

**Energy, Environmental & Green Audit Report**  
**of**  
**Santhiram Engineering College**  
**Nandyal-518501**



**Submitted By**

**Dr V Siva Reddy**  
Energy Auditor & Professor  
Certification Number EA-20245

## Energy, Environmental & Green Audit Completion Certificate

This is certified that following utility has carried out Energy, Environmental & Green Audit as per guidelines laid down in the energy conservation, Act 2001, in the month of April 2021

<b>Name of the Institute</b>	Santhiram Engineering College
<b>Details Facilities Audited</b>	All departments, laboratories, Principal office, Library, Etc.
<b>Date of Energy, Environmental &amp; Green Audit</b>	April 1-16, 2021
<b>Name of the Certified Energy Auditor</b>	Dr V. Siva Reddy
<b>Certification Number</b>	EA-20245
<b>Validity of Certificate</b>	April 16, 2022

  
Signature of Auditor  


### Executive Summary – Energy Audit

Sr. No.	Area	Proposed Action	Expected Result	Saving Potential kWh	Monetary Saving (Rs.)	Investment (Rs.)	Simple Payback Period (Months)
1	Lighting Recommendations 1 -(FTL-40W)	Replace FTL-36W Conventional fitting with 1x18W Led Tube Light.	Replace the existing 36 W FTL tube lights into 18 W LED tubes <ul style="list-style-type: none"> <li>• Total No. of light fittings = 127 Nos.</li> <li>• Total No. of light fittings to be replace= 100Nos.</li> <li>• Present Energy Consumption = 655 kWh</li> <li>• Expected Energy Consumption = 327 kWh</li> <li>• Total Energy Saved per Month = 655-327= 328 kWh</li> </ul>	328	2505	45000	18
2	Fan system(Ceiling Fan)	Replace present ceiling fan Consuming 70W with energy efficient fans consuming40.	<ul style="list-style-type: none"> <li>• Total No. of ceiling fans present = 346 Nos.</li> <li>• Total No. of ceiling fans presently operated= 346 Nos.</li> <li>• Total No. of ceiling fans to be replace= 250 Nos.</li> <li>• Present Energy Consumption = 3185 kWh</li> <li>• Expected Energy Consumption = 1820 kWh</li> <li>• Total Energy Saved per Month = 3185-1820 = 1365 kWh</li> </ul>	1365	10442	212500	20
3	AC System	Replace present AC Consuming 1800W for 1.5 TR with energy efficient AC consuming 890 W for 1.5 TR.	<ul style="list-style-type: none"> <li>• Total No. of AC present = 23 Nos.</li> <li>• Total No. of AC presently operated= 23 Nos.</li> <li>• Total No. of AC to be replace= 15 Nos.</li> <li>• Present Energy Consumption = 4914 kWh</li> <li>• Expected Energy Consumption = 2430 kWh</li> <li>• Total Energy Saved per Month = 4914 -2430 = 2484 kWh</li> </ul>	2484	19005	570000	30



### Executive Summary – Environmental Audit

Sr.No	Area	Observations	Remark
1	Air Quality	It shows that there are very less polluted particles in ambient air; AQI for Particulate matter, SO <sub>2</sub> & NO <sub>2</sub> parameters are within the range of Indian living standards.	There are a number of factors responsible for this cleanliness, in this area. Firstly, camps surrounded with agriculture activities. Secondly, in this area more trees have been planted as compared to other places.
2	Water Quality	The water quality indicators like Colour, Odour, Taste, Turbidity, Total Dissolved solids, Alkalinity, pH value and Chloride are within the range of Indian standard Limits.	Institute is maintaining safe and clean drinking water.
3	Noise level	Noise levels of the Institute under permissible limits (45 dB -60 dB)	The Institute is away from the city center. So, noise levels under permissible limits
4	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



### Executive Summary – Green Audit

Sr.No	Area	Observations	Remark
1	Awareness and use of renewable energy	Renewable energy such as solar water heater is effectively used in college hostels and canteens Awareness program has been also carried out annually in nearby villages about use of solar energy such as solar cooker, water heater, etc	Good initiative taken by college toward use of renewable energy
2	Solid Waste Management	At present, Waste generated by college is sent to Nandyal Municipality, Andhra Pradesh -18501	Sewage treatment plant can be installed in future to reuse the flushed water.
3	Liquid Waste Management	At present, processing of the liquid waste water system is available and same processed water is using for gardening purpose.	Good initiative taken by college towards use of recycler
4	E waste Management	At present, E -waste generated by college is sent to Green Waves Environment, Andhra Pradesh -530026	
5	Rain Water Harvesting	At present, rain water harvesting system of 1500 L is available in the college campus. College has planned to make enhance the capacity of the system in coming months. Also same water has been used for gardening purpose	Good initiative taken by college towards use of rain water harvesting system to make the water available in summer seasons
6	Plastic and Paper free campus	Initiative has been taken by college administrative to make the campus plastic and paper free. Most of the information is now shared to the faculty and students by email and social media applications rather than paper notice.	Good initiative by college towards to implement plastic free campus



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## **Acknowledgement**

RGMCET Energy auditor extends gratitude to Santhiram Engineering College (SREC) for extending us the opportunity to conduct the Energy, Environmental & 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 distinguished personnel's of Santhiram Engineering College (SREC) in person for the diligent involvement and cooperation.

Dr. Makam Venkata Subramanyam

Mr. M. SivaRam

Dr.M.Santhiramudu

Principal

Managing Director

Chairman

## **About College**

Santhiram Engineering College (SREC) is sponsored by M/s Sri Shirdi Sai Educational Academy, Nandyal. SREC is established under the able guidance of Dr. M. Santhiramudu, Chairman in the year 2007 with a noble motto “Education for peace and progress”. SREC is approved by AICTE, New Delhi: Recognized by UGC under 2(f) and 12 (B): Permanently Affiliated to JNTUA, Ananthapuramu: Certified to an ISO 9001:2015. The college is ranked as one of the Best Engineering Colleges of JNTUA. Ananthapuramu.

SREC is situated on NH-40, 12 KM away from Nandyal, Kurnool Dist. Andhra Pradesh. It is a learning abode for 1600+ Students. The Campus is pollution free and its serene environment is ideally suited for academic activities. Our goal is to produce Engineers and Managers who can contribute to the progress of the Nation and the World through excellent Scientific, Technical Innovations and Research Activities.

