VASANTDADA SUGAR INSTITUTE

MANJARI BK, TALUKA HAVELI, DISTRICT PUNE-412 307

https://www.vsisugar.com

Criterion 7 - Institutional Values and Best Practices

7.1 Institutional Values and Social Responsibilities

7.1.6 - Quality audits on environment and energy are regularly undertaken by the institution

Reports on Energy, Environmental and Green audits submitted by the auditing agency

Report of Energy Audit (2023-24) received from Engress Services, Pune

ENERGY AUDIT REPORT

VASANDADA SUGAR INSTITUTE,

Manjari Budruk, Taluka: Haveli, District: Pune 412 307

संशोधनेन संवृद्धिः

Year: 2023-24

Prepared by:

ENGRESS SERVICES

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

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Principal
Vasantdada Sugar Institute
Manjari (Bk.), Tal. Haveli,
Dist. Pune - 412 307

REGISTRATION CERTIFICATES: BEE, UDYAM, MEDA, ISO-9001 & 14001:

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)

Regn. No. EA-8192 — No. 2942

National Productivity Council
(National Certifying Agency)
PROVISIONAL CERTIFICATE

This is to certify that Mr. / Ms. *Achyut Yashavant Mehendale*
son / daughter of Mr. *Yashavant*
has passed the National Certification Examination for Energy Auditors in April - 2007, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.

He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.

He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency.

Place : Chennai, India
Date : 10th August 2007

Controller of Examination

भारत सरकार
Government of India
सूक्ष्म, लघु एवं मध्यम उद्यम मंत्रालय
Ministry of Micro, Small and Medium Enterprises

UDYAM REGISTRATION CERTIFICATE

UDYAM REGISTRATION NUMBER	UDYAM-MH-26-0135636
NAME OF ENTERPRISE	ENGRESS SERVICES

TYPE OF ENTERPRISE *

SNo.	Classification Year	Enterprise Type	Classification Date
1	2023-24	Micro	03/02/2024
2	2022-23	Micro	26/06/2022
3	2021-22	Micro	27/07/2021

MAJOR ACTIVITY: SERVICES

SOCIAL CATEGORY OF ENTREPRENEUR: GENERAL

NAME OF UNIT(S)

S.No.	Name of Unit(s)
1	Engress Services

OFFICAL ADDRESS OF ENTERPRISE

Flat/Door/Block No.	26	Name of Premises/ Building	Yashashree
Village/Town	Pune	Block	1
Road/Street/Lane	Lokmanya Nagar,Nirmal Baug Soc	City	Pune
State	MAHARASHTRA	District	PUNE , Pin 411009
Mobile	8767447244	Email:	engress123@gmail.com

DATE OF INCORPORATION / REGISTRATION OF ENTERPRISE: 13/04/2021

DATE OF COMMENCEMENT OF PRODUCTION/BUSINESS: 13/04/2021

NATIONAL INDUSTRY CLASSIFICATION CODE(S)

SNo.	NIC 2 Digit	NIC 4 Digit	NIC 5 Digit	Activity
1	70 - Activities of head offices; management consultancy activities	7020 - Management consultancy activities	70200 - Management consultancy activities	Services

DATE OF UDYAM REGISTRATION: 27/07/2021

Certificate of Registration

This is to Certify that
Environmental Management System of

ENGRESS SERVICES

26, YASHASHREE, BLOCK 1, LOKMANYA NAGAR, NIRMAL BAUG SOC, PARVATI, PUNE- 411009, MAHARASHTRA, INDIA

has been assessed and found to conform to the requirements of
ISO 14001:2015
for the following scope :

CONSULTANCY SERVICES FOR ENERGY AUDIT, GREEN AUDIT & ENVIRONMENTAL AUDIT IN EDUCATIONAL INSTITUTIONS & SUBMISSION OF AUDIT CERTIFICATE AND REPORT.

Certificate No : 23EEKW20
Initial Registration Date : 29/03/2023 — Issuance Date : 29/03/2023
Date of Expiry : 28/03/2026
1st Surve. Due : 29/02/2024 — 2nd Surve. Due : 28/02/2025

EGAC Accredited QMS Certification CAB # 113005 — IAF

Director

Magnitude Management Services Pvt. Ltd.
B-55, Lower Ground Floor, Sector 02, Noida-201301, U.P. India
e-mail: info@mmscertification.com, website: www.mmscertification.com

---

Certificate of Registration

This is to Certify that
Quality Management System of

ENGRESS SERVICES

26, YASHASHREE, BLOCK 1, LOKMANYA NAGAR, NIRMAL BAUG SOC, PARVATI, PUNE- 411009, MAHARASHTRA, INDIA

has been assessed and found to conform to the requirements of
ISO 9001:2015
for the following scope :

CONSULTANCY SERVICES FOR ENERGY AUDIT, GREEN AUDIT & ENVIRONMENTAL AUDIT IN EDUCATIONAL INSTITUTIONS & SUBMISSION OF AUDIT CERTIFICATE AND REPORT.

Certificate No : 23EQKC13
Initial Registration Date : 27/03/2023 — Issuance Date : 27/03/2023
Date of Expiry : 26/03/2026
1st Surve. Due : 27/02/2024 — 2nd Surve. Due : 27/02/2025

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Magnitude Management Services Pvt. Ltd.
B-55, Lower Ground Floor, Sector 02, Noida-201301, U.P. India
e-mail: info@mmscertification.com, website: www.mmscertification.com

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SEAL OF THE VASANTDADA SUGAR INSTITUTE PUNE — VSI

Principal
Vasantdada Sugar Institute
Manjari (Bk.), Tal. Haveli,
Dist. Pune - 412 307

INDEX

SEAL OF THE VASANTDADA SUGAR INSTITUTE PUNE

Principal
Vasantdada Sugar Institute
Manjari (Bk.), Tal. Haveli,
Dist. Pune - 412 307

ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Vasantdada Sugar Institute, Manjari Budruk, Taluka: Haveli, District: Pune, for awarding us the assignment of Energy Audit of their Campus for the Year: 2023-24.

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

SEAL OF THE VASANTDADA SUGAR INSTITUTE, PUNE

Principal
Vasantdada Sugar Institute
Manjari (Bk.), Tal. Haveli,
Dist. Pune - 412 307

EXECUTIVE SUMMARY

1. Vasantdada Sugar Institute Manjari Budruk, Taluka: Haveli, District: Pune consumes Energy in the form of **Electrical Energy; us**ed for various Electrical Equipment.

2. Present Connected Load & Energy Consumption:

No	Particulars	Value	Unit
1	Total Connected Load	**1342.3**	kW
2	Annual Energy Purchased	**279131**	kWh

3. Per Capita Energy Consumption:

No	Particulars	Value	Unit
1	Total Annual Energy Purchased	**279131**	kWh
2	Annual Energy Generated	**1089421**	kWh
3	Energy Exported	**350851**	kWh
4	Net Energy Consumed=1+2-3	**107701**	kWh
5	No of students studying in the Institute	**3100**	No
6	Per Capita Energy Consumption **= (4) / (5)**	**328.29**	kWh/Annum

4. Study of % Usage of LED Lighting:

No	Particulars	Value	Unit
1	% of Usage of LED Lighting to Total Lighting Load	**84.30**	%

5. Renewable Energy & Energy Efficiency Projects:

- Usage of Energy Efficient LED fittings
- Installation of **800 kWp** Roof Top Solar PV Plant
- Installation of Solar Thermal Water Heating System

6. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.93 Kg of CO_2** into atmosphere
2. CO_2 Emission is computed based on Electrical Purchased

7. References:

- Audit Methodology: www.mahaurja.com
- Energy Conservation Building Code: ECBC-2017: www.beeindia.gov.in
- For CO_2 Emissions: www.ccd.gujarat.gov.in

SEAL OF THE VASANTDADA SUGAR INSTITUTE PUNE

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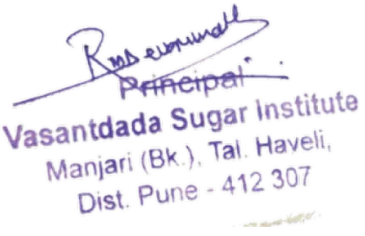
ABBREVIATIONS

LED	:	Light Emitting Diode
MSEDCL	:	Maharashtra State Electricity Distribution Company Limited
IQAC	:	Internal Quality Assurance Cell
BEE	:	Bureau of Energy Efficiency
FTL	:	Fluorescent Tube Light
CFL	:	Compact Fluorescent Light
PV	:	Photo Voltaic
Kg	:	Kilo Gram
kWh	:	kilo-Watt Hour
CO_2	:	Carbon Di Oxide
MT	:	Metric Ton



CHAPTER-I
INTRODUCTION

1.1 Introduction:

An Energy Audit is conducted at Vasantdada Sugar Institute, Manjari Budruk, Taluka: Haveli, District: Pune.

