PowerTech Energy Solutions
Conserve to Consume

Energy & Green Audit Report
Of
SNJB's Karmveer Keshavlalji Harakchandji Abad ARTS, Shriman Motilalji Giridharilalji Lodha COMMERCE and Shriman P.H. Jain SCIENCE College, Chandwad, Nashik

Submitted By

PowerTech Energy Solutions

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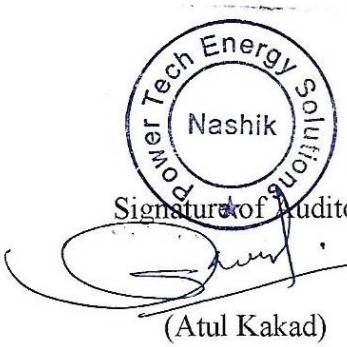
ENERGY & GREEN AUDIT COMPLETION CERTIFICATE

This is to certify that following utility has carried out Energy & Green Audit as per guidelines laid down in The Energy Conservation Act, 2001 in the month of January 2019

Name of the Installation	SNJB's Karmveer Keshavlalji Harakchandji Abad ARTS, Shriman Motilalji Giridharilalji Lodha COMMERCE and Shriman P.H. Jain SCIENCE College, Chandwad, Nashik
Details of Facilities Audited	Main college building including laboratories, libraries, etc.
Date of Energy and Green Audit	08 January 2019
Name of Certified Energy Auditor	Mr. Atul Kakad
Certification No.	EA 20121
Validity of the Certificate	07 January 2020



Signature of Auditor

(Atul Kakad)

Executive Summary – Energy Audit

Sr. No	Area	Proposed Action	Expected Result	Monthly Energy Savings in kWh	Annual Reduction in CO_2 emission in Tons	Monthly Cost Savings in Rs	Investment in Rs.	Payback Period in Months
1	Lighting	R Replace the existing 36 W FTL tube lights into 18 W LED tubes	• Total No. of light fittings = 37 Nos. • Total No. of Light fitting presently operated= 37 Nos. • Total No. of light fittings to be replace= 37 Nos. • Present Energy Consumption = 204 kWh • Expected Energy Consumption = 102kWh • Total Energy Saved per Month = 204-102= 102 kWh	102	0.99	854	14060	16.4
2	Ceiling Fan	Replace existing 78 watt conventional ceiling fans with 40 watt energy efficient fans	• Total No. of ceiling fans present = 142 Nos. • Total No. of ceiling fans presently operated= 142 Nos. • Total No. of ceiling fans to be replace= 142 Nos. • Present Energy Consumption = 1139kWh • Expected Energy Consumption = 579 kWh • Total Energy Saved per Month = 1139-579= 579 kWh	579	4.6	4618	255600	55
Total				**681**	**5.59**	**5472**	**269600**	**71.4**

Executive Summary – Green Audit

Sr.No	Area	Observations	Remark
1	Tree Plantation	College has carried out tree plantation activity. Several type of trees has been planted by students and staffs	Good initiative taken by college toward green campus
2	Use of renewable energy – Solar PV system for power generation	Solar PV system of 7.2 kW has been installed by college to generate the electricity from solar energy. It helps to reduce 7.8 tons of CO2 emission annually	Good initiative taken by college towards use of renewable energy
3	Rain Water Harvesting	Rain water harvesting system is developed by college. It helps to save the water and use for future use	Good initiative taken by college towards water conservation
4	Vermicomposting Plant	College has developed vermicompost plant which is managed by Botany department. Generated compost is used for tress, gardening in college camps	Good imitative taken by college towards solid waste management
5	E waste Management	At present, E -waste generated by college collected or distributed to other required departments	College shall ensure that e-waste generated by them is channelised through collection centre or dealer of authorised producer or dismantler or recycler
6	Plastic and Paper free campus	Till date, college has not issued any notification for plastic free and paper free campus. However staff and students are taking initiatives to reduce the use of plastic and papers in college campus	Management should make policy to avoid the use of plastic and paper wherever possible and publish to the student's staffs, etc.

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Acknowledgement

PowerTech Energy Solutions extends gratitude to SNJB's Karmveer Keshavlalji Harakchandji Abad ARTS, Shriman Motilalji Giridharilalji Lodha COMMERCE and Shriman P.H. Jain SCIENCE College, Chandwad, Nashik for extending us the opportunity to conduct the Energy & Green Audit.

We are thankful to the professors & supporting staff of the college for their transparency & consistent support in sharing relevant information and for providing data about policies and projects along with their other valuable information. This report would have not been possible without their support.

The study team would like to acknowledge the following distinguished personnel's of Sir Visvesvaraya Institute Of Technology in person for the diligent involvement and cooperation.

Prof. Dr. G.H.Jain	Principal
Prof. Madhukar P. Zanje	Department of Mathematics

About College

Shri. Neminath Jain Brahmacharyashrams Karmvir Keshavlalji Harakchandji Abad Arts and Shriman Motilalji Girdharilalji Lodha Commerce College, Chandwad was established in 1970. It is affiliated to University of Pune and is recognized under 2f and 12b. It caters to the educational needs of students dwelling in rural areas around Chandwad taluka. It provides graduation courses in Arts and Commerce. In the academic year 2010-11 it opened up avenue for graduation in Science.

At present, students can opt for B.A. with any of the following special subjects- History,

Economics, Politics, Marathi and English. The subject Geography it taught at general level. Along with those courses the college has introduced Self Employment based Short term courses for girl students and women in the town. There is a separate gymnasium for boys and girls.

The college has been sanctioned an N.S.S. unit 250 volunteers. The departments organizing curricular, co-curricular, student's welfare and social activities are as follows.

Commerce Association, Social Sciences Association, Literary Association, Students' welfare Association, Girls Forum, Soft Skills Development Centre, National Service Scheme and Gymkhana Association etc.

The College signed collaborated with Nigeria University, Nigeria for Research, Development and Academic interactions in the field of nanotechnology in April 2014. Dr. G.E. Patil, Department of Physics represented India in 6th HOPE Meeting with Nobel Laureates which was held in Tokyo, JAPAN in March, 2014.

Mission

"Our ultimate aim is to link education with the entire society so that underprivileged and economically disadvantaged students are benefited and they could become self-reliant, ethically strong and law-abiding citizens."

