



ENERGY AUDIT AT TEJAA SHAKTHI INSTITUTE OF TECHNOLOGY FOR WOMEN

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ABSTRACT

An increasing energy price, severe power shortage, widening in supply gap, efficiency and conservation measure have gained more attention in the recent years. Buildings in educational institutions are consuming more energy and the possibility for energy saving is also substantial. But, in India, educational institutions are ignored as a contributor to energy intensive operations within the commercial buildings sector. The electricity cost is one of the manageable costs within an institute's budget. So, the educational institutions are having lack of interest in energy conservation (EC). An energy study stated that 5-20% of energy can be saved in an educational institution through Energy Audit. An energy audit is carried out to find chances to reduce the amount of energy input into the system, without affecting the outputs when the object of study is the buildings of an educational institution, then reducing energy consumption while maintaining or improving student comfort, health and safety are of main concern. This paper contains the details of the energy audit has been performed in the campus of Tejaa Shakthi Institute of Technology for Women (TSITW), Coimbatore, Tamil Nadu, India. During the energy audit, the power consumption pattern was determined for Lighting, Fans, Air Conditioners, Computers, Laboratory Equipment, DG Sets, and Motors in TSITW and the energy loss is also calculated. EC measures were suggested for minimizing the power consumption in the TSITW campus.

Key words: Energy Audit, Educational Sector, Audit Methodology, Energy Conservation, Cost Saving.

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1. INTRODUCTION

Currently, the electricity consumption in the commercial buildings sector including educational institutions is about 8-10% of the total electricity in India. The electricity demand in commercial buildings is increasing annually by 11-12% due to demands for providing international level comforts and facilities. This makes a challenge to ensure that energy growth in commercial building does not become uncontrollable, but at the same time, also presents an opportunity to influence and address energy management problems in different commercial buildings and facilities. Energy management function organizes a strategic area for electricity cost reduction. In this work, the energy audit was conducted at the buildings of Tejaa Shakthi Institute of Technology for Women (TSITW), Coimbatore, to identify the major areas of energy waste. The energy audit was conducted within a span of one month.

Previously, the energy audit had been done in different industries like, mechanical and heavy engineering [1, 2]. The energy audit had been done at the Technical Institute Campus [3]. In this paper the Energy Auditing had been dealt as the index of the consumption which normalizes the situation of Energy crisis by providing the conservation schemes. This had been done to minimize the unwanted power shutdown either incidentally or by load shedding. Here author had defined Energy auditing is one of the tools through which balancing of demand and supply is determined. The recommendations reduce around 15-20% of the energy and 25-30% of cost reduction. In [4], Equipment wise analysis had been performed in order to identify the electrical equipment's, within same application area, which consume more power as compared to others. During equipment wise analysis of the overall campus, the equipment's with power consumption less than 1% of total power consumption of the campus were ignored so as to make the analysis results simple and easy to observe.

TSITW's energy bill keeps up around INR 14-15 lakhs per year. This amount is huge and thus naturally attracts attention to understand that quite a lot of energy is being wasted, which in turn would mean that huge amount of financial resources are being wasted. Making TSITW energy efficient will not only reduce its expenses but also helps the people to fulfil the moral responsibility of not wasting this precious resource. The results from this work are bound to be of interest to everyone and can be the first step to make TSITW energetically the most efficient campus.

2. ENERGY AUDIT

As per the Energy Conservation Act, 2001, Energy Audit is defined as "the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption". Implementation of recommended measures can help consumes to achieve significant reduction in their energy consumption levels.

Energy audit analysis in general order involves:

1. Analysis of the energy consumable systems and the utility bills
2. Survey about the condition of the system
3. Understanding the need of the consumer
4. Evaluating the possible energy conservation measures and
5. Estimating the energy savings potential.