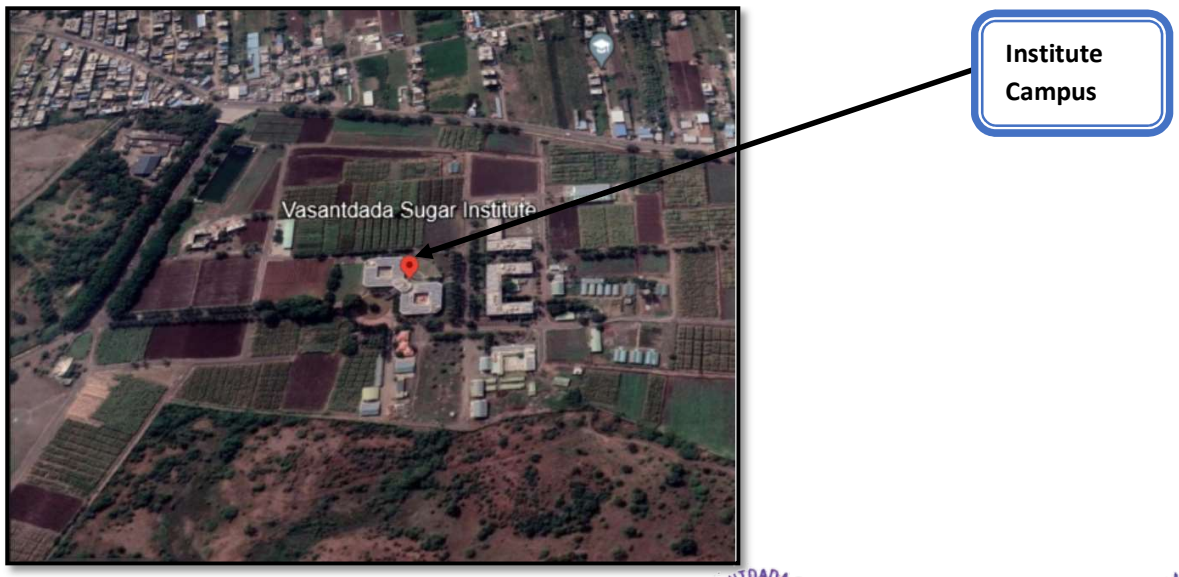
The guidelines followed for conducting the Energy Audit are:

- BEE India's Energy Conservation Building Code: ECBC-2017
- Maharashtra Energy Development Agency (www.mahaurja.com)
- Tata Power: www.tatapower.com

1.2 Key Study Points:

No	Particulars
1	Study of Present Connected Load
2	Study of Present Energy Consumption
3	Study of Per Capita Energy Consumption
4	Study of Lighting
5	Study of Energy Efficiency & Renewable Energy

1.3 Institute Location Image:



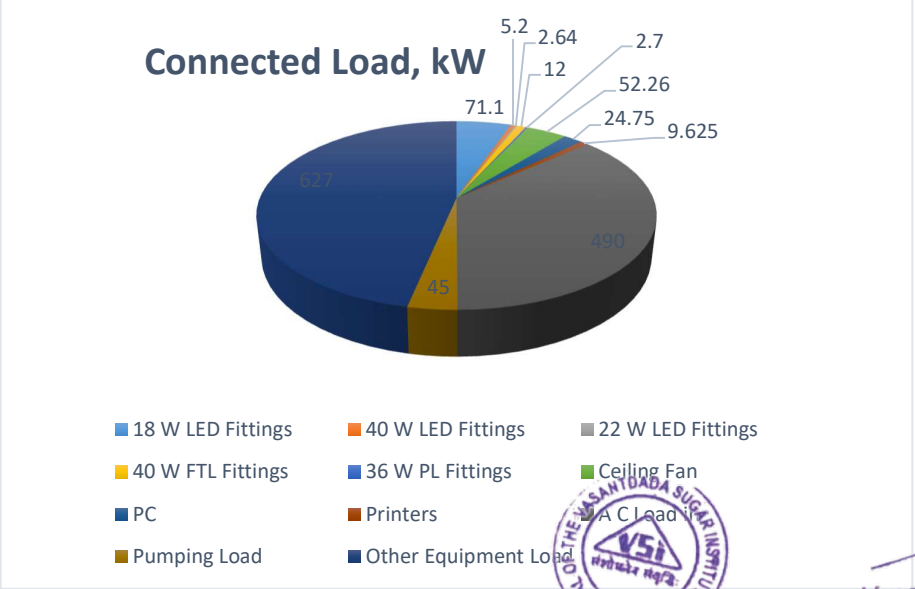
CHAPTER-II
STUDY OF CONNECTED LOAD

The major contributors to the connected load of the Institute include:

Table No 1: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load, W/unit	Load, kW
1	18 W LED Fittings	3950	18	71.1
2	40 W LED Fittings	130	40	5.2
3	22 W LED Fittings	120	22	2.64
4	40 W FTL Fittings	300	40	12
5	36 W PL Fittings	75	36	2.7
6	Ceiling Fan	804	65	52.26
7	PC	165	150	24.75
8	Printers	55	175	9.625
9	A C Load in	490000	1	490
10	Pumping Load	45000	1	45
11	Other Equipment Load	627000	1	627
12	**Total**			**1342.3**

Chart No 1: Study of Connected Load:



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Dist. Pune - 412 307

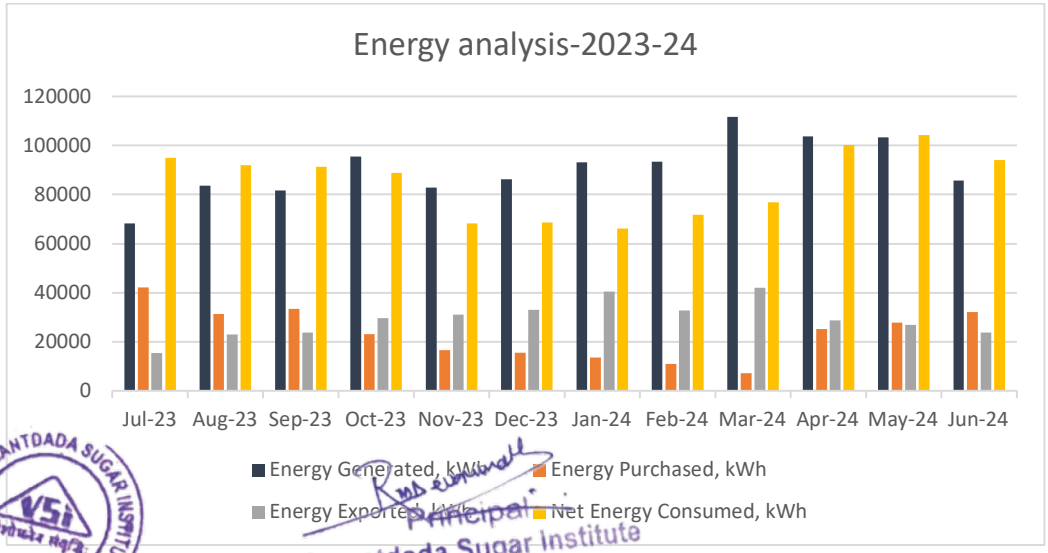
CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Electrical Energy Consumption.

