



**Shri Vile Parle Kelavani Mandal's  
Institute of Technology, Dhule**

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Approved By AICTE, DTE & Affiliated to DBATU, Lonere

## Index

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

Sr. No.	Particulars	Page No.
1.	Green Audit / Environment Audit	
1.1	Green Audit Certificate 2022-23	1
1.2	Green Audit Report 2022-23	2-27
1.3	Environment Audit Certificate 2022-23	28
1.4	Environment Audit Report 2022-23	29-46
1.5	Green Audit Certificate 2021-22	47
1.6	Green Audit Report 2021-22	48-71
1.7	Environment Audit Certificate 2021-22	72
1.8	Environment Audit Report 2021-22	73-90
	Annexure Recommendation and Action Taken	91



*Dalunke*  
**Principal**  
SVKM's Institute of Technology, Dhule

# Nutan Urja Solutions

(ISO 9001:2015, ISO 50001:2018, ISO 14001:2015) 

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Date: 27/08/2023

## CERTIFICATE

This is to certify that we have conducted Green Audit at Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule for the year 2022-23.

The College has already adopted **Green** practices like:

- Installation of Rain Water Harvesting system
- Installation of Sewage Treatment Plant
- Installation of **251kW** Roof Top Solar PV Power Plant.
- Usage of Energy Efficient LED
- Usage of Energy Efficient BEE STAR Rated equipment

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

Nutan Urja Solutions,



K G Bhatwadekar,

Certified Energy Auditor,

EA - 22428



**Report  
On  
Green Audit  
At**

**Shri Vile Parle Kelavani Mandal's Institute of Technology,  
Dhule  
(Year 2022-23)**



Prepared by

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## Contents

Acknowledgement .....	3
Executive Summary .....	4
Abbreviations.....	6
1. Introduction.....	7
1.1 Objectives.....	7
1.2 Audit methodology .....	7
2. Study of Electrical Energy Consumption .....	8
3. Carbon Foot printing .....	11
4. Study of Usage of Alternate Energy .....	13
5. Study of Water System .....	14
5.1 Source of Water .....	14
5.2 Rain Water Harvesting.....	14
5.3 Sewage Treatment Plant.....	15
6. Study of Waste Management.....	16
6.1 Solid Waste Management .....	16
6.2 E-Waste Management.....	16
6.3 Waste Water Management .....	16
7. Study of Green Practices .....	17
7.1 No. of students who don't use own Vehicle for coming to Institute .....	17
7.2 Usage of Public Transport.....	17
7.3 Pedestrian Friendly Roads.....	17
7.4 Plastic Free Campus.....	18
7.5 Paperless Office.....	19
7.6 Food Service in college campus .....	19
7.7 Provision of Ramp for Divyangajan.....	19
7.8 Provision of Sanitary Waste Incinerator .....	20





7.9 Usage of daylight available .....	20
7.8 Usage of Electric vehicles to travel within campus.....	21
7.9 Usage of drip and sprinkler irrigation to water garden.....	21
8. Green Landscaping with Trees and Plants .....	22



## **Acknowledgement**

We at Nutan Urja Solutions, Pune, express our sincere gratitude to the management of Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule for awarding us the assignment of Green Audit of their college premises.

We hope that the recommendations stated in this report will be useful and worthy of discussions to take things forward to help implementation of energy conservation measures and green practices. While we have made every attempt to adhere to high quality standards, in both data collection and analysis through the report, we would welcome your suggestions so as to improve upon this report further.



## Executive Summary

Green Audit of Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule is conducted by Nutan Urja Solutions, Pune. Based On the audit field study, following important points can be presented.

### 1. Present Energy Consumption

Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule uses Electrical Energy as the source of Energy for various equipment in the college campus.

In the following Table, we present the details of Energy Consumption.

**Table no 1: Details of energy consumption**

S. No	Parameter	Energy consumed (Units)	CO <sub>2</sub> Emission (MT)
1	Maximum	31,126	24.9
2	Minimum	3,412	2.7
3	Average	12,706	10.2
4	Total	152,472	122.0

### 2. Various Measures Adopted for Energy Conservation

1. Usage of STAR Rated ACs
2. Usage of LED lights at indoor lighting.
3. Usage of LED Lights for outdoor lighting.

### 3. Usage of Renewable Energy

The institute has installed **251 kW** of Solar PV Power Plant.

### 4. Rain Water Harvesting

The College has installed the Rainwater harvesting project.

### 5. Waste Management

The internal communication is through emails and E-waste generated in college is disposed time to time through proper vendors.



## 6. Notes and Assumptions

1. Daily working hours – 8 hrs.
2. Annual working Days – 300 days
3. Average Rate of Electrical Energy: **Rs. 11/kWh**



## Abbreviations

LED	:	Light Emitting Diode
V	:	Voltage
I	:	Current
kW	:	Kilo- Watt
kWh	:	kilo-Watt Hour
kVA	:	Active Power





## 1. Introduction

SVKM's Dhule Campus Dhule is largely emerging as one of the biggest future hubs of technology and Education. It has gained a strategic advantage for being on the junction of three National Highways viz. NH-3, NH-6, and NH-211. Dhule is aiming to develop into an industrial town which may provide next generation technologies across infrastructure sectors. Our president has a dream to make Dhule city known for its quality education institutes. SVKM has taken an initiative to develop state of the art engineering and pharmacy institute that will impart quality education in Dhule Spread over 33 acres of land on the outskirts of Dhule, it will house colleges as SVKM's Institute of Technology.

### 1.1 Objectives

1. To study present level of Energy Consumption
2. To Study the present CO<sub>2</sub> emissions
3. To assess the various equipment/facilities from Energy efficiency aspect
4. To measure various Electrical parameters
5. To study Scope for usage of Renewable Energy
6. To study various measures to reduce the Energy Consumption

### 1.2 Audit methodology

1. Study of connected load
2. Study of various Electrical parameters
3. To prepare the Report with various Encon measures with payback analysis



## 2. Study of Electrical Energy Consumption

In this chapter, electricity bills are studied for the analysis of electrical energy consumption.

**Table no 2.1: Summary of electricity bills**

S. No	Month	Energy (kWh)	Bill Amount (Rs.)
1	Jul-23	26,922	445,140
2	Jun-23	31,126	529,024
3	May-23	16,057	311,071
4	Apr-23	11,201	246,790
5	Mar-23	3,553	139,615
6	Feb-23	3,412	145,613
7	Jan-23	3,796	155,196
8	Dec-22	8,866	207,020
9	Nov-22	8,480	193,589
10	Oct-22	10,689	218,873
11	Sep-22	15,682	293,250
12	Aug-22	12,689	261,216
	<b>Total</b>	<b>152,473</b>	<b>3,146,396</b>



Variation in energy consumption is as follows

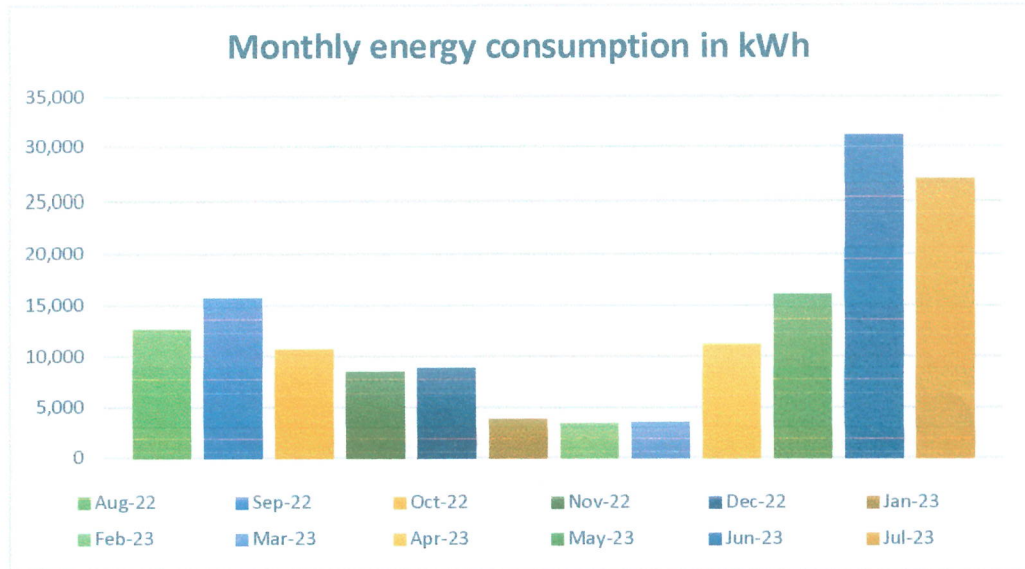


Figure 2.1: Month wise energy consumption

Monthly variation in electricity bill is as follows,

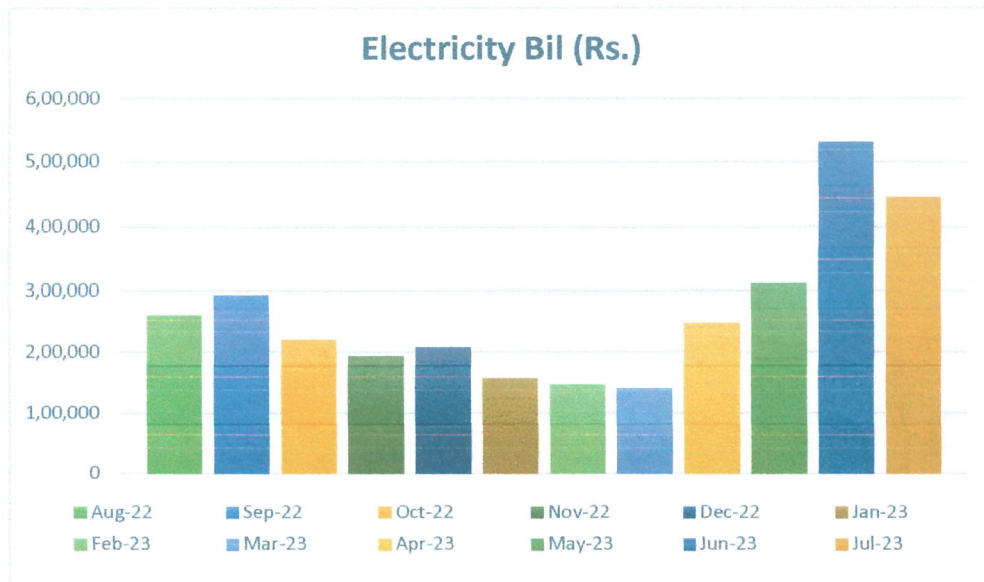


Figure 2.2: Month wise electricity bill



Key observations of electricity bill are as follows,

**Table no 2.2: Key observations**

S. no	Parameter	Energy consumed, (Units)	CO2 Emission (MT)
1	Maximum	31,126	24.9
2	Minimum	3,412	2.7
3	Average	12,706	10.2
4	Total	152,473	122.0



### 3. Carbon Foot printing

1. A Carbon Foot print is defined as the Total Greenhouse Gas emissions (CO<sub>2</sub> emissions), emitted due to various activities. In this we compute the emissions of Carbon-Di-Oxide, by usage of the various form of Electrical Energy used by the College for performing its day to day activities.