2.1. Types of Energy Audit

Energy audit is very essential in all the sectors and the type of energy audit to be performed depends mainly on the consumer's need. There are mainly four types of energy auditing:

2.1.1. Bench Marking

Benchmarking mainly consists of comparing the measured consumption with reference of consumption of other similar buildings or generated by simulation tools to identify excessive or unacceptable running costs. As mentioned before, benchmarking is also necessary to identify buildings presenting interesting energy saving potential. An important issue in benchmarking is the use of performance indexes to characterize the building.

2.1.2. Walk-through audit

The simplest and quickest type of audit is preliminary audit. It is also called a simple audit, screening audit or walk-through audit. It involves minimal interviews with site-operating personnel, a brief review of facility utility bills and other operating data, and a walk-through of the facility to become familiar with the building operation. Only major problem occurring areas will be covered during this type of audit.

2.1.3. General Audit

The general audit also called mini-audit, site energy audit or detailed energy audit or complete site energy audit expands on the preliminary audit. Utility bills are collected for a 12 to 36 month period to allow the auditor to evaluate the facility's energy demand rate structures and energy usage profiles. This type of audit will be able to identify all energy-conservation measures appropriate for the facility, given its operating parameters.

2.1.4. Investment grade Audit

In most corporate settings, upgrades to a facility's energy infrastructure must compete for capital funding with non-energy-related investments. Both energy and non-energy investments are rated on a single set of financial criteria that generally stress the expected return on investment (ROI). The projected operating savings from the implementation of energy projects must be developed such that they provide a high level of confidence. In fact, investors often demand guaranteed savings.

3. ENERGY AUDIT IN TSITW BUILDINGS

The energy consumed by TSITW is evaluated in two regions as college building and hostel building.

3.1. Energy Consumption in College Building

The energy consumption by college building is initially calculated with electrical devices and its operating time. The college building having the electrical devices such as fans, tube lights, computers, motors and electronic devices in labs. The energy consumed by college building for the day 23, February, 2016 is given in Figure 1. Similarly, the energy consumed by college building for all other days of February, 2016 can be theoretically calculated.

