Shri Vile Parle Kelavani Mandal's
Institute of Technology, Dhule
Survey No. 499, Plot No. 02, Behind Gurudwara, Mumbai - Agra Road,
Dist. Dhule, Maharashtra, 424001 Phone No.: (02562) 297801, 297601
Web: - svkm-iot.ac.in Mail: - iotdhule@svkm.ac.in
Approved By AICTE, DTE & Affiliated to DBATU, Lonere

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DVV Clarification Documentation for 7.1.3 Quality audits on environment and energy regularly undertaken by the Institution

Shri Vile Parle Kelavani Mandal's
Institute of Technology, Dhule
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Policy Documents (2022-23):

Shri Vile Parle Kelavani Mandal's Institute of Technology DHULE

Principal
SVKM's Institute of Technology,Dhule

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

Policy Document For Clean and Green Campus

Shri Vile Parle Kelavani Mandal's Institute of Technology DHULE

Shri Vile Parle Kelavani Mandal's
Institute of Technology, Dhule
Survey No. 499, Plot No. 02, Behind Gurudwara,
Mumbai - Agra Highway, Dhule. (02562) 297801, 660633
iotdhule@svkm.ac.in, www.svkm-iot.ac.in

Hon. Shri. Amrish R. Patel
(President)

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

25/6/2021

Policy Document for

Green and Clean Campus

Our institution is committed to creating and maintaining a sustainable and environmentally responsible campus. This policy outlines our approach to managing salient aspects of sustainable development such as Management of degradable and non-degradable waste, water conservation, and overall green campus management. All the faculty members, and students of the institute are required to follow these instructions/practices wholeheartedly besides becoming an active member of all such activities in a self-motivated manner:

Objectives of the policy

- To safeguard and preserve ecological systems and resources present within the campus.
- To ensure responsible utilization of environmental resources to fulfil the present and future generations' needs and aspirations.
- To collaborate with all stakeholders and the local community to raise awareness and advocate for the adoption of environmentally friendly practices, while minimizing any detrimental effects on the environment.
- To continually enhance our efforts to combat climate change, adapt to its impacts, and contribute to the global resource conservation. This includes ongoing improvements in resource efficiency, encompassing energy and water conservation, as well as waste reduction, recycling wherever feasible.
- To strive for a campus that is free from plastic usage.
- To conduct environmental and energy audits.
- To reduce paper consumption in administrative processes by implementing e-governance policies.

Policy:

Clean Campus Initiatives

SVKM's Institute of Technology is committed to proactively organizing cleanliness initiatives not only within our college campus but also extending our efforts to the broader community, aligning with the principles of the Swachh Bharat Abhiyan.

Shri Vile Parle Kelavani Mandal's DHULE Institute of Technology

Our overarching vision encompasses the following objectives:

- Generating mass awareness on cleanliness and hygiene amongst students and staff members by holding regular cleanliness drives. The idea is to motivate them to contribute in a proactive manner.
- The activities associated with the 'Swachh Bharat Abhiyan' will form an integral part of the community initiatives led by NSS volunteers from the college.
- Staff members will be actively encouraged to participate in campus cleanliness drives.
- Proper disposal of waste materials, and non-functional equipment, will be ensured.
- Awareness programmes focusing on the principles of the 3R's (Reduce, Reuse, and Recycle) of waste management will be held.
- A dedication to effective waste management and the maintenance of a clean campus, particularly during college events, will be upheld.
- Conducting initiatives for tree plantation and motivating student organizations to host tree plantation activities.

Clean Air Initiatives

- Promoting carpooling to college as a means to combat air pollution and enhance social interaction.
- Limiting vehicle access within the campus to discourage the use of private cars.
- The college adheres to the guidelines outlined in the National Tobacco Control Programme (NTCP) of 2007-2008, which strictly forbids smoking and the consumption of other tobacco products on and around the campus.

Infrastructural Initiatives

- Minimizing electricity consumption and implementing sustainable energy management practices by reducing its reliance on non-renewable energy sources and transitioning to clean energy alternatives, such as solar power, to illuminate the campus.
- Install energy-efficient electrical appliances designed to conserve energy and minimize inefficiencies. The college is dedicated to adopting cleaner energy solutions, including LED lighting, to contribute to a more sustainable environment.
- The institute has made a commitment to replenish and recharge the groundwater table through the practice of rainwater harvesting. This sustainable approach aids in replenishing and recharging groundwater resources.

Waste Management Processes

The institute is committed to minimizing its environmental footprint and effectively managing waste generated on the college campus. In alignment with its commitment to offer holistic education with a positive environmental impact, the college will implement measures to minimize the generation of solid waste and manage it systematically, following the principles of

- Environmental responsibility-reduce, reuse, and recycle.
- Reduce paper usage by promoting the digitization of attendance and internal assessment records.
- Updating the collection of e-books and e-journals in the college library to decrease the need for printed books.
- Encouraging students and teachers to utilize email for assignment submissions.
- Strategies for reducing food wastage
- Minimizing the consumption of packaged food and fostering habits of reusing and recycling non-biodegradable items.
- Spreading awareness on solid waste management among students and their understanding and participation in responsible waste handling.
- Periodic maintenance of water fixtures to prevent leaks and minimize water wastage.
- Additional provisions for the disposal of institutional e-waste to ensure its proper handling and disposal.
- Collaboration with reputable e-waste recycling companies to facilitate the responsible recycling of electronic waste, adhering to environmental standards and regulations.
- Increase in awareness campaigns among students to educate them about reducing e-waste and adopting environmentally friendly practices for e-waste disposal.

Awareness Initiatives

- Outreach and education are paramount to ensure that all members of the campus community appreciate the goals of the policy and actively contribute to its realization.
- In line with this, SVKM's Institute of Technology, Dhule actively promotes and supports awareness seminars, workshops, and other interactive sessions aimed at facilitating the effective implementation of the Green Campus, Energy, and Environment policies.

Conduct Green Audit

- The college is committed to conduct Green Audits of its campus as part of its ongoing efforts to assess its strengths and weaknesses in pursuit of long-term sustainability goals.
- A Green Audit serves as a valuable tool for understanding how and where the institute is utilizing its resources such as energy and water. It enables to identify areas where improvements can be made to make the system economical.
- It also helps in determining the type and volume of waste generated, which can lead to the implementation of waste minimization plans. It also fosters a culture of health consciousness and promotes environmental values and ethics among the community members. It is imperative that the college evaluates its own contributions to building a sustainable future.

Conduct Energy Audit

- The college is committed to conduct an Energy Audit of its campus to monitor energy consumption and seek improvement.
- It also helps in identifying instances of energy wastage. Such inspections often uncover various inefficiencies that result in substantial energy losses, which may not be apparent to the college otherwise.
- These identified flaws typically have straightforward and cost-effective solutions, leading to significant savings in energy costs and contributing to our sustainability efforts.

Plastic-Free Campus

- In alignment with the Government of India's resolution to combat the hazardous effects of plastic usage and pollution, the college administration has taken decisive action by enforcing a strict ban on single-use plastics within its premises, transforming it into a 'Plastic Free Campus'.
- The institute has also informed its various stakeholders such as Canteen personnel, to minimise use of plastic.

Shri Vile Parle Kelavani Mandal's Institute of Technology DHULE

Principal

Principal
SVKM's Institute of Technology,Dhule

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

Policy for Energy Conservation

Shri Vile Parle Kelavani Mandal's
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Hon. Shri. Amrish R. Patel
(President)

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

25/6/2021

Policy for

Energy Conservation

Shri Vile Parle Kelavani Mandal's (SVKM's) Institute of Technology, Dhule has pledged to adopt an environment friendly Energy Conservation policy aimed at minimizing its environmental impact. This strategy aims to ease the burden on the environment and explore renewable energy sources as sustainable solutions to the energy challenge. All staff members, and students associated with the institute must strictly adhere to this environmental and energy policy. This commitment will help us fulfil our responsibilities and dedication to conserving natural resources while incorporating efficiency and environmental awareness into our daily practices, thereby limiting our consumption.

Measures:

- ✓ Prioritize energy-efficient equipment and practices to reduce energy consumption.
- ✓ Utilization of renewable energy sources to produce energy.
- ✓ Minimize waste generation and promote responsible disposal.
- ✓ Implement water-saving measures to reduce water consumption.
- ✓ Encourage sustainable transportation options, such as carpooling or public transit.
- ✓ Maintain energy-efficient temperatures and practices in buildings.
- ✓ Educate staff and students about energy conservation and environmental responsibility.
- ✓ Ensure strict adherence to environmental and energy policies at all levels of the institution.
- ✓ Stay updated on best practices.
- ✓ Organizing various environment awareness programmes and activities that aids in environmental conservation.
- ✓ To share knowledge and provide instruction on energy-saving practises.

Shri Vile Parle Kelavani Mandal's Institute of Technology DHULE

Principal
~~Principal~~
SVKM's Institute of Technology, Dhule

Shri Vile Parle Kelavani Mandal's
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Action taken reports and achievement reports as clear and Green campus

Shri Vile Parle Kelavani Mandal's Institute of Technology DHULE

Principal
SVKM's Institute of Technology,Dhule

Shri Vile Parle Kelavani Mandal's
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(President)

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

Energy Audit AY 2022-23, Recommendation and Action Taken

Energy Audit conducted by Nutan Urja Solutions for academic year 2022-23 and issued the certificate on 27/08/2023. Following were the recommendation given after the audit:

1. Installation of additional 50kW Solar PV panels

Action taken on given recommendation are as follow

1. Installation of additional 50kW Solar PV panels

Action Taken:

Due to ongoing construction activities in the campus, there is an additional consumption of electricity. The construction work necessitates the use of various electrical tools and equipment, contributing to the temporary surge in energy usage. This heightened electricity consumption will persist until the completion of the construction, expected within the next one to two years. Once the construction is completed, the campus will transit to rely entirely on the energy generated from our grid-connected solar panels. This sustainable energy source will adequately meet our power needs, eliminating the requirement for additional power.

