International Standard

ISO 50002-1

Energy audits —

Part 1: General requirements with guidance for use

Audits énergétiques —

Partie 1: Exigences et recommandations de mise en œuvre

First edition
2025-06

Reference number
ISO 50002-1:2025(en)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Principles of energy auditing ... **6**
4.1 General ... 6
4.2 Competency ... 6
4.3 Confidentiality ... 6
4.4 Objectivity ... 6
4.5 Access to equipment, resources and information ... 6
4.6 Evidence-based approach ... 6
4.7 Risk-based approach ... 7
4.8 Communication ... 7
5 Performing an energy audit ... **7**
5.1 General ... 7
5.2 Planning ... 8
5.3 Opening meeting ... 10
5.4 Data collection ... 11
5.5 Measurement plan ... 12
5.6 Site visit ... 13
5.7 Analysis ... 14
5.7.1 General ... 14
5.7.2 Analysis of current energy performance ... 14
5.7.3 Identification of energy performance improvement opportunities ... 14
5.7.4 Evaluation of energy performance improvement opportunities ... 15
5.7.5 Prioritization of energy performance improvement actions ... 15
5.8 Reporting ... 16
5.8.1 General ... 16
5.8.2 Report content ... 16
5.9 Closing meeting ... 17
6 Competence of the energy auditor ... **18**
6.1 General ... 18
6.2 Generic competence of energy auditors ... 18
6.2.1 General ... 18
6.2.2 Energy audit principles, processes and methods ... 18
6.2.3 Energy audit standards and other references ... 18
6.2.4 Organization and its context ... 19
6.2.5 Applicable legal requirements and other requirements ... 19
6.3 Energy specific competence of energy auditors ... 19
6.4 Generic competence of a lead energy auditor ... 20
Annex A (informative) **Guidance on the use of this document** ... **21**
Annex B (informative) **Applicability of this document to other International Standards** ... **32**
Annex C (informative) **Sampling** ... **36**
Bibliography ... **37**

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 301, *Energy management and energy savings*.

This first edition cancels and replaces ISO 50002:2014, which has been technically revised.

The main changes are as follows:

— the terms and definitions have been aligned with ISO 50001:2018;

— new principles have been added;

— decarbonization options have been included in improvement opportunities (renewable energy and achievement of net zero);

— energy auditor competencies have been clarified.

A list of all parts in the ISO 50002 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

0.1 Background

An energy audit comprises multiple yet interlinked activities and processes ranging from establishing the scope of the energy audit, collecting and measuring the appropriate data, analysing the energy performance of an organization, building(s), equipment, system(s) and/or process(es), site observations and using the information to draw conclusions about energy performance improvement actions (EPIAs). The intended result of energy audits is to use a structured and planned process to identify and prioritize EPIAs, which will help reduce wasted energy and can obtain related environmental benefits.

Audit outputs include information on current energy use and performance, and they provide ranked recommendations for improvement that are relevant and practicable. The benefits of carrying out an energy audit include:

— reduced energy consumption;

— economic and financial benefits;

— reduced CO_{2e} emissions and greenhouse gas (GHG) reduction arising from energy use;

— related environmental benefits (e.g. air quality, water reduction);

— distribution of energy use and GHG emissions among various energy systems;

— benchmarking of energy use;

— assessment of energy performance of specific energy systems;

— other benefits (e.g. production efficiencies, maintenance, training).

0.2 ISO 50002series

The ISO 50002 series was revised using ISO 50002:2014 and EN 16247-1:2022 as the starting point. It allows for differences in approach and in terms of scope, boundary and audit objective, and seeks to harmonize common aspects of energy auditing in order to enhance clarity and transparency.

The ISO 50002 series includes the following parts:

— This document provides the principles and defines the common set of requirements for conducting energy audits for buildings, equipment, processes, systems, transport and other applications needed to identify opportunities to improve energy performance. The energy audit process is presented as a simple chronological sequence, but this does not preclude repeated iterations of certain steps.

— ISO 50002-2 provides guidance for using this document when conducting an energy audit of a building or a portfolio of buildings.

— ISO 50002-3 provides guidance for using this document when conducting an energy audit involving processes. This applies to any process that converts an input of an organization into saleable outputs such as a manufacturing process or industrial process.

The ISO 50002 series benefits organizations, energy auditors, and stakeholders worldwide by providing clarity and consistency for designing, developing, conducting and reporting energy audits. Specifically, the use of the ISO 50002 series:

— enhances the credibility and transparency of energy auditing activities;

— promotes a common understanding and expectations between the organization and the energy auditors on the energy audit processes and the roles and responsibilities of each parties;

— facilitates the development and implementation of EPIAs that provide credible and tracible analysis;

— facilitates the ability to track performance and progress of the energy audit activity;

— facilitates the design of energy audit services by organizations providing energy auditing services;

— supports sustainable development and the actions needed to achieve a low-carbon economy.

The applicability of this document to other International Standards is given in Annex B.

0.3 Usingthis document as part of an ISO 50001energy review

An energy audit can be used as part of an ISO 50001 energy review or part of other associated organizational initiatives (e.g. environmental management, sustainability, net zero initiatives). It can also be conducted independent of the organization's other initiatives.

Some organizations implementing an ISO 50001 energy management system can require additional support to implement the technical elements of an ISO 50001 energy review. Using this document as part of an ISO 50001 energy review enables the organization to:

— organize, plan and resource the energy review activities;

— ensure that the activities are carried out by competent energy auditors;

— be able to monitor and track its progress.

Clause B.1 gives additional guidance on how to structure an energy audit as part of an ISO 50001 energy review.

If an energy audit is going to be part of a wider EnMS, the energy auditor can be required to have competence in ISO 50001.