



**PowerTech Energy Solutions**  
Conserve to Consume

# Energy & Green Audit Report Of Scient Institute of Technology, Ibrahimpatnam.



Submitted By  
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## **Energy Audit Summary**

<b>S.No</b>	<b>Equipment</b>	<b>Proposed action</b>	<b>Result for proposed Action</b>
1	Lightning equipment – 40W	Replace 40 W conventional light with 18W LED tube light	Total No. of light fitting =421 No's Total No. of presently operated =421 No's Total No. of light fitting to be replace=421 No's Present energy consumption =3368KWH Expected Energy consumption=1484KWH Total energy saved per month =3368-1484=1884KWH
3	Fan system(Ceiling Fan)	Replace present ceiling fan Consuming 72W with energy efficient fans consuming 40W. In the campus where usage is high this conservation measure will produce good savings.	Total No. of Fans in the campus =401 No's Total No. of Fans used in the campus(considering usage factor) =401Nos Total No. of Fans to be replace=401Nos Present current consumption =6956KWH Expected Fan consumption=3580KWH Total KWH saved per month =6956-3580=3376KWH

## **Green Audit Summary**

<b>S.No</b>	<b>Area</b>	<b>Observations</b>	<b>Remark</b>
<b>1</b>	Solid waste management	Bio gas plant is installed in the campus to make use of solid waste	Good initiative taken by college towards use compose of solid waste and its effective use for fertilizer and biogas
<b>2</b>	Liquid waste management	However Rain water harvesting system is used to recharge the ground level water	Good initiative taken by college towards water conservation
<b>3</b>	Plastic free campus	College is taking imitative by displaying poster/banners about the awareness of plastic free campus	Good initiative taken by college towards Implement of plastic free campus

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# CHAPTER I

## 1.1 About the college:

SCIENT Institute of Technology, Popularly Known as SCIENT. It is the first Engineering College in Ibrahimpatnam on the Sagar Road established in 2001 and is one of the most reputed engineering colleges in the state of TELAGANA affiliated to JNTU, Hyderabad.

SCIENT offers 4 Under Graduate Programmers B.Tech. CSE, ECE, EEE and MBA & M.Tech Programs at PG level with a fine blend of young and experienced teaching faculty. The commitment and enthusiasm of the faculty members are exceptional and as a result SCIENT has been producing hundreds of top class engineering professionals over the years, who are now employed in scores of Multinational companies in India and abroad

## 1.2 Vision and mission:

### Vision:

To impart quality education in building engineering and management professionals striving for a symbiosis of innovative technological excellence, research and human values with global standards to meet skills, knowledge and behavior of industry and societal needs with global exposure

### Mission:

- To achieve excellence by imparting innovative Teaching & Learning and Research.
- To generate, empower, disseminate, and preserve knowledge and information.
- To render social relevant technical services and inculcating entrepreneurial talents in technological advancements.
- To nurture, inculcate and develop skills, knowledge and attitudes to render technical services for industry and societal needs.

### Quality policy:

SCIENT INSTITUTE OF TECHNOLOGY is committed to prepare high standards Engineering & Management professionals with global technical skills, knowledge, leadership quality attitudes by usage of consistent advance ICT Teaching- Learning, innovative research aptitude and providing technical services for continual empowerment in enabling quality management system, practice, training and incubating for real time requirements and utility.

