

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

7.1.3 Quality audits on environment and energy regularly undertaken by the Institution. The institutional environment and energy initiatives are confirmed through the following

- i. Green audit/ Environment Audit**
- ii. Energy audit**

**Audit reports of Green audit, Environment Audit
and Energy**

Year 2022-23

ENERGY AUDIT REPORT
of
VASANDADA SUGAR INSTITUTE,
Manjari Budruk, Taluka: Haveli, District: Pune 412 307




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


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



ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society, Near Mukhtangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: engress123@gmail.com
MEDA Registration No: ECN/2022-23/CR-43/1709
ISO: 9001-2015 Certified (Cert No: 23EQKC13),
ISO: 14001-2015 Certified (Cert No: 23EEKW20)

ENERGY AUDIT CERTIFICATE

Certificate No: ES/VSI/22-23/01

Date: 29/7/2023

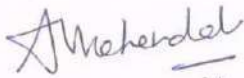
This is to certify that we have conducted an Energy Audit at Vasantdada Sugar Institute, Manjari Budruk, Taluka: Haveli, District: Pune 412 307, in the Year 2022-23.

The Institute has adopted following Energy Efficient Practices:


- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 800 kWp Roof Top Solar PV Plant

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

For Engress Services,



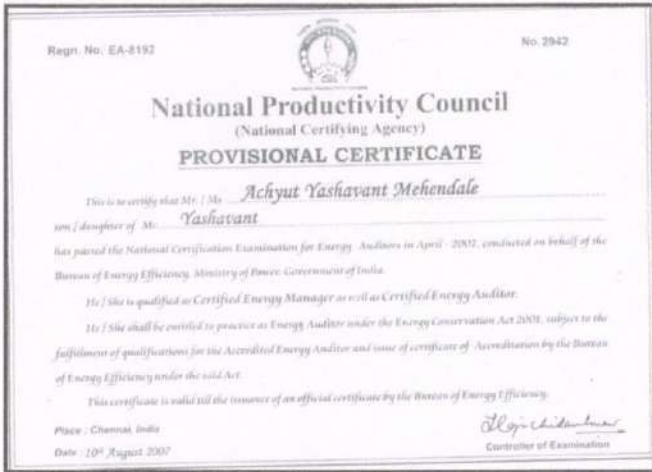
A Y Mehendale,
B E-Mechanical, M Tech- Energy
BEE Certified Energy Auditor, EA-8192



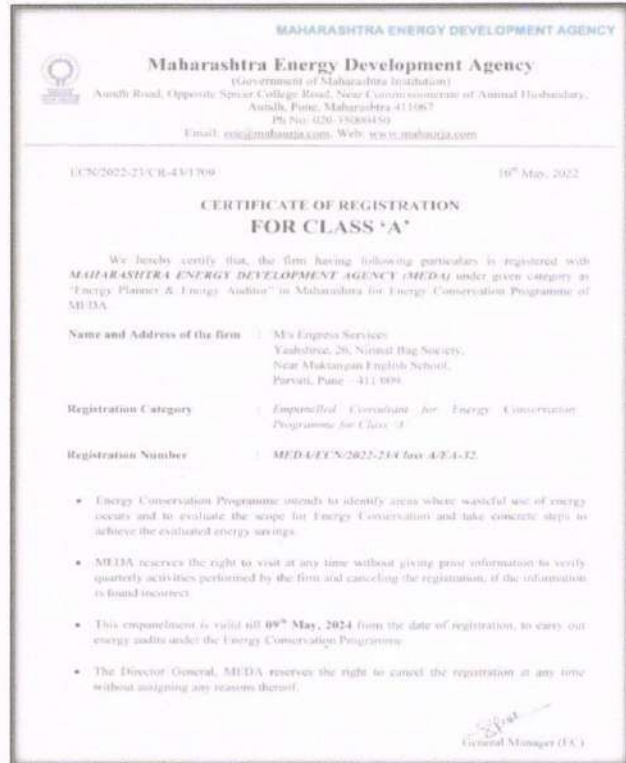
Principal
Vasantdada Sugar Institute
Manjari (Bk), Tal. Haveli,
Dist Pune - 412 307



REGISTRATION CERTIFICATES



AUDITOR CERTIFICATE



MEDA Registration Certificate



ISO: 9001-2015 Certificate




ISO: 14001-2015 Certificate

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



INDEX

Sr. No	Particulars	Page No
I	Acknowledgement	5
II	Executive Summary	6
III	Abbreviations	7
1	Introduction	8
2	Study of Connected Load	9
3	Study of Present Energy Consumption	10
4	Study of Energy Performance Index	11
5	Study of Lighting	12
6	Study of Renewable Energy & Energy Efficiency	14



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: 2022-23.

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


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**; used for various Electrical Equipment.

2. Present Connected Load & Energy Consumption:

No	Particulars	Value	Unit
1	Total Connected Load	1344	kW
2	Net Energy Consumed	1200478	kWh

3. Energy Performance Index:

No	Particulars	Value	Unit
1	Total Annual Energy Purchased	528549	kWh
2	Annual Energy Generated	1150953	kWh
3	Energy Exported	479024	kWh
4	Net Energy Consumed=1+2-3	1200478	kWh
5	Total Built up area of Institute	69648.07	m ²
6	Energy Performance Index =(4) / (5)	17.24	kWh/m ²

4. Study of % Usage of LED Lighting:

No	Particulars	Value	Unit
1	% of Usage of LED Lighting to Total Lighting Load	80.65	%

5. Renewable Energy & Energy Efficiency Projects:


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

6. Assumption:

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of CO₂ into atmosphere

7. References:


- Audit Methodology: www.mahaurja.com
- Energy Conservation Building Code: ECBC-2017: www.beeindia.gov.in
- For CO₂ Emissions: www.tatapower.com


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



ABBREVIATIONS

AC	: Air conditioner
MSEDCL	: Maharashtra Electricity Distribution Company Limited
LED	: Light Emitting Diode
kWh	: kilo-Watt Hour
Qty	: Quantity
W	: Watt
kW	: Kilo Watt
PC	: Personal Computer
MT	: Metric Ton


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



CHAPTER-I INTRODUCTION

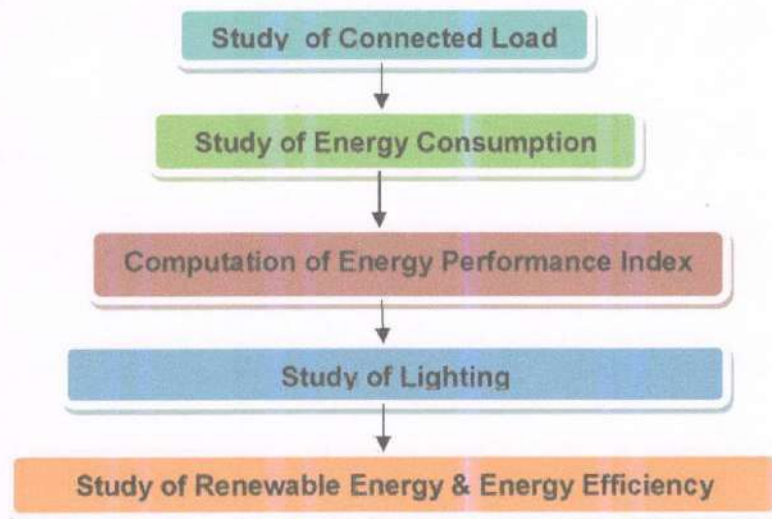
1.1 Introduction:

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 Audit Procedural Steps:



1.3 Google Earth Location Image:



Institute
Campus


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



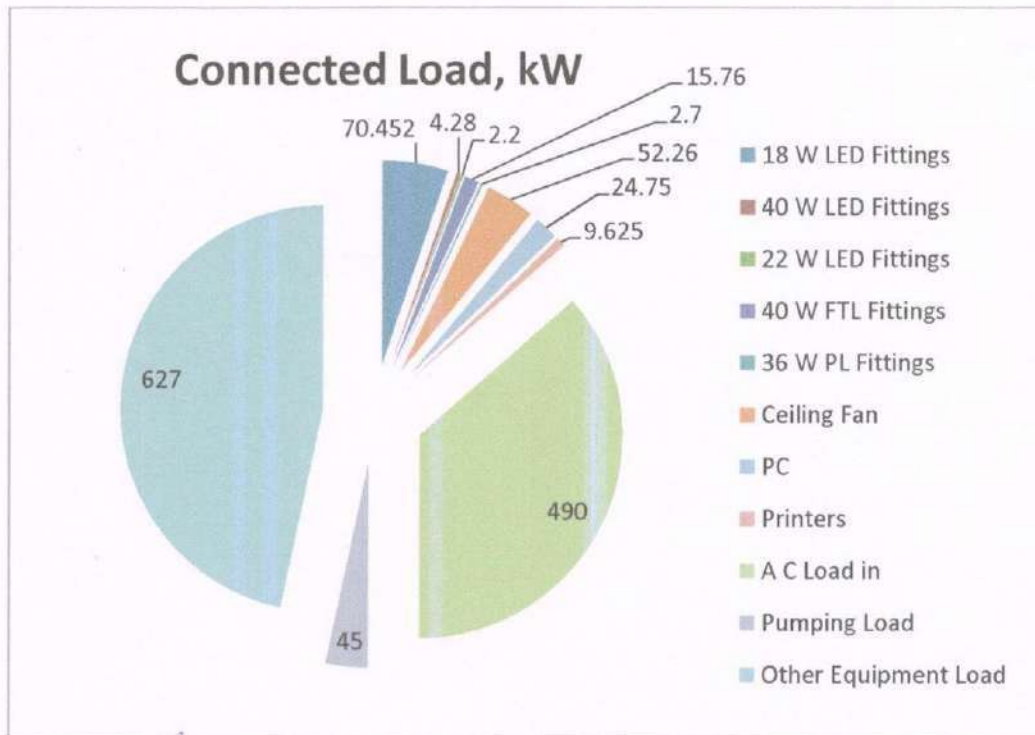
CHAPTER-II STUDY OF CONNECTED LOAD

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

Table No 1: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load, W/unit	Load, kW
1	18 W LED Fittings	3914	18	70.452
2	40 W LED Fittings	107	40	4.28
3	22 W LED Fittings	100	22	2.2
4	40 W FTL Fittings	394	40	15.76
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	490000	Lot	490
10	Pumping Load	45000	Lot	45
11	Other Equipment Load	627000	1	627
12	Total			1344.0

Chart No 1: Details of Connected Load:



[Signature]
Principal
Vasantdada Sugar Institute
Manjari (Bk.), Tal. Haveli,
Dist. Solapur, Maharashtra

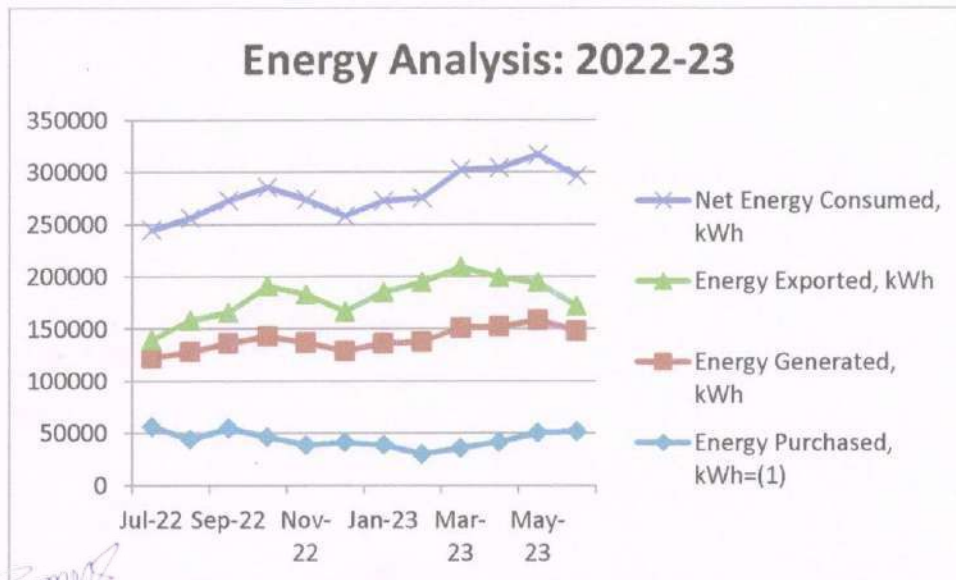


CHAPTER-III STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Electricity Energy Consumption
Table No 2: Electrical Energy Purchase Analysis- 2022-23:

No	Month	Energy Purchased, kWh=(1)	Energy Generated, kWh=(2)	Energy Exported, kWh=(3)	Net Energy Consumed, kWh=(4) =(1)+(2)-(3)	CO ₂ Emissions, MT
1	Jul-22	56340	65955	16909	105386	94.85
2	Aug-22	43819	84213	30055	97977	88.18
3	Sep-22	54643	81813	29272	107184	96.47
4	Oct-22	46220	96539	48342	94417	84.98
5	Nov-22	38533	98317	46048	90802	81.72
6	Dec-22	41048	87946	37706	91288	82.16
7	Jan-23	38697	97545	48901	87341	78.61
8	Feb-23	29961	107785	56855	80891	72.80
9	Mar-23	35776	115539	57899	93416	84.07
10	Apr-23	41529	110528	47343	104714	94.24
11	May-23	50340	108151	36007	122484	110.24
12	Jun-23	51643	96622	23687	124578	112.12
13	Total	528549	1150953	479024	1200478	1080.43
14	Maximum	56340	115539	57899	124578	112.12
15	Minimum	29961	65955	16909	80891	72.80
16	Average	44045.8	95912.8	39918.7	100040	90.04

Chart No 2: To study the variation of Month wise Energy Purchased, kWh:



Principal
Vasantdada Sugar Institute
Magan (Bk), Tal. Havell
Engrss Services, Pune



CHAPTER-IV STUDY OF ENERGY PERFORMANCE INDEX

Energy Performance Index: Energy Performance Index of a Building is its Annual Energy Consumption in Kilo Watt Hours per square meter of the Building


It is determined by:

$$\text{EPI} = \frac{\text{(Annual Energy Consumption in kWh)}}{\text{(Total Built-up area in m}^2\text{)}}$$

Now we compute the EPI for the Institute as under:

Table No 3: Computation of Energy Performance Index:

No	Particulars	Value	Unit
1	Total Annual Energy Purchased	528549	kWh
2	Energy Generated by Solar PV Plant	1150953	kWh
3	Energy Exported	479024	kWh
4	Net Energy Consumed= 1+2-3	1200478	kWh
5	Total Built up area of Institute	69648.1	m ²
6	Energy Performance Index =(4) / (5)	17.24	kWh/m ²


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. **Installed Power Density.** The installed power density per 100 lux is the power needed per square metre of floor area to achieve 100 lux of average maintained illuminance on a horizontal working plane with general lighting of an interior. Unit: watts per square metre per 100 lux (W/m²/100 lux) 100 Installed power density (W/m²/100 lux)


7. **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 of Class Room 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	3914	Nos
2	Load of 18 W LED fitting	18	W/unit
3	Total Load of 18 W LED Fittings	70.452	kW
4	No of 22 W LED Fittings	100	Nos

5	Load of 22 W LED fitting	22	W/unit
6	Total Load of 22 W LED Fittings	2.2	kW
7	No of 40 W LED Fittings	107	Nos
8	Load of 40 W LED fitting	40	W/unit
9	Total Load of 40 W LED Fittings	4.28	kW
10	No of 40 W FTL Fittings	394	Nos
11	Load of 40 W FTL fitting	40	W/unit
12	Total Load of 40 W FTL Fittings	15.76	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	76.932	kW
17	Total Lighting Load=3+6+9+12+15	95.392	kW
18	% of LED to Total Lighting Load=16*100/17	80.65	%


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



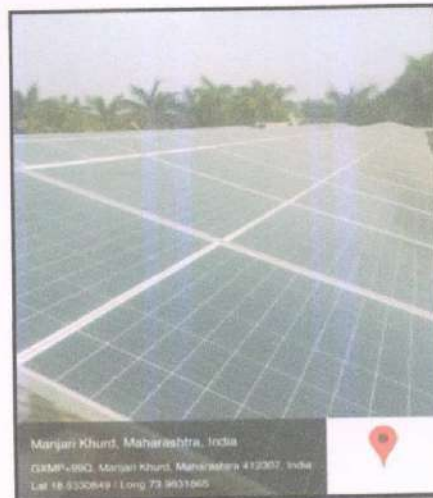
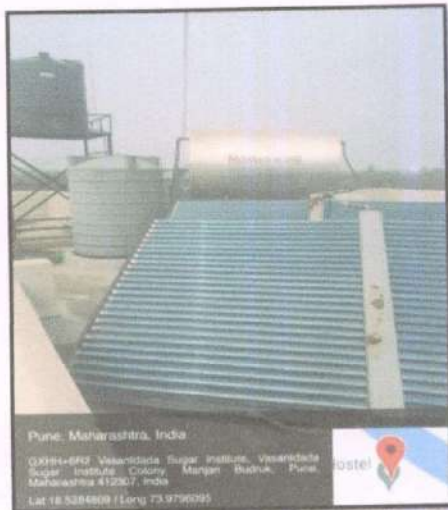
CHAPTER-VI STUDY OF RENEWABLE ENERGY & ENERGY EFFICIENCY

6.1 Usage of Renewable Energy:

The Institute has installed:

- Roof Top Solar PV Plant of Capacity 800 kWp

Photograph of Roof Top Solar PV Plant:



6.2 Energy Efficiency Measures adopted:

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

Photographs of STAR Rated AC & LED Lighting:



GREEN AUDIT REPORT
of
VASANDADA SUGAR INSTITUTE,
Manjari Budruk, Taluka: Haveli, District: Pune 412 307



Year: 2022-23

Prepared by

ENGRESS SERVICES

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




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



ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society, Near Mukhtangan English School,
Parvati, Pune 411 009 Tel: 09890444795 Email: engress123@gmail.com
MEDA Registration No: ECN/2022-23/CR-43/1709
ISO: 9001-2015 Certified (Cert No: 23EQKC13),
ISO: 14001-2015 Certified (Cert No: 23EEKW20)

GREEN AUDIT CERTIFICATE

Certificate No: ES/VSII/22-23/02

Date: 29/7/2023

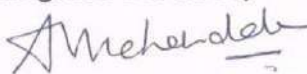
This is to certify that we have conducted Green Audit at Vasantdada Sugar Institute, Manjari Budruk, Taluka: Haveli, District: Pune 412 307, in the Year 2022-23.

