Report

On

Green, Energy & Environment Audit

For

Vidyalankar Dyanapeeth Trust
Mumbai 400 037

Prepared

By

Senergy Consultants Pvt Ltd
Mumbai 400 088

March 2022

Helping You to Conserve Energy

Contents

I
Introduction

Green, Energy & Environment Audit was undertaken at Vidyalankar Dyanapeeth Trust (Vidyalankar Campus, Vidyalankar College Road, Wadala East, Mumbai 400 037) during the month of March 2022.

The organization is very keen to promote green culture wherever possible, as a commitment towards better environment and conservation of energy. A lot of efforts have already been put up to bring down the carbon footprint. To further optimize consumption and identify saving opportunities, M/s Senergy Consultants was assigned to carry out Green Energy & Environment Audit of the premises.

This Audit Report presents the analysis of the data collected, observations made at the facility and is governed by the objectives, scope of work, methodology etc. discussed in the ensuing paragraphs.

Team:

The team members of the audit study.

- Mr Ravindra Datar
- Mr Siddhesh Pagare

Acknowledgment:

We wish to express our gratitude towards Dr Rohini Kelkar (Principal - VSIT), Dr Sunil Patekar (Principal - VIT) , Mr Ashish Ukidve (Principal - VP) for having given us the opportunity for conducting the study and the support provided during the study.

We are also thankful to the entire team comprising of the following members for extending the necessary help and co-operation from their side.

- Mr Shailesh Mhapuskar (Facility Manager, VDT)
- Mr Abhijit Jagtap (Technical coordinator, VDT).
- Prof Sindhu Krishnan (VSIT)
- Prof Maitreyi Joglekar (VSIT)
- Prof Kavitha Mohan (VSIT)

II
Executive Summary

The premises were evaluated against the various criterions laid down by the National Assessment and Accreditation Council (NAAC). The major observations are.

Air Quality & Ventilation:

- The classrooms and other area are well ventilated to ensure proper air quality.
- The fans are appropriately installed to ensure proper air circulation.
- The outdoor and few indoor plants have also been provided to improve the environment.
- The air conditioned rooms are provided with proper ventilation and fresh air.

Lighting System:

- The usage of natural light is optimized through well designed structure and windows.
- Almost all the light fitting are provided with high efficiency LED lamps.
- It is suggested to automate switching of lamps in the common areas and rest rooms with sensor based control.

Green Campus Initiative:

- The movement of vehicle inside the campus is restricted.
- The plastic usage is restricted inside the campus; the usage may be completely banned.
- The campus is surrounded with a lot of greenery, trees, and proper landscaping.
- The college has various committees to create awareness on Waste & E-waste management and other initiatives
- The student participation is encouraged in such activities through student clubs and groups.

Environment & Energy Initiative:

- Tree Plantation drive was undertaken by students and staff members.

Water Quality & Conservation:

- The water is supplied by the Municipal Corporation, which is a common practice in Mumbai, Thane & Navi Mumbai.
- The Sewage Treatment Plant is installed to treat the swage water. The treated water is used for gardening.
- Water purifiers & coolers are provided at individual floors and convenient locations.
- The distribution network and piping are more or less satisfactory and adequate.
- The restrooms are provided with water efficient (low usage) fittings.

Waste Management:

- College is looking at environmental issues very seriously and taking all possible steps towards sustainability.
- The waste is segregated and treated / handled accordingly.
- The canteen kitchen waste and garden waste is converted into the compost in the special composting bins.
- The dry waste is disposed through Municipal System.
- The sewage water is treated in the he Sewage Treatment Plant and the treated water is used for gardening.

Air Conditioning System:

- The Air Conditioners are operated as required with manual control. The operation is minimal consequently automation may not be economical.
- The room temperature is maintained at 23 to 25 ^{o}C, which is well within the recommended values.
- The Air Conditioners are serviced regularly and properly maintained.
- Most of the Air Conditioners units are energy efficient with 3 star rating.

Infrastructure usage:

- The on-campus movement is distributed with multiple entrances as well as staircases.
- There are ramps and lifts at key locations.
- A special assistance is provided to address the needs of differently abled persons.
- The fire extinguishers are provided at key areas.
- The draining system for washrooms is efficient and effective.
- There were no seepages observed in the building premises.