## CHAPTER II

### 2.1 Electric Bill Analysis:

The following table shows the energy consumed in units from July 2018 to July 2019

Sl.No	Bill month	CMD	Billed units
1	26 JUL 2018	125	7080
2	26 AUG 2018	125	7219
3	26 SEP 2018	125	7512
4	26 OCT 2018	125	6950
5	26 NOV 2018	125	7182
6	26 DEC 2018	125	6305
7	26 JAN 2019	125	6087
8	26 FEB 2019	125	6902
9	26 MAR 2019	125	8143
10	26 APRIL 2019	125	8968
11	26 MAY 2019	125	8749
12	26 JUN 2019	125	6913
13	26 JULY 2019	125	5694

#### 2.1.1 Observations on the electricity bill analysis

From the above table observe that

- Average monthly energy consumption of the college campus is 7208 units.
- Total monthly billing is Rs.57664.
- Average unit rate is Rs.8/-

## 2.2. ENERGY AUDIT:

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

### 2.2.1 Connected Load List:

In SCIENT, there is a 250KVA transformer and one 120KVA generator for 3 blocks electrical load, the following blocks are

- S block
- T block
- C block



**Figure 1**



Figure 2

Figure 1 shows 500KVA transformer and Figure shows 100 KVA generators.



The following Table represented connected load for each block

### S-Block

Sl. no	Room Number	Light				Fan			Computer	Printer	AC		UPS	Projec tor	Lab equipment
		10 w	40 w	72 w	108 w	Celling fan	Pedestal Fan	Exhaust fan	300 w	250 W	1.5 Ton	2 TON	in VA	300 w	in watt
1	S-301		3			6									
2	S-302		3			5									
3	S-303		3			4									2300
4	S-304		3			4									2300
5	S-305		4			4									
6	S-306		2			2			1						
7	S-307		2			2			1						
8	S-308								1						
9	S-309		2			2			1						
10	S-310		3			4								1	
11	S-311		4			4								1	
12	S-312		3			4									
13	S-313		2			3									
14	S-314		6			6									
15	S-201		7			6								1	
16	S-202		6			6								1	
17	S-203		4			4								1	
18	S-204		4			4								1	
19	S-205		6			4								1	
20	S-206		4			2									
21	S-207		4			2				1					
22	S-208		4			2				1					
23	S-209		4			2									
24	S-210		4			4								1	
25	S-211		4			4								1	
26	S-212		4			4								1	
27	S-213		7			4								1	
28	S-103		10			20			10						
29	S-105		4			4			3	1			5000		
30	S-106		6			4			1	1		1			
31	S-107		4			2									
32	S-108		5			8						2		1	
33	S-109		12			8			60	2			20000		13800
34	G-01		1			1									10000

35	G-02		8			6									13000
36	G-03		2			4									2300
37	G-04		8			6									19000
38	G-05		6			6									2300
39	G-06		7			6									2300

## C-Block

Sl. no	Room Number	Light				Fan			Computer	Printer	AC		UPS	Projector	Lab equipment
		10 w	40 w	72 w	108 w	Ceiling fan	Pedestal Fan	Exhaust fan	300 w	250 W	1.5Ton	2 Ton	in VA	300 w	in watt
1	C-302		6			1									
2	C-303		6			6									
3	C-304		1			2									
4	C-305		2												
5	C-306		8			10									
6	C-307		2			2									
7	C-308		4			6									
8	C-309		4			4									
9	C-201		2												
10	C-202		6			4								1	
11	C-203		6			5								1	
12	C-204-6 seminar hall		13			19					5			1	
13	C-207		5			3									
14	C-208		1												
15	C-101		6			4								1	

16	C-102		3			3			1	1					
17	C-103		3			3									
18	C-104		2			2			1	1					
19	C-105		2			2			1	1	1				
20	C-106		5			5								1	
21	C-107		6			4								1	
22	C-108		5			3								1	
23	C-109		5			5			30	2					6900
24	C-110		8			5									
25	G-01		6			4									3000
26	G-02		6			4									4800
27	G-03		6			3									500
28	G-04		12			11									1200
29	Store 1		9			1									
30	Store 2		8			1									

## T-Block

Sl. no	Room Number	Light				Fan			Computer	Printer	AC		UPS	Projector	Lab equipment
		10 w	40 w	72 w	108 w	Ceiling fan	Pedestal Fan	Exhaust fan	300 w	250 W	1.5Ton	2 TON	in VA	300 w	in watt
1	T-301		4			6									
2	T-302		4			6									
3	T-303		2			1									
4	T-304		2			2									
5	T-305		2			2									
6	T-306		6			4									
7	T-		7			4									