The Institute has adopted following Energy Efficient & Green Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 800 kWp Roof Top Solar PV Plant
- Segregation of Waste at source
- Provision of Bio Composting Unit, for conversion of Organic Waste
- Provision of Septic Tanks for Liquid Waste Management
- Implementation of Rain Water Management Project
- Good Internal Road
- Internal Tree Plantation
- Provision of Ramp for Divyangajan
- Creation of awareness about 3 Rs: Reduce, Recycle & Reuse by Display of Posters

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Green & Sustainable.

For Engress Services,



A Y Mehendale,

Certified Energy Auditor, EA-8192

ASSOCHAM GEM Certified Professional: GEM: 22/788



Principal

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

Engress Services, Pune



REGISTRATION CERTIFICATES

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
 (Government of Maharashtra Institution)
 Kanchi Road, Opposite Spices College Road, Near Commissionerate of Animal Husbandry,
 Aurang, Pune, Maharashtra 411007
 Ph No: 020-25824501
 Email: mea@mehda.com, Web: www.mehda.com

ECN:2022/MEC/413/90 07th 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 Engross Services
 Yashdree, 26, Narmad Bag Society,
 Near Muktagani English School,
 Parvati, Pune - 411 009.

Registration Category: Greenfield Consultant for Energy Conservation Programme for Class 'A'

Registration Number: MEDA/ECN/2022-23/413-90

- 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 cancelling the registration, if the information is found incorrect.
- This endorsement 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 (E.C.)

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

Deepak Sood
 Secretary General, ASSOCHAM

GEM CP 22/788

MEDA REGISTRATION CERTIFICATE

ASSOCHAM GEM CP CERTIFICATE

Certificate of Registration

This is to Certify that
Quality Management System of

ENGRESS SERVICES
 26, YASHASHREE, BLOCK 'E', LOKMANYA NAGAR, NEEMAJI BAGH 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: 23EQNC13
 Initial Registration Date: 25/01/2023
 Date of Expiry: 26/03/2026
 Issuance Date: 25/02/2024
 Valid Until: 23/02/2025