Green IT culture:

- The Energy efficient computers and laptops have been procured.
- The electronic communication is encouraged to minimize usage of papers.
- Most of the papers are reused for doubled sided printing to further minimize usage of paper.

Renewable Energy:

- The present Solar Photovoltaic System may be made functional and efficient with NET metering facility.

III
Electrical System

Gadget

Air Conditioning Units:

Location	Type	Capacity	Quantity
Vidyalankar Polytechnic & W Block	Split	1.5	85
Vidyalankar Polytechnic & W Block	Ductable	4.0	6
X Block	Window	1.5	3
X Block	Split	2.0	70
X Block	Cassette	2	1
VIT	Window	1.5	1
VIT	Split	2	99
VIT	Ductable	5.5	14
M Block	Split	1	5
M Block	Split	1.5	1
M Block	Cassette	2	15

Observations & Suggestions:

- Most of the Air Conditioners units are energy efficient with 3 star rating.
- The Air Conditioners are operated as required with manual control.
- The rooms are well ventilated and provided with fans at appropriate location for proper air circulation.
- The temperature is maintained at 23 to 25 ^{o}C, which is within the recommended values.

Lamps:

The details of the light fittings is as under.

Location	LED Sq. Panel	LED Round	LED PL	LED Spot	LED T8	LED T5	LED Bulb	CFL PL	Tube Light	CFL Bulb
	15 W	12 W	9 W	15 W	18 W	18 W	9 W	11 W	36 W	20 W
X-Block										
X-001	12	0	0	0	0	0	0	0	0	0
X-002	0	0	0	0	0	0	0	0	2	0
X-003	0	0	0	0	12	0	0	0	4	0
X-004	0	0	0	0	10	0	0	0	2	0
X-005	0	0	0	0	12	0	0	0	3	0
X-006	0	0	0	0	11	0	0	0	0	0
X-007	0	0	0	0	9	0	0	0	6	0
X-008	0	0	0	0	3	0	0	0	2	0
X-009L	0	0	0	0	7	2	1	0	0	0
X-009G	0	0	0	0	0	0	2	1	0	0
X-010L	0	0	2	0	0	0	4	0	0	0
X-010G	0	0	1	0	0	0	4	1	0	0
X-011	15	3	0	0	0	0	0	1	0	0
X-012	0	0	0	0	8	1	0	0	0	0
X-013	0	0	0	0	7	2	0	0	0	0
X-014	0	0	0	0	7	2	0	0	0	0
X-015	8	0	0	0	0	0	0	0	0	0
X-016	0	0	30	0	0	0	30	3	0	0
X-017	32	0	0	0	0	0	0	26	0	0
X-018	12	0	0	0	0	0	0	0	0	0
X-019	6	0	0	0	0	0	0	0	0	0
X-020	12	12	0	0	0	0	0	0	0	0
X-21L	0	0	0	0	0	0	0	0	0	0
X-22G	0	0	0	0	0	0	0	0	0	0
X-Main Entry	0	0	5	0	1	0	0	5	0	0
X-Front Passage	0	0	0	0	5	0	6	0	5	0
X-Back Passage	8	0	0	0	6	1	0	0	0	0
X-101	0	0	0	0	0	0	0	0	0	0
X-102	0	0	0	0	0	0	9	2	0	0
X-103	0	0	0	0	0	0	15	38	0	0
X-105	0	0	25	0	1	0	0	0	0	0
X-106	0	0	0	0	1	1	0	0	0	0
X-107	0	0	0	0	0	1	7	13	0	0
X-108	0	0	0	0	0	0	2	20	0	0
X-109	0	0	0	0	0	3	0	0	0	0
X-110	0	0	0	0	0	0	13	9	0	0
X-111	0	0	1	0	1	0	9	10	1	0