Vision

To achieve academic excellence, material and spiritual development of the students, to strengthen rational and scientific attitude among them and to make them well competent.

Energy Audit

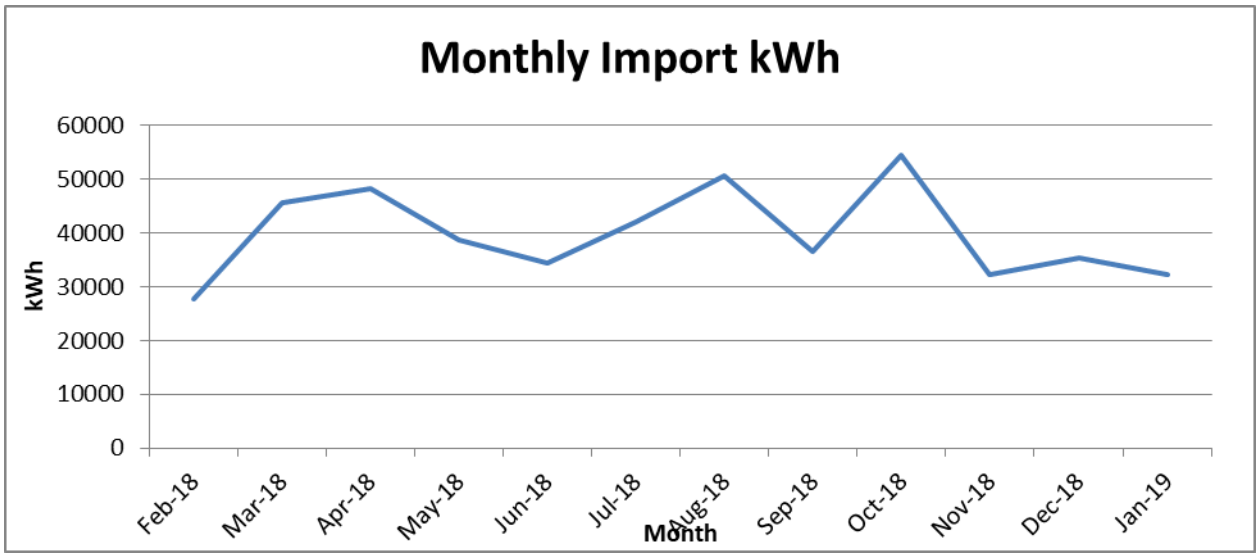
An energy audit is an inspection, survey and analysis of energy flows, for energy conservation in a building, process or system to reduce the amount of energy input into the system without negatively affecting the output(s). In commercial and industrial real estate, an energy audit is the first step in identifying opportunities to reduce energy expense and carbon footprints.