	307													
8	T-308		4			4								
9	T-201		4			6						20000		
10	T-202		3			6								
11	T-203		5			4							1	
12	T-204												1	
13	T-205		4			4								
14	T-206		4			4							1	
15	T-207		4			4			4				1	
16	T-101		6			6			50	2			20000	11500
17	T-102		4			6			50	2			20000	11500
18	T-103		6			4			45	2			20000	9200
19	T-104		6			4			45	2				9200
20	T-105		5			5						2		
21	T-106		6			5						2		
22	T-107		4			6				1			5000	
23	G-IT		7			6								
24	T-G1 Seminar hall		12			12						4		1
25	WATER PUMP													5 HP-1 3HP-1 1HP-3

## 2.3 ENERGY SAVING MEASUREMENT

The following table represents the period for proposal load

<b>Payback Calculation</b>		
<b>40W FTL vs. 18W LED Tube light</b>		
<b>A Saving in operation(per month analysis)</b>		
Particulars	FTL	LED
Luminaries Type	40W	18W
Wattage	40	18
Total No of Luminaries	421	421
Working hours per day(hrs)	8	8
Working days per month(hrs)	25	25
Electrical Units consumed per month(KWHr)	3368	1515
Per Unit Electrical cost Rs.	8	8
Total Electricity cost per month(Rs)	26944	12120
Electrical savings with Use of LED (Rs)		14824
Investment	146087	
Payback in month	10 months	
Per Annum saving	177888	

<b>Payback Calculation</b>		
<b>75W Existing Fans vs. 50W Fans</b>		
<b>A Saving in operation(per month analysis)</b>		
Particulars	Existing Fan	Proposed fan
Luminaries Type	75W	50W
Wattage	75	50
Total No of Luminaries	401	401
Working hours per day(hrs)	8	8
Working days per month(hrs)	25	25
Electrical Units consumed per month(KWHr)	6015	4010
Per Unit Electrical cost Rs.	8	8
Total Electricity cost per month(Rs)	48120	32080
Electrical savings with Use of Fans (Rs)		16040
Investment	601500	
Payback in month	38 months	
Per Annum saving	192480	

## **CHAPTER III**

### **3.1 GREEN AUDIT:**

Green audit was initiated with the beginning of 1970 with the motive of inspecting the work conducted within the organization whose excises can cause the risk to the health of inhabitants and the environment, It authenticity of the proclamations companies, armies and national government within the concern of the health issue as the consequences of environmental pollution. It is the duty of the organization to carry out the Green Audit of their ongoing processes for various reasons such as to make sure whether they are performing in accordance with the relevant rules and regulations, to improve the procedure and ability of materials, to analyze the potential duties and to determine a way which can lower the cost add the revenue. Through Green Audit one gets a direction as how to improve the conditions of environment and there are few factors that have determined the growth of carrying out Green Audit. Some the incidents like Bhopal gas tragedy (Bhopal: 194), Chernobyl Catatrophe (ukrine:1986)and Exxon-Valdez Oil Spill(Alask: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.

### **3.2 MAIN GOALS OF GREEN AUDIT**

Following are the goals of the 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

### **3.3 BENEFITS OF GREEN AUDIT**

Following are the 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
- Enhance the alertness for environmental guidelines and duties

## CHAPTER IV

### 4.1 INITIATIVES TAKEN BY COLLEGE TOWARDS SUSTAINABLE ENVIRONMENT

The college has its part to play in creating initiatives for Green campus. The campus has trees and the students are made to plant trees and protect them. We also have gardens and maintained by gardeners with treated STP water. Water is conserved by rain water harvesting. LED lights and bulbs are used to conserve energy. Plastics are avoided and reusable bags are advised and used. Water conservation and harvesting are done. RO Water is provided for students in cans and water dispenser rather than water bottles. Solar power is used for road lights. Waste is segregated and disposed of suitably. Pedestrian pathways are provided.

