



ENERGY AUDIT SERVICES

Ensure uptime at all levels, Early detection of short circuits, Prevent from Fire accidents, Improvement of Energy Efficiency and Establishment of Green Environment



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Sachu Technologies offering Energy audit which is an inspection, survey and analysis of energy flows, for energy conservation in a building, process Plants or system to reduce the amount of energy input into the system Energy Audit Procedure

Step 1: Building and Utility Data Analysis

The main purpose of this step is to evaluate the characteristics of the energy systems and the patterns of energy use for the building. Collect at every years of records of utility data, Identify the fuel types used (electricity, natural gas, oil, etc.), Understand utility rate structure (energy and demand rates)

Step 2: Walk-Through Survey

This step should identify potential energy savings measures. The results of this step are important since they determine if the building warrants any further energy auditing work. Some of the tasks involved in this step are Identify the customer's concerns and needs, Check the current operating and maintenance procedures, Determine the existing operating conditions of major energy use equipment (lighting, HVAC systems, motors, etc.), Estimate the occupancy, equipment, and lighting (energy use density and hours of operation)

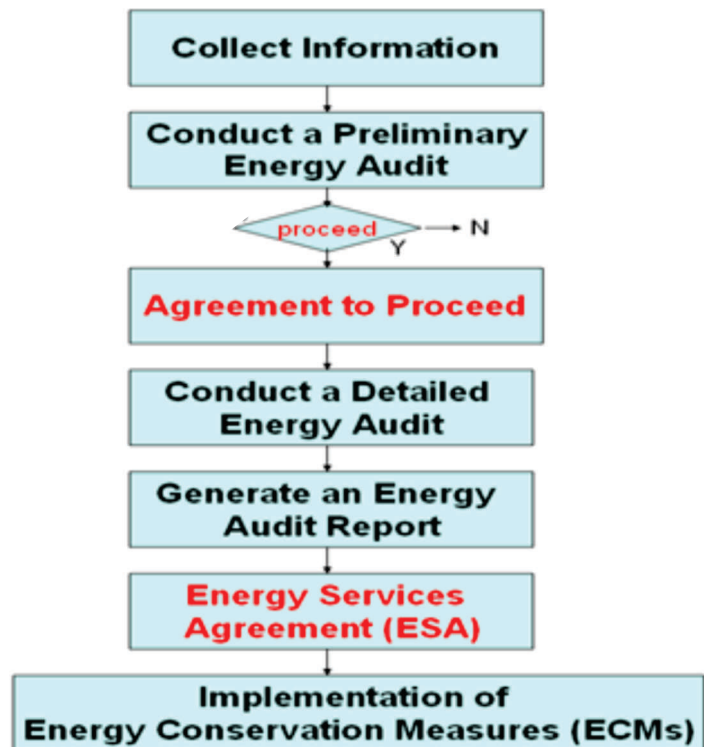
Step 3: Baseline for Building /Plant Energy Use

The main purpose of this step is to develop a base-case model that represents the existing energy use and operating conditions for the building. This model will be used as a reference to estimate the energy savings due to appropriately selected energy conservation measures. The major tasks to be performed during this step are obtain and review architectural, mechanical, electrical, and control drawings, Inspect, test, and evaluate building equipment for efficiency, performance, and reliability, obtain all occupancy and operating schedules for equipment (including lighting and HVAC systems), develop a baseline model for building energy use, Calibrate the baseline model using the utility data and/or metered data