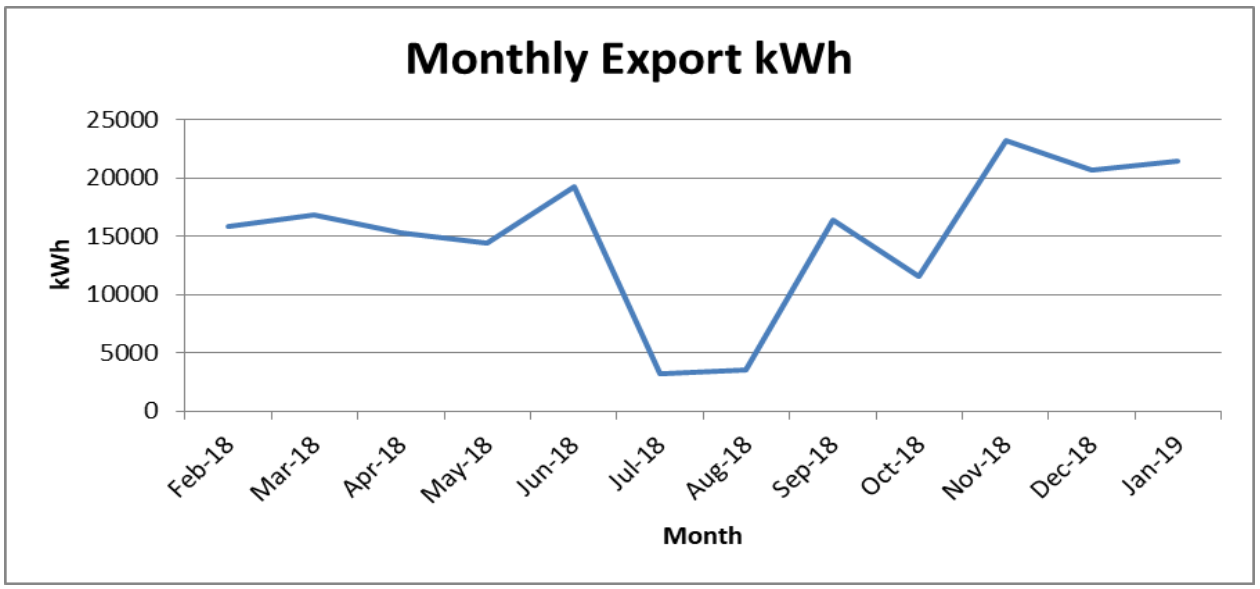
Electricity Bill Analysis

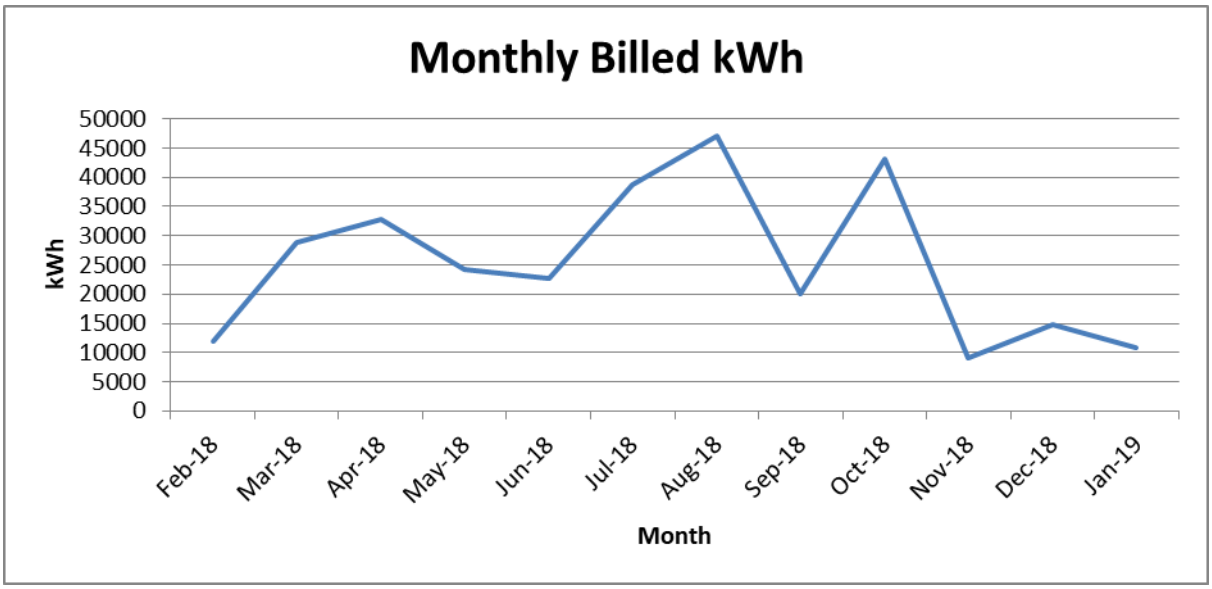
At present, one electricity meter is there for all campus

Bill analysis for consumer number 059739009400shown below

Electricity Bill - Maharashtra State Electricity Distribution Co. Ltd						
CONSUMER : M/S NEMINATH JAIN BRAHMACHARYA						
CONSUMER NO. :059739009400						
UTILITY : MSEDCL						
INCOMING VOLTAGE : 22 kv						
TARIFF : 146 HT-IX B						
CONNECTED LOAD (KW) : 500.00 KW						
CONTRACT DEMAND (KVA) :350.00						
50% OF CONTRACT DEMAND(KVA) : 175						
MONTH	**Import kWh**	**Export kWh**	**Billed KWH**	**PF**	**BILL(Rs)**	**Rate (Rs./kWh)**
Feb-18	27635	15795	11840	1.000	167010.2	6.04
Mar-18	45635	16870	28765	0.999	311546.1	6.83
Apr-18	48245	15345	32900	0.998	354138.1	7.34
May-18	38695	14450	24245	0.997	278222.3	7.19
Jun-18	34425	19258	22725	1.000	266218.6	7.73
Jul-18	41983	3195	38788	1.000	407363.7	9.70
Aug-18	50695	3525	47170	0.999	490479.5	9.68
Sep-18	36453	16390	20063	0.999	349229.2	9.58
Oct-18	54553	11523	43030	0.980	676698.1	12.40
Nov-18	32243	23208	9035	0.920	201597.5	6.25
Dec-18	35318	20630	14688	0.939	277520.7	7.86
Jan-19	32173	21413	10760	0.948	233163.5	7.25
Total	**478053**	**181602**	**304009**		**4013188**	**8.39**
Average	**39838**	**15134**	**25334**	**0.982**	**334432**	


Monthly Import kWh
60000
50000
40000
30000
20000
10000
0
kWh
Feb-18
Mar-18
Apr-18
May-18
Jun-18
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Month


Monthly Export kWh
25000
20000
15000
10000
5000
0
kWh
Feb-18
Mar-18
Apr-18
May-18
Jun-18
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Month


Monthly Billed kWh
kWh
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
Feb-18
Mar-18
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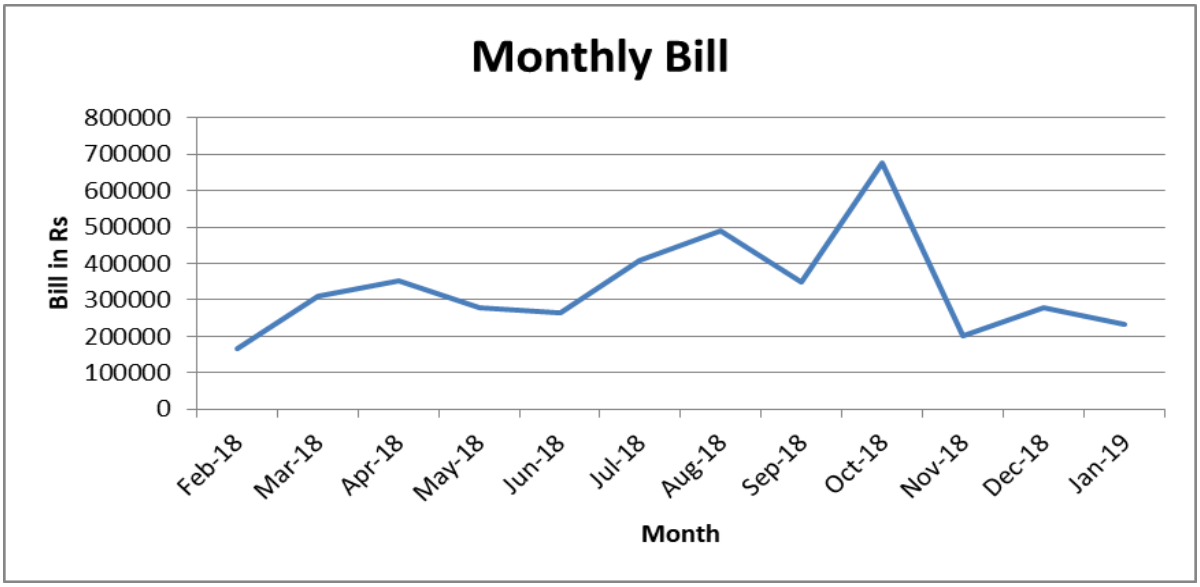
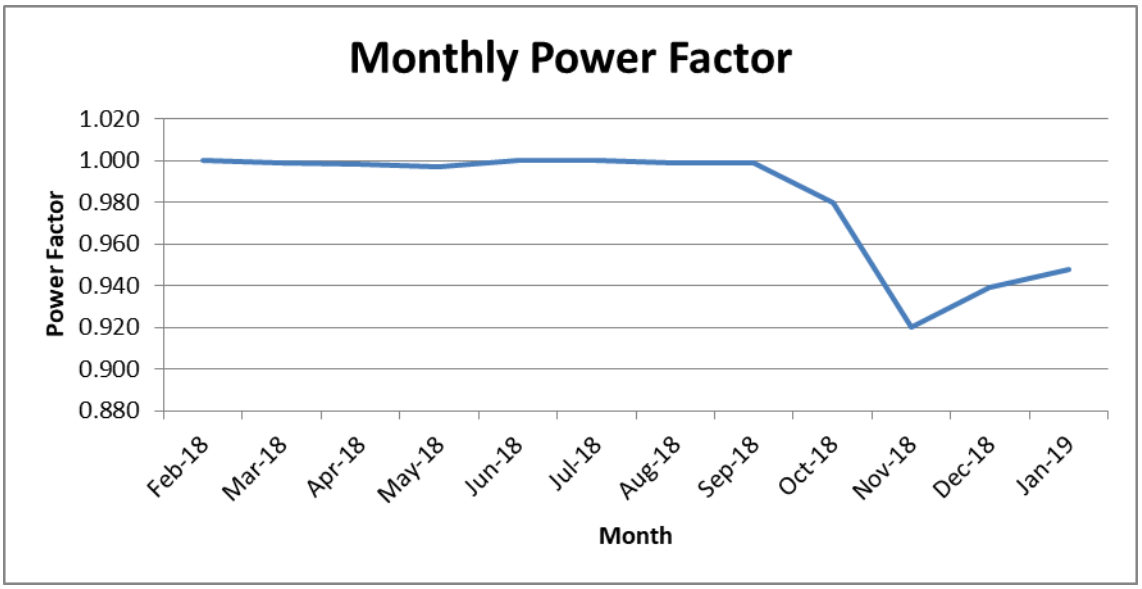
May-18
Jun-18
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Month


