

GREEN AUDIT REPORT
of
Shiksha Mandal's
Bajaj College of Science, Wardha
(Formerly known as Jankidevi Bajaj College of Science)



Year: 2022-23

Prepared by:

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GREEN AUDIT CERTIFICATE

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

Date: 05/04/2023

This is to certify that we have conducted Green Audit at Bajaj College of Science, Wardha, in the Year 2022-23.

The Institute has adopted following Energy Efficient & Green Practices:

- Usage of Energy Efficient LED Light Fitting
- Installation of 50 kWp Roof Top Solar PV Plant
- Segregation of Waste at Source
- Installation of Bio & Vermi Composting Pit
- College has installed septic tanks and it cleans periodically
- Installation of Sanitary Waste Incinerator
- Installation of Rain Water Harvesting Project
- Maintenance of good Internal Road
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan
- Creation of awareness by display of Posters on Resource Conservation

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

For Engress Services,



A Y Mehendale,

B E- Mech, M Tech-Energy, Certified Energy Auditor, EA-8192
ASSOCHAM GEM Certified Professional: GEM: 22/788



REGISTRATION CERTIFICATES



MEDA Registration Certificate

GEM Certified Professional Certificate



ISO: 9001-2015 Certificate



ISO: 14001-2015 Certificate



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ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Bajaj College of Science, Wardha for awarding us the assignment of Green Audit of their Campus for the Year: 2022-23.

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



EXECUTIVE SUMMARY

1. Bajaj College of Science, Wardha consumes Energy in the form of **Electrical Energy**; used for various Electrical Equipment, office & other facilities.

2. Present Energy Consumption & CO₂ Emission:

No	Particulars	Value	Unit
1	Annual Energy Consumption	90942	kWh
2	Annual CO ₂ Emissions	72.75	MT

3. Renewable Energy & Energy Efficiency Projects:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 50 kWp Roof Top Solar PV Plant

4. Waste Management:

5.1 Segregation of Waste at Source:

The Waste is segregated at source in separate Waste Bins & is handed over for further action.

5.2 Bio Composting & Vermi Composting Pit:

The Institute has a Bio Composting & Vermi Composting Pit, to convert the Leafy Waste into Bio Compost.

5.3 Liquid Waste Management:

The Institute has installed Septic Tank and it cleans periodically.

5.4 Sanitary Waste Management:

The Institute has installed Sanitary Waste Incinerator, for disposal of the Sanitary Waste.

5.5 Bio Medical Waste Management:

The Bio Medical Waste is collected in a separate bin and is disposed of through Authorized agency.

5.6 E Waste Management:

It is recommended to dispose of the E Waste through Authorized Agency.



6. Rain Water Harvesting:

The Institute has installed the Rainwater harvesting project; the rain water falling on the terrace is collected through pipes and is used for recharging the bore well.

7. Green & Sustainable Practices:

- Maintenance of good Internal Road
- Maintenance of Internal Garden: 100 plus Trees in the campus.
- Provision of Ramp for Divyangajan
- Creation of awareness on Resource Conservation Display of Posters

8. Assumption:

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

9. Reference:

- For CO₂ Emissions: www.tatapower.com



ABBREVIATIONS

BEE	Bureau of Energy Efficiency
kWh	Kilo Watt Hour
LPD	Liters Per Day
Kg	Kilo Gram
MT	Metric Ton
CO ₂	Carbon Di Oxide
Qty	Quantity

