



STUDY OF ENERGY BILL CONSUMPTION AT SSCET COLLEGE

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ABSTRACT

Energy management is one of the environmental management issues which need to be addressed by facilities managers, as part of their support to their organization's effectiveness and well-being. Overall energy consumption is significant in majority of higher educational institutions due to their large number of buildings. Improving the energy performance of buildings is one of the ways to address this challenge. A strategy for achieving this is proper targeting and monitoring of energy consumptions. Sufficient data about electricity consumption over large periods of time was accumulated and analysed in order to develop appropriate electricity-saving measures.

Keywords: - Energy Bill Consumption

1. INTRODUCTION

Electric energy consumption is the form of energy consumption that uses electric energy. Electric energy consumption is the actual energy demand made on exist electricity supply for transportation, residential, industrial commercial and other miscellaneous purpose. Electric energy cost often measured either in joules (J), or in watt hours (W presenting a constant power over a period of time.

$$1 \text{ WS}=1 \text{ J}$$

$$1 \text{ Wh}= 3600 \text{ WS}= 3600 \text{ J}$$

Electric and electronic devices consume electric energy o generate desired output (i.e. light, heat, motion, etc.). During operation, some part of the energy is lost depending on the electrical efficiency.

BLOCK DIAGRAM:



2. METHODS AND MATERIALS

STUDY AREA:

Geographically Shri Sai College Of Engineering And Technology Bhadrawati Maharashtra India is located at Nagpur-Chandrapur Highway For conducting proper survey of college campus, it is divided into various study areas like industrial, commercial and residential. The various study areas of college campus are as follows.

- 1) **Departments:** - There are about 12 departments. All the departments have to be considered for such data collection as monthly electricity bills.
- 2) **Laboratories:** - All Science Departments have one or more laboratories with an array of instruments required for their experimental purpose which requires electricity for their operation and working.
- 3) **Streets:** - The streets of the campus of Shri Sai College of Engineering and Technology Bhadrawati were considered as separate entity, 40% of the 356 hectors of the college property is covered by street light. The street light mostly includes tube light and it requires highest electricity supply.
- 4) **Hostels:** -After the department and official institution the second largest energy requirement is in ladies and boys hostels.
- 5) **Other buildings:** - In these buildings other than Departments and Hostels are considered such as Library, Study Center, Examination Building, which requires maximum amount of energy for their regular use.

METHODOLOGY:

The areas which are covered by Shri Sai College of Engineering and Technology, Bhadrawati for energy consumption the Departments like Departments of Science, Library and uses more electricity than Social Science Departments, Garden and Sport Room. Collection of monthly Electricity Bills of College Campus for the analysis of energy consumed by using suitable statistical methods,

The entire College campus is divided into three categories for consumption of energy.

- 1) **Campus area:** - It includes Common Facility Centre (C F C) Administrative Buildings, etc
- 2) **Residential area:** - It includes all Residential Quarters of teaching and non-teaching Staff in College Campus.
- 3) **Commercial area:** - It includes all Departments, Hostels (boys and Girls), Canteen and Sport Complex etc.

APPLIANCES:

The appliances in our college including our Tube lights, fans, LEDs AC (Air conditioner) Machines and etc. Account for about 13% of all of the energy that is used each month. Every appliance in your home has been rated with two price tags: the cost of purchasing the appliance and the cost of operating it. Take both of these prices into account when considering which appliance.



Energy efficient appliances can help you save both money and energy, but they need to be properly used. When buying new, energy efficient appliances, it is important to know how to read Energy Guide labels. These labels deliver essential information about the efficiency and operating cost of the appliance.

LEDs (Light Emitting Diode):-



A light-emitting diode (LED) is a semiconductor light source that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons (Energy packets). The color of the light (corresponding to the energy of the photons) is determined by the energy required for electrons to cross the band gap of the semiconductor. White light is obtained by using multiple semiconductors or a layer of light-emitting phosphor on the semiconductor device.

IMPORTANCE:

- 1) Energy plays an important role in the lives of humans and in the activities of the economy, both as a scale of economic and social development and as the basic humanitarian need.
- 2) Conserving energy result in lower living expenses as energy saving leads to monetary savings.
- 3) Everyone knows that high energy consumption usually equals a high energy bill. By knowing your energy consumption, you will be able to strategize a plan to reduce your energy bills, saving you money. You may also think of it as a way to off-set future energy costs. This is especially vital today with the rising cost of energy.
- 4) Energy consumption is inevitable for human existence. There are various reasons for the search of an alternative fuel that is technically feasible, environmentally acceptable, economically competitive, and readily available. The first primary reason is the increasing demand for fossil fuels in all sections of human life, be it transportation, power generation, industrial processes and residential consumption. The requirement of fuels for the production of electricity and running of vehicles, and cooking is increasing gradually.

RESULT:


Energy consumption pattern of SSCET College Campus has been studied Between April 2022 to May 2022 and following results were observed which shows the electricity consumption pattern in the last Month.

Energy Bill Consumption in SSCET Bhadrawati College Campus

APPLIANCES	NO. OF APPLIANCES	WATTAGE PER UNIT
1. Ceiling Fans	310	80W
2. Wall Fans	7	70W
3. Tube Lights	158	60W
4. LEDs Lights	65	65W
5. AC (Air conditioner)	6	750W
6. PC (Personal Computer)	185	300W
7. CCTV	8	15W
8. POP Lights	82	15W
9. Projector	5	300W
10.CFL	2	30W

Total Energy Bill Consumption in College Campus = 2980 Unit.