Monthly Bill
Bill in Rs
800000
700000
600000
500000
400000
300000
200000
100000
0
Feb-18
Mar-18
Apr-18
May-18
Jun-18
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Month


Monthly Power Factor
Power Factor
1.020
1.000
0.980
0.960
0.940
0.920
0.900
0.880
Feb-18
Mar-18
Apr-18
May-18
Jun-18
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Month

Observations

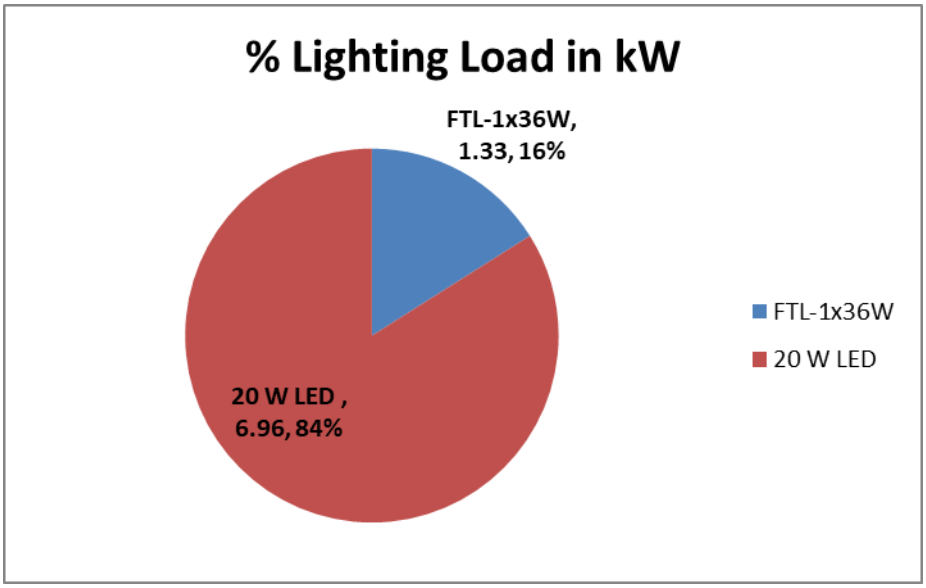
- Monthly avergae energy consumption is 39838 kWh
- Monthly average maximum demand is 76 kVA
- Monthly average power factor is 0.981 which can be improved to unity
- Monthly average electricity bill is Rs./- 3,34,432 only
- Avg. unit rate is 8.39 Rs./kWh

Connected Load List – Lighting

Area	Type	Total Qty	On Qty	UF	Wattage	Daily Op hr	Load
Electronic Science	FTL-1x36W	1	1	1	36	6	0.036
Electronic Science	LED - 20W	9	9	1	20	6	0.18
Mathematics	FTL-1x36W	1	1	1	36	6	0.036
Mathematics	LED - 20W	2	2	1	20	6	0.04
Chemistry	FTL-1x36W	5	5	1	36	6	0.18
Chemistry	LED - 20W	60	60	1	20	6	1.2
Physics	FTL-1x36W	4	4	1	36	6	0.144
Physics	LED - 20W	28	28	1	20	6	0.56
Botony	FTL-1x36W	4	4	1	36	6	0.144
Botony	LED - 20W	39	39	1	20	6	0.78
Science Building	FTL-1x36W	5	5	1	36	6	0.18
Science Building	LED - 20W	40	40	1	20	6	0.8
Commercial Lab	FTL-1x36W	1	1	1	36	6	0.036
Commercial Lab	LED - 20W	2	2	1	20	6	0.04
Geography	FTL-1x36W	1	1	1	36	6	0.036
Geography	LED - 20W	4	4	1	20	6	0.08
Arts, Commerce & Science Building	FTL-1x36W	8	8	1	36	6	0.288
Arts, Commerce & Science Building	LED - 20W	123	123	1	20	6	2.46
Library	FTL-1x36W	2	2	1	36	6	0.072
Library	LED - 20W	18	18	1	20	6	0.36
Pricipal office	FTL-1x36W	2	2	1	36	6	0.072
Pricipal office	LED - 20W	4	4	1	20	6	0.08
Gynmasium	FTL-1x36W	2	2	1	36	6	0.072
Gynmasium	LED - 20W	10	10	1	20	6	0.2
DMLT	FTL-1x36W	1	1	1	36	6	0.036
DMLT	LED - 20W	9	9	1	20	6	0.18
Total		**385**	**385**				**8.292**

