

# Building Energy Audit



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for Youth Hostels Network

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# Energy Management Program In Facilities

- **An Energy Management Program is a systematic approach for controlling a building's energy utilization so as to reduce energy waste to the absolute minimum without adversely affecting the building's functional requirements.**
- **For a network to have a successful energy management program, it must create an environment of established goals to prevent waste and protect the assets of facilities; management must understand and support the importance of energy efficiency, environmental quality, and the programming of energy improvements; and a significant portion of energy savings must be reinvested in the energy management program.**

# Goals and Objectives

- **Audit the energy consumption of selected buildings to determine which types of energy are used and the amount of each.**
- **Analyze which operations/processes consume extensive amounts of energy in each building**
- **Plan measures by which individual building can conserve energy used in their high-energy using operations/processes.**
- **Provide consultation to managers of buildings that were audited in an attempt to reduce the consumption of energy in their facility.**
- **Provide a pathway to benchmark energy conservation methods that can be used in other buildings and facilities.**
- **Identify the major construction, maintenance and design features that make building energy efficient.**

# Strategies of Energy Savings Program - “1”

## 1. Evaluate Your Facilities to Identify Potential Energy Savings Measures

- a. Perform energy accounting audit of facilities, compare results to industry standards.
- b. Assess potential energy savings opportunities in each facility, including building envelope as well as mechanical and engineering systems based on energy audit results by means of a “walk-through audit.”
- c. Inventory mechanical and electrical systems and their operating schedules.
- d. Identify existing monitoring and metering equipment.
- e. Interview facilities’ users about operating and comfort needs.
- f. Evaluate the facility operating schedule and the operating and maintenance practices of current operation and maintenance staff.
- g. Develop a “potential energy savings opportunity checklist” for each facility.
- h. Select, evaluate the feasibility of and design new, energy-efficient systems and equipment that may be implemented in each facility.

Consider such measures:

- (1) Computerized energy management systems for automated equipment operation and monitoring and performance and energy consumption;
- (2) Additional monitoring and metering equipment;
- (3) Integration of innovative technologies.

# Strategies of Energy Savings Program - “2”

- 2. Examine Your Regulatory and Rate/Cost Environment**
  - a. Determine whether and how local utility or energy supply costs vary with time of use, season of use, peak usage, etc.
  - b. Identify sources for lowest cost purchase of fuels and electricity.
  - c. Identify relevant local standards for indoor air quality, environmental emissions, etc. that apply to your facilities.

# Strategies of Energy Savings Program - “3”

## **3. Examine Financial Opportunities**

- a. **Identify grants, incentives, etc., available from local, national, and international sources that may apply to your facilities.**
- b. **Consider potential collaborations and partnerships with other local industries, utilities, governmental facilities, etc.**

# Strategies of Energy Savings Program - “4”

## Analyze the economics and feasibility of opportunities for Energy Savings measures identified above including potential savings, long-term cost avoidance, and payback periods

- a. Determine implementation schedule, costs, and payback period for each measure.
- b. Identify and implement measures that you can finance from your current operating budget by applying savings from current cost reductions (these will generally be low-cost/no-cost measures).
- c. Project the cost savings and cost avoidance value of all measures for a 3-5 year period beyond your current budget year.
- d. Program standards:
  - (1) The first program implemented in a conventional facility should yield up to a 40% energy consumption reduction.
  - (2) Subsequent programs implemented should maintain or reduce the accomplished levels of energy consumption.
  - (3) Measures should result in:
    - a) longer service lives of building systems;
    - b) environmental improvements; and,
    - c) maintain comfort levels and other services provided for building occupants.

# Why Should You Have An Energy Accounting Audit

**You can't manage what you don't measure!**

## Purposes:

- Track utility costs
- Account for current energy consumption and cost
- Identify areas where opportunities for savings may exist
- Justify capital investment decisions
- Identify and correct consumption problems
- Pinpoint billing errors

# Building Energy Accounting Audit

- **Identify relationships between energy use and factors such as occupancy and outdoor temperatures.**
- **Once patterns are established, potential problems such as equipment malfunctions can be identified and corrected.**

# Information Gathering - 1

- **Assemble copies of all monthly utility bills.**
- **Characterize utility bills either by building or by meter, and organize them into 12-month blocks using the meter-read dates.**
- **Familiarize yourself with all meters and sub-meters. If several meters are used, it is helpful to clearly label them on a blueprint for each facility being monitored.**
- **Determine which facility or space is being served by each meter.**

## Information Gathering - 2

- **Obtain historical energy data to establish a base year. If you don't have this information in your files, it can be obtained from your local utility company.**
- **Obtain degree-day data. This information may be obtained from your utility company, National Oceanic and Atmospheric Administration, or your local weather stations.**

# Purpose Of The Audit

- **The building energy accounting audit provides a detailed weather-adjusted evaluation of the historical energy utility (electric, natural gas, oil, and steam) usage and costs for the facility that was audited.**

# An Audit Will Assist In:

- The initial stages of project development;
- The ongoing monitoring and verification of a specific facility's project savings; and,
- Identifying facilities to target conservation project efforts supported by an energy audit and complete economic analysis.



**THANK YOU**