Green Audit Report

(2022-23)

Gokhale Education Society's

RNC Arts, JDB Commerce & NSC Science College

Nashik road, Nashik- 422101 Maharashtra

Green Audit report Submitted by

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Energy Auditor Empanelled Mahaurja, Govt. of Maharashtra

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ACKNOWLEDGEMENT

We express our sincere gratitude to the management of RNC Arts, JDB Commerce & NSC Science College for awarding us the assignment of Green Audit of their Nashik Campus.

We are thankful to: I/c Principal Dr. Manjusha Kulkarni Madam given opportunity to conduct audit.

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

Kedar Khamitkar
Energy Auditor
Certified by Bureau of Energy Efficiency, Ministry of Power, Gov. of India
Empanelled Consultant MAHAURJA (Govt. of Maharashtra Institution

EXECUTIVE SUMMARY:

Objective	Observation	Recommendation
Green Cover - Plantation of Trees	Plantation of trees is started in the campus and the green cover is extended every year in the campus. At Present 18% area campus is having the Green cover.	It is recommended to increase the Green Cover Further.
Use of Renewable Energy	Institute has been installed 10KWp Solar Power Plant in the campus	It's recommended to install Solar streetlight to minimize Import.
Water Conservation	Recommended to Install Sign Boards. Awareness for Water Conservation.	It is recommended to install taps with reduced water flow
Rain Water harvesting	In Process	
Avoid Misuse/ wastage of water	RO water providing safe drinking water.	Recommended for waste water treatment plant.
Bio Waste Management	**The Bio Waste – Food Waste generated in the campus is proposed to be feed stock for Bio Gas plant**	Recommended for Bio gas plant.
Non Bio Waste	Non Bio Waste – Plastic Bottles / Paper Waste Metals waste is being collected in the dust bins placed across the campus.	It is proposed to install plastic bottle crusher, which can be sold as a Feed stock for the Plastic industry.
E Waste	E Waste – All Electronic Junk is generated in the campus in the form of Used Computer key boards/ Mouse/ CPU's/ Damaged Printers etc.	An agreement is in place with local Company to pick up the E waste every six month
Carbon Foot Print	**Transportation :** Mostly Students commute in the City Bus from City / rural Areas	Recommended to install EV Charging station.

Chapter No.1 Scope of Work & Green Audit Methodology

RNC Arts, JDB Commerce & NSC Science College, Nashik entrusted the work of conducting a detailed Green Audit of campus with the main objectives are as bellows:

Objectives of Green Audit:

1. To examine the current practices, which can impact on environment such as of resource utilization, waste management etc.
2. To identify and analyze significant environmental issues.
3. Setup goal, vision, and mission for Green practices in campus.
4. Establish and implement Environment Management in various departments.
5. Continuous assessment for betterment in performance in green

Need of Green Audit:

Green auditing is the process of identifying and determining whether institutions practices are eco-friendly and sustainable. Green audit regulates all such practices and gives an efficient way of natural resource utilization. In the era of climate change and resource depletion it is necessary to verify the processes and convert it in to green and clean one. Green audit provides an approach for it. It also increases overall consciousness among the people working in institution towards an environment.

Methodology of Green Audit:

Green Audit of RNC Arts, JDB Commerce & NSC Science College, Nashik Campus has been conducted with specific methodology as follows:

Goals of Green Audit:

Conducted a green audit of RNC Arts, JDB Commerce & NSC Science College, Nashik Campus with specific goals as:

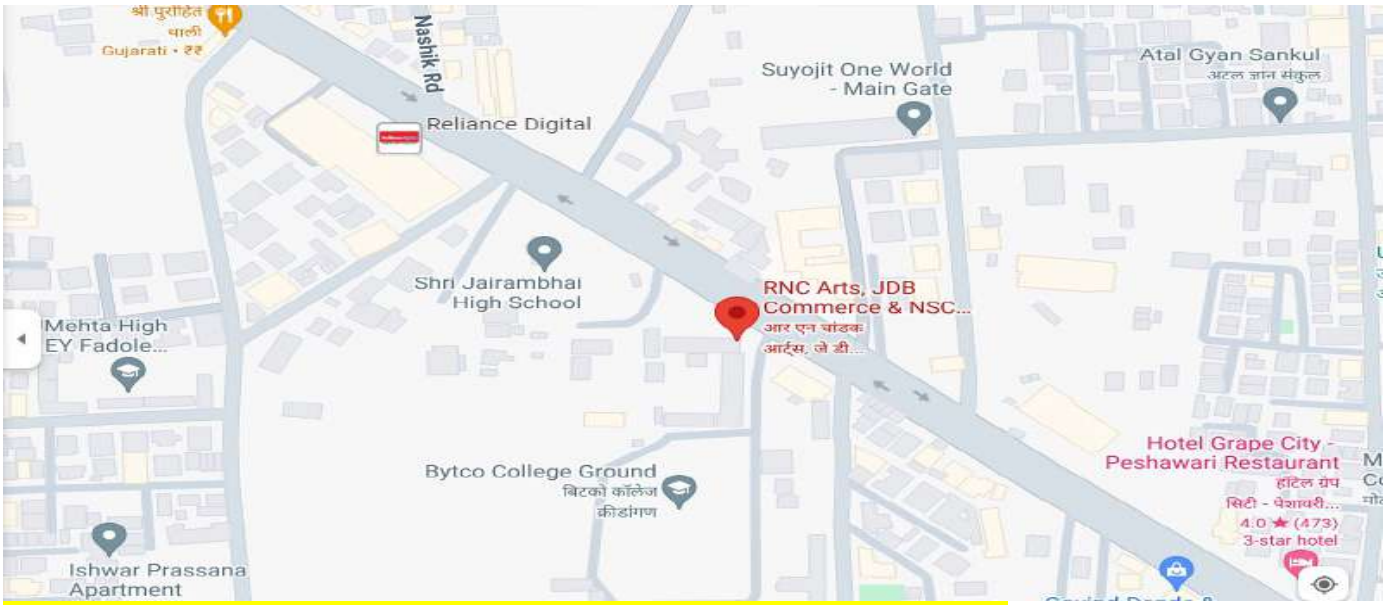
1. Identification and documentation of green practices followed by the Institute.
2. Identify strength and weakness in green practices.
3. Analyze and suggest solution for problems identified.
4. Assess facility of different types of waste management.
5. Increase environmental awareness throughout campus
6. Identify and assess environmental risk.
7. Motivates staff for optimized sustainable use of available resources.
8. The long-term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental Issue before they become problem.

Chapter No.2 **Introduction about the Institute**

R.N.C. Arts, J.D.B. Commerce and N.S.C. Science College, Nashik Road was established in 1963, primarily with the vision of imparting quality education to students from socially and economically disadvantaged communities and to be an institution which was accessible to people from remote tribal areas.

College has a number of undergraduate programs such as B.A., B.Com., B.Sc. as well as masters programs like M.A., M.Com. and M.Sc. We also run some professional courses at both UG and PG levels such as B.B.A., B.B.A.(C.A.), B.Sc. (Computer Science), B.Sc. (Biotechnology) along with M.Sc. Computer Science and M.Sc. Organic Chemistry.

College has established various forums which include N.S.S., N.C.C. (Air wing), N.C.C. (Army wing), Student Council, Vidyarthini Munch, Youth Empowerment Cell.



ARIAL VIEW OF COLLEGE CAMPUS (SOURCE GOOGLE EARTH)

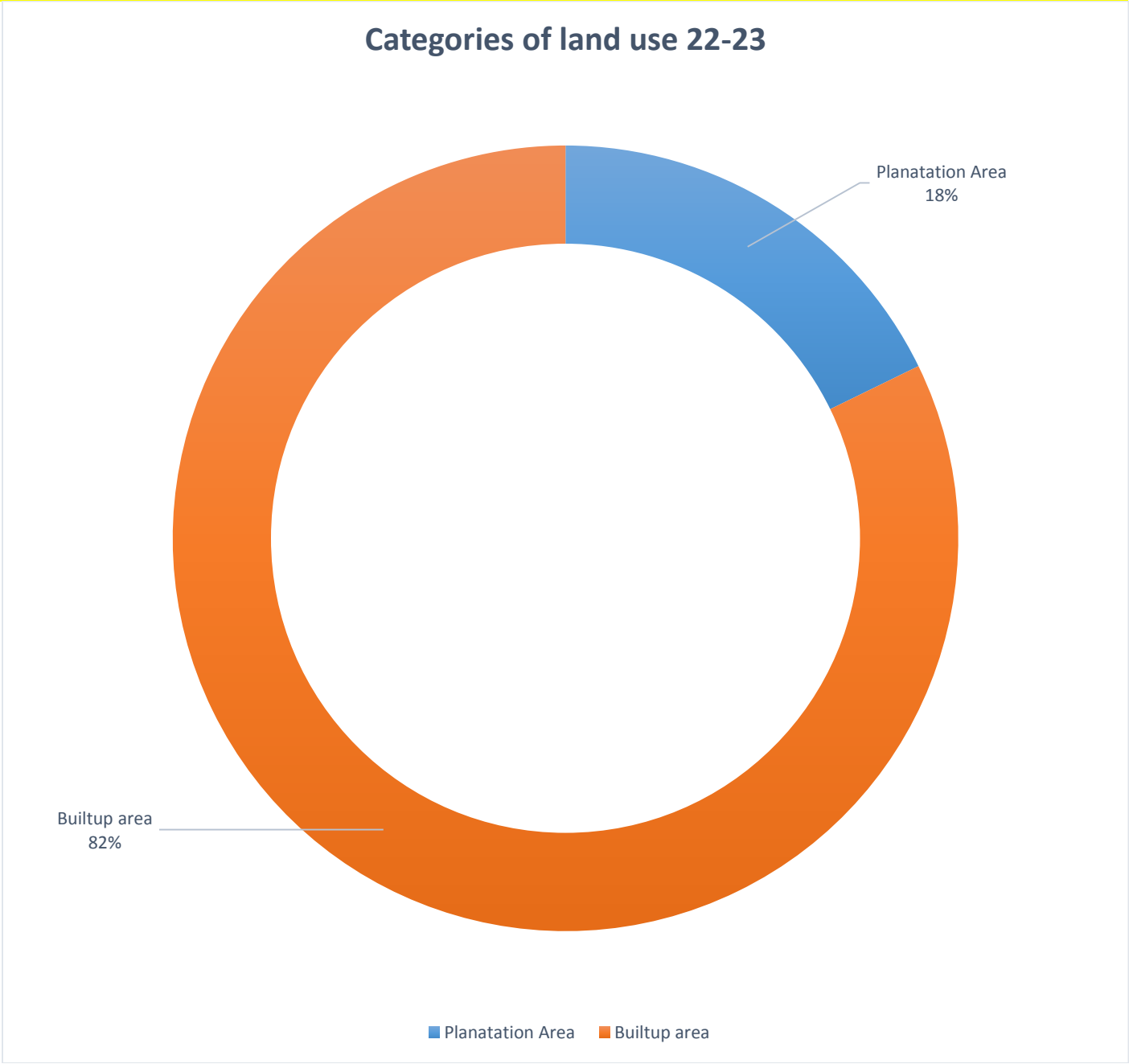
Address: Ashirwad stop, Nashik - Pune Rd, Dawkhar Wadi, Nashik Road, Nashik

Chapter No.3 CATEGORIES OF LAND USE

Plantation of trees is started in the campus and the green cover is extended every year in the campus. At Present **18%** area campus is having the Green cover.

Built up Area	5032	SQM
Plantation Area	1563	SQM

Audit Framework and detailed findings of the Audit:



Green Landscaping with Trees and Plants – the campus is beautifully landscaped.