#### 2. Basis for computation of CO<sub>2</sub> Emissions:

The basis of Calculation for CO<sub>2</sub> emissions due to Electrical Energy is as under

- 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO<sub>2</sub>** into atmosphere.

Based on the above Data we compute the CO<sub>2</sub> emissions which are being released in to the atmosphere by the College due to its Day to Day operations.

We herewith furnish the details of various forms of Energy consumption as under

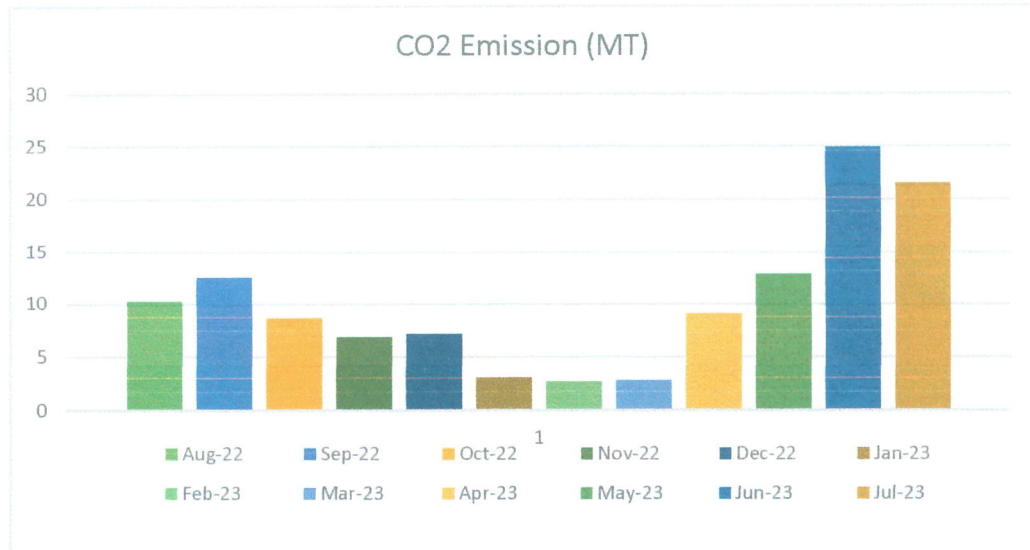
**Table 3.1: Month wise Consumption of Electrical Energy & CO<sub>2</sub> Emissions**

S. No	Month	Energy Consumed, kWh	CO <sub>2</sub> Emissions, MT
1	Jul-23	26,922	21.5
2	Jun-23	31,126	24.9
3	May-23	16,057	12.8
4	Apr-23	11,201	9.0
5	Mar-23	3,553	2.8
6	Feb-23	3,412	2.7
7	Jan-23	3,796	3.0
8	Dec-22	8,866	7.1
9	Nov-22	8,480	6.8
10	Oct-22	10,689	8.6
11	Sep-22	15,682	12.5
12	Aug-22	12,689	10.2
	<b>Total</b>	<b>152,473</b>	<b>122.0</b>





In the following Chart we present the CO<sub>2</sub> emissions due to usage of Electrical Energy.



**Figure 3.1: Month wise CO<sub>2</sub> Emission**



#### 4. Study of Usage of Alternate Energy

In this Chapter, we compute the percentage of Usage of Alternate/Renewable Energy to Annual Energy Requirement of the College.

Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule is situated in Shri Vile Parle Kelavani Mandal campus, Dhule. The institute have installed Roof Top Solar PV System to cater energy requirement. The Installed Capacity of Solar PV Plant is 251 kW.

**Table 4.1: Computation of % Usage of Alternate Energy to Annual Energy Requirement**

No	Particulars	Value	Unit
1	Annual Energy Purchased from MSEDCL	1,52,473	kWh/Annum
2	Energy Generated by Roof Top Solar PV System	2,88,980	kWh/Annum
3	Total Energy Requirement of College	441,453	kWh/Annum
4	% of Usage of Alternate Energy to Annual Energy Requirement	65	%

#### Photograph of Solar PV plant



## 5. Study of Water System

### 5.1 Source of Water

The stored water in overhead tank is provided to use for day to day purpose. The treated RO water is provided for drinking.

#### Photograph of overhead water tank



### 5.2 Rain Water Harvesting

The College has already installed Rain Water Harvesting project, wherein the rain water falling on the terrace is collected and through pipes it is fed to Water Storage. This stored water is then reused for domestic purpose.

#### Photograph of Rain Water Harvesting

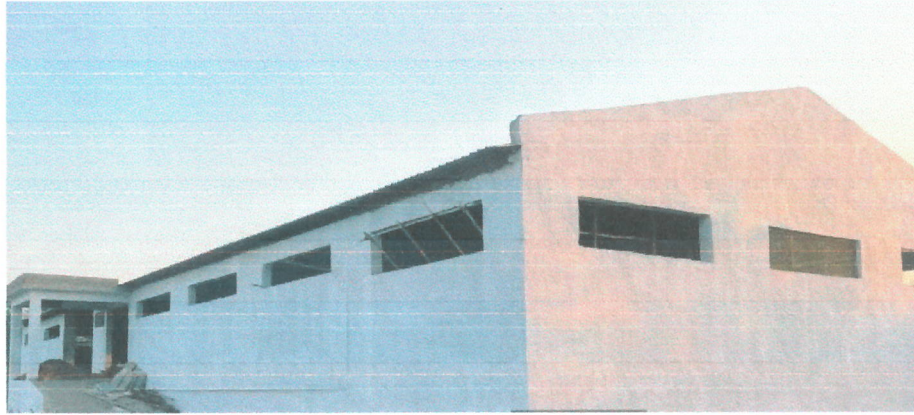




### 5.3 Sewage Treatment Plant

In the institute premises the sewage treatment plant is available. This plant aims to remove contaminants from sewage to produce an effluent that is suitable for reuse application.

#### Photograph of Sewage Treatment Plant



## **6. Study of Waste Management**

### **6.1 Solid Waste Management**

The garbage collection in college is done in dustbins having separate chambers for dry and wet waste. Waste bins are placed everywhere in the college campus for collection of waste.

### **6.2 E-Waste Management**

The E- waste generated in college is disposed time to time through authorized vendor

### **6.3 Waste Water Management**

The waste water generated in college is disposed to corporation. Sewage treatment plant is in progress.





## **7. Study of Green Practices**

### **7.1 No. of students who don't use own Vehicle for coming to Institute**

Student hostels are located near college campus only. Many students live in hostel campus. Out of total students coming to Institute, about 60% students use own Automobile. During the lockdown of Covid-19 negligible vehicles are reported on the campus during the year 2019-20 and 2020-21. Online teaching mode used for the teaching learning processes.

### **7.2 Usage of Public Transport**

Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule can be conveniently reached by public transport. Most of the staff are using their own vehicles i.e cars and two wheelers. The capacity of the parking is enough to accommodate all vehicles.

During the Students transport study, it was revealed that the local students who are residing nearby areas make use of Public Transport like local sharing type auto rickshaws. Institute encourages students to not to use automobiles. Students staying in hostels don't have to use any vehicle for college.

### **7.3 Pedestrian Friendly Roads**

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



### Photograph of Road within campus



### 7.4 Plastic Free Campus

The Institute is an active participant in the Government of India's most prestigious project of SWATCHH BHARAT ABHIYAN. The Institute has displayed signboards in the Campus, to make the campus plastic free.

Various measures adopted for this purpose are as follows

- Installation of Separate waste bins for collection of Dry waste & wet waste.
- Usage of steel cutlery in the Institute canteen
- Display of sign boards in the campus for Plastic Free campus

Photograph of steel cutlery used in canteen and cafeteria



### 7.5 Paperless Office

The internal communication of the Institute is through the Internet. There is hardly any day to day operations, where printing is required.

### 7.6 Food Service in college campus

There are canteens and cafeterias within college campus. Students need not to travel outside the college for food. Hygiene in canteen is well maintained.

### 7.7 Provision of Ramp for Divyangajan

The college has made provision of ramp for Divyangajan

#### Photograph for Divyangajan facility





### 7.8 Provision of Sanitary Waste Incinerator

The college has installed Sanitary Waste Incinerator to dispose of the sanitary waste.

#### Photograph of Sanitary Waste Incinerator



### 7.9 Usage of daylight available

College construction is such that, day light can be used.

#### Photograph of usage of day light



### 7.8 Usage of Electric vehicles to travel within campus

The institute use pollution free electric vehicles for transport within campus.