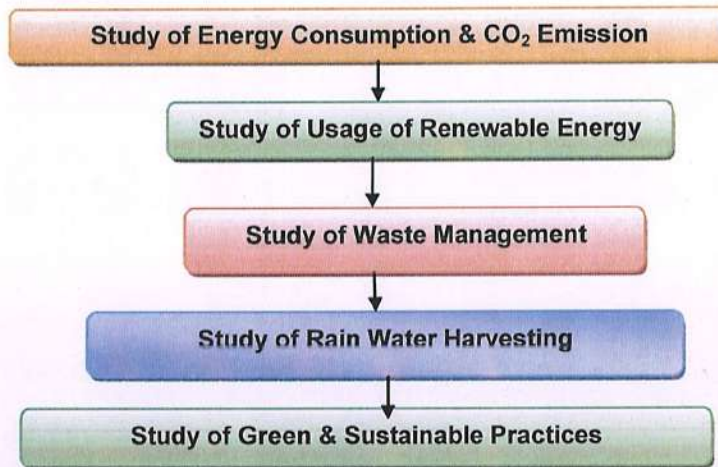


CHAPTER-I INTRODUCTION

1.1 Introduction:

A Green Audit is conducted at Bajaj College of Science, Wardha.

1.2 Audit Procedural Steps:



1.3 Institute Location Image:



Institute
Campus

CHAPTER-II

STUDY OF ENERGY CONSUMPTION & CO₂ EMISSION

A **Carbon Foot print** is defined as the Total Greenhouse Gas emissions, emitted due to various activities. In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the Institute for performing its day to day activities

The Institute uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO₂ Emissions:

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

- 1 kWh of Electrical Energy releases 0.9 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 Institute due to its Day to Day operations

Table No 1: Month wise CO₂ Emissions:

No	Month	Energy Generated (kWh)=A	Energy Purchased (kWh)=B	Energy Exported (kWh)=C	Net Energy Consumption (kWh) A+B-C	CO2 Emissions MT
1	Mar-22	18531	4951	4564	18918	15.134
2	Apr-22	6407	5089	4754	6742	5.393
3	May-22	6377	4446	4996	5827	4.661
4	Jun-22	5936	3667	4696	4907	3.925
5	Jul-22	6400	4545	5151	5794	4.635
6	Aug-22	4771	4594	3619	5746	4.596
7	Sep-22	4229	5974	2780	7423	5.938
8	Oct-22	4673	4491	3502	5662	4.529
9	Nov-22	3192	5875	2273	6794	5.435
10	Dec-22	4365	5301	3281	6385	5.108
11	Jan-23	5693	5029	4225	6497	5.197
12	Feb-23	6413	7696	3862	10247	8.197
13	Total	76987	61658	47703	90942	72.753
14	Maximum	18531	7696	5151	18918	15.134
15	Minimum	3192	3667	2273	4907	3.925
16	Average	6415.583	5138.166	3975.25	7578.5	6.062

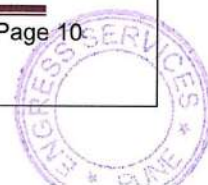


Chart No 1: Month wise CO₂ Emissions:

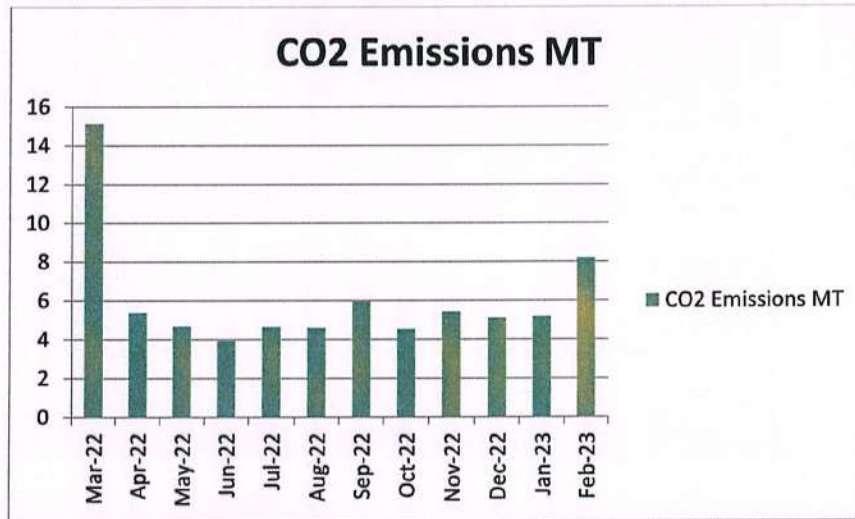


Table No 2: Important Parameters:

No	Parameter/ Value	Energy Generated (kWh)	Energy Purchased (kWh)	Energy Exported (kWh)	Net Energy Consumption (kWh)	CO2 Emissions MT
1	Total	76987	61658	47703	90942	72.75
2	Maximum	18531	7696	5151	18918	15.13
3	Minimum	3192	3667	2273	4907	3.92
4	Average	6415.58	5138.16	3975.25	7578.5	6.06



CHAPTER III STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed Roof Top Solar PV Plant of Capacity **50 kWp**.

In the following Table, we compute the Annual Reduction in CO₂ Emissions due to installation of Roof TOP Solar PV Plant.

Table No6: Computation of Annual Reduction in CO₂ Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	50	kWp
2	Energy Generated in per kWp	4	kWh/kWp
3	Annual Solar Energy generation Days	300	Nos
4	Energy Generated in the Year: 22-23	60000	kWh
5	1 kWh of Electrical Energy saves	0.9	Kg/kWh
6	Qty of CO₂ Saved by Solar PV Plant = (4)*(5) /1000	54	MT of CO₂



CHAPTER IV STUDY OF WASTE MANAGEMENT

4.1 Segregation of Waste at Source:

The Waste is segregated at source in separate Waste Bins & is handed over for further action.

Photograph of Waste Collection Bins:



4.2 Bio Composting & Vermi Composting Pit:

The Institute has a Bio Composting & Vermi Composting Pit, to convert the Leafy Waste into Bio Compost.

Photograph of Bio Composting & Vermi Composting Pit:



4.3 Liquid Waste Management:

The Institute has installed Septic Tanks it cleans periodically.

4.4 Sanitary Waste Management:

The Institute has installed Sanitary Waste Incinerator for disposal of the Sanitary Waste.



4.5 Bio Medical Waste Management:

The Bio Medical Waste is collected in a separate bin and is disposed of through Authorized agency.



4.6 E Waste Management:

It is recommended to dispose of the E Waste through Authorized Agency.



CHAPTER V STUDY OF RAIN WATER HARVESTING

The Institute has implemented the Rain Water Harvesting Project. The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used for recharging the bore well.

Photograph of Rain Water Harvesting & Bore well Recharge Section:



CHAPTER VI STUDY OF GREEN & SUSTAINABLE PRACTICES

6.1 Pedestrian Friendly Road & Internal Tree Plantation:

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

Photograph of Internal Road & Tree plantation:



6.2 Provision of Ramp for Divyangajan:

For easy movement of Divyangajan, the Institute has made provision of Ramp.

Photograph of Ramp:



6.3 Creation of Awareness about Plastic Ban Water Conservation:

The Institute has displayed posters emphasizing on importance of Plastic Ban and Water Conservation.

Photograph of Poster on Plastic Ban and Water Conservation:



6.4 Tree Plantation:

Tree plantation event was organized in the campus under NSS Unit.

Photograph of Tree Plantation in the Campus:



6.5 Floral Diversity of College:

The institute premise has immensely diverse with variety of tree species. The college has planted different ornamentals and medicinal plants in the garden.

Photograph of ornamentals and medicinal plants in the Campus:



ANNEXURE-1:

LIST OF TREES & PLANTS IN THE CAMPUS:

Ornamental Plants			
1	Euphorbia tithymaloides	27	Agave chiapensis
2	Combretum indicum	28	Muntingia calabura
3	Coleus scutellarioides	29	Kigella africana
4	Echeveria elegans	30	Phoenix canariensis
5	Syngonium podophyllum	31	Plumeria rubra
6	Arum italicum	32	Dracaena angolensis
7	Bismarckia neobolism	33	Bahunia variegata
8	Dracaena trifaciata	34	Pennisetum alpecuroides
9	Mussaenda sp.	35	Dillenia indica
10	Ageratum conizoides	36	Wedelia chinensis
11	Pandanus veitchii	37	Pyrenacantha grandiflora
12	Chrysanthemum sp.	38	Tradescantia pallida
13	Crinum asiaticum	39	Tradescantia zebrina
14	Tupistra kressii	40	Tradescantia spathacea
15	Tagetes erecta	41	Antigonon leptopus
16	Acalypha wilkesiana	42	Caesalpinia pulcherima
17	Monstera deliciosa	43	Thevetia peruviana
18	Yucca sp.	44	Gravillea robusta
19	Lagerstroemia floribunda	45	Anthocephalus cadamba
20	Ixora chinensis	46	Pterospermum acerifolium
21	Syzygium jambos*	47	Magnolia champaca
22	Polianthes tuberosa	48	Ficus elastica
23	Mimosa pudica	49	Duranta erecta
24	Cestrum nocturnum	50	Delonix regia
25	Hibiscus rosasinensis	51	Washingtonia filifera
26	Hibiscus schizopetalous	52	Peltophorum pterocarpum

Fruit Plants		Vegetables	
1	Citrus limon	1	Spinacia oleracea
2	Punica granatum	2	Amaranthus sp.
3	Litchi chinensis	3	Cyamopsis tetragonoloba
4	Ficus glomerata	4	Cucumis sativus
5	Annona squamosa	5	Momordica charantia
6	Mangifera indica	6	Luffa acutangula
7	Syzygium cumini	7	Trigonella foenum-graecum
8	Artocarpus heterophyllus	8	Coriandrum sativum

		9	Solanum melongena
		10	Raphanus sativus
	Aquatic Plants	11	Solanum lycopersicum
1	Nymphaea	12	Allium cepa
2	Pistia	13	Daucus carota
3	Hydrilla		
	Gymnosperms		Spices
1	Cycas circinalis	1	Cinnamomum tamala
2	Cyacas revoluta	2	Cinnamomum verum
3	Zamia	3	Pimenta dioica
4	Cupressus		
5	Araucaria		Bamboos
			9 species

Medicinal Plants			
1	Catharanthus roseus	33	Spilanthes acmella
2	Cissus quadrangularis	34	Eclipta alba
3	Adhathoda zeylanica	35	Ricinus oommunic
4	Cinnamomum camphora	36	Morinda citrifolia
5	Bacopa monierii	37	Barleria prionitis
6	Chenopodium album	38	Calotropis procera
7	Putranjiva roxburgii	39	Bombax ceiba
8	Centella asiatica	40	Cassia fistula
9	Costus speciosus	41	Mitragyna parviflora
10	Dracaena reflexa	42	Tectona grandis
11	Dracaena fragrance	43	Pterocarpus santalinus
12	Agave chiapensis	44	Dichrostachys cinerea
13	Stachytarpetta jamaisensis	45	Mimosops elengi
14	Santalum album	46	Caesalpinia bonduc
15	Synedrella nodiflora	47	Ficus racemosa
16	Tridax procumbens	48	Elaeocarpus ganitrus
17	Basella rubra	49	Cocculus hirsutus
18	Curculigo orchioides	50	Terminalia bellerica
19	Aloe vera	51	Diospyros melanoxylon
20	Solanum torvum	52	Dalbergia sisoo
21	Thunbergia erecta	53	Rauwolfia serpentina
22	Commiphora wightii	54	Butea monosperma
23	Vetiveria zizinoides	55	Pongamia pinnata
24	Andrographis paniculata	56	Lysimachia foemina

25	Gardenia gummifera	57	Hemidesmus indicus
26	Gardenia tubifera	58	Sonchus asper
27	Oxalis corniculata	59	Verbascum thapsus
28	Piper betle	60	Tinospora cordifolia
29	Gloriosa superba	61	Asparagus racemosus
30	Clerodendrum serratum	62	Vicoa indica
31	Albizzia lebbeck	63	Melia azadirach
32	Colocasia esculenta	64	Cayratia trifolia