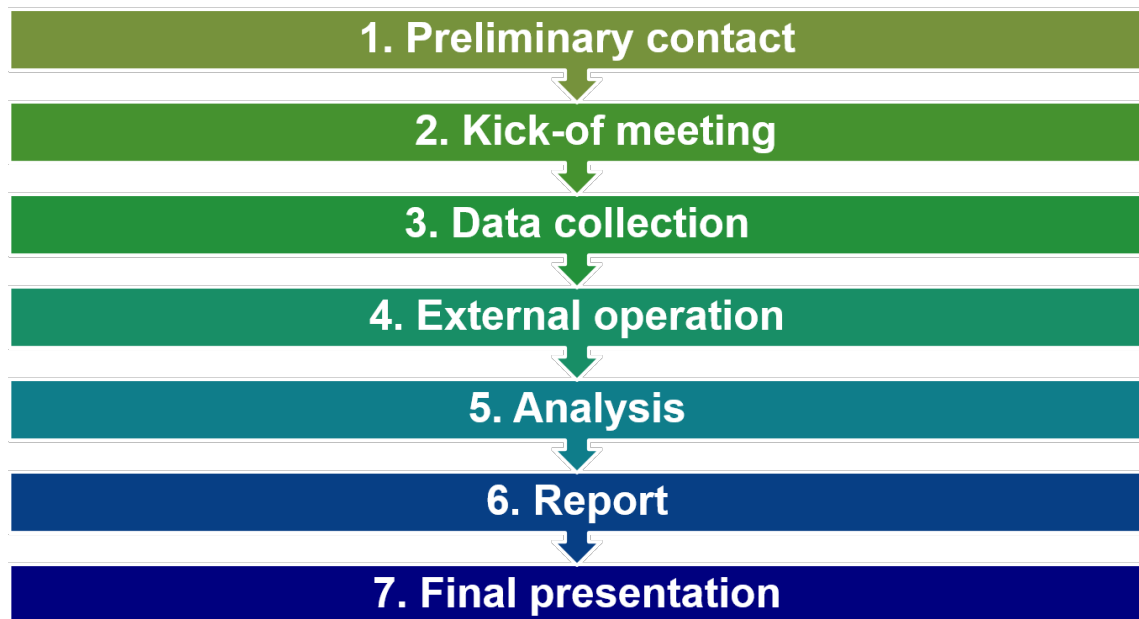
Step 4: Evaluation of Energy-Saving Measures

In this step, a list of cost-effective energy conservation measures is determined using both energy savings and economic analysis. To achieve this goal, the following tasks are recommended:

Prepare a comprehensive list of energy conservation measures (using the information collected in the walk-through survey), Determine the energy savings due to the various energy conservation measures pertinent to



the building by using the baseline energy use simulation model developed in Step 3, Estimate the initial costs required to implement the energy conservation measures, Evaluate the cost-effectiveness of each energy conservation measure using an economical analysis method (simple payback or life-cycle cost analysis)



Some of Instruments using for Energy Audit

Power Quality Analysers

Three Phase Power Quality Analyser instruments for measuring major electrical parameters such as kVA, kW, PF, Hertz, kvar, Amps and Volts. In addition some of these instruments also measure Harmonics. These instruments are applied on-line i.e on running motors without any need to stop the motor. Instant measurements can be taken with hand-held meters, while more advanced ones facilitates cumulative readings with print outs at specified intervals.

Thermal Imaging Cameras

Create a stronger predictive maintenance program, maximize uptime and reduce potential safety hazards using Thermography Inspection to Objects and Machines specially for Electrical , Mechanical , Refractory, and other applications .

Insulation Resistance Testers(Meggers)

The insulation resistance (IR) test is a spot insulation test which uses an applied DC voltage 250Vdc to 5,000Vdc to measure insulation resistance in either k Ω , M Ω or G Ω . The measured resistance is intended to indicate the condition of the insulation or dielectric between two conductive parts, where the higher the resistance, the better the condition of the insulation. Ideally, the insulation resistance would be infinite, but as no insulators are perfect, leakage currents through the dielectric will ensure that a finite (though high)

resistance value is measured and confirm the reliability of the circuit and that there are no leakage currents from unintended faults in the wiring.

Earth Ground Testers

Earth testing covers the testing of earth electrodes and the measurement of soil resistivity

Lux Meters

Illumination levels are measured with a lux meter. It consists of a photo cell which senses the light output, converts to electrical impulses which are calibrated as lux

Stroboscope

In any audit exercise speed measurements are critical may change with frequency, belt slip and loading. A simple tachometer is a contact type instrument which can be used where direct access is possible. More sophisticated and safer ones are non contact instruments such as Tachometer/ Stroboscope

Ultrasonic Leak Detectors

Ultrasonic instruments which can be used to detect leaks of compressed air and other gases which are normally not possible with human abilities.

Ultrasonic flow meter

This a non contact flow measuring device using Doppler effect principle. There is a transmitter and receiver which are positioned on opposite sides of the pipe. The meter Pitot Tube and manometer Air velocity in ducts can be measured using a pitot tube and inclined manometer for further calculation of flows.

Combustion analyzer

This instrument has in-built chemical cells which measure various gases such as CO₂, CO, NO_x, SO_x etc

Fuel Efficiency Monitor

This measures Oxygen and temperature of the flue gas. Calorific values of common fuels are fed into the microprocessor which calculates the combustion efficiency.

Energy audits identify energy consumed by a facility and locate energy conservation measures or projects. Typical audits start with a walkthrough and checklist and progress to monitoring and metering for information on real-time energy consumption. More intricate audits involve economic calculations, such as internal rate of return that are used to obtain funding for conservation projects, code compliance and development of an equipment maintenance schedule.