#### Photograph of electrical vehicles



### 7.9 Usage of drip and sprinkler irrigation to water garden

The college uses water saving techniques such as drip and sprinkler irrigation to water garden

#### Photograph of irrigation





## 8. Green Landscaping with Trees and Plants

The Institute has beautiful maintained Garden and trees





**Figure 8.1: Beautiful maintained Garden of college**



List of trees in garden are as follows,

**Table 8.1: List of trees**

S. No.	Scientific Name	Common Name	Family	Habitat	Characteristic feature of plant
1.	Cassia Nodosa	Pink Shower Tree	Fabaceae	Tree	Ornamental Plant
2.	Peltuphorum Pterocarpum	Copperpod	Caesalpiniaceae	Tree	Ornamental Plant
3.	Lawsenia Inermii	Henna	Lythraceae	Shrub	Ornamental Plant
4.	Nerium Olender Dwarf Alba	Rose Bay	Apocynaceae	Shrub	Ornamental Plant
5.	Nerium olender Dwarf Rosem	South Sea Rose	Apocynaceae	Shrub	Ornamental Plant
6.	Tabernomontana Variegated	Pinwheel flower	Apocynaceae	Shrub	Ornamental Plant
7.	Jatropha Pink	Spicy Jatropha	Euphorbiaceae	Shrub	Ornamental Plant
8.	Oreodoxa Regia	Florida Royal Palm	Arecaceae	Tree	Ornamental Plant
9.	Plumeria Red	Frangipani	Apocynaceae	Tree	Ornamental Plant
10.	Terminalia Cattapa	Almond Tree	Combretaceae	Tree	CO <sub>2</sub> absorption
11.	Nerium Dwarf White	Oleander	Apocynaceae	Shrub	Ornamental Plant
12.	Plumeria Alba	West Indian jasmine	White frangipani	Tree	Ornamental Plant
13.	Delonix Regia	Flame-of-the-forest	Fabaceae	Tree	Ornamental Plant
14.	Prosopis Tamarugo	Tamarugo	Fabaceae	Tree	Ornamental Plant
15.	Lantana Purple	Trailing lantana	Verbenaceae	Shrub	Ornamental Plant



16.	Asystechia	Coromandel	Acanthaceae	Shrub	Ornamental Plant
17.	Crynum Lily	Seashore Lily	Amaryllidaceae	Herbs	Ornamental Plant
18.	Wadelia	Singapore daisy	Asteraceae	Creeping plant	Ornamental Plant
19.	Ficus religiosa	Sacred Fig	Moraceae	Tree	O <sub>2</sub> releasing Plant
20.	Leucaena leucocephala	Wild Tamarind	Fabaceae	Tree	Increases soil fertility
21.	Azadirachta indica	Neem Tree	Meliaceae	Tree	Mitigates the production of reactive oxygen species
22.	Lagerstroemia speciosa	Pride of India	Lagerstroemia	Tree	Medicinal Plant
23.	Syagrus romanzoffiana	Queen Palm	Arecaceae	Tree	Medicinal Plant
24.	Prunus domestica	Plum	Rosaceae	Tree	Oxygen radical absorbant
25.	Moringa oleifera	Drumstick	Moringaceae	Tree	Reduces the reactive oxygen species
26.	Aegle marmelos	Bilva	Rutaceae	Tree	Medicinal Plant
27.	Magnolia grandiflora	Southern magnolia	Magnoliaceae	Tree	Herbal Medicinal Plant
28.	Royal Poinciana	Gulmohar	Caesalpiaceae	Tree	absorb carbon dioxide and release oxygen
29.	Ficus religiosa	Sacred Fig Tree	Moraceae	Tree	produce oxygen day and night
30.	Elaeocarpus Sylvstris	Hortonoki	Elaeocarpus	Tree	Medicinal Plant
31.	Mangifera indica	Mango	Mangifera	Tree	Absorbs carbon dioxide
32.	Arecaceae	Palm Tree	Perennial	Tree	Medicinal Plant



# Nutan Urja Solutions

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Date: 27/08/2023

## CERTIFICATE

This is to certify that we have conducted Environmental Audit at Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule in the year 2022-23.

The College has already adopted following projects for making the campus **Energy Efficient**.

- Installation of Sewage Treatment Plant
- Maximum Usage of Day Lighting.
- Installation of Rain Water Harvesting System
- Installation of **251kW** Solar PV Power Plant.

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

**Nutan Urja Solutions,**

*K G Bhatwadekar*

K G Bhatwadekar,  
Certified Energy Auditor,  
EA – 22428



**Report  
On  
Environmental Audit  
At  
Shri Vile Parle Kelavani Mandal's Institute of Technology,  
Dhule  
(Year 2022-23)**



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## Table of Contents

Acknowledgement .....	2
Executive Summary .....	3
Abbreviations .....	5
1. Introduction.....	6
1.1 Important Definitions: .....	6
1.2 Objectives:.....	7
1.3 Audit Methodology: .....	8
1.4 General Details of College .....	8
2. Study of Consumption of Various Resources .....	9
2.1 Variation of Monthly Electrical Energy Consumption .....	11
2.2 Key Inferences drawn.....	11
3. Study of Environmental Pollution .....	12
3.1 Air Pollution.....	12
3.2 Study of Solid Waste Generation .....	13
3.3 Canteen food wastage.....	14
3.4 Study of Liquid Waste Generation.....	14
3.5 Study of e-Waste Management: .....	14
4. Study of CO2 Emission reduction .....	15
5. Study of Rain Water Harvesting .....	16





### **Acknowledgement**

We at Nutan Urja Solutions, Pune wish to express our sincere gratitude to the management of Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule for assigning the work of Environmental Audit of college campus.

We appreciate the co-operation and support extended to our team members during the entire tenure of field study. We are also thankful to all other staff members who helped us during the measurements at the field and for giving us the necessary inputs to carry out this vital exercise.



## Executive Summary

After the Field measurements & analysis, we present herewith important observations made and various measures to reduce the dependency on Natural resources & reduce the pollution.

Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule consumes various resources for day to day operations, namely: Air, Water, Electrical Energy & LPG.

### 1. Various Pollution due to College Activities:

- Air pollution: Mainly CO<sub>2</sub> on account of Electricity & LPG Consumption
- Solid Waste: Bio degradable Kitchen Waste, Garden Waste
- Liquid Waste: Human liquid waste

### 2. Present Level of CO<sub>2</sub> Emissions:

S. No	Parameter	Energy consumed (Units)	CO <sub>2</sub> Emission (MT)
1	Maximum	31,126	24.9
2	Minimum	3,412	2.7
3	Average	12,706	10.2
4	Total	152,472	122.0

### 3. The various projects that are already implemented for Environmental Conservation:

- Usage of Energy Efficient BEE STAR Rated ACs.
- Usage of Natural Day light.
- Implementation of Rain Water Harvesting
- Installation of 251 kW of Solar PV Power Plant.
- Installation of Sewage Treatment Plant.



**5. Notes & Assumptions:**

1. **1 kWh** of Electrical Energy releases **0.8 Kg of CO<sub>2</sub>** into atmosphere
2. 1 kW Solar PV plant generates 5 kWh/day Electrical Energy in a year.



### Abbreviations

AC	:	Air conditioner
LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
PF	:	Power Factor
MD	:	Maximum Demand
PC	:	Personal Computer
MSEDCL	:	Maharashtra State Electricity Distribution Company Ltd



## 1. Introduction

### 1.1 Important Definitions:

#### 1.1.1 Environment: Definition as per environment Protection Act: 1986

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

#### 1.1.2. Environmental Audit: Definition:

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

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

#### 1.1.3. Environmental Pollutant:

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

#### 1.1.4. Relevant Environmental Laws in India:

Table No-1

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





### 1.1.5. Some Important Environmental Rules in India:

Table No-2

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

### 1.1.6 National Environmental Plans & Policy Documents:

Table No-3:

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

### 1.2 Objectives:

1. To study present usage of Natural resources the College is consuming
2. To Study the present pollution sources
3. To study various measures to make the campus Self sustainable in respect of Natural resources
4. To suggest the various measures to reduce the pollution: Air, Water, Noise



### 1.3 Audit Methodology:

1. Study of College as System
2. Study of Electrical Energy Consumption
3. Study of CO<sub>2</sub> emissions
4. Suggestions on usage of Renewable Energy

### 1.4 General Details of College

S. No	Head	Particulars
1	Name of Institution	Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule
2	Address	Survey No. 499, Plot No. 2, Mumbai Agra Highway, behind Gurudwara, Dhule, Maharashtra 424 001.
3	Affiliation	Babasaheb Ambedkar Technological University, Lonere



## 2. Study of Consumption of Various Resources

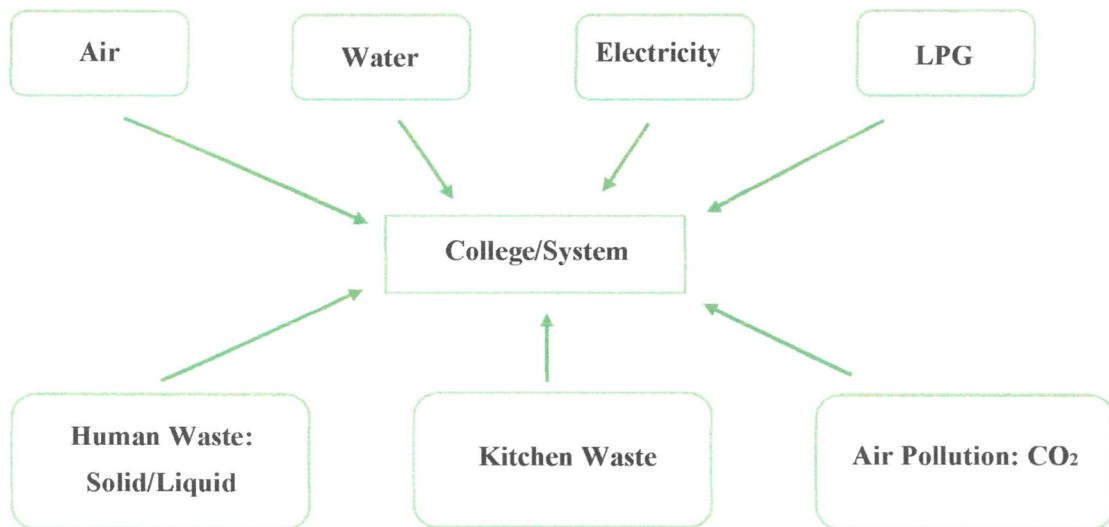
The Institute consumes following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy
4. Liquefied Petroleum Gas

Also, college emits following pollutants to environment

1. Human Waste: Solid/ Liquid
2. Kitchen waste
3. Air pollution

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



Now we compute the Generation of CO<sub>2</sub> on account of consumption of Electrical Energy & LPG as under. The calculation of electrical energy consumption by college can be given as,

**Table 2.1: Electrical Energy Consumption**

S. No	Month	Energy (kWh)
1	Jul-23	26,922
2	Jun-23	31,126
3	May-23	16,057
4	Apr-23	11,201
5	Mar-23	3,553
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9	Nov-22	8,480
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11	Sep-22	15,682
12	Aug-22	12,689
<b>Total</b>		<b>152,473</b>
<b>Maximum</b>		<b>31,126</b>
<b>Minimum</b>		<b>3,412</b>
<b>Average</b>		<b>12,706</b>



