



DIFFERENCE BETWEEN AUDIT- TYPES: 1, 2, AND 3

An Energy Audit is a series of actions which are carried out by highly skilled specialists, on a public, commercial or industrial facility, to quantify the energy use in the facility and to identify ways by which energy optimization can be achieved. An Energy Audit is a key to a systematic approach for decision-making in the area of energy management. Furthermore, an Energy Audit is the core of an organization's Energy Management System.

Upon conducting an energy audit in a facility, energy reduction will be obtained, and such reduction should not impact on any other organizational parameter such as health & safety or overall quality or quantity of production. Practical energy audit work requires a flexible approach tailored to each type of building and process. Procedures are adapted to meet the needs of the specific facility during the energy audit activity / period with better environments, better comfort, and solve their operations issues.

01 Global Standards for energy audits

Many different international standards for energy audit exist. These include BSI (British Standards); EN 16247-1 (The European Standard); ANSI (The American Standards); ISO 50002 (The International Standard). All the standards agree on the objectives. However, the approaches may vary but all target to improve the energy efficiency and reduce the energy costs.

02 Levels of Energy Audits within the ISO Standard

The ISO standard for energy audit ISO 50002:2014 Energy Audit Standard has three levels (Types) of energy audits as shown in table 1:

Levels	Technical Name	Characteristics / Description
Type 1	Basic Energy Audit	Energy audit of smaller organizations or facilities/ preliminary audit for larger organizations or facilities.
Type 2	Detailed Energy Audit	Detailed energy audit (usually of large facilities) including energy measurements in the facility.
Type 3	Comprehensive Energy Audit	Comprehensive energy audit of large organizations including detailed energy measurements in the facility. Also applicable for individual systems such as compressed air, steam to design an energy efficiency project in detail.

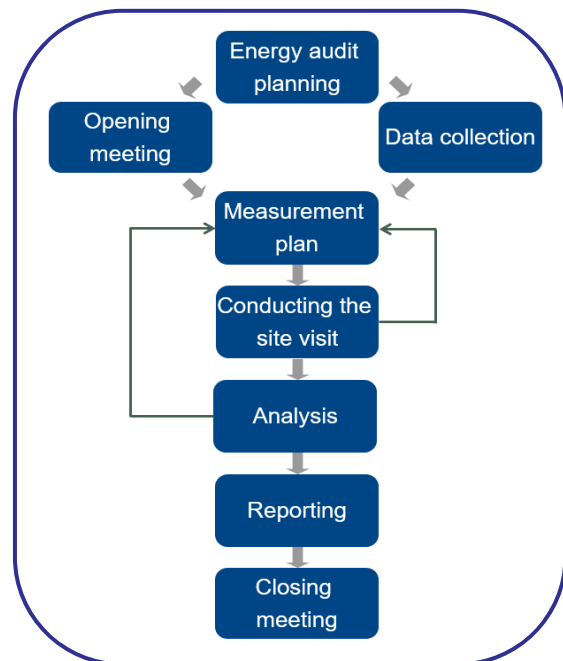
03 Differences between Types 1, 2 and 3 energy audits

The table below shows actions which an energy auditor will execute for the three types (levels) of ISO 50002:2014 energy audits.

Analysis	Type 1	Type 2	Type 3
Review of current and historical data	X	X	X
Review of daily, monthly, seasonal energy profiles to identify anomalies	X	X	X
Factory level energy flow and identification of SEUs	X	X	X
Comparison with available benchmarks to identify inefficiencies	X	X	X
EnPIs at plant, system, process or equipment level		X	X
Mass and energy balance of significant energy users, systems, processes		X	X
Energy balance reconciled with sub-metering data		X	X
Variation of energy consumption with relevant variables		X	X
Recommendation for additional data or investigations			X

04 Typical Steps in an energy audit

Assessing the operational process of an existing building, manufacturing facility, or an energy consuming department requires a step-by-step approach that needs a good collaboration between the energy auditor and the staff of the audited client. The auditor will generate ideas to improve the energy efficiency and submit them to the operating staff for their review, challenge them, and assess their impact on the operations which remain under the client control and obligations. Figure 1 shows the typical steps in an energy audit.



05 Typical Steps in an energy audit

Developing a bankable energy efficiency project consumes money and time that need to be progressively managed with tangible results at well understood milestones. The overall result will generate savings in energy and costs that are

recurrent and usually repaid within acceptable pay-back period when done by audit specialists. The energy consumer will primarily control his energy expenses while improving the comfort and the environment.

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