Table No 2: Electrical Energy Purchase Analysis:2023-24:

No	Month	Energy Purchased, kWh=(1)	Energy Generated, kWh=(2)	Energy Exported, kWh=(3)	Net Energy Consumed, kWh= =1+2-3	CO_2 Emissions, MT
1	Jul-23	68316	42188	15434	95070	39.23
2	Aug-23	83564	31344	23001	91907	29.15
3	Sep-23	81713	33518	23840	91391	31.17
4	Oct-23	95471	23129	29671	88929	21.51
5	Nov-23	82940	16521	31138	68323	15.36
6	Dec-23	86291	15539	33166	68664	14.45
7	Jan-24	93118	13562	40423	66257	12.61
8	Feb-24	93483	10997	32705	71775	10.23
9	Mar-24	111747	7187	42006	76928	6.68
10	Apr-24	103681	25230	28703	100208	23.46
11	May-24	103373	27784	26921	104236	25.84
12	Jun-24	85724	32132	23843	94013	29.88
13	Total	1089421	279131	350851	1017701	259.59
14	Maximum	111747	42188	42006	104236	39.23
15	Minimum	68316	7187	15434	66257	6.68
16	Average	90785.08	23260.92	29237.58	84808.4	21.63

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



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CHAPTER-IV
STUDY OF PER CAPITA ENERGY CONSUMPTION

Per Capita Energy Consumption Index: Per Capita Energy Consumption Index of an educational Institute/Institute is its Annual Energy Consumption in Kilo Watt Hours per student studying in the Institute/Institute.

It is determined by:

$$\text{Per Capita Energy Consumption Index} = \frac{\text{Annual Energy Consumption in kWh}}{\text{Total No of students studying}}$$

Table No 3: Computation of Energy Performance Index:

No	Particulars	Value	Unit
1	Total Annual Energy Purchased	**279131**	kWh
2	Annual Energy Generated	**1089421**	kWh
3	Energy Exported	**350851**	kWh
4	Net Energy Consumed=1+2-3	**107701**	kWh
5	No of students studying in the Institute	**3100**	No
6	Per Capita Energy Consumption **= (4) / (5)**	**328.29**	kWh/Annum

SEAL OF THE VASANTDADA SUGAR INSTITUTE, PUNE

Principal
Vasantdada Sugar Institute
Manjari (Bk.), Tal. Haveli,
Dist. Pune - 412 307

CHAPTER-V
STUDY OF LIGHTING

Terminology:

1. Lumen is a unit of light flow or luminous flux. The lumen rating of a lamp is a measure of the total light output of the lamp. The most common measurement of light output (or luminous flux) is the lumen. Light sources are labeled with an output rating in lumens.

2. Lux is the metric unit of measure for illuminance of a surface. One lux is equal to one lumen per square meter.

3. Circuit Watts is the total power drawn by lamps and ballasts in a lighting circuit under assessment.

4. Installed Load Efficacy is the average maintained illuminance provided on a horizontal working plane per circuit watt with general lighting of an interior. Unit: lux per watt per square metre (lux/W/m²)

5. Lamp Circuit Efficacy is the amount of light (lumens) emitted by a lamp for each watt of power consumed by the lamp circuit, i.e. including control gear losses. This is a more meaningful measure for those lamps that require control gear. Unit: lumens per circuit watt (lm/W)

6. Lighting Power Density: It is defined as Total Lighting Load in a room divided by the Area of that Room in square meters.

In this Chapter we compute the Lighting Power density and the percentage usage of LED Lighting to total Lighting Load of the Institute.

Table No 4: Percentage Usage of LED Lighting to Total Lighting Load:

No	Particulars	Value	Unit
1	No of 18 W LED Fittings	3950	Nos
2	Load of 18 W LED fitting	18	W/unit
3	Total Load of 18 W LED Fittings	**71.1**	kW
4	No of 22 W LED Fittings	120	Nos
5	Load of 22 W LED fitting	22	W/unit
6	Total Load of 22 W LED Fittings	**2.64**	kW
7	No of 40 W LED Fittings	130	Nos

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8	Load of 40 W LED fitting	40	W/unit
9	Total Load of 40 W LED Fittings	**5.2**	kW
10	No of 40 W FTL Fittings	300	Nos
11	Load of 40 W FTL fitting	40	W/unit
12	Total Load of 40 W FTL Fittings	**12**	kW
13	No of 36 W PL Fittings	75	Nos
14	Load of 36 W PL fitting	36	W/unit
15	Total Load of 36 W PL Fittings	**2.7**	kW
16	Total LED Lighting Load=3+6+9	**78.94**	kW
17	Total Lighting Load=3+6+9+12+15	**93.64**	kW
18	% of LED to Total Lighting Load=16*100/17	**84.30**	%

SEAL OF THE VASANTDADA SUGAR INSTITUTE PUNE

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Vasantdada Sugar Institute
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Report of Enviornmental Audit (2023-24) recived from Engress Services, Pune

CHAPTER-VI
STUDY OF RENEWABLE ENERGY & ENERGY EFFICIENCY

6.1 Usage of Renewable Energy:

The Institute has installed Roof Top Solar PV Plant of Capacity **800 kWp &** Solar Thermal Water Heating System.

Photograph of Roof Top Solar PV Plant Solar Water Heater:

6.2 Energy Efficiency Measures adopted:

- The Institute has Energy Efficient LED Fittings.
- Usage of BEE STAR Rated Equipment

Photograph of LED Lighting & STAR Rated AC:

Vasantdada Sugar Institute
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ENVIRONMENTAL AUDIT REPORT

VASANDADA SUGAR INSTITUTE,

Manjari Budruk, Taluka: Haveli, District: Pune 412 307

Year: 2023-24

Prepared by:

ENGRESS SERVICES

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

SEAL OF THE VASANTDADA SUGAR INSTITUTE PUNE

Principal
Vasantdada Sugar Institute
Manjari (Bk.), Tal. Haveli,
Dist. Pune - 412 307

ENGRESS SERVICES PUNE

Registration Certificates: UDYAM, MEDA, ASSOCHAM GEM-CP, ISO: 9001 & 14001:

भारत सरकार
Government of India
सूक्ष्म, लघु एवं मध्यम उद्यम मंत्रालय
Ministry of Micro, Small and Medium Enterprises

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MAJOR ACTIVITY: SERVICES

SOCIAL CATEGORY OF ENTREPRENEUR: GENERAL

NAME OF UNIT(S)

S.No.	Name of Unit(s)
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DATE OF COMMENCEMENT OF PRODUCTION/BUSINESS: 13/04/2021

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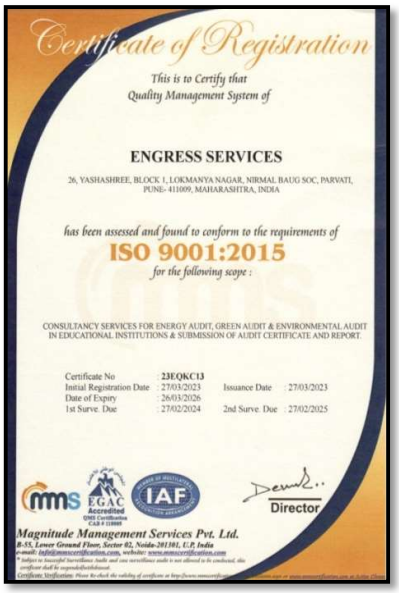
DATE OF UDYAM REGISTRATION: 27/07/2021



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

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Name and Address of the firm : M/s Engress Services
Yashshree, 26, Nirmal Bag Society,
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Registration Number : *MEDA/ECN/2022-23/Class A/EA-32.*

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General Manager (EC)

SEAL OF THE VASANTDADA SUGAR INSTITUTE PUNE

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

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Dist. Pune - 412 307

EXECUTIVE SUMMARY

1. Vasantdada Sugar Institute Manjari Budruk, Taluka: Haveli, District: Pune, consumes Energy in the form of **Electrical Energy; us**ed for various Electrical Equipment.