### 2.1 Variation of Monthly Electrical Energy Consumption

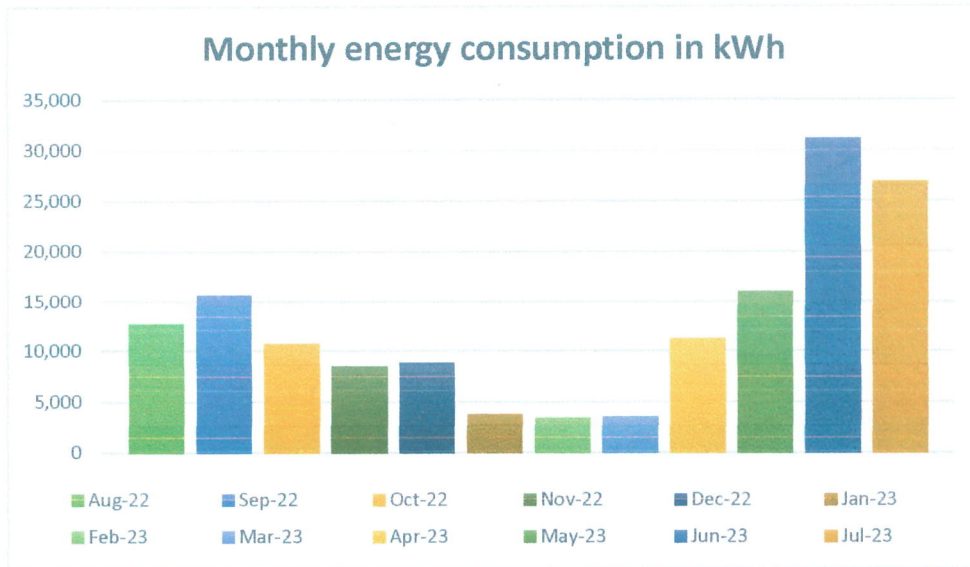


Figure 2.1: Monthly Electrical Energy Consumption

### 2.2 Key Inferences drawn

From the above analysis, we present following important parameters:

Table 2.2: Variation in Important Parameters

S. No	Parameter/Value	Energy Consumed, kWh
1	Total	152,473
2	Maximum	31,126
3	Minimum	3,412
4	Average	12,706





### 3. Study of Environmental Pollution

In this Chapter, we present the various types of Pollution as under:

#### 3.1 Air Pollution

The College is using two forms of Energies, namely: Thermal in the form of LPG and Electrical Energy used for day to day operations of the College. The major pollutant on account of above Energy forms is the Carbon Dioxide.

- 1 unit (kWh) of Electrical Energy emits 0.8 Kg of CO<sub>2</sub> in the atmosphere
- 1 Kg of LPG emits 3 Kg of CO<sub>2</sub> in the atmosphere

In the following Table, we present the CO<sub>2</sub> emissions.

**Table 3.1: Month wise Consumption of Electrical Energy & CO<sub>2</sub> Emissions**

S. No	Month	Energy Consumed, kWh	CO <sub>2</sub> Emissions, MT
1	Jul-23	26,922	21.5
2	Jun-23	31,126	24.9
3	May-23	16,057	12.8
4	Apr-23	11,201	9.0
5	Mar-23	3,553	2.8
6	Feb-23	3,412	2.7
7	Jan-23	3,796	3.0
8	Dec-22	8,866	7.1
9	Nov-22	8,480	6.8
10	Oct-22	10,689	8.6
11	Sep-22	15,682	12.5
12	Aug-22	12,689	10.2
	<b>Total</b>	<b>152,473</b>	<b>122.0</b>
	<b>Maximum</b>	31,126	24.9
	<b>Minimum</b>	3,412	2.7
	<b>Average</b>	12,706	10.2



In the following Chart we present the CO2 emissions due to usage of Electrical Energy.

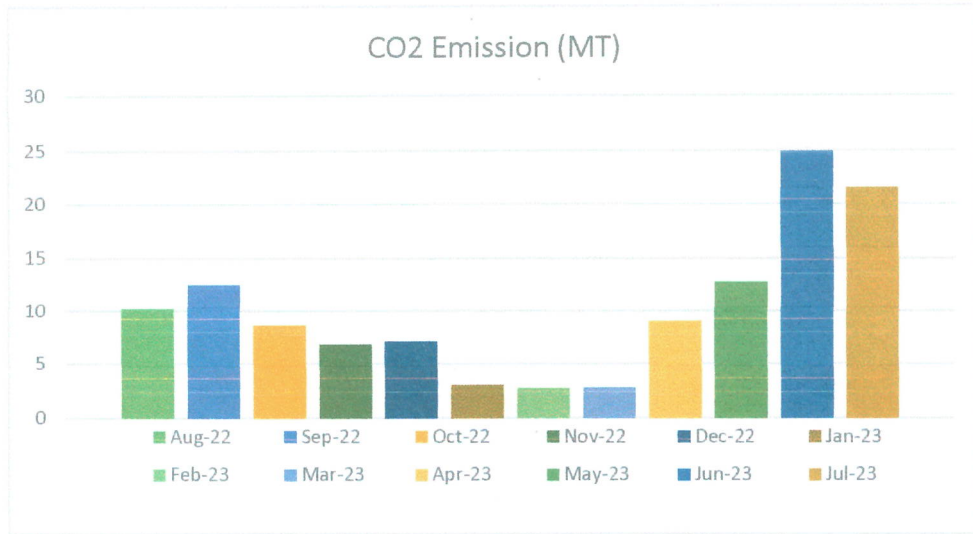


Figure 3.1: CO2 emission due to usage of electrical energy

### 3.2 Study of Solid Waste Generation

The garbage collected in college is segregated into wet and dry centrally in campus. Waste bins are placed in college campus for collection of waste.

#### Photographs of Waste bins in college campus



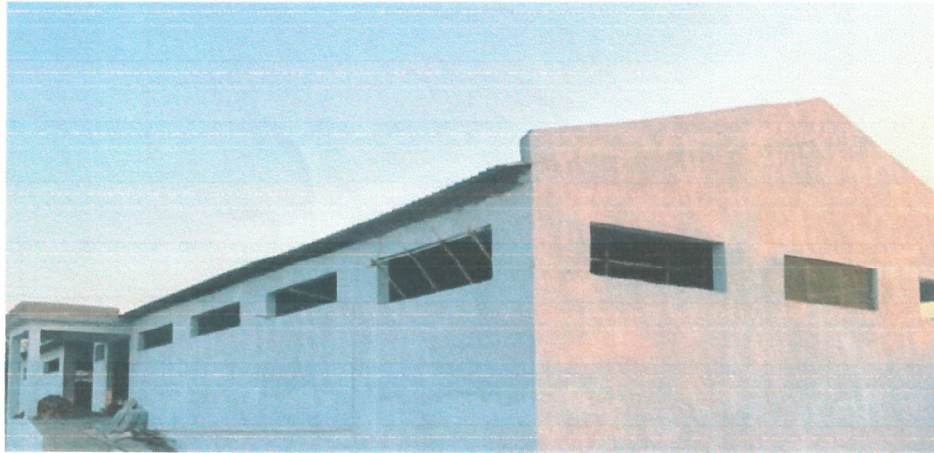
### 3.3 Canteen food wastage

The students and canteen staff are encouraged to have minimal food wastage. The canteen uses steel cutlery.

### 3.4 Study of Liquid Waste Generation

In the institute premises the sewage treatment plant is available. This plant aims to remove contaminants from sewage to produce an effluent that is suitable for reuse application.

#### Photograph of Sewage Treatment Plant



### 3.5 Study of e-Waste Management:

E-waste generated in college is disposed time to time through proper vendor.



#### 4. Study of CO<sub>2</sub> Emission reduction

Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule is situated in Shri Vile Parle Kelavani Mandal campus. The institute have installed Roof Top Solar PV System to cater energy requirement. The Installed Capacity of Solar PV Plant is 251 kWp.

**Table 6.1: CO<sub>2</sub> emission reduction through usage of Alternate Energy**

S. No	Particulars	Value	Unit
1	Energy Generated by Roof Top Solar PV System	2,88,980	kWh/Annum
2	CO <sub>2</sub> emission reduction through usage of Alternate Energy	231.2	MT

#### Photograph of Solar PV plant

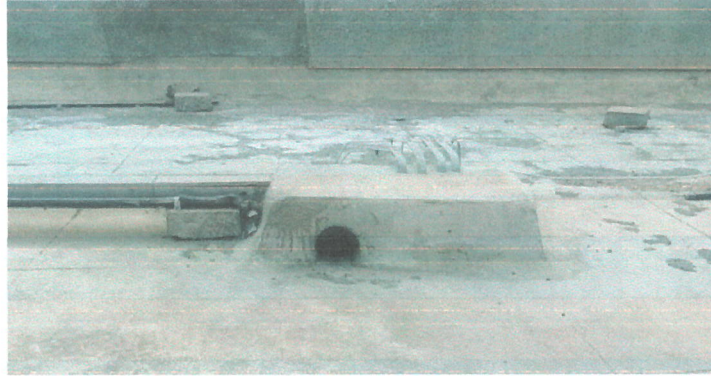




## 5. Study of Rain Water Harvesting

The College has already installed Rain Water Harvesting project, wherein the rain water falling on the terrace is collected and through pipes it is fed to Water Storage. This stored water is then reused for domestic purpose.

### Photograph of Rain Water Harvesting





# Nutan Urja Solutions

(ISO 9001:2015, ISO 50001:2018, ISO 14001:2015) 

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Date: 13/11/2022

## CERTIFICATE

This is to certify that we have conducted Green Audit at Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule for the year 2021–22.

The College has already adopted **Green** practices like:

- Installation of Rain Water Harvesting system
- Installation of **251kW** Roof Top Solar PV Power Plant.
- Usage of Energy Efficient LED
- Usage of Energy Efficient BEE STAR Rated equipment

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

Nutan Urja Solutions,



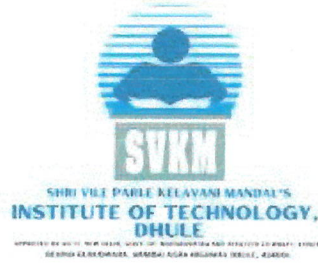
K G Bhatwadekar,

Certified Energy Auditor,

EA - 22428



**Report  
On  
Green Audit  
At  
Shri Vile Parle Kelavani Mandal's Institute of Technology,  
Dhule  
(Year 2021-22)**



Prepared by  
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## Contents

Acknowledgement .....	3
Executive Summary .....	4
Abbreviations.....	6
1. Introduction.....	7
1.1 Objectives.....	7
1.2 Audit methodology .....	7
2. Study of Electrical Energy Consumption.....	8
3. Carbon Foot printing.....	11
4. Study of Usage of Alternate Energy .....	13
5. Study of Water System.....	14
5.1 Source of Water.....	14
5.2 Rain Water Harvesting.....	14
6. Study of Waste Management.....	15
6.1 Solid Waste Management .....	15
6.2 E-Waste Management.....	15
6.3 Waste Water Management.....	15
7. Study of Green Practices .....	16
7.1 No. of students who don't use own Vehicle for coming to Institute.....	16
7.2 Usage of Public Transport.....	16
7.3 Pedestrian Friendly Roads.....	16
7.4 Plastic Free Campus.....	17
7.5 Paperless Office.....	18
7.6 Food Service in college campus.....	18
7.7 Provision of Ramp for Divyangajan.....	18
7.8 Provision of Sanitary Waste Incinerator.....	19
7.9 Usage of daylight available.....	19



7.8 Usage of Electric vehicles to travel within campus.....	20
7.9 Usage of drip and sprinkler irrigation to water garden.....	20
8. Green Landscaping with Trees and Plants .....	21



## **Acknowledgement**

We at Nutan Urja Solutions, Pune, express our sincere gratitude to the management of Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule for awarding us the assignment of Green Audit of their college premises.