Copy of Energy Bill of SSCET College Campus:-



Maharashtra State Electricity Distribution Co. Ltd.

MAHARASHTRA STATE ELECTRICITY DISTRIBUTION CO. LTD.

BILL OF SUPPLY FOR THE MONTH OF May 2022

000001659-49798
GSTIN : 27AA EGM2933K1ZB
CHANDRAPUR CIRCLE : 640

Website : www.mahadiscom.in
WARORA DIVISION : 642

HSN CODE : 2760000
BHADRAWATI URBAN SDN : 333 I

<p>Consumer No. : 4600006424 Consumer Name : SHRI VITHAL MURLIDHAR YERGUDE Address : PRESIDENT SHRI SAI COLLEGE OF ENGINEERING & TECHNOLOGY, MOHABALA, TA BHADRAWATI Village : DIST CHANDRAPUR Pincode : 400001</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>BILL DATE</td><td>30-06-2022</td><td>39,030.00</td></tr> <tr><td>DUE DATE</td><td>30-06-2022</td><td></td></tr> <tr><td>IF PAID UPTO</td><td>16-06-2022</td><td>38,660.00</td></tr> <tr><td>IF PAID AFTER</td><td>30-06-2022</td><td>39,600.00</td></tr> <tr><td>Last Receipt No./Date</td><td></td><td>/12-05-2022</td></tr> <tr><td>Last Month Payment</td><td></td><td>36,900.00</td></tr> <tr><td>Scale / Sector</td><td></td><td>Medium Scale / PUBLIC SECTOR</td></tr> </table>	BILL DATE	30-06-2022	39,030.00	DUE DATE	30-06-2022		IF PAID UPTO	16-06-2022	38,660.00	IF PAID AFTER	30-06-2022	39,600.00	Last Receipt No./Date		/12-05-2022	Last Month Payment		36,900.00	Scale / Sector		Medium Scale / PUBLIC SECTOR
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Email ID : sai*****@mahadiscom.com	Activity : SCHOOLS AND COLLEGES
Mobile No. : 94*****38	Factor No. : 055-XH412743
Tariff : 88 LT-VII B1	Seasonal : N
Contract Demand (KVA) : 78.00	Load Shed Ind :
Sanctioned load (KW) : 50.00	Urban/Rural Flag : R
DTG : 4333202	Express Feeder Flag : N
	Feeder Voltage (KV) : II
	LIS Indicator :
Date of Connection : 01-04-2009	Category : LT-X PUBLIC SERVICES
	20-50KW
Supply at : LT	Elect. Duty : 06
Pres. Highest (Mth) :	TAN : AADAS7386_J
Sec. Highest (Mth) :	Pres. Highest Bill Demand (KVA) :
Security Deposit Held Rs. : 1,56,000.00	Add. S. D. Demanded Rs. : 00.00
Bank Guarantee Rs. : 0.00	S. D. Arrears Rs. : 00.00

BILLING HISTORY			
Bill Month	Consumption (Units)	Bill Demand (KVA)	Bill Amount
Apr 2022	2,896	3037	255.42
Mar 2022	841	3022	976.64
Feb 2022	118	3014	749.03
Jan 2022	141	3014	917.70
Dec 2021	232	3015	674.76
Nov 2021	963	3023	372.47
Oct 2021	1,428	3027	361.24
Sep 2021	797	3021	024.88
Aug 2021	1,464	3028	130.41
Jul 2021	915	3022	786.65
Jun 2021	658	3020	141.29
May 2021	597	3019	018.25

CUSTOMER CARE Toll Free No.
1912, 1800-102-3435,
1800-233-3435

Rule & Procedure for Consumer Grievances Redressal is available at www.mahadiscom.in consumer portal-CGRF instead of Printed bill, register for E-bill and avoid Rs. 10 per bill as a "Go-green" discount. For registration visit at www.mahadiscom.in -> consumer portal -> Quick access -> Go-green request

For making Energy Bill Payment through RIGS/NEFT mode, use following details

- Beneficiary Name: MSEDCL
- Beneficiary Account Number: MSEDCL046010006424
- IFS Code: SBIN0008965
- Name of Bank: STATE BANK OF INDIA
- Name of Branch: IFB BRK
- Bill Amount: 39,030.00

Disclaimer: Please use above bank details only for payment against consumer number mentioned in beneficiary account number.

3. CONCLUSION

The proposed approach replaces the manual reading process in the conventional method of energy consumption calculation. Our approach gives better accuracy than the manual reading process. The various stages of results have been presented in this article. In the future, the blurred images sent by the consumers can be processed by increasing the intensity of the image and the manual cropping process can be replaced.

ACKNOWLEDGEMENT:

It is a matter of great honor for me to take this opportunity to extend my sincere thanks and heartiest gratitude to my respected guide **Prof.S.S.Raut(AssistantProfessor)** in SSCET, Bhadravati for their valuable guidance, practical suggestions and lasting encouragement at every stage of this work to bring about completion of project.

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PROJECT MEMBERS:

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