Shri Vile Parle Kelavani Mandal's Institute of Technology DHULE

Principal
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Hon. Shri. Amrish R. Patel
(President)

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

Energy Audit AY 2021-22, Recommendations and Action Taken

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

1. Installation of additional 50kW Solar PV panel
2. Replace all metal halide street lights with LED lamps.

Action taken on given recommendation are as follow

1. Installation of additional 50kW Solar PV panel

Action Taken:

Due to ongoing construction activities in the campus, there is an additional consumption of electricity. The construction work necessitates the use of various electrical tools and equipment, contributing to the temporary surge in energy usage. This heightened electricity consumption will persist until the completion of the construction, expected within the next two to three years. Once the construction is completed, the campus will transit to rely entirely on the energy generated from our grid-connected solar panels. This sustainable energy source will adequately meet our power needs, eliminating the requirement for additional power.

2. Replace all metal halide street lights with LED lamps

Action Taken:

a) All metal halide street lights are replaced with LED lamps. So, the entire campus street lighting load is 100% LED lighting.

b) All LED street lamps are manufactured by our Site Project Engineer team which helps in achieving a cost saving on manufacturing up to 4 lakhs and energy saving by replacing 10 Nos. of 240 W metal halide lamps with 35 Nos. of LED lamps of 22 W rating.

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Ph.D.,M.E.,LMISTE

Geo-tagged photo of street lamps

Shri Vile Parle Kelavani Mandal's DHULE Institute of Technology

Principal
SVKM's Institute of Technology, Dhule

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Approved By AICTE, DTE & Affiliated to DBATU, Lonere

Achievement report of Clear and Green campus

Landscaping with trees and plants **AY 2021-22:**

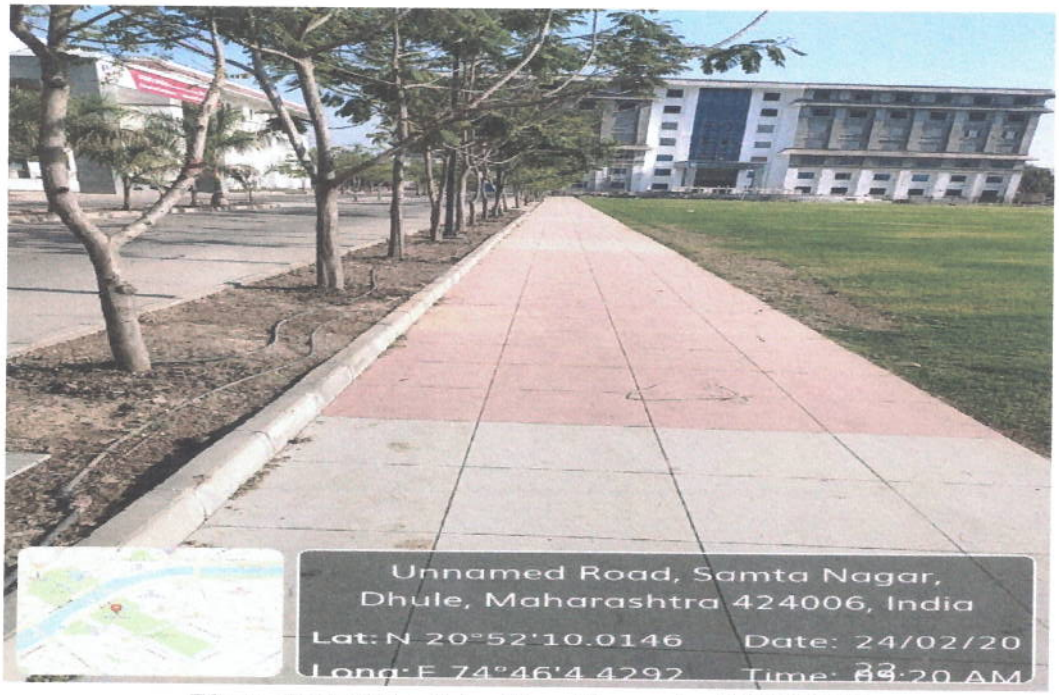

Photo. Pedestrian-friendly pathways in AY 2021-22

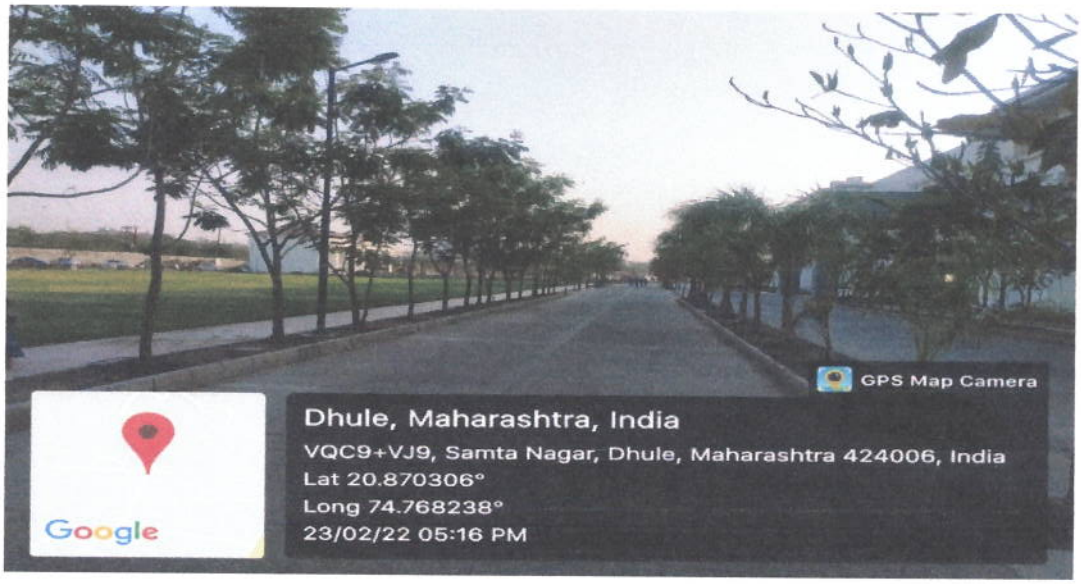

Photo. Pathways inside college campus with tree plantation in AY 2021-22

Shri Vile Parle Kelavani Mandal's DHULE Institute of Technology

Landscaping with trees and plants **AY 2022-23:**

- The institute's NSS unit conducted regular tree planting initiatives, fostering an environmentally friendly atmosphere that enhances air quality on campus and raises student consciousness.
- The care and maintenance of all trees and plants, including gardening and watering tasks, are managed by a team of dedicated work force.

Photo. Pathways inside college campus with increased tree plantation making it lusher and greener in AY 2022-23