We hope that the recommendations stated in this report will be useful and worthy of discussions to take things forward to help implementation of energy conservation measures and green practices. While we have made every attempt to adhere to high quality standards, in both data collection and analysis through the report, we would welcome your suggestions so as to improve upon this report further.



## Executive Summary

Green Audit of Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule is conducted by Nutan Urja Solutions, Pune. Based On the audit field study, following important points can be presented.

### 1. Present Energy Consumption

Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule uses Electrical Energy as the source of Energy for various equipment in the college campus.

In the following Table, we present the details of Energy Consumption.

**Table no 1: Details of energy consumption**

Sr no	Parameter	Energy consumed, (Units)	CO2 Emission (MT)
1	Maximum	16,029	12.8
2	Minimum	2,164	1.7
3	Average	7,878	6.3
4	Total	94,540	75.6

### 2. Various Measures Adopted for Energy Conservation

1. Usage of STAR Rated ACs
2. Usage of LED lights at indoor locations.
3. Usage of LED Lights for outdoor lighting.

### 3. Usage of Renewable Energy

The institute has installed **251 kW** of Solar PV Power Plant.

### 4. Rain Water Harvesting

The College has installed the Rainwater harvesting project.





## 5. Waste Management

The internal communication is through emails and E-waste generated in college is disposed time to time through proper vendors.

## 6. Recommendation

- Increase Campus Greenery

## 7. Notes and Assumptions

1. Daily working hours – 8 hrs.
2. Annual working Days – 300 days
3. Average Rate of Electrical Energy: **Rs. 11/kWh**



## Abbreviations

LED	:	Light Emitting Diode
V	:	Voltage
I	:	Current
kW	:	Kilo- Watt
kWh	:	kilo-Watt Hour
kVA	:	Active Power



## 1. Introduction

SVKM's Dhule Campus Dhule is largely emerging as one of the biggest future hubs of technology and Education. It has gained a strategic advantage for being on the junction of three National Highways viz. NH-3, NH-6, and NH-211. Dhule is aiming to develop into an industrial town which may provide next generation technologies across infrastructure sectors. Our president has a dream to make Dhule city known for its quality education institutes. SVKM has taken an initiative to develop state of the art engineering and pharmacy institute that will impart quality education in Dhule Spread over 33 acres of land on the outskirts of Dhule, it will house colleges as SVKM's Institute of Technology.

### 1.1 Objectives

1. To study present level of Energy Consumption
2. To Study the present CO<sub>2</sub> emissions
3. To assess the various equipment/facilities from Energy efficiency aspect
4. To measure various Electrical parameters
5. To study Scope for usage of Renewable Energy
6. To study various measures to reduce the Energy Consumption

### 1.2 Audit methodology

1. Study of connected load
2. Study of various Electrical parameters
3. To prepare the Report with various Encon measures with payback analysis



## 2. Study of Electrical Energy Consumption

In this chapter, electricity bills are studied for the analysis of electrical energy consumption.

**Table no 2.1: Summary of electricity bills**

No	Month	Energy Consumed, kWh	CO2 Emissions, MT
1	Jul-22	15,870	12.7
2	Jun-22	16,029	12.8
3	May-22	12,307	9.8
4	Apr-22	13,965	11.2
5	Mar-22	3,380	2.7
6	Feb-22	2,164	1.7
7	Jan-22	2,489	2.0
8	Dec-21	4,961	4.0
9	Nov-21	3,175	2.5
10	Oct-21	3,362	2.7
11	Sep-21	5,807	4.6
12	Aug-21	11,032	8.8
	<b>Total</b>	<b>94,540</b>	<b>75.6</b>





Variation in energy consumption is as follows

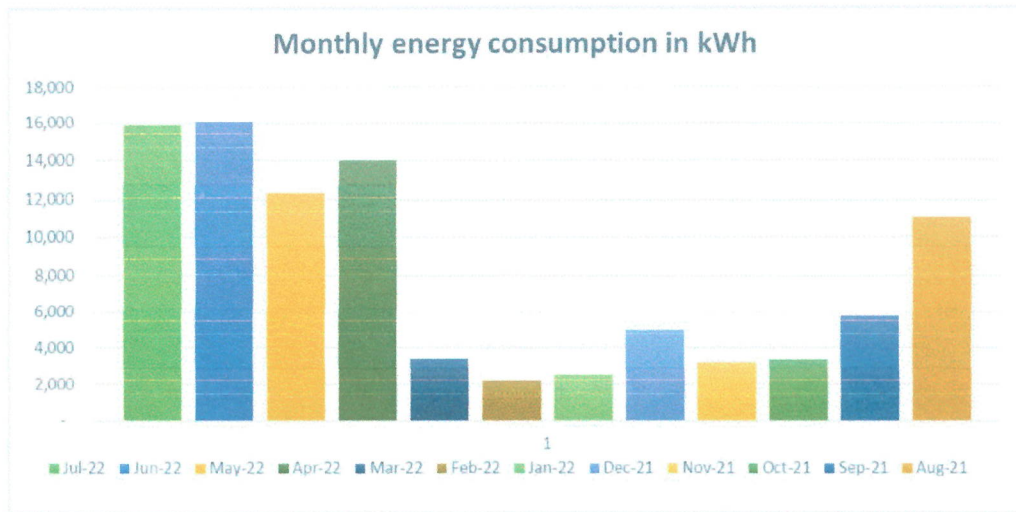


Figure 2.1: Month wise energy consumption

Monthly variation in electricity bill is as follows,

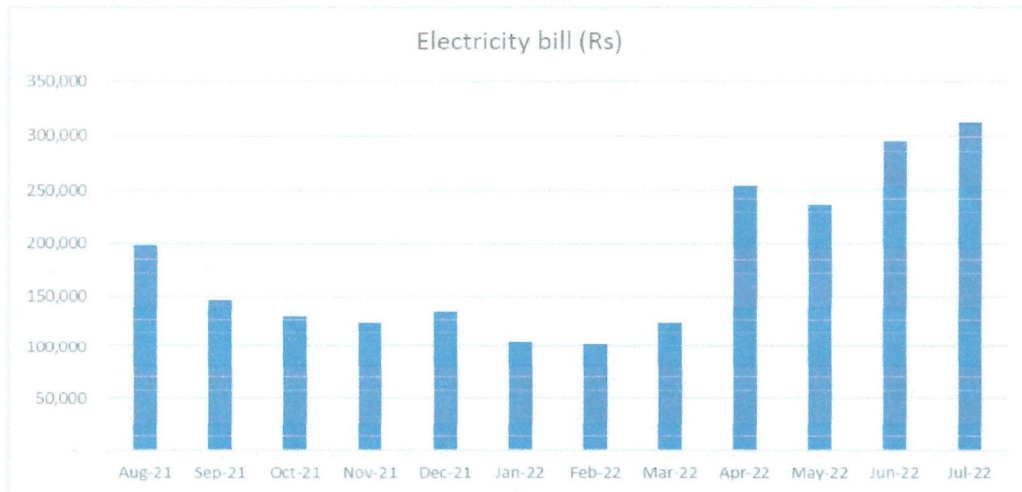


Figure 2.2: Month wise electricity bill



Key observations of electricity bill are as follows,

**Table no 2.2: Key observations**

S. no	Parameter	Energy consumed, (Units)	CO2 Emission (MT)
1	Maximum	16,029	12.8
2	Minimum	2,164	1.7
3	Average	7,878	6.3
4	Total	94,540	75.6



### 3. Carbon Foot printing

1. A Carbon Foot print is defined as the Total Greenhouse Gas emissions (CO<sub>2</sub> emissions), emitted due to various activities. In this we compute the emissions of Carbon-Di-Oxide, by usage of the various form of Electrical Energy used by the College for performing its day to day activities.

#### 2. Basis for computation of CO<sub>2</sub> Emissions:

The basis of Calculation for CO<sub>2</sub> emissions due to Electrical Energy is as under

- 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO<sub>2</sub>** into atmosphere.

Based on the above Data we compute the CO<sub>2</sub> emissions which are being released in to the atmosphere by the College due to its Day to Day operations.

We herewith furnish the details of various forms of Energy consumption as under

**Table 3.1: Month wise Consumption of Electrical Energy & CO<sub>2</sub> Emissions**

No	Month	Energy Consumed, kWh	CO <sub>2</sub> Emissions, MT
1	Jul-22	15,870	12.7
2	Jun-22	16,029	12.8
3	May-22	12,307	9.8
4	Apr-22	13,965	11.2
5	Mar-22	3,380	2.7
6	Feb-22	2,164	1.7
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11	Sep-21	5,807	4.6
12	Aug-21	11,032	8.8
	<b>Total</b>	<b>94,540</b>	<b>75.6</b>



In the following Chart we present the CO<sub>2</sub> emissions due to usage of Electrical Energy.

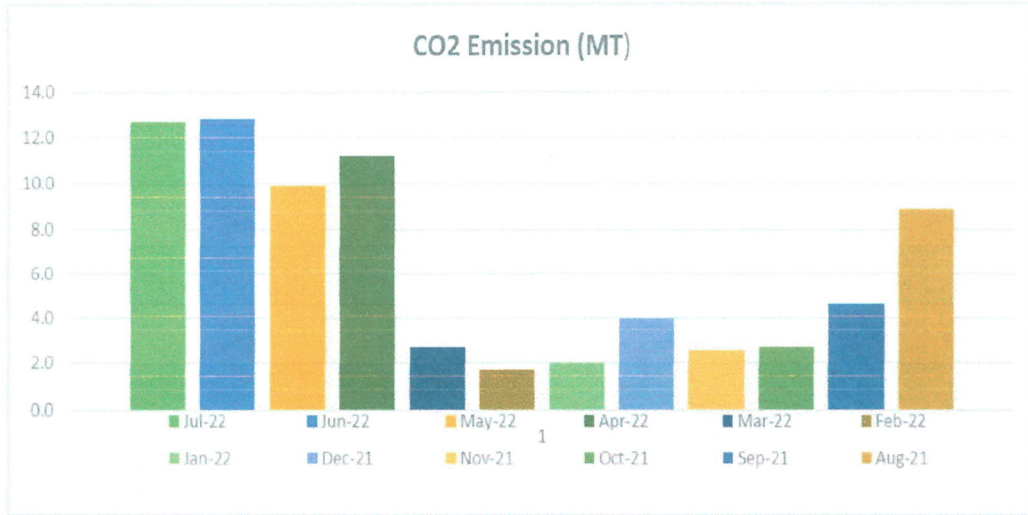


Figure 3.1: Month wise CO<sub>2</sub> Emission





#### 4. Study of Usage of Alternate Energy

In this Chapter, we compute the percentage of Usage of Alternate/Renewable Energy to Annual Energy Requirement of the College.

Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule is situated in Shri Vile Parle Kelavani Mandal campus, Dhule. The institute have installed Roof Top Solar PV System to cater energy requirement. The Installed Capacity of Solar PV Plant is **251 kW**.

**Table 4.1: Computation of % Usage of Alternate Energy to Annual Energy Requirement**

No	Particulars	Value	Unit
1	Annual Energy Purchased from MSEDCL	94,540	kWh/Annum
2	Energy Generated by Roof Top Solar PV System	136,735	kWh/Annum
3	Total Energy Requirement of College	231,275	kWh/Annum
4	% of Usage of Alternate Energy to Annual Energy Requirement	59	%

#### Photograph of Solar PV plant



## 5. Study of Water System

### 5.1 Source of Water

The stored water in overhead tank is provided to use for day to day purpose. The treated RO water is provided for drinking.

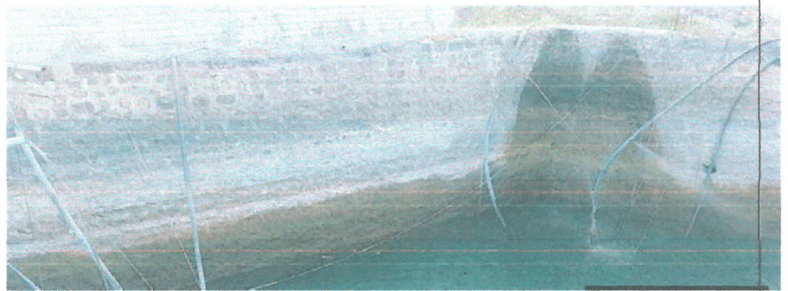
#### Photograph of overhead water tank



### 5.2 Rain Water Harvesting

The College has already installed Rain Water Harvesting project, wherein the rain water falling on the terrace is collected and through pipes it is fed to Water Storage. This stored water is then reused for domestic purpose.

#### Photograph of Rain Water Harvesting



## **6. Study of Waste Management**

### **6.1 Solid Waste Management**

The garbage collection in college is done in dustbins having separate chambers for dry and wet waste. Waste bins are placed everywhere in the college campus for collection of waste.

### **6.2 E-Waste Management**

The E- waste generated in college is disposed time to time through authorized vendor.

### **6.3 Waste Water Management**

The waste water generated in college is disposed to municipal corporation.





## **7. Study of Green Practices**

### **7.1 No. of students who don't use own Vehicle for coming to Institute**

Student hostels are located near college campus only. Many students live in hostel campus. Out of total students coming to Institute, about 60% students use own Automobile. During the lockdown of Covid-19 negligible vehicles are reported on the campus during the year 2019-20 and 2020-21. Online teaching mode used for the teaching learning processes.

### **7.2 Usage of Public Transport**

Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule can be conveniently reached by public transport. Most of the staff are using their own vehicles i.e. cars and two wheelers. The capacity of the parking is enough to accommodate all vehicles.

During the Students transport study, it was revealed that the local students who are residing nearby areas make use of Public Transport like local sharing type auto rickshaws. Institute encourages students to not to use automobiles. Students staying in hostels don't have to use any vehicle for college.

### **7.3 Pedestrian Friendly Roads**

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





### Photograph of Road within campus



### 7.4 Plastic Free Campus

The Institute is an active participant in the Government of India's most prestigious project of SWATCHH BHARAT ABHIYAN. The Institute has displayed signboards in the Campus, to make the campus plastic free.

Various measures adopted for this purpose are as follows

- Installation of Separate waste bins for collection of Dry waste & wet waste.
- Usage of steel cutlery in the Institute canteen
- Display of sign boards in the campus for Plastic Free campus

Photograph of steel cutlery used in canteen and cafeteria



### 7.5 Paperless Office

The internal communication of the Institute is through the Internet. There is hardly any day to day operations, where printing is required.

### 7.6 Food Service in college campus

There are canteens and cafeterias within college campus. Students need not to travel outside the college for food. Hygiene in canteen is well maintained.

### 7.7 Provision of Ramp for Divyangajan

The college has made provision of ramp for Divyangajan

#### Photograph for Divyangajan facility





### 7.8 Provision of Sanitary Waste Incinerator

The college has installed Sanitary Waste Incinerator to dispose of the sanitary waste.

#### Photograph of Sanitary Waste Incinerator



### 7.9 Usage of daylight available

College construction is such that, day light can be used.

#### Photograph of usage of day light



### 7.8 Usage of Electric vehicles to travel within campus

The institute uses pollution free electric vehicles for transport within campus.

#### Photograph of electrical vehicles



### 7.9 Usage of drip and sprinkler irrigation to water garden

The college uses water saving techniques such as drip and sprinkler irrigation to water garden

#### Photographs of drip irrigation





## 8. Green Landscaping with Trees and Plants

The Institute has beautiful maintained Garden and trees



**Figure 8.1: Beautiful maintained trees of college**



List of trees in garden are as follows.

**Table 8.1: List of trees**

S. No.	Scientific Name	Common Name	Family	Habitat	Characteristic feature of plant
1.	Cassia Nodosa	Pink Shower Tree	Fabaceae	Tree	Ornamental Plant
2.	Peltuphorum Pterocarpum	Copperpod	Caesalpiniaceae	Tree	Ornamental Plant
3.	Lawsenia Inermii	Henna	Lythraceae	Shrub	Ornamental Plant
4.	Nerium Olender Dwarf Alba	Rose Bay	Apocynaceae	Shrub	Ornamental Plant
5.	Nerium olender Dwarf Rosem	South Sea Rose	Apocynaceae	Shrub	Ornamental Plant
6.	Tabernomontana Variegated	Pinwheel flower	Apocynaceae	Shrub	Ornamental Plant
7.	Jatropha Pink	Spicy Jatropha	Euphorbiaceae	Shrub	Ornamental Plant
8.	Oreodoxa Regia	Florida Royal Palm	Arecaceae	Tree	Ornamental Plant
9.	Plumeria Red	Frangipani	Apocynaceae	Tree	Ornamental Plant
10.	Terminalia Cattapa	Almond Tree	Combretaceae	Tree	CO <sub>2</sub> absorption
11.	Nerium Dwarf White	Oleander	Apocynaceae	Shrub	Ornamental Plant
12.	Plumeria Alba	West Indian jasmine	White frangipani	Tree	Ornamental Plant
13.	Delonix Regia	Flame-of-the-forest	Fabaceae	Tree	Ornamental Plant
14.	Prosopis Tamarugo	Tamarugo	Fabaceae	Tree	Ornamental Plant
15.	Lantana Purple	Trailing lantana	Verbenaceae	Shrub	Ornamental Plant



16.	Asystechia	Coromandel	Acanthaceae	Shrub	Ornamental Plant
17.	Crynum Lily	Seashore Lily	Amaryllidacea e	Herbs	Ornamental Plant
18.	Wadelia	Singapore daisy	Asteraceae	Creeping plant	Ornamental Plant
19.	Ficus religiosa	Sacred Fig	Moraceae	Tree	O <sub>2</sub> releasing Plant
20.	Leucaena leucocephala	Wild Tamarind	Fabaceae	Tree	Increases soil fertility
21.	Azadirachta indica	Neem Tree	Meliaceae	Tree	Mitigates the production of reactive oxygen species
22.	Lagerstroemia speciosa	Pride of India	Lagerstroemia	Tree	Medicinal Plant
23.	Syagrus romanzoffiana	Queen Palm	Arecaceae	Tree	Medicinal Plant
24.	Prunus domestica	Plum	Rosaceae	Tree	Oxygen radical absorbant

## 9. Recommendations

- Increase Campus Greenery



# Nutan Urja Solutions

(ISO 9001:2015, ISO 50001:2018, ISO 14001:2015)



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Phone: 83568 18381. Email: [nutanurja.solutions@gmail.com](mailto:nutanurja.solutions@gmail.com)

Date: 13/11/2022

## CERTIFICATE

This is to certify that we have conducted Environmental Audit at Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule in the year 2021-22.

The College has already adopted following projects for making the campus **Energy Efficient**.

- Maximum Usage of Day Lighting.
- Installation of Rain Water Harvesting System
- Installation of **251kW** Solar PV Power Plant.

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

Nutan Urja Solutions,



K G Bhatwadekar,  
Certified Energy Auditor,  
EA – 22428





## Table of Contents

Acknowledgement .....	2
Executive Summary .....	3
Abbreviations.....	5
1. Introduction.....	6
1.1 Important Definitions:.....	6
1.2 Objectives:.....	7
1.3 Audit Methodology:.....	8
1.4 General Details of College.....	8
2. Study of Consumption of Various Resources.....	9
2.1 Variation of Monthly Electrical Energy Consumption.....	11
2.2 Key Inferences drawn .....	11
3. Study of Environmental Pollution.....	12
3.1 Air Pollution.....	12
3.2 Study of Solid Waste Generation .....	13
3.3 Canteen food wastage .....	14
3.4 Study of Liquid Waste Generation .....	14
3.5 Study of e-Waste Management: .....	14
4. Study of CO2 Emission reduction .....	15
5. Study of Rain Water Harvesting .....	16
6. Recommendations.....	17





## Acknowledgement

We at Nutan Urja Solutions, Pune wish to express our sincere gratitude to the management of Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule for assigning the work of Environmental Audit of college campus.

We appreciate the co-operation and support extended to our team members during the entire tenure of field study. We are also thankful to all other staff members who helped us during the measurements at the field and for giving us the necessary inputs to carry out this vital exercise.



## Executive Summary

After the Field measurements & analysis, we present herewith important observations made and various measures to reduce the dependency on Natural resources & reduce the pollution.

Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule consumes various resources for day to day operations, namely: Air, Water, Electrical Energy & LPG.

### 1. Various Pollution due to College Activities:

- Air pollution: Mainly CO<sub>2</sub> on account of Electricity & LPG Consumption
- Solid Waste: Bio degradable Kitchen Waste, Garden Waste
- Liquid Waste: Human liquid waste

### 2. Present Level of CO<sub>2</sub> Emissions:

Sr no	Parameter	Energy consumed, (Units)	CO2 Emission (MT)
1	Maximum	16,029	12.8
2	Minimum	2,164	1.7
3	Average	7,878	6.3
4	Total	94,540	75.6

### 3. The various projects that are already implemented for Environmental Conservation:

- Usage of Energy Efficient BEE STAR Rated ACs.
- Usage of Natural Day light.
- Implementation of Rain Water Harvesting
- Installation of **251 kW** of Solar PV Power Plant.

### 4. Recommendations:

1. Installation of Sewage Water Treatment Plant
2. Increase in number of dustbins in college campus to collect dry waste.



**5. Notes & Assumptions:**

1. **1 kWh** of Electrical Energy releases **0.8 Kg of CO<sub>2</sub>** into atmosphere
2. 1 kWp Solar PV plant generates 5 kWh/day Electrical Energy in a year.



### Abbreviations

AC	:	Air conditioner
LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
PF	:	Power Factor
MD	:	Maximum Demand
PC	:	Personal Computer
MSEDCL	:	Maharashtra State Electricity Distribution Company Ltd



## 1. Introduction

### 1.1 Important Definitions:

#### 1.1.1 Environment: Definition as per environment Protection Act: 1986

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

#### 1.1.2. Environmental Audit: Definition:

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

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

#### 1.1.3. Environmental Pollutant:

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

#### 1.1.4. Relevant Environmental Laws in India:

Table No-1

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





### 1.1.5. Some Important Environmental Rules in India:

Table No-2

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

### 1.1.6 National Environmental Plans & Policy Documents:

Table No-3:

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

### 1.2 Objectives:

1. To study present usage of Natural resources the College is consuming
2. To Study the present pollution sources
3. To study various measures to make the campus Self sustainable in respect of Natural resources
4. To suggest the various measures to reduce the pollution: Air, Water, Noise



### 1.3 Audit Methodology:

1. Study of College as System
2. Study of Electrical Energy Consumption
3. Study of CO<sub>2</sub> emissions
4. Suggestions on usage of Renewable Energy

### 1.4 General Details of College

S. No	Head	Particulars
1	Name of Institution	Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule
2	Address	Survey No. 499, Plot No. 2, Mumbai Agra Highway, behind Gurudwara, Dhule, Maharashtra 424 001.
3	Affiliation	Babasaheb Ambedkar Technological University, Lonere



## 2. Study of Consumption of Various Resources

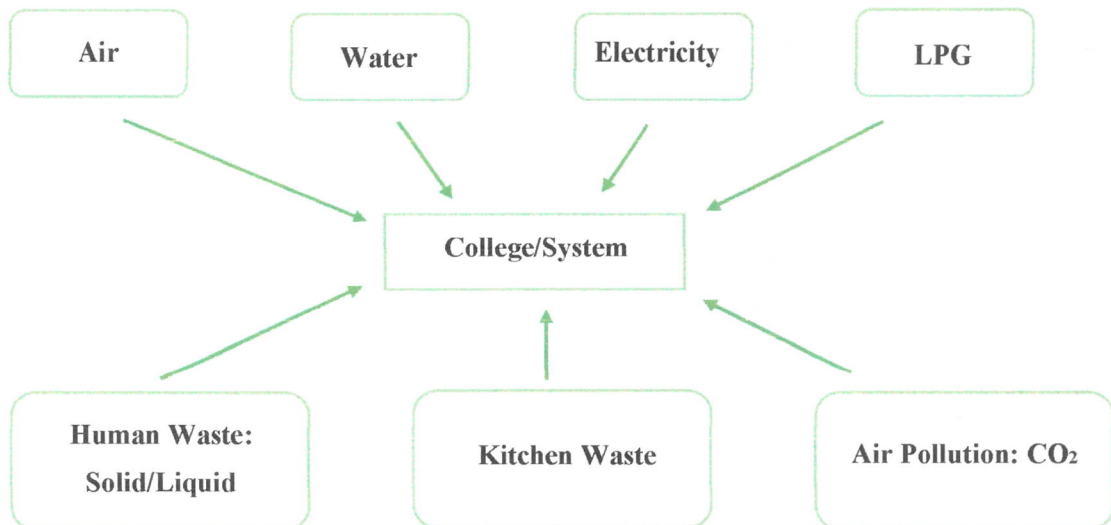
The Institute consumes following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy
4. Liquefied Petroleum Gas

Also, college emits following pollutants to environment

1. Human Waste: Solid/ Liquid
2. Kitchen waste
3. Air pollution

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



Now we compute the Generation of CO<sub>2</sub> on account of consumption of Electrical Energy & LPG as under. The calculation of electrical energy consumption by college can be given as,

**Table 2.1: Electrical Energy Consumption**

S. No	Month	Energy (kWh)
1	Jul-22	15,870
2	Jun-22	16,029
3	May-22	12,307
4	Apr-22	13,965
5	Mar-22	3,380
6	Feb-22	2,164
7	Jan-22	2,489
8	Dec-21	4,961
9	Nov-21	3,175
10	Oct-21	3,362
11	Sep-21	5,807
12	Aug-21	11,032
<b>Total</b>		<b>94,540</b>
<b>Maximum</b>		<b>16,029</b>
<b>Minimum</b>		<b>2,164</b>
<b>Average</b>		<b>7,878</b>



### 2.1 Variation of Monthly Electrical Energy Consumption

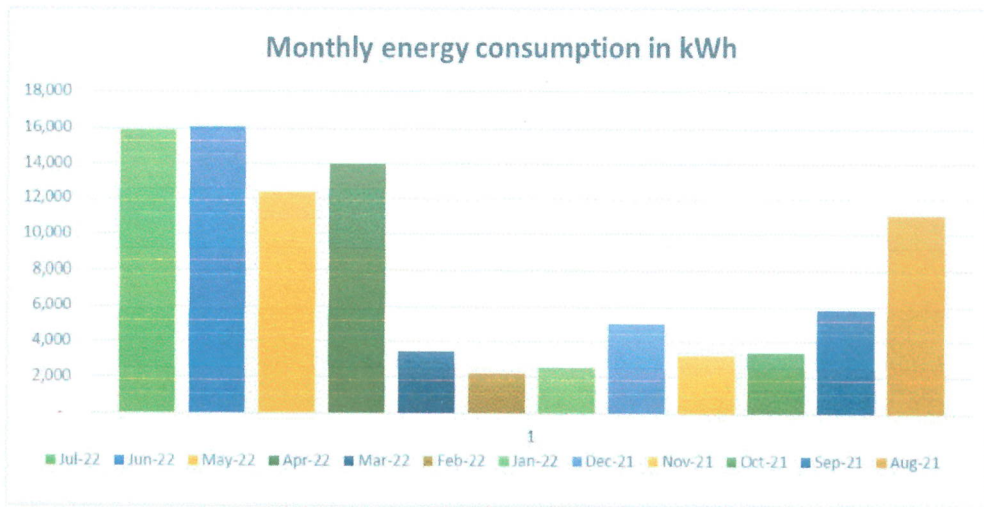


Figure 2.1: Monthly Electrical Energy Consumption

### 2.2 Key Inferences drawn

From the above analysis, we present following important parameters:

Table 2.2: Variation in Important Parameters

S. No	Parameter/Value	Energy Consumed, kWh
1	Total	94,540
2	Maximum	16,029
3	Minimum	2,164
4	Average	7,878





### 3. Study of Environmental Pollution

In this Chapter, we present the various types of Pollution as under:

#### 3.1 Air Pollution

The College is using two forms of Energies, namely: Thermal in the form of LPG and Electrical Energy used for day to day operations of the College. The major pollutant on account of above Energy forms is the Carbon Dioxide.

- 1 unit (kWh) of Electrical Energy emits 0.8 Kg of CO<sub>2</sub> in the atmosphere
- 1 Kg of LPG emits 3 Kg of CO<sub>2</sub> in the atmosphere

In the following Table, we present the CO<sub>2</sub> emissions.

**Table 3.1: Month wise Consumption of Electrical Energy & CO<sub>2</sub> Emissions**

No	Month	Energy Consumed, kWh	CO <sub>2</sub> Emissions, MT
1	Jul-22	15,870	12.7
2	Jun-22	16,029	12.8
3	May-22	12,307	9.8
4	Apr-22	13,965	11.2
5	Mar-22	3,380	2.7
6	Feb-22	2,164	1.7
7	Jan-22	2,489	2.0
8	Dec-21	4,961	4.0
9	Nov-21	3,175	2.5
10	Oct-21	3,362	2.7
11	Sep-21	5,807	4.6
12	Aug-21	11,032	8.8
	<b>Total</b>	<b>94,540</b>	<b>75.6</b>
	<b>Maximum</b>	16,029	12.8
	<b>Minimum</b>	2,164	1.7
	<b>Average</b>	7,878	6.3



In the following Chart we present the CO<sub>2</sub> emissions due to usage of Electrical Energy.

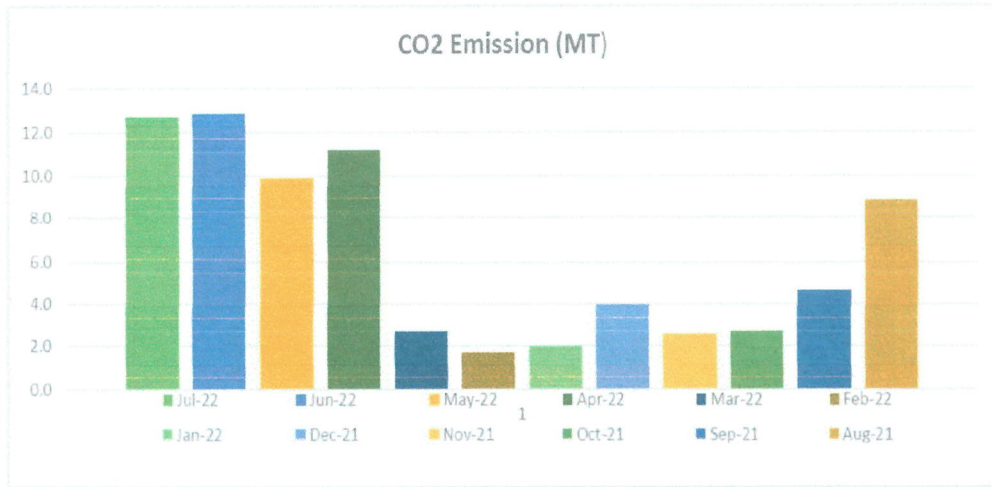


Figure 3.1: CO<sub>2</sub> emission due to usage of electrical energy

### 3.2 Study of Solid Waste Generation

The garbage collected in college is segregated into wet and dry centrally in campus. Waste bins are placed in college campus for collection of waste.

