

# Energy audit of College premises

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**Abstract-** This paper presents an energy audit of college premises (Vishwaniketan Institute). An energy audit comprises of a detailed examination of consumption in electrical power, cost of this power consumption, lastly a suggested program for changes in working practices or power consuming equipment that will effectively saves the cost. The energy audit is a positive involvement with a significant advantages to college. The review process begins by gathering data about facility's operation and about its past record of service bills. This data is then inspects to realize that how much energy is used and wasted.

**keywords-** energy audit; power consumption; service bills; energy;

## INTRODUCTION

An energy audit is systematic inspection of power utilizes in the organisation for identifying, quantifying wastage of energy. It will help in energy cost optimization, pollution control, safety aspects and suggest the method for improve the operating practices of the system. It is the key for system programmed to illustrating and pursuing overall energy. By giving the technically possible advice with economic and other organizational considerations within a stated time period, audit process will apply the defensive measurements into realities. This review establishes the references to organisation for improvement of utilizing the energy. An review process provides necessary data base to retain the overall power utilization analysis. It is a process by which we can decrease the quantity of input power of the system without any negative impact on the output. It covers forecast of power input of distinct process, gathering of past data on production level and specific power consumption. Lower power utilization use lower energy cost. And obviously lower power utilization is good for environment.

### A. Purpose of energy audit

- It enables diminished energy to cost in your college.
- It lessens the reliance on remote and contamination.
- It can build the security of your energy supply.
- It can lessened the utilization of normal assets.
- It helps lessened the effect of ozone harming substance discharge.
- It encourages you to bring down energy bills.
- Empowers you to expand the solace of those in the college.
- It builds life traverse of the gear in your college.
- Finds any unaccounted utilization that may exist at the college.

### B. Supply details

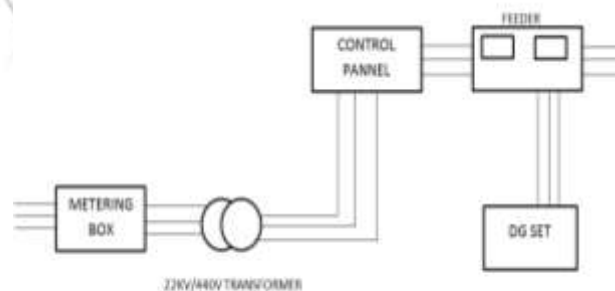


Fig.(1) Power flow

The 22kv,3 phase supply is coming to "Vishwaiketan's Institute " from Maharashtra state Electricity Distribution (MSEB). It is step down voltage to 440v by step down transformer. Then it is distributed through feeders to college campus. The DG set is provide because if supply is cut off from MSEB by any fault or by some reason, the supply is continued by DG set. The supply is distributed to college in A-wing,B-wing, C-wing, and D-wing of the building sections.

#### (i) Metering box:-

A meter box indicates the amount of the reading of voltage utility and also input and output readings. It shows the energy consumed by the load in the college. They are using for domestic , industrial,and commercial purpose.

#### (ii) Transformer:-

A transformer is static device which transforms power without changing the frequency. 22kvdelta star step down transformer is used, which step down the voltage upto 440v.

(iii) *Feeder:-*

The 440v step down voltage is fed to the college building from the feeder. Its 3 phases is distributed to college building in A-wing, B-wing, C-wing, D-wing, Hostel and Architecture building.

(iv) *Control panel:-*

It controls the operation of switching. When supply is cut from MSEB, its switches the supply of DG set to supply the power to building.

(v) *Diesel generator set:-*

DG set is used for the backup purpose. 'Gmmco' company's generator is used where the capacity of generator is 125KVA. It takes 18 liter diesel in 1 hours for generating the electricity.

### C. Methodology of energy audit

This process includes the determination of energy consumption organization, find out the scope for saving and identify the most likely area which consumes most power. Makes improvements in and saving in cost. Identify the area for measurements and study purpose.

It includes four step3:

1. *Data collection:-*

Energy utilization of college and some specialized data, for example, process graph and equipment list.

2. *Field work:-*

One side visit must be improved the situation gathering the data of study. This data incorporates particular of gear for example, model, brand power consumed and hours of task. A few meetings were required for taking history about the college.

3. *Analysis of energy consumption:-*

Power consumed by the hardware is computed. Examining all the task of the college and furthermore the types of gear which expending higher energy is discover. Distinguishing the zones where the energy is wastage.

4. *Determine the energy saving measures:-*

After the braking down of information collection, energy sparing measures is resolved to decreased the energy utilization. Energy and cost sparing of these measures will be evaluated,together with venture required and payback.

### D. Present energy scenario of college

The campus have connected load requirement is 375KVA. The agreement request is 250KVA. The utility bill includes two parts:

I. Energy consumed i.e. per KWH or per unit energy consumed.

II. Maximum demand charge i.e. per KVA maximum demand during month.

The power factor was 0.984 for August 2017 and energy charges for commercial activity is Rs. 9.1 per unit.

### E. Comparison which shows saving in wattage for monthly:

If we use 9W fluroscent bulb rather than using incandescent lamp with the same lumens capacity of 400-550 it will be the beneficial for the college.

Room No.	Monthly KWH (36W)	Saving in wattage (9W)
A107	178.704	27.54
A108	141.984	18.36
A106	14.688	3.672
A105	41.616	5.508
A111a	97.92	14.68
A109	102.816	11.16
A112	105.672	14.68
A101	80.784	5.508
A113	100.368	12.852

Table(1). Comparison between two wattage

### F. Recommendation:

- The electricity energy consumption can be lowered by replacing 36W incandescent tube instead of using that we can use 9W and 22W LED tube and fluorescent lamb which gives same lumens.
- To minimizing the energy consumption, setting the existing window AC at reasonable temperature.
- Turn ON the AC when required and turn it OFF when people will not be in their corporate offices.
- Install MCB for separate room so that we do not need to switch OFF all the loads when walkout from the classroom.
- Use advance system adjust the temperature setting of AC according to the weather conditions.
- Use light color for wall which reflect day light to improve the illumination.
- To maintain the illumination, De-dust the lightning fixture.
- Setting the computers, monitors etc. to sleep mode when not required which saves approximately 40% energy.

*G. Conclusion:*

The analysis calculation of electrical energy conservation of Vishwaniketan (iMEET) campus. According to the past examination, if low evaluation utilized might be valuable in decreasing power bills. We have tried to shed some light on the way of energy conservation by method of energy audit. There are numerous viewpoints included like portion new, productive utilization of assets. In the event that utilize energy by effective hardware then we will moderate a consideration measure of energy being wastage without disturbing the outcome. These energy saving will signify enhance condition of environment and lessening in power bill of college campus.

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