Director

Magnitude Management Services Pvt. Ltd.
 B-15, Lower Ground Floor, Sector 02, Noida 201301, U.P. India
 Contact: 0120-2810000/0120-2810001, website: www.magnitude.com
 Email: info@magnitude.com, hr@magnitude.com, certification@magnitude.com
 ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, ISO 27001:2017, ISO 27002:2017, ISO 27005:2018, ISO 27031:2017, ISO 27032:2017, ISO 27033:2017, ISO 27034:2017, ISO 27035:2017, ISO 27036:2017, ISO 27037:2017, ISO 27038:2017, ISO 27039:2017, ISO 27040:2017, ISO 27041:2017, ISO 27042:2017, ISO 27043:2017, ISO 27044:2017, ISO 27045:2017, ISO 27046:2017, ISO 27047:2017, ISO 27048:2017, ISO 27049:2017, ISO 27050:2017, ISO 27051:2017, ISO 27052:2017, ISO 27053:2017, ISO 27054:2017, ISO 27055:2017, ISO 27056:2017, ISO 27057:2017, ISO 27058:2017, ISO 27059:2017, ISO 27060:2017, ISO 27061:2017, ISO 27062:2017, ISO 27063:2017, ISO 27064:2017, ISO 27065:2017, ISO 27066:2017, ISO 27067:2017, ISO 27068:2017, ISO 27069:2017, ISO 27070:2017, ISO 27071:2017, ISO 27072:2017, ISO 27073:2017, ISO 27074:2017, ISO 27075:2017, ISO 27076:2017, ISO 27077:2017, ISO 27078:2017, ISO 27079:2017, ISO 27080:2017, ISO 27081:2017, ISO 27082:2017, ISO 27083:2017, ISO 27084:2017, ISO 27085:2017, ISO 27086:2017, ISO 27087:2017, ISO 27088:2017, ISO 27089:2017, ISO 27090:2017, ISO 27091:2017, ISO 27092:2017, ISO 27093:2017, ISO 27094:2017, ISO 27095:2017, ISO 27096:2017, ISO 27097:2017, ISO 27098:2017, ISO 27099:2017, ISO 27100:2017, ISO 27101:2017, ISO 27102:2017, ISO 27103:2017, ISO 27104:2017, ISO 27105:2017, ISO 27106:2017, ISO 27107:2017, ISO 27108:2017, ISO 27109:2017, ISO 27110:2017, ISO 27111:2017, ISO 27112:2017, ISO 27113:2017, ISO 27114:2017, ISO 27115:2017, ISO 27116:2017, ISO 27117:2017, ISO 27118:2017, ISO 27119:2017, ISO 27120:2017, ISO 27121:2017, ISO 27122:2017, ISO 27123:2017, ISO 27124:2017, ISO 27125:2017, ISO 27126:2017, ISO 27127:2017, ISO 27128:2017, ISO 27129:2017, ISO 27130:2017, ISO 27131:2017, ISO 27132:2017, ISO 27133:2017, ISO 27134:2017, ISO 27135:2017, ISO 27136:2017, ISO 27137:2017, ISO 27138:2017, ISO 27139:2017, ISO 27140:2017, ISO 27141:2017, ISO 27142:2017, ISO 27143:2017, ISO 27144:2017, ISO 27145:2017, ISO 27146:2017, ISO 27147:2017, ISO 27148:2017, ISO 27149:2017, ISO 27150:2017, ISO 27151:2017, ISO 27152:2017, ISO 27153:2017, ISO 27154:2017, ISO 27155:2017, ISO 27156:2017, ISO 27157:2017, ISO 27158:2017, ISO 27159:2017, ISO 27160:2017, ISO 27161:2017, ISO 27162:2017, ISO 27163:2017, ISO 27164:2017, ISO 27165:2017, ISO 27166:2017, ISO 27167:2017, ISO 27168:2017, ISO 27169:2017, ISO 27170:2017, ISO 27171:2017, ISO 27172:2017, ISO 27173:2017, ISO 27174:2017, ISO 27175:2017, ISO 27176:2017, ISO 27177:2017, ISO 27178:2017, ISO 27179:2017, ISO 27180:2017, ISO 27181:2017, ISO 27182:2017, ISO 27183:2017, ISO 27184:2017, ISO 27185:2017, ISO 27186:2017, ISO 27187:2017, ISO 27188:2017, ISO 27189:2017, ISO 27190:2017, ISO 27191:2017, ISO 27192:2017, ISO 27193:2017, ISO 27194:2017, ISO 27195:2017, ISO 27196:2017, ISO 27197:2017, ISO 27198:2017, ISO 27199:2017, ISO 27200:2017, ISO 27201:2017, ISO 27202:2017, ISO 27203:2017, ISO 27204:2017, ISO 27205:2017, ISO 27206:2017, ISO 27207:2017, ISO 27208:2017, ISO 27209:2017, ISO 27210:2017, ISO 27211:2017, ISO 27212:2017, ISO 27213:2017, ISO 27214:2017, ISO 27215:2017, ISO 27216:2017, ISO 27217:2017, ISO 27218:2017, ISO 27219:2017, ISO 27220:2017, ISO 27221:2017, ISO 27222:2017, ISO 27223:2017, ISO 27224:2017, ISO 27225:2017, ISO 27226:2017, ISO 27227:2017, ISO 27228:2017, ISO 27229:2017, ISO 27230:2017, ISO 27231:2017, ISO 27232:2017, ISO 27233:2017, ISO 27234:2017, ISO 27235:2017, ISO 27236:2017, ISO 27237:2017, ISO 27238:2017, ISO 27239:2017, ISO 27240:2017, ISO 27241:2017, ISO 27242:2017, ISO 27243:2017, ISO 27244:2017, ISO 27245:2017, ISO 27246:2017, ISO 27247:2017, ISO 27248:2017, ISO 27249:2017, ISO 27250:2017, ISO 27251:2017, ISO 27252:2017, ISO 27253:2017, ISO 27254:2017, ISO 27255:2017, ISO 27256:2017, ISO 27257:2017, ISO 27258:2017, ISO 27259:2017, ISO 27260:2017, ISO 27261:2017, ISO 27262:2017, ISO 27263:2017, ISO 27264:2017, ISO 27265:2017, ISO 27266:2017, ISO 27267:2017, ISO 27268:2017, ISO 27269:2017, ISO 27270:2017, ISO 27271:2017, ISO 27272:2017, ISO 27273:2017, ISO 27274:2017, ISO 27275:2017, ISO 27276:2017, ISO 27277:2017, ISO 27278:2017, ISO 27279:2017, ISO 27280:2017, ISO 27281:2017, ISO 27282:2017, ISO 27283:2017, ISO 27284:2017, ISO 27285:2017, ISO 27286:2017, ISO 27287:2017, ISO 27288:2017, ISO 27289:2017, ISO 27290:2017, ISO 27291:2017, ISO 27292:2017, ISO 27293:2017, ISO 27294:2017, ISO 27295:2017, ISO 27296:2017, ISO 27297:2017, ISO 27298:2017, ISO 27299:2017, ISO 27300:2017, ISO 27301:2017, ISO 27302:2017, ISO 27303:2017, ISO 27304:2017, ISO 27305:2017, ISO 27306:2017, ISO 27307:2017, ISO 27308:2017, ISO 27309:2017, ISO 27310:2017, ISO 27311:2017, ISO 27312:2017, ISO 27313:2017, ISO 27314:2017, ISO 27315:2017, ISO 27316:2017, ISO 27317:2017, ISO 27318:2017, ISO 27319:2017, ISO 27320:2017, ISO 27321:2017, ISO 27322:2017, ISO 27323:2017, ISO 27324:2017, ISO 27325:2017, ISO 27326:2017, ISO 27327:2017, ISO 27328:2017, ISO 27329:2017, ISO 27330:2017, ISO 27331:2017, ISO 27332:2017, ISO 27333:2017, ISO 27334:2017, ISO 27335:2017, ISO 27336:2017, ISO 27337:2017, ISO 27338:2017, ISO 27339:2017, ISO 27340:2017, ISO 27341:2017, ISO 27342:2017, ISO 27343:2017, ISO 27344:2017, ISO 27345:2017, ISO 27346:2017, ISO 27347:2017, ISO 27348:2017, ISO 27349:2017, ISO 27350:2017, ISO 27351:2017, ISO 27352:2017, ISO 27353:2017, ISO 27354:2017, ISO 27355:2017, ISO 27356:2017, ISO 27357:2017, ISO 27358:2017, ISO 27359:2017, ISO 27360:2017, ISO 27361:2017, ISO 27362:2017, ISO 27363:2017, ISO 27364:2017, ISO 27365:2017, ISO 27366:2017, ISO 27367:2017, ISO 27368:2017, ISO 27369:2017, ISO 27370:2017, ISO 27371:2017, ISO 27372:2017, ISO 27373:2017, ISO 27374:2017, ISO 27375:2017, ISO 27376:2017, ISO 27377:2017, ISO 27378:2017, ISO 27379:2017, ISO 27380:2017, ISO 27381:2017, ISO 27382:2017, ISO 27383:2017, ISO 27384:2017, ISO 27385:2017, ISO 27386:2017, ISO 27387:2017, ISO 27388:2017, ISO 27389:2017, ISO 27390:2017, ISO 27391:2017, ISO 27392:2017, ISO 27393:2017, ISO 27394:2017, ISO 27395:2017, ISO 27396:2017, ISO 27397:2017, ISO 27398:2017, ISO 27399:2017, ISO 27400:2017, ISO 27401:2017, ISO 27402:2017, ISO 27403:2017, ISO 27404:2017, ISO 27405:2017, ISO 27406:2017, ISO 27407:2017, ISO 27408:2017, ISO 27409:2017, ISO 27410:2017, ISO 27411:2017, ISO 27412:2017, ISO 27413:2017, ISO 27414:2017, ISO 27415:2017, ISO 27416:2017, ISO 27417:2017, ISO 27418:2017, ISO 27419:2017, ISO 27420:2017, ISO 27421:2017, ISO 27422:2017, ISO 27423:2017, ISO 27424:2017, ISO 27425:2017, ISO 27426:2017, ISO 27427:2017, ISO 27428:2017, ISO 27429:2017, ISO 27430:2017, ISO 27431:2017, ISO 27432:2017, ISO 27433:2017, ISO 27434:2017, ISO 27435:2017, ISO 27436:2017, ISO 27437:2017, ISO 27438:2017, ISO 27439:2017, ISO 27440:2017, ISO 27441:2017, ISO 27442:2017, ISO 27443:2017, ISO 27444:2017, ISO 27445:2017, ISO 27446:2017, ISO 27447:2017, ISO 27448:2017, ISO 27449:2017, ISO 27450:2017, ISO 27451:2017, ISO 27452:2017, ISO 27453:2017, ISO 27454:2017, ISO 27455:2017, ISO 27456:2017, ISO 27457:2017, ISO 27458:2017, ISO 27459:2017, ISO 27460:2017, ISO 27461:2017, ISO 27462:2017, ISO 27463:2017, ISO 27464:2017, ISO 27465:2017, ISO 27466:2017, ISO 27467:2017, ISO 27468:2017, ISO 27469:2017, ISO 27470:2017, ISO 27471:2017, ISO 27472:2017, ISO 27473:2017, ISO 27474:2017, ISO 27475:2017, ISO 27476:2017, ISO 27477:2017, ISO 27478:2017, ISO 27479:2017, ISO 27480:2017, ISO 27481:2017, ISO 27482:2017, ISO 27483:2017, ISO 27484:2017, ISO 27485:2017, ISO 27486:2017, ISO 27487:2017, ISO 27488:2017, ISO 27489:2017, ISO 27490:2017, ISO 27491:2017, ISO 27492:2017, ISO 27493:2017, ISO 27494:2017, ISO 27495:2017, ISO 27496:2017, ISO 27497:2017, ISO 27498:2017, ISO 27499:2017, ISO 27500:2017, ISO 27501:2017, ISO 27502:2017, ISO 27503:2017, ISO 27504:2017, ISO 27505:2017, ISO 27506:2017, ISO 27507:2017, ISO 27508:2017, ISO 27509:2017, ISO 27510:2017, ISO 27511:2017, ISO 27512:2017, ISO 27513:2017, ISO 27514:2017, ISO 27515:2017, ISO 27516:2017, ISO 27517:2017, ISO 27518:2017, ISO 27519:2017, ISO 27520:2017, ISO 27521:2017, ISO 27522:2017, ISO 27523:2017, ISO 27524:2017, ISO 27525:2017, ISO 27526:2017, ISO 27527:2017, ISO 27528:2017, ISO 27529:2017, ISO 27530:2017, ISO 27531:2017, ISO 27532:2017, ISO 27533:2017, ISO 27534:2017, ISO 27535:2017, ISO 27536:2017, ISO 27537:2017, ISO 27538:2017, ISO 27539:2017, ISO 27540:2017, ISO 27541:2017, ISO 27542:2017, ISO 27543:2017, ISO 27544:2017, ISO 27545:2017, ISO 27546:2017, ISO 27547:2017, ISO 27548:2017, ISO 27549:2017, ISO 27550:2017, ISO 27551:2017, ISO 27552:2017, ISO 27553:2017, ISO 27554:2017, ISO 27555:2017, ISO 27556:2017, ISO 27557:2017, ISO 27558:2017, ISO 27559:2017, ISO 27560:2017, ISO 27561:2017, ISO 27562:2017, ISO 27563:2017, ISO 27564:2017, ISO 27565:2017, ISO 27566:2017, ISO 27567:2017, ISO 27568:2017, ISO 27569:2017, ISO 27570:2017, ISO 27571:2017, ISO 27572:2017, ISO 27573:2017, ISO 27574:2017, ISO 27575:2017, ISO 27576:2017, ISO 27577:2017, ISO 27578:2017, ISO 27579:2017, ISO 27580:2017, ISO 27581:2017, ISO 27582:2017, ISO 27583:2017, ISO 27584:2017, ISO 27585:2017, ISO 27586:2017, ISO 27587:2017, ISO 27588:2017, ISO 27589:2017, ISO 27590:2017, ISO 27591:2017, ISO 27592:2017, ISO 27593:2017, ISO 27594:2017, ISO 27595:2017, ISO 27596:2017, ISO 27597:2017, ISO 27598:2017, ISO 27599:2017, ISO 27600:2017, ISO 27601:2017, ISO 27602:2017, ISO 27603:2017, ISO 27604:2017, ISO 27605:2017, ISO 27606:2017, ISO 27607:2017, ISO 27608:2017, ISO 27609:2017, ISO 27610:2017, ISO 27611:2017, ISO 27612:2017, ISO 27613:2017, ISO 27614:2017, ISO 27615:2017, ISO 27616:2017, ISO 27617:2017, ISO 27618:2017, ISO 27619:2017, ISO 27620:2017, ISO 27621:2017, ISO 27622:2017, ISO 27623:2017, ISO 27624:2017, ISO 27625:2017, ISO 27626:2017, ISO 27627:2017, ISO 27628:2017, ISO 27629:2017, ISO 27630:2017, ISO 27631:2017, ISO 27632:2017, ISO 27633:2017, ISO 27634:2017, ISO 27635:2017, ISO 27636:2017, ISO 27637:2017, ISO 27638:2017, ISO 27639:2017, ISO 27640:2017, ISO 27641:2017, ISO 27642:2017, ISO 27643:2017, ISO 27644:2017, ISO 27645:2017, ISO 27646:2017, ISO 27647:2017, ISO 27648:2017, ISO 27649:2017, ISO 27650:2017, ISO 27651:2017, ISO 27652:2017, ISO 27653:2017, ISO 27654:2017, ISO 27655:2017, ISO 27656:2017, ISO 27657:2017, ISO 27658:2017, ISO 27659:2017, ISO 27660:2017, ISO 27661:2017, ISO 27662:2017, ISO 27663:2017, ISO 27664:2017, ISO 27665:2017, ISO 27666:2017, ISO 27667:2017, ISO 27668:2017, ISO 27669:2017, ISO 27670:2017, ISO 27671:2017, ISO 27672:2017, ISO 27673:2017, ISO 27674:2017, ISO 27675:2017, ISO 27676:2017, ISO 27677:2017, ISO 27678:2017, ISO 27679:2017, ISO 27680:2017, ISO 27681:2017, ISO 27682:2017, ISO 27683:2017, ISO 27684:2017, ISO 27685:2017, ISO 27686:2017, ISO 27687:2017, ISO 27688:2017, ISO 27689:2017, ISO 27690:2017, ISO 27691:2017, ISO 27692:2017, ISO 27693:2017, ISO 27694:2017, ISO 27695:2017, ISO 27696:2017, ISO 27697:2017, ISO 27698:2017, ISO 27699:2017, ISO 27700:2017, ISO 27701:2017, ISO 27702:2017, ISO 27703:2017, ISO 27704:2017, ISO 27705:2017, ISO 27706:2017, ISO 27707:2017, ISO 27708:2017, ISO 27709:2017, ISO 27710:2017, ISO 27711:2017, ISO 27712:2017, ISO 27713:2017, ISO 27714:2017, ISO 27715:2017, ISO 27716:2017, ISO 27717:2017, ISO 27718:2017, ISO 27719:2017, ISO 27720:2017, ISO 27721:2017, ISO 27722:2017, ISO 27723:2017, ISO 27724:2017, ISO 27725:2017, ISO 27726:2017, ISO 27727:2017, ISO 27728:2017, ISO 27729:2017, ISO 27730:2017, ISO 27731:2017, ISO 27732:2017, ISO 27733:2017, ISO 27734:2017, ISO 27735:2017, ISO 27736:2017, ISO 27737:2017, ISO 27738:2017, ISO 27739:2017, ISO 27740:2017, ISO 27741:2017, ISO 27742:2017, ISO 27743:2017, ISO 27744:2017, ISO 27745:2017, ISO 27746:2017, ISO 27747:2017, ISO 27748:2017, ISO 27749:2017, ISO 27750:2017, ISO 27751:2017, ISO 27752:2017, ISO 27753:2017, ISO 27754:2017, ISO 27755:2017, ISO 27756:2017, ISO 27757:2017, ISO 27758:2017, ISO 27759:2017, ISO 27760:2017, ISO 27761:2017, ISO 27762:2017, ISO 27763:2017, ISO 27764:2017, ISO 27765:2017, ISO 27766:2017, ISO 27767:2017, ISO 27768:2017, ISO 27769:2017, ISO 27770:2017, ISO 27771:2017, ISO 27772:2017, ISO 27773:2017, ISO 27774:2017, ISO 27775:2017, ISO 27776:2017, ISO 27777:2017, ISO 27778:2017, ISO 27779:2017, ISO 27780:2017, ISO 27781:2017, ISO 27782:2017, ISO 27783:2017, ISO 27784:2017, ISO 27785:2017, ISO 27786:2017, ISO 27787:2017, ISO 27788:2017, ISO 27789:2017, ISO 27790:2017, ISO 27791:2017, ISO 27792:2017, ISO 27793:2017, ISO 27794:2017, ISO 27795:2017, ISO 27796:2017, ISO 27797:2017, ISO 27798:2017, ISO 27799:2017, ISO 27800:2017, ISO 27801:2017, ISO 27802:2017, ISO 27803:2017, ISO 27804:2017, ISO 27805:2017, ISO 27806:2017, ISO 27807:2017, ISO 27808:2017, ISO 27809:2017, ISO 27810:2017, ISO 27811:2017, ISO 27812:2017, ISO 27813:2017, ISO 27814:2017, ISO 27815:2017, ISO 27816:2017, ISO 27817:2017, ISO 27818:2017, ISO 27819:2017, ISO 27820:2017, ISO 27821:2017, ISO 27822:2017, ISO 27823:2017, ISO 27824:2017, ISO 27825:2017, ISO 27826:2017, ISO 27827:2017, ISO 27828:2017, ISO 27829:2017, ISO 27830:2017, ISO 27831:2017, ISO 27832:2017, ISO 27833:2017, ISO 27834:2017, ISO 27835:2017, ISO 27836:2017, ISO 27837:2017, ISO 27838:2017, ISO 27839:2017, ISO 27840:2017, ISO 27841:2017, ISO 27842:2017, ISO 27843:2017, ISO 27844:2017, ISO 27845:2017, ISO 27846:2017, ISO 27847:2017, ISO 27848:2017, ISO 27849:2017, ISO 27850:2017, ISO 27851:2017, ISO 27852:2017, ISO 27853:2017, ISO 27854:2017, ISO 27855:2017, ISO 27856:2017, ISO 27857:2017, ISO 27858:2017, ISO 27859:2017, ISO 27860:2017, ISO 27861:2017, ISO 27862:20

