business Administration

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study the Connected Load
2. To study present level of Energy Consumption
3. To Study the present CO_2 emissions
4. To study Scope for usage of Renewable Energy
5. To study usage of LED Lighting.

1.3 General Details of Institute: Table No 1:

No	Head	Particulars
1	Name	RJSPM's Educational Campus, Building-B
2	Address	Dudulgaon, Pune 412 105
3	Affiliation	Savitribai Phule Pune University

CHAPTER-II
STUDY OF CONNECTED LOAD

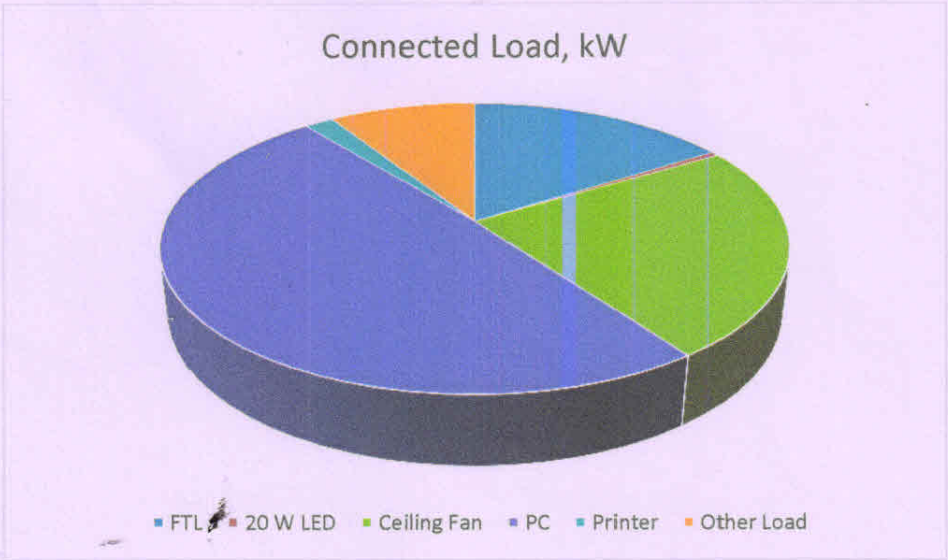
In this chapter, we present the details of various Electrical loads as under

2.1.1 Details of Overall Connected Load: Table No-2:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	FTL	67	40	2.68
2	20 W LED	4	20	0.08
3	Ceiling Fan	55	72	3.96
4	PC	55	150	8.25
5	Printer	2	150	0.3
6	Other Load	10	150	1.5
7	**Total**			**17**

We present the same in a PIE Chart as under:

Chart No-1: Details of Connected Load:



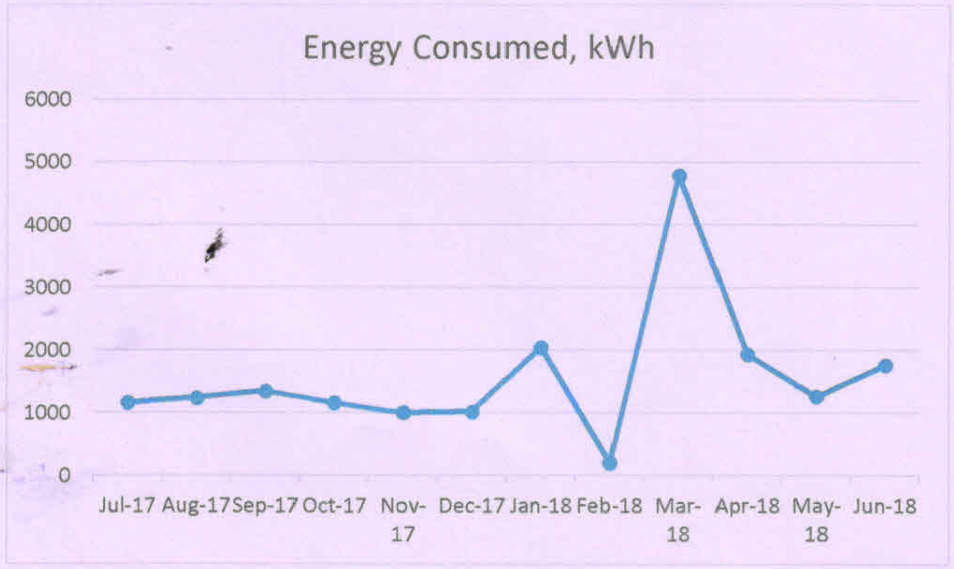
CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of last year Electricity Bills

Table No 3: Electrical Bill Analysis- 2017-18:

No	Month	Energy Consumed, kWh	CO2 Emissions, MT
1	Jul-17	1159	0.93
2	Aug-17	1231	0.98
3	Sep-17	1339	1.07
4	Oct-17	1157	0.93
5	Nov-17	998	0.80
6	Dec-17	1012	0.81
7	Jan-18	2042	1.63
8	Feb-18	200	0.16
9	Mar-18	4783	3.83
10	Apr-18	1931	1.54
11	May-18	1255	1.00
12	Jun-18	1759	1.41
13	Total	18866	15.09
14	Maximum	4783	3.83
15	Minimum	200	0.16
16	Average	1572.17	1.26

To study the variation of Monthly Energy Consumption: Chart No 2:



Key Inference drawn:

From the above analysis, we present following important parameters:

Table No 4: Various Important Parameters:

No	Parameter/ Value	Total Energy Consumed, kWh
1	Total	18866
2	Maximum	4783
3	Minimum	200
4	Average	1572.17

CHAPTER-IV
CARBON FOOTPRINTING

4.1 A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the Institute for performing its day to day activities

The Institute uses Electrical Energy for various Electrical gadgets.

4.2 Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to LPG & Electrical Energy are as under

- 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the Institute due to its Day to Day operations

4.3 Table No 5: Month wise CO_2 Emissions:

No	Month	Energy Consumed, kWh	CO2 Emissions, MT
1	Jul-17	1159	0.93
2	Aug-17	1231	0.98
3	Sep-17	1339	1.07
4	Oct-17	1157	0.93
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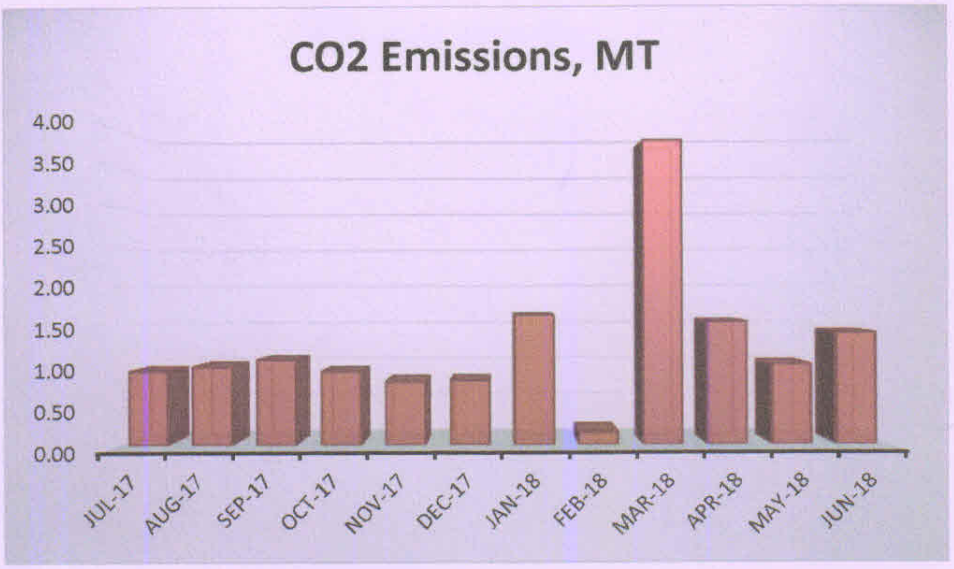
12	Jun-18	1759	1.41
13	Total	18866	15.09
14	Maximum	4783	3.83
15	Minimum	200	0.16
16	Average	1572.17	1.26

Representation of Month wise CO_2 emissions: Chart No 3:



CHAPTER-V
STUDY OF USAGE OF ALTERNATE ENERGY

RJSPM's Educational Campus, Building-B is in a process of installation of Roof Top Solar PV Plant.

Hence as on today, the percent of usage of Alternate Energy to Total Annual Load works out to be zero percent.

CHAPTER-VI
STUDY OF LED LIGHTING

In this Chapter, we present the usage of LED Lighting. In the following Table, we compute the percentage of usage of LED Lighting to Annual Lighting Power requirement.

Table No 6: Computation of % of Usage of LED Lighting to Annual Lighting Power Requirement:

No	Particulars	Value	Unit
1	Qty of 40 W FTL Lights	67	Nos
2	Energy requirement of FTL Fitting	40	W
3	Demand of 67 Nos FTL Fittings	2.68	kW
4	Qty of 20 W LED Lights	4	Nos
5	Energy requirement of 20 W LED Fitting	20	W
6	Demand of 4 Nos FTL Fittings	0.08	kW
7	Total Lighting Load	2.76	kW
8	Total LED Lighting Load	0.08	kW
9	Average Daily Usage Period	7	Hrs
10	Annul Working Days	300	Nos
11	Total Annual Lighting Requirement	**5796**	kWh
12	Annual LED Lighting Requirement	**168**	kWh
13	% of Usage of Annual Lighting Power met by Alternate Energy = (12) *100 /(11)	**2.90**	%

ENERGY AUDIT REPORT

of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S

Educational Campus, Building-B,

Dudulgaon, Pune 412 105

Year: 2018-19

Prepared by:

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,

Near Muktangan English School, Parvati, Pune 411009

Phone: 09890444795 Email: enrichcons@gmail.com

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(A Government of Maharashtra undertaking)
2nd Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006
Ph No: 020-26614393/266144403, Fax No: 020-26615031
Email: econ@mahaurja.com , Web: www.mahaurja.com

ECN/2017-18/CR-01/5726

30th November 2017

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with ***MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)*** under given category as "Energy Planner & Energy Auditor in Maharashtra under Save Energy Programme of MEDA.

Name and Address of the firm	:	Enrich Consultants Yashashree, Plot No. 26,Nirmal Baug Society,Parvati, Pune - 411009.
Registration Category	:	Empanelled *Consultant for Save Energy Programme.*
Registration Number	:	***MEDA/ECN/CR-01/2017-18/EA-37***

- The Save Energy Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid upto **3 year** from the date of registration, to carry out energy audits under the Save Energy Programme of MEDA.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

30/11

(Smita Kudarikar)
Manager (EC)

ENRICH CONSULTANTS * Pune *

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: enrichcons@gmail.com

Ref: EC/RJSPMICMR/18-19/01 Date: 13/8/2019

CERTIFICATE

This is to certify that we have conducted Energy Audit at Rajmata Jijau Shikshan Prasarak Mandal's Educational Campus, Building-B, Dudulgaon, Pune in the year 2018-19.

The Institute has already adopted **Energy Efficient** practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient.

For Enrich Consultants,

ENRICH CONSULTANTS Pune

A Y Mehendale,
Certified Energy Auditor
EA-8192

INDEX

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of RJSPM's Educational Campus, Building-B, Dudulgaon, Pune for awarding us the assignment of Energy Audit of their Building-B, Dudulgaon Campus for the Year: 2018-19.

We are thankful to:

- Prof. Yashwant Lembhe, In Charge Director

We are also thankful to various Head of Departments & other Staff members for helping us during the field Study.

EXECUTIVE SUMMARY

After the Field Study & Analysis, we present herewith important observations made during the assignment of Energy Audit.

1. RJSPM's Educational Campus, Building-B, Dudulgaon, Pune consumes Energy in the form of Electrical Energy used for various gadgets, Office & other facilities.

2. Present Energy Consumption:

No	Parameter/ Value	Total Energy Consumed, kWh	CO_2 Emissions, MT
1	Total	20626	16.50
2	Maximum	2108	1.69
3	Minimum	1478	1.18
4	Average	1718.83	1.38

3. Usage of Alternate Energy:

The Institute is in a process of installation of Roof Top Solar PV Plant of 10 kWp Capacity. As on today, the % of usage of Alternate Energy to Annual Energy Demand is zero percent.

4. Usage of LED Lighting:

The Total Annual Lighting Energy Demand is **5628 kWh**. The Lighting demand of LED Lighting is **840 kWh**. The % of total Annual Lighting Demand met by LED Lighting is **14.93 %.**

5. Assumptions:

1. 1 Unit of Electrical Energy releases **0.8 Kg** of CO_2 into atmosphere
2. Daily working hours-**7 Nos**
3. Annual working Days-**300 Nos**

ENRICH CONSULTANTS * Pune *

ABBREVIATIONS

LED	Light Emitting Diode
MSEDCL	Maharashtra State Electricity Distribution Company Ltd
kWp	Kilo Watt peak
kWh	kilo-Watt Hour
CO_2	Carbon Di Oxide
MT	Metric Ton
RJSPM	Rajmata Jijau Shikshan Prasarak Mandal
M B A	Master in Business Administration

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study the Connected Load
2. To study present level of Energy Consumption
3. To Study the present CO_2 emissions
4. To study Scope for usage of Renewable Energy
5. To study usage of LED Lighting.

1.3 General Details of Institute: Table No 1:

No	Head	Particulars
1	Name	RJSPM's Educational Campus, Building-B
2	Address	Dudulgaon, Pune 412 105
3	Affiliation	Savitribai Phule Pune University

CHAPTER-II
STUDY OF CONNECTED LOAD

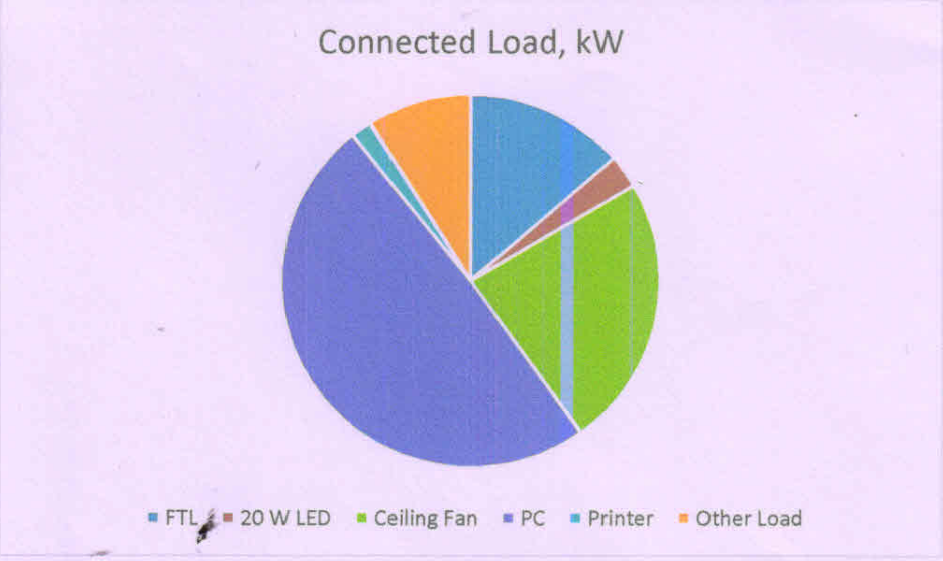
In this chapter, we present the details of various Electrical loads as under

2.1.1 Details of Connected Load: Table No-2:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	FTL	57	40	2.28
2	20 W LED	24	20	0.48
3	Ceiling Fan	55	72	3.96
4	PC	55	150	8.25
5	Printer	2	150	0.3
6	Other Load	10	150	1.5
7	**Total**			**17**

We present the same in a PIE Chart as under:

Chart No-1: Details of Connected Load:



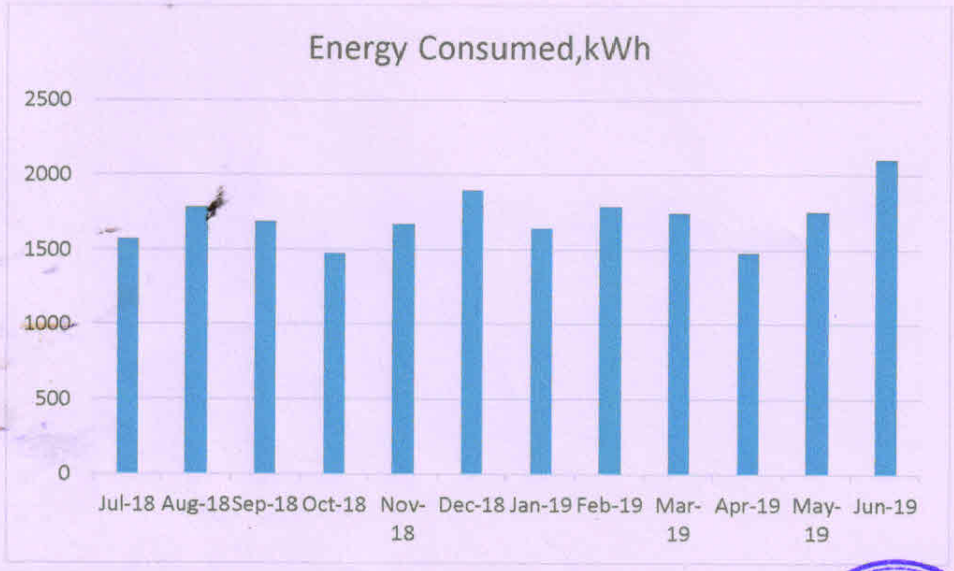
CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of last year Electricity Bills

Table No 3: Electrical Bill Analysis- 2018-19:

No	Month	Energy Consumed, kWh
1	Jul-18	1574
2	Aug-18	1785
3	Sep-18	1689
4	Oct-18	1478
5	Nov-18	1674
6	Dec-18	1896
7	Jan-19	1645
8	Feb-19	1789
9	Mar-19	1749
10	Apr-19	1483
11	May-19	1756
12	Jun-19	2108
13	Total	20626
14	Maximum	2108
15	Minimum	1478
16	Average	1718.83

To study the variation of Monthly Energy Consumption: Chart No 2:



Key Inference drawn:
From the above analysis, we present following important parameters:

Table No 4: Various Important Parameters:

No	Parameter/ Value	Total Energy Consumed, kWh
1	Total	20626
2	Maximum	2108
3	Minimum	1478
4	Average	1718.83

CHAPTER-IV
CARBON FOOTPRINTING

4.1 A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the Institute for performing its day to day activities

The Institute uses Electrical Energy for various Electrical gadgets.