Observations : Plantation area 18%

Chapter No. 4 Green Cover - Plantation of Trees

List of Plants in the Campus:

Sr	Botanical name	Family	Common name	Total
1	*Abrus precatorius* L.	Fabaceae	Gunj	
2	*Abutilon indicum* (Link) Sweet	Malvaceae	Mudra, Ati-bala	
3	*Acacia auriculiformis* A.Cunn. Ex Benth.	Mimosaceae	Australian Babhul	
4	*Acacia mangium* Willd.	Mimosaceae	Mangium	
5	*Acacia catechu* (L.) Wild	Mimosaceae	Khair	
6	*Acalypha hispida* L.	Euphorbiaceae	cat-tail	
	Acanthospermum hispidum D.C. , A.Chiv	*Asteraceae*		
7	*Achyranthes aspera* L.	Amaranthaceae	Aghada	
8	*Adhatoda vasica* Nees	Acanthaceae	Adulsa	
9	*Aegle marmelos* L.	Rutaceae	Bel	
10	*Agave americana* L.	Agavaceae	Ghaypat	
11	*Albizia procera* Benth.	Mimosaceae	Shirish	
12	*Albizia saman* F. Muell.	Mimosaceae	Rain Tree	
13	*Allamanda cathartica* L.	Apocynaceae	Pivali Ghanta	
14	*Allternanthera sessilis R.Br*	Amaranthaceae	Chubuk kata	
15	*Aloe vera* L.	Liliaceae	Korphad	
16	*Alstonia scholaris* (L.) R.Br.	Apocynaceae	Saptaparni	
17	*Achyranthus aspera L.*	Amaranthaceae	Aghada	
18	Annona Squmosa L.	Annonaceae	Siltaphal	
19	*Annona reticulata* L.	Annonaceae	Ramphal	
20	*Artabotrys hexapetalus Bhandari*	Annonaceae	Hirawa chapha	
21	*Anthocephalus cadamba* (Roxb.) Miq.	Rubiaceae	Kadamb	

22	Alianthus excelsa Roxb.	Simaraubaceae	Maharukh	
23	*Azadirachta indica L.*	Meliaceae	Neem	
24	*Artocarpus integrifolius* Lam.	Moraceae	Phanas	
25	*Asparagus racemosus* Willd.	Liliaceae	Garden Shatavari	
26	*Alysicarpus vagilnalis* DC.	Fabaceae	Alysicarpus	
27	*Azadirachta indica* L	Meliaceae	Neem	
28	*Allamanda nerifoloa Hook*	Apocynaceae	alamanda	
29	*Adnanthera pavonia L.*	Mimosaceae	Ratangunj	
30	*Bauhinia purpurea* L.	Caesaslpiniaceae	Kanchan	
31	*Bauhinia racemosa Lamk.*	Caesaslpiniaceae	Apata	
32	*Blumea lacera* L.	Asteraceae	Burundi	
33	*Bombax malbaricum L.*	Bombacaceae	Katesavar	
34	*Bougainvillea spectabilis Willd.*	Nyctaginaceae	Boganvel	
35	*Borassus flabellifer L.*	Arecaceae	Tad	
36	*Butea monosperma (Lam.) Taub.*	Fabaceae	Palas	
37	*Bignonia venusta Ker.Gawl*	Bignoniaceae	Waghnakhi	
38	*Bidens pilosa L.*	Astaraceae	Black jack	
39	*Caesalpinia pulcherrima (L.) SW*	Caesaslpiniaceae	Shankasur	
40	*Ceiba pentandra (L.) Gaertn.*	Bombacaceae	Pandhari savar	
41	*Cordia dichotoma L*	Cordiaceae	Bhokar	
42	*Calatropis prosera (Ait.) R.Br.*	Asclepiadaceae	Rui	
43	*Calliandra haematocephala Hassk.*	Mimosaceae	Powder Puff	
44	*Canna indica L.*	Cannaceae	Kardal	
45	*Caesalpinia bonducella (L.)Fleming*	Caesalpiniaceae	Sagar Gota	
46	*Carica papaya L.*	Caricaceae	Papaya	
47	*Carissa carandas L.*	Apocynaceae	Karvand	
48	*Caryota urens L.*	Arecaceae	Bherli Maad	
49	*Cassia fistula L.*	Caesaslpiniaceae	Bahava/ Amaltas	
50	*Cassia siamia Lam.*	Caesaslpiniaceae	Kashid	
51	*Cassuarina equisetifolia L.*	Cassuarinaceae	Suru	

52	*Catharanthus rosea(L.) G. Don*	Apocynaceae	Sadaphuli	
53	*Cestrum nocturnum L.*	Solanaceae	Ratrani	
54	*Cestrum diurnam L.*	solanaceae	Din ka raja	
55	*Cissus quadrangularis L.*	Vitaceae	Hadjodi	
56	*Citrus medica L.*	Rutaceae	Citrus, Lemon	
57	*Clitoria ternatea L.*	Fabaceae	Gokarna	
58	*Cleome viscosa L.*	Cleomaceae	Ran til	
59	*Clerodendrum splendens G.Don.*	Verbenaceae	Flaming Glory	
60	*Cocos nucifera L.*	Arecaceae	Coconut	
61	*Codiaeum variegatum* (L.) A. Juss.	Euphorbiaceae	Garden Croton, Codium	
62	Callistemon lanceolatus Skeel.	Myrtaceae	Bottle brush	
63	Chukrasia tabularis A.Juss	Meliaceae	Lal deodar	
64	Curcuma longa L.	Zingiberaceae	Turmeric	
65	*Crinum asiaticum* L.	Amaryllidaceae	Lily	
66	*Croton species*	Euphorbeaceae	Rushfoil	
67	Cocculus hirsutus DC	Menispermaceae	Vasan	
68	*Cyperus diffusas Vahl.*	Cyperaceae	Cyprus	
69	*Cynadon dactylon L.Pers*	Poaceae	Durva	
70	*Cymbopogon schoenanthus* (L.) Spreng	Poaceae	Lemon Grass	
71	*Dalbergia sissoo* Roxb.	Fabaceae	Shisham	
72	*Delonix regia* (Bojer ex Hook) Raf	Caesaslpiniaceae	Gulmohor	
73	*Desmodium dichotomum* (Wild.) DC	Fabaceae	Chikata	
74	Dracaena goldieana Bull	LIliaceae	Dracaena	
75	*Dendrocalamus strictus*	Poaceae	Bamboo	
76	*Duranta erecta* L.	Verbenaceae	Duranta	
77	*Dypsis lutescens* (H.Wendl.) & J. Dranst.	Arecaceae	Areca Palm	
78	Erythrina suberosa Roxb.	Fabaceae	Pangara	
79	Epipremnum aureum bunting	araceae	pothas	
80	*Euphorbia pulcherima Wild*	Euphorbiaceae	Lalpatti	
81	*Euphorbia hirta L.*	Euphorbiaceae	Dudhi	
82	*Euphorbia geniculata Ortag*	Euphorbiaceae	Dudhi	
83	*Evolvulus alsinoides* L.	Convolvulaceae	Vishnukrant	

84	*Eucalyptus globulus Labill*	Mytraceae	Nilgiri	
85	*Ficus benghalensis* L.	Moraceae	Vad	
86	*Ficus carica* L.	Moraceae	Fig	
87	Ficus arnottiania Miq	Moraceae	Payar	
88	*Ficus racemosa* L.	Moraceae	Umbar	
89	*Ficus religiosa* L.	Moraceae	Pimpal	
90	Grevillea robusta A. Cunn.	Proteaceae	Silver oak	
91	*Gmelina arborea* Roxb.	Verbenaceae	Shivan	
92	*Goniogyna hirta(willd)Ali.*	Fabaceae	Godhadi	
93	Helianthus annus L.	Asteraceae	Sunflower	
94	*Hamelia patens* Jacq.	Rubiaceae	Hamelia	
95	*Hibiscus rosa-sinensis* L.	Malvaceae	Jasvand	
96	*Hydrilla verticillata(L.f.)Royle*	Hydrocharitaceae	Hydrilla	
97	*Impatiens balsamina* L.	Balsaminaceae	Balsam, Terada	
98	*Ixora coccinia* Roxb.	Rubiaceae	Ishwari	
99	Ixora parviflora korth	Rubiaceae	Lokhandi	
100	Indiogophera cordifolia L.	Fabaceae	Bhuiguli	
101	Indiogophera linerifoloa L.	Fabaceae	Bhuiguli	
102	Indiogophera tintoria L.	Fabaceae	Diwali	
103	Ipomea palmata L.	Convolvulaceae	Garvel	
104	*Jacaradna mimosifolia D.Don*	Bignoniaceae	Neel Mohor	
105	*Jusminum sambac* (L.) Aiton.	Oleaceae	Mogara, Arabian Jasmine	
106	*Jusminum officinale L.*	Oleaceae	Jai, Jue	
107	*Jatropha pandurifolia Linn*	Euphorbiaceae	Jatropha	
108	*Kalanchoe pinnata* (Lam.) Pers.	Crassulaceae	Panphuti	
109	Kigellia africana (Lamk.)Benth.	Bignoniaceae	Sausage tree	
110	*Lantana camara* L.	Verbenaceae	Lantana	
111	*Lawsonia inermis* L.	Lythraceae	Mendi	
112	*Leucaena leucocephala* (Lam.) de Wilt.	Mimosaceae	Subabhul	
113	*Limonia acidissima L.*	Rutaceae	kavath	
114	*Loranthus* globulus Jacq.	Loranthaceae	Bandgul	
115	*Livistona chinensis L.*	Aracaceae	Fan palm	
116	*Madhuca longifolia* (J.Konig) J.F. Macbr.	Sapotaceae	Moha	
117	*Mangifera indica* L.	Anacardiaceae	Ambaa	
	Manilkara zapota			

118	(L.) P.Royane	Sapotaceae	Chikku	
119	*Michelia champaca* L.	Magnoliaceae	Chafa	
120	*Millingtonia hortensis* L.*f.*	Bignoniaceae	Akashnim, Buch	
121	*Mimosa pudica* L.	Mimosaceae	Lajalu	
122	*Mimusops elengei* L.	Sapotaceae	Bakul	
123	Moringa pteregosperma L.	Moringaceae	Drumstick	
124	*Murraya koenigii* (L.) Sprengel	Rutaceae	Kadipatta	
125	*Musa paradisiaca* L.	Musaceae	Keli	
126	*Mussaenda belilla* Buch- Ham.	Rubiaceae	Mussanda	
127	*Mentha piperita L*	Labiatae	Papermint	
128	*Morus alba L.*	Moraceae	Tuti	
129	*Mellia azadirach L.*	Meliaceae	Bakam	
130	*Nerium odorum* Aiton	Apocynaceae	Kanher	
131	*Nymphea odorata Aiton*	Nymphaceae	Lotus	
132	*Ocimum sanctum* L.	Lamiaceae	Tulas	
133	*Opuntia dilleneii(Ker-Gawl)Haw*	Cactaceae	Prickly pear	
134	*Oxalis corniculata* L.	Oxalidaceae	Wood sorel	
135	*Pancratium zeylanicum* L.	Amaryllidaceae	Spider lilly	
136	*Parthenium hysterophorus L.*	Asteraceae	Congress	
137	*Peltophorum pterocarpum(D.C.)K.Heyne.*	Caesaslpiniaceae	CopperPod/ sonmohar	
138	*Phyllanthus emblica* L.	Euphorbiaceae	Awala	
139	*Phyllanthus niruri* L.	Euphorbiaceae	Bhuiawala	
140	*Pithocellobium dulce* (Roxb.) Benth.	Mimosaceae	Vilayati Chinch	
141	*Pistia stratiotes L*	Araceae	pistia	
142	*Plumbago zeylanica* L.	Plumbaginaceae	Nila Chitrak	
143	*Plumeria alba* L.	Apocynaceae	Pandhara Chafa	
144	*Plumeria rubra* L.	Apocynaceae	Lal Chafa	
145	*Polyalthia longifolia* (Sonn.) Thw.	Annonaceae	Ashok	
146	*Psidium guyava* L.	Myrtaceae	Peru	
147	Passiflora foetida L.	Passilfloraceae	Krushnakamal	
148	Peristrophe bicalyculata (Retz) Nees	Acanthaaceae	Peristrophe	
149	Pentas lanceolata Forssk	Solanaceae	Pentas	
150	*Putranjiva roxburghii* Wall.	Euphorbiaceae	Putrajiva	
151	*Punica granatum L*	Punicaceae	Pomegranate	

152	Piper betle L.	Piperaceae	Betel pan	
153	Phoenix sylvestris (L.) Roxb.	Aracaceae	Shindhi	
154	*Combretum indicum (L.)DeFillpps.*	Combretaceae	Madhumalati	
155	*Ricinus communis L.*	Euphorbiaceae	Mogali Erand	
156	*Rosa chinensis* Jacq.	Rosaceae	Rose	
157	*Roystonia regia* (Kunth) O.F. Cook	Arecaceae	Bottle Palm	
158	*Tradescantia spathacea Sw.*	Commelinaceae	Rhoeo	
159	*Ravenela madagascariensis Solle.*	Musaceae	Travellers palm	
160	*Santalum album* L.	Santalaceae	Chandan	
161	*Sansevieria trifasciata Prain*	Asparagaceae	sanseveria	
162	*Sapindus saponaria* L.	Sapindaceae	Ritha	
162	*Semecarpus anacardium L.f.*	Anacardiceae	Bibba	
163	Susbania graadiflora (L.) Pears.	Fabaceae	Hadga	
164	*Spothodea campanulata* P. Beauv	Bignoniaceae	Pichkari	
165	*Samania saman Merr.*	Mimosaceae	Rain tree	
166	*Sida acuta Burm f.*	Malvaceae		
167	*Sida rhombridfolia L.*	Malvaceae		
168	*Syzygium cuminii* (L.) Skeels	Myrtaceae	Jambhul	
169	*Tabarnemontana divaricata* R.Br.	Apocynaceae	Chandani	
170	*Tabebuia argentia Britt.*	Bignoniaceae	Trumpet Tree	
171	*Tamarindus indica* L.	Caesaslpiniaceae	Chincj	
172	*Terminalia bellerica* (Gaertn.) Roxb.	Combretaceae	Beheda	
173	*Terminalia arjuna* L.	Combretaceae	Arjuna	
174	*Terminalia chebula*	Combretaceae	Hirada	
175	*Tectona grandis L.*	Verbenaceae	Sag	
176	*Thespesia populnea (L.)Sol.ex.correa*	Malvaceae	Ranbhendi	
177	*Tridex procumbens L.*	Astreraceae	Ghavati	
178	*Tephrosia purpurea (L.) Pers.*	Fabaceae	Sharpukha	
179	*Tagetes erecta L.*	Asteraceae	Merigold	
180	*Thevesia peruviana L.*	Apocynaceae	Bitti	
181	*Tribulus terestris L.*	Zygophyllaceae	Gokharu	