INDEX

Sr. No	Particulars	Page No
I	Acknowledgement	5
II	Executive Summary	6
III	Abbreviations	7
1	Introduction	8
2	Study of Energy Consumption & CO ₂ Emission	9
3	Study of Usage of Renewable Energy	10
4	Study of Waste Management	11
5	Study of Rain Water Management	12
6	Study of Green & Sustainable Practices	13



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: 2022-23.

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


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**; used for various Electrical Equipment.

2. Present Energy Consumption & CO₂ Emission:

No	Particulars	Value	Unit
1	Net Energy Consumed	1200478	kWh
2	Annual CO ₂ Emissions	1080.43	MT

3. Usage of Renewable Energy & Reduction in CO₂ Emissions:

- The Institute has installed Roof Top Solar PV Plant of Capacity **800 kWp**.
- The Energy generated by Solar PV Plant in 2022-23 is **1150953 kWh**.
- Reduction in CO₂ Emissions in 2022-23 is **1035.86 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

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 about 3 Rs: Reduce, Recycle & Reuse by Display of Posters

7. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of CO₂ into atmosphere
2. Energy generated by Roof Top Solar PV Plant: **4 kWh/kWp per Day**
3. Annual Solar Energy generation Days: **300 Nos**

8. References:


- For CO₂ Emissions: www.tatapower.com
- For Solar PV Energy generation: www.solarrooftop.gov.in

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



ABBREVIATIONS

LED	: Light Emitting Diode
kWh	: kilo-Watt Hour
Qty	: Quantity
W	: Watt
kW	: Kilo Watt
MT	: Metric Ton


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

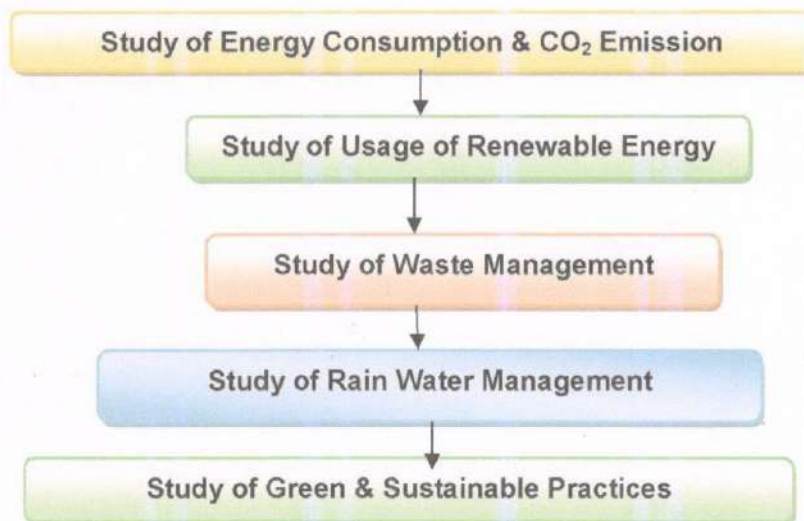


CHAPTER-I INTRODUCTION

1.1 Introduction:

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


1.2 Audit Procedural Steps:



1.3 Google Earth Location Image:



Institute
Campus


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



CHAPTER-II

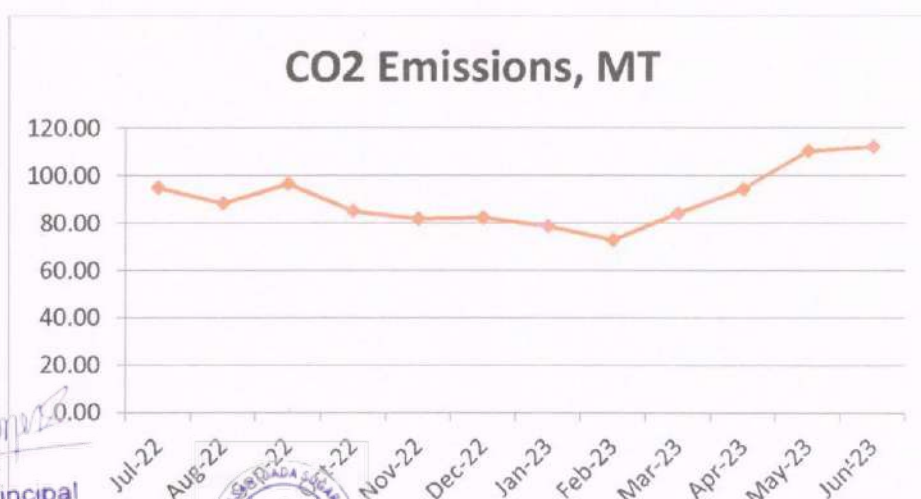
STUDY OF ENERGY CONSUMPTION & CO₂ EMISSION