They are in high spirits and our mirth knows no boundaries to announce that our SREC, the pioneer of value-based education, has been awarded the Permanent Affiliation for the branches viz. CSE, ECE, MECH & EEE to the JNTU University, Anantapuram

### **Vision**

To become a nucleus for pursuing technical education and pool industrial research and developmental activities with social-conscious and global standards.

### **Mission**

1. To provide Advanced Educational Programs and prepare students to achieve success and take leading roles in their chosen fields of specialization by arising a self-sustained University.
2. To establish postgraduate programs in the current and Advanced Technologies.
3. To establish an R&D Consultancy through developing Industry Institute Interaction, building up exceptional infrastructure.
4. To propel every individual, realize and act for the technical development of the society.

### **Our Motto**

Education for Peace and Progress



## 1. Energy Audit

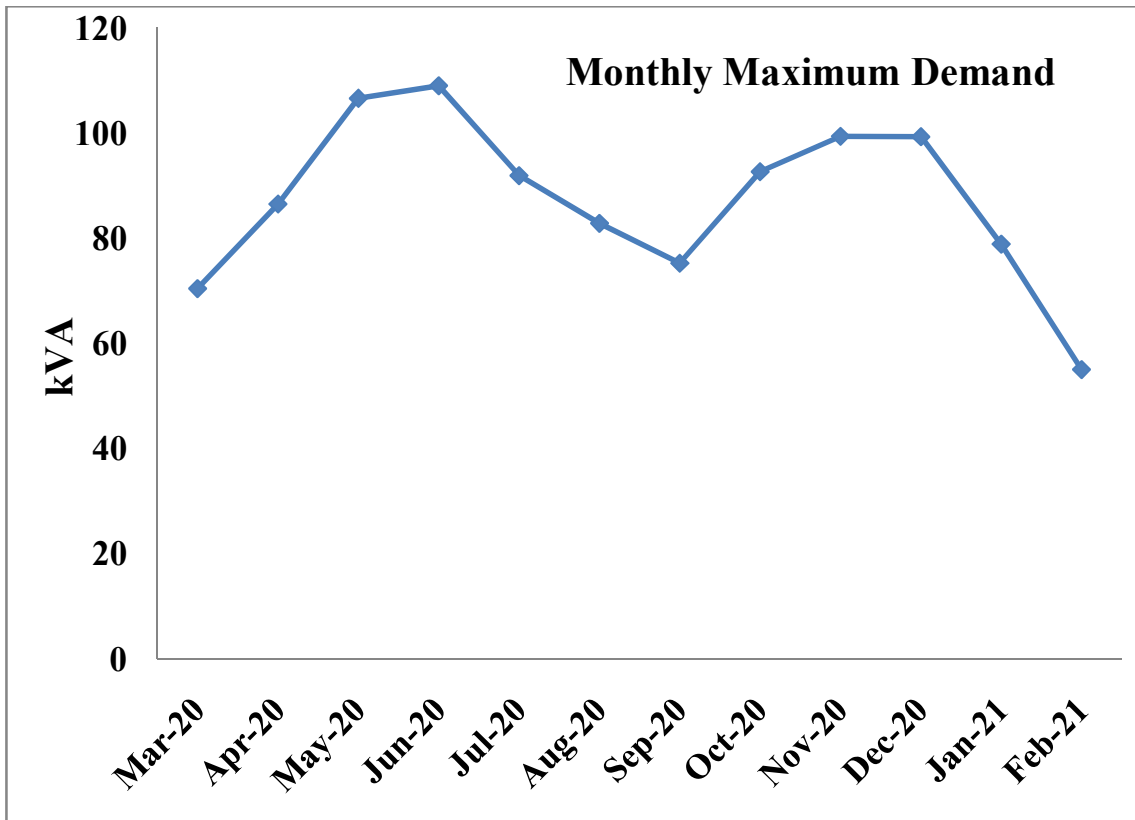
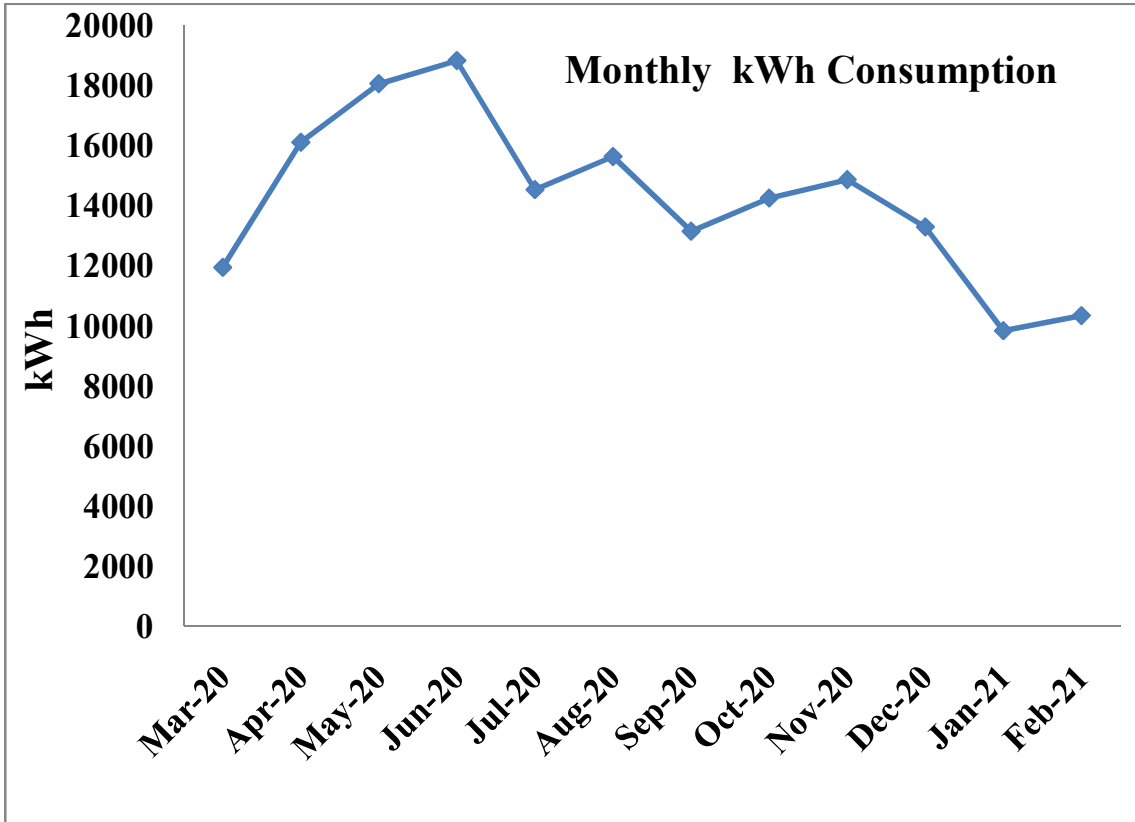
An energy audit is an inspection, survey and analysis of energy flows, for energy conservation in a building, process or system to reduce the amount of energy input into the system without negatively affecting the output(s). In commercial and industrial real estate, an energy audit is the first step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