182	*Tecoma stans (L.) Juss.ex. Kunth*	Bignoniaceae	Yellow bells	
183	*Vitex negundoL.*	Verbenaceae	Nirgudi	
184	*Withania somnifera (L.)Dunal*	Solanaceae	Ashwagandha	
185	*Ziziphus jujube Mill*	Rhamnaceae	Bor	
186	*Zingiber officinale Roscoe*	Zingiberaceae	Ginger	
187	*Zea mays L.*	Poaceae	Maize	
188	*Tridax procumbens*	Asteraceae	Dagadi Pala	
189	*Vitex negundo* L.	Lamiaceae	Nirgudi	
190	*Vanda roxburgii*	Orchidaceae	Vanda	
191	*Ziziphus oenoplia* (L.) Mill	Rhamnaceae	Jangali Bor	
192	Gryllotalpidae	*Neocurtilla sps*	Mole Cricket	
193	Nimobiinae	*Acheta sps*	Ground Cricket	
194	Acrididae	*Poicelocera picta*	Grasshopper	
195	Acrididae	*Omocestus viridulus*	Green grasshopper	
196	Mantidae	*Mantis religiosa*	Praying mantis	
197	Phylliidae	*Microcentrum rhombifolium*	Leaf hopper	
198		*Phyllium bioculatum*	Leaf Insect	

Observations : A total of 198 saplings have been planted in the campus



AQI AIR QUALITY INDEX

Education Society's RNC ARTS JDB COMMERCE AND
IK ROAD NASHIK MAHARASHTRA- 422101

Air Quality Index

AQI
AIR QUALITY INDEX

Air Quality Index (AQI) Values	Levels of Health Concern
0 to 50	Good
51-100	Moderate
101-150	Unhealthy for Sensitive Groups
151-200	Unhealthy
201-300	Very Unhealthy
301 to 500	Hazardous

Observations :

AQI 68 MODERATE

Chapter No. 5: Use of renewable Energy

Institute has been taken good initiative for energy conservation.

Installed Rooftop Solar Power generation plant of Capacity 10KW in the campus.

Observations :

Electricity Conserved **22500** KWh / Year

Suggestions :

Install Solar Street Lights to Minimize Electricity Import during Night.

Chapter No. 6: Study of Waste Management

Environmental consciousness and sustainability friendly initiatives

1. Solid waste management

- The college is taking utmost care of cleanliness and hygiene. Daily waste is collected by the cleaning staff and segregated into degradable and non-degradable waste.
- The leaves, all non-toxic and biodegradable waste, are collected and used to make compost through the composting process, for which pit was made in the campus.
- Solid waste is generated in the form of plastic, glass, metal, newspapers, lab manuals, etc. is stored at one place and scrapped periodically for recycling.
- Non degradable waste (Dry and wet) is collected separately empty bottles, cartons are collected regularly at one place and handed over to the municipal vehicle for collection and proper disposal.
- College is using number of software's Tally for digitalization concept that made steps towards way to less paper use.

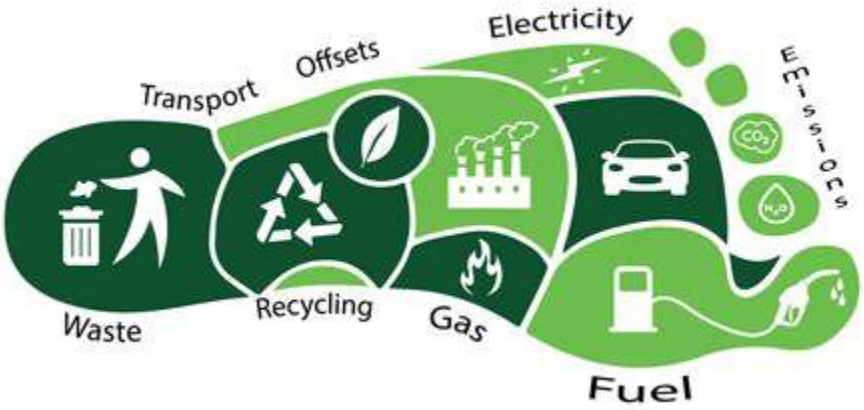
Observations: Institute has been done Good Management of the various types of degradable and non-degradable waste.

2. Sustainability Project : Compost Prepared in College Campus

The leaves, all non-toxic and biodegradable waste, are collected and used to make compost through the microbial composting process, for which pits was made in the campus. Vermicomposting is the process of turning organic debris into worm castings. The content of the earthworm castings, along with the natural tillage by the worms burrowing action, enhances the permeability of water in the soil. Worm castings can hold close to nine times their weight in water "Vermiconversion," or using earthworms to convert waste into soil additives.

Chapter No. 7 : CARBON FOOTPRINTING

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 College for performing its day to day activities. The College Imports Electrical Energy during Night for various Electrical gadgets.



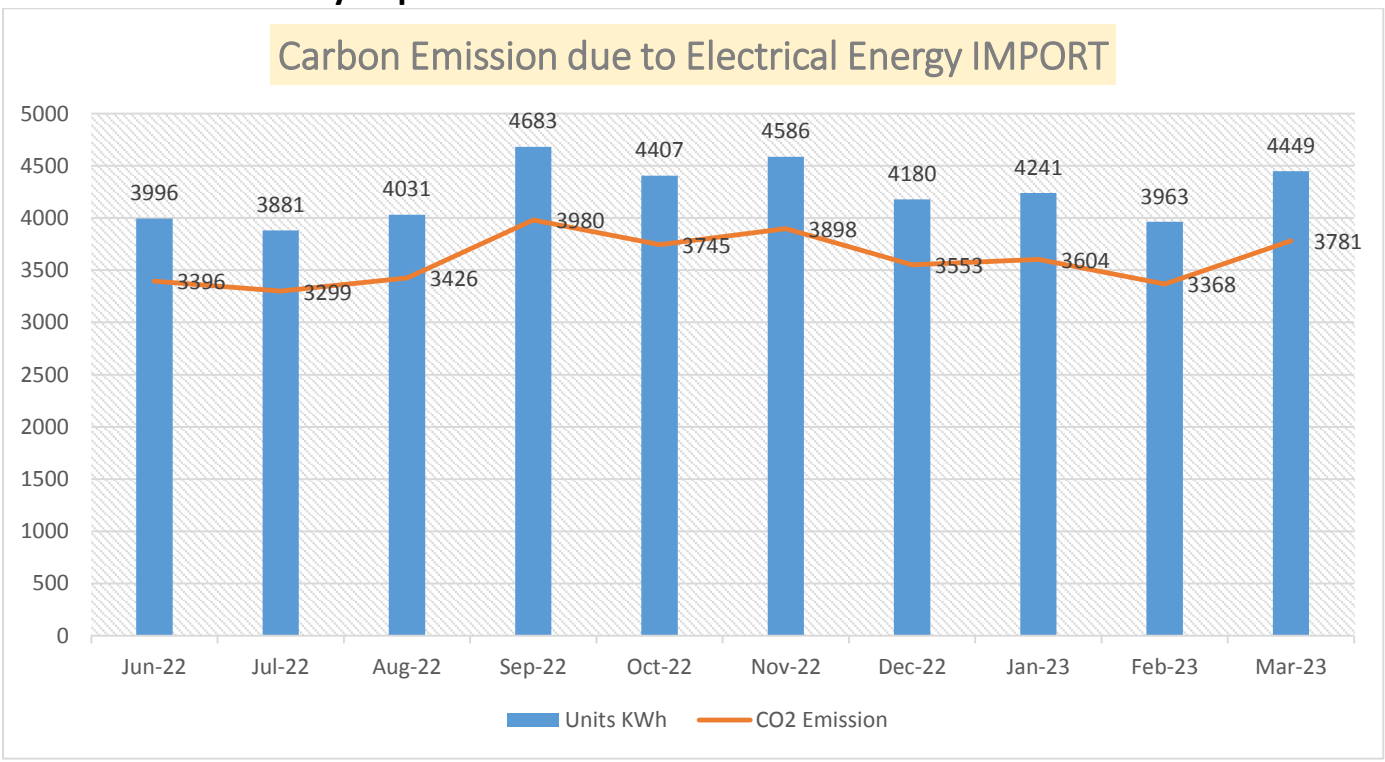
Basis for computation of CO2 Emissions:

The basis of Calculation for CO2 emissions due to Electrical Energy are 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 College due to its Day to Day operations

Month wise Electricity Import details:



Observations: The College Imports Electrical Energy during Night for various Electrical gadgets. Average Monthly Carbon Emission due to Electricity IMPORT = **3600 Kg of CO2** into atmosphere.

Suggestions:

1. Reduce the Electricity Import during Night install Solar Streetlights.
2. Install Occupancy Sensors to minimize losses in Lighting System

Chapter No. 8 : Best Practices & Activities

Institute has been declared their Environment Policy

Policy Document On Environment and Energy Usage

- To install LED bulbs in the complete campus to save energy
- To operate institute building in most efficient energy manner.
- Maximum use of Renewable Energy.
- Encourage a culture of Energy conservation on campus.
- To take additional measures to continuously improve our energy consumption.
- To develop and maintain Energy Management System based on ISO: 50001.
- To encourage use of advanced technology to minimize energy consumption.
- To engage in dialogue with the government agencies, and actively work with the local organizations in the areas of environment, energy efficiency and sustainable development.
- To strengthen our employees' and students' environmental knowledge and skills in order to improve our own environmental performance.
- To provide information and training opportunities on energy saving measures.
- To train our employees and students through our Enviro Club to make them 'Go Green Specialists' and partners to plant trees each year.

Principal

Best Practices & Activities

Several significant and fruitful awareness programs both students and staff of the Campus are arranged every year in the campus. Reflections from students are Evident how effective such awareness programs conducted in the campus. Major programs conducted in the campus during the last Five years.

Campaigns: Nature camps, field trips and some of these activities are year round programs and others are regular year wiser semester wise or any other stipulated time bound programs.

SEMINAR on EARTH DAY

Every year, Earth Day is observed on April 22 to raise awareness about saving the planet and how our actions add to climate change and global warming. It is also called International Mother Earth Day.

Environmental education through systematic environmental management approach.


Environment Day
WORLD ENVIRONMENT DAY QUIZ


लोकमत


थिटको महाविद्यालयात भौगोलिक प्रदर्शन


PCRA
ईंधन अधिक न खपाएं,
आओ पर्यावरण बचाएं

Energy Audit Report

(2022-23)

Gokhale Education Society's

RNC Arts, JDB Commerce & NSC Science College

Nashik road, Nashik- 422101 Maharashtra

Energy Audit Conducted by

Kedar Khamitkar & Associates

Energy Auditor

(Empanelled Mahaurja, Govt. of Maharashtra Institution)

M: 9850244701 Email. : urjabachat@gmail.com

Requirements for the NAAC

Energy Audit Team has been Conducted Detailed Energy Audit of RNC Arts, JDB Commerce & NSC Science College Building Located at Nashik - Maharashtra
During Energy Audit We have found Environmental Consciousness and Sustainability initiatives in their Campus.

1. Percentage of Annual Lighting power requirement met through LED Bulbs

(Current Year Data) = **58** %

2. Percentage of Annual Power requirements met through Renewable Energy Sources

(Current year Data) = **15**%

KEDAR KHAMITKAR
Govt. Certified
Energy Auditor
Reg.No.EA-8287
LATUR-Maharashtra

Kedar Khamitkar
Energy Auditor
(Certified by Bureau of Energy Efficiency, Ministry of Power, Gov. of India)
Empanelled Energy Auditor MAHAURJA , Govt. of Maharashtra Institution

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Executive Summary

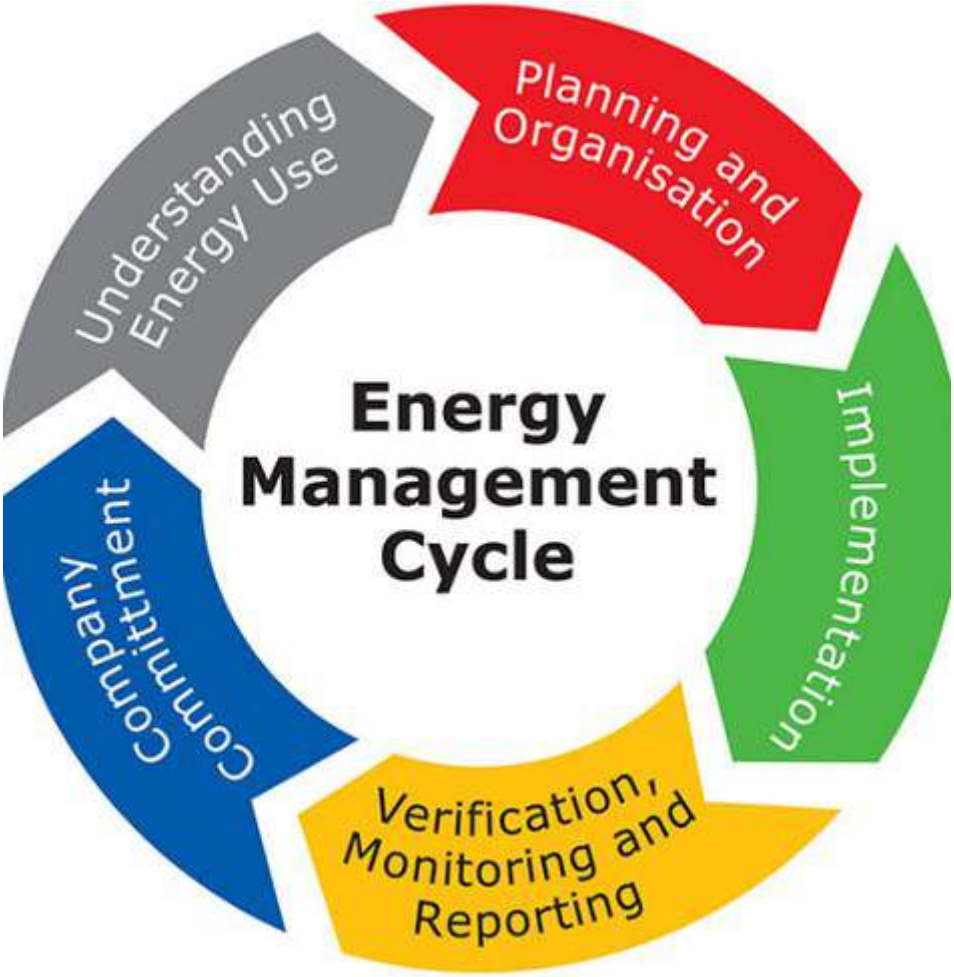
The objective of the audit was to study the energy consumption pattern of the facility, identify the areas where potential for energy/cost saving exists and prepare proposals for energy/cost saving along with investment and payback periods. The salient observations and recommendations are given below.