Location	LED Sq. Panel	LED Round	LED PL	LED Spot	LED T8	LED T5	LED Bulb	CFL PL	Tube Light	CFL Bulb
	15 W	12 W	9 W	15 W	18 W	18 W	9 W	11 W	36 W	20 W
X-112	12	0	0	0	0	0	0	0	0	0
X-113	0	13	0	0	0	0	4	14	0	0
X-114	0	0	0	0	0	0	5	17	0	0
X-115	0	0	0	0	0	0	15	10	0	0
X-116	0	9	0	0	0	0	0	0	0	0
X-117	0	0	1	0	1	0	5	7	1	0
X-118	0	0	2	0	0	0	12	0	2	0
X-119	0	0	0	0	0	0	12	0	0	0
X-120	0	0	0	0	0	0	9	10	0	0
X-121	0	0	0	0	0	0	12	4	0	0
X-122	0	0	0	0	0	0	12	0	0	0
X-123	0	0	0	0	0	0	12	7	0	0
Y-Block										
Y-001	30	0	0	15	0	0	0	0	0	0
Y-002	18	0	0	0	0	0	0	0	0	0
Y-003	38	0	5	0	0	0	0	0	0	0
Y-004	2	0	0	0	0	0	0	0	0	0
Y-Ground Floor Passage	12	0	0	4	0	0	0	0	0	0
Y-101	14	0	0	0	0	0	0	0	0	0
Y-102	20	0	0	0	0	0	0	0	0	0
Y-103	18	0	0	0	0	0	0	0	0	0
Y-104	8	0	0	0	0	0	0	0	0	0
Y-105	18	0	0	0	0	0	0	0	0	0
Y-106	18	0	0	0	0	0	0	0	0	0
Y-1st Floor Passage	16	0					4		0	
S-Block										
S-001	6	0	0	12	0	0	0	0	0	12
S-002	0	0	0	0	2	0	0	0	0	0
S-003	0	0	0	0	0	0	0	0	0	0
S-Ground Floor Passage	0	0	0	3	0	0	0	0	0	0
S-101	0	0	0	6	0	0	4	0	0	6
S-102	0	0	0	38	0	0	0	0	0	7
S-103	0	0	0	4	0	0	0	0	0	6
Total	**335**	**37**	**72**	**82**	**104**	**13**	**208**	**198**	**28**	**31**

Observations & Suggestions:

- Almost all the light fitting are provided with high efficiency LED lamps; the others being replaced shortly.
- The usage of natural light is optimized through well designed structure and windows.
- It is suggested to automate switching of lamps in the common areas and rest rooms with sensor based control.

Fans:

Location	Ceiling	Wall Mounted	Pedestal
	60 W	**45 W**	**45 W**
VP	26	3	1
VSIT	23	1	2
VIT	389	5	3
M Block	4	8	2
Total	**442**	**17**	**8**

Observations & Suggestions:

- All the fans are of standard rating and efficiency.
- The fans may be progressively replaced with energy efficient BLDC fans, especially during replacements and new purchases.

Computers:

Almost all the computers are with energy efficient LCD / LED monitors.

The battery / power management system may be incorporated for more efficient operation.

General Observations & Suggestions:

- The rooms are well ventilated and provided with fans at appropriate location for proper air circulation.
- The gadgets are services properly and maintained in good condition.

Electricity Bills:

The details of the electricity bill is as under.

Consumer Name:	Vidyalankar Dnyanpeeth Trust		
Utility Provider:	BEST		
Consumer No:	202-026-265*2		
Meter No:	T190766		
Tariff Category:	LT IVB-T		
Description	**Consumption**		**Cost**
Unit	**KWH**	**Rs**	**Rs/KWH**
Apr-21	8760	75809	8.65
May-21	2460	21124	8.59
Jun-21	2100	17956	8.55
Jul-21	4860	41140	8.47
Aug-21	6360	53776	8.46
Sep-21	5760	48384	8.40
Oct-21	5460	47503	8.70
Nov-21	7860	67844	8.63
Dec-21	7260	61417	8.46
Jan-22	7500	63530	8.47
Feb-22	3120	26731	8.57

General Observations & Suggestions:

- The average cost of power is 8.46; which is in the normal range.

