


Nutan Urja Solutions

(ISO 9001:2015) 

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

Sus Road, Sus, Pune 411 021

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

Date: 27/06/2023

CERTIFICATE

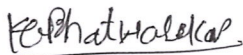
This is to certify that we have conducted Green Audit at D Y Patil International University Akurdi, Pune for the year 2022-23.

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

- Installation of Rain Water Harvesting system
- Installation of Sewage Treatment Plant.
- Installation of **350 kW** 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
D. Y. Patil International University
Akurdi, Pune
(Year 2022-23)**

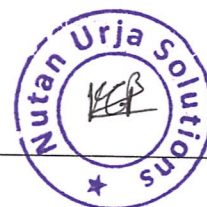


Prepared by
Nutan Urja Solutions
A 703, Balaji Witefield, Near Sunni's World,
Sus Road, Sus, Pune 411 021
Phone: 83568 18381. Email: nutanurja.solutions@gmail.com

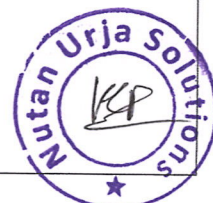


Contents

Acknowledgement	3
Executive Summary	4
Abbreviations	6
1. Introduction.....	7
1.1 Objectives.....	7
1.2 Audit methodology.....	7
2. Study of Electrical Energy Consumption	8
3. Carbon Foot printing.....	10
4. Study of Usage of Alternate Energy	12
5. Study of Water System	13
5.1 Source of Water.....	13
5.2 Rain Water Harvesting	13
5.3 Sewage Treatment Plant.....	13
6. Study of Waste Management.....	15
6.1 Solid Waste Management.....	15
6.2 e-Waste Management.....	15
6.3 Waste Water Management	15
7. Study of Green Practices.....	16
7.1 No of students who don't use own Vehicle for coming to Institute.....	16
7.2 Usage of Public Transport.....	16
7.3 Pedestrian Friendly Roads.....	16
7.4 Plastic Free Campus	16
7.5 Paperless Office.....	17
7.6 Food Service in institute campus	17



7.7 Provision of Ramp for Divyangajan.....	17
7.8 Provision of Sanitary Waste Incinerator	17
7.9 Creation of Aareness about Resource Conservation.....	17
7.10. Green Landscaping with Trees and Plants	17



Acknowledgement

We at Nutan Urja Solutions, Pune, express our sincere gratitude to the management D. Y. Patil International University, Akurdi, Pune for awarding us the assignment of Green Audit of their university 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 D. Y. Patil International University Akurdi, Pune is conducted by Nutan Urja Solutions, Pune. Based On the audit field study, following important points can be presented.

1. Present Energy Consumption

D. Y. Patil International University Akurdi, Pune uses Electrical Energy as the source of Energy for various equipment in the university campus. In the following Table, we present the details of Energy Consumption.

Table no 1: Details of energy consumption

Sr no	Parameter	Energy consumed, (Units)	CO2 Emission (MT)
1	Maximum	55,873	44.70
2	Minimum	30,138	24.11
3	Average	43,230	34.58
4	Total	518,762	415.01

2. Various Measures Adopted for Energy Conservation

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

3. Usage of Renewable Energy

The institute has installed **350 kW** Solar PV Power Plant.

4. Rain Water Harvesting

The university has installed the Rainwater harvesting project, to reduce dependency on municipal corporation water supply.

5. Waste Management

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

6. Notes and Assumptions

1. Daily working hours-10 Nos

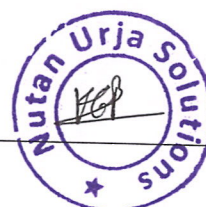


2. Annual working Days-250 Nos
3. Average Rate of Electrical Energy : **Rs 11/- per kWh**



Abbreviations

CFL	: Compact Fluorescent Lamp
FTL	: Fluorescent Tube Light
LED	: Light Emitting Diode
V	: Voltage
I	: Current
kW	: Kilo- Watt
kWh	: kilo-Watt Hour
kVA	: Active Power



1. Introduction

D. Y. Patil International University, Akurdi, Pune (DYPIU) has recently become operational as a State Private University and has rolled out with a fundamental mission of covering a remarkable milestone in the history of Higher Education in India. It further aims to convert itself into a Private University of global value by developing socially relevant and contemporary outcome-based programs, carrying out inter and intra disciplinary research in thrust areas, enhancing the scope of collaborations for research, and boosting faculty and student exchange programs worldwide. Also, by its acute focus on empowerment through Education and Academic Excellence, it aspires to provide an inspirational and experiential learning environment for its stakeholders and is also keenly responsive towards serving the prerequisites of the Industry and society by embedding internationalization, employability and value ruminating in all its programs.