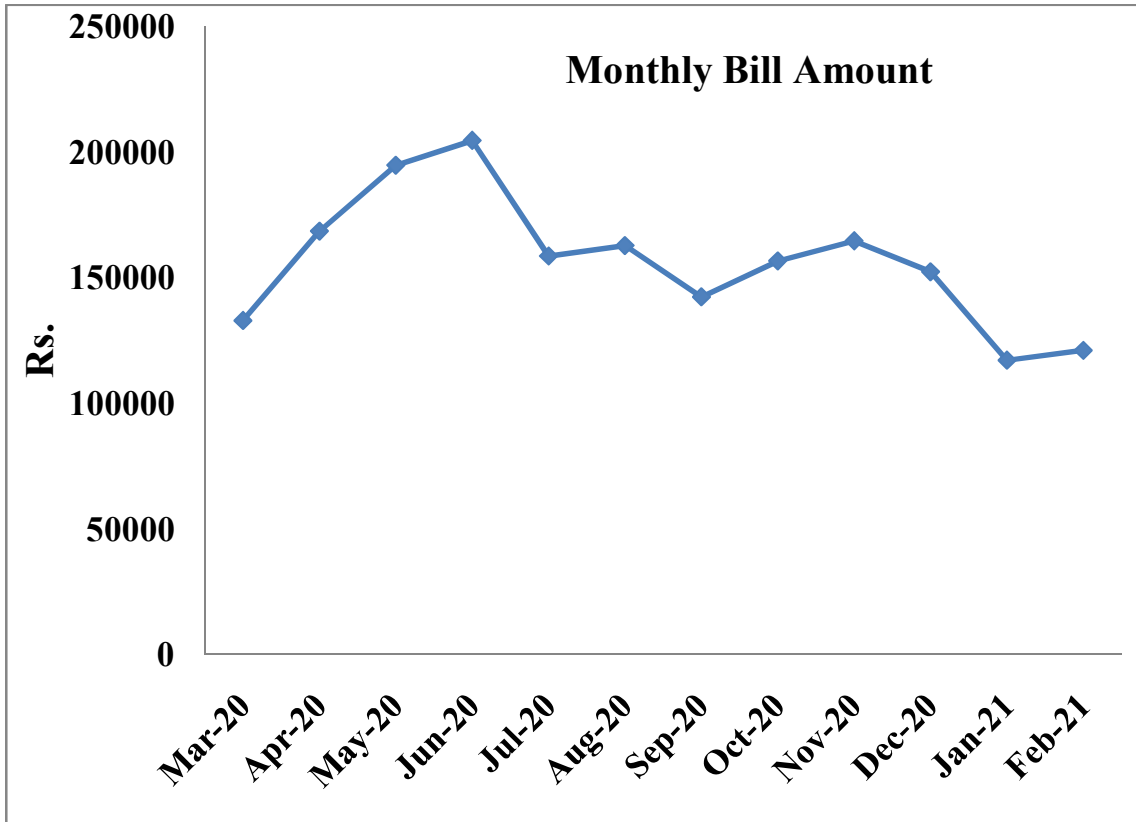
### 1.1. Electricity Bill Analysis

At present, one electricity meter is there for all campus

Bill analysis for consumer number KNL361 shown below

Month	KWh Unit	Bill Demand(KVA)	Max Demand(KVA)	Energy Charges(Rs.)	Demand Charges(Rs.)	P.F	Penalty (Rs)	Bill Amt	Unit/Rate (Rs.)
Mar-20	11944	100	70.40	91491.00	38000	0.99	0	132845	7.65
Apr-20	16106	100	86.49	123372.00	41082.75	0.99	0	168380	7.65
May-20	18060	100	106.6	138159.00	53770	0.99	6270	194628	7.65
Jun-20	18829	100	109	144041.90	56050	0.99	8550	204481	7.65
Jul-20	14532	100	91.90	111169.80	43652.50	0.99	0	158497	7.65
Aug-20	15634	100	82.81	119600.10	39334.75	0.99	0	162683	7.65
Sep-20	13148	100	75.22	100582.20	38000	0.99	0	142223	7.65
Oct-20	14253	100	92.64	109035.20	44004	0.99	0	156545	7.65
Nov-20	14865	100	99.39	113717.30	47210.25	0.99	0	164545	7.65
Dec-20	13291	100	99.3	101676.20	47167.50	0.99	0	152252	7.65
Jan-21	9839	100	78.87	75268.40	38000	0.99	0	117031	7.65
Feb-21	10344	100	55	79131.60	38000	0.99	0	120952	7.65





### 1.2.Observations

- Monthly average energy consumption is 14237 kWh
- Monthly average maximum demand is 87.30 kVA
- Monthly average power factor is 0.99
- Monthly average electricity bill is Rs. 156255/-
- Avg. unit rate is 7.65 Rs./kWh