Type wise lighting distribution in college

Type	Qty	Power in kW	%
FTL-1x36W	37	1.33	16%
20 W LED	348	6.96	84%



Connected Load List – Fan

Area	Type	Total Qty	On Qty	UF	Wattage	Daily Op hr.	Load
Electronic Science	Ceiling fan	7	7	1	78	4	0.546
Mathematics	Ceiling fan	2	2	1	78	4	0.156
Chemistry	Ceiling fan	18	18	1	78	4	1.404
Physics	Ceiling fan	19	19	1	78	4	1.482
Botany	Ceiling fan	0	0	1	78	4	0
Science Building	Ceiling fan	32	32	1	78	4	2.496
Commercial Lab	Ceiling fan	0	0	1	78	4	0
Geography	Ceiling fan	0	0	1	78	4	0
Arts, Commerce & Science Building	Ceiling fan	48	48	1	78	4	3.744
Library	Ceiling fan	8	8	1	78	4	0.624
Principal office	Ceiling fan	1	1	1	78	4	0.078
Gymnasium	Ceiling fan	5	5	1	78	4	0.39
DMLT	Ceiling fan	2	2	1	78	4	0.156
Total		**142**	**142**				**11.076**

Energy Saving Measure 1 – Replacement of conventional lighting system into LED

Area	Type	Total Qty	On Qty	UF	Wattage	Daily Op hr.	Load	Mthly Kwh	Change	New Wattage	New Load	Mthly Kwh	Saving Kwh	Saving Rs	Unit Rate	Inv	Payback
Electronic Science	FTL-1x36W	2	2	1	36	6	0.072	11.016	1x18W Led Tube light	18	0.036	5.508	5.508	46.21212	380	760	16.4
Mathematics	FTL-1x36W	1	1	1	36	6	0.036	5.508	1x18W Led Tube light	18	0.018	2.754	2.754	23.10606	380	380	16.4
Chemistry	FTL-1x36W	13	13	1	36	6	0.468	71.604	1x18W Led Tube light	18	0.234	35.802	35.802	300.3788	380	4940	16.4
Physics	FTL-1x36W	7	7	1	36	6	0.252	38.556	1x18W Led Tube light	18	0.126	19.278	19.278	161.7424	380	2660	16.4
Botany	FTL-1x36W	8	8	1	36	6	0.288	44.064	1x18W Led Tube light	18	0.144	22.032	22.032	184.8485	380	3040	16.4
Science Building	FTL-1x36W	9	9	1	36	6	0.324	49.572	1x18W Led Tube light	18	0.162	24.786	24.786	207.9545	380	3420	16.4
Commercial Lab	FTL-1x36W	1	1	1	36	6	0.036	5.508	1x18W Led Tube light	18	0.018	2.754	2.754	23.10606	380	380	16.4
Geography	FTL-1x36W	2	2	1	36	6	0.072	11.016	1x18W Led Tube light	18	0.036	5.508	5.508	46.21212	380	760	16.4
Arts, Commerce &	FTL-1x36W	27	27	1	36	6	0.972	148.716	1x18W Led	18	0.486	74.358	74.358	623.8636	380	10260	16.4

Area	Type	Total Qty	On Qty	UF	Wattage	Daily Op hr.	Load	Mthly Kwh	Change	New Wattage	New Load	Mthly Kwh	Saving Kwh	Saving Rs	Unit Rate	Inv	Payback
Science Building									Tube light								
Library	FTL-1x36W	12	12	1	36	6	0.432	66.096	1x18W Led Tube light	18	0.216	33.048	33.048	277.2727	380	4560	16.4
Principal office	FTL-1x36W	2	2	1	36	6	0.072	11.016	1x18W Led Tube light	18	0.036	5.508	5.508	46.21212	380	760	16.4
Gymnasium	FTL-1x36W	4	4	1	36	6	0.144	22.032	1x18W Led Tube light	18	0.072	11.016	11.016	92.42424	380	1520	16.4
DMLT	FTL-1x36W	2	2	1	36	6	0.072	11.016	1x18W Led Tube light	18	0.036	5.508	5.508	46.21212	380	760	16.4
Total		**90**	**90**				**3.24**	**496**			**1.62**	**248**	**248**	**2080**		**34200**	**16.4**

Lighting Recommendation -1

Replace the existing 36 W FTL tube lights into 18 W LED tubes

- Total No. of light fittings = 37 Nos.
- Total No. of Light fitting presently operated= 37 Nos.
- Total No. of light fittings to be replace= 37 Nos.
- Present Energy Consumption = 204 kWh
- Expected Energy Consumption = 102 kWh
- Total Energy Saved per Month = 204-102= 102 kWh
- Total Saving = 102 kWh
- Monetary Savings = Rs.854
- Investment = Rs.14060
- Simple Payback period = 16.4 Months

Energy Saving Measure 2 – Replacement of conventional ceiling fans with energy efficient ceiling fans

Area	Type	Total Qty	On Qty	UF	Wattage	Daily Op hr.	Load	Mthly Kwh	Change	New Wattage	New Load	Mthly Kwh	Saving Kwh	Saving Rs	Unit Rate	Inv	Payback
Electronic Science	Ceiling fan	7	7	1	78	4	0.546	56	40W Ceiling Fan	40	0.28	29	27	228	1800	12600	55
Mathematics	Ceiling fan	2	2	1	78	4	0.156	16	40W Ceiling Fan	40	0.08	8	8	65	1800	3600	55
Chemistry	Ceiling fan	18	18	1	78	4	1.404	143	40W Ceiling Fan	40	0.72	73	70	585	1800	32400	55
Physics	Ceiling fan	19	19	1	78	4	1.482	151	40W Ceiling Fan	40	0.76	78	74	618	1800	34200	55
Botany	Ceiling fan	0	0	1	78	4	0	0	No change	40	0	0	0	0	1800	0	#DIV/0!
Science Building	Ceiling fan	32	32	1	78	4	2.496	255	40W Ceiling Fan	40	1.28	131	124	1041	1800	57600	55
Commercial Lab	Ceiling fan	0	0	1	78	4	0	0	No change	40	0	0	0	0	1800	0	#DIV/0!
Geography	Ceiling fan	0	0	1	78	4	0	0	No change	40	0	0	0	0	1800	0	#DIV/0!
Arts, Commerce & Science Building	Ceiling fan	48	48	1	78	4	3.744	382	40W Ceiling Fan	40	1.92	196	186	1561	1800	86400	55
Library	Ceiling fan	8	8	1	78	4	0.624	64	40W Ceiling Fan	40	0.32	33	31	260	1800	14400	55
Principal office	Ceiling fan	1	1	1	78	4	0.078	8	40W Ceiling Fan	40	0.04	4	4	33	1800	1800	55