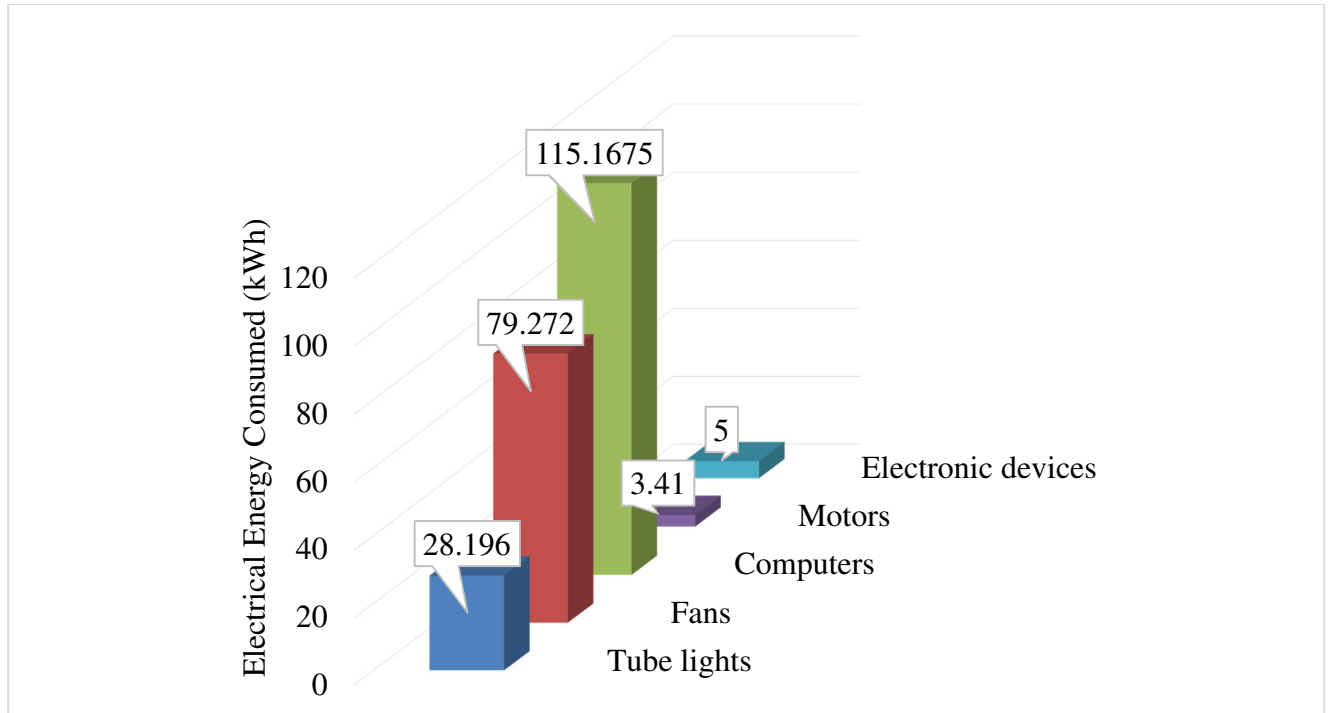


Figure 1 Energy consumed by college building for the day 23, February, 2016

The Energy meter reading for every one hour for the month of February, 2016 has been noted practically using the software ENERGY LENS. The practically noted values have been given in Figure 2. The total energy consumed in college building for the month February is 6745 kWh.