## 2. CONNECTED LOAD LIST

### Labs

S.NO	Room Name or Number	Type of load	Number	Capacity Watts	Volume (L×W×H)Meters	Load in kW	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
1	420	Light	4	36	12.6×10.15×3.45	0.144	7	182	1.008	26.208
		Fan	9	70		0.63	7	182	4.41	114.66
2	421	Light	6	36	12.6×10.15×3.45	0.216	7	182	1.512	39.312
		Fan	6	70		0.42	7	182	2.94	76.44
3	422	Light	4	36	12.6×10.15×3.45	0.144	7	182	1.008	26.208
		Fan	6	70		0.42	7	182	2.94	76.44
4	423	Light	4	36	12.6×10.15×3.45	0.144	7	182	1.008	26.208
		Fan	6	70		0.42	7	182	2.94	76.44
5	317	Light	25	15	17×10.15×2.75	0.375	7	182	2.625	68.25
		Fan	12	70		0.84	7	182	5.88	152.88
		AC (1.5 T)	4	1800		7.2	7	182	50.4	1310.4
6	319	Light	30	15	17×10.15×2.75	0.45	7	182	3.15	81.9
		Fan	8	70		0.56	7	182	3.92	101.92
		AC (1.5 T)	4	1800		7.2	7	182	50.4	1310.4
7	320	Light	6	36	12.6×10.15×3.45	0.216	7	182	1.512	39.312
		Fan	9	70		0.63	7	182	4.41	114.66
8	321	Light	4	36	12.6×10.15×3.45	0.144	7	182	1.008	26.208
		Fan	8	70		0.56	7	182	3.92	101.92

S.NO	Room Name or Number	Type of load	Number	Capacity Watts	Volume (L×W×H)Meters	Load in kW	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
9	322	Light	4	36	12.6×10.15×3.45	0.144	7	182	1.008	26.208
		Fan	9	70		0.63	7	182	4.41	114.66
10	318	Light	2	36	3.95×10.15×3.45	0.072	7	182	0.504	13.104
		Fan	1	70		0.07	7	182	0.49	12.74
		AC (1.5 T)	1	1800		1.8	7	182	12.6	327.6
11	217	Light	16	36	33.95×10.15×3.45	0.576	7	182	4.032	104.832
		Fan	24	70		1.68	7	182	11.76	305.76
12	218	Light	2	36	4.05×10.15×3.45	0.072	7	182	0.504	13.104
		Fan	3	70		0.21	7	182	1.47	38.22
13	219	Light	4	36	12.6×10.15×3.45	0.144	7	182	1.008	26.208
		Fan	9	70		0.63	7	182	4.41	114.66
14	220	Light	4	36	12.6×10.15×3.45	0.144	7	182	1.008	26.208
		Fan	9	70		0.63	7	182	4.41	114.66
15	221	Light	3	36	12.6×10.15×3.45	0.108	7	182	0.756	19.656
		Fan	9	70		0.63	7	182	4.41	114.66
16	103	Light	3	36	8.35×7.95×3.45	0.108	7	182	0.756	19.656
		Fan	4	70		0.28	7	182	1.96	50.96
17	113	Light	3	20	12.6×7.95×3.45	0.06	7	182	0.42	10.92
		Light	7	36		0.252	7	182	1.764	45.864
		Fan	6	70		0.42	7	182	2.94	76.44
		AC (1.5 T)	3	1800		5.4	7	182	37.8	982.8

S.NO	Room Name or Number	Type of load	Number	Capacity Watts	Volume (L×W×H)Meters	Load in kW	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
18	114	Light	8	36	12.6×7.95×3.45	0.288	7	182	2.016	52.416
		Fan	6	70		0.42	7	182	2.94	76.44
		AC (1.5 T)	3	1800		5.4	7	182	37.8	982.8
19	124	Light	8	36	12.6×10.15×3.45	0.288	7	182	2.016	52.416
		Fan	9	70		0.63	7	182	4.41	114.66
20	123	Light	8	36	12.6×10.15×3.45	0.288	7	182	2.016	52.416
		Fan	6	70		0.42	7	182	2.94	76.44
21	122	Light	8	36	12.6×10.15×3.45	0.288	7	182	2.016	52.416
		Fan	6	70		0.42	7	182	2.94	76.44
22	120	Light	4	36	8.35×7.95×3.45	0.144	7	182	1.008	26.208
		Fan	6	70		0.42	7	182	2.94	76.44
23	115	Light	10	15	8.35×7.95×2.85	0.15	7	182	1.05	27.3
		Fan	4	70		0.28	7	182	1.96	50.96
		AC (1.5 T)	2	1800		3.6	7	182	25.2	655.2
24	117 & 118	Light	35	15	25.5×10.15×3.45	0.525	7	182	3.675	95.55
		Fan	12	70		0.84	7	182	5.88	152.88
		AC (1.5 T)	4	1800		7.2	7	182	50.4	1310.4

**Staff Room**

S.NO	Room Name or Number	Type of load	Number	Capacity Watts	Volume (L×W×H)Meters	Load in kW	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
1	106	Light	1	36	4.35×2.65×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
2	108	Light	1	36	3.95×3.45×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
3	110	Light	1	36	4.10×3.45×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
4	112	Light	1	36	4.10×2.75×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
5	111	Light	1	36	4.10×3.45×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
6	107	Light	2	36	4.10×3.45×3.45	0.072	7	182	0.504	13.104
		Fan	1	70		0.07	7	182	0.49	12.74
7	211	Light	1	36	4.10×2.75×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
8	210	Light	1	36	4.10×3.45×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
9	209	Light	1	36	4.10×3.45×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74

S.NO	Room Name or Number	Type of load	Number	Capacity Watts	Volume (L×W×H)Meters	Load in kW	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
10	205	Light	1	36	4.10×2.75×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
11	206	Light	1	36	4.10×3.45×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
12	207	Light	1	36	3.95×3.45×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
13	310	Light	1	36	4.10×3.45×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
14	311	Light	1	36	4.10×2.75×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
15	309	Light	1	36	4.10×2.75×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
16	307	Light	1	36	4.10×3.45×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
17	306	Light	1	36	4.10×3.45×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
18	305	Light	1	36	4.10×2.75×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
19	411	Light	1	36	4.10×2.75×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74



S.NO	Room Name or Number	Type of load	Number	Capacity Watts	Volume (L×W×H)Meters	Load in kW	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
20	410	Light	1	36	4.10×3.45×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
21	409	Light	1	36	4.10×3.45×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
22	405	Light	1	36	4.10×3.45×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
23	406	Light	1	36	4.10×3.45×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74
24	407	Light	1	36	4.10×3.45×3.45	0.036	7	182	0.252	6.552
		Fan	1	70		0.07	7	182	0.49	12.74