2. Pollution due to Institute Activities:

- **Air pollution:** Mainly CO_2 on account of Electricity Consumption
- **Solid Waste:** Bio degradable Garden Waste, Paper & Plastic Waste
- **Liquid Waste:** Human liquid waste

3. Present Energy Consumption & CO_2 Emission:

No	Particulars	Value	Unit
1	Annual Energy Purchased	**279131**	kWh
2	Annual CO_2 Emissions	**259.59**	MT

4. Renewable Energy & Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Solar PV Plant Capacity	**800**	kWp
2	Energy Generated by Solar PV Plant in 23-24	**1089421**	kWh
3	Reduction in Annual CO_2 Emissions	**1013.16**	MT

5. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	**76**	**45**	**56**
2	Minimum	**70**	**40**	**50**

6. Indoor Lux & Noise Level Parameters:

No	Parameter/Value	Lux Level	Noise Level, dB
1	Maximum	**265**	**47.5**
2	Minimum	**238**	**42**

7. Waste Management:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source
2	Organic Waste	Bio Composting Unit installed
3	Liquid Waste	Septic Tank installed & cleaned periodically
4	Sanitary Waste	Recommended to install Sanitary Waste Incinerator

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8. Rain Water Management:

The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is stored in an Open well and is further used for watering the farm.

9. Environment Friendly Initiatives:

- Tree Plantation in the campus.
- Creation of Awareness on Water Conservation by Display of Poster

10. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.93 Kg of CO_2** into atmosphere
2. CO_2 Emission is computed based on Electrical Purchased

11. References:

- For CO_2 Emissions: www.ccd.gujarat.gov.in
- For Various Indoor Air Parameters: www.ishrae.com
- For AQI & Water Quality Standards: www.cpcb.com

Principal
Vasantdada Sugar Institute
Manjari (Bk.), Tal. Haveli,
Dist. Pune - 412 307

ABBREVIATIONS

Kg	:	Kilo Gram
MSEDCL	:	Maharashtra State Distribution Company Limited
MT	:	Metric Ton
kWh	:	kilo-Watt Hour
LPD	:	Liters per Day
LED	:	Light Emitting Diode
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
ISHRAE	:	The Indian Society of Heating & Refrigerating & Air Conditioning Engineers

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CHAPTER-I
INTRODUCTION

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

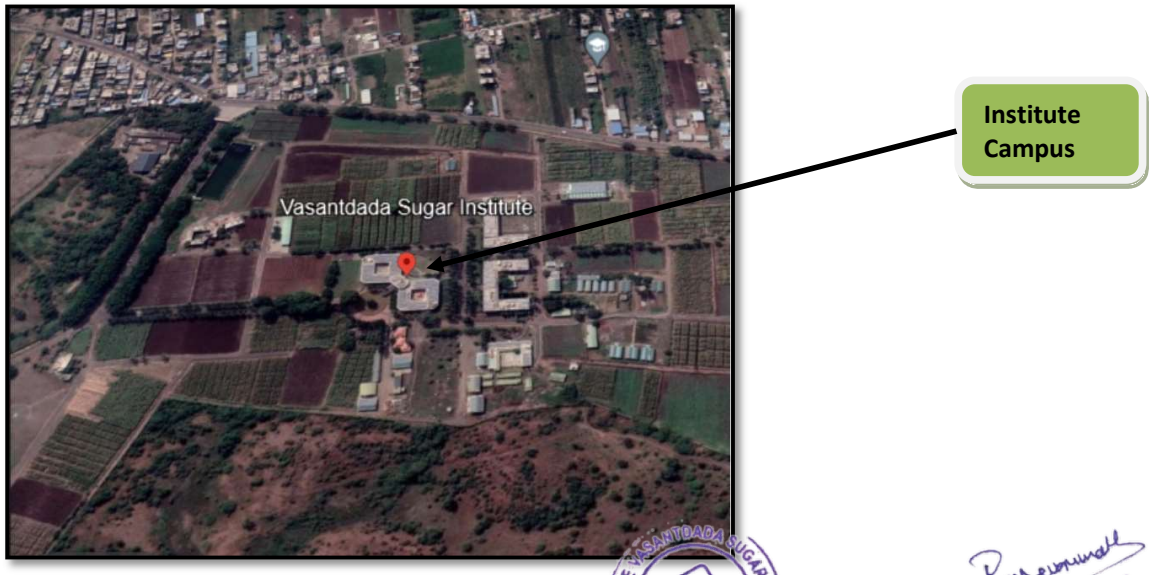
1.1.2 Environmental Audit: Definition:

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

1.3 Key Study Points:

No	Particulars
1	Study of Present Resource Consumption & CO_2 Emission
2	Study of Usage of Renewable Energy
3	Study of Indoor Air Quality
4	Study of Indoor Lux & Noise Level
5	Study of Water Management
6	Study of Waste Management Practices
7	Study of Environment Friendly Practices

1.4 Institute Location Image:



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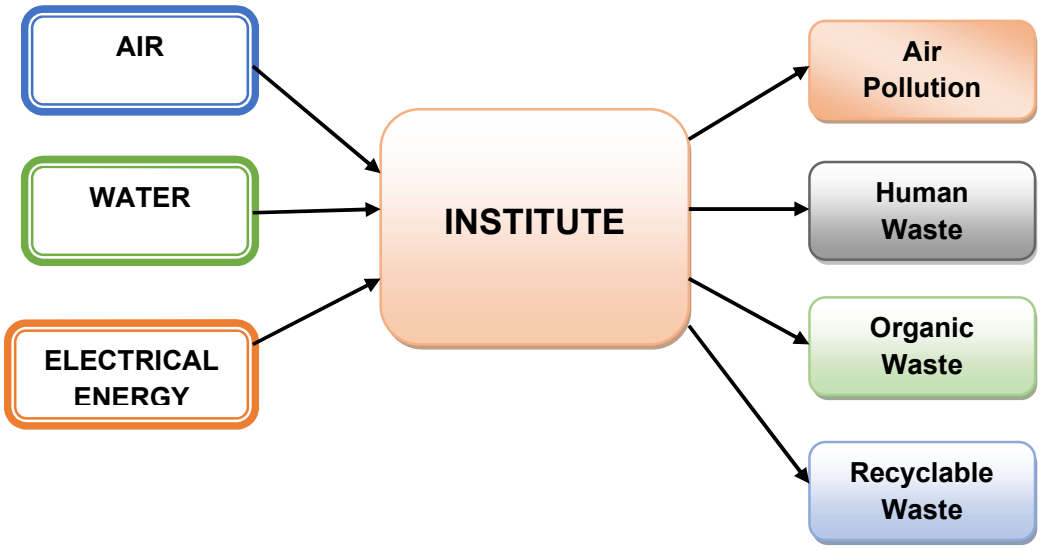
CHAPTER-II
STUDY OF RESOURCE CONSUMPTION & CO_2 EMISSION

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: Representation of Resource Requirement & Waste of a Institute:



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.