Day	6 A.M	7 A.M	8 A.M	9 A.M	10 A.M	11 A.M	12 P.M	1 P.M	2 P.M	3 P.M	4 P.M	5 P.M	6 P.M	7 P.M	8 P.M	9 P.M	10 P.M	11 P.M	12 A.M	1 A.M	2 A.M	3 A.M	4 A.M	5 A.M	Practice Value
01.02.2016	3	2	4.2	15	8.2	11.3	12	14.3	12.6	8	10	8	5	5.1	5	5.8	6	6.1	6.3	6	6.1	6.2	5	4	175.2
02.02.2016	4	2	5.1	17	9.4	15	15.2	20.6	17	13	14	13	6	7.1	7	7.2	7.7	7.1	8.2	8	7	7.2	6.7	7	231.5
03.02.2016	3.8	2.2	5	17.1	9.5	15.1	15	20.8	16.8	13	13.8	12.7	6.1	7	7.1	7.1	7.6	7	8	7.9	7.1	7	6.5	6.9	230.1
04.02.2016	3.7	2.3	5.1	17	9.6	15	15.8	20	16.4	13.4	13.6	12.9	6	7.1	7	7.2	7.2	7.4	8	7.5	7	7.2	6.3	7.1	229.8
05.02.2016	3	2.1	4	15.1	8	11.3	12.1	14.3	12	7.9	10.2	8	5.7	5	5.2	5	6	6.1	6.3	6.4	6	6.2	4	4	173.9
06.02.2016	5	2	6	20	10	18	16	20.5	19	14	17	15	5.9	7	7.2	7.1	7.6	7.3	8	8.1	7.9	7.4	6.8	6.9	249.7
07.02.2016	3.1	2.1	4.2	15.1	8	11.3	12	14.3	12.4	7.9	10.2	8	5.7	5	5.2	5.6	6	6.1	6.3	6.4	6	6.2	4.1	4	175.2
08.02.2016	7	1.8	6.4	21	11.2	19	17	22	20	15.6	18.6	14.3	8.1	7.5	7.1	7	7.7	7.4	8.2	8	8	7.2	6.9	7	264
09.02.2016	3.8	2.2	5	15	9.5	15.1	15	19.8	16	12.5	13.5	12	6	6.5	7.1	7	7.6	7.1	7	7.5	7	6.5	7	6.9	222.6
10.02.2016	3.8	2.2	5	17.1	9.5	15.1	15	20.8	16.8	13	13.8	12.7	6.1	7	7.1	7.1	7.6	7	8	7.9	7.1	7	6.5	6.9	230.1
11.02.2016	6	2.9	5.6	18.2	10.5	19.5	14.5	17.7	22.9	15.9	16.1	14.8	5.4	4.9	5.9	4.8	5.8	5.7	5.8	4.2	4.8	3.9	5.9	5.9	227.6
12.02.2016	5.2	2.5	5.1	18.6	9.1	18.2	15.2	16.8	19	14.9	17.9	15.8	5.7	7.2	5.8	7.5	7.7	7.8	7.1	3.9	4.5	5	3.2	3.5	227.2
13.02.2016	5.1	2.8	5.2	17.8	9.2	18	15.8	17.5	19.2	14.5	17.5	15.9	5.9	7.5	6	7.8	7.8	7.9	7.9	4.1	3.8	3.4	3.7	3.3	227.6
14.02.2016	5.8	2.9	5.8	21.2	9	18.2	15.6	17	19.4	15.8	17	15.9	5.8	7.8	5.8	7.1	7.9	6.9	4	4	3.7	3.5	3.5	3.6	227.2