#### Photographs of Waste bins in college campus



### **3.3 Canteen food wastage**

The students and canteen staff are encouraged to have minimal food wastage. The canteen uses steel cutlery.

### **3.4 Study of Liquid Waste Generation**

Currently the waste water generated in institute is discharged to corporation through pipe.

### **3.5 Study of e-Waste Management:**

E-waste generated in college is disposed time to time through proper vendor.



#### 4. Study of CO<sub>2</sub> Emission reduction

Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule is situated in Shri Vile Parle Kelavani Mandal campus. The institute have installed Roof Top Solar PV System to cater energy requirement. The Installed Capacity of Solar PV Plant is **251 kW**.

**Table 6.1: CO<sub>2</sub> emission reduction through usage of Alternate Energy**

S. No	Particulars	Value	Unit
1	Energy Generated by Roof Top Solar PV System	136,735	kWh/Annum
2	CO <sub>2</sub> emission reduction through usage of Alternate Energy	109.4	MT

#### Photograph of Solar PV plant

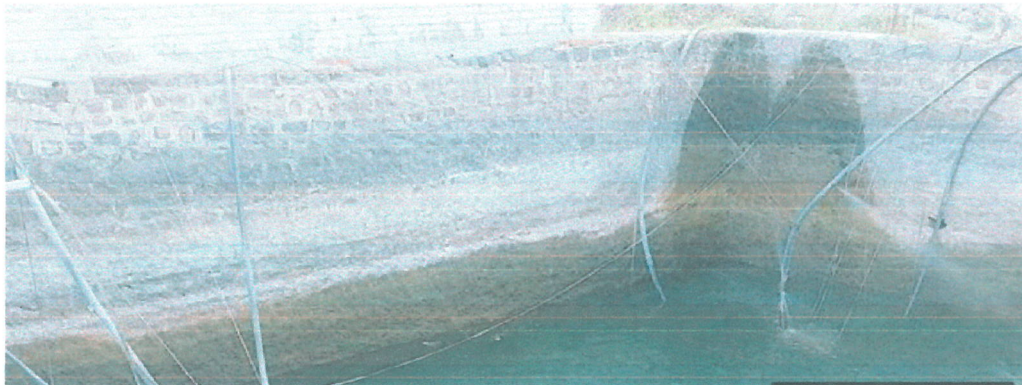
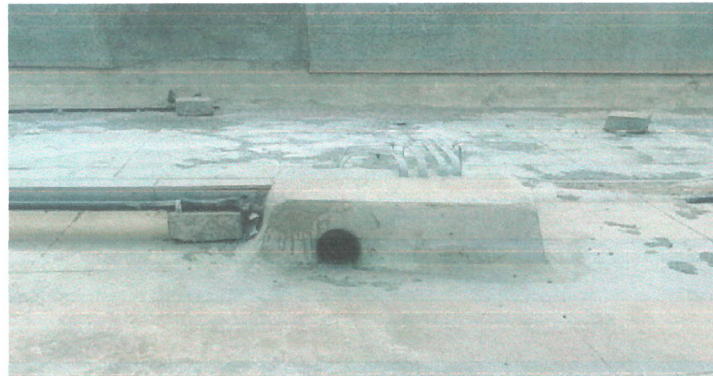




## 5. Study of Rain Water Harvesting

The College has already installed Rain Water Harvesting project, wherein the rain water falling on the terrace is collected and through pipes it is fed to Water Storage. This stored water is then reused for domestic purpose.

### Photograph of Rain Water Harvesting



## 6. Recommendations

In order to reduce the dependency on Natural resources and also in order to reduce the various pollutions arising due to the day to day operations of the College we herewith recommend following recommendations.

- Installation of Sewage Water Treatment Plant
- Increase in number of dustbins in college campus to collect dry waste.





# Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule

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Hon. Shri. Amrish R. Patel  
(President)

Dr. Nilesh P. Salunke  
(Principal)  
Ph.D., M.E., LMISTE

## Green Audit AY 2021-22, Recommendation and Action Taken

Green Audit conducted by Nutan Urja Solutions for academic year 2021-22 and issued the certificate on 13/11/2022. Following were the recommendation given after the audit:

### 1. Increase Campus Greenery

Action taken on given recommendation are as follow

### 1. Increase Campus Greenery

#### Action Taken:

The diversity and abundance of plant species across the campus is increased. Through dedicated efforts in planting new species, the institute aims to create a more vibrant and sustainable environment for our community.

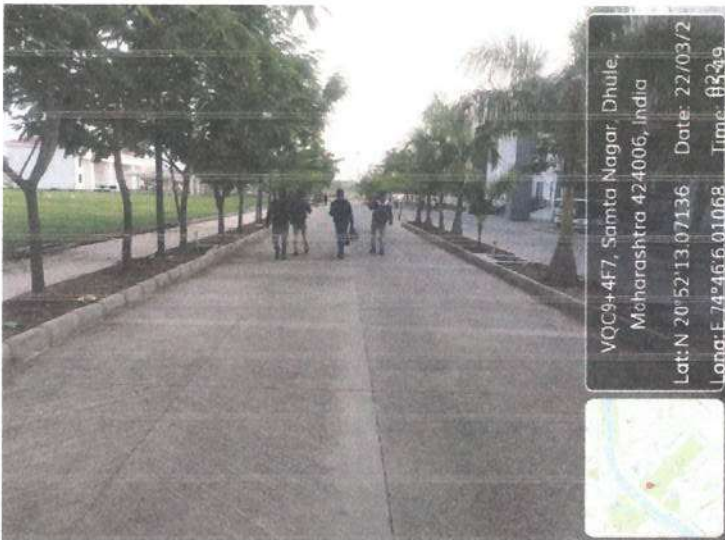


Photo captured during audit period

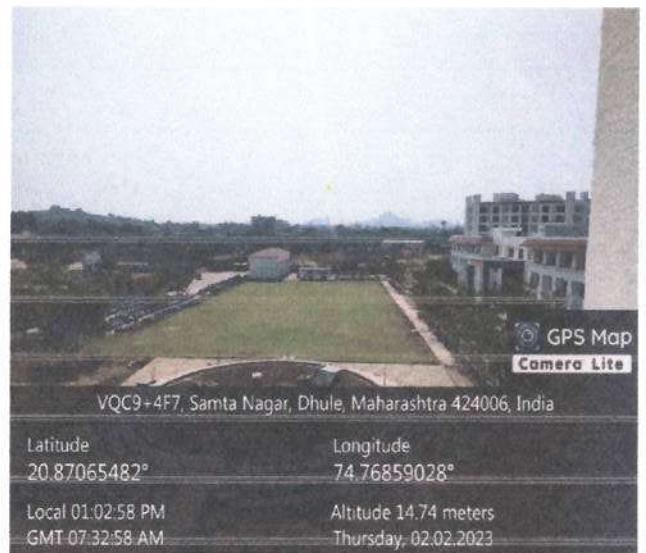


Photo captured after audit period



*N. Salunke*  
**Principal**  
SVKM's Institute of Technology, Dhule





# Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule

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## Environment Audit AY 2021-22, Recommendation and Action Taken

Environment Audit conducted by Nutan Urja Solutions for academic year 2021-22 and issued the certificate on 13/11/2022. Following were the recommendation given after the audit:

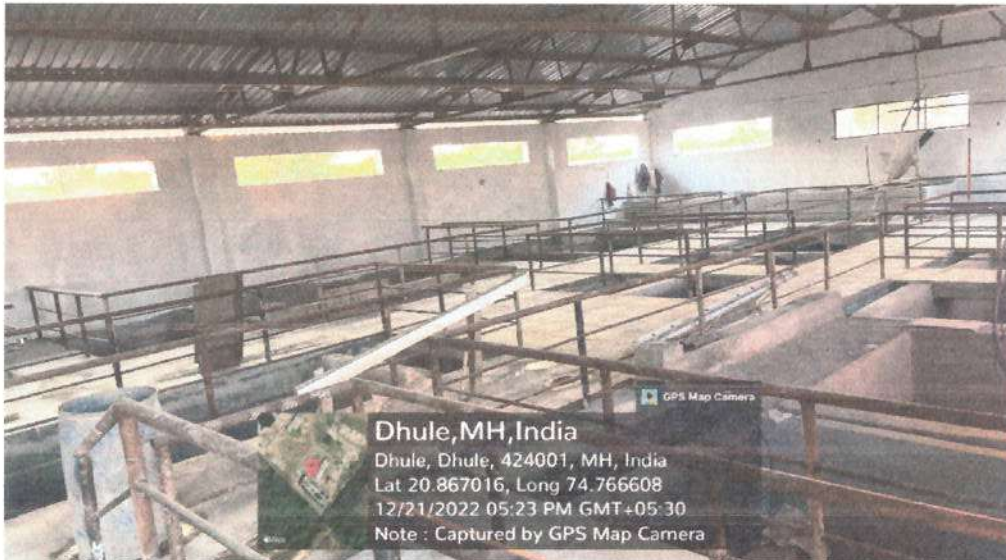
1. Installation of Sewage Water Treatment Plant
2. Increase in number of dustbins in college campus to collect dry waste.

Action taken on given recommendation are as follow

### 1. Installation of Sewage Water Treatment Plant

#### Action Taken:

Approximately 95% of the work has been successfully completed. The remaining 5% is anticipated to be completed within the next 3-4 months, marking the final phase of the STP. Following completion of this remaining segment, the commissioning process will be initiated.



Geo-tagged photo of STP







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(Principal)  
Ph.D., M.E., LMISTE

## 2. Increase in number of dustbins in college campus to collect dry waste.

### Action Taken:

Efforts are taken to enhance collection of segregated dry waste in the college campus. In response to valuable recommendations, the institute has successfully increased the number of dustbins which are strategically placed across the premises to facilitate the collection of dry waste.



Geo tagged Photo of Dustbin



*N. Salunke*  
**Principal**  
SVKM's Institute of Technology, Dhule