Area	Type	Total Qty	On Qty	UF	Wattage	Daily Op hr.	Load	Mthly Kwh	Change	New Wattage	New Load	Mthly Kwh	Saving Kwh	Saving Rs	Unit Rate	Inv	Payback
Gymnasium	Ceiling fan	5	5	1	78	4	0.39	40	40W Ceiling Fan	40	0.2	20	19	163	1800	9000	55
DMLT	Ceiling fan	2	2	1	78	4	0.156	16	40W Ceiling Fan	40	0.08	8	8	65	1800	3600	55
Total		**142**	**142**				**11.076**	**1130**			**5.68**	**579**	**550**	**4618**		**255600**	**55**

Fan Recommendation 1

Replace existing 75 watt conventional ceiling fans with 40 watt energy efficient fans

- Total No. of ceiling fans present = 142 Nos.
- Total No. of ceiling fans presently operated= 142 Nos.
- Total No. of ceiling fans to be replace= 142 Nos.
- Present Energy Consumption = 1139kWh
- Expected Energy Consumption = 579 kWh
- Total Energy Saved per Month = 1139-579= 579 kWh
- Total Saving = 579 kWh
- Monetary Savings = Rs.4618
- Investment = Rs. 255600
- Simple Payback period = 55 Months

Requirements of NAAC

Alternative Energy Initiative

Percentage of power requirement met by renewable energy sources
= (Power requirement met by renewable energy sources / Total power requirement) X 100

= (181602/478053) X 100

= 37.98/%

Percentage of lighting power requirement met through LED bulbs

Percentage of lighting power requirement met through LED bulbs
= (Lighting power requirement met through LED bulbs / Total lighting power requirement) X 100

= (6.96/8.29)

= 84 %

Green Audit

Green audit was initiated with the beginning of 1970s with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. It exposes the authenticity of the proclamations made by multinational companies, armies and national governments with the concern of health issues as the consequences of environmental pollution. It is the duty of organizations to carry out the Green Audits of their ongoing processes for various reasons such as; to make sure whether they are performing in accordance with relevant rules and regulations, to improve the procedures and ability of materials, to analyze the potential duties and to determine a way which can lower the cost and add to the revenue. Through Green Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out Green Audit. Some of the incidents like Bhopal Gas Tragedy (Bhopal; 1984), Chernobyl Catastrophe (Ukraine; 1986) and Exxon-Valdez Oil Spill (Alaska; 1989) have cautioned the industries that setting corporate strategies for environmental security elements have no meaning until they are implemented.

Green Audit is assigned to the Criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India that declares the institutions as Grade a, Grade B or Grade C according to the scores assigned at the time of accreditation.

The intention of organizing Green Audit is to upgrade the environment condition in and around the institutes, colleges, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmental friendly institute.

Goals of Green Audit

- The objective of carrying out Green Audit is securing the environment and cut down the threats posed to human health.
- To make sure that rules and regulations are taken care of
- To avoid the interruptions in environment that are more difficult to handle and their correction requires high cost.
- To suggest the best protocols for adding to sustainable development

Benefits of Green Audit

- It would help to shield the environment
- Recognize the cost saving methods through waste minimizing and managing
- Point out the prevailing and forthcoming complications
- Authenticate conformity with the implemented laws
- Empower the organizations to frame a better environmental performance
- It portrays a good image of a company which helps building better relationships with the group of stakeholders
- Enhance the alertness for environmental guidelines and duties

Initiatives by College towards Sustainable Environment

Tree Plantation

Tree-planting is the process of transplanting tree seedlings, generally for forestry, land reclamation, or landscaping purpose. It differs from the transplantation of larger trees in arboriculture, and from the lower cost but slower and less reliable distribution of tree seeds.

In silviculture the activity is known as reforestation, or afforestation, depending on whether the area being planted has or has not recently been forested. It involves planting seedlings over an area of land where the forest has been harvested or damaged by fire, disease or human activity. Tree planting is carried out in many different parts of the world, and strategies may differ widely across nations and regions and among individual reforestation companies. Tree planting is grounded in forest science, and if performed properly can result in the successful regeneration of a deforested area. Reforestation is the commercial logging industry's answer to the large-scale destruction of old growth forests, but a planted forest rarely replicates the biodiversity and complexity of a natural forest.

Because trees remove carbon dioxide from the air as they grow, tree planting can be used as agro engineering technique to remove $CO_2$from the atmosphere. Desert greening projects are also motivated by improved biodiversity and reclamation of natural water systems, but also improved economy and social welfare due to increased number of jobs in farming and forestry.

College has planted the trees campus area to make it more environments friendly. Below are the some records, photos which shows the