1.1 Objectives

1. To study present level of Energy Consumption
2. To Study the present CO₂ 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. The D. Y. Patil International University Akurdi, Pune is situated in Padmashree D. Y. Patil Educational Complex. Entire Padmashree D. Y. Patil Educational Complex is having single energy meter for all institutes situated in complex. The bill analysis is carried for electricity bills of entire campus.

Table no 2.1: Summary of electricity bills

No	Month	Energy (kWh)	Bill Amount (Rs)
1	May-23	47,627	814,560
2	Apr-23	36,498	723,275
3	Mar-23	30,138	594,047
4	Feb-23	32,035	624,237
5	Jan-23	44,454	798,045
6	Dec-22	48,115	847,858
7	Nov-22	49,666	867,630
8	Oct-22	32,114	622,879
9	Sep-22	55,873	984,153
10	Aug-22	44,479	797,784
11	Jul-22	46,234	822,386
12	Jun-22	51,529	1,003,847
	Total	518,762	9,500,701

Variation in energy consumption is as follows,

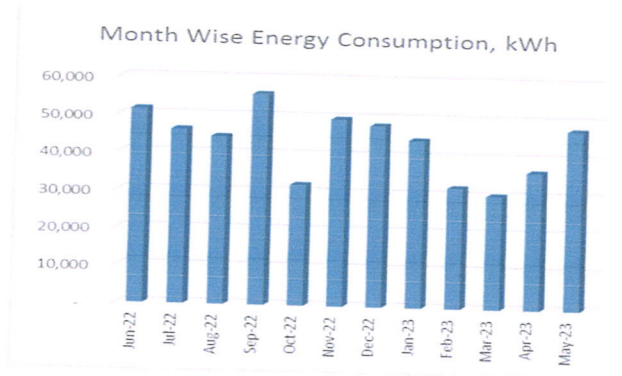


Figure 2.1: Month wise energy consumption

Monthly variation in electricity bill is as follows,

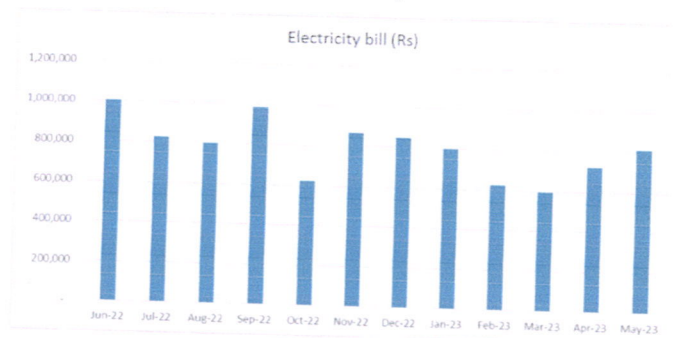


Figure 2.2: Month wise electricity bill

Key observations of electricity bill are as follows,

Table no 2.2: Key observations

Sr no	Parameter	Energy consumed, (Units)	CO2 Emission (MT)
1	Maximum	55,873	44.70
2	Minimum	30,138	24.11
3	Average	43,230	34.58
4	Total	518,762	415.01

3. Carbon Foot printing

1. A **Carbon Foot print** is defined as the Total Greenhouse Gas emissions (CO₂ 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 university for performing its day to day activities

2. Basis for computation of CO₂ Emissions:

The basis of Calculation for CO₂ emissions due to Electrical Energy is as under

- 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO₂** into atmosphere.

Based on the above Data we compute the CO₂ emissions which are being released in to the atmosphere by the university due to its Day to Day operations.

The D. Y. Patil International University Akurdi, Pune is situated in Padmashree D. Y. Patil Educational Complex. Entire Educational Complex is having single energy meter for all institutes situated in complex. Calculation for CO₂ emissions due to Electrical Energy is carried for entire campus.