Sr.	Recommendations	Savings	Investment	Payback
1	**Improve Energy Efficiency in Fan System :** Replace Existing Inefficient Ceiling Fans with Efficient BLDC fans (Qty. 322 Nos.)	19500 KWh/Yr.	Rs. 5.80 Lakhs	2.9 Yrs.
2	**Install Additional Solar Power Plant** (10KW + 10KW + 10KW = 30KW Capacity)	38400 KWh/Yr.	Rs. 13.50 Lakhs	3.5 Yrs.
3	**Improve Lighting system:** Install Occupancy sensors with Timing controls	5000 KWh/Yr.	Rs. 1.25 Lakhs	2.5 Yrs.
4	**Conduct 'Save Energy Program'**	-	No Investment	Immediate

Preface

An energy audit is a study of a facility to determine how and where energy is used and to identify methods for energy savings. There is now a universal recognition of the fact that new technologies and much greater use of some that already exist provide the most hopeful prospects for the future. Data collection for energy audit of RNC Arts, JDB Commerce & NSC Science College, Nashik was conceded by EA Team on 16th March 2023. This audit was over sighted to inquire about convenience to progress the energy competence of the campus.

All data collected from each classroom, Laboratory, Library & every room. The work is completed by considering how many Tubes, Fan, A.Cs, Electronic instruments, etc. in each room. How much was participation of each component in total electricity consumption.



Acknowledgement

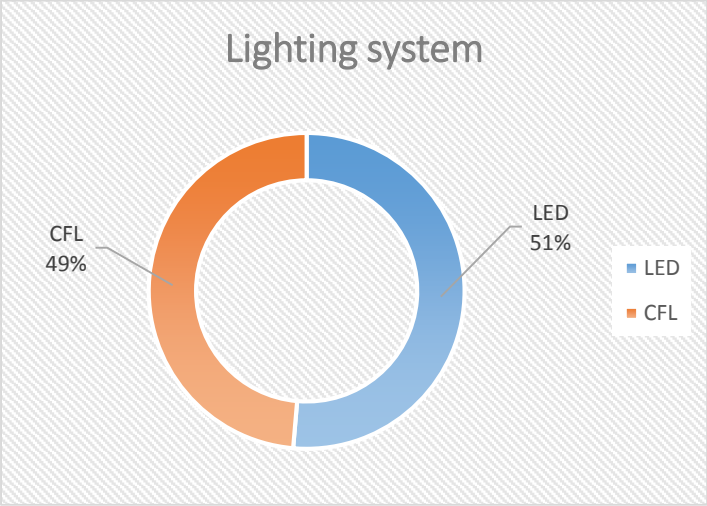
We express our sincere gratitude to the I/c Principal Dr. Manjusha Kulkarni Madam & Authorities of RNC Arts, JDB Commerce & NSC Science College, Nashik for entrusting and offering the opportunity of energy performance assessment assignment. We are thankful to Institute for their positive support in undertaking the task of system mapping and energy efficiency assessment of all electrical system, utilities and other workshop equipment. The field studies would not have been completed on time without their interaction and guidance. We are grateful to their cooperation during field studies and providing necessary data for the study.

Kedar Khamitkar
- Energy Auditor, Certified by Bureau of Energy Efficiency, Ministry of Power, Govt. of India
- Empanelled MAHAURJA , Govt. of Maharashtra Institution

Requirements for NAAC

1. Percentage of Annual Power requirements met through LED

Type	Total
LED Lights Connected Load	8500
CFL Bulb Connected Load	8048
Total Lighting Load	**16548**

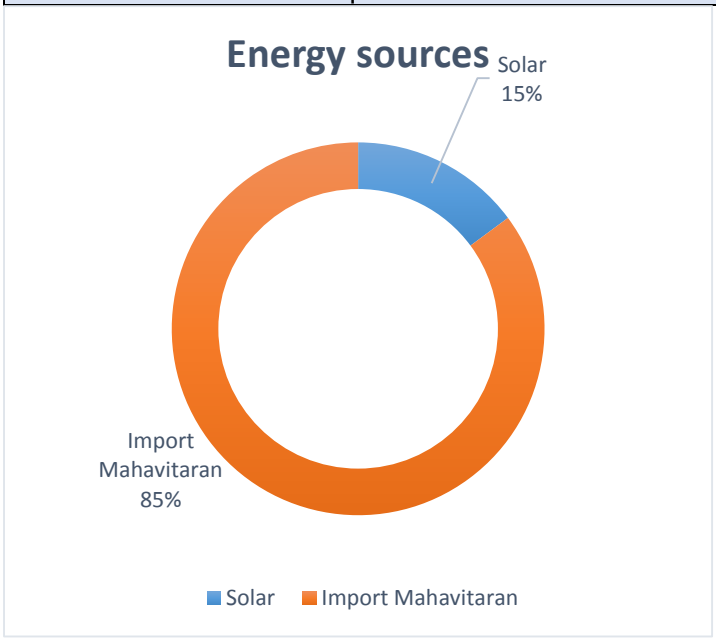


Observations: Percentage of Annual Power requirements met through LED Bulb/Tube Current year data is **51**%

Suggestions: Replace **49**% Inefficient CFL lighting with Efficient LED Lighting

2. Percentage of Annual Power requirements met through Renewable Energy

Average Renewable Energy units generated	8997	KWH
Nonrenewable Energy (Mahavitaran) imported	51557	KWH
Annual Total Power Requirement	24208	KWH



Observations: Percentage of Annual Power requirements met through Renewable Energy Sources Current year data is **15** %

Suggestions:

Reduce Import from MAHAVITRAN

- Install additional solar power plant
- Install Motion sensors

Energy Performance Index (EPI)

Electrical Energy received to the College from MSEDCL Maharashtra State Electricity Distribution Company Limited.

The Specific Energy Consumption (SEC) is the ratio of energy required per square meter.

Total Electricity Consumption **51557** KWh /Year

Total Built-up Area **5033** Sq. Meter

In this case the SEC is evaluated as electrical units consumed per square meter of area.

Observations:

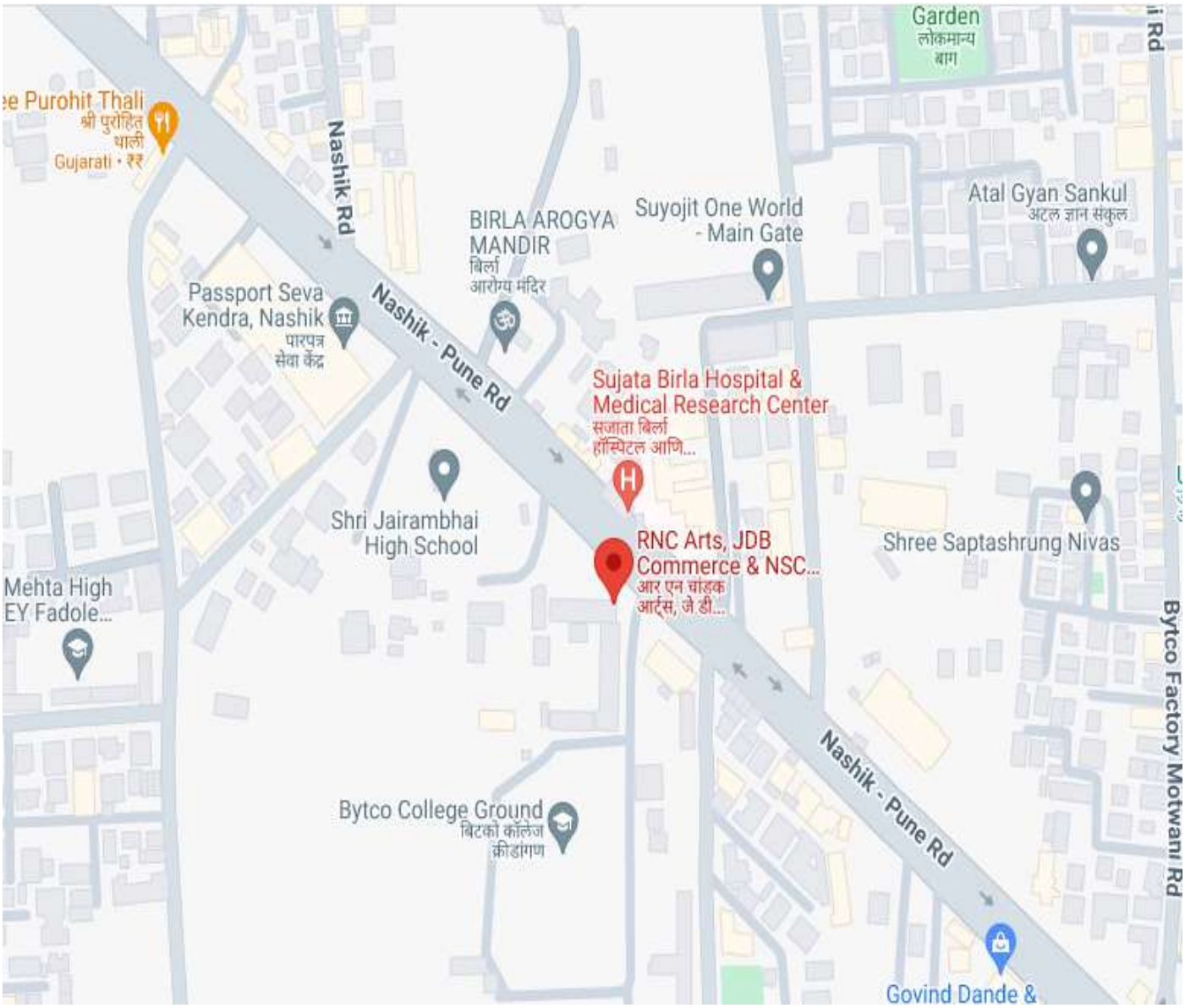
EPI calculated as under (for Electricity): 10.24 KWh/Sq. Meter

As per BEE Star Rating Guidelines Existing College Buildings may be considered as 5 Star.

EPI KWH/Sq. Meter/Year	Star Label
80-70	1 Star
70-60	2 Star
60-50	3 Star
50-40	4 Star
Below 40	**5 Star**

Chapter: 1 Introduction

R.N.C. Arts, J.D.B. Commerce and N.S.C. Science College, Nashik Road was established in 1963, primarily with the vision of imparting quality education to students from socially and economically disadvantaged communities and to be an institution which was accessible to people from remote tribal areas. The management is committed to foreseeing future requirements and meeting them through creative, value-based, high quality education. College faculty is welling qualified, dedicated and sensitive to the needs of students and specially committed to offering a very democratic learning environment. College has a number of under graduate programmes such as B.A., B.Com. B.Sc. as well as masters programmes like M.A., M.Com. and M.Sc. College run some professional courses at both UG and PG levels such as B.B.A., B.B.A.(C.A.), B.Sc. (Computer Science), B.Sc. (Biotechnology) along with M.Sc. Computer Science and M.Sc. Organic Chemistry. For the overall development of students, college has established various forums which includes N.S.S., N.C.C. (Air wing), N.C.C. (Army wing), Student Council, Vidyarthini Munch, and Youth Empowerment Cell.



Address : Ashirwad stop, Nashik - Pune Rd, Nashik Road, Nashik, 422101 Maharashtra

Chapter 2: Energy Audit Objectives

R.N.C. Arts, J.D.B. Commerce and N.S.C. Science College, Nashik Road entrusted the work of conducting a detailed Energy Audit of campus with the main objectives given bellow:

- To study the present pattern of energy consumption
- To identify potential areas for energy optimization
- To recommend energy conservation proposals with cost benefit analysis.