Details of Tree Plantation

Sr.No.	Botanical Name	Common Name	Family	Habit
		Angiosperms		
1	Polyalthia longifolia	Ashoka	Annanaceae	Tree
2	Bombax ceiba	Cotton silk tree	Malvaceae	Tree
3	Ficus religiosa	Peeple	Moraceae	Shrub
4	Lantana camera	Ghaneri	Verbenaceae	Shrub
5	Pithocellobium dulce	Vilayati chinch	Fabaceae	Tree
6	Withania somnifera	Ashwagandha	Solanaceae	Herb
7	Spathodea companulata	Pichkari	Bignoniaceae	Tree
8	Calotropis procera	Rui	Apocynaceae	Shrub
9	Caesalpinia pulcherima	Shakhansur	Fabaceae	Shrub
10	Cassia siamea	Kashid	Fabaceae	Tree
11	Catharanthus roseus	Sadafuli	Apocynaceae	Herb
12	Azadirachta indica	Neem	Meliaceae	Tree
13	Bauhnia racemosa	Apta	Fabaceae	Shrub
14	Canna indica	Kardal	Cannaceae	Herb
15	Jasmine sambac	Mogra	Oleaceae	Herb
16	Citrus lemon	Lemon	Rutaceae	Shrub
17	Ficus glomerata	Umber	Moraceae	Tree
18	Leucaena leucosaphala	Subabhul	Fabaceae	Tree
19	Bambusa vulgaris	Bamboo	Poaceae	Herb
20	Asparagus racemosus	Shatavari	Asparagaceae	Herb
21	Phyllanthus niruri	Bhuiawala	Phyllanthaceae	Tree
22	Santalum album	Chandan	Santalaceae	Tree
23	Ziziphus jujuba	Bor	Rhamnaceae	Tree
24	Murraya coenigii	Curry leaves	Rutaceae	Tree
25	Tinospora cordifolia	Gulvel	Menispermaceae	Climber
26	Hibiscus rosasinensis	Hibiscus	Malvaceae	Shrub
27	Tectona grandis	Teak	Verbinaceae	Tree
28	Rosa indica	Rose	Rosaceae	Shrub
29	Psidium guajava	Gauva	Myrtaceae	Tree

Sr.No.	Botanical Name	Common Name	Family	Habit
30	Magnifera indica	Mango	Anacadriaceae	Tree
31	Casurina equisetifolia	Suru	Casurinaceae	Tree
32	Oscimum sanctum	Tulsi	Lamiaceae	Herb
33	Tobernmontena divarticantana	Chandani	Apocynaceae	Tree
34	Solanum surattense	Kantkari	Solanaceae	Creeping
35	Mentha piperita	Pudina	Lamiaceae	Herb
36	Chrysanthemum morifolium	Shevanti	Asteraceae	Herb
37	Morus alba	Tuti	Moraceae	Tree
38	Ixora coccinea	Ixora	Rubiaceae	Shrub
39	Solanum nigrum	Black night shade	Solanaceae	Herb
40	Aegle marmelos	Bael	Rutaceae	Tree
41	Annona squamosa	Custard	Annonaceae	Tree
42	Punica granatum	Pomergranate	Lythraceae	Shrub
43	Terminalia catapa	Almond	Combrytaceae	Tree
44	Clitoria ternatea	Gokarn	Fabaceae	Herb
45	Tecoma stans		Bignoniaceae	Shrub
46	Zea mays	Maize	Poaceae	Grass
47	Triticum aestivum	Wheat	Poaceae	Grass
48	Ficus benghalensis	Fig	Moraceae	Tree
49	Nyctanthus arbertensis	Parijatak	Verbenaceae	Tree
50	Delonix regia	Gulmohor	Fabaceae	Tree
51	Maytenus sengalensis	Henkal	Celastraceae	Shrub
52	Tradescantia spathacea	Rhoebud	Commelinaceae	Herb
53	Datura metal	Kala Dhotra	Solanaceae	Herb
54	Datura stromium	Dhotra	Solanaceae	Herb
55	Milingtonia hortensis	Buch	Bignoniaceae	Tree
56	Nerium oleander	Kaner	Apocynaceae	Shrub
57	Nerium sps	Kaner	Apocynaceae	Shrub
58	Nerium sps	Kaner	Apocynaceae	Shrub
59	Nerium sps	Kaner	Apocynaceae	Shrub
60	Eucalyptus globules	Nilgiri	Myrtaceae	Tree

Sr.No.	Botanical Name	Common Name	Family	Habit
61	Syzium cumini	Jambhul	Myrtaceae	Tree
62	Chromolenaodorata		Asteraceae	Herb
63	Plumeria rubra	Chapha	Apocynaceae	Tree
64	Hemerocalis fulva	Spider lily	Asphodelaceae	Herb
65	Hymenocalis caribaea	White lily	Amaryllidaceae	Herb
66	Cordyline fruticosa	Red drecenae	Asparagaceae	Herb
67	Ailanthus excelsa	Maharukh	Simaroubaceae	Herb
68	Acalypha indica		Euphorbiaceae	Herb
69	Tamarindus indicus	Chinch	Fabaceae	Tree
70		Sursuri	Asteraceae	Herb
71	Acalypha wilkesiana	Copper leave	Euphorbiaceae	Shrub
72	Bauhnia purpurea	Kanchan	Fabaceae	Tree
73	Centipeda minima		Asteraceae	Herb
74	Anemone sp.			
75	Albizzia saman			
Ornamental Plant				
1	Durant rapens	Duranta	Verbenaceae	Shrub
2	Ficus benjamina	Weeping fig	Moraceae	Tree
3	Cynadon dactylon	Durva	Poaceae	Runner
4	Euphorbia cotinifolia	Smoke tree	Euphorbiaceae	Shrub
5	Ficus benjamina varigata	Starlight	Moraceae	Tree
6	Solenostemon scuteloides		Lamiaceae	Herb
7	Asparagus setaces		Asparagaceae	Climbing
8	Dieffenbachia seguine	Dumbcane	Araceae	Herb
9	Dracena marginata	Draceana	Asparagaceae	Herb
10	Dracena sps.	Draceana	Asparagaceae	Herb
Cactus				
1	Echeveria elegans	Chick & hen	Crassulaceae	Herb
2	Aloe barbadensis	Aloe	Liliaceae	Herb
3	Euphorbia tricauli	Firestick	Euphorbiaceae	Herb
4	Sanseviera	Snake Plant		Herb

Sr.No.	Botanical Name	Common Name	Family	Habit
5	Euphorbia maculate	Prostrate	Euphorbiaceae	Creeping
6	Euphorbia	Saber	Euphorbiaceae	Shrub
7	Opuntia stricta	Opuntia	Cactaceae	Shrub
8	Euphorbia milli		Euphorbiaceae	Herb
9	Bryophyllum daigremonitum	Panfuti	Crassulaceae	Herb
Gymnosperms				
1	Thuja orientalis	Thuja	Cupressaceae	Shrub
2	Aurocaria heterphylla	Christmas tree	Aurocaraceae	Tree
3	Cycus revoluta	cycas	Cycadaceae	Shrub
Pteridophytes				
1	Asplenium trichomanes	Fern	Aspleniaceae	Herb