IV
Environmental System

Ventilation & Air Quality:



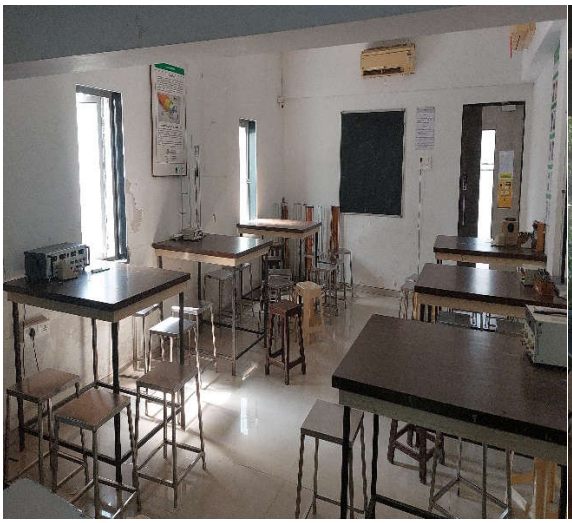
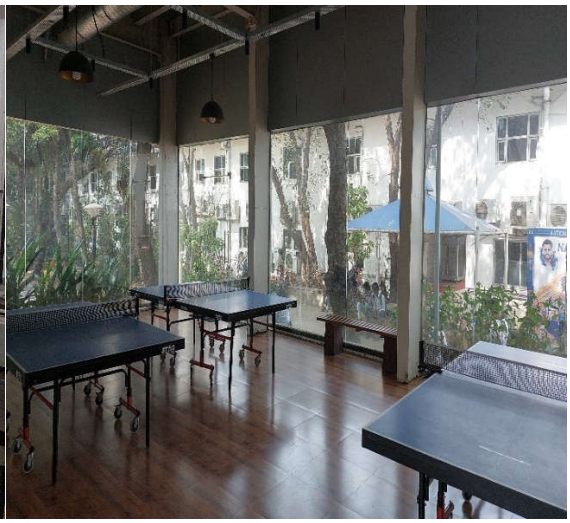

- Several indoor & outdoor plants have been installed to improve air quality.
- The air ventilation is adequate.
- The air-conditioned rooms are provided with proper ventilation and fresh air.
- It has been a general practice to switch off the fans & lights in an unoccupied area.

Indoor & Outdoor Plants:

Sr No	Description	Indigenous, Local, Exotic	Height	Quantity
			M	No
1	Christmas Tree	Exotic	1.5	2
2	Mango	Local	30	26
3	False Ashoka	Local	20	18
4	Saptaparni	Local	15	1
5	Temple Chapha	Local	7	2
6	Golden Pothos	Exotic	4	1
7	Fiji fan palm	Indigenous	5	1
8	Royal Palm	Indigenous	15	84
9	Khajur	Local	6	2
10	Mexican Fan Palm	Indigenous	20	2
11	Cane Palm	Local	3	51
12	Coconut	Indigenous	15	40
13	Shatawari	Local	2	2
14	Kardal	Local	3	6
15	Papaya	Local	8	1
16	Deshi Badam	Local	15	8
17	Copper Pod	Indigenous	15	6
18	Gulmohar	Indigenous	9	36
19	Rain Tree	Exotic	30	6
20	Jaswand	Local	3	1
21	Phanas	Local	10	1
22	Pipal Tree	Local	30	15
23	Banyan tree	Local	30	3
24	Guava Tree	Local	6	1
25	Jambhul	Local	9	3
26	Parijatak	Local	7	4
27	Golden Bamboo	Indigenous	9	1
28	Putranjiva	Local	12	1
29	Kadamb	Local	45	1
30	Foxtale Palm	Local	12	1
31	Shankasur	Local	3	1
32	Bindweed	Local	2	1
33	Durva	Local	1	1
34	Tulsi	Local	1	1
35	Sleeping Beauty	Local	6	1
36	Lagerstromia Rosea	Local	20	4
37	Tbebuja Rosea	Local	30	9
38	Bakul	Local	15	1
39	Prajakta	Local	3	8
40	Golden Champaka	Local	6	1

Sr No	Description	Indigenous, Local, Exotic	Height	Quantity
			M	No
41	Sraca Indica	Local	9	10
42	Foxtail Palms	Local	10	25
43	Bahumia Alba	Local	2	2
44	Peltophorum Pterocarpum	Local	2	1
45	Golden Trumphet	Local	4	3
46	Bauhinia Blackena	Local	6	6

Natural Lighting:

- The usage of natural light is optimized.

V
Water Management

The water supplied by the municipal corporation is used for drinking and other requirements. The incoming water from the municipal corporation is metered.

Observations & Suggestions:

- The treated water from the Sewage Treatment Plant is used for gardening, thereby considerably reducing the consumption of municipal water.