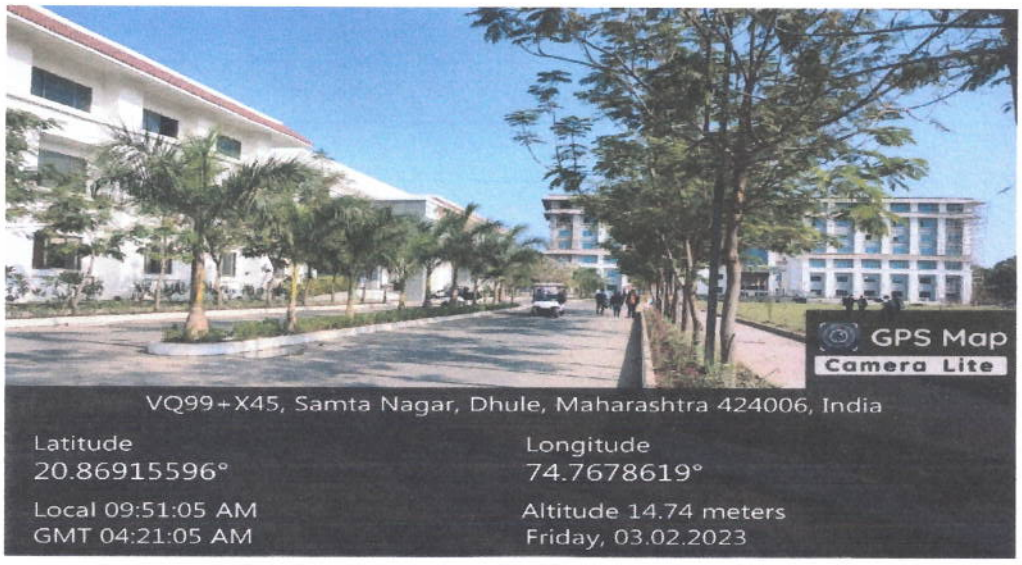

Photo. Green landscaping and clear campus in AY 2022-23

Shri Vile Parle Kelavani Mandal's DHULE Institute of Technology

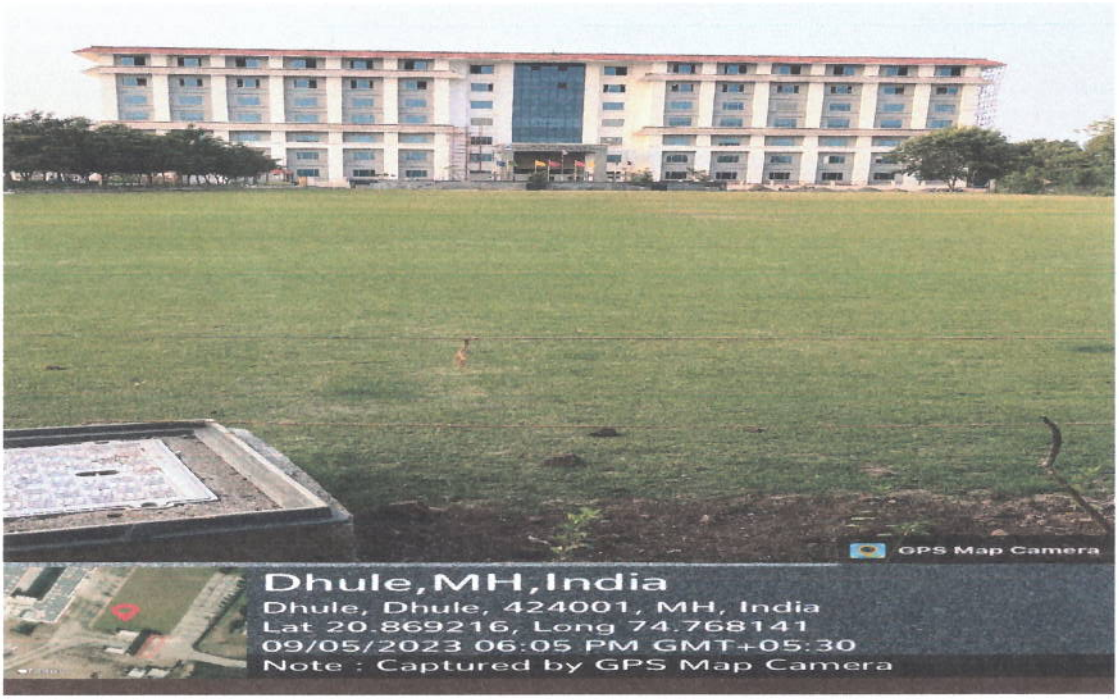

Photo. Green landscaping in AY 2022-23

Photo. Clean passages in institute in AY 2022-23

Shri Vile Parle Kelavani Mandal's DHULE Institute of Technology

झाडे लावा-झाडे जगवा पाणी आडवा – पाणी जिरवा
वृक्षारोपण, वृक्षसंवर्धन, वन्यप्राणी-पशू-पक्षी, जंगलाची जोपासना करणारे व जलसंवर्धन,जन-जागृती करणारे पर्यावरणवादी
महाराष्ट्र शासन छत्रपती शिवाजी महाराज राज्यस्तरीय वनश्री पुरस्कार प्राप्त
निसर्ग-मित्र समिती
संस्थापक अध्यक्ष : मा.प्रेमकुमार डी. अहिरे मोबा. ७०८३९२४६३०
बापूसो. देविदास रामभाऊ पाटील
प्रदेशाध्यक्ष
मोबा. ९४२२७८६११२
आबासो. संतोषराव पाटील
प्रदेश सचिव
मोबा. ९४०४५७५९६०
महाराष्ट्र राज्य कार्यालय : एस. आर. पाटील हायस्कूल समोर, स्टेडियम जवळ, गोंदूर विमानतळ रोड, वलवाडी, ता.जि. धुळे

जा. क्र. 184 दिनांक : 11 /08/2023

To,
The Principal,
SVKM'S IOT,
Dhule.

Subject: Appreciation for College Clean and Green Campus for AY 2022-23

Respected Sir,

I hope this letter finds you well. I am writing to express my sincere appreciation on behalf of **Nisarg Mitra Samiti, Dhule** for your outstanding efforts and contributions to maintain your campus as a clean and green environment on AY 2022-23.

Your dedication and hard work have significantly enhanced the overall aesthetics and sustainability of your **Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule** campus. We have received numerous positive comments from students, faculty and visitors regarding the noticeable improvements in cleanliness and the flourishing greenery on your premises.

Your commitment to environmental stewardship aligns perfectly with your institute values, and the positive impact of your initiatives. The attention to detail and the proactive approach you have taken for waste management, landscaping, and overall environmental conservation has created a pleasant and conducive learning environment for everyone on campus.

We understand that maintaining a clean and green campus is an ongoing challenge, and we commend your efforts for consistently surpassing our expectations. Your efforts have not only contributed to the well-being of your college community but have also set an inspiring example for other educational institutions and the community at large.

Your commitment to excellence is truly commendable, and we are grateful for the positive impact it has had on your college community.

Once again, thank you for your exceptional service and dedication to creating a clean and green campus environment.

प्रेमकुमार डी. अहिरे
संस्थापक, निसर्ग – मित्र समिती

झाडे लावा-झाडे जगवा पाणी आडवा - पाणी जिरवा
वृक्षारोपण, वृक्षसंवर्धन, वन्यप्राणी-पशू-पक्षी, जंगलाची जोपासना करणारे व जलसंवर्धन,जन-जागृती करणारे पर्यावरणवादी
महाराष्ट्र शासन छत्रपती शिवाजी महाराज राज्यस्तरीय वनश्री पुरस्कार प्राप्त

निसर्ग-मित्र समिती

संस्थापक अध्यक्ष : मा.प्रेमकुमार डी. अहिरे मोबा. ७०८३९२४६३०

बापूसो. देविदास रामभाऊ पाटील
प्रदेशाध्यक्ष
मोबा. ९४२२७८६११२

आबासो. संतोषराव पाटील
प्रदेश सचिव
मोबा. ९४०४५७५९६०

कार्यालय : एस. आर. पाटील हायस्कूल समोर, स्टेडियम जवळ, गोंदूर विमानतळ रोड, वलवाडी, ता.जि. धुळे

जा. क्र. १४३

दिनांक : ११ / ०४/२०२३

TO WHOM SO EVER IT MAY CONCERN

This is to express our appreciation to **Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule,** for certifying that initiatives in terms of tree plantations have resulted in a reduction in air quality parameters as observed for **AY 2022-23**.

Nisarg Mitra Samiti, Dhule appreciated your outstanding contributions to the efforts of the Institute in environmental aspects and expect the same efforts in the near future.

प्रेमकुमार डी. अहिरे
संस्थापक, निसर्ग - मित्र समिती

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7.1.3: Quality audits on environment and energy regularly undertaken by the Institution (2022-23).

The institutional environment and energy initiatives are confirmed through the following

Principal
SVKM's Institute of Technology, Dhule

Nutan Urja Solutions

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

A 703, Balaji Witefield, Near Sunni's World,
Sus Road, Sus, Pune 411 021
Phone: 83568 18381. Email: nutanurja.solutions@gmail.com

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

Nutan Urja Solutions

A 703, Balaji Witefield, Near Sunni's World,

Sus Road, Sus, Pune 411 021

Phone: 83568 18381. Email: nutanurja.solutions@gmail.com

Contents

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_2 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**

Nutan Urja Solutions

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 inititative 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_2 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
	Total	**152,473**	**3,146,396**

Variation in energy consumption is as follows

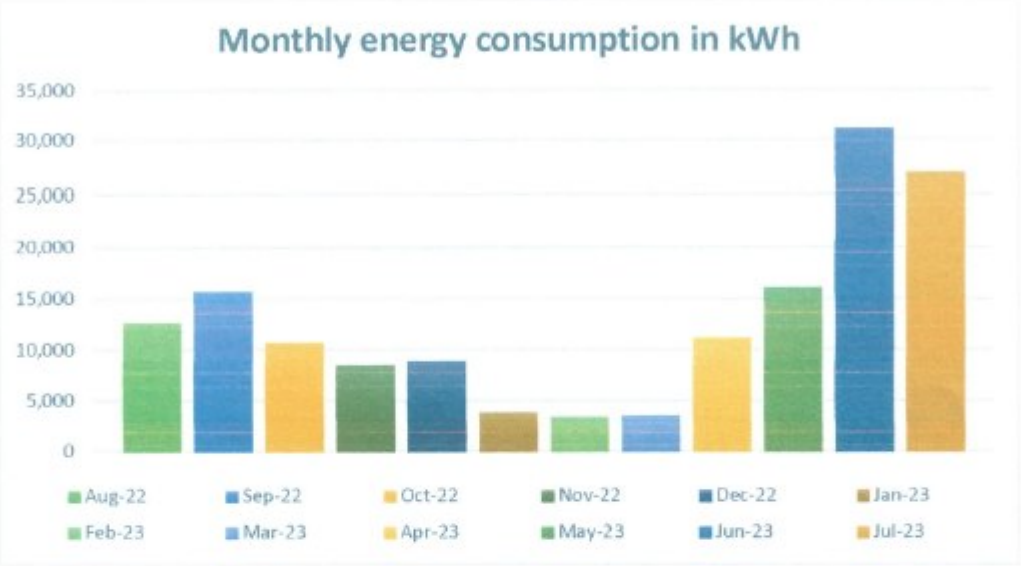


Figure 2.1: Month wise energy consumption

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_2 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_2 Emissions:

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

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

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

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

Table 3.1: Month wise Consumption of Electrical Energy & CO2 Emissions

S. No	Month	Energy Consumed, kWh	CO2 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
	Total	**152,473**	**122.0**

In the following Chart we present the CO_2 emissions due to usage of Electrical Energy.

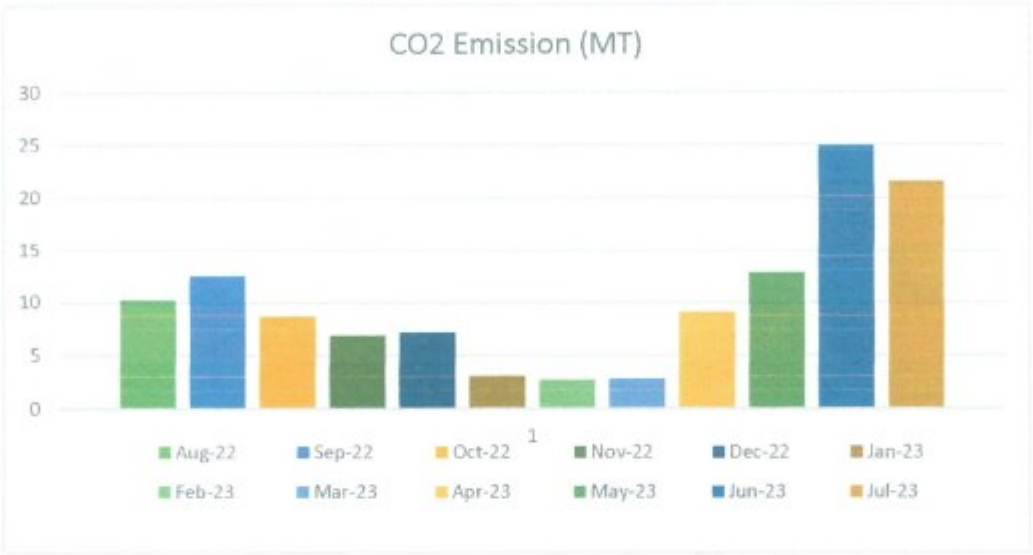


Figure 3.1: Month wise CO_2 Emission

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

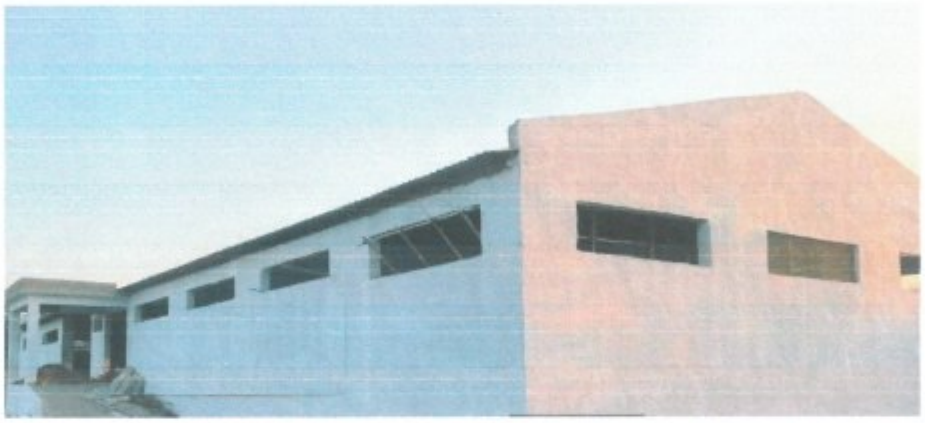
The College has already installed Rain Water Harvesting project, wherein the rain water falling on the terrace is collected and through pipes it is fed to Water Storage. This stored water is then reused for domestic purpose.