4.2 Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to LPG & Electrical Energy are as under

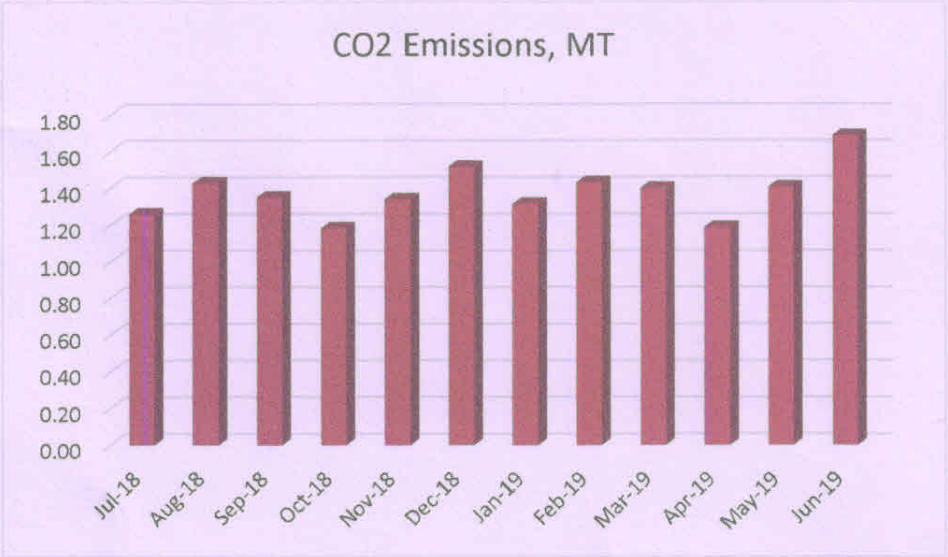
- 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the Institute due to its Day to Day operations

4.3 Table No 5: Month wise CO_2 Emissions:

No	Month	Energy Consumed, kWh	CO_2 Emissions, MT
1	Jul-18	1574	1.26
2	Aug-18	1785	1.43
3	Sep-18	1689	1.35
4	Oct-18	1478	1.18
5	Nov-18	1674	1.34
6	Dec-18	1896	1.52
7	Jan-19	1645	1.32
8	Feb-19	1789	1.43
9	Mar-19	1749	1.40
10	Apr-19	1483	1.19
11	May-19	1756	1.40
12	Jun-19	2108	1.69
13	Total	20626	16.50
14	Maximum	2108	1.69
15	Minimum	1478	1.18
16	Average	1718.83	1.38

Representation of Month wise CO_2 emissions: Chart No 3:



CHAPTER-V
STUDY OF USAGE OF ALTERNATE ENERGY

The Institute is in a process of installation of Roof Top Solar PV Plant. Therefore, as on Date, the percentage of usage of Alternate Energy to Annual Energy works out to be zero percent.

CHAPTER-VI
STUDY OF LED LIGHTING

In this Chapter, we present the usage of LED Lighting. In the following Table, we compute the percentage of usage of LED Lighting to Annual Lighting Power requirement.

Table No 6: Computation of % of Usage of LED Lighting to Annual Lighting Power Requirement:

No	Particulars	Value	Unit
1	Qty of 40 W FTL Lights	57	Nos
2	Energy requirement of FTL Fitting	40	W
3	Demand of 57 Nos FTL Fittings	2.28	kW
4	Qty of 20 W LED Lights	20	Nos
5	Energy requirement of 20 W LED Fitting	20	W
6	Demand of 20 Nos FTL Fittings	0.4	kW
7	Total Lighting Load	2.68	kW
8	Total LED Lighting Load	0.4	kW
9	Average Daily Usage Period	7	Hrs
10	Annul Working Days	300	Nos
11	Annual Total Lighting Requirement	**5628**	kWh
12	Annual LED Lighting Requirement	**840**	kWh
13	% of Usage of Annual Lighting Power met by Alternate Energy = (11) *100 /(10)	**14.93**	**%**

ENERGY AUDIT REPORT

of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S

Educational Campus, Building-B, Dudulgaon, Pune 412 105

Year: 2019-20

Prepared by:

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
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Phone: 09890444795 Email: enrichcons@gmail.com

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

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ECN/2017-18/CR-01/5726 30th November 2017

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

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30/11

(Smita Kudarikar)
Manager (EC)

ENRICH CONSULTANTS * Pune *

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
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Ref: EC/RJSPMICMR/19-20/01 Date: 30/8/2020

CERTIFICATE

This is to certify that we have conducted Energy Audit at Rajmata Jijau Shikshan Prasarak Mandal's Educational Campus, Building-B, Dudulgaon, Pune in the year 2019-20.

The College has already adopted **Energy Efficient** practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of **10 kWp** Roof Top Solar PV Plant.

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient.

For Enrich Consultants,

ENRICH CONSULTANTS * Pune *

A Y Mehendale,
Certified Energy Auditor
EA-8192

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ACKNOWLEDGEMENT

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We are thankful to:

- Prof. Yashwant Lembhe, In Charge Director

We are also thankful to various Head of Departments & other Staff members for helping us during the field Study.

EXECUTIVE SUMMARY

After the Field Study & Analysis, we present herewith important observations made during the assignment of Energy Audit.

1. RJSPM's Educational Campus, Building-B, Dudulgaon, Pune consumes Energy in the form of Electrical Energy used for various gadgets, Office & other facilities.

2. Present Energy Consumption:

No	Parameter/ Value	Total Energy Consumed, kWh	CO_2 Emissions, MT
1	Total	29104	23.28
2	Maximum	5238	4.19
3	Minimum	1208	0.97
4	Average	2425.33	1.94

3. Usage of Alternate Energy:

The Institute has installed **10 kWp** Roof Top Solar PV Plant. The percentage of usage of Alternate Energy to Annual Energy Demand works out to be **17.09 %.**

4. Usage of LED Lighting:

The Total Annual Lighting Energy Demand is **3469.2 kWh.** The Lighting demand of LED Lighting is **705.6 kWh.** The % of total Annual Lighting Demand met by LED Lighting is **20.34 %.**

5. Assumptions:

1. 1 Unit of Electrical Energy releases **0.8 Kg** of CO_2 into atmosphere
2. Daily working hours-**6 Nos**
3. Annual working Days-**210 Nos**
4. Solar Generation Days- **150 Nos.** (Plant installed in January-2020)

ABBREVIATIONS

LED	Light Emitting Diode
MSEDCL	Maharashtra State Electricity Distribution Company Ltd
kWp	Kilo Watt peak
kWh	kilo-Watt Hour
CO_2	Carbon Di Oxide
MT	Metric Ton
RJSPM	Rajmata Jijau Shikshan Prasarak Mandal
M B A	Master in Business Administration

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study the Connected Load
2. To study present level of Energy Consumption
3. To Study the present CO_2 emissions
4. To study Scope for usage of Renewable Energy
5. To study usage of LED Lighting.

1.3 General Details of Institute: Table No 1:

No	Head	Particulars
1	Name	RJSPM's Educational Campus, Building-B
2	Address	Dudulgaon, Pune 412 105
3	Affiliation	Savitribai Phule Pune University

CHAPTER-II
STUDY OF CONNECTED LOAD

In this chapter, we present the details of various Electrical loads as under

2.1.1 Details of Tube Light Fittings & Fans at various locations: Table No-2:

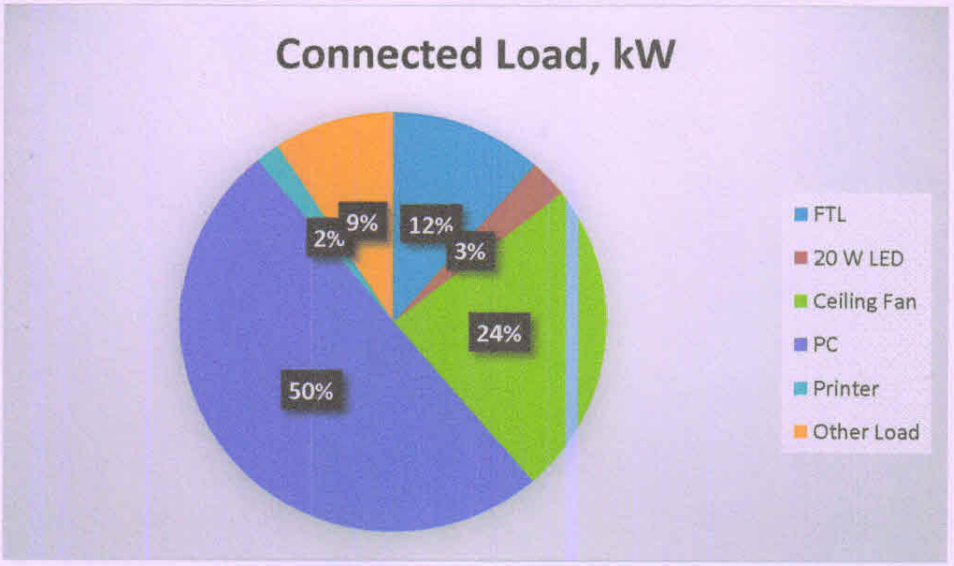
No	Location	FTL	20 W LED	Ceiling Fan	PC	Printer
	Ground Floor					
1	Reading Room	4	2	5		
2	Tutorial Room	4		2		
3	Class Room	3	3	4		
4	Class Room		6	5		
5	Class Room		6	7		
6	Computer Lab	11	1	11	50	2
7	Store Room	2		1		
8	Admin Office	11	3	13	5	
	First Floor					
1	Seminar Hall	12	3	7		
	Total	**47**	**24**	**55**	**55**	**2**

2.1.2 Details of Overall Connected Load: Table No 3:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	FTL	47	40	1.88
2	20 W LED	24	20	0.48
3	Ceiling Fan	55	72	3.96
4	PC	55	150	8.25
5	Printer	2	150	0.3
6	Other Load	10	150	1.5
7	**Total**			**16.37**

We present the same in a PIE Chart as under:

Chart No-1: Details of Connected Load:



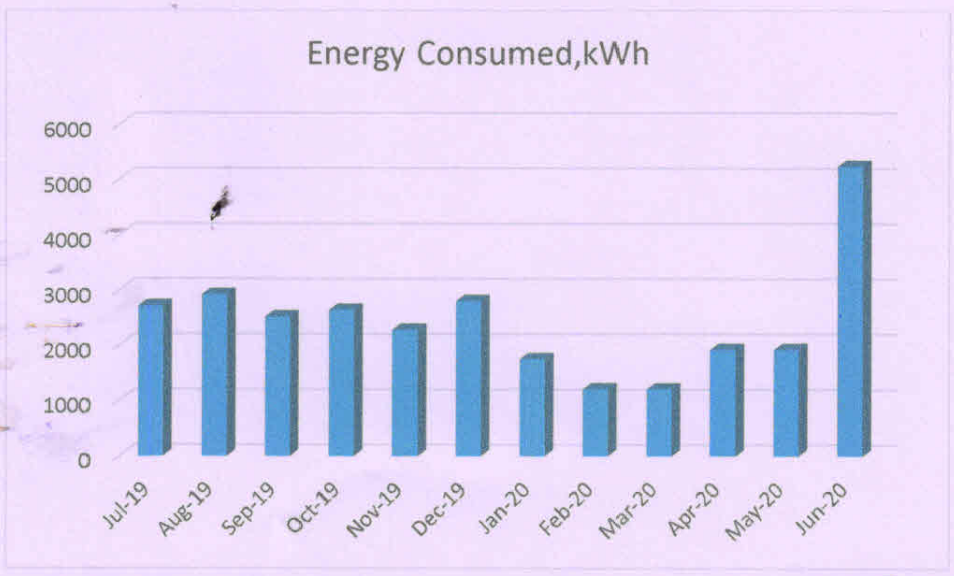
CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of last year Electricity Bills

Table No 4: Electrical Bill Analysis- 2019-20:

No	Month	Energy Consumed, kWh
1	Jul-19	2714
2	Aug-19	2915
3	Sep-19	2514
4	Oct-19	2639
5	Nov-19	2280
6	Dec-19	2801
7	Jan-20	1749
8	Feb-20	1208
9	Mar-20	1208
10	Apr-20	1919
11	May-20	1919
12	Jun-20	5238
13	Total	29104
14	Maximum	5238
15	Minimum	1208
16	Average	2425.33

To study the variation of Monthly Energy Consumption: Chart No 2:



ENRICH CONSULTANTS * Pune *

Key Inference drawn:
From the above analysis, we present following important parameters:

Table No 5: Various Important Parameters:

No	Parameter/ Value	Total Energy Consumed, kWh
1	Total	29104
2	Maximum	5238
3	Minimum	1208
4	Average	2425.33

CHAPTER-IV
CARBON FOOTPRINTING

4.1 A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the College for performing its day to day activities

The College uses Electrical Energy for various Electrical gadgets.

4.2 Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to LPG & Electrical Energy are as under

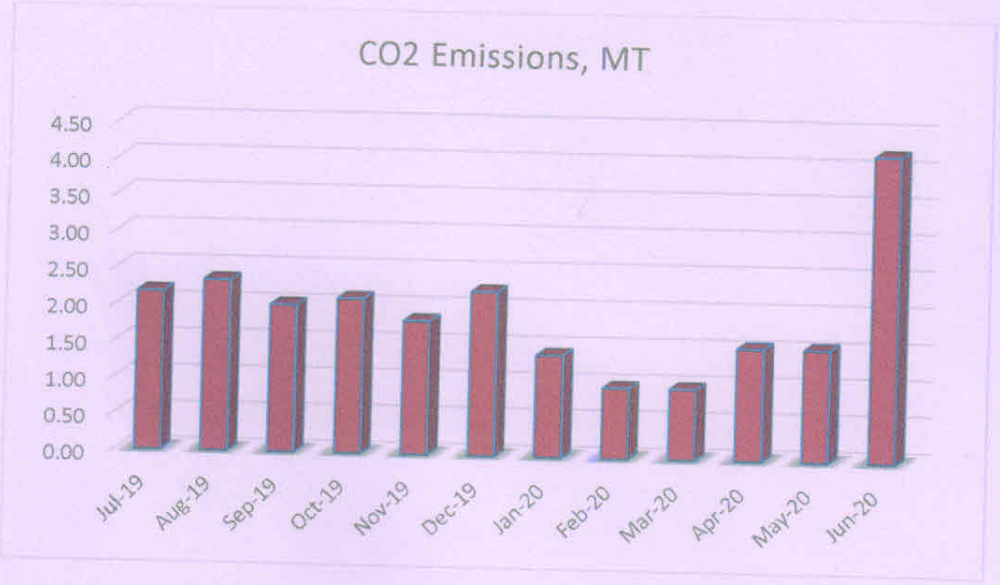
- 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the College due to its Day to Day operations

4.3 Table No 6: Month wise CO_2 Emissions:

No	Month	Energy Consumed, kWh	CO_2 Emissions, MT
1	Jul-19	2714	2.17
2	Aug-19	2915	2.33
3	Sep-19	2514	2.01
4	Oct-19	2639	2.11
5	Nov-19	2280	1.82
6	Dec-19	2801	2.24
7	Jan-20	1749	1.40
8	Feb-20	1208	0.97
9	Mar-20	1208	0.97
10	Apr-20	1919	1.54
11	May-20	1919	1.54
12	Jun-20	5238	4.19
13	Total	29104	23.28
14	Maximum	5238	4.19
15	Minimum	1208	0.97
16	Average	2425.33	1.94

Representation of Month wise CO_2 emissions: Chart No 3:



CHAPTER-V
STUDY OF USAGE OF ALTERNATE ENERGY

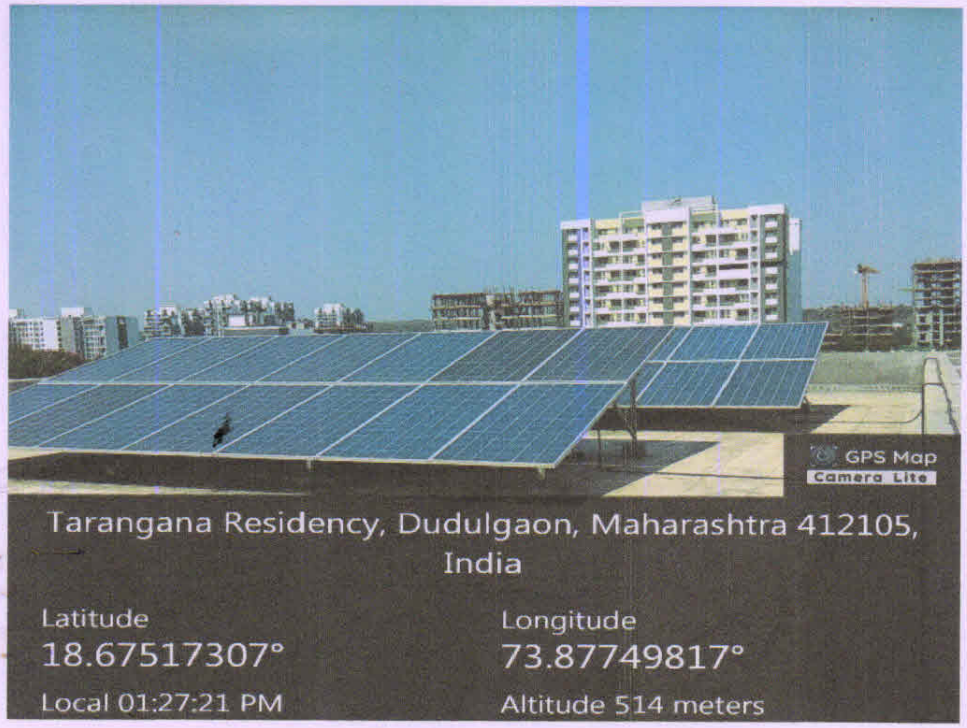
The Institute has installed Roof Top **10 kWp** Roof Top Solar PV Plant.

In the following Table, we compute the Annual Energy requirement met by Alternate Energy.

Computation of % Usage of Alternate Energy to Annual Energy Demand: Table No 7:

No	Parameter	Value	Unit
1	Energy Purchased from MSEDCL	**29104**	kWh/Annum
2	Installed Solar PV Capacity	10	kWp
3	Average Daily Energy Generated	4	kWh/kWp
4	Annual Working Days	150	Nos
5	Annual Energy Generated	6000	kWh/Annum
6	Annual Total Energy Requirement = (1) + (5)	**35104**	kWh/Annum
7	% of Annual Energy Requirement met by Solar PV = (5) * 100 / (6)	**17.09**	%

Photograph of 10 kWp Roof Top Solar PV Plant:



CHAPTER-VI
STUDY OF LED LIGHTING

In this Chapter, we present the usage of LED Lighting. In the following Table, we compute the percentage of usage of LED Lighting to Annual Lighting Power requirement.

Table No 8: Computation of % of Usage of LED Lighting to Annual Lighting Power Requirement:

No	Particulars	Value	Unit
1	Qty of 40 W FTL Lights	47	Nos
2	Energy requirement of FTL Fitting	40	W
3	Demand of 47 Nos FTL Fittings	1.88	kW
4	Qty of 20 W LED Lights	24	Nos
5	Energy requirement of 20 W LED Fitting	20	W
6	Demand of 24 Nos FTL Fittings	0.48	kW
7	Total Lighting Load	2.36	kW
8	Total LED Lighting Load	0.48	kW
9	Average Daily Usage Period	7	Hrs
10	Annul Working Days	210	Nos
11	Annual Total Lighting Requirement	**3469.2**	kWh
12	Annual LED Lighting Requirement	**705.6**	kWh
13	% of Usage of Annual Lighting Power met by Alternate Energy = (11) *100 /(10)	**20.34**	**%**

ENERGY AUDIT REPORT

of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S

Educational Campus, Building-B, Dudulgaon

Year: 2021-22

Prepared by:

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795, Email: engress123@gmail.com

ENGRESS SERVICES PUNE

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary,
Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
Email: eee@mahaurja.com, Web: www.mahaurja.com

ECN/2022-23/CR-43/1709 — 10th May, 2022

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with ***MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)*** under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm : M/s Engress Services
Yashshree, 26, Nirmal Bag Society,
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- This empanelment is valid till **09th May, 2024** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

ENGRESS SERVICES PUNE

ENGRESS SERVICES

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Ref: ES/RJSPMICMR/21-22/01 Date: 11/5/2022

CERTIFICATE

This is to certify that we have conducted Energy Audit at Rajmata Jijau Shikshan Prasarak Mandal's Educational Campus, Building-B, Dudulgaon, Pune in the year 2021-22.

The Institute has adopted Energy Efficient practices:

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting
- Installation of 10 kWp Roof Top Solar PV Plant.

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient.

For Engress Services,

A Y Mehendale,
Certified Energy Auditor
EA-8192

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ENGRESS SERVICES PUNE

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of RJSPM's Educational Campus, Building-B, Dudulgaon, Pune for awarding us the assignment of Energy Audit of their Building-B, Dudulgaon Campus for the Year: 2021-22.

We are thankful to all Staff members for helping us during the field Study.