15.02.2016	5.9	2.8	4.9	20	8.9	17.9	15.4	17.2	19	15	17	15.9	6.4	7.8	6.2	8.9	8	7.8	3.9	4.5	3.5	3.1	3.1	3.4	226.5
16.02.2016	4.6	2.2	6.1	20	10.5	17.2	15.9	20.2	19.2	14	17.3	15.1	5.8	6.9	7.1	7.5	7.9	7	7.6	8.1	7.5	7.3	6.9	7	248.9
17.02.2016	4.9	2	6	20.5	11	17	16	20.6	19.1	14.6	17.2	15	5	7	7.2	7	7.6	7.3	8.9	8.2	7	7	6.5	6.8	249.4
18.02.2016	5	3	6.8	21	10.8	18.2	16.2	20.5	20.8	15.5	17.5	16.5	6	8	7.2	7.1	8.6	7.3	8	8.8	7.5	7.4	7.1	8	292.8
19.02.2016	6.8	2.8	6.5	21.5	10.7	18	16	20.2	20	15.8	17.5	16	6.8	7.2	7.6	7.8	8.4	7.9	8	8.1	8.5	7.5	7.2	6.7	263.5
20.02.2016	5	2	4	18	9	18	14.5	17.5	19	12.9	16	14	4.1	5	4.4	4	4.1	4.3	4.2	4	3.7	3.4	3.2	3.7	198
21.02.2016	4.2	2.5	4.2	16.2	6.7	17.2	12	13	18	11	14	14	4	5	4.1	4	3.5	4	3.2	3.4	3.2	3.3	3	4	177.7
22.02.2016	4.8	2.5	6.5	22	13.5	18.7	15.4	15.2	20.1	17	12.9	15	6.8	7	7.2	7.1	7.6	7.3	8	8.1	7.9	7.4	6.8	6.9	251.7
23.02.2016	6.2	2.5	5.2	22.5	15	18	16	20.5	19	14	17.5	15	5.9	9.8	6.6	7.1	7.6	7.3	8	8.1	7.9	7.4	6.8	6.9	260.8
24.02.2016	5.8	3	5.8	24	18	17.4	15.5	20	17.4	12	20.3	17.2	7	9	5.9	7	7	7.8	8.2	9	8.5	7.9	7.5	7.2	268.4
25.02.2016	6.3	3.2	6	24.2	16	18	16	21.5	18	12.5	21.4	18	7.5	8	4.9	7.2	6.9	7.1	8.5	9.2	8.4	7.4	8	7.9	272.1
26.02.2016	5.5	3.1	6.1	24.5	16.4	19	16.4	22	18.2	13	20	17	7.4	7.4	5.5	7.4	7.2	6.5	7.4	8	8.7	7	8	7.4	269.1
27.02.2016	6	3	5.9	19.5	10	19	16	18	20	12	15.9	14.8	5	6	5	5.8	5	4.9	5.2	5	4	4.1	3.9	3.5	217.5
28.02.2016	6.8	3.5	7	25	18	19	18	24	19	13	22.9	19	8	9	5	7	7	8	9	10.2	9	8	8.5	8	291.9
29.02.2016	3.5	2	4	16	6	17	11	11.4	16.2	11.2	12	11.2	4.2	5	4.2	3.2	3	4.1	3	3.2	3	3.5	3.2	4.1	165.2
																									6745.2