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 though 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

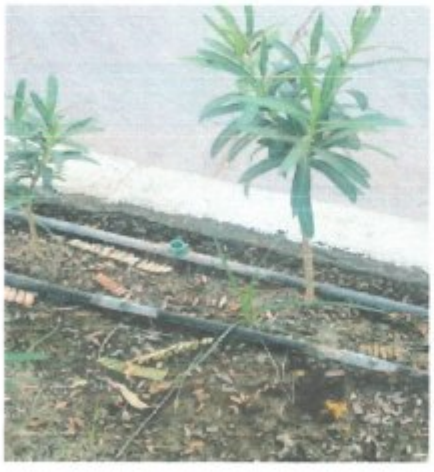
The institute use pollution free electric vehicles for transport within campus.

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 Nodasa	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.	Orerdoxa Regia	Florida Royal Palm	Arecaceae	Tree	Ornamental Plant
9.	Plumeria Red	Frangipani	Apocynaceae	Tree	Ornamental Plant
10.	Terminalia Cattapa	Almond Tree	Combretaceae	Tree	CO_2 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_2 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	Caesalpiniaceae	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

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

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Sus Road, Sus, Pune 411 021

Phone: 83568 18381. Email: nutanurja.solutions@gmail.com

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,

Nutan Urja Solutions

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)

Prepared by

Nutan Urja Solutions

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Nutan Urja Solutions

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_2 on account of Electricity & LPG Consumption
- Solid Waste: Bio degradable Kitchen Waste, Garden Waste
- Liquid Waste: Human liquid waste

2. Present Level of CO_2 Emissions:

S. No	Parameter	Energy consumed (Units)	CO_2 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.

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5. Notes & Assumptions:

1. **1 kWh** of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere
2. 1 kW Solar PV plant generates 5 kWh/day Electrical Energy in a year.

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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 compiled with and adequate care has been taken towards environmental protection and preservation

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

1.1.3. Environmental Pollutant:

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_2 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

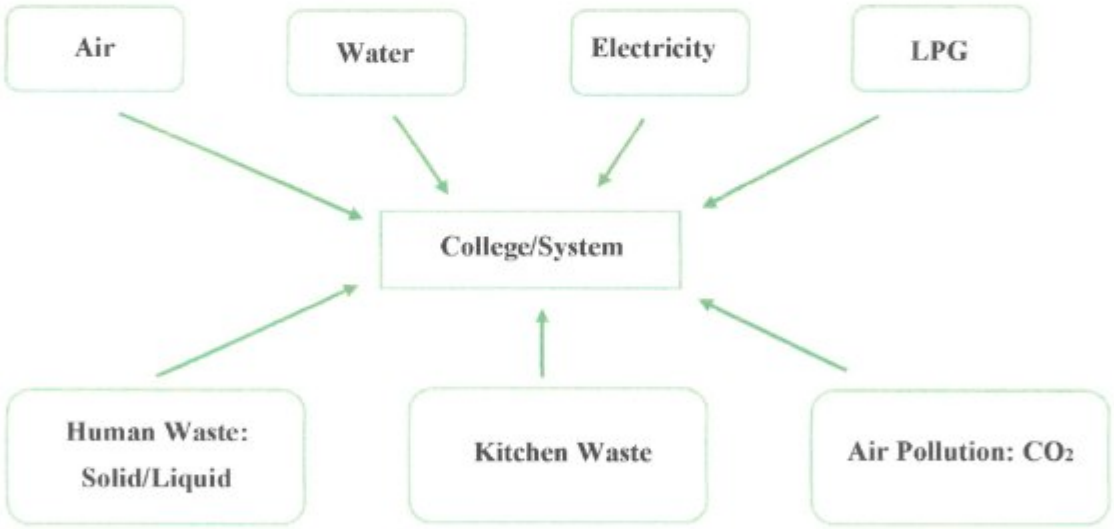
The Institute consumes following basic/derived Resources:

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_2 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
6	Feb-23	3,412
7	Jan-23	3,796
8	Dec-22	8,866
9	Nov-22	8,480
10	Oct-22	10,689
11	Sep-22	15,682
12	Aug-22	12,689
Total		**152,473**
Maximum		31,126
Minimum		3,412
Average		12,706

2.1 Variation of Monthly Electrical Energy Consumption

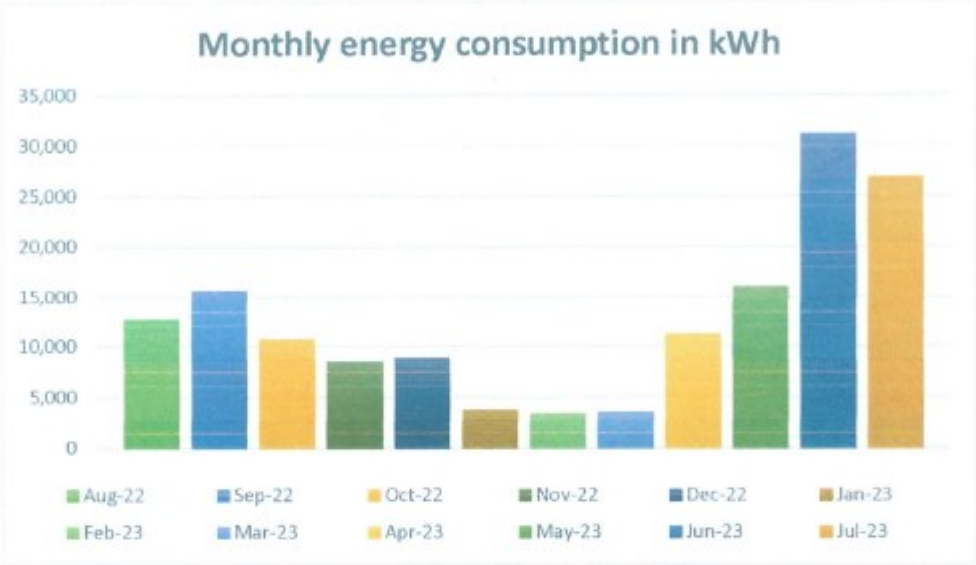


Figure 2.1: Monthly Electrical Energy Consumption

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_2 in the atmosphere
- 1 Kg of LPG emits 3 Kg of CO_2 in the atmosphere

In the following Table, we present the CO_2 emissions.

Table 3.1: Month wise Consumption of Electrical Energy & CO_2 Emissions

S. No	Month	Energy Consumed, kWh	CO2 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
	Total	**152,473**	**122.0**
	Maximum	31,126	24.9
	Minimum	3,412	2.7
	Average	12,706	10.2

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

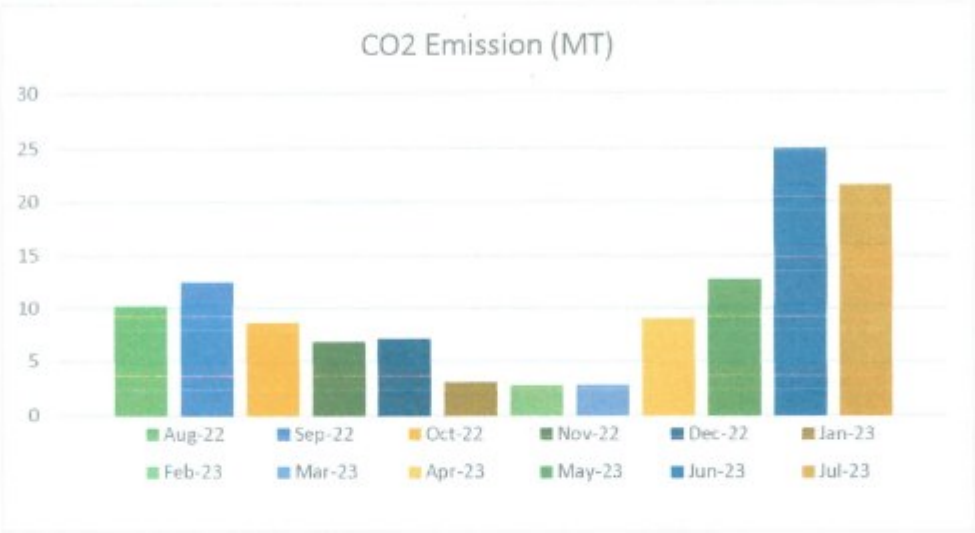


Figure 3.1: CO2 emission due to usage of electrical energy

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

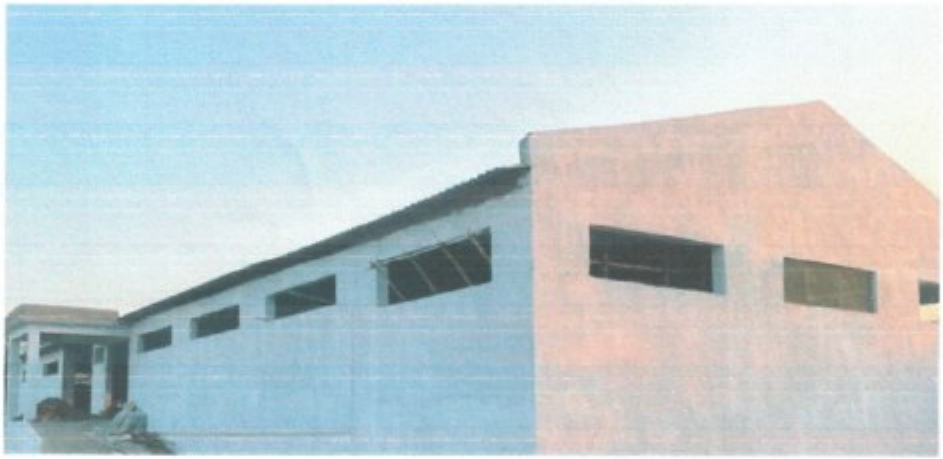
3.3 Canteen food wastage

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_2 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_2 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_2 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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Sus Road, Sus, Pune 411 021

Phone: 83568 18381. Email: nutanurja.solutions@gmail.com

Date: 27/08/2023

CERTIFICATE

This is to certify that we have conducted Energy Audit at Shri Vile Parle Kelavani Mandal's Institute of Technology, Dhule as per the guidelines of Maharashtra Energy Development Agency (www.mahaurja.com) in the year 2022-23.