EXECUTIVE SUMMARY

1. RJSPM's Educational Campus, Building-B, Dudulgaon, Pune consumes Energy in the form of Electrical Energy; used for various gadgets, Office & other facilities.

2. Present Energy Consumption & CO_2 Emission:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	18567	16.71
2	Maximum	13382	12.04
3	Minimum	0	0.00
4	Average	1547.25	1.39

3. Usage of Alternate Energy:

- The Institute has installed a Roof Top Solar PV Plant of Capacity **10 kWp**.
- The Energy purchased from MSEDCL is **18567 kWh.**
- The Energy Generated by Roof Top Solar PV Plant in 21-22 is **12000 kWh.**
- The Total Energy Requirement is **30567 kWh.**
- The percentage of usage of Alternate Energy to Annual Energy Demand is **39 %.**

4. Usage of LED Lighting:

- The Total Lighting Load is **2.36 kW**
- The LED Lighting Load is **0.48 kW**
- The % of total Annual Lighting Demand met by LED Lighting is **20.34%.**

5. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2into atmosphere
2. Average Energy generated by **1 kWp** Solar PV Plant : **4 kWh/Day**
3. Annual Solar Energy Generation Days: **300 Nos**

6. References:

- For CO_2 Emissions: www.tatapower.com
- For Roof Top Solar Energy generation: www.solarrooftop.gov.in

ENGRESS SERVICES PUNE

ABBREVIATIONS

LED	Light Emitting Diode
MSEDCL	Maharashtra State Electricity Distribution Company Ltd
kWp	Kilo Watt peak
kWh	kilo-Watt Hour
CO_2	Carbon Di Oxide
MT	Metric Ton
RJSPM	Rajmata Jijau Shikshan Prasarak Mandal
M B A	Master in Business Administration

CHAPTER-I
INTRODUCTION

Objectives:

1. To study the Connected Load
2. To study present level of Energy Consumption
3. To Study the present CO_2 emissions
4. To study Scope for usage of Renewable Energy
5. To study usage of LED Lighting.

Table No 1: General Details of Institute:

No	Head	Particulars
1	Name	RJSPM's Educational Campus, Building-B
2	Address	Dudulgaon, Pune 412 105
3	Affiliation	Savitribai Phule Pune University

CHAPTER-II
STUDY OF CONNECTED LOAD

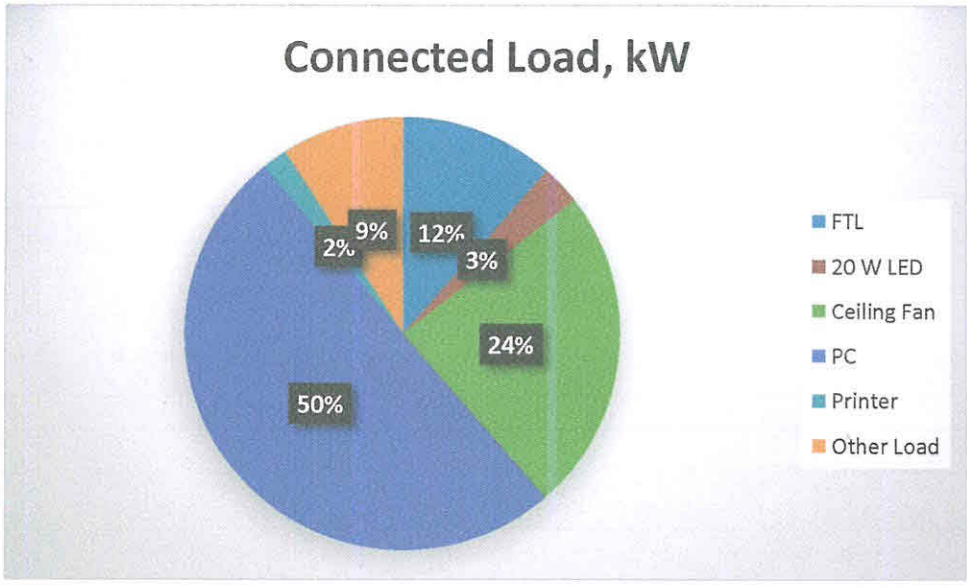
In this chapter, we present the details of various Electrical loads as under

Table No-2: Details of Overall Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	FTL	47	40	1.88
2	20 W LED	24	20	0.48
3	Ceiling Fan	55	72	3.96
4	PC	55	150	8.25
5	Printer	2	150	0.3
6	Other Load	10	150	1.5
7	**Total**			**16.37**

We present the same in a PIE Chart as under:

Chart No-1: Details of Connected Load:



CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of last year Electricity Bills

Table No 3: Electrical Bill Analysis- 2021-22:

No	Month	Energy Purchased, kWh
1	Feb-21	962
2	Mar-21	983
3	Apr-21	1090
4	May-21	1194
5	Jun-21	956
6	Jul-21	13382
7	Aug-21	0
8	Sep-21	0
9	Oct-21	0
10	Nov-21	0
11	Dec-21	0
12	Jan-22	0
13	Total	18567
14	Maximum	13382
15	Minimum	0
16	Average	1547.25

Chart No 2: To study the variation of Monthly Energy Consumption:

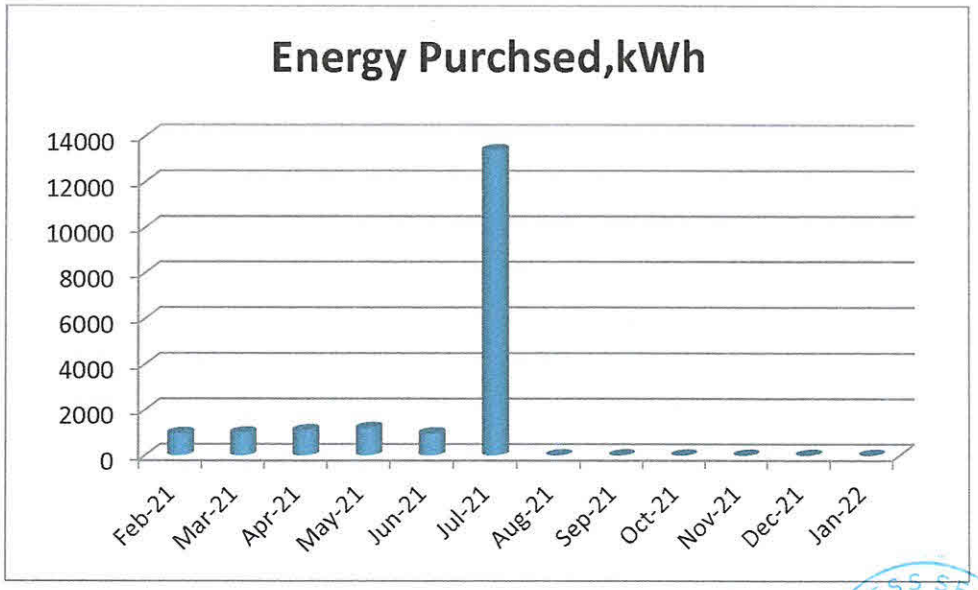


Table No 4: Various Important Parameters:

No	Parameter/ Value	Total Energy Consumed, kWh
1	Total	18567
2	Maximum	13382
3	Minimum	0
4	Average	1547.25

CHAPTER-IV
CARBON FOOT PRINTING

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the Institute for performing its day to day activities

The Institute uses Electrical Energy for various Electrical gadgets.

4.2 Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy are as under

- 1 Unit (kWh) of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the Institute due to its Day to Day operations

Table No 5: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Feb-21	962	0.87
2	Mar-21	983	0.88
3	Apr-21	1090	0.98
4	May-21	1194	1.07
5	Jun-21	956	0.86
6	Jul-21	13382	12.04
7	Aug-21	0	0.00
8	Sep-21	0	0.00
9	Oct-21	0	0.00
10	Nov-21	0	0.00
11	Dec-21	0	0.00
12	Jan-22	0	0.00
13	Total	18567	16.71
14	Maximum	13382	12.04
15	Minimum	0	0.00
16	Average	1547.25	1.39

Chart No 3: Representation of Month wise CO_2 Emissions:

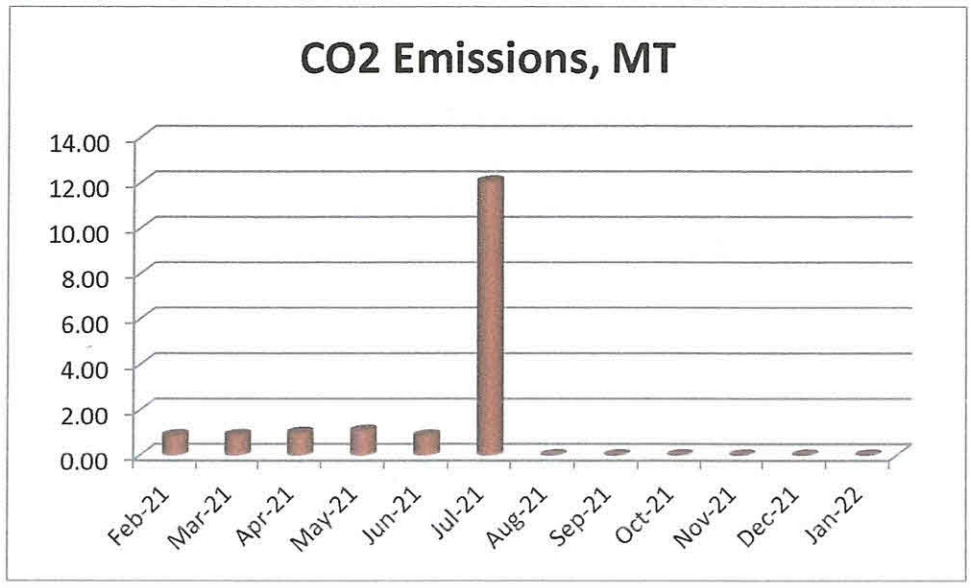


Table No 6: Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	18567	16.71
2	Maximum	13382	12.04
3	Minimum	0	0.00
4	Average	1547.25	1.39

CHAPTER-V
STUDY OF USAGE OF ALTERNATE ENERGY

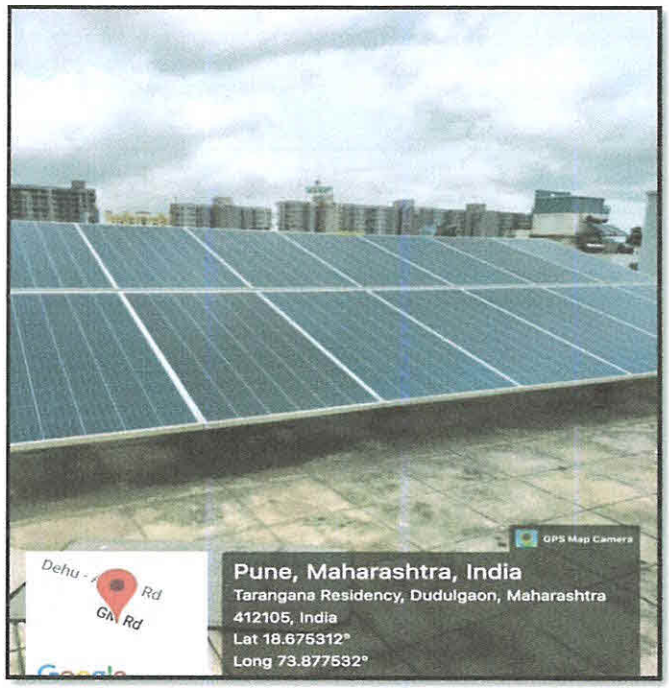
The Institute has installed Roof Top **10 kWp** Roof Top Solar PV Plant.

In the following Table, we compute the Annual Energy requirement met by Alternate Energy.

Table No 7: Computation of % Usage of Alternate Energy to Annual Energy Demand:

No	Parameter	Value	Unit
1	Energy Purchased from MSEDCL	**18567**	kWh/Annum
2	Installed Solar PV Capacity	10	kWp
3	Average Daily Energy Generated	4	kWh/kWp
4	Annual Working Days	300	Nos
5	Annual Energy Generated	12000	kWh/Annum
6	Annual Total Energy Requirement = (1) + (5)	**30567**	kWh/Annum
7	% of Annual Energy Requirement met by Solar PV = (5) * 100 / (6)	**39.25**	%

Photograph of 10 kWp Roof Top Solar PV Plant:



ENGRESS SERVICES PUNE

CHAPTER-VI
STUDY OF LED LIGHTING

In this Chapter, we present the usage of LED Lighting.

In the following Table, we compute the percentage of usage of LED Lighting to Total Lighting Load.

Table No 8: Computation of % of Usage of LED Lighting to Total Lighting Load:

No	Particulars	Value	Unit
1	Qty of 40 W FTL Lights	47	Nos
2	Energy requirement of FTL Fitting	40	W
3	Demand of 47 Nos FTL Fittings	**1.88**	kW
4	Qty of 20 W LED Lights	24	Nos
5	Energy requirement of 20 W LED Fitting	20	W
6	Demand of 24 Nos LED Fittings	**0.48**	kW
7	Total Lighting Load **= 3+6**	**2.36**	kW
8	Total LED Lighting Load **=6**	**0.48**	kW
9	% of Usage of LEDs to Total Lighting Load = **(8)*100/(7)**	**20.34**	**%**

ENERGY AUDIT REPORT

of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S

Educational Campus, Building-B,Dudulgaon, Pune 412 105

Year: 2022-23

Prepared by:

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795, Email: engress123@gmail.com

ENGRESS SERVICES
PUNE

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency

(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary,
Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
Email: eee@mahaurja.com, Web: www.mahaurja.com

ECN/2022-23/CR-43/1709 — 10th May, 2022

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with ***MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)*** under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm : M/s Engress Services
Yashshree, 26, Nirmal Bag Society,
Near Muktangan English School,
Parvati, Pune – 411 009.

Registration Category : *Empanelled Consultant for Energy Conservation Programme for Class 'A'*

Registration Number : ***MEDA/ECN/2022-23/Class A/EA-32.***

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **09th May, 2024** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

ENGRESS SERVICES PUNE

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: engress123@gmail.com

Ref: ES/RJSPMICMR/22-23/01 Date: 28/2/2023

CERTIFICATE

This is to certify that we have conducted Energy Audit at Rajmata Jijau Shikshan Prasarak Mandal's Educational Campus, Building-B, Dudulgaon, Pune in the year 2022-23.

The College has adopted Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 10 kWp Roof Top Solar PV Plant.

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient.

For Engress Services,

A Y Mehendale,
Certified Energy Auditor
EA-8192

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ENGRESS SERVICES PUNE

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We at Engress Services, Pune, express our sincere gratitude to the management of RJSPM's Educational Campus, Building-B, Dudulgaon, Pune for awarding us the assignment of Energy Audit of their Building-B, Dudulgaon Campus for the Year: 2022-23.

We are thankful to all staff members for helping us during the field Study.

ENGRESS SERVICES PUNE

EXECUTIVE SUMMARY

1. RJSPM's Educational Campus, Building-B, Dudulgaon, Pune consumes Energy in the form of Electrical Energy; used for various gadgets, Office & other facilities.

2. Present Energy Consumption:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	7810	7.03
2	Maximum	2956	2.66
3	Minimum	0	0.00
4	Average	650.83	0.59

3. Usage of Alternate Energy:

- The Institute has installed a Roof Top Solar PV Plant of Capacity **10 kWp**.
- The Energy purchased from MSEDCL is **7810 kWh.**
- The Energy Generated by Roof Top Solar PV Plant in 22-23 is **12000 kWh.**
- The Total Energy Requirement is **19810 kWh.**
- The percentage of usage of Alternate Energy to Annual Energy Demand is **61 %.**

4. Usage of LED Lighting:

- The Total Lighting Load is **2.16 kW**
- The LED Lighting Load is **0.68 kW**
- The % of total Annual Lighting Demand met by LED Lighting is **31.48 %.**

5. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2into atmosphere
2. Average Energy generated by **1 kWp** Solar PV Plant : **4 kWh/Day**
3. Annual Solar Energy Generation Days: **300 Nos**

6. References:

- For CO_2 Emissions: www.tatapower.com
- For Roof Top Solar Energy generation: www.solarrooftop.gov.in

ABBREVIATIONS

LED	Light Emitting Diode
MSEDCL	Maharashtra State Electricity Distribution Company Ltd
kWp	Kilo Watt peak
kWh	kilo-Watt Hour
CO_2	Carbon Di Oxide
MT	Metric Ton
RJSPM	Rajmata Jijau Shikshan Prasarak Mandal
M B A	Master in Business Administration

CHAPTER-I
INTRODUCTION

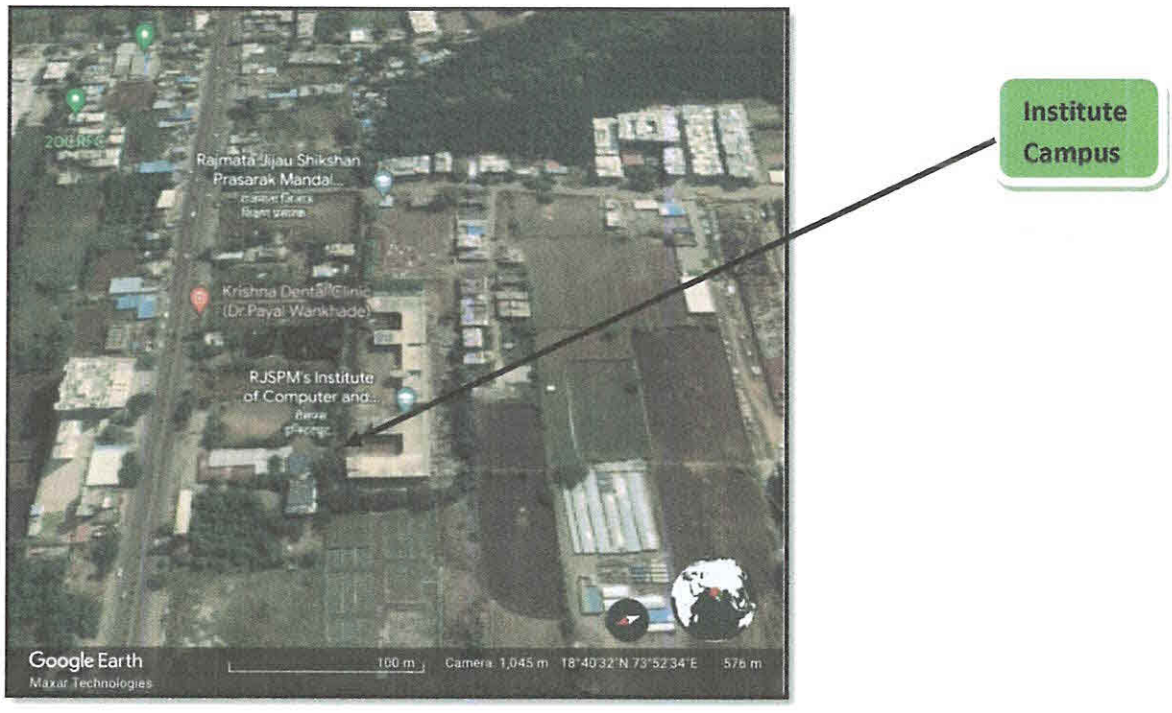
1.1 Objectives:

1. To study the Connected Load
2. To study present level of Energy Consumption
3. To Study the present CO_2 emissions
4. To study Scope for usage of Renewable Energy
5. To study usage of LED Lighting.