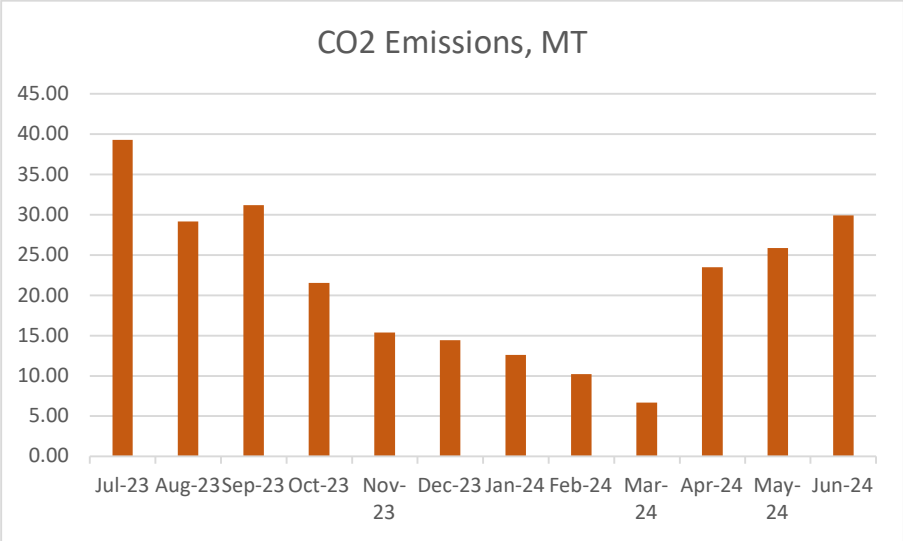
- **1 kWh** of Electrical Energy releases **0.93 Kg of CO_2** into atmosphere

Table No 1: Study of Purchase of Energy & CO_2 Emissions: 23-24:

No	Month	Energy Purchased, kWh=(1)	Energy Generated, kWh=(2)	Energy Exported, kWh=(3)	Net Energy Consumed, kWh= =1+2-3	CO_2 Emissions, MT
1	Jul-23	68316	42188	15434	95070	39.23
2	Aug-23	83564	31344	23001	91907	29.15
3	Sep-23	81713	33518	23840	91391	31.17
4	Oct-23	95471	23129	29671	88929	21.51
5	Nov-23	82940	16521	31138	68323	15.36
6	Dec-23	86291	15539	33166	68664	14.45
7	Jan-24	93118	13562	40423	66257	12.61
8	Feb-24	93483	10997	32705	71775	10.23

9	Mar-24	111747	7187	42006	76928	6.68
10	Apr-24	103681	25230	28703	100208	23.46
11	May-24	103373	27784	26921	104236	25.84
12	Jun-24	85724	32132	23843	94013	29.88
13	Total	1089421	279131	350851	1017701	259.59
14	Maximum	111747	42188	42006	104236	39.23
15	Minimum	68316	7187	15434	66257	6.68
16	Average	90785.08	23260.92	29237.58	84808.4	21.63

Chart No 2: Month wise CO_2 Emissions:



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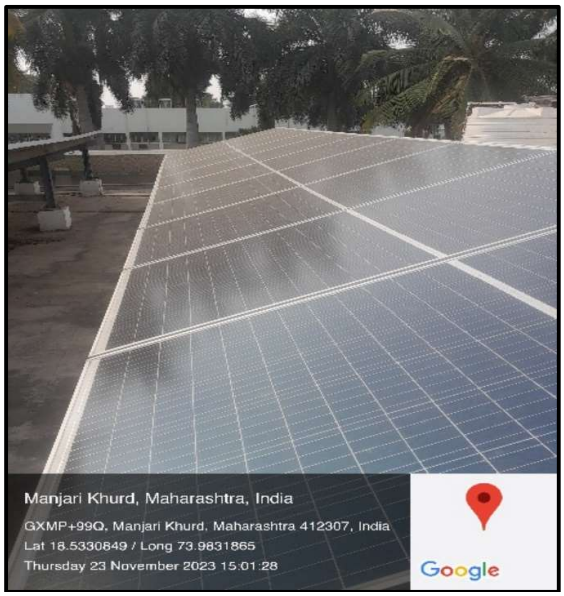
CHAPTER III
STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has installed Roof Top Solar PV Plant of Capacity **800 kWp**
In the following Table, we present the reduction in CO_2 emissions due to Solar Energy:

Table No 2: Computation of Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	800	kWp
2	Energy Generated in the Year: 2023-24	1089421	4 kWh
3	1 kWh of Electrical Energy saves	**0.93**	Kg/kWh
4	**Qty of CO_2 Saved by Solar PV Plant =(2)*(3) /1000**	**1013.16**	**MT of CO_2**

Photograph of Roof Top Solar PV Plant:



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CHAPTER IV
STUDY OF INDOOR AIR QUALITY

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

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

3. Air Quality Index: Air Quality Index (AQI) is a number used by government agencies to measure the **Air Pollution** levels and communicate it to the population.

In this Chapter, we present three important Parameters: **AQI**- Air Quality Index, **PM-2.5**- Particulate Matter of Size 2.5 micron and **PM-10**- Particulate Matter of Size 10 micron

Table No 3: Indoor Air Quality Parameters:

No	Location	AQI	PM2.5	PM10
1	Registrar Office	73	43	54
2	Admin Office	76	45	56
3	Class Room	70	42	53
4	Engineering Section	75	44	55
5	Alcohol Tech Section	71	40	50
	Maximum	**76**	**45**	**56**
	Minimum	**70**	**40**	**50**

Table No 4: Air Quality Index Values & Concentration of PM 2.5 & PM10: (By CPCB):

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 +

Conclusion:

From the above measured values, we conclude that the observed values of AQI, PM-2.5 & PM-10 are in the **Satisfactory Range**, as per the guidelines given by Central Pollution Control Board.

CHAPTER V
STUDY OF LUX & NOISE PARAMETERS

In this Chapter, we present the various Indoor Comfort Parameters measured during the Audit. The Parameters include: **Lux Level and Noise Level.**

Table No 5: Study of Indoor Comfort Condition Parameters:

No	Location	Lux Level	Noise Level, dB
1	Registrar Office	260	42.9
2	Admin Office	249	45
3	Class Room	265	47.5
4	Engineering Section	241	42
5	Alcohol Tech Section	238	46
	Maximum	**265**	**47.5**
	Minimum	**238**	**42**

Recommended Lux & Noise Level: As per BEE & ISHRAE Guidelines:

A) Noise Level Reference:		
No	**Location**	**Noise Level Range, dB**
1	Offices	45-50
2	Occupied Class Room	40-45
3	Libraries	35-40
B) Reference Lux Level, Lumens:		
1	For Class Rooms	**200 Plus**
2	For Reading Rooms	**200 Plus**

Conclusion:

From the above measured values, we conclude that:

- The Noise Level is within the prescribed Limit
- The Lux Level at various locations is Okay