#### 4.1.1 Proposed solar plant

There is a proposal of solar tree of capacity 1 KW. This plant will save approx 1830 units annually.

#### 4.1.2 Biogas plant

Biogas is the mixture of gases produced by the breakdown of organic matter in the absence of oxygen (anaerobically), primarily consisting of methane and carbon dioxide. In SCIENT 2 Cubic Meter Biogas Plant was constructed near to old canteen. Biogas plant is using in canteen to cook food.



Figure 3. Bio gas



Biogas can be produced from raw materials such as agricultural waste, manure, municipal waste, plant material, sewage, green waste or food waste. Biogas is a renewable energy source. In India, it is also known as "Gobar Gas".

Biogas is produced by anaerobic digestion with methanogen or anaerobic organisms, which digest material inside a closed system, or fermentation of biodegradable materials. This closed system is called an anaerobic digester, biodigester or a bioreactor.

Biogas is primarily methane ( $\text{CH}_4$ ) and carbon dioxide ( $\text{CO}_2$ ) and may have small amounts of hydrogen sulfide ( $\text{H}_2\text{S}$ ), moisture and siloxanes. The gases methane, hydrogen, and carbon monoxide ( $\text{CO}$ ) can be combusted or oxidized with oxygen. This energy release allows biogas to be used as a fuel; it can be used for any heating purpose, such as cooking. It can also be used in a gas engine to convert the energy in the gas into electricity and heat.

### 4.1.3 Rainwater harvesting

Sustaining and recharging the ground water along with judicious use of the limited fresh water resources is the need of the hour. Scientist Institute of Technology is seriously implementing the rain water harvesting techniques in the campus.

Rainwater Harvesting Pits are available to collect the rain water from roof top of Main Block and Pharmacy Block .



Figure 4. Rainwater harvesting

These two pits will contribute the improvement of ground water table substantially in the college premises. SCIENT is also in the process of identifying the other locations in the campus for construction of Rain water harvesting pits.

#### **4.1.4 Plastic 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. It has been decided that I day in a month will be celebrate as bicycle day which will avoid the use of motor vehicles

Below is the image of awareness program conducted in college



Figure5: Awareness program on no plastic

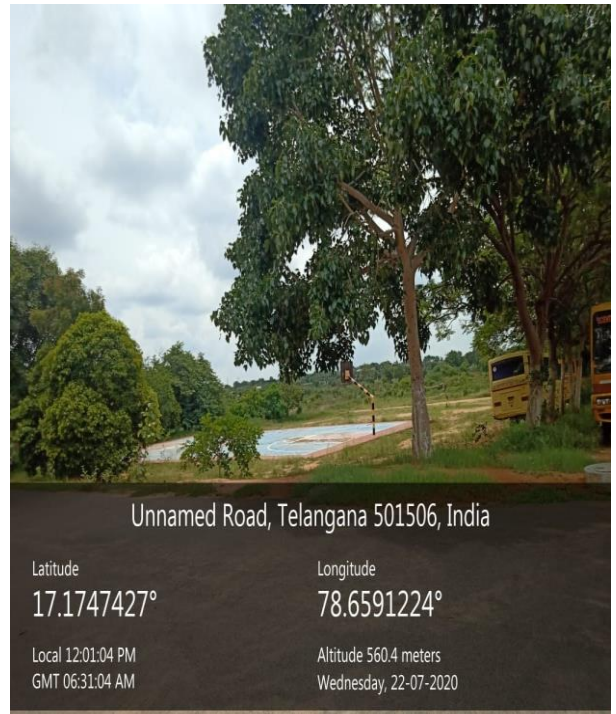


Figure 6: Plastic Free Campus