1.3 General Details of Institute: Table No 1:

No	Head	Particulars
1	Name	RJSPM's Educational Campus, Building-B
2	Address	Dudulgaon, Pune 412 105
3	Affiliation	Savitribai Phule Pune University

1.3 Google Earth Image:



CHAPTER-II
STUDY OF CONNECTED LOAD

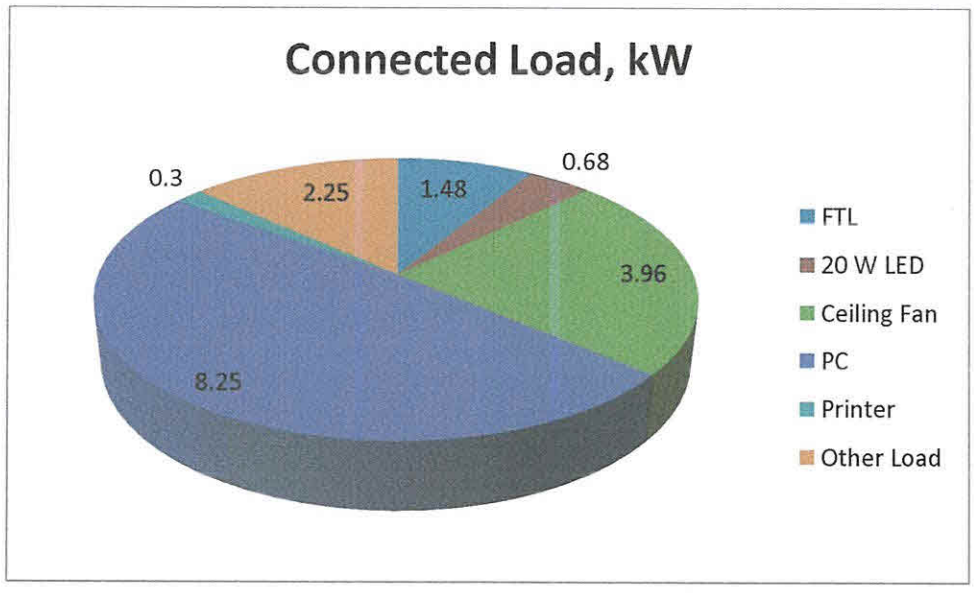
In this chapter, we present the details of various Electrical loads as under

Table No-2: Details of Overall Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	FTL	37	40	1.48
2	20 W LED	34	20	0.68
3	Ceiling Fan	55	72	3.96
4	PC	55	150	8.25
5	Printer	2	150	0.3
6	Other Load	15	150	2.25
7	**Total**			**17**

We present the same in a PIE Chart as under:

Chart No-1: Details of Connected Load:



CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of last year Electricity Bills

Table No 3: Electrical Bill Analysis- 2022-23:

No	Month	Energy Purchased, kWh
1	Feb-22	0
2	Mar-22	0
3	Apr-22	0
4	May-22	0
5	Jun-22	0
6	Jul-22	0
7	Aug-22	0
8	Sep-22	75
9	Oct-22	1590
10	Nov-22	1175
11	Dec-22	2014
12	Jan-23	2956
13	Total	7810
14	Maximum	2956
15	Minimum	0
16	Average	650.83

Chart No 2: To study the variation of Monthly Energy Consumption:

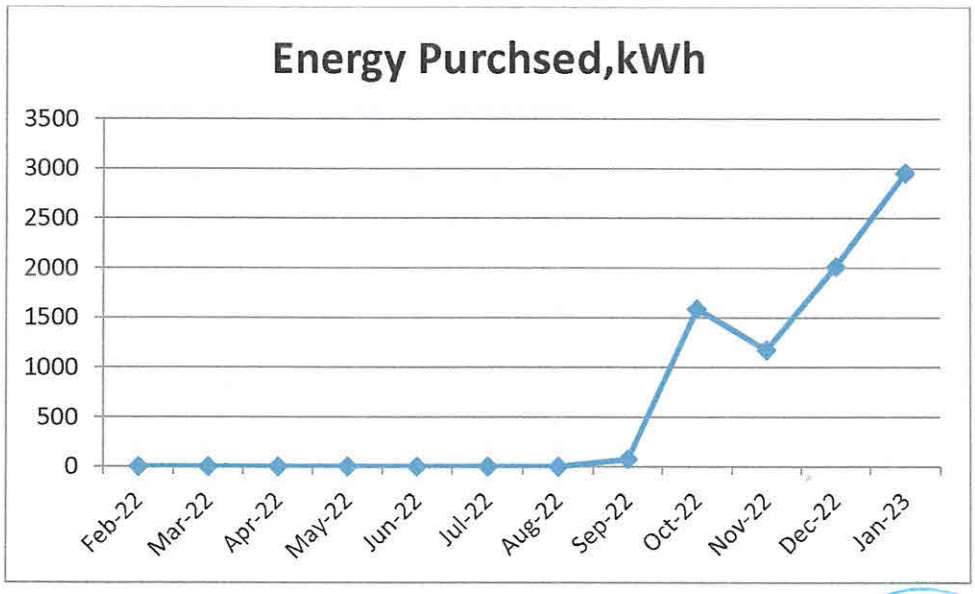


Table No 4: Various Important Parameters:

No	Parameter/ Value	Total Energy Consumed, kWh
1	Total	7810
2	Maximum	2956
3	Minimum	0
4	Average	650.83

CHAPTER-IV
CARBON FOOT PRINTING

4.1 A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the College for performing its day to day activities

The College uses Electrical Energy for various Electrical gadgets.

4.2 Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy are as under

- 1 Unit (kWh) of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the College due to its Day to Day operations

4.3 Table No5: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Feb-22	0	0
2	Mar-22	0	0
3	Apr-22	0	0
4	May-22	0	0
5	Jun-22	0	0
6	Jul-22	0	0
7	Aug-22	0	0
8	Sep-22	75	0.07
9	Oct-22	1590	1.43
10	Nov-22	1175	1.06
11	Dec-22	2014	1.81
12	Jan-23	2956	2.66
13	Total	7810	7.03
14	Maximum	2956	2.66
15	Minimum	0	0.00
16	Average	650.83	0.59

Chart No 3: Representation of Month wise CO_2 emissions:

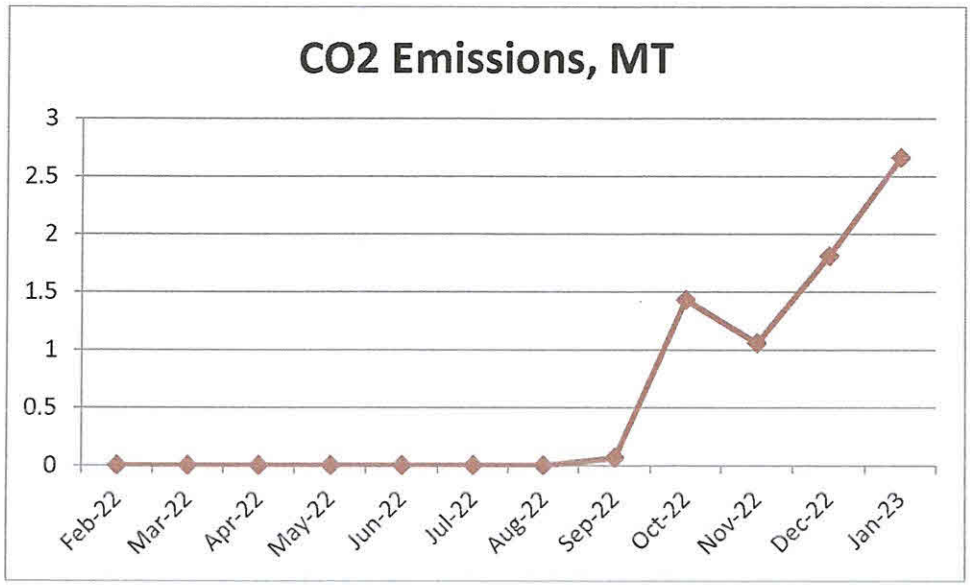


Table No 6: Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	7810	7.03
2	Maximum	2956	2.66
3	Minimum	0	0.00
4	Average	650.83	0.59

CHAPTER-V
STUDY OF USAGE OF ALTERNATE ENERGY

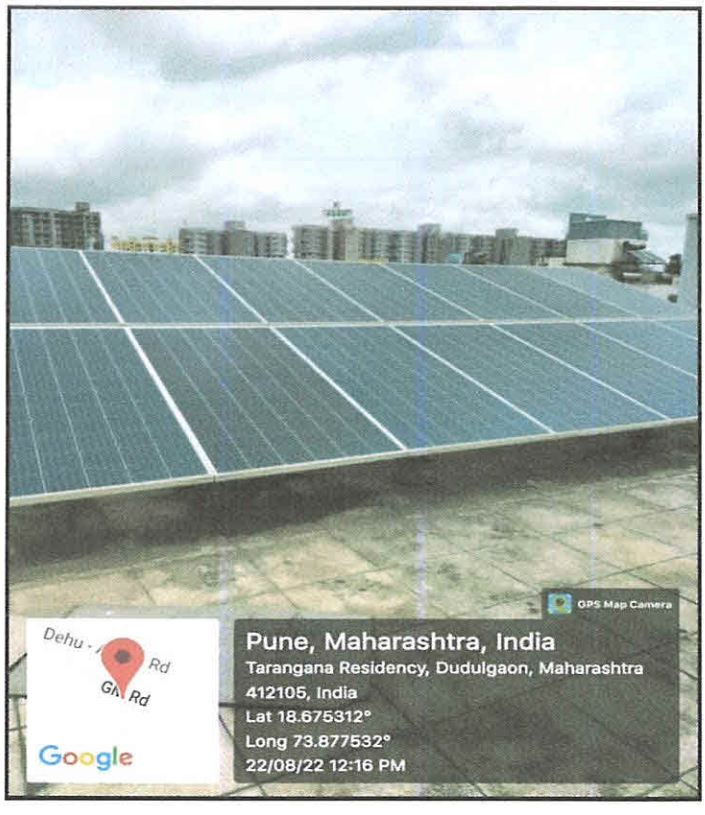
The Institute has installed Roof Top **10 kWp** Roof Top Solar PV Plant.

In the following Table, we compute the Annual Energy requirement met by Alternate Energy.

Computation of % Usage of Alternate Energy to Annual Energy Demand: Table No 7:

No	Parameter	Value	Unit
1	Energy Purchased from MSEDCL	**7810**	kWh/Annum
2	Installed Solar PV Capacity	10	kWp
3	Average Daily Energy Generated	4	kWh/kWp
4	Annual Working Days	300	Nos
5	Annual Energy Generated	**12000**	kWh/Annum
6	Annual Total Energy Requirement = **(1) + (5)**	**19810**	kWh/Annum
7	% of Annual Energy Requirement met by Solar PV = **(5)*100/(6)**	**61**	**%**

Photograph of 10 kWp Roof Top Solar PV Plant:



CHAPTER-VI
STUDY OF LED LIGHTING

In this Chapter, we present the usage of LED Lighting.

We compute the percentage of usage of LED Lighting to Total Lighting Load.

Table No 8: Computation of % of Usage of LED Lighting to Total Lighting Load:

No	Particulars	Value	Unit
1	Qty of 40 W FTL Lights	37	Nos
2	Energy requirement of FTL Fitting	40	W
3	Demand of 47 Nos FTL Fittings	**1.48**	kW
4	Qty of 20 W LED Lights	34	Nos
5	Energy requirement of 20 W LED Fitting	20	W
6	Demand of 24 Nos FTL Fittings	**0.68**	kW
7	Total Lighting Load = **3+6**	**2.16**	kW
8	Total LED Lighting Load =**6**	**0.68**	kW
9	% of Usage of LEDs to Total Lighting Load= **(8) *100 /(7)**	**31.48**	%

Report

on

Electrical Safety & Power Quality Audit

At

Rajmata Jijau Shikshan Prasarak Mandal

MBA Collage, Dudhalgaon, Dist. Pune

Submmited to

Management of Rajmata College, Dudhalgaon

Date

28/06/2021

TRUE COPY

DIRECTOR

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S
Institute of Computer & Management Research
Dudulgaon, Alandi, Pune-412 105.

SPARK ENERGY SOLUTION
Mob.
9922880897
9423038879
Laxmi Karanja, Ahmednagar

Prepared By

Spark Energy Solution

Opp. BJP Office, Laxmi Karanja, Ahmednagar - 414001
Phone No- 9922880897 / 9423038879 Email :-spark.auditors@gmail.com

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency

(A Government of Maharashtra undertaking)
2nd Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006
Ph No: 020-26614393/26614403
Email: eec@mahaurja.com, Web: www.mahaurja.com

ECN/2020-21/CR-14/3561

27th November, 2020

CERTIFICATE OF REGISTRATION
FOR CLASS 'B'

We hereby certify that, the firm having following particulars is registered with *MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)* under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm	:	M/s. Spark Energy Solution, Laxmi Karanja, Ahmednagar 414 001.
Registration Category	:	*Empanelled Consultant for Energy Conservation Programme*
Registration Number	:	*MEDA/ECN/CR-14/2020-21/EA-16*

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **26th November, 2022** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

TRUE COPY
DIRECTOR
RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S
Institute of Computer & Management Research
Dudulgaon, Alandi, Pune-412 105.

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Contents

ACKNOWLEDGEMENT

We Spark Energy Solution, Ahmednagar express our gratitude to the management of rajmata College, Dudhalgaon, Dist. Pune for assigning us the power quality and electrical safety audit Rajmata College.

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DIRECTOR
RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S
Institute of Computer & Management Research
Dudulgaon, Alandi, Pune-412 105.

CHAPTER – 1

GENERAL DESCRIPTION OF COLLAGE

Rajmata College is located at Dudhalgaon, Dist. Pune mainly. College having large build up area and college having various departments including comp lab, library, classrooms, seminar hall, MBA, Pharmacy etc.

College having 10 kw Roof top solar system is installed.

SCOPE of WORK

- Review the electrical safety aspects in the substations, electrical equipment's.
- Review of statutory electrical documents & records.
- Audit/Review of compliance to statutory requirements as per the Electricity act & the Indian Electricity Rules & relevant Indian standards & codes of practice.
- Review of Personal Protection Equipment's.
- Verification of periodical checking of the earthing as per IS-3043 and suggest suitable recording.
- Review and audit of preventive electrical maintenance.
- Review of corrective actions taken on last audit findings.
- Review of Electrical fire safety and need of training needs.

IMPORTANT DEFINITIONS AND CODES

1. Electrical Parameters

- Voltage(V)
- Current(A)
- Power(kW)
- Energy(kWh)
- Harmonics (Vthd and Ithd)
- Power Factor
- Demand(kVA)
- Reactive Power (kVAR)

2. IS Codes

Sr.No.	IS code	Remark
1.	IS5216-1969	Guide for safety procedure & practices in electrical work
2.	IS3043:1987	Code for practice for earthing
3.	IS1886-1961	Code for practice for installation & maintenance of transformer
4.	IS 5424	Specification for electrical earth mat
5.	IS 5578:1984	Guide for making insulated conductors
6.	IS -3770	Specification for safety gloves

3. Temperature parameter (Thermographs)

PRIORITY CODE	TEMPERATURE LEVELS	ABNORMILITIES DESCRIPTION AND ACTION
5	UPTO 40^0C	**Normal** . No action
4	40^0C TO 60^0C	**Alert**. Monitoring recommended

3	61°C TO 80°C	**Severe** . Rectification recommended during scheduled shutdown within 30 days.
2	81°C TO 100°C	**Critical** . Rectification recommended as soon as possible.
1	ABOVE 100°C	**Immediate**. Rectification immediate by taking shutdown

4. Earth Pit test values

Item	Value
Minor Sub-station	5 Ω
Neutral Bushing	5 Ω
Service connection	5 Ω
Medium Voltage Network	5 Ω
L.T. Pole	5 Ω
L.T. Lightening Arrestor	5 Ω

Treatments to for minimizing Earth resistance

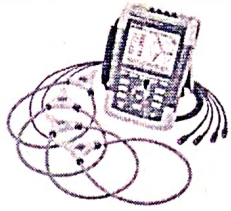
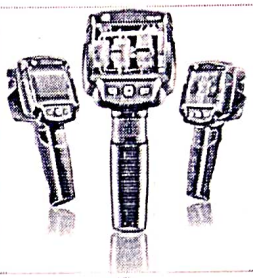
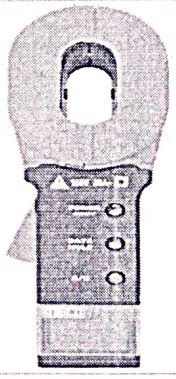
- Remove Oxidation on joints and joints should be tightened.
- Poured sufficient salty water in earth electrode.
- Used bigger size of Earth Electrode.
- Electrodes should be connected in parallel.
- Earth pit of more depth & width- breadth should be made
- Mainly use Rod Earthing.

5. Insulation resistance test

For 440V size of electrical equipment and megger size of 1000V the minimum resistance value 200 MΩ.

LIST OF INSTRUMENTS USED FOR THE AUDIT

Following instrument was used during the audit

Number	Instrument	Make	Model No	
1	3 Phase Energy analyzer	Fluke	434 Series-II	
2	Thermal Imaging Camera	Testo	868	
3	Clamp On Meter	Rishabh	1000AC-DC	
4	Earth tester	MECO	4680BLC	

CHAPTER – 2

POWER QUALITY SURVEY

RMS Voltage value							
	Phase R-Y	Phase Y-B	Phase R-B	Phase R-N	Phase Y-N	Phase B-N	N to G
Min	399.78	393.72	399.09	236.58	223.15	228.77	9.63
Avg	400.12	393.82	399.12	236.65	223.27	228.79	9.67
Max	401.21	393.92	399.21	337.70	223.30	228.88	9.70

RMS Current Value				
	Phase R	Phase Y	Phase B	Neutral
Min	2.77	10.46	12.32	12.05
Avg	2.80	10.57	12.44	12.13
Max	2.84	10.67	12.57	12.14

RMS Peak Current Value				
	Phase R	Phase Y	Phase B	Neutral
Min	5.28	22.40	34.74	20.01
Avg	5.63	22.83	35.39	20.61
Max	6.12	23.12	36.10	21.16

Harmonics Level in %						
	Phase R	Phase Y	Phase B	N to G	As Per IEEE in %	As Per MSEDCL in %
Voltage	3.12	2.70	3.71	29.12	Below 5%	Below 5%
Current	47.67	38.90	80.41	73.86	Below 5%	Below 5%

Power Factor				
	Phase R	Phase Y	Phase B	Total PF
Min	0.94	0.97	0.90	0.92
Avg	0.95	0.97	0.91	0.92
Max	0.95	0.97	0.91	0.92

Frequency	
Min	49.97
Avg	49.97
Max	49.97

A. Power Quality Analysis Scenario :

1. Current unbalance is observed, it is suggested that kindly balance the load properly to avoid unbalancing issue and to avoid unnecessary burden on phases.
2. Peak current observed in neutral, due to current in neutral system gets highly affected in form of unbalancing, harmonics creation etc.
3. Overall single phase and three phase voltage is proper.
4. Voltage harmonics and current harmonics are highly observed in neutral because of neutral of system is weak due to 3rd harmonics is highly observed, it is suggested that kindly installed separate new copper earthings to all panels and sub-feeders also or install 30Amp Active Harmonics Filter with neutral compensation mainly.
5. Current harmonics are also observed in all phases which affects on system reliability and increase in Kvah.
6. Poor Power Factor is observed , it is suggested that if the Hospital facility having more than 19kw connection of MSEDCL tariff then install APFC panel to avoid PF penalty from MSEDCL and system reliability.