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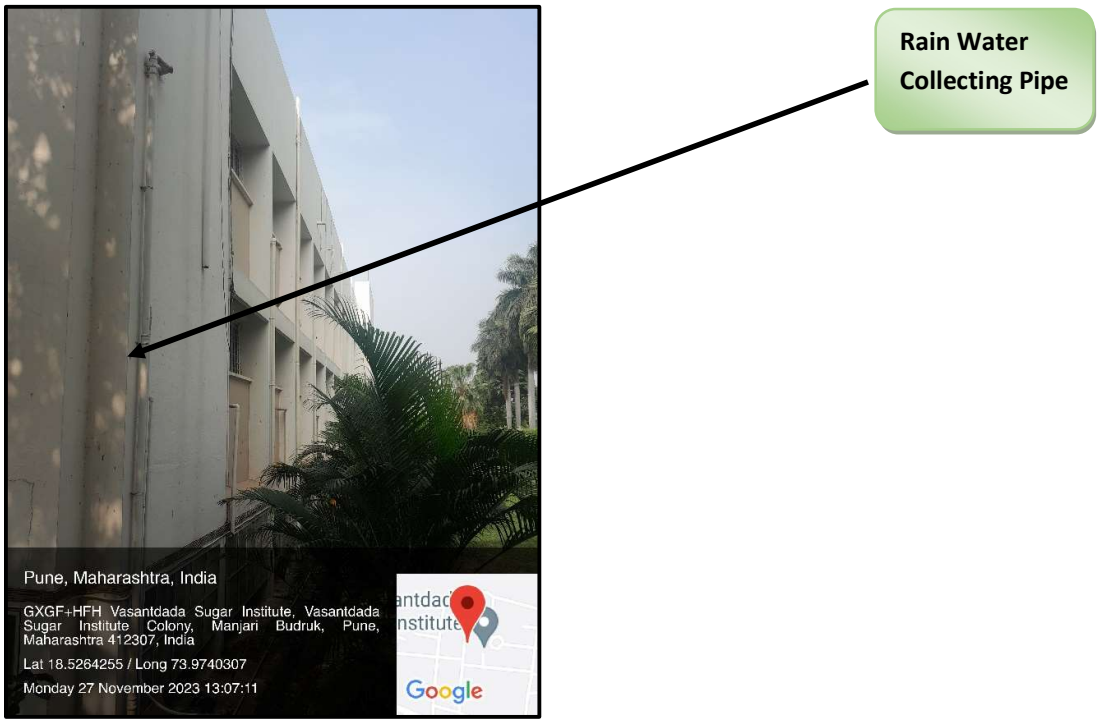
CHAPTER VI
STUDY OF RAIN WATER MANAGEMENT

The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is stored in an open well and is used for watering the farm.

Photograph of Rain water Collecting Pipe:



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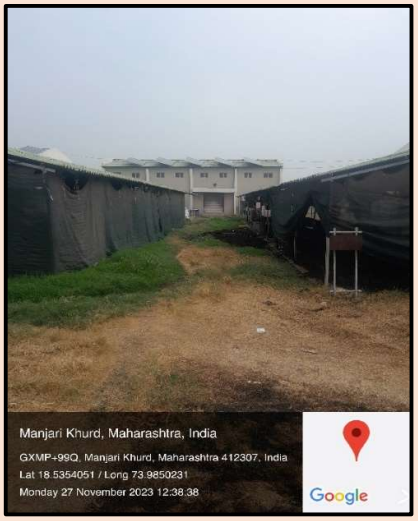
CHAPTER-VII
STUDY OF WASTE MANAGEMENT

In this Chapter, we present the Waste Management Practices, followed by the Institute.

Details of Waste Management Practices:

No	Head	Observation	Photograph
1	**Solid Waste**	Segregation of Waste at Source: Provision of Waste Collection Bins	**Waste Collection Bin** 
2	**Organic Waste**	The Institute has a Bio Composting Unit, for conversion of Organic Waste into Bio Compost.	**Bio Composting Unit:** 
3	**Liquid Waste**	The Institute has installed Septic Tanks and the tanks are cleaned periodically. .	
4	**Sanitary Waste**	It is recommended to install Sanitary Waste Incinerator	

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CHAPTER-VIII
STUDY OF ECO-FRIENDLY PRACTICES

In this Chapter, we present the Eco-Friendly Practices, followed by the Institute.

Details of Eco-Friendly Practices:

No	Head	Observation	Photograph
1	**Tree Plantation**	Tree Plantation in the Campus	**Internal Tree Plantation:** 
2	**Creation of Awareness among Stake Holders**	Display of Poster on Water Conservation	**Poster on Water Conservation:** 

Vasantdada Sugar Institute
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Report of Green Audit (2023-24) recived from Engress Services, Pune

GREEN AUDIT REPORT

VASANDADA SUGAR INSTITUTE,

Manjari Budruk, Taluka: Haveli, District: Pune 412 307

Year: 2023-24

Prepared by:

ENGRESS SERVICES

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

Vasantdada Sugar Institute
Manjari (Bk.), Tal. Haveli,
Dist. Pune - 412 307

Registration Certificates: UDYAM, MEDA, ASSOCHAM GEM-CP, ISO: 9001 & 14001:

भारत सरकार
Government of India
सूक्ष्म, लघु एवं मध्यम उद्यम मंत्रालय
Ministry of Micro, Small and Medium Enterprises

UDYAM REGISTRATION CERTIFICATE

UDYAM REGISTRATION NUMBER	UDYAM-MH-26-0135636
NAME OF ENTERPRISE	ENGRESS SERVICES

TYPE OF ENTERPRISE *

SNo.	Classification Year	Enterprise Type	Classification Date
1	2023-24	Micro	03/02/2024
2	2022-23	Micro	26/06/2022
3	2021-22	Micro	27/07/2021

MAJOR ACTIVITY: SERVICES

SOCIAL CATEGORY OF ENTREPRENEUR: GENERAL

NAME OF UNIT(S)

S.No.	Name of Unit(s)
1	Engress Services

OFFICAL ADDRESS OF ENTERPRISE

Flat/Door/Block No.	26	Name of Premises/ Building	Yashashree
Village/Town	Pune	Block	1
Road/Street/Lane	Lokmanya Nagar,Nirmal Baug Soc	City	Pune
State	MAHARASHTRA	District	PUNE , Pin 411009
Mobile	8767447244	Email:	engress123@gmail.com

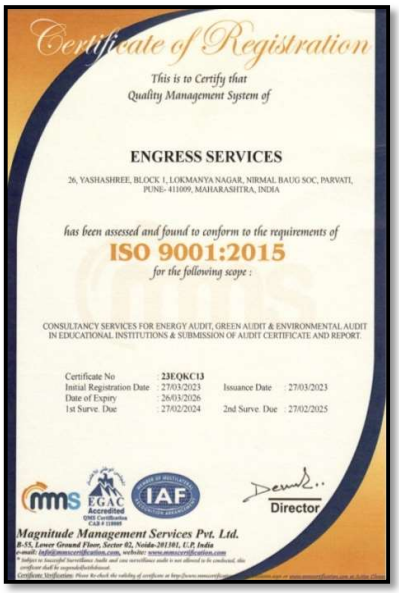
DATE OF INCORPORATION / REGISTRATION OF ENTERPRISE: 13/04/2021

DATE OF COMMENCEMENT OF PRODUCTION/BUSINESS: 13/04/2021

NATIONAL INDUSTRY CLASSIFICATION CODE(S)

SNo.	NIC 2 Digit	NIC 4 Digit	NIC 5 Digit	Activity
1	70 - Activities of head offices; management consultancy activities	7020 - Management consultancy activities	70200 - Management consultancy activities	Services

DATE OF UDYAM REGISTRATION: 27/07/2021



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)

THE VASANTDADA SUGAR INSTITUTE

Principal
Vasantdada Sugar Institute
Manjari (Bk.), Tal. Haveli,
Dist. Pune - 412 307

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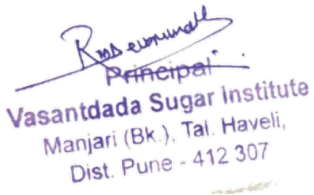
SEAL OF THE VASANTDADA SUGAR INSTITUTE PUNE

Principal
Vasantdada Sugar Institute
Manjari (Bk.), Tal. Haveli,
Dist. Pune - 412 307

ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Vasantdada Sugar Institute, Manjari Budruk, Taluka: Haveli, District: Pune 412 307, for awarding us the assignment of Green Audit of their Campus for the Year: 2023-24.