Figure 2 Practically noted energy consumption values of college building for the month of February

3.2. Energy Consumption in Hostel Building

The hostel building have the electrical devices such as fans, tube lights, motors and large appliances in kitchen. The energy consumed by hostel building for the day 23, February, 2016 is given in Figure 3. Similarly, the energy consumed by hostel building for all other days of February, 2016 can be theoretically calculated.

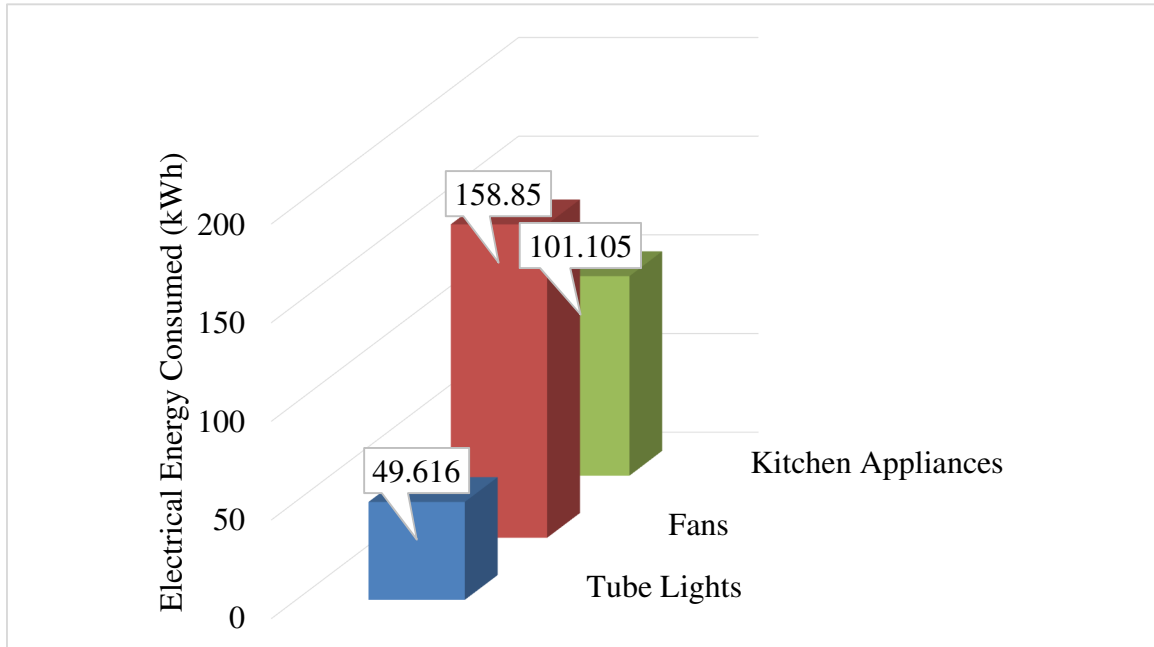


Figure 3 Energy consumed by hostel building for the day 23, February, 2016

The hourly based energy consumption values in hostel building is practically noted from energy meter and is given in Figure 4. The total energy consumed in hostel building for the month February is 9700 kWh.