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

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Installation of **251kW** Roof Top 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

Report

On

Energy Audit

At

Shri Vile Parle Kelavani Mandal's Institute of Technology,

Dhule

(Year 2022-23)

SHRI VILE PARLE KELAVANI MANDAL'S
INSTITUTE OF TECHNOLOGY,
DHULE

Prepared by

Nutan Urja Solutions

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Nutan Urja Solutions

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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 Energy Audit of their college premises.

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

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 through energy savings. 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

After the Field measurements & analysis, we present herewith important observations made and various measures to reduce the Energy Consumption & mitigate the CO_2 emissions. College consumes Energy in the form of Electrical Energy used for various gadgets, Office & other facilities.

1. Present Energy Consumption

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

Table no 2.1: Details of energy consumption

S. No	Parameter	Energy consumed (Units)	CO_2 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. Energy Conservation Projects already installed

1. Usage of Energy Efficient BEE STAR Rated ACs.
2. Usage of Natural Day light.
3. Usage of LED lights for indoor locations
4. Usage of LED Lights for outdoor lighting.
5. Installation of **251 kW** of Solar PV Power Plant.

3. Key Observations

1. Usage of LED lights.
2. Usage of star rated equipment.
3. Maintained a good power factor.

4. Percentage of Usage of Alternate Energy

The College has installed a Roof Top Solar PV Plant. The percentage of usage of Alternate Energy to Annual Energy Requirement is 65 %.

5. Percentage of Usage of LED Lighting

The College has various types of Light fittings. The percentage of Annual LED Lighting Usage to Annual Lighting requirement works out to be 100 %.

6. Recommendations

Table no 1: Recommendations for energy savings

No	Recommendation	Annual Saving potential, kWh/Annum	Annual Monetary Gain (Rs.)	Investment Required (Rs.)	Payback period, Months
1	Installation of additional 50kW grid connected PV panel	75,000	825,000	2,500,000	36
	Total	**75,000**	**825,000**	**2,500,000**	**36**

7 Notes & Assumptions

1. Daily working hours – 08 hours
2. Annual working Days - 300 days
3. Average Rate of Electrical Energy: Rs 11/- per kWh

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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 inititative 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 Electrical Consumption
3. To assess the various equipment/facilities from Energy efficiency aspect
4. 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

1.3 General Details of College

Table No-1.1: Details of college

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 connected load

In this chapter, we present details of various connected electrical equipment and electrical load.

Shri Vile Parle Mandal Campus has installed centralized chiller of capacity 400 TR to cater cooling load of all institutes in campus. Apart from above load, the college has pumps, street lights and 11 ACs of 2TR capacity. Data can be represented in terms of PIE chart as under

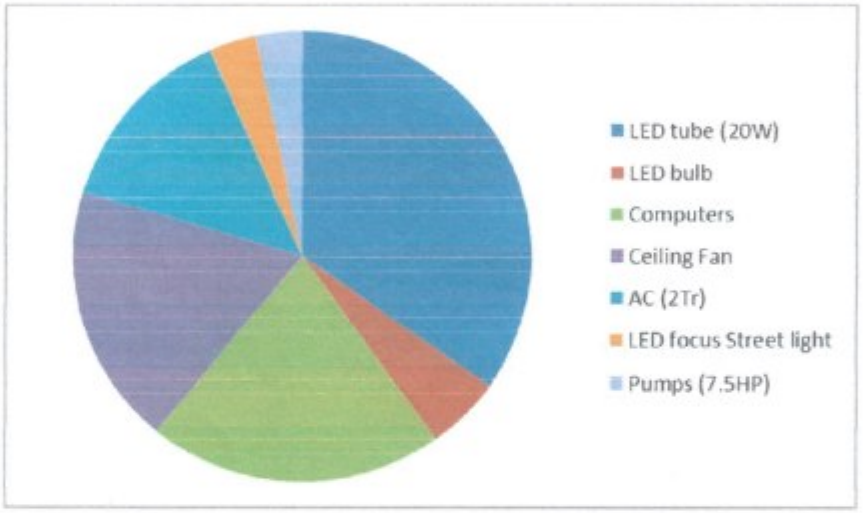

Figure 2.1: Distribution of connected load.

3. Study of Electrical Energy Consumption

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

Table no 3.1: 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
	Total	**152,473**	**3,146,396**

Variation in energy consumption is as follows,

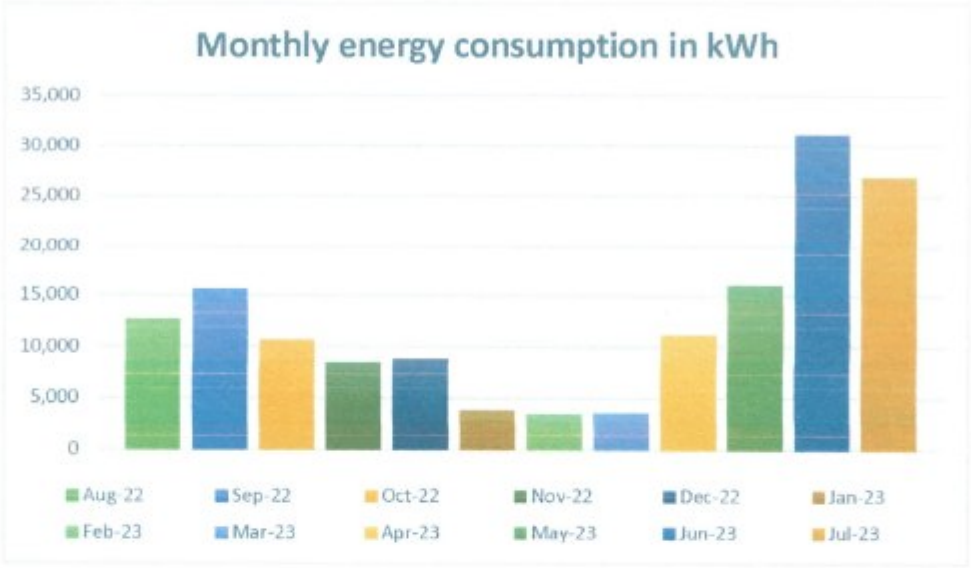

Figure 3.1: Month wise energy consumption

Monthly variation in electricity bill is as follows,

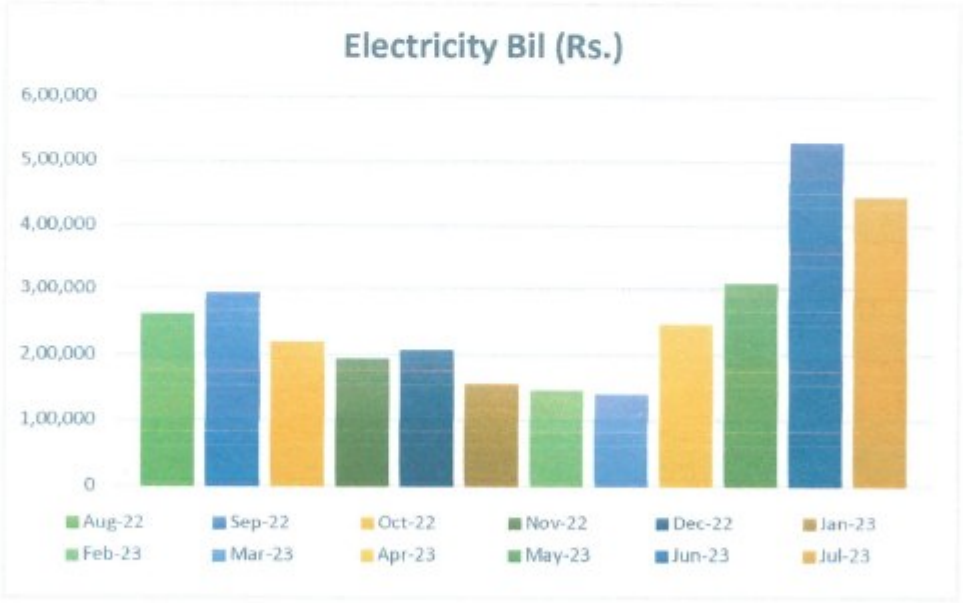

Figure 3.2: Month wise electricity bill

Key observations of electricity bill are as follows,

Table no 3.2: 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

Nutan Urja Solutions

4. Carbon Foot printing

1. **A Carbon Foot print** is defined as the Total Greenhouse Gas emissions (CO_2 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_2 Emissions:

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

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

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

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

Table 3.1: Month wise Consumption of Electrical Energy & CO2 Emissions

S. No	Month	Energy Consumed, kWh	CO2 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
	Total	**152,473**	**122.0**

In the following Chart we present the CO_2 emissions due to usage of Electrical Energy,

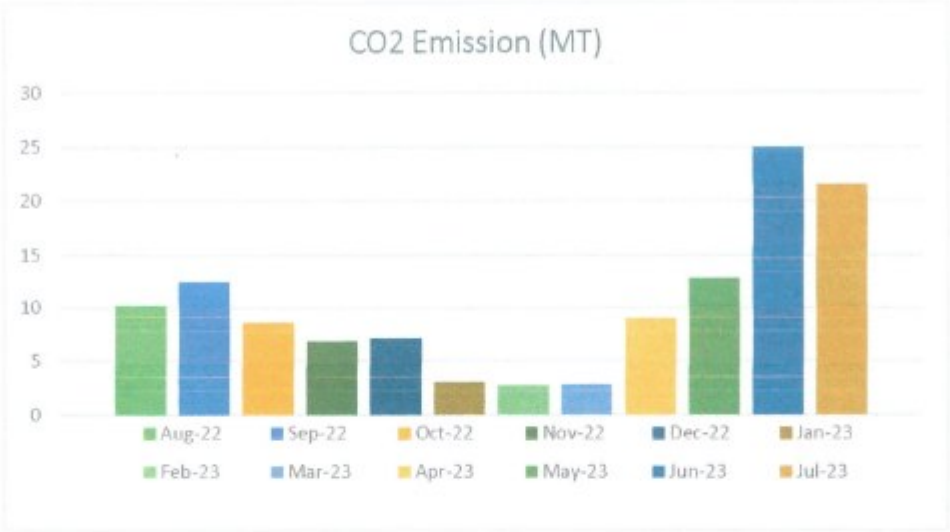

Figure 4.1: Month wise CO_2 Emission

5. Study of utilities

5.1 APFC Panel

The Office has already installed the APFC Panel of 175 kVAR capacity. During the measurements, it was found that the panel is working properly.