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. **Basis for computation of CO₂ Emissions: 1 kWh of Electrical Energy releases 0.9 Kg of CO₂ into atmosphere.**

Table No 1: Month wise Energy Consumption & CO₂ Emissions:

No	Month	Energy Purchased, kWh=(1)	Energy Generated, kWh=(2)	Energy Exported, kWh=(3)	Net Energy Consumed, kWh=(4) = (1)+(2)-(3)	CO ₂ Emissions, MT
1	Jul-22	56340	65955	16909	105386	94.85
2	Aug-22	43819	84213	30055	97977	88.18
3	Sep-22	54643	81813	29272	107184	96.47
4	Oct-22	46220	96539	48342	94417	84.98
5	Nov-22	38533	98317	46048	90802	81.72
6	Dec-22	41048	87946	37706	91288	82.16
7	Jan-23	38697	97545	48901	87341	78.61
8	Feb-23	29961	107785	56855	80891	72.80
9	Mar-23	35776	115539	57899	93416	84.07
10	Apr-23	41529	110528	47343	104714	94.24
11	May-23	50340	108151	36007	122484	110.24
12	Jun-23	51643	96622	23687	124578	112.12
13	Total	528549	1150953	479024	1200478	1080.43
14	Maximum	56340	115539	57899	124578	112.12
15	Minimum	29961	65955	16909	80891	72.80
16	Average	44045.8	95912.8	39918.7	100040	90.04

Chart No 1: Month wise CO₂ Emissions:



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



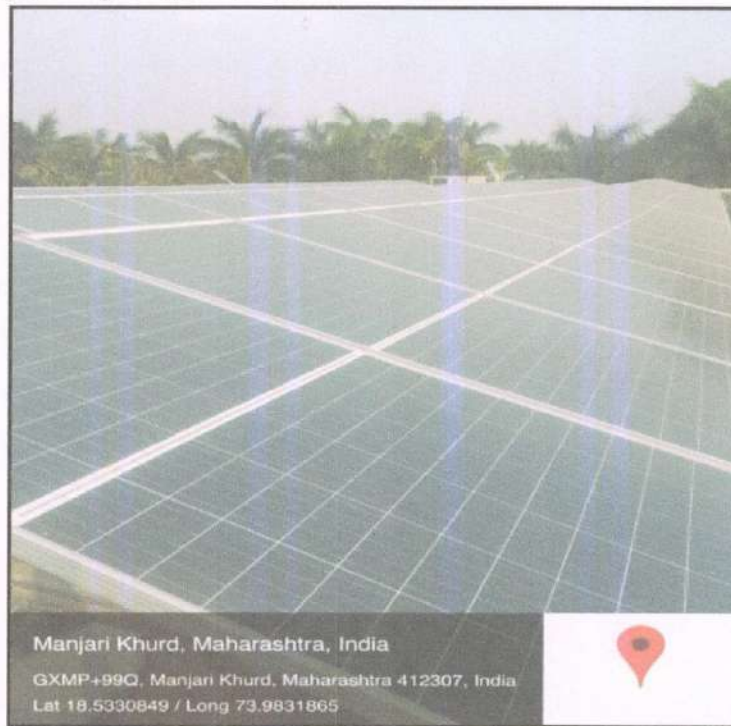
CHAPTER III STUDY OF USAGE OF RENEWABLE ENERGY


The Institute has installed Roof Top Solar PV Plant of Capacity **800 kWp**
In the following Table, we present the reduction in CO₂ emissions due to Solar Energy:

Table No 3: Computation of Reduction in CO₂ Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	800	kWp
2	Energy Generated in the Year: 2022-23	1150953	4 kWh
3	1 kWh of Electrical Energy saves	0.9	Kg/kWh
4	Qty of CO ₂ Saved by Solar PV Plant $= (2) * (3) / 1000$	1035.86	MT of CO ₂

Photograph of Roof Top Solar PV Plant:




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



CHAPTER IV STUDY OF WASTE MANAGEMENT

4.1 Segregation of Waste at Source:

The Institute has good housekeeping practices. The Waste is segregated at source. Waste collection Bins are placed at strategic locations.

Photograph of Waste Collection Bin:



4.2 Organic Waste Management:

The Institute has a Bio Composting Unit, for conversion of Organic Waste into Bio Compost.

Photograph of Bio Composting Unit:



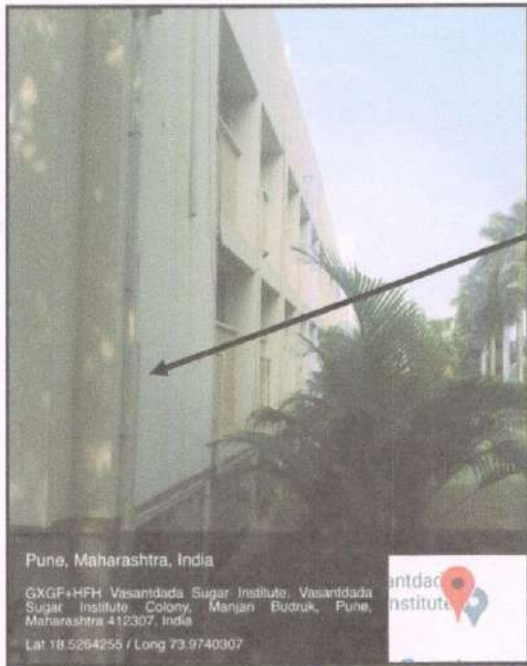
4.3 Liquid Waste Management:

The Institute has installed Septic Tanks and the tanks are cleaned periodically.


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 Carrying Pipe:



Rain Water Carrying Pipe


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

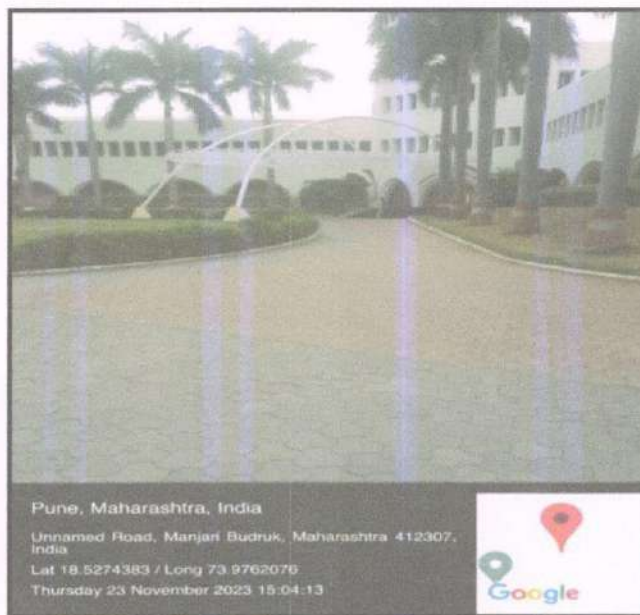


CHAPTER-VI STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Internal Road:

The Institute has well maintained internal road to facilitate the easy movement of the students within the campus.

Photograph of Internal Road:



7.2 Tree Plantation:

The Institute has Tree Plantation in the campus.

Photograph of Internal Tree Plantation:



[Handwritten Signature]

Principal

Vasantdada Sugar Institute

Engress Services, Pune (Tal. Havelli,
Dist. Pune - 412 307



7.3 Provision of Ramp for Divyangajan:

The Institute has made provision of Ramp for easy movement of Divyangajan.