Day	6 A.M	7 A.M	8 A.M	9 A.M	10 A.M	11 A.M	12 P.M	1 P.M	2 P.M	3 P.M	4 P.M	5 P.M	6 P.M	7 P.M	8 P.M	9 P.M	10 P.M	11 P.M	12 A.M	1 A.M	2 A.M	3 A.M	4 A.M	5 A.M	Practical Value	
01.02.2016	18	7	15.2	10.2	5.1	4.3	10.7	5.5	6.8	6.1	3	10	8.1	10	15	16.2	15.2	22	20	10	12	11	16	19.1	204.5	
02.02.2016	20	12	20.5	12.4	6	8	10.1	5.3	6.4	8	5	14.7	13	13.2	19	18	15	25.1	29.7	11	12.7	12.5	20	22	339.6	
03.02.2016	20	11.9	20	12	6.1	7.8	10	5.1	6.2	7.9	4.8	14.5	12.8	13	17	17	14.8	25	29	11	12.5	12.4	20.2	22.1	333.1	
04.02.2016	20.2	11.6	20.1	12.1	5.9	7.7	10.2	4.9	6	8.1	5.1	14.4	13	12.8	17.1	16.9	14.2	25.6	28.8	10.8	12.3	12.6	20	22.4	332.0	
05.02.2016	17.5	6.6	15	10	5	4.5	10	5.1	7	6.2	3.1	9.5	8	10	15.1	16	15.3	22.3	28	10	12	11	15	19.1	281.3	
06.02.2016	21	12	20.8	12.6	6.4	8.6	10.7	5.3	7	8.4	5.3	15.2	13.5	14	20.2	18.3	20.5	26.7	30	12	13	12.9	21	22.5	357.9	
07.02.2016	18.1	6.8	15	10.4	5	4.5	10.5	5.3	7	6.2	3.1	10	8	10	15.1	16.2	15.3	22.3	28.1	10	12	11	16	19.1	285	
08.02.2016	22	13	21.2	13.5	8	9.1	11.5	7.1	7.1	9.1	5.5	17.7	13.2	14.5	22	20	21.1	26.4	30.2	11.5	12.1	15.4	24.1	22.3	377.6	
09.02.2016	20	11	19	11	6.2	7	10.2	4.9	5.5	7.5	4.6	14	12	12.1	16.3	16	14	22	27	10.6	12	12	20	21.8	316.7	
10.02.2016	20	11.9	20	12	6.1	7.8	10	5.1	6.2	7.9	4.8	14.5	12.8	13	17	17	14.8	25	29	11	12.5	12.4	20.2	22.1	333.1	
11.02.2016	19.8	8.9	16	8.6	5.2	5.9	8.7	5.6	5.3	5.4	4.5	12.8	12.1	11.9	21.1	21.9	21.9	25.4	27.5	11.2	13.9	11.7	23.5	23.9	332.7	
12.02.2016	20.4	9.1	17	8.9	6	6	9.1	5.2	5.8	4.5	5	12.2	12.8	12	22.5	19.1	20	24.4	27.9	12	14.5	12	23	23.5	332.9	
13.02.2016	19	8.6	16.2	8.7	6.2	6.2	9.8	3.1	4.6	4.2	3.9	15.4	12.6	12.4	21.9	19.2	20.5	24	28	12.8	14.8	12.9	23.4	23.5	331.9	
14.02.2016	18.7	7.5	15.2	8.5	5.8	6.5	9	3.8	4	3.8	3.2	11.8	13.5	12.8	21.8	20.8	24.8	23.5	28.6	12.7	14.9	12.8	24.8	24	332.0	
15.02.2016	20.5	8.9	16.1	8.9	6.8	6.9	9.9	4.2	3.8	3.9	4.2	13.5	11.6	12.4	22	20.9	23.8	24	28.9	10	12	11.5	23.7	23.9	332.3	
16.02.2016	20.8	12.1	20.5	12.8	6.2	10.4	7.4	5.8	6.4	8.7	5.4	13.8	14.9	14.6	20.8	17.9	20.6	26.4	31	12.6	13.5	12	21	22	357.4	
17.02.2016	20.4	12.8	20.8	12	6.8	8	9	5.1	6.1	8.9	5.1	15.9	13.5	14.2	20.7	18.2	20.5	26.7	31.5	12.8	13	11.8	20.8	23	357.6	
18.02.2016	21	12.8	20.8	12.8	6.4	8.6	10.8	5.3	7.8	8.4	5.3	15.8	13.5	15.1	20.2	18.3	20.5	26.7	30	13.5	13	11.2	20	22.5	360.3	
19.02.2016	21	12	20.8	12.6	6.4	8.6	10.7	5.3	7	8.4	5.3	15.2	13.5	14	20.2	18.3	20.5	27	30.5	12.5	13	12.9	21	22.5	359.2	
20.02.2016	19	8.5	16	8.5	5.2	6.1	8.4	4.2	4.6	4.5	3.7	12.2	12	11	20	19	20.5	24.4	28	10	12	12	22	19	310.8	
21.02.2016	18	7	14.2	6.5	5	7	5.9	4.2	4.2	4	3.5	12	11	9	20.4	10.4	18.5	23	27.2	9	11	12	21	10	290	
22.02.2016	19.2	11.3	19.2	13.5	7.2	6.5	10.5	6	7	11	5.3	14.5	13.5	11.2	18.5	19	22	24.2	28.5	12	13	13.5	22.2	24.2	352.9	
23.02.2016	20	13	18	14	8	7.5	11.4	8.5	9	10	4.2	13.8	12.5	14	21	17	18	27	28.5	11	14	14.2	21	24	359.6	
24.02.2016	20	13	18	14	8	7.5	11.4	8.5	9	10	4.2	13.8	12.5	14	21	17	18	27	28.5	11	14	14.2	21	24	359.6	
25.02.2016	18.9	4	18.4	14.5	8	8	12	9	9.2	10	5	14	12	11.5	24	18	19	25.9	24.8	11.2	14.5	15	22	22	350.9	
26.02.2016	19.2	5	19	16	7	8.5	13	10	8.9	11	6	12.8	12.5	11.9	24.9	18.4	19.5	26	25.8	11	14	15.8	22.8	20	359	
27.02.2016	20.2	9	16.5	9	6	6.8	9.2	5	5.5	5.2	4.2	12	13.5	12.5	22	22	20	22	26	11	12	13.5	23.5	24.5	331.1	
28.02.2016	19	5	19.2	15	8.5	9	12.2	9	9	9.5	6	14.2	13.5	14	25	20	21	28.5	26	13	15.5	16	24	22.9	375	
29.02.2016	17	5.3	14	6	5.2	6.2	5.1	4	4.2	3.2	3.5	10	10	9.2	20	17.2	18	22.1	26.2	8.2	9.1	11	20	17	271.7	
																										9699.3