5.2 Study of Lighting

In the facility, the lighting system can be divided mainly in to parts, indoor lighting and outdoor lighting. There are 3006 nos. of LED tubes and 705 nos. of LED bulbs. There are 35 No of LED street lights.

5.3 Air-conditioners

In the facility, there are about 11 Nos. of 2 Tr old Air-conditioners.

5.4 Ceiling Fans

At building facility, there are about 500 Nos star rated Ceiling Fans.

5.5 Water Pumps

There are in 1 Water pumps with 7.5HP capacities respectively.

6. 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. The institute has installed Roof Top Solar PV System. The Installed Capacity of Solar PV Plant is 251 kWp.

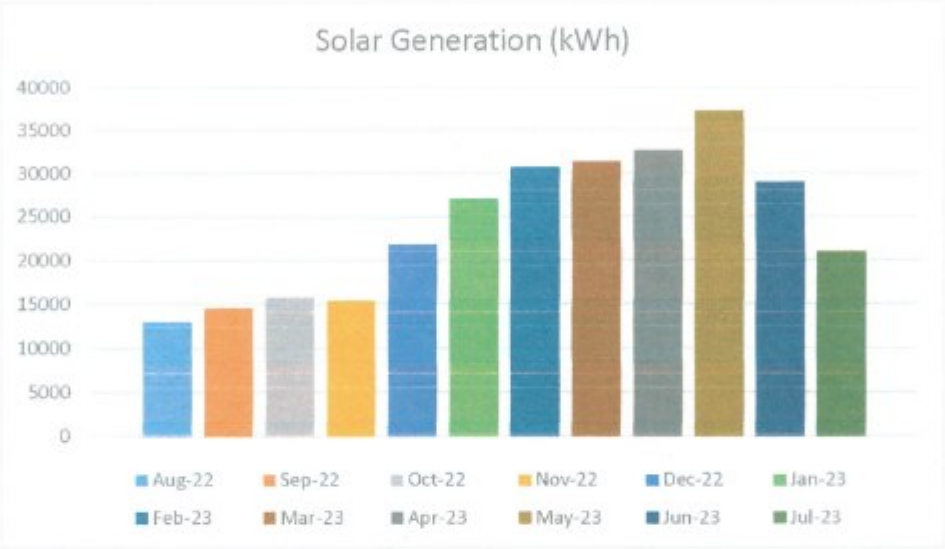

Figure 6.1: Solar PV power Generation

Table 6.1: Computation of % Usage of Alternate Energy to Annual Energy Requirement

No	Particulars	Value	Unit
1	Annual Energy Purchased from MSEDCL	152,473	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

7. Study of usage of LED lighting

In this chapter we study the lighting system of college and compute the percentage of total load catered by LED lighting.

Table 7.1: Total lighting load

No	Particulars	Qty.	Load (W/Unit)	Load (kW)
	LED lighting load			
1	LED bulbs	705	15	10.5
2	LED tubes	3006	20	60.1
3	LED street lights	35	22	0.77
	Total LED lighting load			**71.37**
	Total Lighting load			**71.37**

It can be seen that out of total lighting load 100% load is LED lighting load.

8. Energy conservation proposals

8.1 Installation of additional 50kW Solar PV panel

It is recommended to install additional 50 kWp of solar PV panel.

In the following Table, we present the savings, investment required & payback analysis.

No	Particulars	Value	Unit
1	Installation of additional PV units	50	kW
2	Energy saving	75000	kWh/Annum
3	Rate of electrical energy	11	Rs.
4	Annual monetary savings	825000	Rs./ Annum
5	Investment required	2500000	Rs. lump sum
6	Simple payback period	36	Months

8.2 Summary of Savings

No	Recommendation	Annual Saving potential, kWh/Annum	Annual Monetary Gain (Rs.)	Investment Required (Rs.)	Payback period, Months
1.	Installation of additional 50W grid connected PV panel	75,000	825,000	2,500,000	36
	Total	**75,000**	**825,000**	**2,500,000**	**36**

Nutan Urja Solutions

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Certificate from the external accredited auditing agency

Shri Vile Parle Kelavani Mandal's Institute of Technology DHULE

Principal
SVKM's Institute of Technology, Dhule

Nutan Urja Solutions

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

A 703, Balaji Witefield, Near Sunni's World,

Sus Road, Sus, Pune 411 021

Phone: 83568 18381. Email: nutanurja.solutions@gmail.com

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

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 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,

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K G Bhatwadekar,
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The College has already adopted **Energy Efficient** practices like:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Installation of **251kW** Roof Top 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.

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Geo-tagged photographs/videos of the facilities (2022-23):

Video Link of Clean and Green Campus	https://www.youtube.com/watch?v=vA4WkO61FKI

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Principal
SVKM's Institute of Technology,Dhule

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1. Signboards

Photo. Use of signboards for water and energy conservation – 26/04/2023

Photo. Use of signboards to promote greenery – 26/04/2023

Shri Vile Parle Kelavani Mandal's Institute of Technology DHULE

Photo. Use of signboards to minimize food wastage – 26/04/2023

2. Automated Water Saving

Photo. Automatic tap shutoff for water conservation – 16-05-2023

Shri Vile Parle Kelavani Mandal's Institute of Technology DHULE

3. ***Sanitization and freshness***

Photo. Using air freshener blocks and sanicubes for keeping things clean and fresh– 16-05-2023