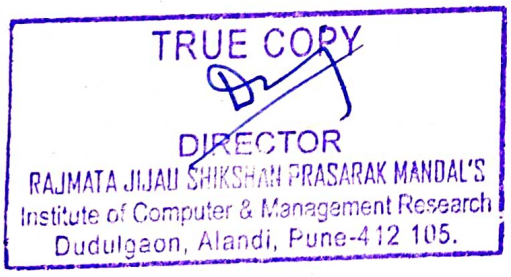
CHAPTER - 3

EARTHING SCENARIO

Sr.No	Location	Resistance in OHM (Ω)	Leakage Current in mA	Remark
1	MBA College Main meter	12.24 Ω	12.88 mA	Not Ok
		14.52 Ω	8.89 mA	Not Ok
		18.20 Ω	2.88 mA	Not Ok
2	32A Changeover	9.23 Ω	3.44 mA	Not Ok
3	10kW Solar	10.61 Ω	4.13 mA	Not Ok
		8.28 Ω	5.18 mA	Not Ok
		12.30 Ω	11.40 mA	Not Ok
4	Solar LA	27.38 Ω	1.12 mA	Not Ok
		18.8 Ω	6.20 mA	Not Ok

A. Observation :

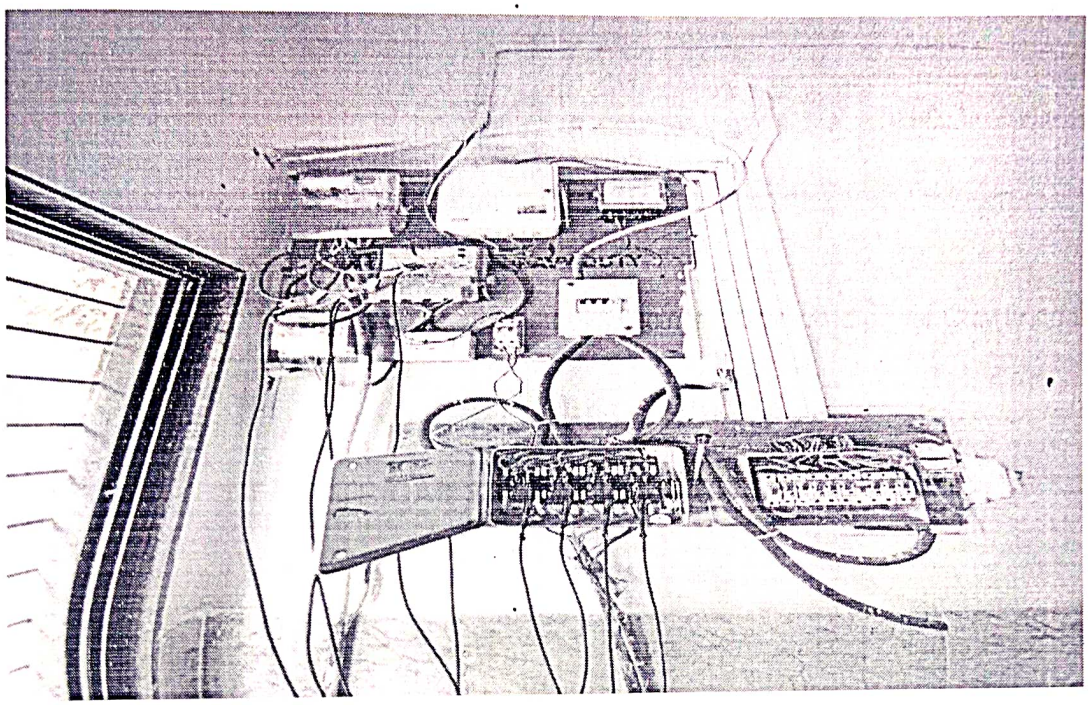
1. Overall Earthing is very weak, it is suggested that kindly install new separate copper eathings to all panels and sub-feeders also to avoid issue of leakage current for safety purpose.
2. Earth resistance should be below than 5 ohm respectively.
3. In maintenance schedule of hospital, it is suggested that pour the salty water at earth pits mainly.



CHAPTER - 4

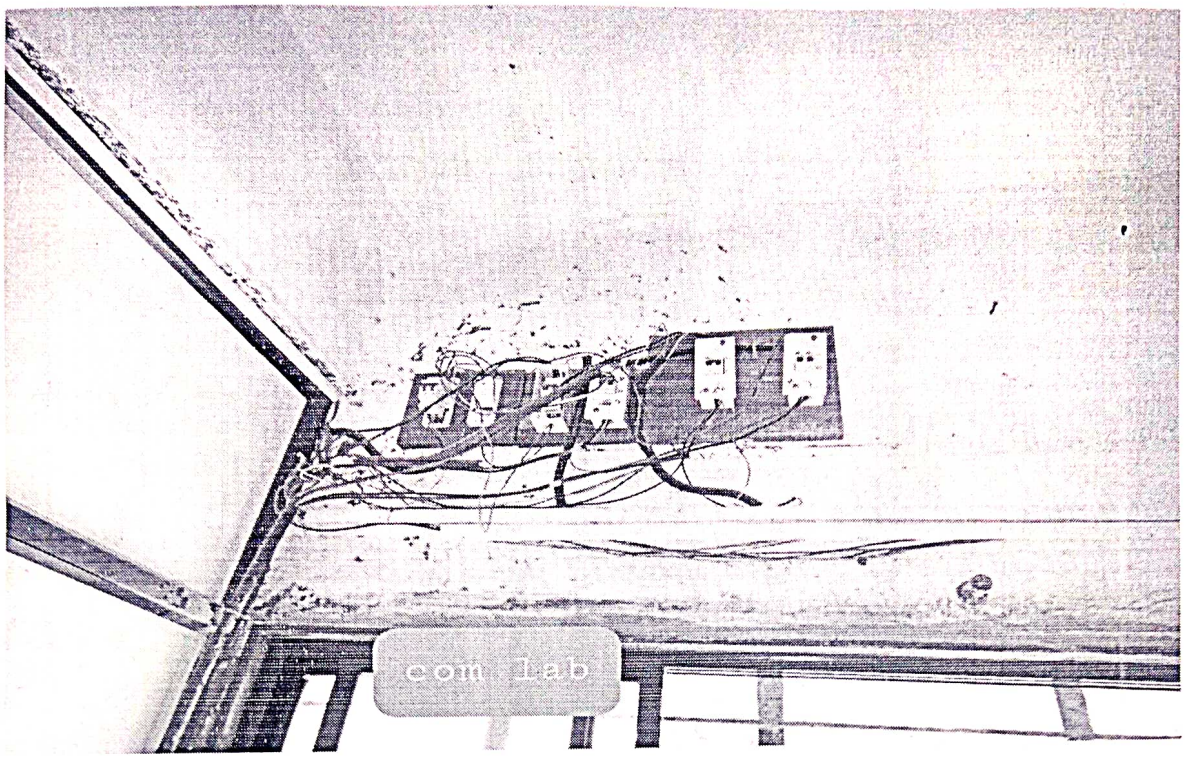
ELECTRICAL SCENARIO OF COLLAGE

A. MSDCL Main Meter



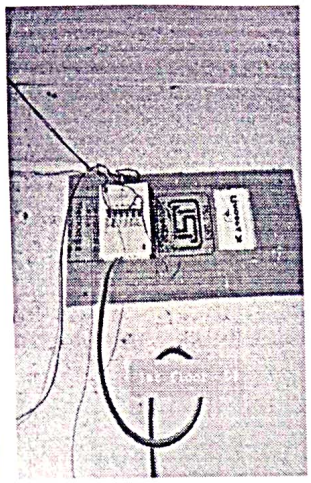
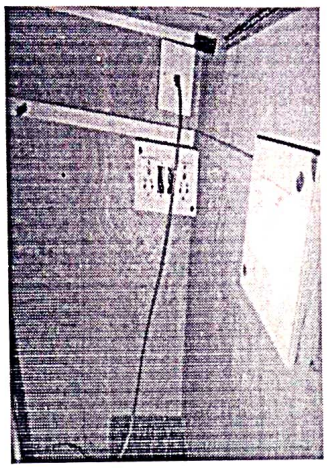
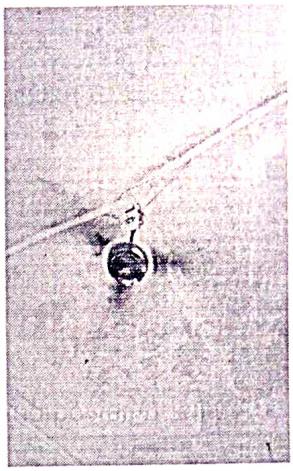
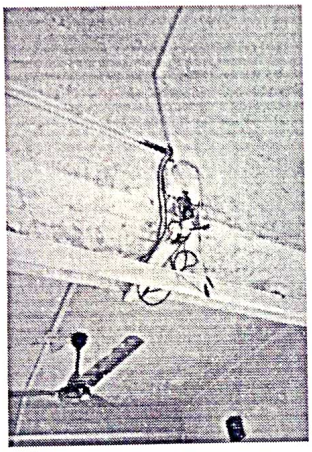
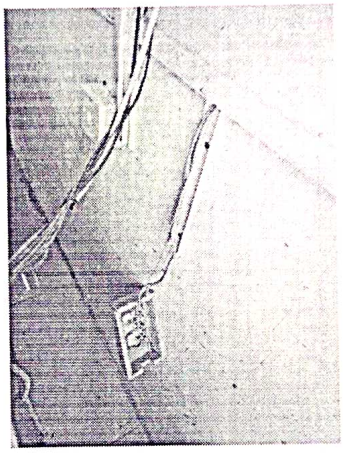
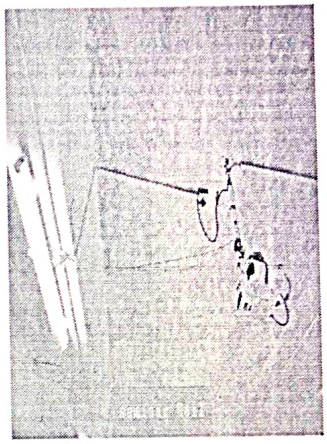
1. In MBA Building main meter room 16*3.5c AL armoured cable is provided as main incoming cable.
2. 32A 415v 2 nos changeover is provided.
3. Wrong Location of main meter, meter is installed in bathroom area, not accessible, change the location of main meter immediately.
4. Joints are majorly observed, avoid joints strictly.
5. Cleaning is highly required.
6. Joints are also observed in earthing, avoid joints in earthing strictly.
7. Open wiring is observed, provide cable trays for same.
8. Termination lugs are absent , provide proper size lugs for termination immediately.
9. Provide rubber mats and fire extinguishers.
10. Provide SOP (Standard Operating process) on main panel.
11. Earthings are very poor, provide seprate copper earthings immediately.
12. Provide damber taping for cable insulation.
13. Nut bolts in busbar box are rusted out, change the nut bolts immediately.
14. Cable entry glands are absent, provide glands properly.

B. Computer Lab



1. In comp lab MCB and controlled switchgears are not accessible due to height issue, change the locations for same.
2. Joints are majorly observed, avoid joints strictly.
3. Cleaning is highly required.
4. Joints are also observed in earthing, avoid joints in earthing strictly.
5. Open wiring is observed, provide cable trays for same.
6. Termination lugs are absent , provide proper size lugs for termination immediately.
7. Earthings are very poor, provide separate copper earthings immediately.
8. Provide damber taping for cable insulation.
9. Nut bolts in busbar box are rusted out, change the nut bolts immediately.
10. Cable entry glands are absent, provide glands properly.

C. Main Hospital Panel and DG changeover switch :

General Images Of Collage			
	1st Floor DB	Computer Lab	Classroom 2
			
	Class Room		Seminar Hall

1. In Class rooms Fan wiring is open, avoid open wiring immediately.
2. Some Switches, switch boards are damaged, provide new for same.
3. 10KW Solar earthings and LA earthings are poor, provide copper earthings for same.
4. Provide extra height for LA because LA must be heighted than Building height respectively.

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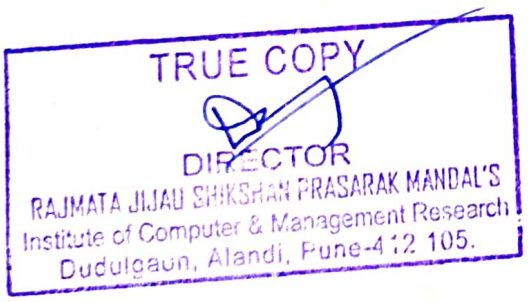
Neutral to Ground Voltage:-

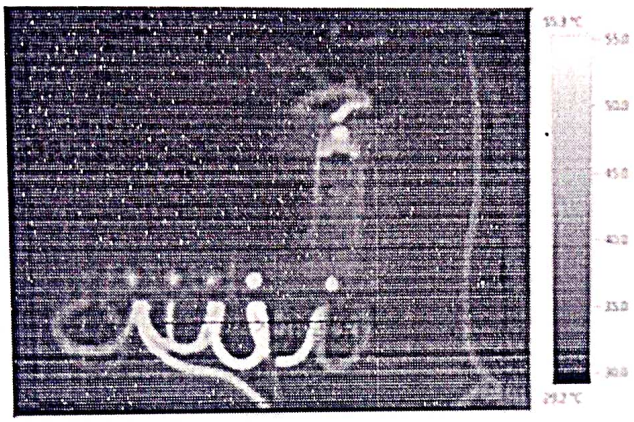
Sr.No	Location	N-E Voltage (Volt)	Remark
1	Comp lab	5.2	Not Ok
2	Office	1.2	Ok
3	Room 1	4.91	Not Ok
4	Room 2	1.0	Ok
5	Library	1.4	OK
6	Seminar hall	4.16	Not Ok
7	Principal cabin	1.1	Ok
8	Nursery room	5.29	Not Ok
9	Activity room	1.8	Ok

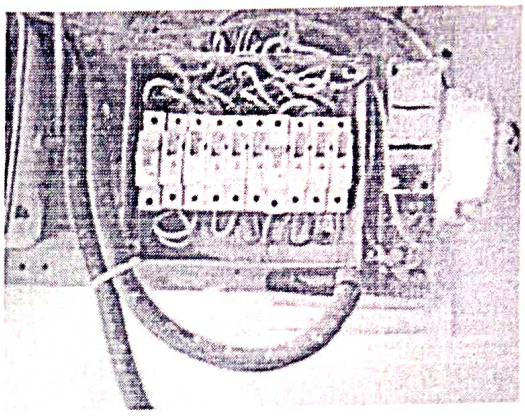
A. Observation :

1. Overall N to E voltage is proper but on some locations voltage is not proper, thus it is suggested that kindly check the switch boards earthing immediately.
2. It is also suggested that provide earthing terminal in each and every switch board properly.
3. N-G voltage should be below than 2V mainly.



CHAPTER - 5
THERMOGRAPHY REPORT





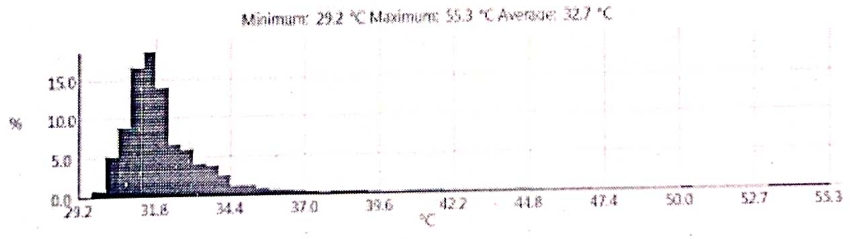
Picture parameters:

Emissivity:	0.95	**Electric current [A]:**	0.0
Refl. temp. [°C]:	20.0	**Electric voltage [V]:**	0.0
		Electric power [W]:	0

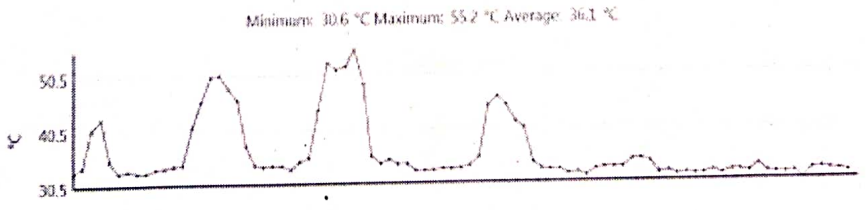
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	31.5	0.95	20.0	CenterSpot
Cold spot 1	29.2	0.95	20.0	cold spot
Hot spot 1	55.3	0.95	20.0	hot spot

Histogram:



Profile line:



Remarks:

Location : MBA College main meter room SP MCB Box
MCB and cables are heated due to bad termination, use the proper size of creamped lugs for termination.

ANNEXURE-I
ELECTRICAL MEASUREMENTS

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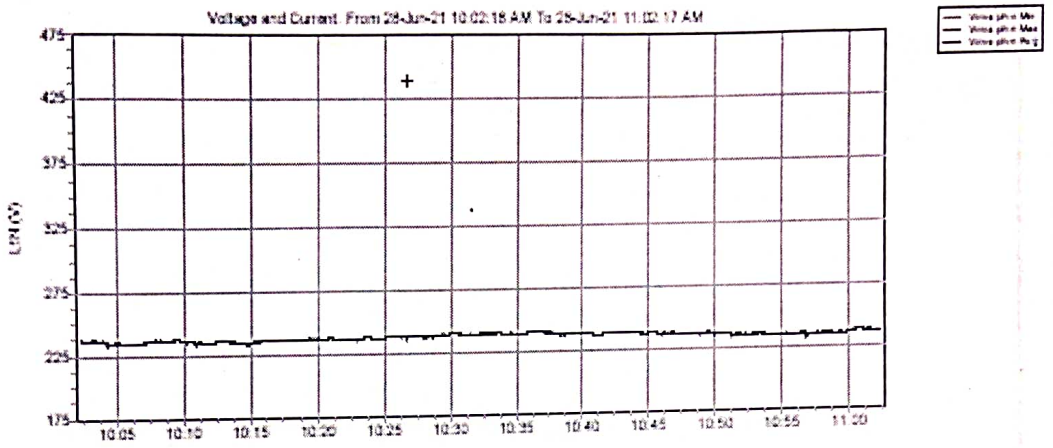
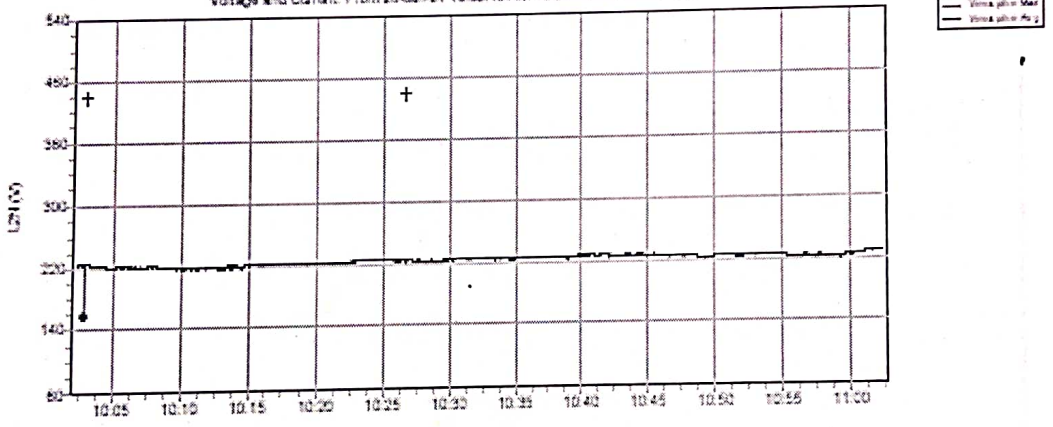
Voltage and Current From 28-Jun-21 10:02:18 AM To 28-Jun-21 11:02:17 AM