Algae					
Sr.No.	**Genus**	**Phylum**	**Class**	**Order**	**Family**
1	Nostoc	Cyanophyta	Cyanopsidacae	Nosocales	Nostocaceae
2	Spirogyra	Charophyta	Zygnematophycaceae	Zygnematales	Zygnemataceae
3	Botrydium	Xanthophyta	Xanthophyaceae	Botrydiales	Botrydiaceae
4	Anabena	Cyanophyta	Hormogoneae	Nostocales	Nostocaceae
Fungi					
1	Polyoporus	Basidiomycota	Agricomycetes	Polyporales	Polyporaceae
2	Cercospora	Ascomycota	Dothideomycetes	Capnodiales	Mycosphaerellaceae
3	Rhizopus	Zygomycota	Mycotina	Mucorales	Mucoraceae
4	Mucor	Zygomycota	Mucromycotina	Mucorales	Mucoraceae
5	Albugo	Heterocanta	Oomycetes	Peronosporales	Albuginaceae

Below are the some photographs of tree plantation activity









Use of Solar PV System for power Generation

College has installed 7.2 kW solar PV plant to generate the electricity through solar energy. Solar power plant is generating almost 9700 units annually which results in reduction of 7.8 Tons of CO_2 emission

Following are the some actual images of installed solar PV plant

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Rain Water Harvesting

Rain water which is accumulated on terrace of different building is getting utiliesed by means of rain water harvesting system. Water from the various buildings is transferred to the main well

Following are the same images of actual system

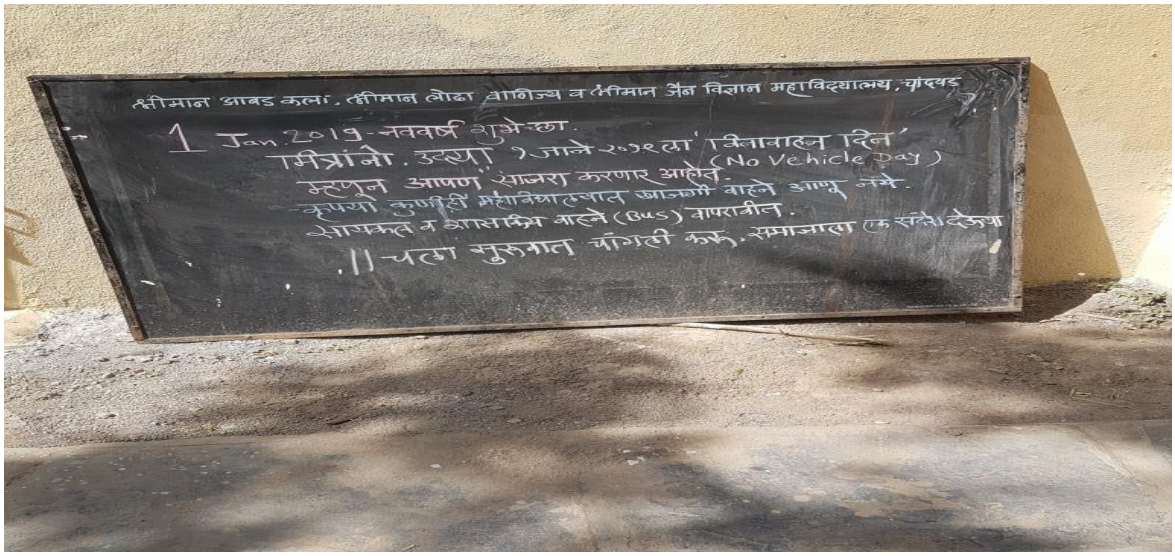
Vermicomposting Plant

College has taken initiative to compost the daily solid waste by means of vermicmpost plant. It generates the valuable compost which has been utilized in college campus garden area

Following are the some actual photographs of vermicomposting plant

No Vehicle Day

College has taken initiative and celebrated no vehicle day in college on 01 January 2019. It helps help students and staff understand the importance of environmental protection and be mindful about saving energy.



Scope for Improvement

E Waste Management

Electronic waste or e-waste describes discarded electrical or electronic devices. Used electronics which are destined for reuse, resale, salvage, recycling, or disposal are also considered e-waste. Informal processing of e-waste in developing countries can lead to adverse human health effects and environmental pollution.

Electronic scrap components, such as CPUs, contain potentially harmful components such as lead, cadmium, beryllium, or brominated flame retardants. Recycling and disposal of e-waste may involve significant risk to health of workers and communities in developed countries and great care must be taken to avoid unsafe exposure in recycling operations and leaking of materials such as heavy metals from landfills and incinerator ashes.

College need to have E-waste management policy and all the E-waste disposals generated in the college campus should be disposed/ reuse as per standard procedures/norms

The environmental impact of the processing of different electronic waste components

E-Waste Component	Process Used	Potential Environmental Hazard
Cathode ray tubes (used in TVs, computer monitors, ATM, video cameras, and more)	Breaking and removal of yoke, then dumping	Lead, barium and other heavy metals leaching into the ground water and release of toxic phosphor
Printed circuit board (image behind table – a thin plate on which chips and other electronic components are placed)	De-soldering and removal of computer chips; open burning and acid baths to remove metals after chips are removed.	Air emissions and discharge into rivers of glass dust, tin, lead, brominated dioxin, beryllium cadmium, and mercury
Chips and other gold plated components	Chemical stripping using nitric and hydrochloric acid and burning of chips	PAHs, heavy metals, brominated flame retardants discharged directly into rivers acidifying fish and flora. Tin and lead contamination of surface and groundwater. Air emissions of brominated dioxins, heavy metals, and PAHs
Plastics from printers, keyboards, monitors, etc.	Shredding and low temp melting to be reused	Emissions of brominated dioxins, heavy metals, and hydrocarbons
Computer wires	Open burning and stripping to remove copper	PAHs released into air, water, and soil.

Plastic Free and Paper Free Campus

Concept of plastic free and paper free campus can be successfully implemented in the college. Management need to take initiative to make the policy for same. It will help to do reduce the use of plastic and papers which will be a good contribution towards sustainable environment

Special Note:

Due to Covid -19 Pandemic situations there was offline mode of education for the students hence there was no additional requirement of the energy. Whatever the sources and infrastructure was existing was continued as it is.