### Administration Section

S.NO	Room Name or Number	Type of load	Number	Capacity Watts	Volume (L×W×H)Meters	Load in kW	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
1	104 Administrative	Light	2	20	8.35×7.95×3.45	0.04	7	182	0.28	7.28
		Light	6	36		0.216	7	182	1.512	39.312
		Fan	5	70		0.35	7	182	2.45	63.7
2	105 Academic section	Light	5	36	8.35×7.95×3.45	0.18	7	182	1.26	32.76
		Fan	4	70		0.28	7	182	1.96	50.96
3	109 Principal	Light	12	5	8.35×3.95×3.45	0.06	7	182	0.42	10.92
		Light	1	36		0.036	7	182	0.252	6.552
		Fan	3	70		0.21	7	182	1.47	38.22
		AC (1.5 T)	1	1800		1.8	7	182	12.6	327.6
4	208 Training section	Light	2	5	8.35×3.95×3.45	0.01	7	182	0.07	1.82
		Light	3	20		0.06	7	182	0.42	10.92
		Fan	3	70		0.21	7	182	1.47	38.22
		AC (1.5 T)	1	1800		1.8	7	182	12.6	327.6
5	308 ECE HOD	Light	2	5	8.35×3.95×3.45	0.01	7	182	0.07	1.82
		Light	2	36		0.072	7	182	0.504	13.104
		Fan	2	70		0.14	7	182	0.98	25.48
6	408 CSE HOD	Light	2	5	8.35×3.95×3.45	0.01	7	182	0.07	1.82
		Light	2	36		0.072	7	182	0.504	13.104
		Fan	2	70		0.14	7	182	0.98	25.48
7	Store Room	Light	1	36	8.35×3.95×3.45	0.036	7	182	0.252	6.552
		Fan	2	70		0.14	7	182	0.98	25.48

### Class Room

S.NO	Room Name or Number	Type of load	Number	Capacity Watts	Volume (L×W×H)Meters	Load in kW	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
1	201	Light	4	20	8.35×7.95×3.45	0.08	7	182	0.56	14.56
		Fan	4	70		0.28	7	182	1.96	50.96
2	202	Light	4	20	8.35×7.95×3.45	0.08	7	182	0.56	14.56
		Fan	4	70		0.28	7	182	1.96	50.96
3	203	Light	4	20	8.35×7.95×3.45	0.08	7	182	0.56	14.56
		Fan	4	70		0.28	7	182	1.96	50.96
4	204	Light	4	20	8.35×7.95×3.45	0.08	7	182	0.56	14.56
		Fan	4	70		0.28	7	182	1.96	50.96
5	212	Light	4	20	8.35×7.95×3.45	0.08	7	182	0.56	14.56
		Fan	4	70		0.28	7	182	1.96	50.96
6	213	Light	4	20	8.35×7.95×3.45	0.08	7	182	0.56	14.56
		Fan	4	70		0.28	7	182	1.96	50.96
7	214	Light	4	20	8.35×7.95×3.45	0.08	7	182	0.56	14.56
		Fan	4	70		0.28	7	182	1.96	50.96
8	215	Light	4	20	8.35×7.95×3.45	0.08	7	182	0.56	14.56
		Fan	4	70		0.28	7	182	1.96	50.96
9	301	Light	3	36	8.35×7.95×3.45	0.108	7	182	0.756	19.656
		Fan	4	70		0.28	7	182	1.96	50.96

S.NO	Room Name or Number	Type of load	Number	Capacity Watts	Volume (L×W×H)Meters	Load in kW	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
10	302	Light	3	36	8.35×7.95×3.45	0.108	7	182	0.756	19.656
		Fan	4	70		0.28	7	182	1.96	50.96
11	303	Light	3	36	8.35×7.95×3.45	0.108	7	182	0.756	19.656
		Fan	4	70		0.28	7	182	1.96	50.96
12	304	Light	3	36	8.35×7.95×3.45	0.108	7	182	0.756	19.656
		Fan	4	70		0.28	7	182	1.96	50.96
13	312	Light	3	36	8.35×7.95×3.45	0.108	7	182	0.756	19.656
		Fan	4	70		0.28	7	182	1.96	50.96
14	313	Light	3	36	8.35×7.95×3.45	0.108	7	182	0.756	19.656
		Fan	4	70		0.28	7	182	1.96	50.96
15	314	Light	3	36	8.35×7.95×3.45	0.108	7	182	0.756	19.656
		Fan	4	70		0.28	7	182	1.96	50.96
16	315	Light	3	36	8.35×7.95×3.45	0.108	7	182	0.756	19.656
		Fan	4	70		0.28	7	182	1.96	50.96
17	401	Light	3	36	8.35×7.95×3.45	0.108	7	182	0.756	19.656
		Fan	4	70		0.28	7	182	1.96	50.96
18	402	Light	3	36	8.35×7.95×3.45	0.108	7	182	0.756	19.656
		Fan	4	70		0.28	7	182	1.96	50.96

S.NO	Room Name or Number	Type of load	Number	Capacity Watts	Volume (L×W×H)Meters	Load in kW	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
19	403,404,DH	Light	11	36	16.35×7.95×3.45	0.396	7	182	2.772	72.072
		Fan	8	70		0.56	7	182	3.92	101.92
20	412	Light	2	36	8.35×7.95×3.45	0.072	7	182	0.504	13.104
		Fan	4	70		0.28	7	182	1.96	50.96
21	413	Light	2	36	8.35×7.95×3.45	0.072	7	182	0.504	13.104
		Fan	4	70		0.28	7	182	1.96	50.96
22	414	Light	2	36	8.35×7.95×3.45	0.072	7	182	0.504	13.104
		Fan	4	70		0.28	7	182	1.96	50.96
23	415	Light	2	36	8.35×7.95×3.45	0.072	7	182	0.504	13.104
		Fan	4	70		0.28	7	182	1.96	50.96
24	417	Light	5	20	8.35×10.2×3.45	0.1	7	182	0.7	18.2
		Fan	6	70		0.42	7	182	2.94	76.44
25	418	Light	5	20	8.35×10.2×3.45	0.1	7	182	0.7	18.2
		Fan	6	70		0.42	7	182	2.94	76.44
26	419	Light	5	20	8.35×10.2×3.45	0.1	7	182	0.7	18.2
		Fan	6	70		0.42	7	182	2.94	76.44
1	Corridor	Light	63	36		2.268	7	182	15.876	412.776
		Refrigerator	7	100		0.7	7	182	4.9	127.4