Voltage and Current From 28-Jun-21 10:02:18 AM To 28-Jun-21 11:02:17 AM



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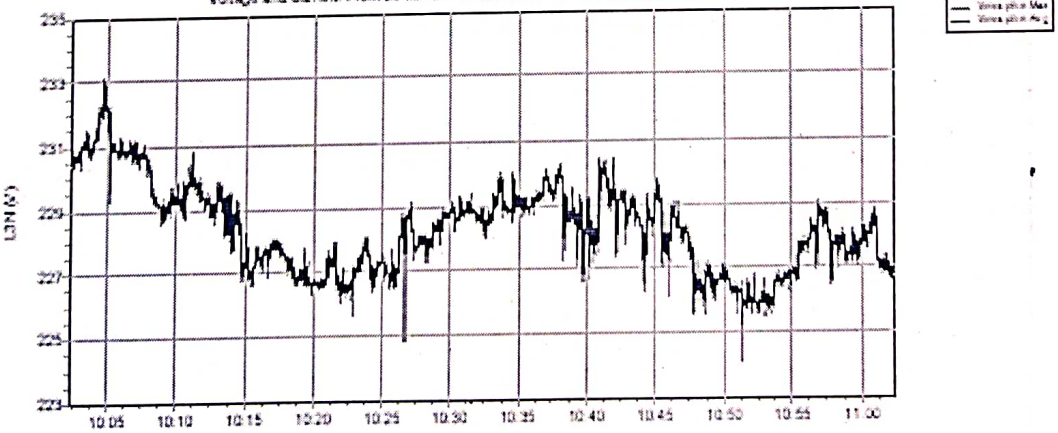

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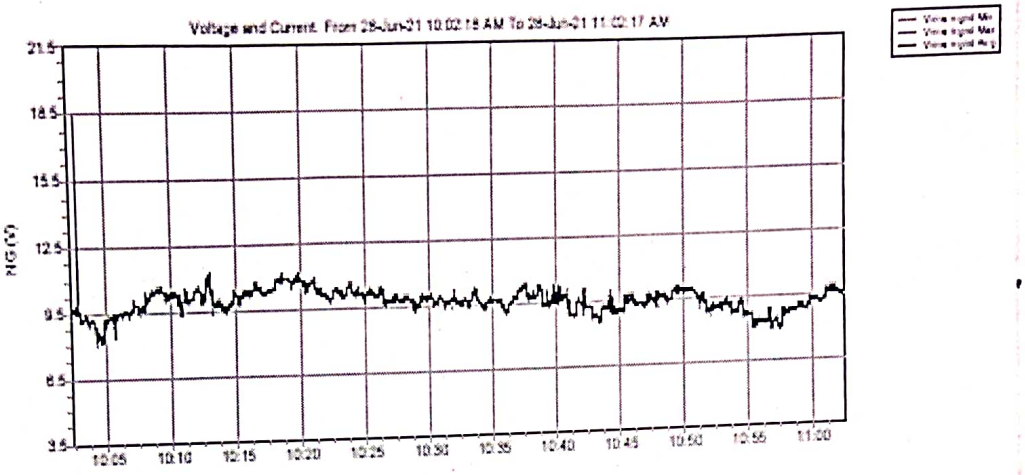

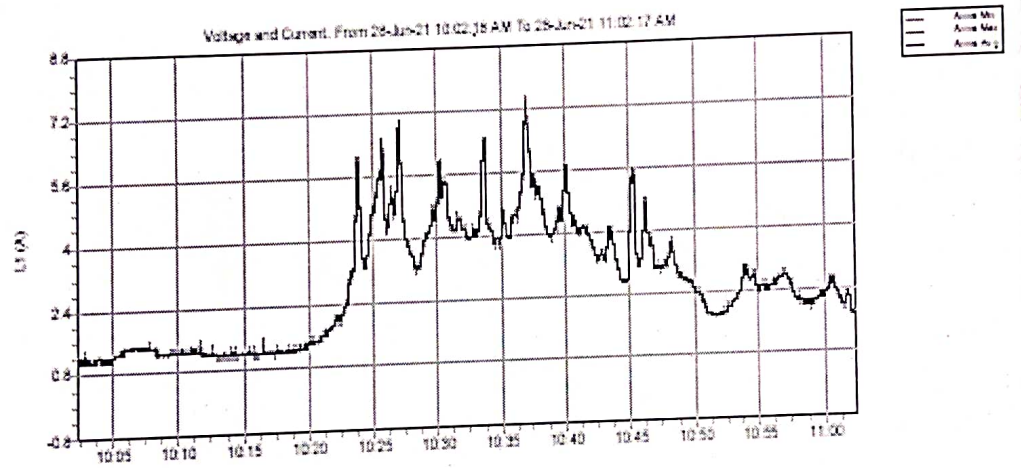

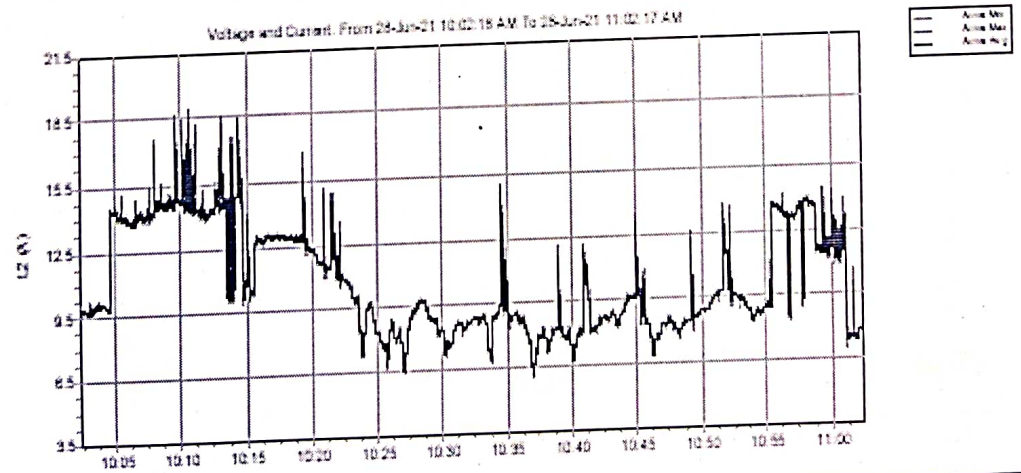

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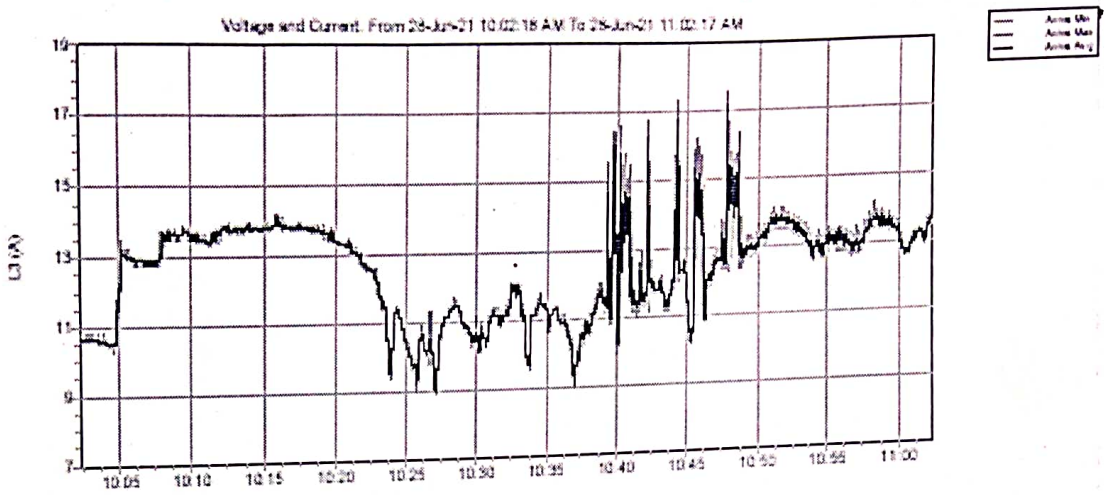
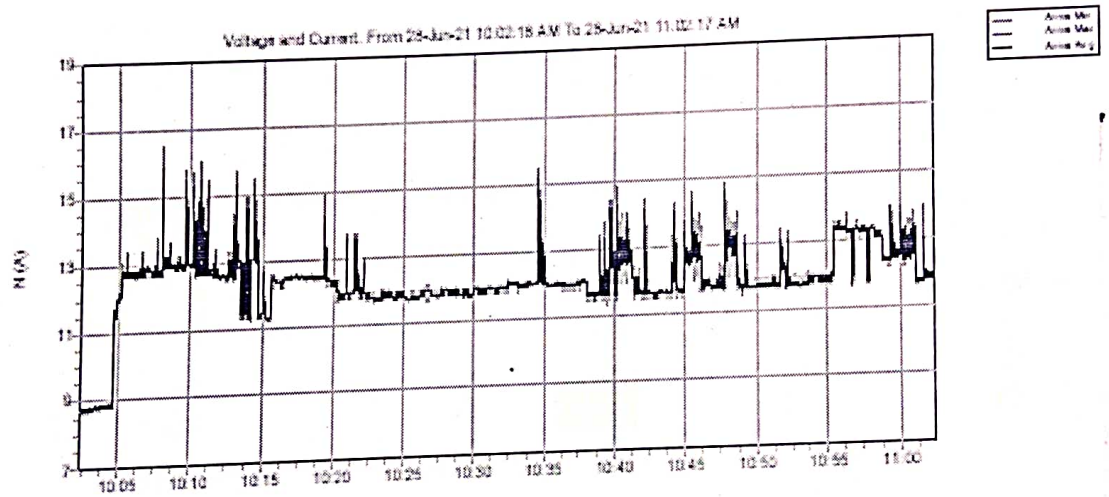
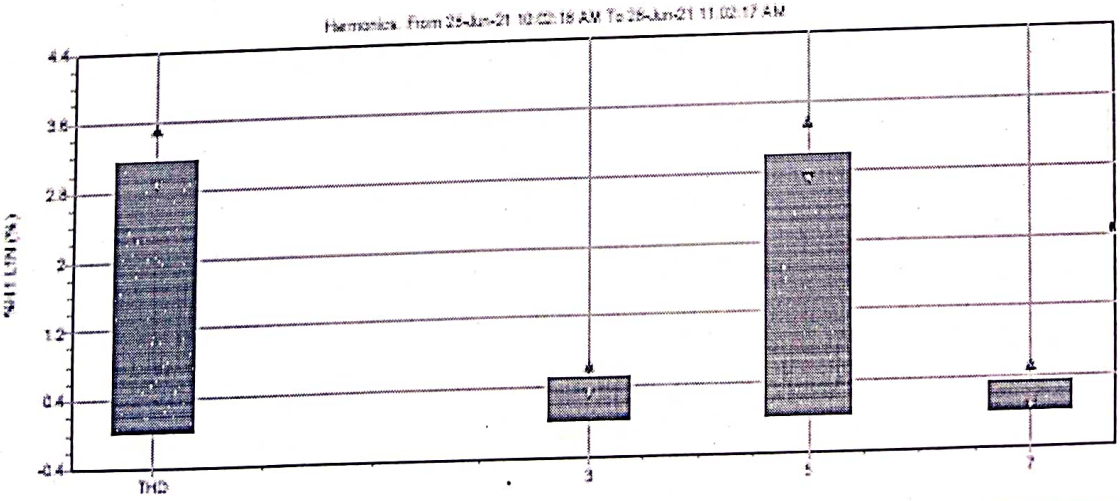


Voltage and Current, From 28-Jun-21 10:02:18 AM To 28-Jun-21 11:02:17 AM



Harmonics, From 28-Jun-21 10:02:18 AM To 28-Jun-21 11:02:17 AM



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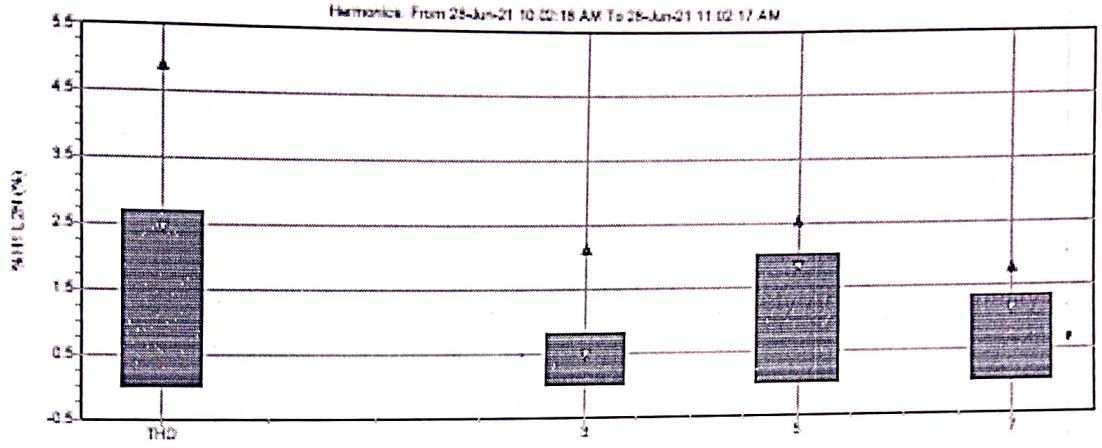

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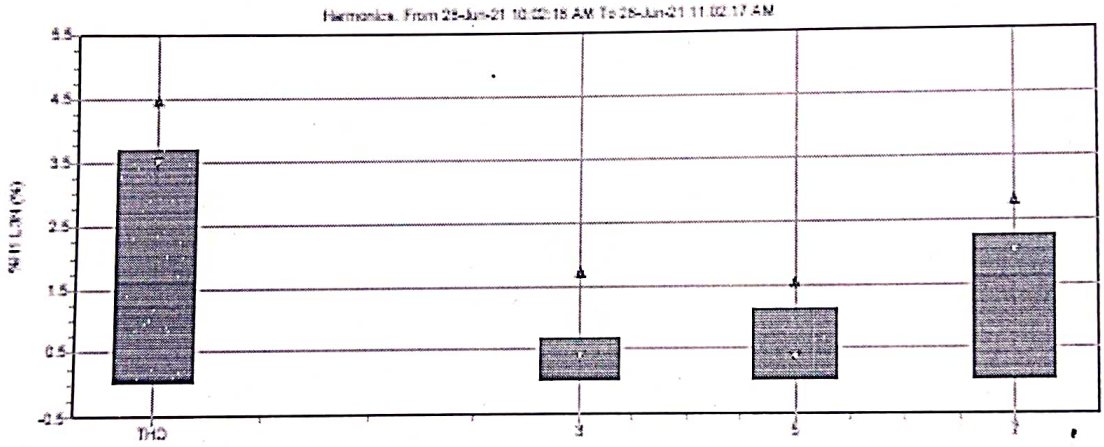

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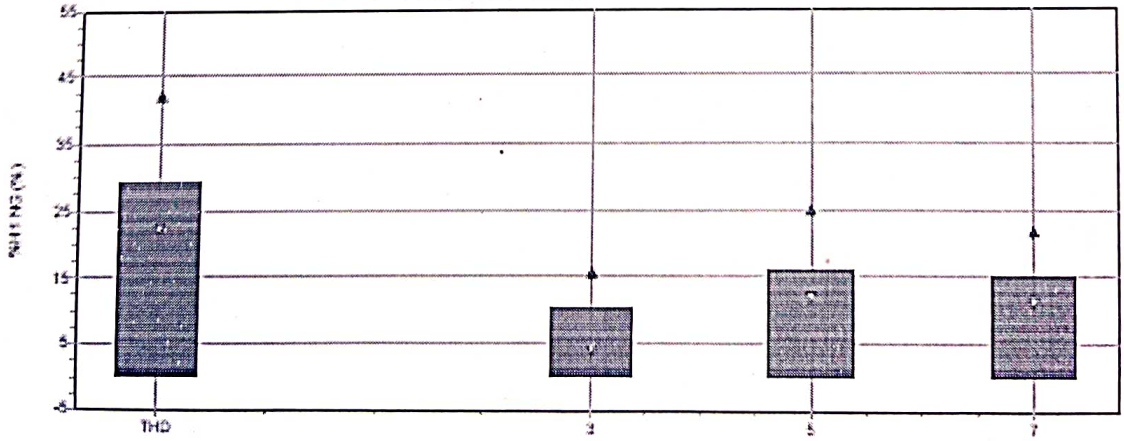

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Filename: MEAS 137 – WiFi SD Card	Report Date/Time: 28-Jun-21 6:29:35 PM	Page 5

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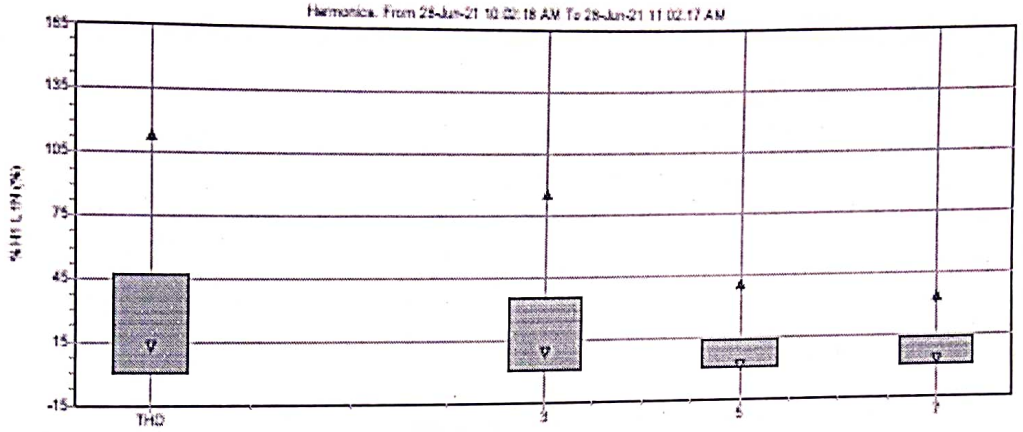

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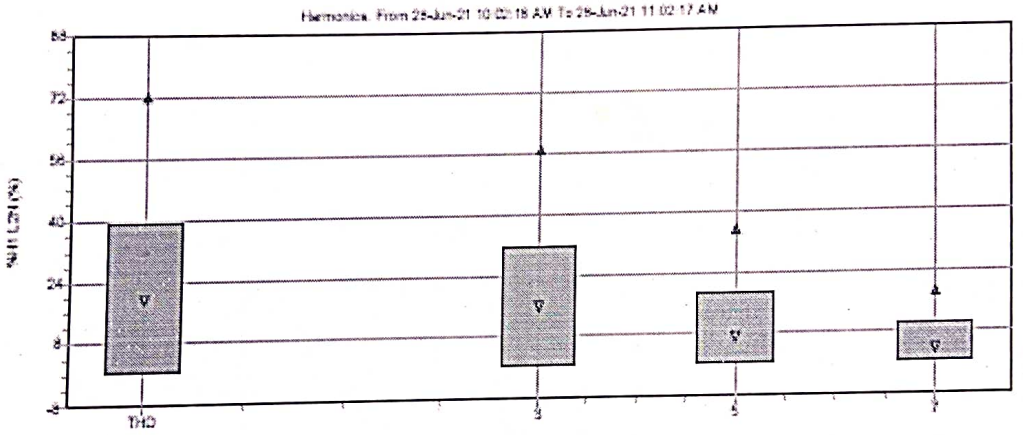

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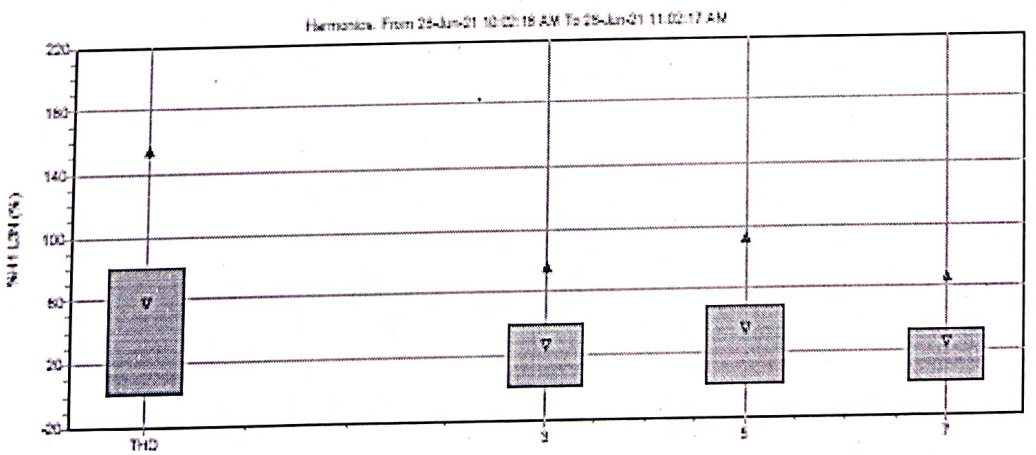

