# GB

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## GB/T 17166-2019

Replacing GB/T 17166-1997

# General principle of energy audits

能源审计技术通则

(ISO 50002:2014, Energy audits - Requirements with guidance for use, NEQ)

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**Standardization Administration of the People's Republic of China.**

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# General principle of energy audits

## 1 Scope

This Standard specifies the general principles, content and basis, implementation process and requirements of energy audits.

This Standard applies to energy audits carried out by energy-consuming organizations.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 2589 General rules for calculation of the comprehensive energy consumption

GB/T 3484 The general principles for energy balance of enterprise

GB/T 6422 Testing guide for energy consumption of equipment

GB/T 13234 Determination of energy savings in organizations

GB/T 15587 Guideline for energy management in industry enterprise

GB 17167 General principle for equipping and managing of the measuring instrument of energy in organization of energy using

GB/T 23331 Energy management systems - Requirements

GB/T 28749 The method of drawing energy balance network diagram for enterprises

GB/T 28750 General technical rules for measurement and verification of energy savings

GB/T 28751 The method of editing energy balance table for enterprises

GB/T 29456 Energy management systems - Implementation guidance

Energy auditors shall meet the following requirements:

a) Possess relevant education and training background;

b) Familiar with laws, regulations, standards, etc. related to energy audits;

c) Possess relevant technical, management and professional experience in energy audits;

d) Familiar with the energy use process of energy-consuming organizations;

e) Keep the business secrets of energy-consuming organizations.

# 5 Content and basis

### 5.1 Content

According to the purpose and requirements of energy audits, energy audits shall include:

a) Energy management status of energy-consuming organizations;

b) Energy consumption status and energy consumption process of energy-consuming organizations;

c) Energy measurement and statistics status;

d) Calculation and analysis of energy performance parameters, including:

- Calculate energy consumption, energy savings, energy consumption indicators, energy efficiency indicators of main energy consumption processes, facilities and equipment, etc.;

- Analyze the historical change trends and main influencing factors of energy performance parameters;

e) Calculation and analysis of energy cost indicators;

f) Technical and economic analysis of energy conservation opportunities and energy conservation measures.

### 5.2 Basis

Energy audits may be carried out on the following basis:

a) Evaluate energy management for energy-consuming organizations according to GB/T 15587, GB/T 23331 and GB/T 29456;

Energy auditors and energy-consuming organizations shall clarify the objective and scope of energy audits, and form a written energy audit plan. Specific requirements are as follows:

a) The work plan shall include:

1) Objective, scope and boundary of energy audits;

2) The time required to complete energy audits and schedule;

3) Energy audit period;

4) Energy audit basis;

5) Evaluation criteria for energy performance improvement opportunities;

6) Resources and working conditions that shall be provided by energy-consuming organizations;

7) Relevant data and information that shall be provided by energy-consuming organizations before the start of energy audits;

8) Expected delivery form of results and requirements;

9) Contact person of both the energy-consuming organization and the energy auditor and person in charge;

10) Approval procedures for energy audit related amendments.

b) In the process of developing a work plan, energy auditors may request energy-consuming organizations to provide the following information:

1) Internal rules and regulations related to energy audits and other uncertain factors;

2) Regulations, systems or constraints affecting energy audits;

3) Strategies and plans that affect the energy performance of energy-consuming organizations;

4) The established management system;

5) Factors or special considerations that may affect the scope, process and results of energy audits;

6) Energy conservation measures to be taken.

c) In the process of developing a work plan, energy auditors shall inform to audits, including:

a) Overview of energy-consuming organizations;

b) A list of energy-consuming systems, processes, facilities and equipment;

c) Energy use characteristics;

d) Current and historical energy performance parameters, including:

- Energy consumption;
- Data on energy consumption indicators;
- Operating data and events affecting energy consumption;
- Data on energy efficiency indicators;
- Historical trend of energy efficiency indicators and energy savings;

e) Energy consumption monitoring equipment, configuration and analysis information;

f) Work plans that affect energy performance;

g) Design, operation and maintenance documents;

h) Past energy audits, energy review reports and research results, etc.;

i) Energy costs, prices, tax rates and data on other relevant economic indicators;

j) Management system for energy purchase, transmission, distribution, utilization and consumption;

k) Other necessary data and information.

**6.6 Developing a test plan**

If it is necessary to carry out on-site data test and collection, energy auditors and energy-consuming organizations shall jointly develop a written test plan. The test plan should include the following main contents:

a) List of measuring points, test process and measuring equipment;

b) Feasibility of measuring points, test process and installing measuring equipment;

c) Measurement accuracy and repeatability requirements, and measurement

b) Evaluate the energy use process and energy consumption according to the scope, boundary, objective and approved methods of energy audits;

c) Understand the impact of operating procedures and user behavior on energy performance;

d) Identify areas and energy use processes that require further detailed investigation of data;

e) Ensure that the relevant data and information obtained can represent actual typical operating conditions;

f) Timely discover and notify energy-consuming organizations of on-site problems that may affect the smooth implementation of energy audits.

### 6.7.3 On-site test

During on-site tests, energy auditors or energy-consuming organizations shall assign relevant personnel to be responsible for the installation of energy measuring and test equipment. k

During on-site tests, the relevant personnel of energy-consuming organizations shall cooperate with the installation of energy measuring and test equipment in accordance with the requirements of the test plan.

If energy-consuming organizations cannot meet the requirements of on-site tests, the energy audit work plan and test plan shall be revised.

## 6.8 Analysis and evaluation

### 6.8.1 Basic requirements

Energy auditors shall evaluate the reliability and validity of data provided by energy-consuming organizations, and point out data issues that affect audit results. When necessary, the test plan shall be modified, supplementing on-site data test and collection.

When the data is incomplete, energy auditors shall declare in the report that the audit objective cannot be achieved.

Energy auditors shall:

a) Use open, transparent and technically reasonable calculation methods;

b) Record the methods used and related assumptions and estimates;

c) Ensure that the impact of measurement uncertainty is fully considered;

e) Possible changes in future energy use and production operations.

#### 6.8.4 Evaluating energy conservation measures

Energy auditors shall evaluate the effects of the energy conservation measures recommended in 6.8.3 based on the following conditions:

a) Energy conservation and expected operating life within a certain time period;

b) Investment required for energy conservation measures, financial costs that can be saved, and investment payback period;

c) Possible non-energy-conservation benefits (e.g. increased productivity, reduced maintenance costs, etc.);

d) Ranking of different energy conservation measures;

e) Interaction between different energy conservation measures.

### 6.9 Preparation of reports

#### 6.9.1 Principle

**6.9.1.1** The energy audit report shall reflect all the work of energy audits in a comprehensive and general way, the relevant supporting information shall be clear and perfect, the arguments and suggestions shall be clear and targeted, so that they can be easily reviewed.

**6.9.1.2** The original data and all calculation processes may be listed in an annex.

**6.9.1.3** For reports with more audit content, sub-reports may be compiled for key audit items, and special technical reports can be compiled for major technical issues.

#### 6.9.2 Main content

The energy audit report shall include the following:

a) Basic status:

1) Overview of energy-consuming organizations;

2) Basic information of energy auditors and energy audit methods;

3) Laws, regulations, standards and other requirements applicable to energy audits;

**------ The End ------**