

HOW TO GET ENERGY AUDIT OF MY BUILDING

Steps of energy audit

1. Hire an ESCO ([List o ESCOs](#))
2. Collect, Organize, and Analyze Energy Data.
3. Assess Building Systems (Electrical and Mechanical) and their Operational Characteristics. Systems should be identified, located, and analyzed
4. Conduct an On-Site Inspection for assessing systems and their operating conditions in order to compare them to best practices.
5. Analyze findings and Issue an Action Report that outlines energy conservation and system improvement measures.

The information to be collected during the audit includes: -

1. Energy consumption by type of energy, by department, by major items of process equipment, by end-use
2. Material balance data (raw materials, intermediate and final products, recycled
3. materials, use of scrap or waste products, production of by-products for re-use in other
4. industries, etc.)
5. Energy cost and tariff data
6. Process and material flow diagrams
7. Generation and distribution of site services (eg.compressed air, steam).
8. Sources of energy supply (e.g. electricity from the grid or self-generation)
9. Potential for fuel substitution, process modifications, and the use of co-generation
10. systems (combined heat and power generation).

Contents of an Audit

An energy audit seeks to document things that are sometimes ignored in the plant, such as the energy being used on site per year, which processes use the energy, and the opportunities for savings. In so doing, it assesses the effectiveness of management structure for controlling energy use and implementing changes. The energy audit report establishes the needs for plant metering and monitoring, enabling the plant manager to institutionalize the practice and hence, save money for the years to come. The energy audit action plan lists the steps and sets the preliminary budget for the energy management program.

1. Analysis of energy use

Identifying where energy is used is useful because it identifies which areas the audit should focus on and raises awareness of energy use and cost. The results of the analysis can be used in the review of management structures and procedures for controlling energy use.

Analysis of energy use can be done by installing submeters in different plant locations to pinpoint actual energy usage per area. This is a good source data for allocating energy use. The plant manager can also list all equipment used and the corresponding operating hours. With this information, he can create spreadsheet information and generate charts useful for analysis.

Important Points to Consider When Collecting Site Load Data

- a. **Operating hours** - This can be gathered from plant personnel. It is important to ensure the accuracy of this data because much of the potential for energy savings lies on correct estimation of the equipment's operating hours.
- b. **Duty cycle** - Machines such as large electric motors have varying loads and hence, different power requirements.
- c. **Actual power consumed** - For electric power users, this is based on either 3-phase current/voltage readings or power analyzer measurements (e.g., direct kW which incorporates power factor). For fuel users, tank readings of monthly consumption estimates and flow meters with totalization can be sources of measurement.

2. Identification of energy projects

Opportunities for energy savings can range from the simplest, such as lighting retrofits, to the most complex such as the installation of a cogeneration plant. The important thing to remember is to focus on major energy users and areas. Always apply the 80/20 rule, focus on opportunities that provide 80% of the saving but require 20% input. After the preliminary identification of opportunities, spend more time on those which have shorter payback periods.

3. Cost benefit analysis

The identified energy conservation opportunities should be analyzed in terms of the costs of implementing the project versus the benefits that can be gained. If you want to, say, install a heat plate exchanger to recover waste heat, you need to calculate the total cost of installation and compare that with the savings you will derive from recovering waste heat. It makes sense to go on with the project if there is a net positive benefit from the project.

4. Action plan to set implementation priority

After passing the cost benefit test, an action plan should be developed to ensure that the opportunities identified are implemented. The action plan should include all the major steps for implementing the opportunity as well as the people responsible. Furthermore, there should be a plan for monitoring the results.

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