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



EXECUTIVE SUMMARY

1. Vasantdada Sugar Institute Manjari Budruk, Taluka: Haveli, District: Pune, consumes Energy in the form of **Electrical Energy; us**ed for various Electrical Equipment.

2. Present Energy Consumption & CO_2 Emission:

No	Particulars	Value	Unit
1	Annual Energy Purchased	**279131**	kWh
2	Annual CO_2 Emissions	**259.59**	MT

3. Usage of Renewable Energy & Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Solar PV Plant Capacity	**800**	kWp
2	Energy Generated by Solar PV Plant in 23-24	**1089421**	kWh
3	Reduction in Annual CO_2 Emissions	**1013.16**	MT

4. Waste Management:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source
2	Organic Waste	Bio Composting Unit installed
3	Liquid Waste	Septic Tank installed & cleaned periodically
4	Sanitary Waste	Recommended to install Sanitary Waste Incinerator

5. Rain Water Management:

The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is stored in an underground Tank and is further used for domestic purpose after treatment.

6. Green & Sustainable Practices:

- Maintenance of good Internal Road
- Tree Plantation in the campus.
- Provision of Ramp for Divyangajan
- Creation of Awareness on Water Conservation by Display of Poster

7. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.93 Kg of CO_2** into atmosphere
2. CO_2 Emission is computed based on Electrical Purchased

8. Reference:

- For CO_2 Emissions: www.ccd.gujarat.gov.in

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ABBREVIATIONS

BEE	Bureau of Energy Efficiency
kWh	Kilo Watt Hour
LPD	Liters Per Day
Kg	Kilo Gram
MT	Metric Ton
CO_2	Carbon Di Oxide
Qty	Quantity

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CHAPTER-I
INTRODUCTION

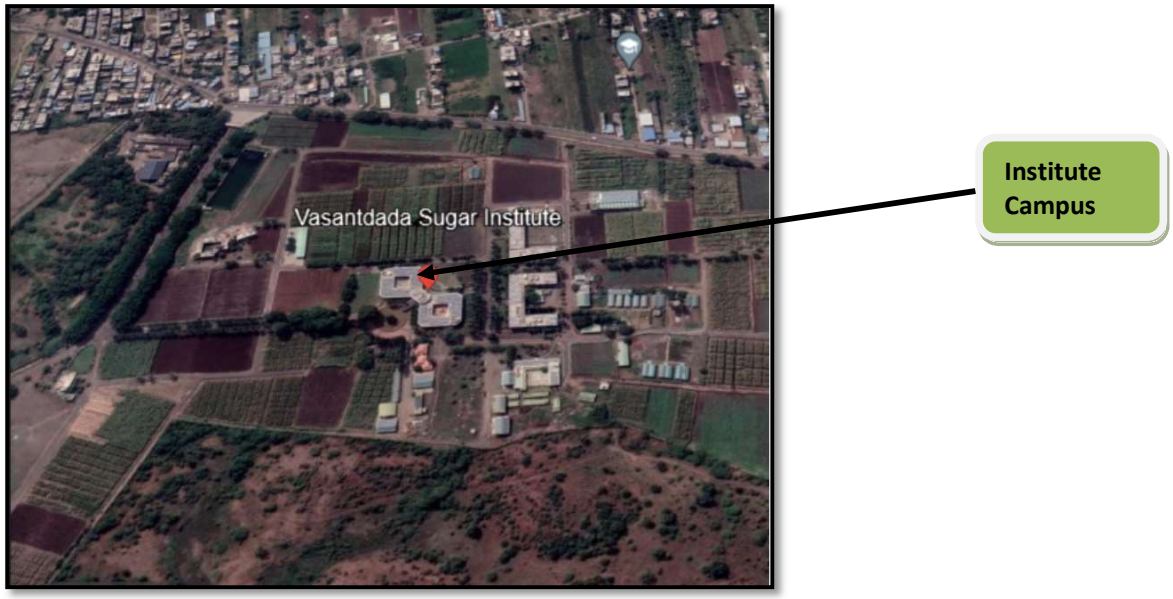
1.1 Introduction:

A Green Audit is conducted at Vasantdada Sugar Institute, Manjari Budruk, Taluka: Haveli, District: Pune.

1.2 Key Study Points:

No	Particulars
1	Study of Present Energy Consumption & CO_2 Emission
2	Study of Usage of Renewable Energy
3	Study of Waste Management Practices
4	Study of Rain Water Management
5	Study of Green & Sustainable Initiatives

1.3 Institute Location Image:



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CHAPTER-II
STUDY OF ENERGY CONSUMPTION & CO_2 EMISSION

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. **Basis for computation of CO_2 Emissions: 1 kWh** of Electrical Energy releases **0.93 Kg of CO_2** into atmosphere.

Table No 1: Month wise Energy Consumption & CO_2 Emissions:

No	Month	Energy Purchased, kWh=(1)	Energy Generated, kWh=(2)	Energy Exported, kWh=(3)	Net Energy Consumed, kWh= =1+2-3	CO_2 Emissions, MT
1	Jul-23	68316	42188	15434	95070	39.23
2	Aug-23	83564	31344	23001	91907	29.15
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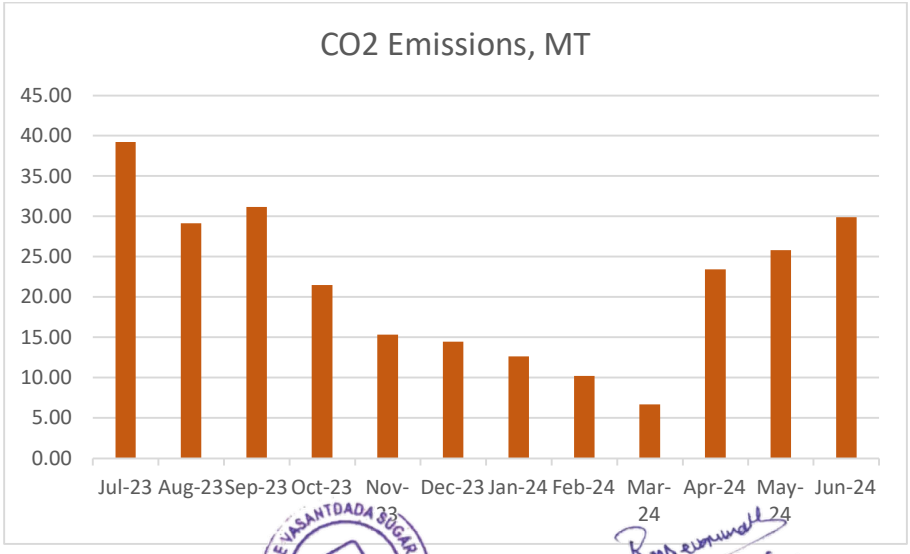
Chart No 1: Month wise CO_2 Emissions:



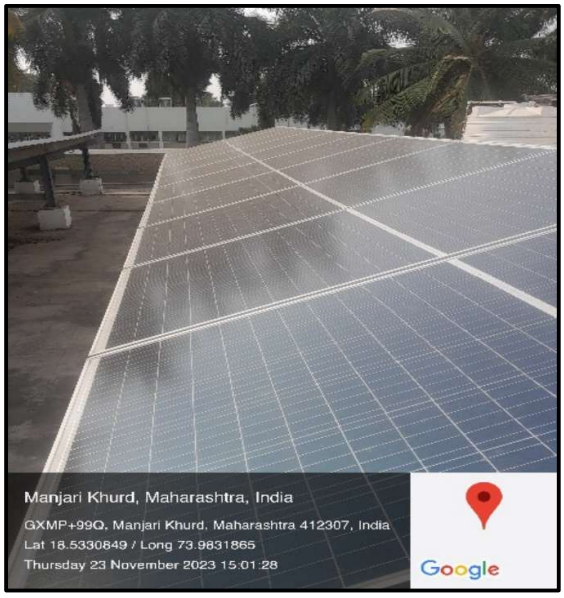
CHAPTER III
STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has installed Roof Top Solar PV Plant of Capacity **800 kWp**
In the following Table, we present the reduction in CO_2 emissions due to Solar Energy:

Table No 2: Computation of Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	800	kWp
2	Energy Generated in the Year: 2023-24	1089421	4 kWh
3	1 kWh of Electrical Energy saves	**0.93**	Kg/kWh
4	**Qty of CO_2 Saved by Solar PV Plant =(2)*(3) /1000**	**1013.16**	**MT of CO_2**

Photograph of Roof Top Solar PV Plant:



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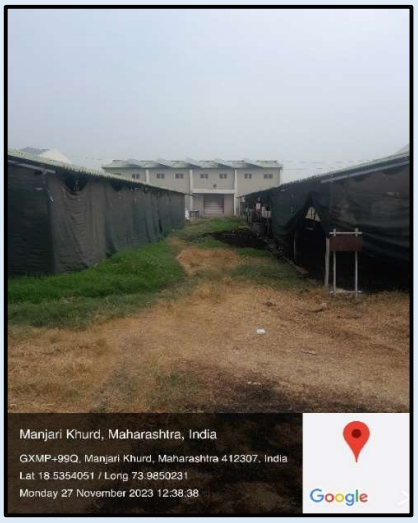
CHAPTER IV
STUDY OF WASTE MANAGEMENT

In this Chapter, we present the Waste Management Practices, followed by the Institute.

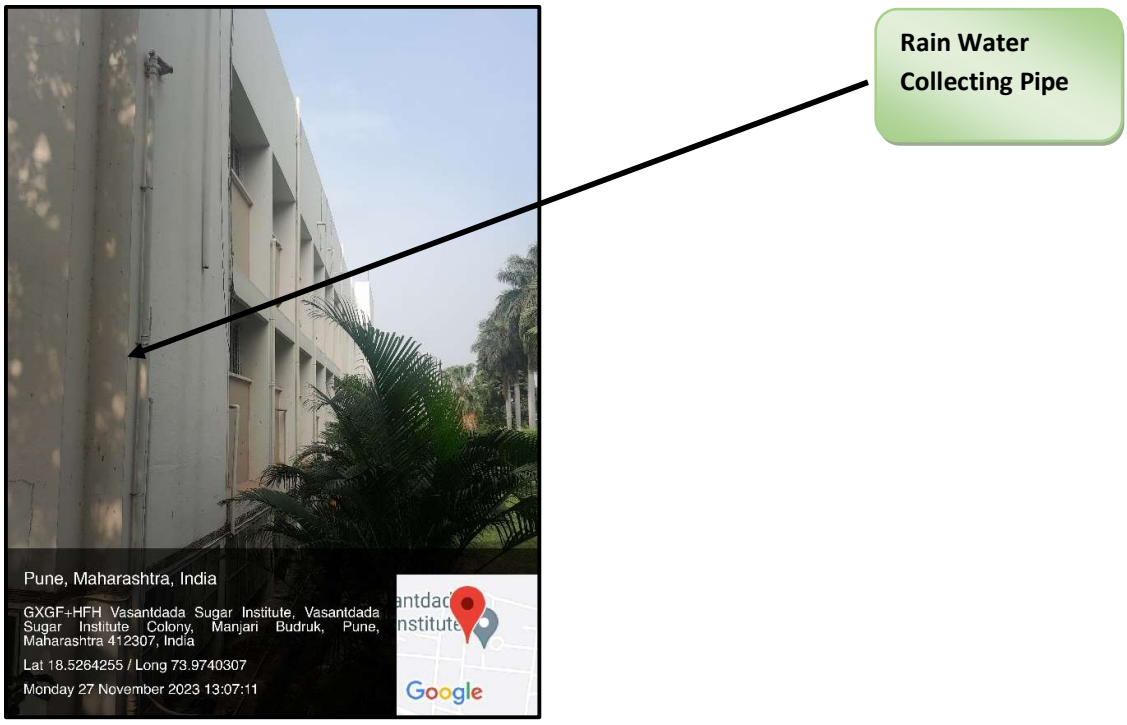
Details of Waste Management Practices:

No	Head	Observation	Photograph
1	**Solid Waste**	Segregation of Waste at Source: Provision of Waste Collection Bins	**Waste Collection Bin** 
2	**Organic Waste**	The Institute has a Bio Composting Unit, for conversion of Organic Waste into Bio Compost.	**Bio Composting Unit:** 
3	**Liquid Waste**	The Institute has installed Septic Tanks and the tanks are cleaned periodically.	
4	**Sanitary Waste**	It is recommended to install Sanitary Waste Incinerator	

CHAPTER-V
STUDY OF RAIN WATER MANAGEMENT

The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is stored in an open well and is used for watering the farm.

Photograph of Rain water Collecting Pipe:



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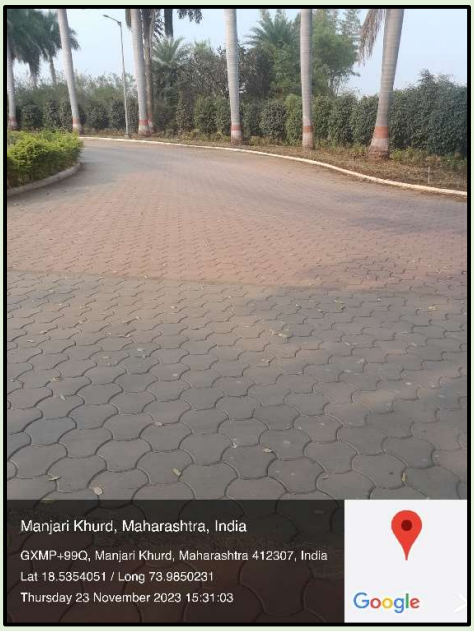
CHAPTER-VI
STUDY OF GREEN & SUSTAINABLE PRACTICES

In this Chapter, we present the Green & Sustainable Practices followed by the Institute.

Green & Sustainable Practices:

No	Head	Observation	Photograph
1	**Easy Movement of Stake Holders**	Provision of Good Internal Road within the Campus	**Internal Road:** 
2	**Tree Plantation**	Internal Tree Plantation in the Campus	**Internal Tree Plantation:** 

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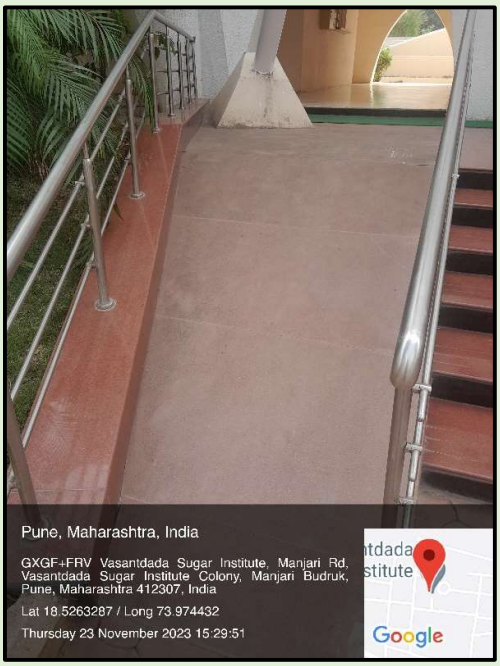
3	**Facilities for Divyangajan**	Provision of Ramp & Lift for Divyangajan	**Ramp for Divyangajan:** 
4	**Creation of Awareness among Stake Holders**	Display of Poster on Water Conservation	**Poster on Water Conservation:** 

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