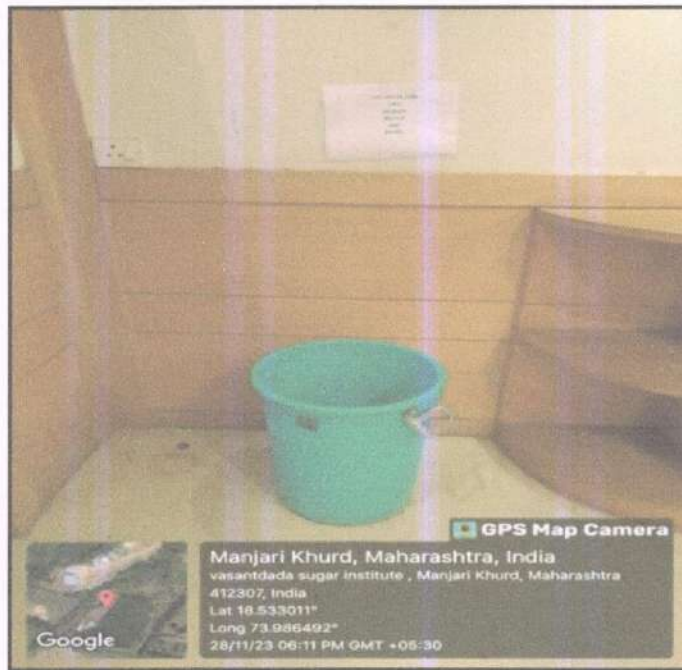
Photograph of Ramp:




7.4 Creation of awareness about 3 Rs: Reduce, Recycle & Reuse by Display of Posters

The Institute has displayed Posters on Importance of 3 Rs: Reduce, Recycle & Reuse.

Photograph of Poster on importance of 3 Rs: Reduce, Recycle & Reuse:




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



ENVIRONMENTAL AUDIT REPORT

of

VASANDADA SUGAR INSTITUTE,

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




Year: 2022-23

Prepared by

ENGRESS SERVICES

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




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



ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society, Near Muktangan English School,
Parvati, Pune 411 009 Tel: 09890444795 Email: engress123@gmail.com
MEDA Registration No: ECN/2022-23/CR-43/1709
ISO: 9001-2015 Certified (Cert No: 23EQKC13),
ISO: 14001-2015 Certified (Cert No: 23EEKW20)

ENVIRONMENTAL AUDIT CERTIFICATE

Certificate No: ES/VSII/22-23/03

Date: 29/7/2023

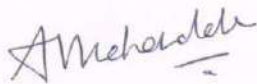
This is to certify that we have conducted Environmental Audit at Vasantdada Sugar Institute,
Manjari Budruk, Taluka: Haveli, District: Pune 412 307, in the Year 2022-23.

The Institute has adopted following Environment Friendly Practices:


- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 800 kWp Roof Top Solar PV Plant
- Segregation of Waste at source
- Provision of Bio Composting Unit, for conversion of Organic Waste
- Provision of Septic Tanks for Liquid Waste Management
- Implementation of Rain Water Management Project
- Internal Tree Plantation
- Creation of awareness about 3 Rs: Reduce, Recycle & Reuse by Display of Posters

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Energy Efficient, Green and Environment Friendly.

For Engress Services,



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



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



REGISTRATION CERTIFICATES



MEDA REGISTRATION CERTIFICATE


ASSOCHAM GEM CP CERTIFICATE



ISO: 9001-2015 CERTIFICATE




ISO: 14001-2015 CERTIFICATE


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



INDEX

Sr. No	Particulars	Page No
I	Acknowledgement	5
II	Executive Summary	6
III	Abbreviations	8
1	Introduction	9
2	Study of Resource Consumption & CO ₂ Emission	11
3	Study of Usage of Renewable Energy	13
4	Study of Indoor Air Quality	14
5	Study of Indoor Comfort Condition Parameters	15
6	Study of Waste Management	16
7	Study of Rain Water Management	17
8	Study of Eco Friendly Initiatives	18
	Annexure	
I	Indoor Air Quality, Noise, & Indoor Comfort Standards	19



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 Environmental Audit of their Campus for the Year: 2022-23.

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


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**; used for various Electrical Equipment.

2. Pollution caused due to Institute Activities:

- **Air pollution:** Mainly CO₂ on account of Electricity Consumption
- **Solid Waste:** Bio degradable Garden Waste, Recyclable Waste and Human Waste
- **Liquid Waste:** Human liquid waste

3. Present Energy Consumption & CO₂ Emissions:

No	Particulars	Value	Unit
1	Net Energy Consumed	1200478	kWh
2	Annual CO ₂ Emissions	1080.43	MT

4. Projects implemented for Environmental Conservation:

- Usage of Energy efficient LED fittings
- Usage of BEE STAR Rated Equipment
- Installation of **800 kWp** Roof Top Solar PV Plant

5. Usage of Renewable Energy & Reduction in CO₂ Emissions:

- The Institute has installed Roof Top Solar PV Plant of Capacity **800 kWp**.
- The Energy generated by Solar PV Plant in 2022-23 is **1150953 kWh**.
- Reduction in CO₂ Emissions in 2022-23 is **1035.86 MT**

6. Indoor Air Quality:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	65	39	50
2	Minimum	60	36	42

7. Indoor Comfort Condition Parameters:

No	Parameter/Value	Temperature, °C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	28.6	68	138	45
2	Minimum	28.3	65	98	42

8. 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

9. 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.

10. Environment Friendly Initiatives:


- Tree Plantation and Well maintained Garden.
- Creation of Awareness on 3 Rs: Reduce, Recycle & Reuse by displaying posters

11. Assumption:

1. 1 kWh of Electrical Energy releases 0.9 Kg of CO₂ into atmosphere

12. References:

- For CO₂ Emission computation: www.tatapower.com
- For Various Indoor Air Parameters: www.ishrae.com
- For AQI Standards: www.cpcb.com


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



ABBREVIATIONS

kWh	: kilo-Watt Hour
Qty	: Quantity
MT	: Metric Ton
CO ₂	: Carbon Di Oxide
LPD	: Liters per Day
AQI	: Air Quality Index
PM2.5	: Particulate Matter of Size 2.5 microns
PM 10	: Particulate Matter of Size 10 microns
CPCB	: Central Pollution Control Board
ISHARE	: The Indian Society of Heating & Refrigerating & Air Conditioning Engineers



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



CHAPTER-I INTRODUCTION

1. Important Definitions:

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

1.2. 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"

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

1.4 Audit Procedural Steps:



1.5 Google Earth Image:



Institute
Campus

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



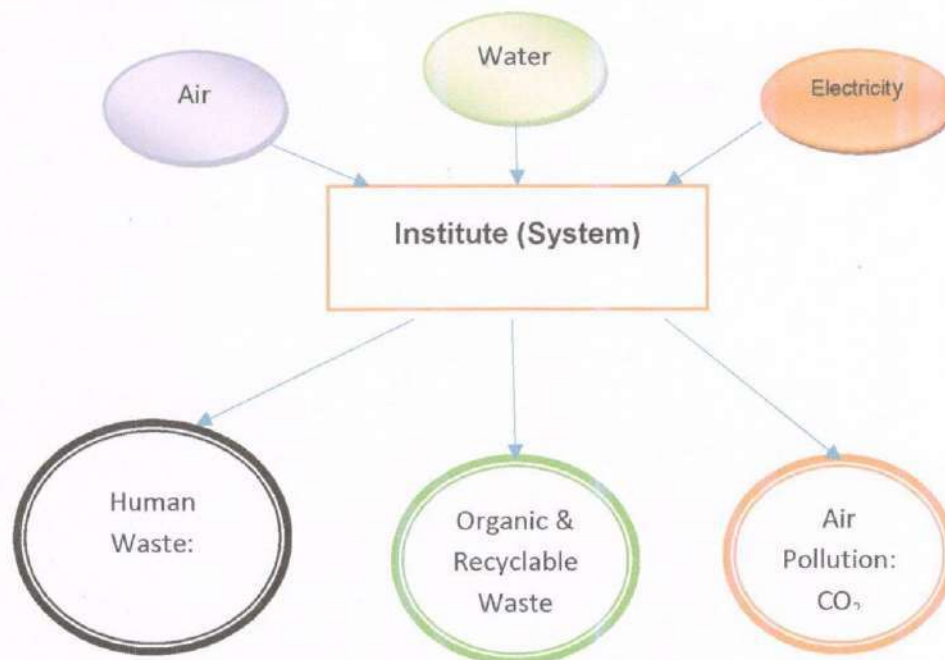
CHAPTER-II STUDY OF RESOURCE CONSUMPTION & CO₂ EMISSION

The Institute consumes following Natural/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 Institute as System:



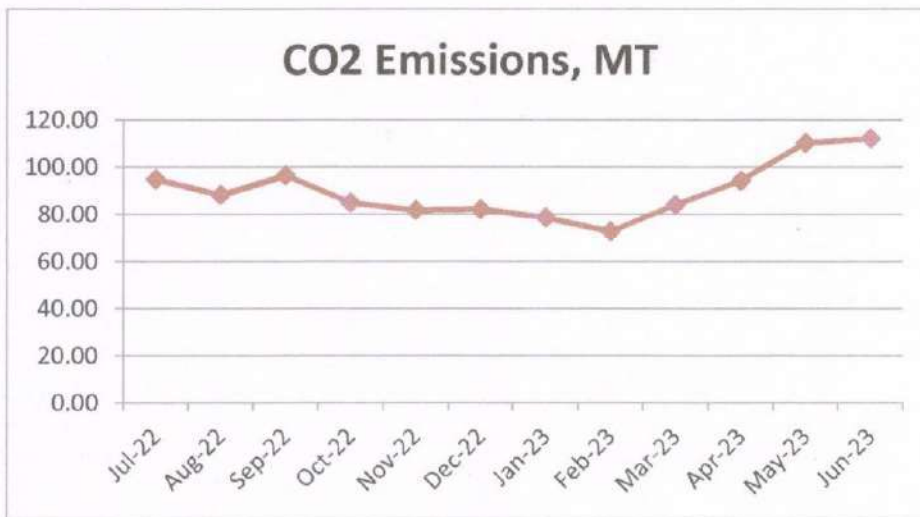
A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. Here we compute the emissions of Carbon-Di-Oxide, by usage of Electrical Energy. The basis of Calculation for CO₂ emissions due to Electrical Energy is 1 kWh of Electrical Energy releases 0.9 Kg of CO₂ into atmosphere.