Figure 4 Practically noted energy consumption values of hostel building for the month February

4. RESULTS AND DISCUSSION

The amount of energy wasted is calculated for the month of February and the ways for energy conservation in TSITW campus are discussed in this section.

4.1. Calculation of Energy loss

The amount of energy wasted is the difference between practical value and theoretical value of energy consumption. The practical and theoretical values of energy consumption and the electrical energy wasted for all the days of the month February in college and hostel buildings of TSITW in given in Table 1.

Table 1 Practical and theoretical values of energy consumption and the electrical energy wasted for all the days of the month February in college and hostel buildings of TSITW

Dates of February	College Building			Hostel Building		
	Practical value (kWh)	Theoretical value (kWh)	Loss (kWh)	Practical value (kWh)	Theoretical value (kWh)	Loss (kWh)
1	175.2	160.7	14.5	284.5	261.3	23.2
2	231.5	215.3	16.2	339.6	319.4	20.2
3	230.1	210.1	20	333.1	310	23.1
4	229.8	217.8	12	332.8	310.2	22.6
5	173.9	153.9	20	281.3	267.3	14
6	249.7	220.7	29	357.9	331.2	26.7
7	175.2	152.1	23.1	285	275	10
8	264	240	24	377.6	360.5	17.1
9	222.6	201.4	21.2	316.7	290.1	26.6
10	230.1	210.1	20	333.1	319.5	13.6
11	227.6	204.6	23	332.7	325	7.7
12	227.2	211.7	15.5	332.9	325.7	7.2
13	227.6	213.6	14	331.9	323.8	8.1
14	227.2	213.4	13.8	332.8	316.4	16.4
15	226.5	210	16.5	332.3	316	16.3
16	248.9	228.9	20	357.4	335	22.4
17	249.4	227	22.4	357.6	336.2	21.4
18	292.8	276	16.8	360.3	340.7	19.6
19	263.5	252.6	10.9	359.2	346.2	13
20	198	176.3	21.7	310.8	290	20.8
21	177.7	165.2	12.5	290	278.3	11.7
22	251.7	230.8	20.9	352.9	326.2	26.7
23	260.8	231	29.8	359.6	309.6	50
24	268.4	249.4	19	359.6	320	39.6
25	272.1	250.3	21.8	350.9	317.4	33.5
26	269.1	252.6	16.5	359	341.3	17.7
27	217.5	200	17.5	331.1	304.5	26.6
28	291.9	278.9	13	375	361.9	13.1
29	165.2	150	15.2	271.7	255.7	16
Total	6745.2	6204.4	540.8	9699.3	9114.4	584.9
Average	232.593	213.944	18.648	334.458	314.289	20.168

From Table 1, it is identified that almost 10% of electrical energy is wasted in TSITW buildings. By promoting energy conservation schemes among faculties and students of TSITW, it is capable to reduce electricity bill about 2-3 lakhs per year.

4.2. Recommendations for Energy Conservation

The EC measures need to be followed in TSITW to reduce energy bill are given in Table 2.

Table 2 Energy Conservation Measures suggested for TSITW

S. No	Recommended EC Measures	Savings in Rs. /year	Capital Cost in Rs.	Pay-back Period (years)
1	Turning off the lights and computer when not in use	3562	Nil	Nil
2	Replacing CRT monitors of PC's with LCD monitors	15,148	72,450	3.8
3	Replacing all FTL's by LED lights of equal similarities	14,452	51,400	3.12
4	Replacing all Laser Printers by Ink-jet Printers	15,455	88,102	2.23
5	Use of motion sensors in corridors and toilets	6427.6	1450	0.41
6	Replacing conventional choke of all FTL's by Electronic choke.	6741.72	26,120	3.4
7	Use of fans in Air Conditioned rooms	Nil	15,452	Nil
8	Installation of Inverters in Air Conditioners	2,41,700	5,87,100	2.2
Total		61,786.32	2,54,974	15.16

Energy Conservation (EC) measures with investment and without investment have been suggested for possible energy savings in TSITW. An energy saving potential of about Rs. 61,786.32 per year can be achieved by implementing the proposals. The implementation would require a onetime investment of about Rs. 2,54,974 to get the benefits.

5. CONCLUSION

Energy audit is an excellent tool in recognizing and checking a complete energy management program. An effective audit of any type will give the organization a plan with which it can manage the organization energy system at minimum energy cost. In this paper, a detailed study has been made to reduce the electrical energy consumption in the complete campus of Tejaa Shakthi Institute of Technology for Women (TSITW), Coimbatore, Tamil Nadu, India. It acmes the amount of energy savings that can be obtained in an educational Institution, thereby energy crisis can be reduced significantly. The detailed energy auditing and the Energy Conservation (EC) measures recommended for TSITW will able to save Rs. 61,786.32 per year. This paper provides solid notice to the consumer not only in terms of the energy bills, but also the energy crisis in the near future to all sectors of people. The organizations should carryout auditing periodically, because Energy Auditing is a continuous process.

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