### Lab Equipments

S.No	Name of Equipment	No	Capacity in (kW)	Load in (kW)	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
1	DC Shunt Motor	6	3.7	22.2	3	36	66.6	799.2
2	DC Compound Motor	3	3.7	11.1	3	36	33.3	399.6
3	DC Series Motor	1	3.7	3.7	3	36	11.1	133.2
4	1-ph Generator Motor	1	0.75	0.75	3	36	2.25	27
5	3-ph Generator Motor	3	3.7	11.1	3	36	33.3	399.6
6	Lathe Machine	1	1.5	1.5	3	36	4.5	54
7	Machine tools	9	0.75	6.75	3	36	20.25	243
8	Shaping, etc	10	0.37	3.7	3	36	11.1	133.2
9	Cutting	1	2.3	2.3	3	36	6.9	82.8
10	Compressor	1	1.6	1.6	3	36	4.8	57.6
11	Pelton Turbine Testing	1	1.5	1.5	3	36	4.5	54
12	Tilting frame	1	2.2	2.2	3	36	6.6	79.2
13	Wood turning	1	2.2	2.2	3	36	6.6	79.2
14	Frances Turbine Testing	1	1.5	1.5	3	36	4.5	54
15	Heat Transfer	1	1.5	1.5	3	36	4.5	54
16	Electrical Blower	1	1.8	1.8	3	36	5.4	64.8

### 3. ENERGY SAVING MEASURE

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

##### Labs

S.NO	Room Name or Number	Number	Capacity Watts	Load in kW	Monthly hr	Monthly kWh	Change	New Capacity W	Load in kW	Monthly kWh	Saving kWh	Saving (Rs.)	Unit cost (Rs.)	Total Inv (Rs)	Payback Period in months
1	420	4	36	0.144	182	26.208	18W Led Tube light	18	0.072	13.104	13.104	100	450	1800	18
2	421	6	36	0.216	182	39.312		18	0.108	19.656	19.656	150	450	2700	18
3	422	4	36	0.144	182	26.208		18	0.072	13.104	13.104	100	450	1800	18
4	423	4	36	0.144	182	26.208		18	0.072	13.104	13.104	100	450	1800	18
5	320	6	36	0.216	182	39.312		18	0.108	19.656	19.656	150	450	2700	18
6	321	4	36	0.144	182	26.208		18	0.072	13.104	13.104	100	450	1800	18
7	322	4	36	0.144	182	26.208		18	0.072	13.104	13.104	100	450	1800	18
8	318	2	36	0.072	182	13.104		18	0.036	6.552	6.552	50	450	900	18
9	217	16	36	0.576	182	104.83		18	0.288	52.415	52.415	401	450	7200	18
10	218	2	36	0.072	182	13.104		18	0.036	6.552	6.552	50	450	900	18
11	219	4	36	0.144	182	26.208		18	0.072	13.104	13.104	100	450	1800	18
12	220	4	36	0.144	182	26.208		18	0.072	13.104	13.104	100	450	1800	18
13	221	3	36	0.108	182	19.656		18	0.054	9.828	9.828	75	450	1350	18
14	103	3	36	0.108	182	19.656		18	0.054	9.828	9.828	75	450	1350	18
15	113	7	36	0.252	182	45.864		18	0.126	22.932	22.932	175	450	3150	18
16	114	16	36	0.576	182	104.83		18	0.288	52.415	52.415	401	450	7200	18
17	124	2	36	0.072	182	13.104		18	0.036	6.552	6.552	50	450	900	18
18	123	4	36	0.144	182	26.208		18	0.072	13.104	13.104	100	450	1800	18
19	122	4	36	0.144	182	26.208		18	0.072	13.104	13.104	100	450	1800	18
20	120	3	36	0.108	182	19.656		18	0.054	9.828	9.828	75	450	1350	18

### Staff Room

S.NO	Room Name or Number	Number	Capacity Watts	Load in kW	Monthly hr	Monthly kWh	Change	New Capacity W	Load in kW	Monthly kWh	Saving kWh	Saving (Rs.)	Unit cost (Rs.)	Total Inv (Rs)	Payback Period in months
1	106	1	36	0.036	182	6.552	18W Led Tube light	18	0.018	3.276	3.276	25	450	450	18
2	108	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
3	110	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
4	112	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
5	111	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
6	107	2	36	0.072	182	13.104		18	0.036	6.552	6.552	50	450	900	18
7	211	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
8	210	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
9	209	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
10	205	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
11	206	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
12	207	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
13	310	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
14	311	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
15	309	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
16	307	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
17	306	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
18	305	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
19	411	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
20	410	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
21	409	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
22	405	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
23	406	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18
24	407	1	36	0.036	182	6.552		18	0.018	3.276	3.276	25	450	450	18



### **Lighting Recommendation -1**

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

- Total No. of light fittings = 127 Nos.
- Total No. of light fittings to be replace= 100Nos.
- Present Energy Consumption = 655 kWh
- Expected Energy Consumption = 327 kWh
- Total Energy Saved per Month =  $655-327= 328$  kWh
- Total Saving = 328 kWh
- Monetary Savings = Rs.2505
- Investment = Rs.45000
- Simple Payback period = 18 Months

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

#### Staff Room

S.NO	Room Name or Number	Number	Capacity Watts	Load in kW	Monthly hr	Monthly kWh	Change	New Capacity W	Load in kW	Monthly kWh	Saving kWh	Saving (Rs.)	Unit cost (Rs.)	Total Inv (Rs)	Payback Period in months
1	106	1	70	0.070	182	12.74	40 W Fans	40	0.040	7.28	5.46	42	850	850	20
2	108	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
3	110	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
4	112	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
5	111	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
6	107	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
7	211	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
8	210	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
9	209	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
10	205	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
11	206	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
12	207	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
13	310	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
14	311	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
15	309	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
16	307	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
17	306	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
18	305	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
19	411	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
20	410	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
21	409	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
22	405	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
23	406	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20
24	407	1	70	0.070	182	12.74		40	0.040	7.28	5.46	42	850	850	20