Table No 1: Study of Energy Purchased & CO₂ Emission: 2022-23:

No	Month	Energy Purchased, kWh=(1)	Energy Generated, kWh=(2)	Energy Exported, kWh=(3)	Net Energy Consumed, kWh=(4) = (1)+(2)-(3)	CO ₂ Emissions, MT
1	Jul-22	56340	65955	16909	105386	94.85
2	Aug-22	43819	84213	30055	97977	88.18
3	Sep-22	54643	81813	29272	107184	96.47
4	Oct-22	46220	96539	48342	94417	84.98
5	Nov-22	38533	98317	46048	90802	81.72
6	Dec-22	41048	87946	37706	91288	82.16

7	Jan-23	38697	97545	48901	87341	78.61
8	Feb-23	29961	107785	56855	80891	72.80
9	Mar-23	35776	115539	57899	93416	84.07
10	Apr-23	41529	110528	47343	104714	94.24
11	May-23	50340	108151	36007	122484	110.24
12	Jun-23	51643	96622	23687	124578	112.12
13	Total	528549	1150953	479024	1200478	1080.43
14	Maximum	56340	115539	57899	124578	112.12
15	Minimum	29961	65955	16909	80891	72.80
16	Average	44045.8	95912.8	39918.7	100040	90.04

Chart No 2: Representation of Month wise CO₂ emissions:




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



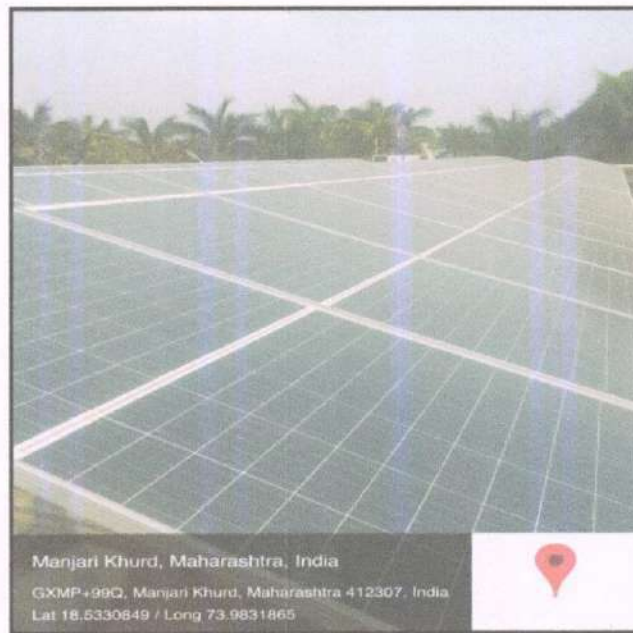
CHAPTER-III STUDY OF USAGE OF RENEWABLE ENERGY


The College has installed Roof Top Solar PV Plant of Capacity 800 kWp
We now calculate the reduction in CO₂ Emission due to Solar PV Plant.

Table No 2: Computation of Reduction in CO₂ Emission:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	800	kWp
2	Energy Generated in the Year: 2022-23	1150953	4 kWh
3	1 kWh of Electrical Energy saves	0.9	Kg/kWh
4	Qty of CO ₂ Saved by Solar PV Plant $= (2) * (3) / 1000$	1035.86	MT of CO ₂

Photograph of Roof Top Solar PV Plant:




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



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 liveability.

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.

We present herewith following 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	PM-2.5	PM-10
1	Admin Office	63	38	46
2	Plant Breeding	65	39	50
3	Instrumentation	61	36	42
4	Sugar Engineering	60	36	50
5	Environmental Science Lab	64	39	46
6	Computer Department	65	39	46
	Maximum	65	39	50
	Minimum	60	36	42


Principal



GREEN AUDIT REPORT
of
VASANDADA SUGAR INSTITUTE,
Manjari Budruk, Taluka: Haveli, District: Pune 412 307



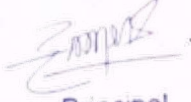
Year: 2022-23

Prepared by

ENGRESS SERVICES

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




Principal
Vasandada Sugar Institute
Manjari (BK), Tal. Haveli,
Dist. Pune - 412 307



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 4: Study of Indoor Comfort Parameters:

No	Location	Temperature, °C	Humidity, %	Lux Level	Noise Level, dB
1	Admin Office	28.4	65	138	44
2	Plant Breeding	28.3	68	112	45
3	Instrumentation	28.3	67	110	43
4	Sugar Engineering	28.4	67	98	42
5	Environmental Science Lab	28.3	68	102	44
6	Computer Department	28.6	65	117	43
	Maximum	28.6	68	138	45
	Minimum	28.3	65	98	42


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



CHAPTER VI STUDY OF WASTE MANAGEMENT

6.1 Segregation of Waste at Source:

The Institute has good housekeeping practices. The Waste is segregated at source. Waste collection Bins are placed at strategic locations.

Photograph of Waste Collection Bin:



6.2 Organic Waste Management:

The Institute has a Bio Composting Unit, for conversion of Organic Waste into Bio Compost.

Photograph of Bio Composting Unit:



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



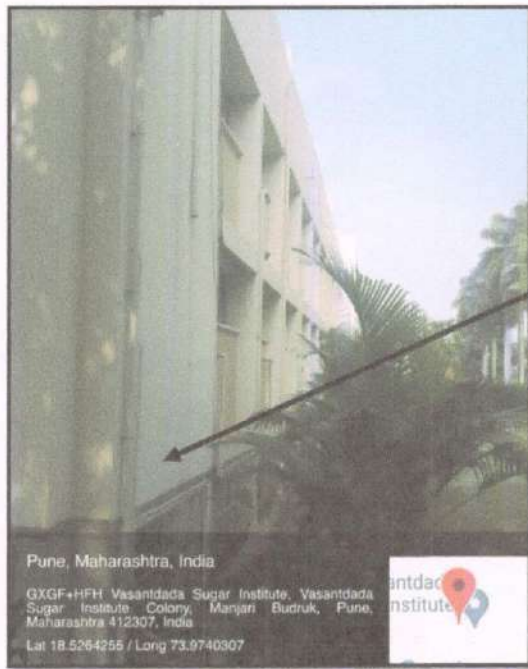
6.3 Liquid Waste Management:

The Institute has installed Septic Tanks and the tanks are cleaned periodically.

CHAPTER-VII 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 Carrying Pipe:



Rain Water Carrying Pipe

Pune, Maharashtra, India
GXGF+HFH Vasantdada Sugar Institute, Vasantdada Sugar Institute Colony, Manjari Budruk, Pune, Maharashtra 412307, India
Lat 18.5264255 / Long 73.9740307

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

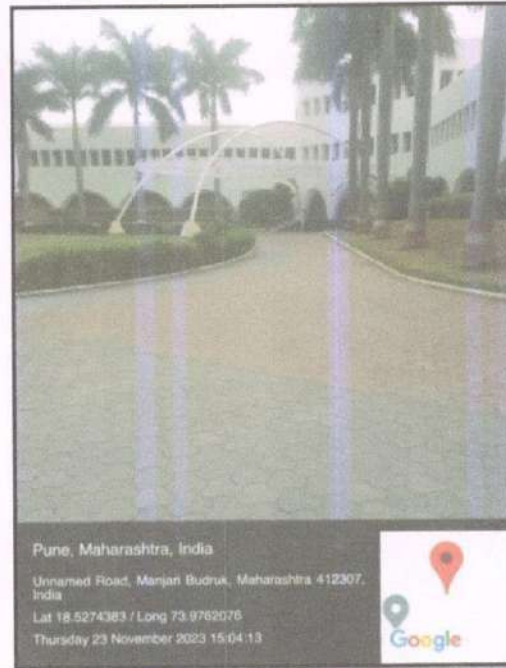


CHAPTER-VIII STUDY OF ENVIRONMENT FRIENDLY PRACTICES

8.1 Tree Plantation in the Campus:

The Institute has landscaped Lawn and well maintained Tree Plantation in the campus.

Photograph of Tree Plantation:




8.2 Creation of awareness about 3 Rs: Reduce, Recycle & Reuse by Display of Posters

The Institute has displayed Posters on Importance of 3 Rs: Reduce, Recycle & Reuse.

Photograph of Poster on importance of 3 Rs: Reduce, Recycle & Reuse:




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



**ANNEXURE-I:
INDOOR AIR QUALITY, NOISE & INDOOR COMFORT
PARAMETER 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 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

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

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

[Signature]
Principal
Vasantdada Sugar Institute