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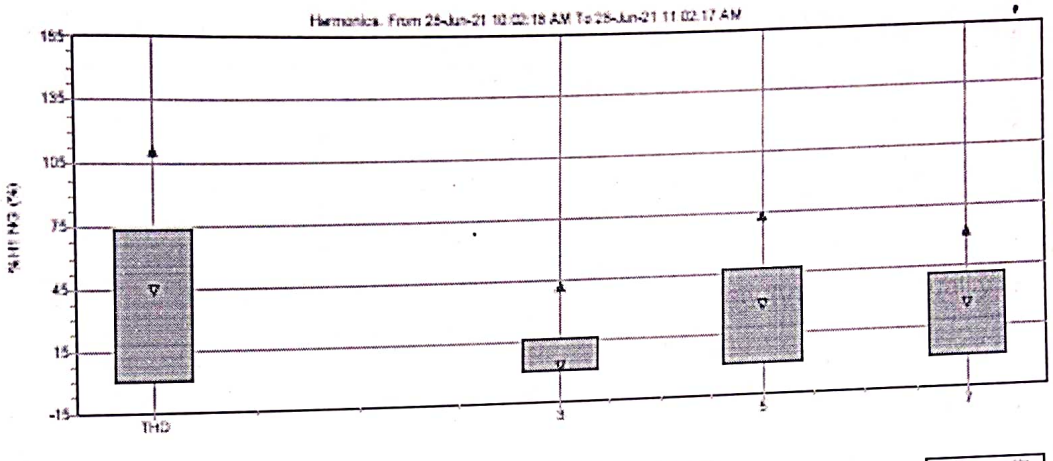

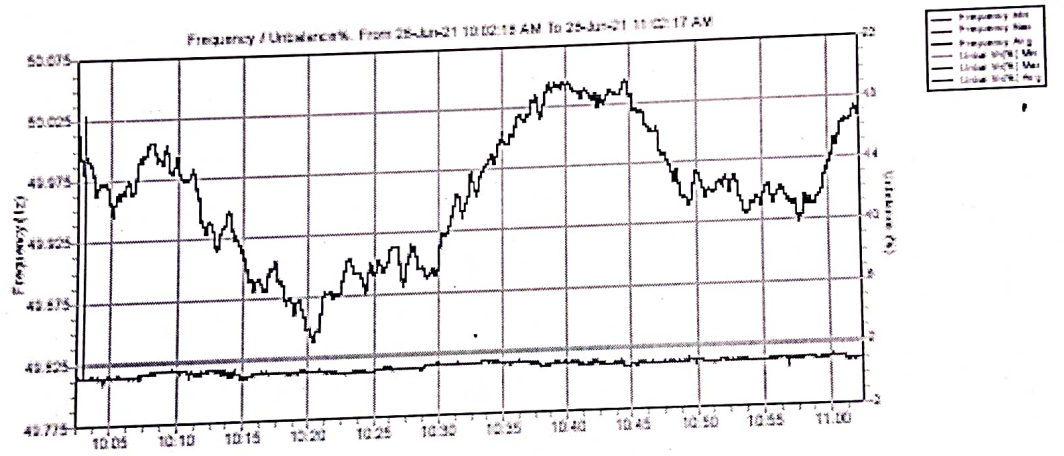

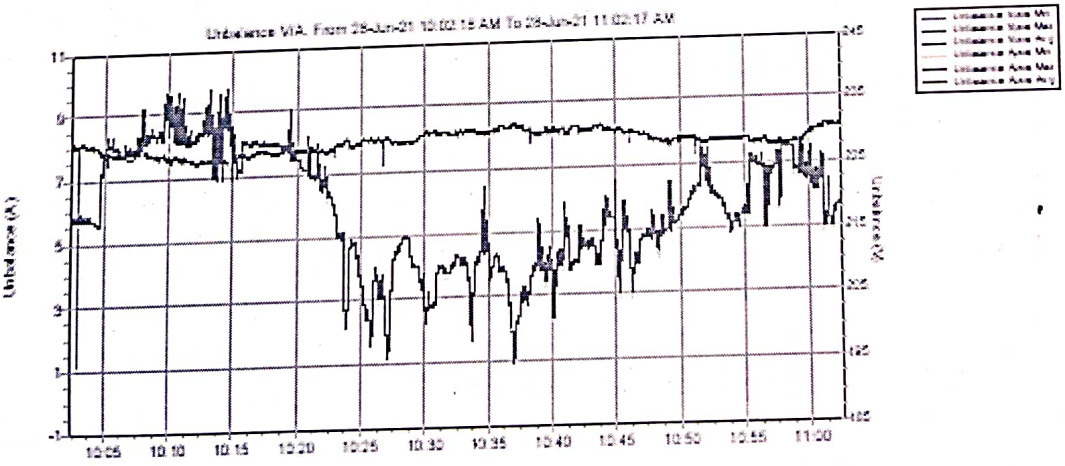

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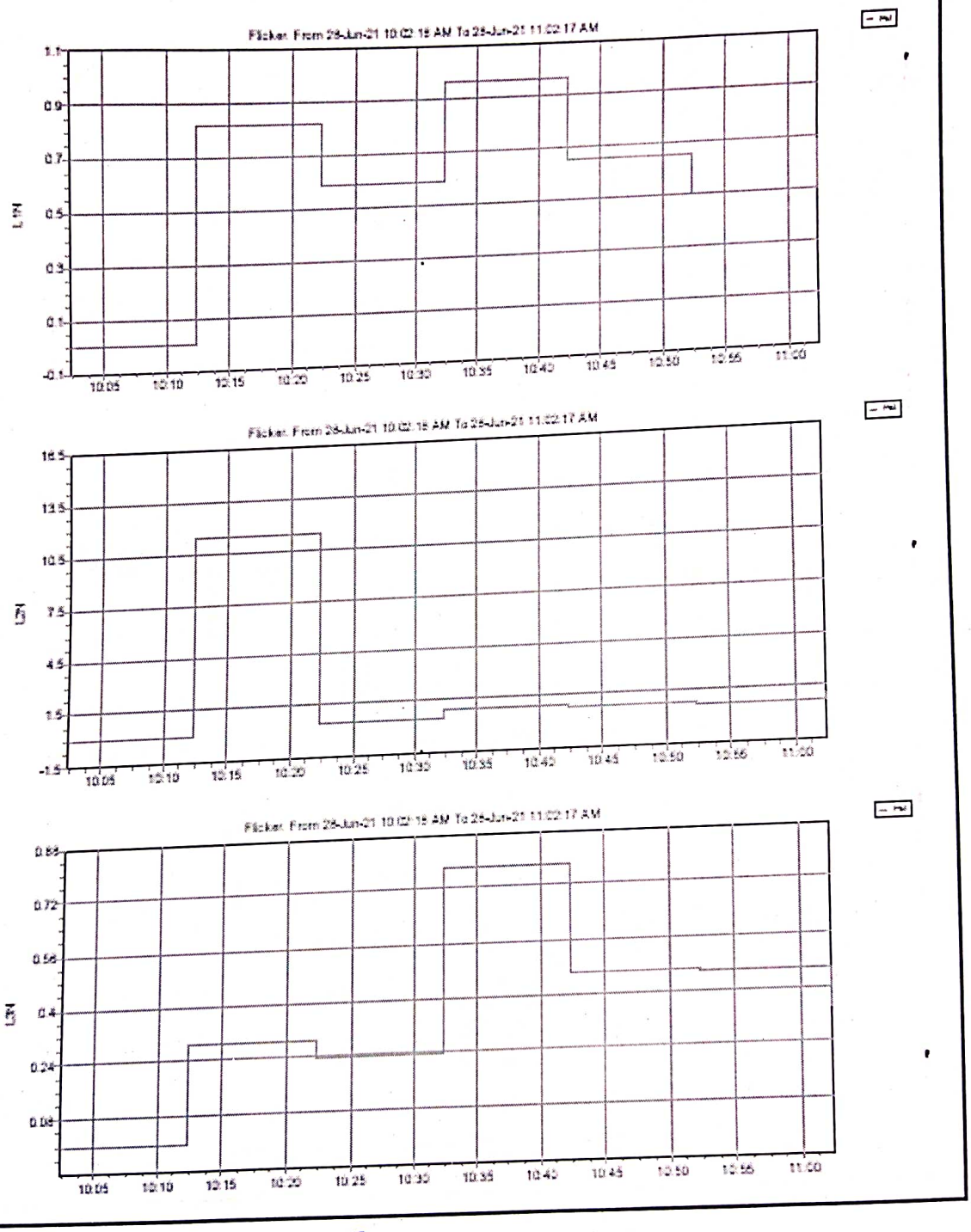

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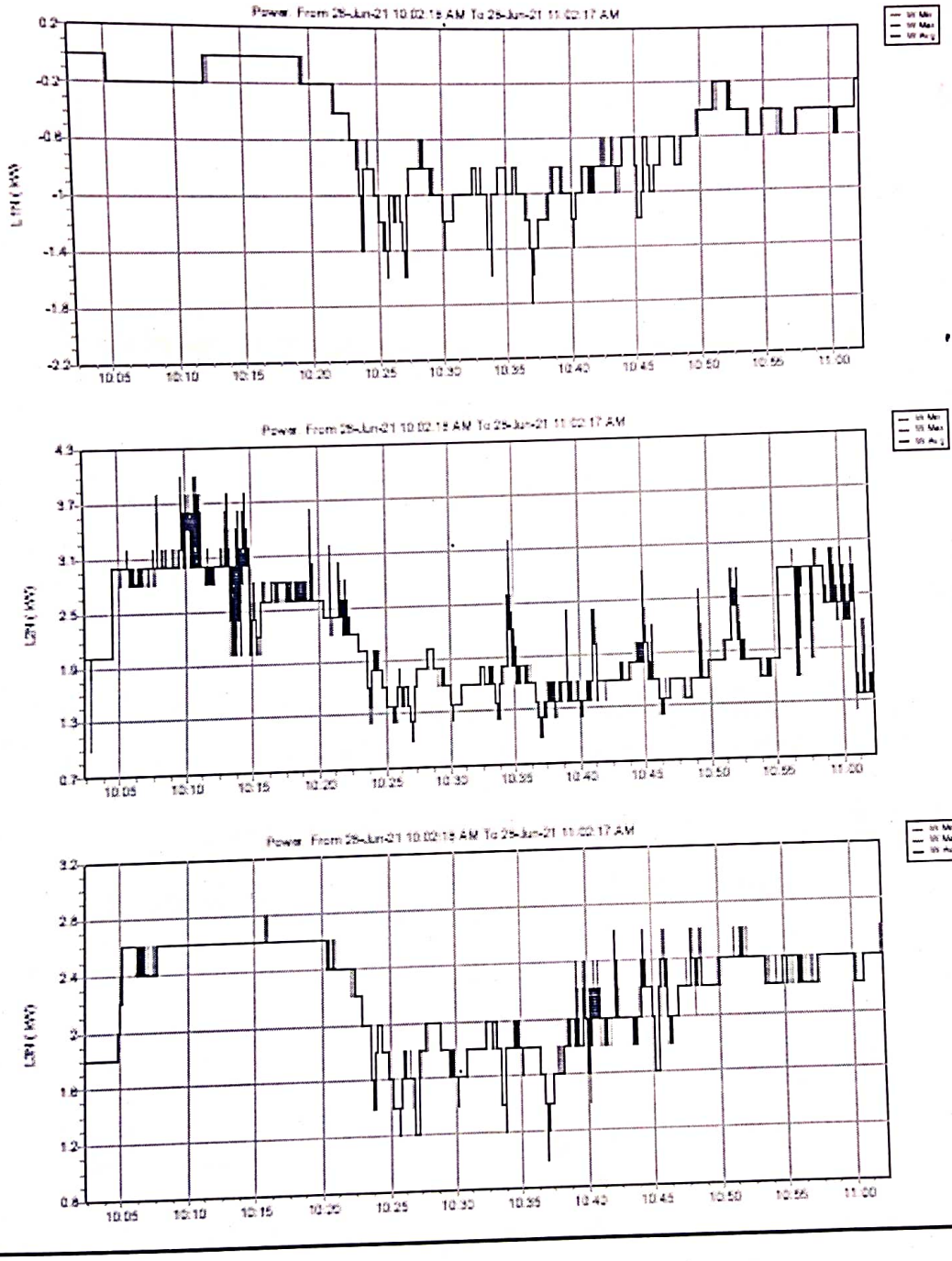
Report	MEAS 137 – WFI SD Card	Report Generated Time	28-Jun-21 8:26:39 PM	Page 11



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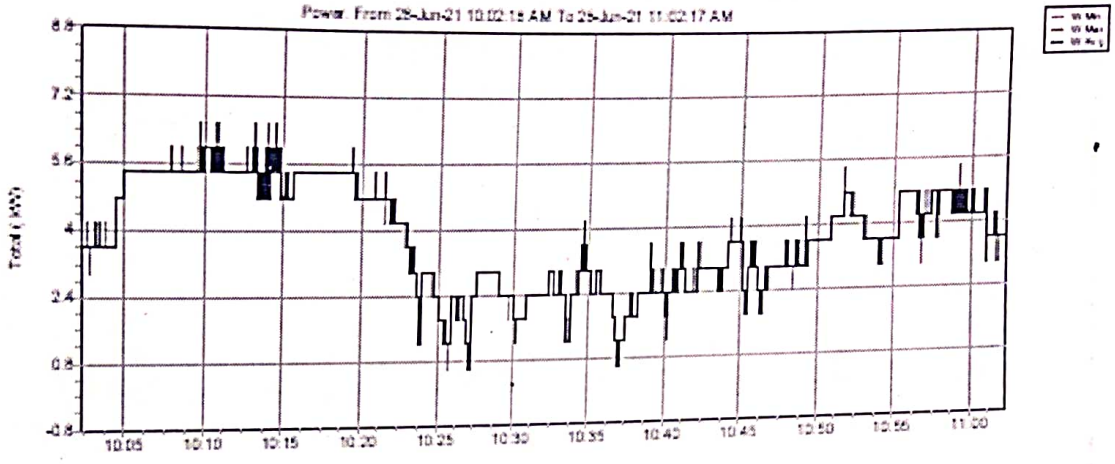
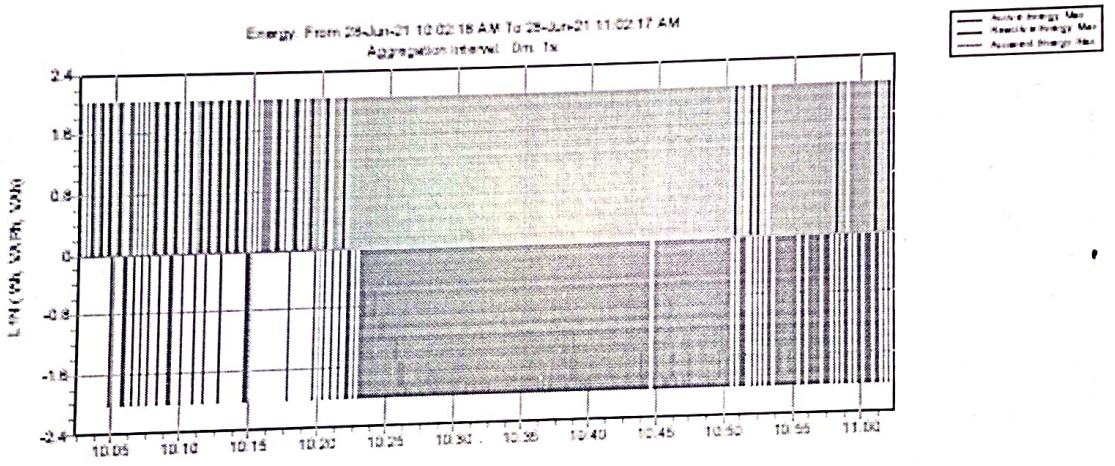
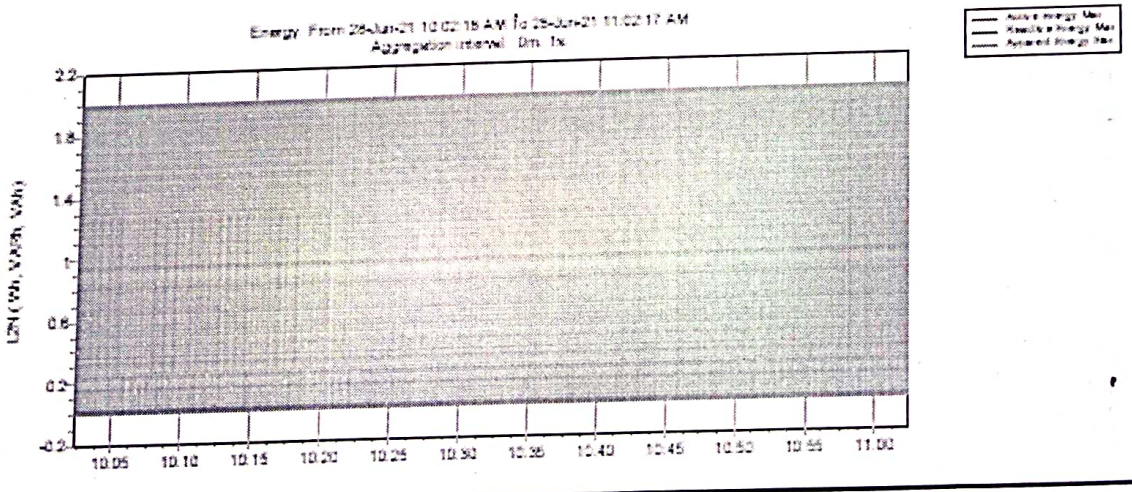
Filename: MEAS 137 – WiFi SD Card	Record Creation Time: 28-Jun-21 8:29:48 PM	Page 12







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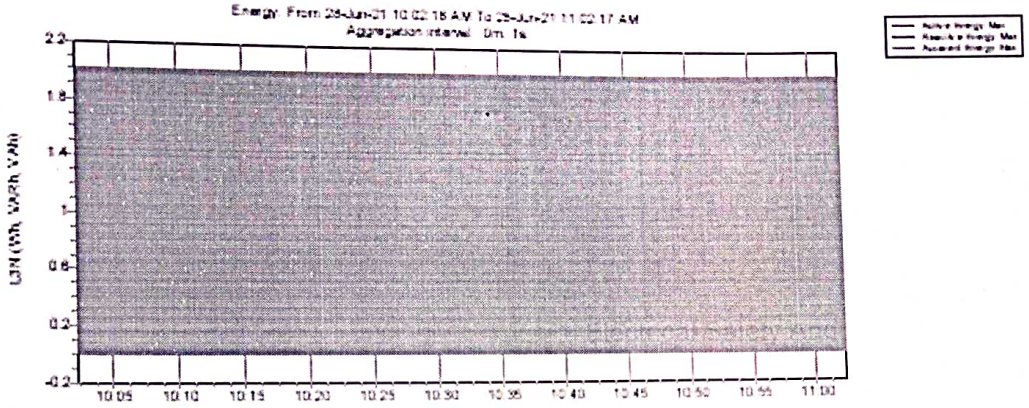
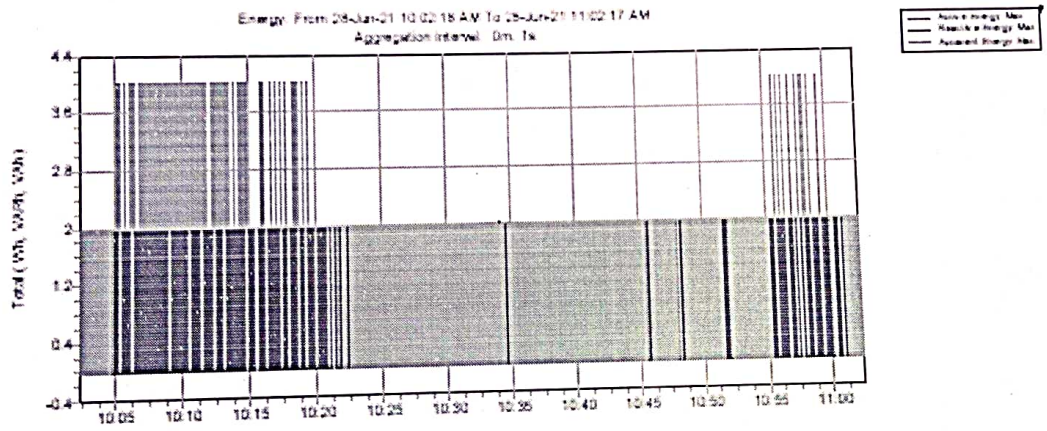
Source	Report Generated	Page
MEAS 137 – WFR SD Card	28-Jun-21 8:29:47 PM	Page 13





DECLARATION

This report is only based on recorded reading of the Electrical system on the date of Electrical safety audit, Report will not take any responsibility against any accidental condition.