### Labs

S. N O	Room Name or Number	Number	Capacity Watts	Load in kW	Monthly hr	Monthly kWh	Change	New Capacity W	Load in kW	Monthly kWh	Saving kWh	Saving (Rs.)	Unit cost (Rs.)	Total Inv (Rs)	Payback Period in months
1	420	9	70	0.63	182	114.66	40W Fans	40	0.36	65.52	49.14	376	850	7650	20
2	421	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	850	5100	20
3	422	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	850	5100	20
4	423	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	850	5100	20
5	317	12	70	0.84	182	152.88		40	0.48	87.36	65.52	501	850	10200	20
6	319	8	70	0.56	182	101.92		40	0.32	58.24	43.68	334	850	6800	20
7	320	9	70	0.63	182	114.66		40	0.36	65.52	49.14	376	850	7650	20
8	321	8	70	0.56	182	101.92		40	0.32	58.24	43.68	334	850	6800	20
9	322	9	70	0.63	182	114.66		40	0.36	65.52	49.14	376	850	7650	20
10	318	1	70	0.07	182	12.74		40	0.04	7.28	5.46	42	850	850	20
11	217	24	70	1.68	182	305.76		40	0.96	174.72	131.04	1002	850	20400	20
12	218	3	70	0.21	182	38.22		40	0.12	21.84	16.38	125	850	2550	20
13	219	9	70	0.63	182	114.66		40	0.36	65.52	49.14	376	850	7650	20
14	220	9	70	0.63	182	114.66		40	0.36	65.52	49.14	376	850	7650	20
15	221	9	70	0.63	182	114.66		40	0.36	65.52	49.14	376	850	7650	20
16	103	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
17	113	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	850	5100	20
18	114	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	850	5100	20
19	124	9	70	0.63	182	114.66		40	0.36	65.52	49.14	376	850	7650	20
20	123	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	850	5100	20
21	122	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	850	5100	20
22	120	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	850	5100	20
23	115	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
24	117 & 118	12	70	0.84	182	152.88		40	0.48	87.36	65.52	501	850	10200	20

### Class Rooms

S. N O	Room Name or Number	Number	Capacity Watts	Load in kW	Monthly hr	Monthly kWh	Change	New Capacity W	Load in kW	Monthly kWh	Saving kWh	Saving (Rs.)	Unit cost (Rs.)	Total Inv (Rs)	Payback Period in months
1	201	4	70	0.28	182	50.96	40W Fans	40	0.16	29.12	21.84	167	850	3400	20
2	202	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
3	203	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
4	204	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
5	212	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
6	213	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
7	214	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
8	215	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
9	301	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
10	302	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
11	303	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
12	304	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
13	312	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
14	313	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
15	314	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
16	315	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
17	401	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
18	402	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
19	403,404	8	70	0.56	182	101.92		40	0.32	58.24	43.68	334	850	6800	20
20	412	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
21	413	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
22	414	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
23	415	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
24	417	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	850	5100	20
25	418	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	850	5100	20
26	419	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	850	5100	20

### Administration Section

S. N O	Room Name or Number	Number	Capacity Watts	Load in kW	Monthly hr	Monthly kWh	Change	New Capacity W	Load in kW	Monthly kWh	Saving kWh	Saving (Rs.)	Unit cost (Rs.)	Total Inv (Rs)	Payback Period in months
1	104 Administrative	5	70	0.35	182	63.7	40W Fans	40	0.2	36.4	27.3	209	850	4250	20
2	105 Academic section	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	850	3400	20
3	109 Principal	3	70	0.21	182	38.22		40	0.12	21.84	16.38	125	850	2550	20
4	208 Training section	3	70	0.21	182	38.22		40	0.12	21.84	16.38	125	850	2550	20
5	308 ECE HOD	2	70	0.14	182	25.48		40	0.08	14.56	10.92	84	850	1700	20
6	408 CSE HOD	2	70	0.14	182	25.48		40	0.08	14.56	10.92	84	850	1700	20
7	Store Room	2	70	0.14	182	25.48		40	0.08	14.56	10.92	84	850	1700	20

**Fan Recommendation -2**

Replace existing 70 watt conventional ceiling fans with 40 watt energy efficient fans

- Total No. of ceiling fans present = 346 Nos.
- Total No. of ceiling fans presently operated= 346 Nos.
- Total No. of ceiling fans to be replace= 250 Nos.
- Present Energy Consumption = 3185 kWh
- Expected Energy Consumption = 1820 kWh
- Total Energy Saved per Month =  $3185 - 1820 = 1365$  kWh
- Total Saving = 1365 kWh
- Monetary Savings = Rs.10442/-
- Investment = Rs. 212500/-
- Simple Payback period = 20 Months

### 3.3. Energy Saving Measure 3 – Replacement of conventional AC system into 5 Star Inverter AC

S. N O	Room Name or Number	Number	Capacity Watts	Load in kW	Monthly hr	Monthly kWh	Change	New Capacity W	Load in kW	Monthly kWh	Saving kWh	Saving (Rs.)	Unit cost (Rs.)	Total Inv (Rs)	Payback Period in months
1	109 Principal	1	1800	1.8	182	327.6	5 Star Inverter AC 890 W	890	0.89	161.98	165.62	1267	38000	38000	30
2	208 Training section	1	1800	1.8	182	327.6		890	0.89	161.98	165.62	1267	38000	38000	30
3	115	2	1800	3.6	182	655.2		890	1.78	323.96	331.24	2534	38000	76000	30
4	117 & 118	4	1800	7.2	182	1310.4		890	3.56	647.92	662.48	5068	38000	152000	30
5	114	3	1800	5.4	182	982.8		890	2.67	485.94	496.86	3801	38000	114000	30
6	113	3	1800	5.4	182	982.8		890	2.67	485.94	496.86	3801	38000	114000	30
7	318	1	1800	1.8	182	327.6		890	0.89	161.98	165.62	1267	38000	38000	30
	319	4	1800	7.2	182	1310.4		890	3.56	647.92	662.48	5068	38000	152000	30
	317	4	1800	7.2	182	1310.4		890	3.56	647.92	662.48	5068	38000	152000	30