4. ***Flush facility in washrooms***

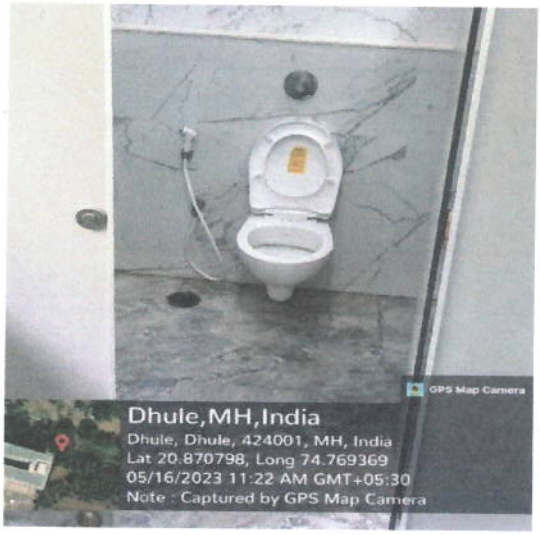

Photo. Toilet flush to maintain cleanliness– 16-05-2023

Shri Vile Parle Kelavani Mandal's ★ DHULE ★ Institute of Technology

5. ***Sanitary pad vending machine and incinerator***

Photo. Toilet flush to maintain cleanliness– 11-05-2023

6. ***RO water purifier***

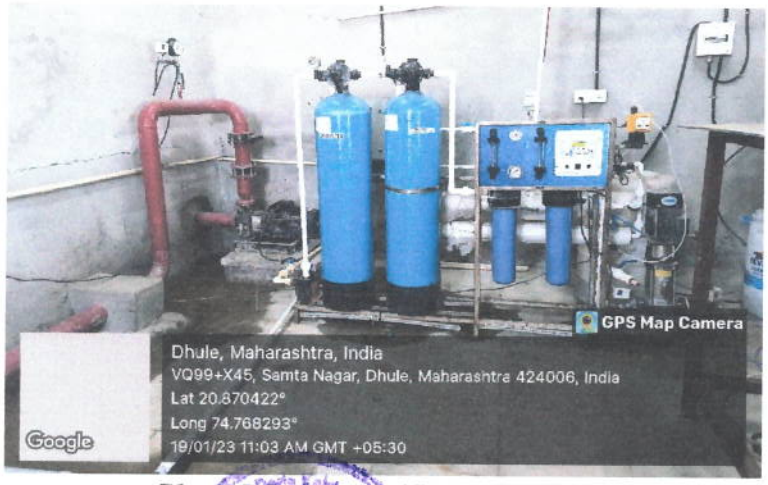

Photo. RO water purifier – 19-01-2023

Shri Vile Parle Kelavani Mandal's Institute of Technology DHULE

7. ***Promoting clean and green campus***

Photo. Cleanliness and greenery within institute – 26-04-2023

Photo. Greenery within institute – 17-02-2023

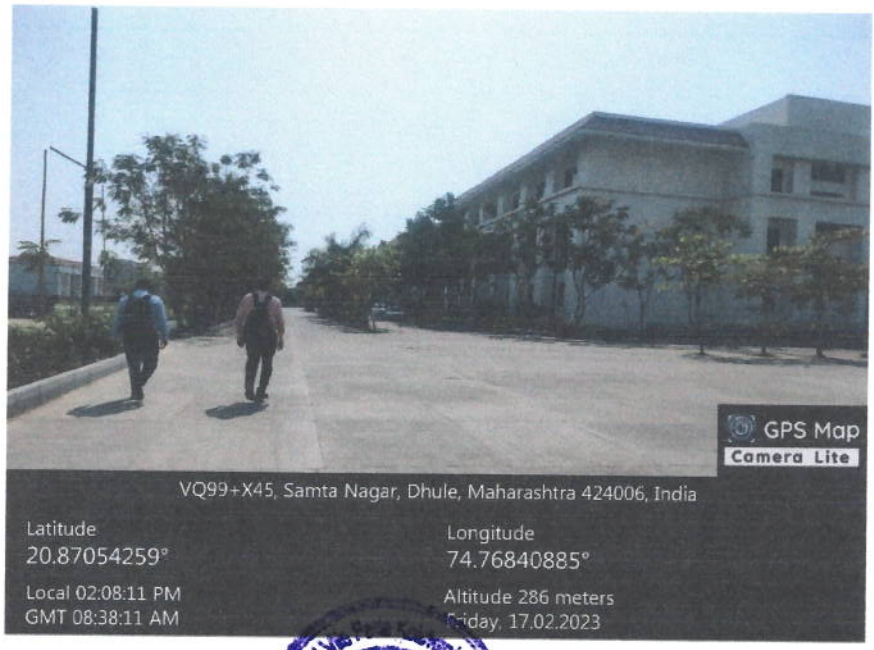

Photo. Lush green campus – 17-02-2023

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Institute of Technology

Photo. Cleaning done by House keeping staff – 16-05-2023

Photo. Cleaning done by House keeping staff – 19-05-2023

Photo. Clean Classrooms – 16-05-2023

DHULE Institute of Technology

Photo. Clean Classrooms – 27-04-2023

Photo. Clean and green campus – 18-08-2023

Photo. Clean and green campus – 18-08-2023

8. Segregated dry waste collection

Photo. Dustbins with segregated chambers for dry waste collection – 26-04-2023

9. Alternate sources of energy and energy conservation measures

Photo. A view of photovoltaic panels set-up on Institute's Rooftop

Photo. A view of photovoltaic panels set-up on Institute's Rooftop

Photo. Solar power generation trend in 2022-23

Photo. Centralized Air conditioning plant

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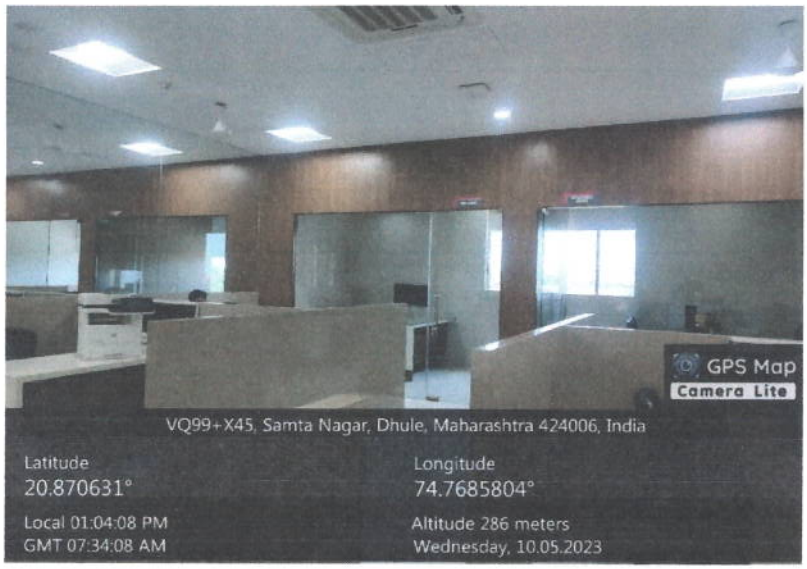

Photo. LED lighting in faculty area

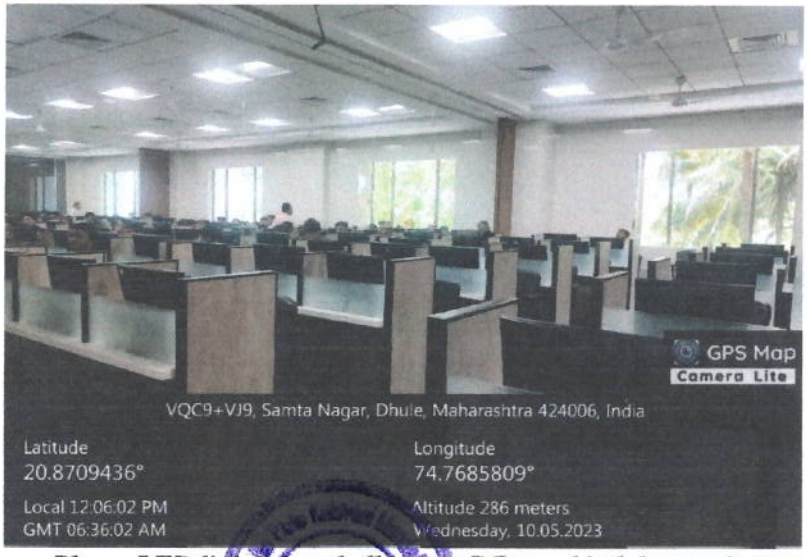

Photo. LED lighting and all in one PCs used in laboratories

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Photo. LED lighting in canteen

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Principal
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7.1.3: Quality audits on environment and energy regularly undertaken by the Institution

Sr. no.	Particulars	Page no
1.	Beyond the campus environmental promotion activities for the academic year 2022-23	1-10

Shri Vile Parle Kelavani Mandal's Institute of Technology DHULE

Dr. Nilesh Salunke
Principal
SVKM's Institute of Technology, Dhule

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4. Beyond the campus environmental promotion activities for the academic year 2022-23

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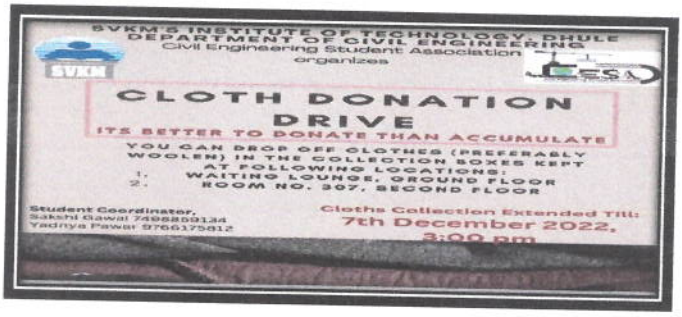
Shri Vile Parle Kelavani Mandal's Institute of Technology DHULE

Dr. Nilesh Salunke
Principal
SVKM's Institute of Technology, Dhule

Activity Report

Of

"Cloth Distribution Drive"



On 12 th December 2022

Organized by,

N.S.S. Unit.

S.V.K.M.'s Institute of Technology Dhule

At

Institute of Technology, Dhule.

Activity "Cloth Distribution Drive."

On 12 th December 2022

Aim: Inculcate social values among the students.

Name of Program:- "Cloth Distribution Drive"

Organized by:

Jointly organized by # N.S.S. Unit of Institute of Technology and Civil Engg. Deparment Intitute of Technology.

Participants: Students, Faculty, Staff members of SVKM IOT, Dhule .

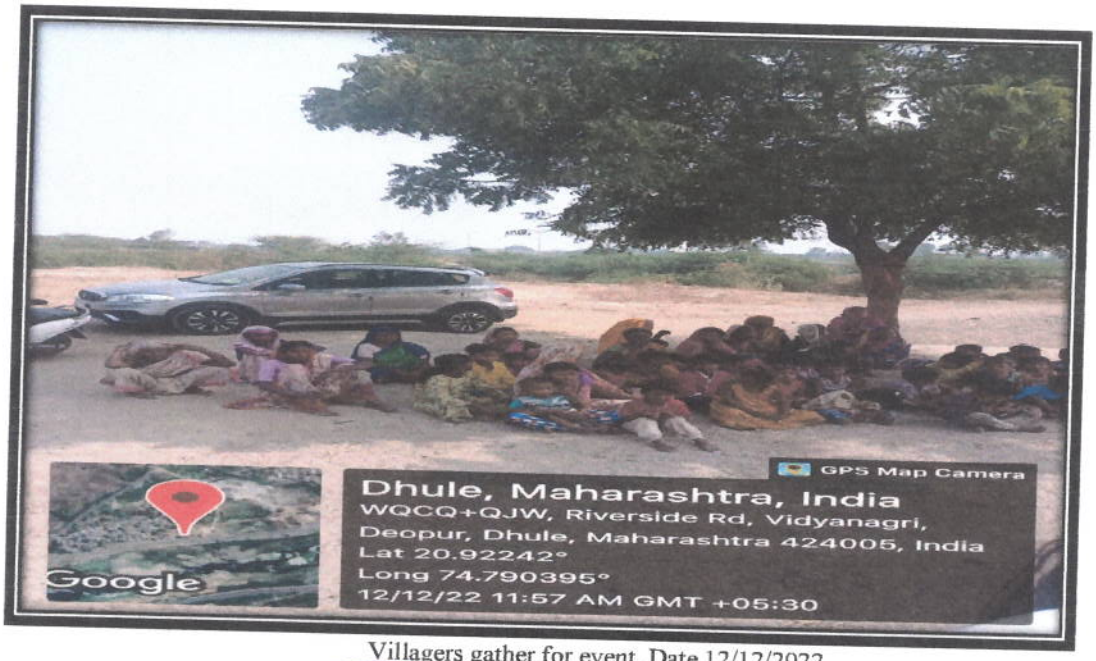
Activity Brief:

The N.S.S. Unite and Dept. of Civil Engineering of Institute collaborate for event of Donation of used clothe especially woolen clothes to distribute among the needy people. After appealing the students of the institute through social media many students donated woolen clothes. Student's coordinators collected it and with faculty and staff all collected clothes donated to the needy people at Ekta nagar near river side area of deopur Dhule.

The Event conducted under the guidance of Hon. Principal Prof. (Dr) N. P. Salunke. Assistance Registrar Mr. Anmol Suryavanshi, Dr.Shrikant Randhavane (HOD), Mr. Manoj Sonar NSS Unit, Prof. Deepaksing Baghel, Prof.Yogesh Bafna, Prof.Basweshwar Jirwankar organized this camp.

Glimpses of the Voter ID Camp..

Students distributing cloths to children, Date: 12/12/2022



Villagers gather for event, Date 12/12/2022

Shri Vile Parle Kelavani Mandal's Institute of Technology DHULE

Principal
SVKM's Institute of Technology, Dhule

Activity Report

"Disaster Management Training"
On 4th July 2022

Organized by,

N.S.S. Unite
S.V.K.M.'s Institute of Technology Dhule

At

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

DHULE

Activity Report of One Day Training on Disaster Management

On 4th July 2022

Aim: To provide knowledge among individuals and groups to take actions to reduce their vulnerability to disasters and create awareness about basic information about Disaster Management.