Water Purifiers & Coolers:

The water purifiers and coolers are provided at on individual floors, the details are as under.

Sr No	Location	Purifier	Cooler
Vidyalankar Polytechnic			
1	Ground Floor	1	1
2	First Floor	1	1
3	Second Floor	1	1
X Block			
1	Ground Floor	1	1
2	First Floor	1	1
VIT			
1	A & B Block	2	2
2	C & D Block	1	1
3	E & F Block	1	1
4	G & H Block	1	1
5	I & J Block	1	1
6	K & L Block	1	1

Water Distribution System:

The distribution network and piping are more or less satisfactory and adequate.

Rainwater Harvesting:

The possibility of installing Rain Water Harvesting System with ground water recharge may be assessed.

VI
Waste Generation & Management

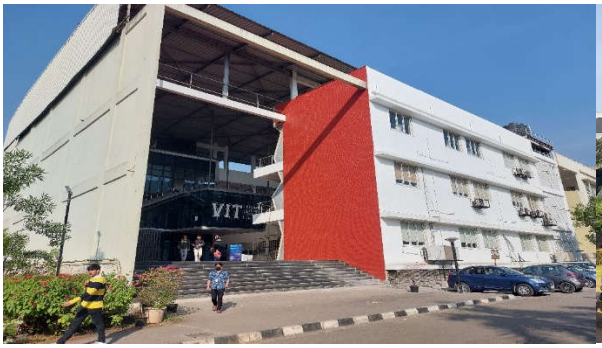
Solid Waste:

- College is looking at environmental issues very seriously and taking all possible steps towards sustainability.
- The waste is segregated and treated / handled accordingly.
- The canteen kitchen waste and garden waste is converted into the compost in the composting bins.
- The dry waste is disposed through Municipal System.
- The sewage water is treated in the he Sewage Treatment Plant and the treated water is used for gardening.

Sewage & Wastewater:

- The sewage water is treated in the he Sewage Treatment Plant and the treated water is used for gardening.
- There is no generation of harmful or hazardous effluent.

VII
Infrastructure & Safety



Observations:

- The premises are provided with multiple staircases with necessary entrances to ensure quick and effective movement in normal as well as emergency conditions.
- The movement of vehicle inside the campus is restricted and separate parking areas are provided in the premises.
- The students and many of the faculty members avail public transport system which is very convenient due to proximity to railway station and bus services.

Draining system:

- The drains from the washrooms are connected to the municipal drainage, which is a common practice in the colleges in and around Mumbai.

Seepage in the building:

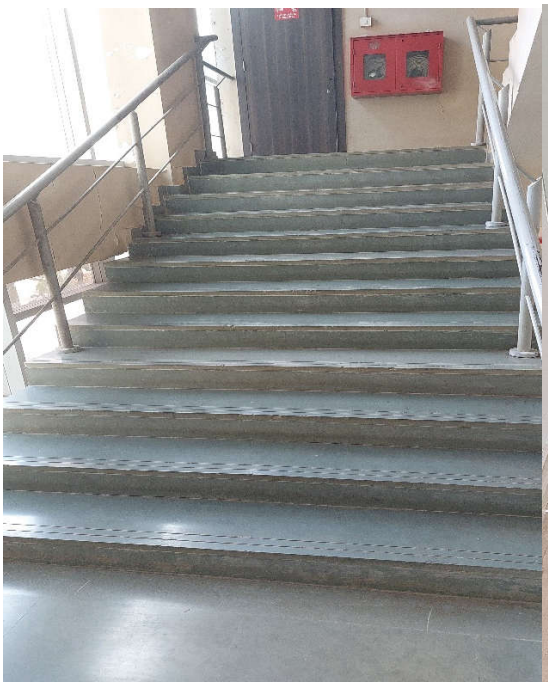
- The premise was visually inspected for seepages. No seepages were observed in any of the places.

Firefighting & fire escape system:

There are efficient fire extinguishers in the premises; which are checked / refilled as per the stipulated frequency. The details of the fire extinguishers is as under.