**AC Recommendation -3**

Replace existing 1800 watt conventional AC with 890 watt energy efficient AC

- Total No. of AC present = 23 Nos.
- Total No. of AC presently operated= 23 Nos.
- Total No. of AC to be replace= 15 Nos.
- Present Energy Consumption = 4914 kWh
- Expected Energy Consumption = 2430 kWh
- Total Energy Saved per Month =  $4914 - 2430 = 2484$  kWh
- Total Saving = 2484 kWh
- Monetary Savings = Rs.19005/-
- Investment = Rs. 570000/-
- Simple Payback period = 30 Months



#### 4. REQUIREMENTS OF “NAAC”

##### 4.1. Alternative Energy Initiative

Percentage of power requirement met by renewable energy sources

$$= (\text{Power requirement met by renewable energy sources} / \text{Total energy requirement}) \times 100$$

$$= (350/14237) \times 100$$

$$= \mathbf{2.45\%}$$

##### 4.2. Percentage of lighting power requirement met through LED bulbs

Percentage of lighting power requirement met through LED bulbs

$$= (\text{Lighting power requirement met through LED bulbs} / \text{Total lighting power requirement}) \times 100$$

$$= (1.050 / 10.050)$$

$$= \mathbf{9.95\%}$$

## **5. ENVIRONMENTAL & GREEN AUDIT**

Environmental and 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 Environmental and 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 Environmental and 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 Environmental and 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. Environmental and 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 Environmental and 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.

### **5.1. Goals of Environmental and Green Audit**

- The objective of carrying out Environmental and 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 maintaining quality of air, water and noise levels of Institution
- 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

## **5.2. Benefits of Environmental and 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

## 6. INITIATIVES BY COLLEGE TOWARDS SUSTAINABLE ENVIRONMENT

### 6.1. Air Quality, Water Quality, Noise level and Tree Plantation

#### 6.1.1. Air Quality

The ambient air quality data for Santhiram Engineering College for the last one year shows that there are very less polluted particles in ambient air; AQI for Particulate matter, SO<sub>2</sub> & NO<sub>2</sub> parameters are within the range of Indian living standards, there are a number of factors responsible for this cleanliness. Firstly, campus surrounded with agriculture activities. Secondly, in this area more trees have been planted as compared to other places.

#### Air Quality Determination

Satisfactory air quality index in Santhiram Engineering College, Nandyal, Andhra Pradesh, India on 7<sup>th</sup> July 2020:

Air Pollutants	Values	Permissible limits (As per NAAQS)
Particulate matter PM ( $\mu\text{g}/\text{m}^3$ )	35	100
Sulphur dioxide SO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	2.8	80
Nitrogen dioxide NO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	30	80

Air Quality Index (AQI): Satisfactory Air Quality.

#### 6.1.2. Water Quality

Water quality testing is important because it identifies contaminants and prevents water-borne diseases. Drinking or using contaminated water can result in severe illness or death. That is why it is important to ensure that drinking water is safe, clean and free from bacteria and disease.

The parameters for water quality are determined by the intended use. Work in the area of water quality tends to be focused on water that is treated for human consumption, or in the environment.

The water quality indicators like Colour, Odour, Taste, Turbidity, Total Dissolved solids, Alkalinity, pH value and Chloride are within the range of Indian standard Limits.

Institute is maintaining safe and clean drinking water.

### **6.1.3. Noise level**

The human ear is constantly being assailed by man-made sounds from all sides, and there remain few places in populous areas where relative quiet prevails. There are two basic properties of sound:

- Loudness and Frequency.

Loudness is the strength of sensation of sound perceived by the individual. It is measured in terms of Decibels. Just audible sound is about 10 dB, a whisper about 20 dB, library place 30 dB, normal conversation about 35-60 dB. The loudest sound a person can stand without much discomfort is about 80 dB. Sounds beyond 80 dB can be safely regarded as Pollutant as it harms hearing system. The WHO has fixed 45 dB as the safe noise level for a city. For international standards a noise level up to 65 dB is considered tolerate.

Noise level meter was used to measure the noise level. The noise level was recorded at the different Important Locations of Santhiram Engineering College. At each spot, the measurements were taken for 60 seconds during day time (6 AM- 6 PM) and noted down the measurements.

Noise levels of the Institute under permissible limits (45 dB -60 dB).

### **6.1.4 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.

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<sub>2</sub> 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

## Photo Gallery

Photo-1



Photo-2



Photo-3



Photo-4



Photo-5



Photo-6



Photo-7





Photo-8



Photo-9



Photo-10



Photo-11



Photo-12

## 6.2. Solar Water Heater for Hostel & Solar PV for Lighting

Solar water heaters have been installed at boys and ladies hostel of college. It conserves the energy which is required to heat the water for bathing and washing clothes purpose. Capacity of the hostel solar water heating system is 10000 Litres.

Solar PV plant of capacity 2 kW has been installed and that they are using for street lighting for night time. Installed solar water heater and solar PV system shown in below images.



Solar Water Heater



Solar PV system

### **6.3 Solid Waste & Liquid Waste Management**

The proper disposal of solid and liquid waste is a must in order to maintain a good human and animal health. Because solid and liquid waste has a high amount of dangerous compounds such as salts and metals and high COD & BOD values. Institute wastes, including dangerous and hazardous liquids, can be disposed of by using a wide variety of techniques and methods. At present they are disposing the waste to Nandyal Municipality for treatment and re-use purpose. There is an improvement opportunity for college. Using anaerobic digester for production of biogas and residue can utilize as a vermicompost. Sewage treatment facility can be provided to re-use the waste water for applications other than drinking.

### **6.4 Rain Water Harvesting**

At present, rain water harvesting system of 1500 L is available in the college campus. Rain water which is accumulated on terrace of different building is getting utilised by means of rain water harvesting system. Water from the various Principal block is transferred to the 1500 litre tank as storage. College has planned to make enhance the capacity of the system in coming months. Also same water has been used for gardening purpose

### **6.5 E - Waste Management**

Electronic scrap components, such as CPUs, contain potentially harmful components such as lead, cadmium, beryllium. 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.

At present, E -waste generated by college is sent to Green Waves Environment, Andhra Pradesh -530026 for Recycling and disposal.

## 7. PLASTIC AND PAPER FREE CAMPUS

Initiative has been taken by college administrative to make the campus plastic and paper free. Most of the information is now shared to the faculty and students by email and social media applications rather than paper notice. Also college has organized awareness program for students on above topic. Awareness program conducted in college shown in below image.

