

# Electrical Energy Conservation and It's Application

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**Abstract – Now a day population increasing day by day due to which electrical energy demand is also increasing so to fulfill the demand of electrical energy we need to save the electrical energy. For this purpose the electrical energy audit is done. In this paper provides information related to electrical energy conservation, wastage of electrical energy and modern methodology are given to reduce the consumption of electrical energy without affecting the cost and comfort of electrical equipments. In this paper the various methods are also given to conserve the energy and using this method the energy conservation can be achieved. Also recommendation is given in this paper.**

**Index Terms – Electrical energy audit, electrical energy management, energy consumption, energy conservation.**

## 1. INTRODUCTION

Energy can perform various tasks. Energy is of different forms such as electrical, mechanical etc. electricity can be produce by renewable and the nonrenewable sources. As the renewable sources are reducing so is preferable to use electrical energy efficient technologies to reduce energy consumption [2]. Energy conservation is reduction of energy consumption through less energy service. Energy conservation and efficiency both are the energy reduction techniques. For better result the energy conservation can be done. The energy audit is one of most important factor in the electricity management and consumption. The energy audit completes the task by giving the effective result with reducing energy consumption cost. Electrical energy audit consists of detailed information of how facility uses energy, what facility pays for that energy and finally recommendation are given. The energy audit is a positive experience with good significance for industries and other commercial sectors.

## 2. ENERGY AUDIT AND IT'S TYPES

Electrical energy audit is a survey, inspection and analysis of energy supplied to the plant and other industrial areas. The energy audit can be simply defined as to evaluate a plant or any industrial sector which uses electrical energy. There are three basic types of electrical energy audit [1];

### 2.1. Walk through audit

Walk through audit, as its name suggest is tour of the facility or electrical equipments to inspect each of the energy using equipments. It includes an evaluation of energy consumption data to analyze energy use quantities. This walk through audit collects the data required for energy audit.

### 2.2 Standard audit

The standard audit gives information regarding to the losses in the particular sector. Standard energy calculations are use to analyze efficiencies and calculate energy cost and savings based on improvements and changes to each system. The standard audit also includes an economic analysis of recommended conservation measures.

### 2.3. Computer simulation

Computer simulation accounts for interaction between systems to help prevent overestimation of savings. Because of the time involved in collecting detailed equipment in formation, operational data and setting up an accurate computer model, this is the most expensive level of energy audit but may be warranted if the facility or system is complex in nature.

## 3. ENERGY AUDIT METHODOLOGY

### 3.1. Data collection

For the preparation of main introduction collect all the data, exhaustive data collection can be done by observation and measurements.

### 3.2. Data analysis

The data analysis was done by power flow diagram, evaluation of collected data department wise analysis, building block wise analysis and location wise analysis, reasons for the difference between connected load and actual consumption was evaluated, the database prepared was advance studied and the results have been graphically represented.

### 3.3. Recommendations

On the basis of data collection, measurements and observation some implementation can be done or some steps are recommended for reducing the consumption of electrical energy without affecting cost and comfort.

#### 4. NEED OF ENERGY AUDIT AND BENEFITS OF ENERGY AUDIT

Energy audit can be done for reducing the consumption electrical energy up to 5%-20% is possible. This energy audit gives information regarding to replacement, renovation and up gradation for better electrical efficiency. Here are the some benefits of energy audit;

4.1. Energy audit will not only inform you of opportunities but provide you with economic analysis. This will allow prioritization based on financial benefit and return on investment.

4.2. It provides you with solid, easy to understand technical information on the subject of the proposed energy conservation measures.

4.3. A good quality audit will analyze your past energy use and appear potential issues using statistical methods.

4.4. Energy audit provides you with production analysis to help you understand the benefits of your decisions from an environmental stand points.

4.5. Provide you with standard information to help you understand your energy use performance compared to others in your area.

#### 5. ENERGY CONSERVATION AND IMPORTANCE OF ENERGY CONSERVATION

Energy conservation is reduction in growth of energy consumption. Energy conservation is the decreasing quantity of energy used. Energy conservation is the process of reduction or elimination of unnecessary energy used and wastage.

Energy conservation is important because we depend on energy for almost everything in our lives. Energy doesn't make our life comfortable, in many ways it's very important for our survival. Without energy conservation, the world will reduce its natural resources. As we can see there are many reasons that conservation is important, range from the environment to the economy. The goal with energy conservation techniques is reduced demand, protect and refill supplies, developed and used.

#### 6. METHODS AND RECOMMENDATIONS FOR ENERGY CONSERVATION

1. Install CFL lights or LED: Replace the incandescent bulbs in your homes with CFL bulbs or LED. CFL bulbs usage is 12 times longer than the regular incandescent lamp. CFL bulbs

will not only save energy but overtime you finish up saving money.

2. Use most of daylight: Turn off lights during the day and use daylight. This will reduce the burden on the local power grid and save you good quality amount of money in the long run.

3. Get energy audit done: Getting energy audit done by hiring an energy audit examination for your home is an energy conservation technique that can help you to conserve energy and save good amount of money every month. Home energy audit is nothing but a process that helps you to recognize area in your home where it is losing energy and what steps you can take to overcome them. Put into action the tips and suggestion given by those energy experts and you might see some drop in your monthly electricity bills.

4. Use energy efficient appliance: When planning to buy some electrical appliances, have a preference to buy one with energy star rating. Energy efficient appliances with energy star rating use less energy and save you money. They may cost you more in the beginning but it is much more of reserves for you.

5. Switch off appliances when not in use: Electrical appliances like laptop, speaker, television etc. keep them switch off when not in use.

6. Plant shady landscaping: Shady landscaping outside your home will protect it from extreme heat during hot and sunny days and cool winds during the winter season. This will keep your home cool during summer season and will finally turn to big savings when you calculate the amount of energy saved at the end of the year.

#### 7. CONCLUSION

Electrical energy audit gives the information regarding to electrical equipments. Within the energy audit, we create a plan, which proposes possible executive and investment measure and also enables efficient achievements of savings. By identifying the energy consuming components of a plant or industrial sectors and documenting the existing conditions, conservation opportunities can be identified.

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