Sr No	Location	Type	Quantity
VIT			
1	MG Block	ABC	1
2	E Block	ABC	1
3	B Block	ABC	1
4	D Block	ABC	1
5	Office	ABC	2
6	Server	CA	1
7	Canteen	K	
8	G Lib	ABC	1
9	Base-3	DCP	1
10	Base-4	DCP	1
11	F Block	DCP	1
12	G comp.	CO2	1
13	Base 1	DCP	1
14	Base 2	DCP	1
15	Lab 9	CO2	1
M Block			
1	Auditorium	ABC	4
2	Ground Floor	CO2	1
3	Ground Floor	ABC	1
4	1st Floor	ABC	2
5	2nd Floor	ABC	3
6	3rd Floor	ABC	4
7	4th Floor	ABC	2
8	4th Floor	DCP	2
9	5th Floor	ABC	3
10	5th Floor	DCP	1
11	6th Floor	ABC	2
12	7th Floor	ABC	2
13	Auditorium	CO2	1
14	Pump Room	CO2	1
15	Café	DCP	1
X Block			
1	Ground Floor	DCP	2
2	1st Floor	DCP	3
Y Block			
1	Electrical Room	CO2	1
2	Electrical Room	ABC	1
3	1st Floor	CO2	1
4	1st Floor	ABC	1
S Block			
1	Ground Floor	ABC	1
2	1st Floor	DCP	1
W Block			
1	Ground Floor	ABC	7

Sr No	Location	Type	Quantity
V Block			
1	Ground Floor	ABC	14
2	1st Floor	ABC	13
3	2nd Floor	ABC	6
4	Pump Room	ABC	1



The premise is provided with multiple staircases with requisite entrances to ensure quick and effective movement in emergency conditions.

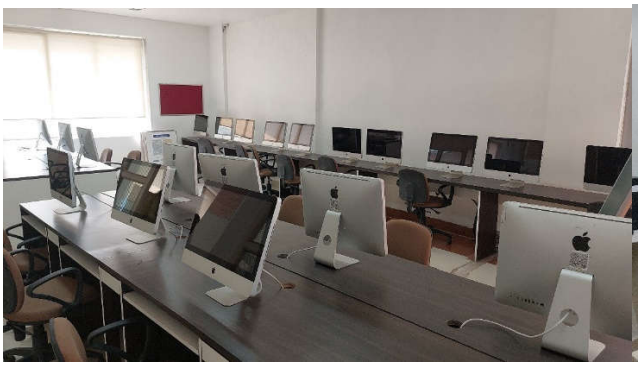
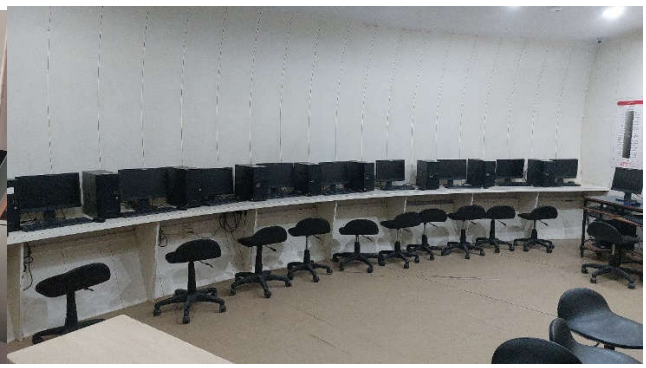

The elevators and ramps are provided for ease of movement.

Parking:


There are separate parking spaces for four and two wheelers.

VIII
Green Culture

Computers:

Observations & Suggestions:

- The LED / LCD monitors & Laptops has been procured, which are energy efficient.
- These monitors are not only energy efficient but also generate minimal heat and cut down on air conditioning load.

The following steps may be initiated to further enhance efficiency of the systems.

1. An efficient power management system may be incorporated to
    a. Switch off the display if not in use.
    b. Put the computer in Sleep mode / switching off the machines, if not used for prolonged period.
2. Optimize brightness of the screen.
3. Discourage use of screen savers, which has similar power consumption.

Paper-less communication:

The major internal as well as external communication is through electronic medium.

Re-using one sided paper for printing:

It was observed that two side printing / printing on the back side of used paper in more than 80% of the cases.

IX
Renewable Energy

Solar Photovoltaic:

The present Solar Photovoltaic System may be made functional and efficient with NET metering facility.

Solar Thermal:

There is no application of solar thermal system and does not find attractive in this case.

Biogas Plant:

There is no possibility of installing biogas plant for cooking as the quantity of plate waste is negligible.