For proper Electrical reliability with Electrical safety ,we would like to suggest do the Electrical safety audit once in year and during maintenance schedule of facility kindly check the all termination and wiring respectively.

Thanking You.

SPARK ENERGY SOLUTION
Mob.
9922880897
9423038879
Laxmi Karanja, Ahmednagar

TRUE COPY
DIRECTOR
RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S
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Energy audit

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Action taken report

After detailed green, environment and energy audits, the following recommendations were made by auditing agency and also the action taken by the institute is as follows,

Sr. No	Audit name and year	Recommendations	Action taken by institute
01	Energy audit report 2017-18 and Energy audit report 2018-19	Auditing agency recommended to install roof top solar system	Institute has installed 10 KWP roof top solar system

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Green campus initiatives

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Green campus Initiatives

Sr. No.	Name of Activity
1	Policies for environmental and green campus initiatives
2	Green campus certificates
3	Tree plantation activities
4	Restricted Entry of Automobiles photos
5	Campus cleaning activities
6	Automatic rain gauge machine (ARG)

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POLICIES FOR ENVIRONMENTAL AND GREEN CAMPUS INITIATIVES

Environmental and Green campus:

Rajmata Jijau Shikshan Prasarak Mandal's Institute of Computer and Management Research has taken initiatives to implement eco-friendly practices in the campus. A green campus is a concept where continuous efforts are taken to establish environmentally sustainable and eco- friendly practices. RJSPM's Institute of Computer and Management Research is regularly engaged in a variety of eco-friendly practices in ourcampus such as tree plantation, installation of solar energy panels etc. Efforts are being made to develop the campus on green concepts, particularly concentrating on water conservation, use of alternative and renewable sources of energy, use of different energy conservation methods, solid waste management, E-waste management etc.

Scope of the Policy:

The Green Campus, Energy and Environment Policies will develop exciting new practices that encourage students in creating positive change. Green campus is achieved by making significant progress in the campus in collaboration with community. The Institute has performed various protocols and programmes under green campus initiatives

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Objectives of the green campus program:

- To protect and preserve ecological systems and natural resources within the campus.
- To incorporate environmental initiatives into policies, plans and programmes for social development and outreach activities.
- To continuously expand our contribution to climate protection and adaptation to climate change and to the conservation of comprehensive resources.
- Effective use of conventional sources of energies for daily power needs, appropriate disposal and handling of different types of wastes etc.
- Everyone at the RJSPM's Institute of Computer and Management Research will work together to encourage a beliefs of self-sustainability and make the whole campus environmental friendly.
- To constantly improve the effective use of all natural resources like energy, water etc.
- To decrease consumption and the amount of waste produced as well as encourage forrecovering and recycling waste where possible.

Major points focused under policies are:

- Clean campus initiatives
- Restricted entry of automobiles in college campus
- Pedestrian –friendly pathways
- Availability of sufficient dustbins for collection of different types of garbage
- Organization of campus cleaning activities and programmes
- Environment promotional activities and programmes
- Landscaping with trees and plants

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- Water conservation system
- Availability of sanitary napkin disposal equipment
- Solid waste management processes
- E-waste management processes
- Environment-centric student societies and department activities
- Green Audit
- Energy Audit

RJSPM's Institute of Computer and Management Research actively coordinates cleanliness activities in the college campus and beyond the campus by organizing different activities like Swachh Bharat Abhiyan. The entry of automobiles inside the campus is restricted to reduce environmental pollution of campus. We encourage our students and staff to use public transportation. Single–useplastic stuffs such as plastic bottles, bags, spoons, straws and cups are banned completely and awareness is created among all teaching, non-teaching staff and students. Landscaping initiatives are best methods to build awareness around the environment. The landscape of trees and plants provide the students and staff with clean and cool air and a soothing environment.

The Municipal Corporation's water supply and bore well are the sources of water supply to the college campus. Our college is aware about the water conservation measures and problems associated with water shortage and therefore we follow the practices for water conservation and efficient use of available water. Water tanks are constructed in campus for proper storage of water. Water is pumped into storage tanks located at different places in the campus. Overhead storage tanks are also available.

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The water is distributed through pipe network in college campus. Maintenance of water bodies and distribution system is periodically carried out to avoid the loss of water by leakage. Some of the common solid wastes include daily garbage comprising of white used papers, card sheets and materials, rubber waste, plastics, cardboard materials, etc. These are collected in dustbins placed in the campus and disposed in ecofriendly manner on daily basis. Separate dustbins are kept in campus for dry and wet waste. The glassware waste is collected and disposed properly. For disposal of papers "Recyclers India Shredding Services" an agency in Pune is engaged for shredding services. We collect E-waste and dispose it properly with the help of agency "Kuldeep E-waste disposals".

The college aims to regularly conduct a Green Audit of our college campus to assess our strengths and weaknesses and to further our goals of long-term sustainability. A green audit is a useful tool to determine how and where most energy or water or resources are being used. An Energy Audit is conducted and required to further reduce its carbon footprint. The importance of reducing energy consumption cannot be overstated. The energy audit, with its specialized tools will identify wastage of energy. Such an inspection often reveals several different flaws which cause a loss of significant amounts of energy which the college will not be able to detect.

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CERTIFICATION OF REGISTRATION

Rajamata Jijau Shikshan Prasarak Mandal's

EDUCATION CAMPUS

Institute of Computer & Management Research (MBA)
Institute of Pharmacy (D.Pharm), College of Pharmacy (B.Pharm)
School of Nursing (RGNM), Dnyanbhakti Junior College (ACS)
Dnyanbhakti International School

Gat No. 101/102, Moshi Alandi Road, Dudulgaon, PCMC,
Pune - 412 105.Maharahstra, India

GREEN EDUCATION CAMPUS

has been assessed by TQV as conforming to the requirements of TQV Green Education Campus Certification. The following Education Campus are fulfilling the requirements of TQV Green Education Campus Certification.

Scope of Registration

For Preventing Pollution, Conserving Natural Resources, and Complying Environmental Regulatory Requirements

Certificate No.	:	**171010912478**
Certificate Date	:	**12 April 2017**
Valid Until	:	**11 April 2020**
EAC Code	:	13, 33, 34, 37

DIRECTOR
TQV Certification Services Private Limited.

The Certificate of Registration remains the property of
TQV Certification Services Private Limited
and shall be returned immediately upon request. for more information
(For current validity of the certificate, visit our website : www.tqvcertification.com)
This registration is subject to the company maintaining a management system,
to the above standard, which will be monitored by **TQV Certification Services Pvt. Ltd.**

CERTIFICATE

Certificate No. : 171010912479

This is to Certify that the
Quality Management System Of

Rajamata Jijau Shikshan Prasarak Mandal's
EDUCATION CAMPUS
Institute of Computer & Management Research (MBA)
Institute of Pharmacy (D.Pharm), College of Pharmacy (B.Pharm)
School of Nursing (RGNM), Dnyanbhakti Junior College (ACS)
Dnyanbhakti International School

Gat No. 101/102, Moshi Alandi Road, Dudulgaon, PCMC, Pune - 412 105.
Maharahstra, India

has been independently assessed and is compliant
with the requirements of

ISO 9001:2015

For the following activities

PROVISION OF EDUCATIONAL SERVICES IN
MBA (SPPU), B.Pharm.(SPPU), D.Pharm (MSBTE), RGNM (INC/MNC) ,
XI ,XII Arts, Commerce & Science (HSC Board, Pune) , and
Pre-Primary, Primary & Secondary Education (SSC/CBSE)

12 April, 2017	Original Registered
12 April, 2017	Latest Issued
11 April, 2020	Valid Until
April, 2018	1st Surveillance Audit
April, 2019	2nd Surveillance Audit

DIRECTOR
TQV Certification Services Private Limited.

MANAGEMENT SYSTEM
ASCAB
QUALITY MANAGEMENT

The Certificate of Registration remains the property of
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(For current validity of the certificate, visit our website : www.tqvcertification.com)
This registration is subject to the company maintaining its system to the required standard, Which will be Monitored by TQV.

CERTIFICATE

Certificate No. : 171010912480

This is to Certify that the
Environmental Management System Of

Rajamata Jijau Shikshan Prasarak Mandal's
EDUCATION CAMPUS
Institute of Computer & Management Research (MBA)
Institute of Pharmacy (D.Pharm), College of Pharmacy (B.Pharm)
School of Nursing (RGNM), Dnyanbhakti Junior College (ACS)
Dnyanbhakti International School

Gat No. 101/102, Moshi Alandi Road, Dudulgaon, PCMC, Pune - 412 105.
Maharahstra, India

has been independently assessed and is compliant
with the requirements of

ISO 14001:2015

For the following activities

PROVISION OF EDUCATIONAL SERVICES IN
MBA (SPPU), B.Pharm.(SPPU), D.Pharm (MSBTE), RGNM (INC/MNC) ,
XI ,XII Arts, Commerce & Science (HSC Board, Pune) , and
Pre-Primary, Primary & Secondary Education (SSC/CBSE)

12 April, 2017	Original Registered
12 April, 2017	Latest Issued
11 April, 2020	Valid Until
April, 2018	1st Surveillance Audit
April, 2019	2nd Surveillance Audit

DIRECTOR
TQV Certification Services Private Limited.

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(For current validity of the certificate, visit our website : www.tqvcertification.com)
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Certificate of Registration

Rajmata Jijau Shikshan Prasarak Mandal's
EDUCATION CAMPUS

Institute of Computer & Management Research (MBA)
Institute of Pharmacy (D. Pharm), College of Pharmacy (B.Pharm)
School of Nursing (GNM), Dnyanbhakti Junior College (ACS)
Dnyanbhakti International School

Gat No. 101/102, Moshi Alandi Road, Dudulgaon,
PCMC, Pune- 412 105, Maharashtra, India.

GREEN EDUCATION CAMPUS

has been assessed by IPQC as conforming to the requirements of IPQC Green Education Campus Certification. The following Education Campus are fulfilling the requirements of IPQC Green Education Campus Certification

Scope of Registration
For Preventing Pollution, Conserving Natural Resources and Complying Environmental Regulatory Requirements.

Certificate Date : 08 October 2020 Valid Until : 07 October 2023

CERTIFICATE NO.: 1571552586

AUTHORISED SIGNATORY

IPQC Certification (info@ipqc.co.uk/www.ipqc.co.uk)
Corporate Office : 7, Merry Terrace Woking, London FU21 3EH, UK

Certificate of Registration

ISO 9001:2015

This is to Certify that
Quality Management System of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S EDUCATION CAMPUS

INSTITUTE OF COMPUTER & MANAGEMENT RESEARCH (MBA), COLLEGE OF PHARMACY (B. PHARM) INSTITUTE OF PHARMACY (D. PHARM), SCHOOL OF NURSING (GNM), DNYANBHAKTI JUNIOR COLLEGE (AC/S) DNYANBHAKTI INTERNATIONAL SCHOOL.

GAT NO. 101/102, MOSHI ALANDI ROAD, DUDULGAON, PUNE- 412105, MAHARASHTRA, INDIA.

has been assessed and found to conform to the requirements of

ISO 9001:2015

for the following scope :

PROVISION OF EDUCATIONAL SERVICES IN MBA (SPPU), B.PHARM.(SPPU), D.PHARM.(MSBTE), GNM (MSBNPE), XI, XII, ARTS, COMMERCE & SCIENCE (HSC BOARD, PUNE) AND PRE-PRIMARY, PRIMARY & SECONDARY EDUCATION (SSC/CBSE)

Certificate No	: **20IQFS37**		
Initial Registration Date	: 06/10/2020	Issuance Date	: 06/10/2020
Date of Expiry	: 05/10/2023		
1st Surve. Due	: 06/09/2021	2nd Surve. Due	: 06/09/2022

Director

IAS ACCREDITED Management Systems Certification Body MSCB-119

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

AQC MIDDLE EAST FZE.

Head Office: E1-1401 E Amber Gem Tower, Sheikh Khalifa Bin Zayed Road, 2, Ajman, UAE. e-mail: info@aqcworld.com,
Key Location: 403, Madhuban Building, 55, Nehru Place, New Delhi-110019, India.

**Validity of the Certificate is subject to successful completion of surveillance audit on or before of due date. In case surveillance audit is not allowed to be conducted, this certificate shall be suspended/withdrawn).*

Certificate Verification: Please Re-check the validity of certificate at http://www.aqcworld.com/certificates.aspx or www.aqcworld.com at Active Clients

Certificate of Registration

ISO 14001:2015

This is to Certify that
Environmental Management System of

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S EDUCATION CAMPUS

INSTITUTE OF COMPUTER & MANAGEMENT RESEARCH (MBA), COLLEGE OF PHARMACY (B. PHARM) INSTITUTE OF PHARMACY (D. PHARM), SCHOOL OF NURSING (GNM), DNYANBHAKTI JUNIOR COLLEGE (ACS) DNYANBHAKTI INTERNATIONAL SCHOOL.

GAT NO. 101/102, MOSHI ALANDI ROAD, DUDULGAON, PUNE- 412105, MAHARASHTRA, INDIA.

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ISO 14001:2015

for the following scope :

PROVISION OF EDUCATIONAL SERVICES IN MBA (SPPU), B.PHARM.(SPPU), D.PHARM.(MSBTE), GNM (MSBNPE), XI, XII, ARTS, COMMERCE & SCIENCE (HSC BOARD, PUNE) AND PRE-PRIMARY, PRIMARY & SECONDARY EDUCATION (SSC/CBSE)

Certificate No	: **20IEFE45**		
Initial Registration Date	: 06/10/2020	Issuance Date	: 06/10/2020
Date of Expiry	: 05/10/2023		
1st Surve. Due	: 06/09/2021	2nd Surve. Due	: 06/09/2022

Director

IAS ACCREDITED Management Systems Certification Body MSCB-119

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Hon. Mr. Vilasrao V. Lande (Ex. MLA)	Mr. Suddhir V. Mungase	Mr. Ajit Gavhane
President	Secretary	Treasurer

Cleaning Activities in RJSPM's Camps

Automatic Rain Guage machine (ARG)

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Hon. Mr. Vilasrao V. Lande (Ex. MLA)	Mr. Suddhir V. Mungase	Mr. Ajit Gavhane
President	Secretary	Treasurer

Automatic rain gauge system installation

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Hon. Mr. Vilasrao V. Lande (Ex. MLA) President | Mr. Suddhir V. Mungase Secretary | Mr. Ajit Gavhane Treasurer

पुढारी

डुडुळगावात स्वयंचलित पर्जन्यमापक यंत्र

तापमान, पर्जन्यमानाची मिळणार माहिती

पुण्य नगरी

राजमाता संकुलामध्ये बसविले स्वयंचलित पर्जन्यमापक

प्रभात

'राजमाता'च्या डुडुळगाव संकुलात स्वयंचलित पर्जन्यमापक यंत्र

पुढारी

डुडुळगाव संकुलामध्ये हवामान विभागाचे स्वयंचलित पर्जन्यमापक यंत्र

ARG Installation news

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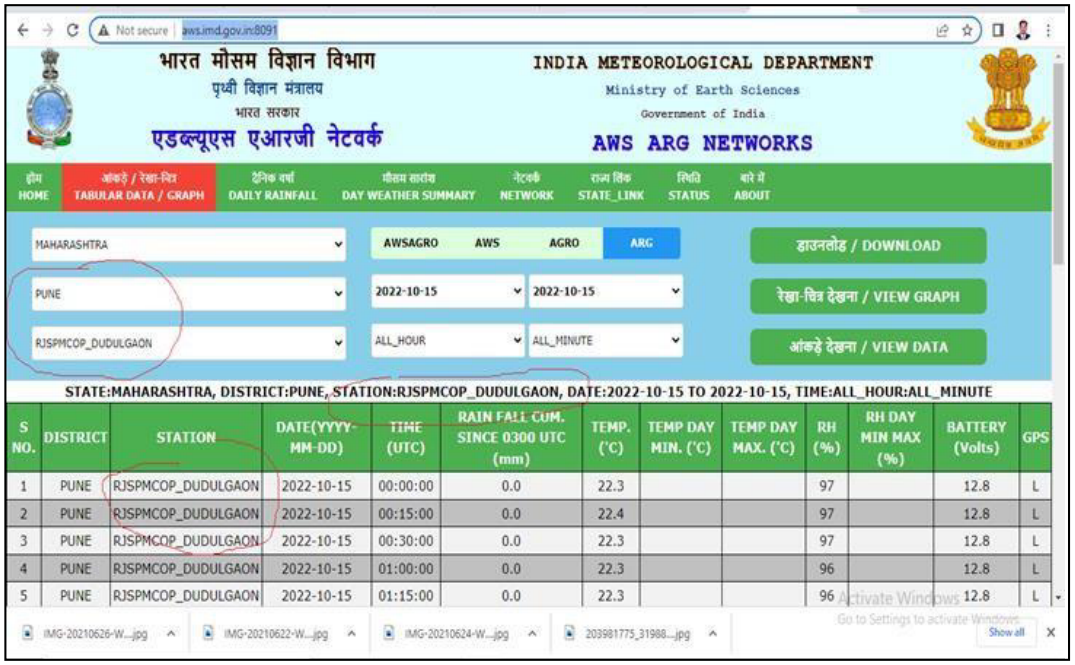
Hon. Mr. Vilasrao V. Lande (Ex. MLA) President | Mr. Suddhir V. Mungase Secretary | Mr. Ajit Gavhane Treasurer



Screenshot of IMD website

Indian Meteorological Department's Automatic Rain Guage machine (ARG) has been installed by the Indian Meteorological Department in Dudulgaon Educational Complex. Information about temperature, humidity and prejudice in the area will be seen on the website of the weather department.

Automatic Rain Guage machine was installed at Rajmata Jijau Educational Complex under the guidance of Hon. Dr. Hosalikar, Scientist IMD Pune department run by the Ministry ofEarth Science. This machine was inaugurated by Principal of College of Pharmacy.

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This real- time weather information will be useful for all factors such as district government institutions, disaster management, students, weather forecasting, as well as agriculture sector.

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