Scope of Work, Methodology and Approach:

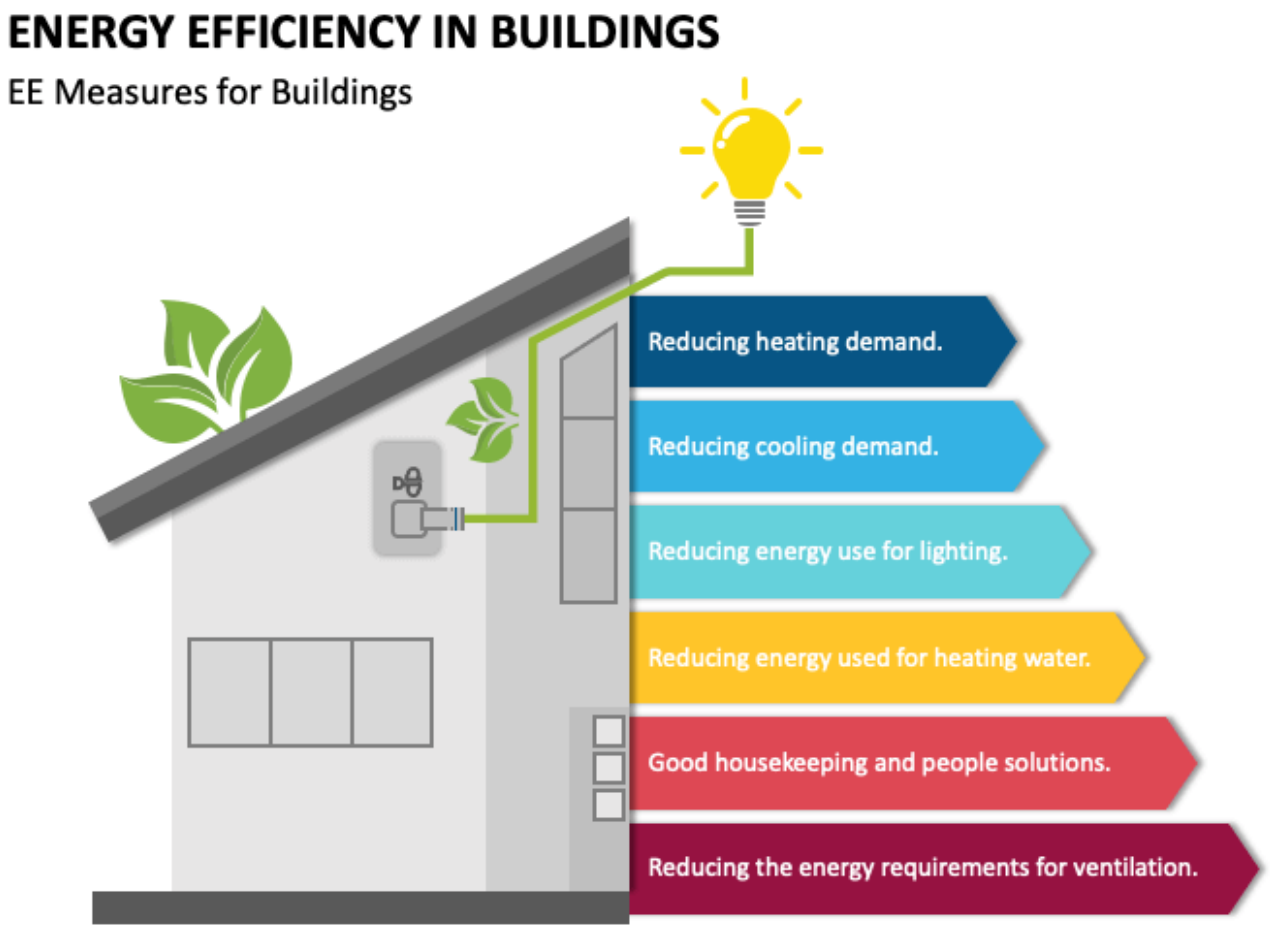
Scope of work and methodology were as per the proposal .While undertaking data Collection, field trials and their analysis, due care was always taken to avoid abnormal situations so as to generate normal/representative pattern of energy consumption at the facility.

Approach to Energy Audit:

We focused our attention on energy management and optimization of energy efficiency of the systems, sub systems and equipment's. The key to such performance evaluation lies in the Sound knowledge of performance of equipment's and system as a whole.

Energy Audit:

The objective of Energy Audit is to balance the total energy inputs with its use and to identify the energy conservation opportunities in the stream. Energy Audit also gives focused Attention to energy cost and cost involved in achieving higher performance with technical and financial analysis. The best alternative is selected on financial analysis basis.



Chapter: 3 Energy Audit Methodology

Energy Audit Study is divided into following steps

1. Historical data analysis:

The historical data analysis involves establishment of energy consumption pattern to the established base line data on energy consumption and its variation with change in production volumes.

2. Actual measurement and data analysis:

This step involves actual site measurement and field trials using various portable Measurement instruments. It also involves input to output analysis to establish actual operating Equipment efficiency and finding out losses in the system.

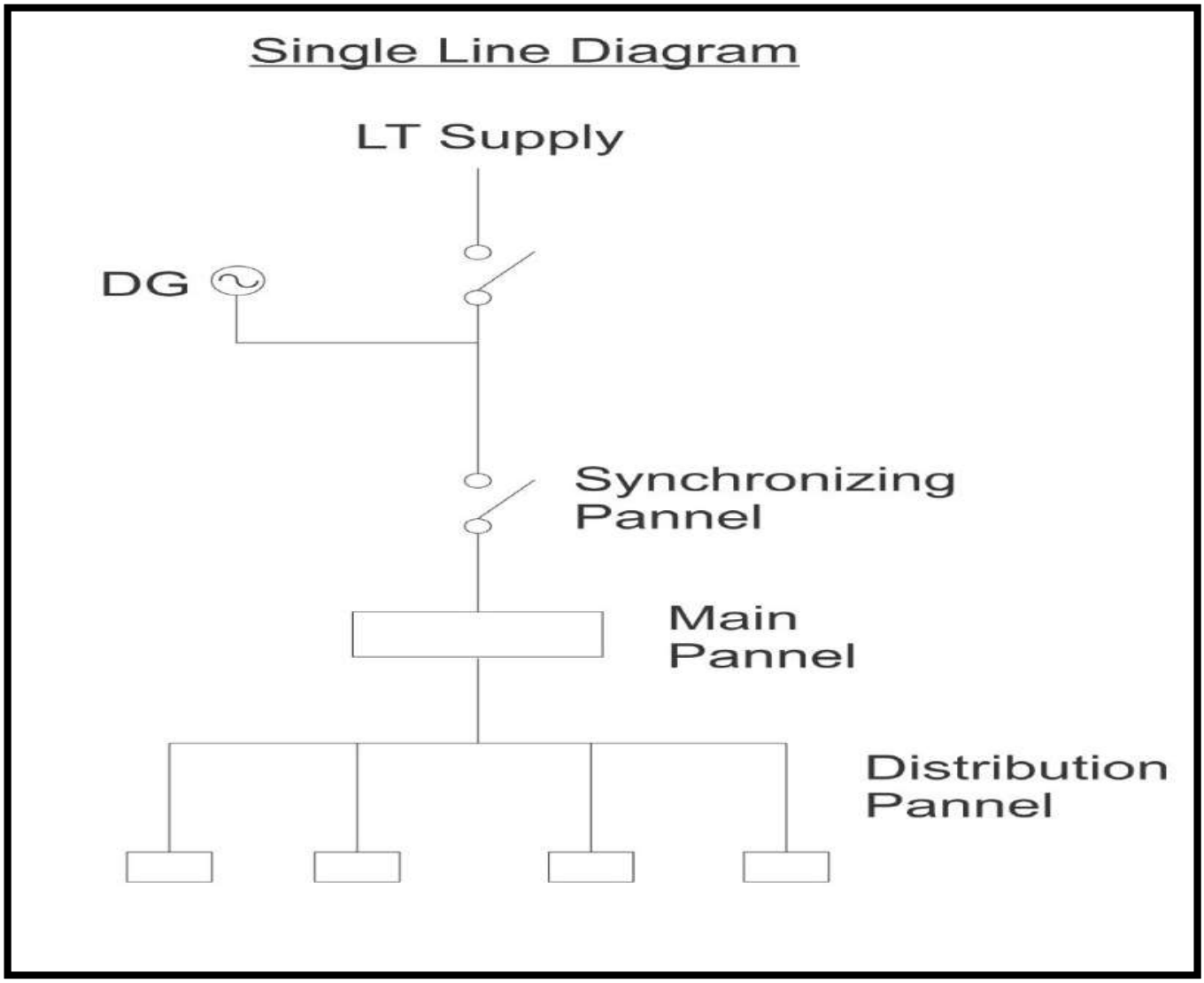
3. Identification and evaluation of Energy Conservation Opportunities:

This step involves evaluation of energy conservation opportunities identified during the energy audit. It gives potential of energy saving and investment required to implement the Proposed modifications with payback period.

Chapter: 4. Study of Electrical Systems

Electrical Energy Sources:

1. The electrical supply to the Institute comes from MSEDCL LT supply.
2. Solar Power Plant Capacity 10 KW
3. Diesel Generator 45 KVA /36 KVA



Observations: 1. Electricity generated KWh from Diesel Generator record not available 2.MSEDCL has been installed Ten Energy meter in Campus which distributes electrical energy to college buildings.

MSEDCL LT Supply Meter - A Consumer No. 049081131421
MSEDCL LT Supply Meter - A Consumer No. 049081131413
MSEDCL LT Supply Meter - A Consumer No. 049081133751
MSEDCL LT Supply Meter - A Consumer No. 049081131405
MSEDCL LT Supply Meter - A Consumer No. 049081131391
MSEDCL LT Supply Meter - A Consumer No. 049084091307
MSEDCL LT Supply Meter - A Consumer No. 049085504290
MSEDCL LT Supply Meter - A Consumer No. 049081132266
MSEDCL LT Supply Meter - A Consumer No. 049080039491 SOLAR NET METER (10KW)
MSEDCL LT Supply Meter - A Consumer No. 049088377175

MSEDCL Supply

The electrical bills have been studied.

SOLAR NET METER (10KW)		
	Consumer No.	**049080039491**
Details of Electricity Demand	**Tariff**	**073 LT-X B I 0-20KW Pub Seroth**
Sanctioned Load	**720**	KW

Solar Power Plant at RNC Arts, JDB Commerce & NSC Science College

Use of renewable Energy:

Institute has been installed **10** KW Capacity Rooftop solar power plant.

Observations :

Percentage of Annual Power requirements met through renewable energy Sources is 15%

1. Electricity Generation from Solar Power Plant **8997** Units/Year
2. Electricity Imported from Mahavitran **51557** Units / Year

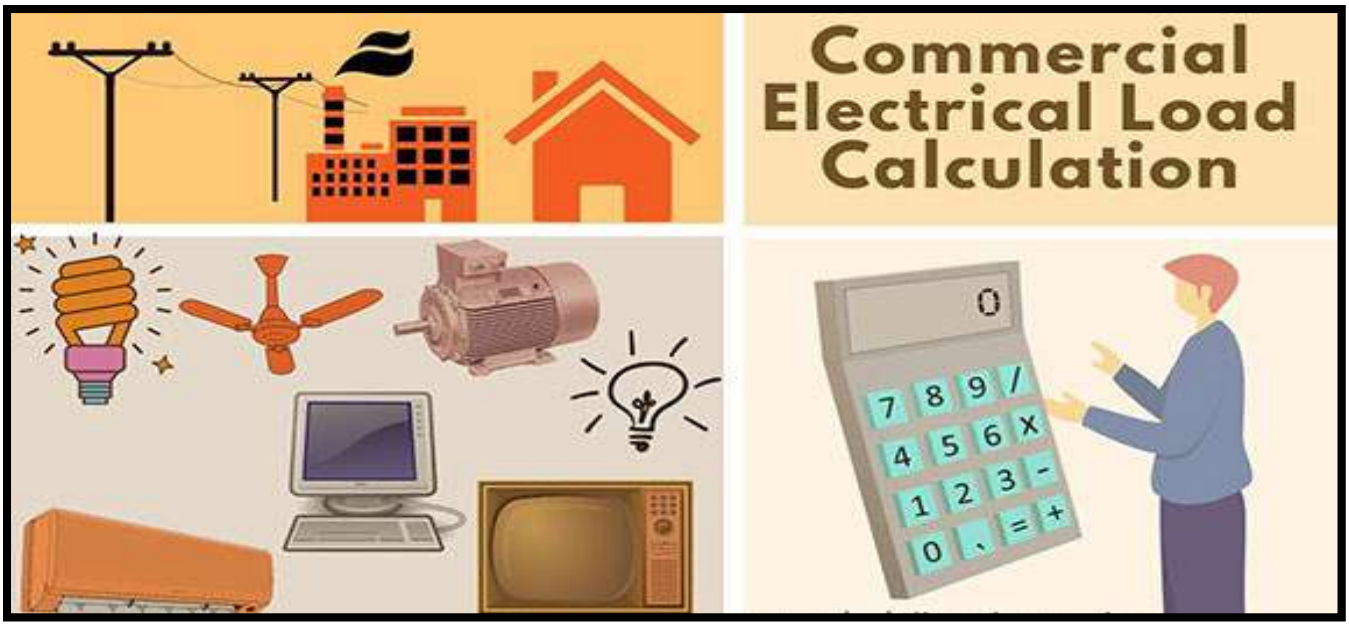
Suggestions :

1. Install Solar Street Lights to Minimize Electricity Import during Night.
2. Install Occupancy Sensors to minimize electricity unknown losses.
3. Install Solar Pumping system.