Objective: To learn how to response in the Disaster Management.

Name of Program:- "One day training session on Disaster Management "

Organized by: Mr. Manoj Sonar. N.S.S. Unite of Institute of Technology.

Participants: Faculty, Staff members and Students of SVKM IOT, Dhule.

Outcomes: Participants learned:

- Basic s of Disaster management.
- First Aids in Disaster.

Activity Brief:

Disaster management training is meant to build the competencies of disaster relief workers and volunteers in improving the preparedness and response time in all levels before and after disasters.

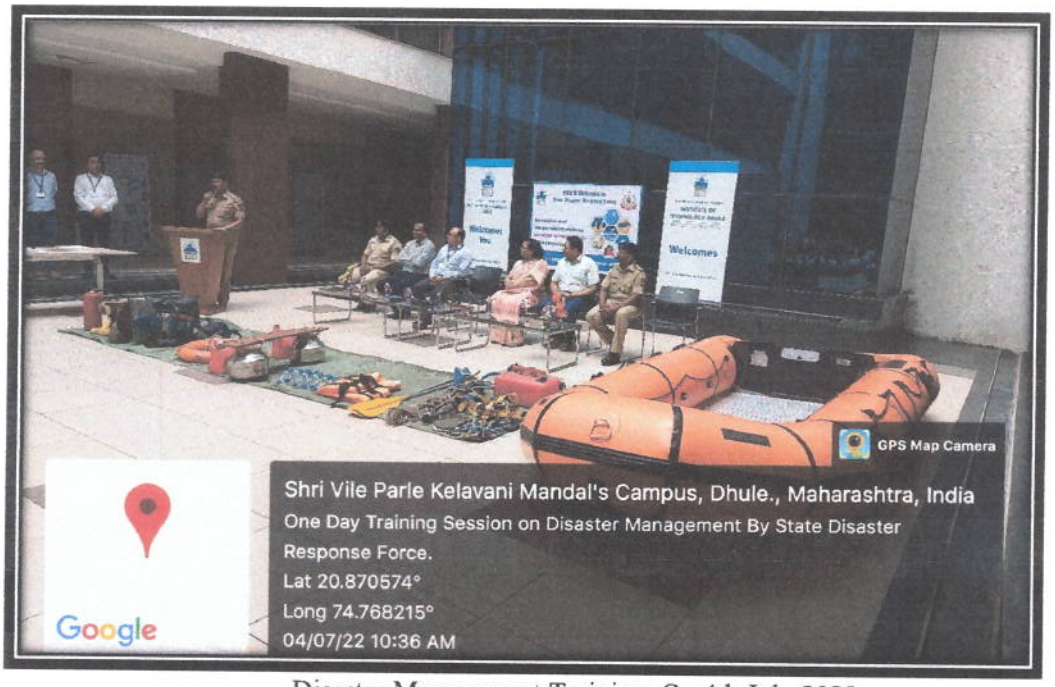
On 4 th July Institute conducted One day training session on Disaster Management for students. State Disaster Response Force Dhule has arrange this session to create awareness among the students and faculty members.

D.Y.S.P. Paraskar address the training session, he has given many useful tactics, which will be helpful in the natural calamities. The trained Jawans from the force showed practical. Mr. Ravikumar Lama, Head of Security S.V.K.M.'s Campus was guest for this program.

The Event conducted under the guidance of Hon. Principal Prof. (Dr) N. P. Salunke. Faculty and Staff members and the Students attend the occasion. For this program, all support given by Assi. Registrar Prof. Anmol Surayavanshi. N.S.S. Dept. Coordinators Prof. Prashant Gavade, Prof. Deepak sing Bhagel, Prof. Sachin Kamble. Worked hard to make this program successful.

Glimpses of the Event: # Training session on Disaster Management.

Shri Vile Parle Kelavani Mandal's Institute of Technology DHULE



Disaster Management Training On 4th July 2022

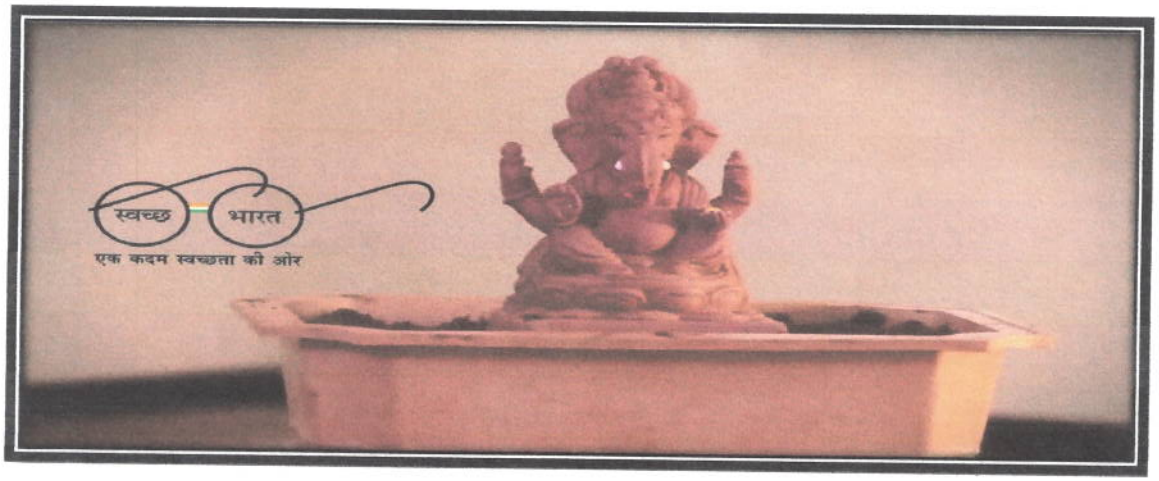
Disaster Management Training On 4th July 2022

Shri Vile Parle Kelavani Mandal's Institute of Technology DHULE

Principal
SVKM's Institute of Technology, Dhule

Activity Report

Of



"Eco Friendly Ganesh Visarjan & Nirmalya Collection Campaign"

On 09th September 2022

Organized by,

N.S.S. Unite
of
S.V.K.M.'s Institute of Technology, Dhule

Activity "Eco Friendly Ganesh Visarjan & Nirmalaya Collection Campaign."

On 09 th September 2022

Aim: Conducting activity to keep river clean.

Name of Program:- "Eco Friendly Ganesh Visarjan & Nirmalaya Collection Campaign "

Organized by: Mr. Manoj Sonar. N.S.S. Coordinator # N.S.S. Dept. of Institute of Technology

Participants: N.S.S. Unite Students and faculty members of SVKM IOT, Dhule .

Activity Brief:

The National Service Scheme of Dr. Babasaheb Ambedkar Technological University has been given many activities to conduct in the academic year; in this regard, on 9th Sep.2022 Our NSS Students organized the activity of "Eco Friendly Ganesh Visarjan & Nirmalaya Collection Campaign"at Panzara River side Dhule. Ganesha idols made of POP is the fact that POP does not degrade easily, leading to severe consequences like polluted water. The material also increases the acid content of water sources and can kill natural life in the water. Not only do they help keep the water pure and healthy but they also help keep common pests like mosquitoes at bay (fish found in lakes and ponds feed on mosquitoes keeping their numbers in check). For this, our students create awareness among the people to keep the river clean.

The N.S.S. Students collected the Ganesha idols from people and handover it to Muncipal Corporation people of Dhule. Students also collect Nirmalaya from riverside and put into the vehicles of Municipal Corporation.

The Event conducted under the guidance of Hon. Principal Prof. (Dr) N. P. Salunke. Prof. Deepk Sing Baghel , Prof. Satish Patil, Prof.Ankush Mudholkar, Prof.Prashant Gawade and Prof. Sachin Kamble has given the Support for this program.

Eco Friendly Ganesh Visarjan & Nirmalaya Collection Campaign On 09 th September 2022

Shri Vile Parle Kelavani Mandal's DHULE Institute of Technology

Principal
SVKM's Institute of Technology, Dhule

Activity Report

Of

"माझी वसुंधरा" अभियान अंतर्गत पर्यावरण जनजागृती व स्वच्छता सप्ताह

"Paryavaran Janjagruti , Swachhata Saptah"

From 7 th June to 13 th June 2022

Organized by,

N.S.S.Dept.
of
S.V.K.M.'s Institute of Technology Dhule

At

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

Shri Vile Parle Kelavani Mandal's DHULE Institute of Technology

Activity ""Paryavaran Janjagruti , Swachhata Saptah"

Aim: Conducting activity of "Mazi Vasundhara" Paryavaran Janjagruti V Swachhata Aabhiyan " in the month of June 2022.

Objective: To know the importance swachhata among the students.

Name of Program:- ""Mazi Vasundhara" Paryavaran Janjagruti v Swachhata Aabhiyan "

Organized by: Mr. Manoj Sonar. N.S.S. Coordinator # N.S.S. Dept. of Institute of Technology.

Participants: Faculty, Staff members and Students of SVKM IOT, Dhule .

Outcomes: Participants learned:

- **Importance of Swachhata .**
- **Students encourages to people do Cleanliness of the surrounding.**
- **Enculture the value of Teamwork.**

Activity Brief:

As per the guidelines of National Service Scheme of Dr. Babasaheb Ambedkar Technological University, this activity conducted in the institute. In this regard, we have conduct the activity of "Mazi Vasundhara" Paryavaran Janjagruti V Swachhata Aabhiyan ". Under " Mazi Vasundhara" Abhiyan our NSS Students Conduct this activity in the Dhule City. The NSS Volunteers cleaned the Mahatma Gandhi Tatwadyan Mandir , Railway Station, State Transport Bus Stand and Historical Jalkumbha at Dhule City.

The Event conducted under the guidance of Hon. Principal Dr. Nilesh Salunke. NSS Program officer Mr. Manoj Sonar and Prof. Satish Patil, Prof. Sachin Kambale, Prof. Farah Naz, Prof.Gawade and Prof. Deepaksing Baghel conducted this program.

Swachhata Abhiyan at Jalakumbha Dhule

DHULE

Mazi Vasundhara From 7 th June to 13 th June 2022

Principal
SVKM's Institute of Technology, Dhule