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



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

No	Month	Energy Consumed, kWh	CO2 Emissions, MT
1	May-23	47,627	38.10
2	Apr-23	36,498	29.20
3	Mar-23	30,138	24.11
4	Feb-23	32,035	25.63
5	Jan-23	44,454	35.56
6	Dec-22	48,115	38.49
7	Nov-22	49,666	39.73
8	Oct-22	32,114	25.69
9	Sep-22	55,873	44.70
10	Aug-22	44,479	35.58
11	Jul-22	46,234	36.99
12	Jun-22	51,529	41.22
	Total	518,762	415.01

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

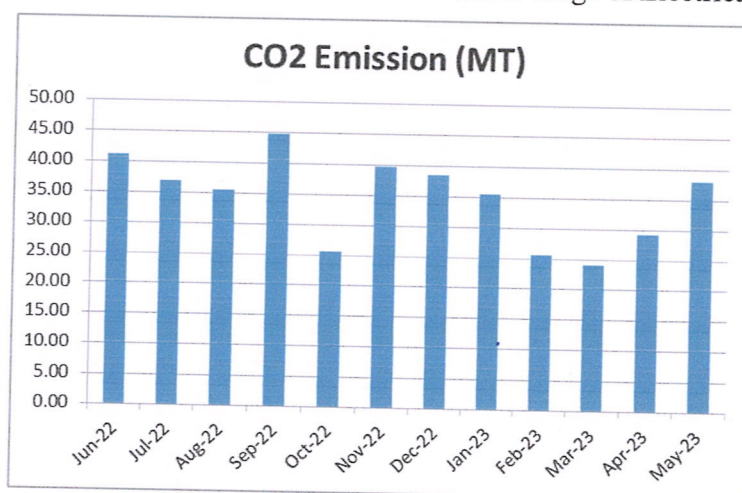


Figure 3.1: Month wise CO2 Emission

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 institute.

The D. Y. Patil International University Akurdi, Pune is situated in Padmashree D. Y. Patil Educational Complex. Entire Educational Complex is having single energy meter for all institutes situated in complex. The institute have installed Roof Top Solar PV System to cater energy requirement of all institutes of entire campus. The Installed Capacity of Solar PV Plant is **350 kWp**.

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

No	Particulars	Value	Unit
1	Annual Energy Purchased from MSEDCL	518,762	kWh/Annum
2	Energy Generated by Roof Top Solar PV System	525,000	kWh/Annum
3	Total Energy Requirement of university	1,043,762	kWh/Annum
4	% of Usage of Alternate Energy to Annual Energy Requirement	50	%

Photograph of Solar PV plant



5. Study of Water System

5.1 Source of Water

university gets water from Pimpri- Chinchwad Municipal Corporation. The RO treated water is provided for drinking.

5.2 Rain Water Harvesting

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

Photograph of Rain Water Harvesting



5.3 Sewage Treatment Plant

The waste water generated in university campus is treated in Sewage Water Treatment Plant. This plant aims to remove contaminants from sewage to produce an effluent that is suitable for reuse application. The sewage water treatment plant is operating with 350 KLD water capacity.

Photograph of Sewage Treatment Plant



6. Study of Waste Management

6.1 Solid Waste Management

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

6.2 e-Waste Management

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

6.3 Waste Water Management

The waste water generated in university campus is treated in Sewage Water Treatment Plant. The sewage water treatment plant is operating with 250 KLD water capacity.



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 campus only. Many students live in hostel campus. Many of the 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

Padmashree D. Y. Patil Educational Complex campus can be conveniently reachable by public transport. Most of the staff is using own vehicles i.e cars and two wheelers. The capacity of parking is enough to accommodate all vehicles. During the Students transport study, it was revealed that the local students who are residing near areas make use of Public Transport like Municipal Transport local buses, local sharing type auto rickshaws. Institute encourages students to not to use automobiles.

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 BHART ABHIYAN. The Institute has displayed boards in the Campus, to make the campus plastic free. Various measures adopted for this purpose are as follows

- Installation of Separate waste bins for Dry waste & wet waste
- Usage of paper tea cups in the Institute canteen

- Display of boards in the campus for Plastic Free campus

7.5 Paperless Office

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

7.6 Food Service in institute campus

There are canteens and cafeterias within institute campus. Students need not to travel outside the institute for food. Canteen contractor have Food license and shop act certificate. Hygiene in canteen is well maintained.

7.7 Provision of Ramp for Divyangajan

The university has made provision of ramp for Divyangajan

7.8 Provision of Sanitary Waste Incinerator

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

7.9 Creation of Aareness about Resource Conservation

The university has displayed Posters on Importance of energy conservation and water conservation.

7.10. Green Landscaping with Trees and Plants

The Institute has beautiful maintained Garden.



Figure 7.1: Beautiful maintained Garden of university