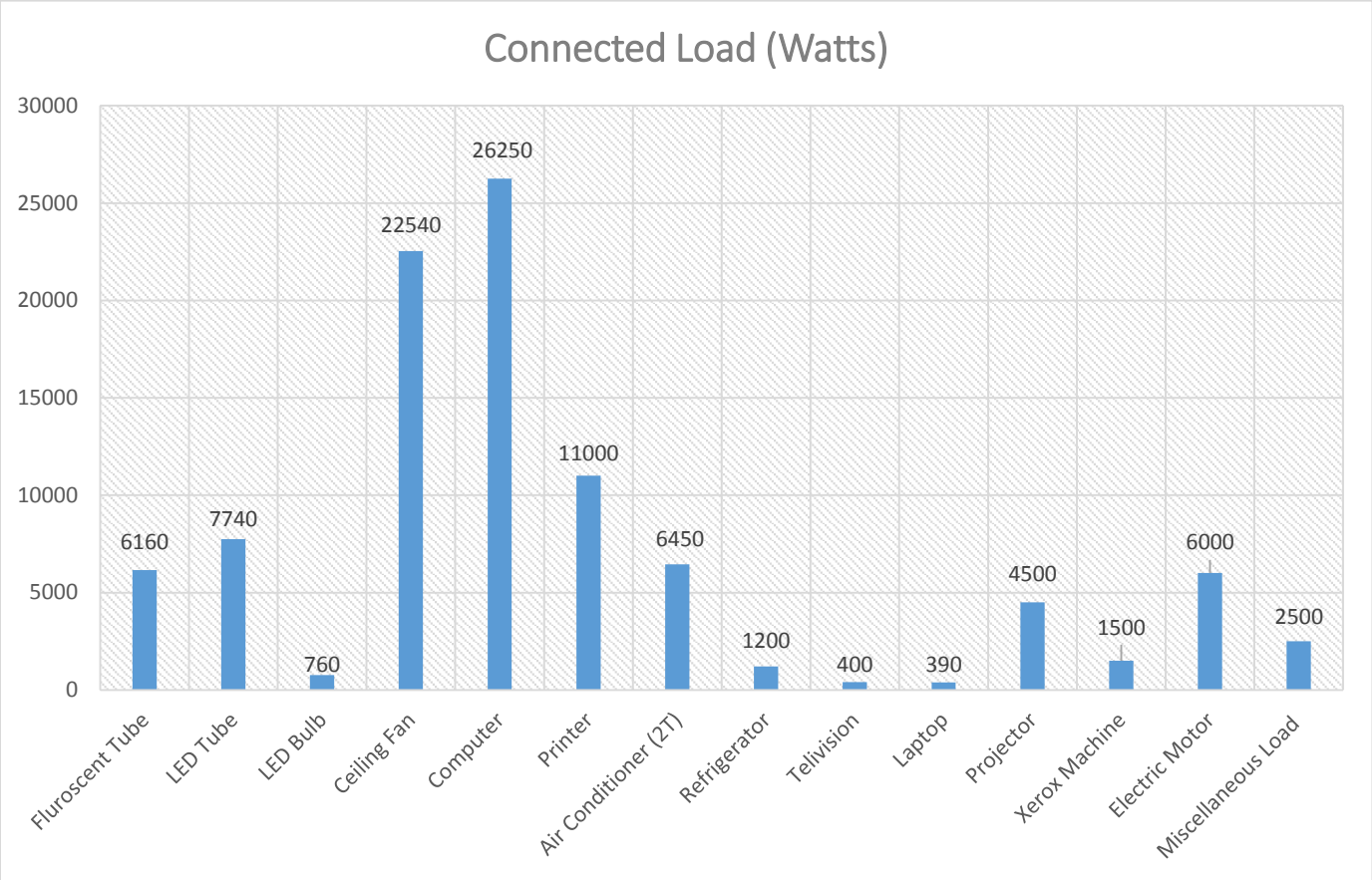
Connected Load Details

Major Energy use and Areas: In the College Campus Electrical energy is used for various applications like: Computers, Printers, Xerox machines, LCD Projector, Router System, Lighting, Fans, Flood light, Pumping Motor, Air-Conditioning & Other Equipment etc.

Sr.	Appliance	Qty.	Watt	Total
1	Fluorescent Tube	154	40	6160
2	LED Tube	387	20	7740
3	LED Bulb	76	10	760
4	Ceiling Fan	322	70	22540
5	Computer	150	175	26250
6	Printer	44	250	11000
7	Air Conditioner (2T)	3	2150	6450
8	Refrigerator	4	300	1200
9	Television	2	200	400
10	Laptop	6	65	390
11	Projector	18	250	4500
12	Xerox Machine	3	500	1500
13	Electric Motor	3	2000	6000
14	Miscellaneous Load		2500	2500
			Total Wattage	**97390**



Connected Load Graphical View:



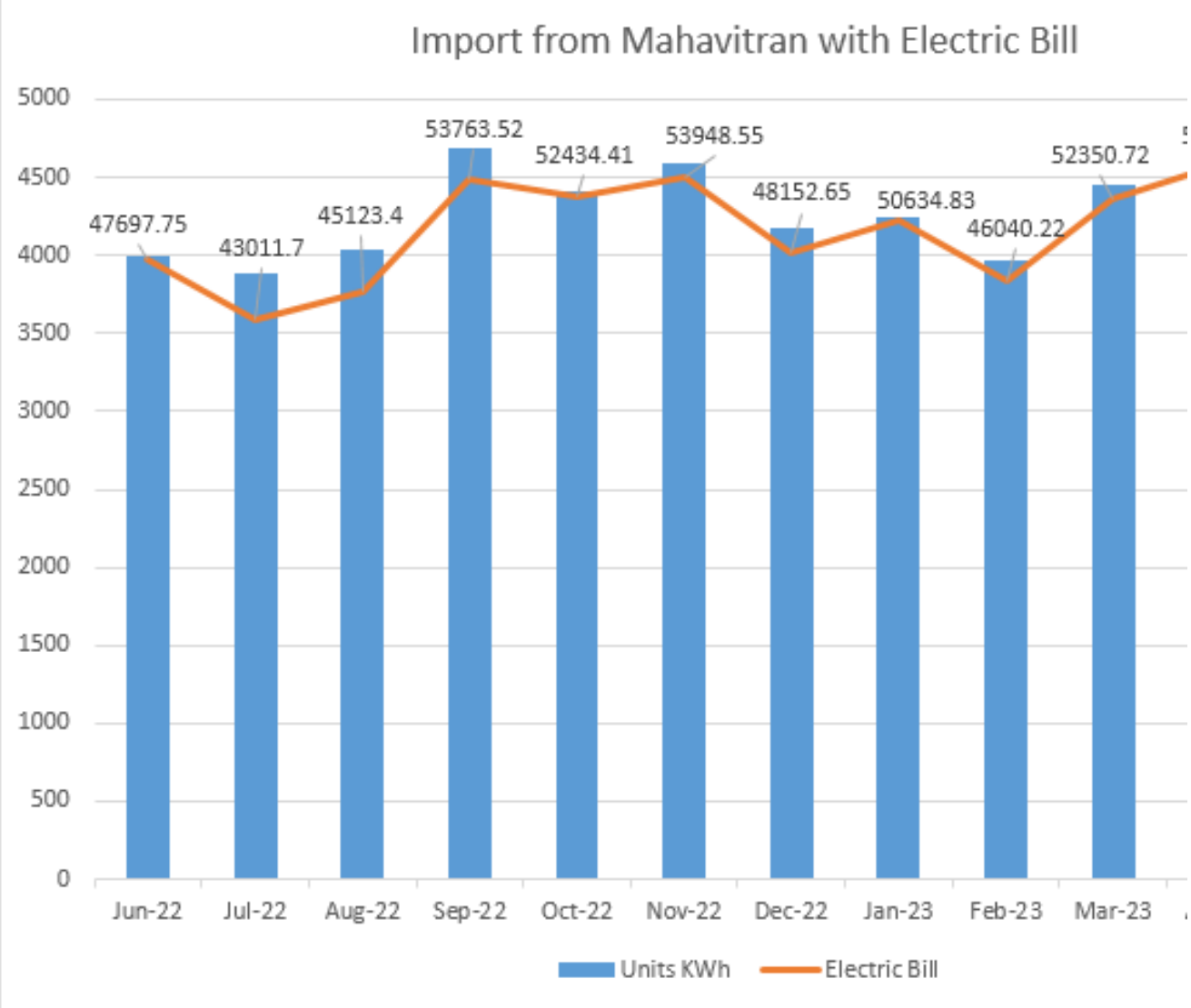
Observations :

Ceiling Fan (70 Watt) Contributes 22.5KW Connected load.

Suggestions : Improve Energy Efficiency in Fan System:

Replace Existing Inefficient Ceiling fan of 70watt with five star 28 Watt BLDC Fan.

Annual Electricity Consumption Historical Electricity Bill:



General Observations based on Electricity Bill:

Annual Electricity Imported from Mahavitran 51557 KWh

Max KWH consumption found in the month of April 23 and Minimum Consumption found in the month of July 22

Suggestions :

1. Install Additional Solar power plant of 30KW capacity for the reduction in electric bill.
2. Use Maximum Natural daylight – Initiate Save Energy Program

Chapter: 5 Performance Evaluation

5.1 Fan System:

Total number of fans used in the campus = **322** No's

Consider @300 days Working 8 Hrs.

- Number of fans to be replace = **322** No's.
- The Total Current Consumption =**32500** kWh
- The Expected fan Consumption =**13000** kWh
- Expected Saving per year = **19500** kWh/year

Suggestions: Replace existing Inefficient Fan System (70W) with Five Star BLDC (28W)

5.2 Improve Power Quality (PQA)

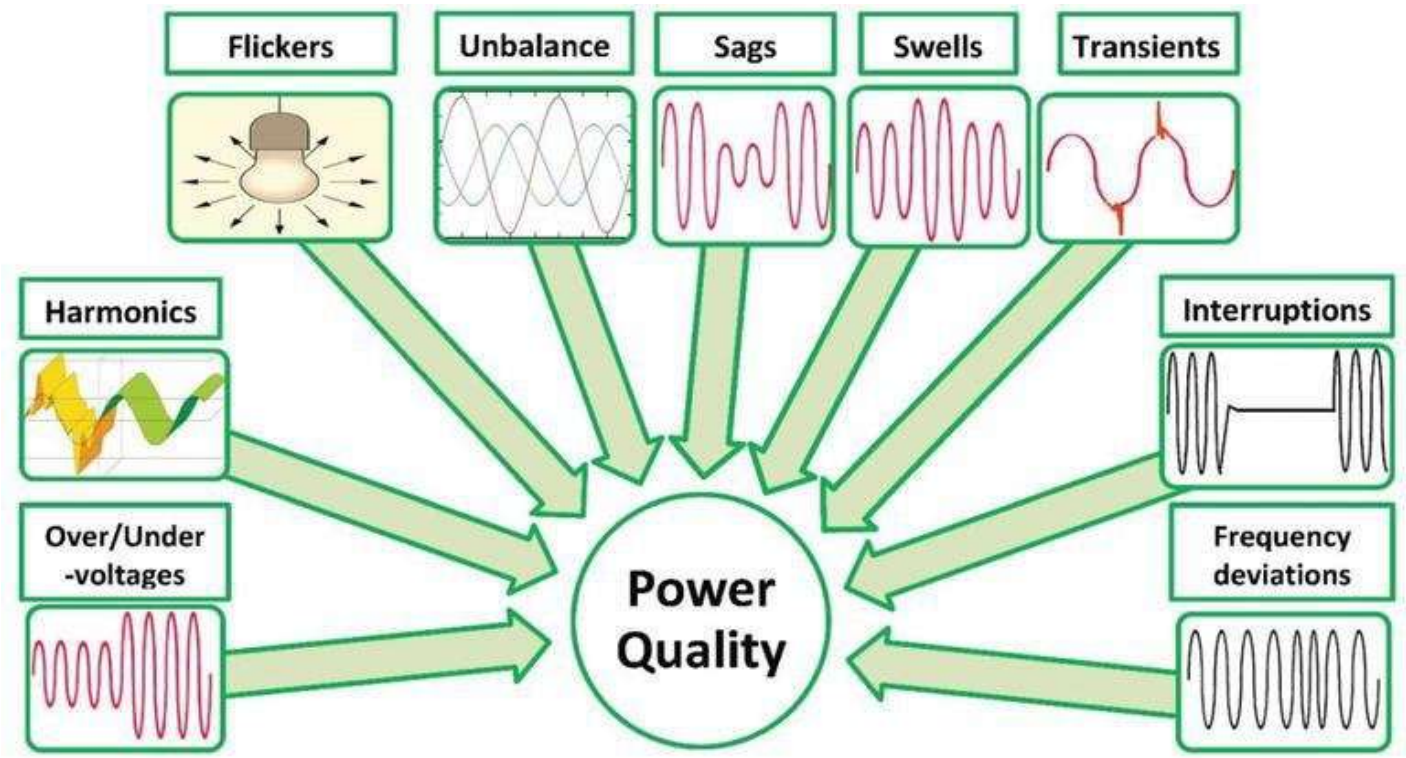
Power quality issues can affect the operation of critical loads and can have the negative impact on operation. This power quality analyser can monitor the cost of energy wasted due to poor power quality. The wider range of measurement function and measurement method in this analyser is the ideal tool and for the calculation of errors.

Factors that affect power quality:

Voltage fluctuations. Voltage fluctuations, such as sags, swells, or interruptions, can cause significant power quality issues. ... Harmonics. ... Power factor. ... Frequency variations.

Voltage level:

Power quality refers to the level of consistency, reliability, and stability of electrical power.

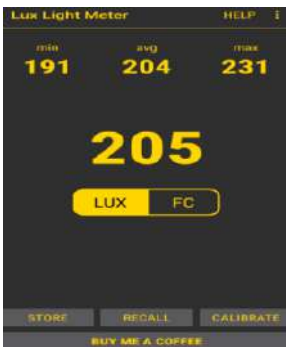


Suggestions:

Install Three Phase 50 kVA (Five unit of 10KVA each capacity) Air Cooled Servo Stabilizer.

5.4 Lighting System: Measurements of Lux level at different Locations

The total output of visible light from a light source is measured in lumens. Typically, the more lumens a light fixture provides, the brighter it is. One lux is equal to one lumen per square meter (lux = lumens/m2)



Principal Office

Library

Department of Geography

Staff Room

Office

Department of Mathematics

Observations: In the campus Majority Existing LED Tube are installed without reflectors.

Majority Measured Lux Level found LOW:

Suggestions: Improve effectiveness of Lighting System.

Increase Lighting Efficiency by using reflectors.

Light globes generally disperse light in all directions from the source. If a ceiling mounted light does not direct the light back down to the working plane, more fittings will be required to achieve the required lux levels. So the effectiveness of the reflectors (or minimizing losses due to poor reflectors) is important. Reflectors should be both reflective as well as carefully designed to disperse light effectively on the working plane at the design height of the fitting (e.g., light should not be concentrated in one area, providing too much light, whilst falling short of required levels in another area).

Proposed:-

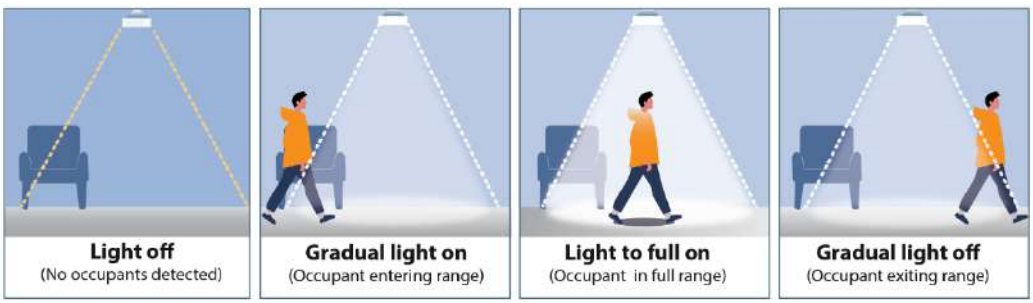
Silver Reflectors. This is the reflector that reflects the most light.

White Reflectors. More flexible between indoor and outdoor use.

1. Gold Reflectors 2. Black Reflectors 3. White Reflectors

Recommended LUX Level in Commercial Buildings

Activity	Illumination *(lux, lumen/m²)*
Public areas with dark surroundings	20 - 50
Simple orientation for short visits	50 - 100
Working areas where visual tasks are only occasionally performed	100 - 150
Warehouses, Homes, Theaters, Archives	150
Easy Office Work, Classes	250
Normal Office Work, PC Work, Study Library, Groceries, Show Rooms, Laboratories	500
Supermarkets, Mechanical Workshops, Office Landscapes	750
Normal Drawing Work, Detailed Mechanical Workshops, Operation Theatres	1,000
Detailed Drawing Work, Very Detailed Mechanical Works	1500 - 2000
Performance of visual tasks of low contrast and very small size for prolonged periods of time	2000 - 5000
Performance of very prolonged and exacting visual tasks	5000 - 10000
Performance of very special visual tasks of extremely low contrast and small size	10000 - 20000



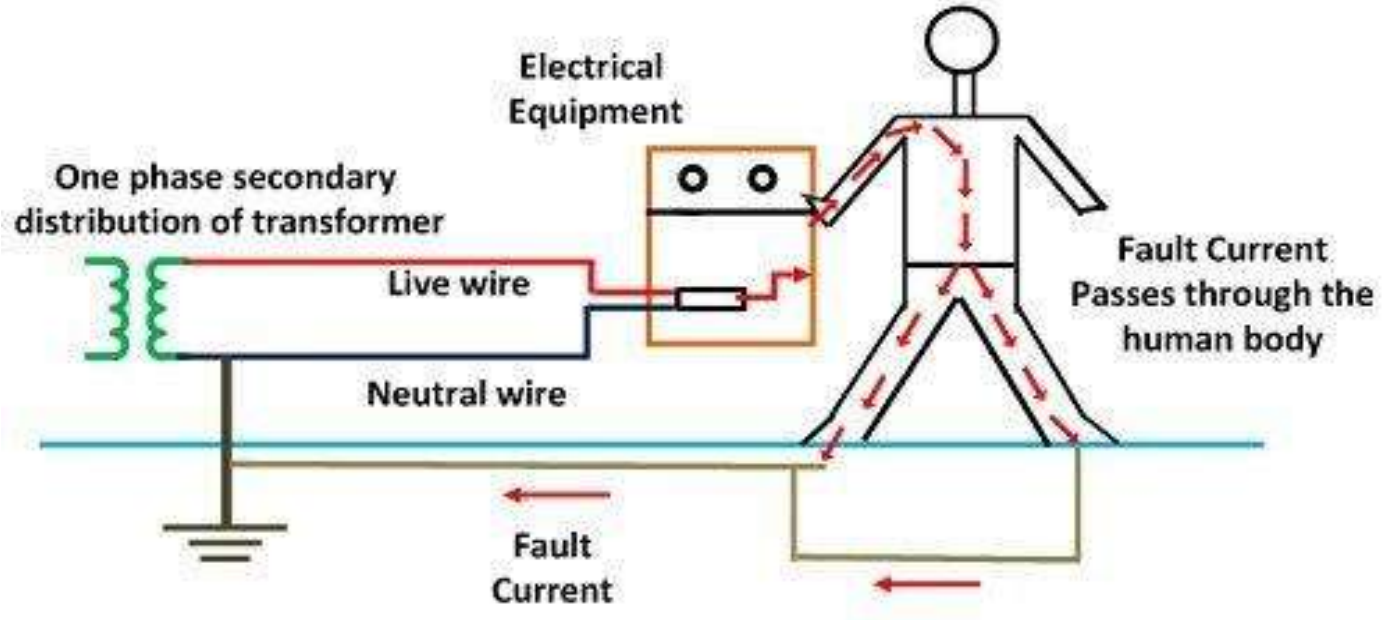
Suggestions: Install occupancy sensors to reduce Losses.

Chapter: 7 Guidelines for Identified Energy Saving Opportunities

• Use as much natural day light as possible by use of translucent roofing sheets.
• Use day lighting effectively by locating work stations requiring good illuminance near the windows.
• Minimize illuminance in non- task areas by reducing the wattage of lamps or number of fittings
• Avoid use of incandescent/tungsten filament lamps. The power consumed by these lamps is 80% more than the fluorescent lamps (discharge) for same lumen output.
• Use electronic ballasts in place of conventional ballast for fluorescent lamps.
• Task lighting saves energy, utilize it whenever possible.
• All surfaces absorb light to some degree and lower their reflectance. Light colored surfaces are more efficient and need to be regularly painted or washed in order to ensure economical use of light.
• Maintenance is very important factor. Evaluate present lighting maintenance program and revise it as necessary to provide the most efficient use of lighting system.
• Clean luminaries, ceilings, walls, lamps etc. on a regular basis.
• Controls are very effective for reducing lighting cost. Provide separate controls for large ratings.
• Install switching or dimmer controls to provide flexibility when spaces are used for multiple purpose and require different amounts of illumination for various activities.
• Switching arrangements should permit luminaries or rows of luminaires near natural light sources like windows or roof lights to be controlled separately.
• Separate lighting feeder and maintain the feeder at permissible voltages by using transformers. • Install occupancy sensors for indoor cabin light controls

Electrical Safety: Earth Resistance

Ideally a ground should be of zero ohms resistance. There is not one standard ground resistance threshold that is recognized by all agencies. However, the NFPA and IEEE have recommended a ground resistance value of 5.0 ohms or less. The use of chemical elements around the electrode of earthing systems reduces the earth resistance which improves the efficiency of these systems.



Conduct Institutional Training / Awareness Program
14th December 'National Energy Conservation day'

The National Energy Conservation Day is organised on 14th December every year by the Bureau of Energy Efficiency (BEE) with an aim to showcase India's achievements in energy efficiency and conservation. BEE - Ministry of Power celebrate every year Energy Conservation Week from 14th December – 20th December.

Create Awareness:

All Class Rooms and labs to have Display Messages regarding optimum use of electrical appliances in the room like, lights, fans, computers and projectors. Save electricity.

1. There has to be Institute level student community that keeps track of the energy consumption Parameters of the various departments, class rooms, halls, areas, meters, etc.
2. Energy auditing inside the campus has to be done on a regular basis and report should be made public to generate awareness.
3. Need to create energy efficiency/ renewable energy awareness among the college campus i.e. solar, wind, Biogas energy. College should take initiative to arrange seminars, lectures, paper presentation competition among students and staff for general awareness.

Display the stickers of save electricity

Save nature everywhere in the campus. So that all stakeholders encouraged to save the electricity.

- Most of the time, all the tube lights in a class room are kept ON, even though, there is sufficient light level near the window opening. In such cases, the light row near the window may be kept OFF.
- All projectors to be kept OFF or in idle mode if there will be no presentation slides.
- All computers to have power saving settings to turn off monitors and hard discs, say after10 minutes/30 minutes.
- The comfort/Default air conditioning temperature to be set between 24˚C to26˚C.

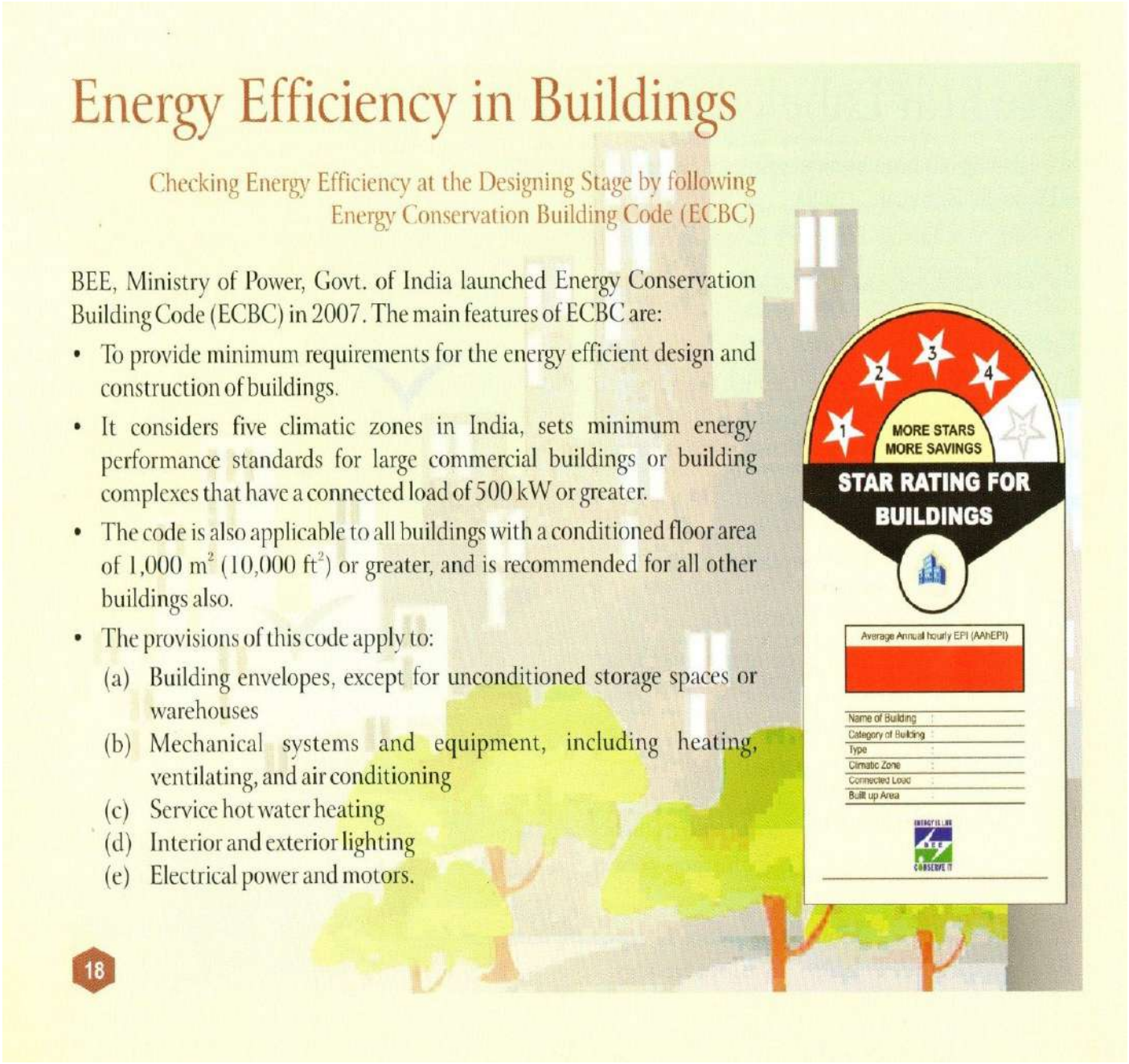
USE OF ELECTRICITY DURING PEAK HOUR AND OFF PEAK HOUR

The applicable electricity tariff is not also based on timing of the day but it may not be applicable in case of domestic LT/ HT type connection. This will also helpful in maintaining the demand graph. It is recommended to avoid use of electrical gadget for cleaning, watering etc. during the peak hours. This type of work should be operational during the off peak hour.

Chapter 8: Conclusion

A total Investment of Approx. Twenty Lakhs Fifty Five thousand rupees (Rs. 20.55/- Lakhs) amount is estimated for the energy efficiency improvement & renewable energy projects

Energy Savings expected around 62900 KWH/year.



Gokhale Education Society's

RNC Arts, JDB Commerce and NSC Science College.

Green Audit Report 2021 - 2022

Green Audit Report.

Energy Audit Report.

Water Audit Report

Nashik Pune Road, Nashik – 422 101.

Gokhale Education Society's

RNC Arts, JDB Commerce and NSC Science College.

Green Audit Report 2021 - 2022

Green Audit was conducted by

CA. Dr. Ashis .Arun. Palkhiwale.

Green Audit, Energy Audit, Water Audit was conducted Online without Actual Physical Visit.

For 2021 - 2022.

For Green Audit the Data considered for the Period

1st June 2021 to 31st May 2022
(Academic Year)

Date of Audit / Report

11th April 2022

Nashik Pune Road, Nashik – 422 101.

Gokhale Education Society's

RNC Arts, JDB Commerce and NSC Science College.

Green Audit Report 2021 - 2022

Inclusions & Exclusions while performing the Green Audit.

1) Carbon emissions due to Students Travelling is not considered.

2) Carbon emissions due to Faculty & Staff Travelling is considered.

3) Carbon emissions during Industrial Visits travelling not considered.

4) Carbon emissions from the Construction of Building are not considered as the Building is more than 10 Years old.

5) All Wood is more than 6 years old so not considered. (Classroom Faculty Platforms). (Still Details of Wooden Furniture is mentioned)

Wood Furniture details excluding Plywood.

Wooden Chairs	Tables	Cupboards	Shelves	Desks / Benches	Partitions
56	146	115	31	207	26

6) Plywood is not considered as Plywood is already recycled.

7) Total Consumption of Electricity for the Institute is considered.

8) Total Consumption of Water for the Institute is considered.

9) LPG Cylinders are consumed mainly in Labs.

10) Green Cover is considered of the premises around the College campus which may include some part common to the Nashik Road Campus.

11) Emissions from Tiles, Cement, Bricks & Paints & Printers are not considered.

12) Ambient Air Quality Monitoring is not performed as it was an Online Remote Audit.

13)Analysis of Water entering the drains / soak pits is not performed. as it was an Online Remote Audit. (Sewage water, Lab washing water, Washing & Cleaning water) is let out in drains.

14) Raw Water Analysis is not performed as it was an Online Remote Audit..

15) Radiation due to Wifi & Mobile Phones is not considered.

Gokhale Education Society's

RNC Arts, JDB Commerce and NSC Science College.

Green Audit Report 2021 - 2022

Air.

Since it was an Online Remote Audit. Ambient Air Quality was not monitored. Ideally it should be monitored at 12 locations depending on the area of the Institute.

Since it was an Online Remote Audit. Stack Emissions of the Diesel Generator was not monitored.

Paper.

Each A 4 paper is used from both the sides.

After use on both the sides then it is sold to Old Paper Merchant.

To the extent possible use of soft copies of documents is promoted.

For the period **June 2021 to May 2022**

The consumption was 230 Reams of A 4 Paper of 75 GSM.
(A 4 500 Sheets in each Ream & each Ream of 2.34 kg)

The consumption was 08 Reams of A 3 Paper of 75 GSM.
(A 3 500 Sheets in each Ream & each Ream of 4.63 kg)

The consumption was 20 Reams of Legal Paper of 75 GSM.
(Legal 500 Sheets in each Ream & each Ream of 2.81 kg)

Gokhale Education Society's

RNC Arts, JDB Commerce and NSC Science College.

Green Audit Report 2021 - 2022

Water.

Water used for

Drinking, Cleaning, Washing & Flushing, Gardening, In Laboratory.

As per the water meter installed.

Yearly reading of the Water Meter 24,00,000 Liters Per Year

So Average Monthly Water Consumption will be

24,00,000 / 12 = 2,00,000 Liters Per Month.

If the Volume of Tanks as informed by the institute is taken as base.
(Volume of water tanks certification not performed).
Two Water Tanks of 2000 Liters each and One Water Tank of 5000 Liters are filled once every day
So it indicates 9000 Liters per day approx. (always at the time of refilling the tanks the tanks may not be full empty).

So if we take working days in a Month as 25 days
2,00,000 / 25 Days in a month = 8000 Liters per day

Total Water Consumption from June 2021 to May 2022

24,00,000 Liters per 12 Months.
2,00,000 Liters per Month

So the Water Foot print is

24,00,000 / 365 Days = 6,575 Liters per Day.

So the Water Foot Print is 6,575 Liters of Water Per Day.

A separate Water Foot Print Certificate is given to the Institute.

No Rain Water Harvesting is performed.

Currently no measures are being taken to save water or to recycle water.

Gokhale Education Society's

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Electricity.

Total Consumption of Electricity is ideally to be considered from the Meter reading shown in the Electricity Bill.

Electricity used for

Air Conditioners, Equipments in Labs, Tube Lights, Lights & Fans. Computers & Printers. To run the Utilities.

Consumption from June 2021 to May 2022 is **51,572 KWH.**

Monthly Average KWH consumed for the Period June 2021 to May 2022 are **4,298 KWH per month.**

Power Generation by running the Diesel Generator.

Generator Details

Quantity	Make	Power Rating	Diesel Consumed
1	Kirloskar	75 KVA	324 Liters Per Year

So Monthly Average Consumption of Diesel is
324 Liters / 12 = 27 Liters per Month.

Measures taken for Energy / Electricity Conservation.

1) Replacing the conventional Florescent Tube Lights with LED Tube Lights. (nearly 50% are replaced).
2) Replacing the CFL Blubs with LED Bulbs. (nearly 60% are replaced).
3) **Solar Power Generation**

Yearly	Monthly
12,396 KWH	**1,033 KWH**

Power Generated by Solar is fed into the Grid.

4) Periodic Maintenance of the Diesel Generator to get Optimum performance.

LPG Consumption

Liquefied Petroleum Gas.

LPG Cylinders are used in Laboratories.

June 2021 to May 2022.

College consumes on an Average 17 Cylinders of LPG per 3 Months
17 Cylinders of 14.2 Kg of LPG Gas in it per 3 Months.
So LPG consumption is 80.47 Kg of Gas per Month.
There is no other application of LPG Cylinders in the Institute.

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Consumption of Petrol / Diesel by Staff Travelling to & fro the Institute.

According to the data given by the Institute. For the period
June 2021 to May 2022.

Distance Travelled by staff To & Fro the Institute by 2 Wheeler per Month based on a 25 days working Month	Petrol Consumption per day by 2 Wheeler in a month by taking an average Fuel efficiency of 40 KMPL
1568 Km per day so 1568 X 25 = 39,200 Km per Month	**980 Liters Per Month**
So 980 Liters per Month X 12 Months = 11,706 Liters Per Year.	

Distance Travelled by staff To & Fro the Institute by 4 Wheeler per month based on a 25 days working Month	Petrol Consumption per day by 4 Wheeler in a month by taking an average Fuel efficiency of 12 KMPL
740 Km per day so 740 X 25 = 18,500 Km per Month	**1542 Liters Per Month**
So 1542 Liters per Month X 12 Months = 18,504 Liters Per Year.	

Distance Travelled by staff To & Fro the Institute by 4 Wheeler per month based on a 25 days working Month	Diesel Consumption per day by 4 Wheeler in a month by taking an average Fuel efficiency of 15 KMPL
538 Km per day so 538 X 25 = 13,450 Km per Month	**897 Liters Per Month**
So 897 Liters per Month X 12 Months = 10,764 Liters Per Year.	

So total Petrol Consumption from June 2021 to May 2022 is
11,706 + 18,504 = 30,210 Liters per Year.
(2,518 Liters per Month).

So total Diesel Consumption from June 2021 to May 2022 is
10,764 Liters per Year.
(897 Liters per Month).

+

Diesel Consumption by the Diesel Generator.

So Monthly Average Consumption of Diesel is
324 Liters Per Year / 12 = 27 Liters per Month.

TOTAL Diesel Consumption is
(897 + 27 = 924 Liters per Month).

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So Following is the Calculation of the Carbon Foot Print.

Calculation of Kg of CO2 emissions

1	2 *As per GRI Standards*	3	4	5
Category	**Kg of CO2 per unit of consumption**	**Average Monthly Consumption**	**Calculation 2*3**	**Total Kg of CO2 2*3=5**
Electricity	**0.371 Kg per KWH**	**4,298 KWH**	**4,298 X 0.371 =**	**1,594.56**
Diesel	**2.68 Kg per liter**	**924 Liters**	**924 X 2.68 =**	**2,476.32**
Petrol	**2.3 Kg per liter**	**2,518 Liters**	**2,518 X 2.3 =**	**5,791.40**
LPG	**3 Kg per Kg**	**80.47 Kg**	**80.47 X 3 =**	**241.41**
			TOTAL	**10,103.69**

***GRI* (Global Reporting Initiative) Standards.**

So the Average Monthly CO2 Emissions rounded off are 10,104 Kg of CO2.

So the Average Monthly CO2 Emissions are 10,104 Kg of CO2.

A separate Carbon Foot Print Certificate is given to the Institute.

Energy Audit Report.

As per Electrical Meter reading Consumption from June 2021 to May 2022 is **51,572 KWH.**

Consumption in KWH from the Solar Power Generated
3,600 KWH consumption of KWH generated by Solar power.

So total Consumption will be 51,572 + 3,600 = 55,172 KWH

Power generation by Diesel Generator is negligible so not considered.

So the Energy Consumption for the period June 2021 to May 2022 is 55,172 KWH that is 55,172 / 12 = 4,598 KWH per Month.

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Green Cover Details.

Green cover area in the campus as a percentage of the total area is not calculated.

Only Data given is the Campus comprising of Many Colleges & Schools is of area 25 Acers & is covered with green cover with many trees

Details of Trees & those planted in 2021 – 22 not available.

Mortality Rate of the Trees planted to be monitored.

Hazardous Waste Disposal

E waste is collected & disposed off to an Authorized E waste Disposer Party.

Used Batteries are given in Buy Back to the Supplier of New Batteries.

Laboratory Waste & Used Chemicals & Reagents are diluted & let out in a pit specifically prepared for Chemical waste.

No Details of Hazardous & Non Hazardous Waste Generated & its Disposal is Given by the Institute

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Suggestions for Green Audit / Energy / Water Audit related activities to be carried out by the Institute.

1) STP (Sewage Treatment Plant) can be installed for processing & reusing the Sewage waste water.
2) The Flushing Tanks of WC (Toilets) to be modified such that only half gets filled & thus while flushing only half of the water is used.
3) Drip irrigation can be implemented for the Trees.
4) To fit the atomizer devise to taps to save water.
5) Testing of the water in the drain as it is directly going into the Municipality Drains.
6) Motion sensors can be fitted for the Light fittings in Washrooms, Lift and Lobby where continuous usage is not there.
7) Survival rate of planted trees to be monitored.
8) Grafting of new plants in the trunk of dead trees can be done.
9) In the next Green Audit to test the Ambient Air Quality at least at 12 Locations.
10) To test the Diesel Generator Stack Emissions.
11) To verify the radiation from Wifi & Mobile phones.
12) To conduct Poster & other Innovative Environment Idea Competition among students.
13) Use of E bikes & E Vehicles can be thought by the Staff Members.

The Above Report is prepared based on the Records & Facts given by the Office bearers of Institute.

CA. Dr. Ashis .Arun. Palkhiwale. **(11th April 2022)**

(Green Auditor & LA ISO 14001)(Blue Flag Certification Auditor)

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