

Redline version
compares Second edition to
First edition



Energy management systems — Requirements with guidance for use

*Systèmes de management de l'énergie — Exigences et
recommandations pour la mise en œuvre*

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Reference number
ISO 50001:redline:2018(E)

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- Text example 1 — indicates added text (in green)
- ~~Text example 2~~ — indicates removed text (in red)
- indicates added graphic figure
- indicates removed graphic figure
- 1.x ... — Heading numbers containg modifications are highlighted in yellow in the Table of Contents

DISCLAIMER

This Redline version provides you with a quick and easy way to compare the main changes between this edition of the standard and its previous edition. It doesn't capture all single changes such as punctuation but highlights the modifications providing customers with the most valuable information. Therefore it is important to note that this Redline version is not the official ISO standard and that the users must consult with the clean version of the standard, which is the official standard, for implementation purposes.



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Published in Switzerland

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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.

~~International Standards are~~ 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 documents should be noted. This document was drafted in accordance with the ~~rules given in~~ editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

~~The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.~~

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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.

~~ISO 50001~~ This document was prepared by ~~Project~~ Technical Committee ISO/PC 242/TC 301, *Energy Management management and energy savings*.

This second edition cancels and replaces the first edition (ISO 50001:2011), which has been technically revised.

The main changes compared to the previous edition are as follows:

- adoption of ISO's requirements for management system standards, including a high-level structure, identical core text, and common terms and definitions, to ensure a high level of compatibility with other management system standards;
- better integration with strategic management processes;
- clarification of language and document structure;
- stronger emphasis on the role of top management;
- adoption of context order for the terms and their definitions in [Clause 3](#) and update of some definitions;
- inclusion of new definitions, including energy performance improvement;
- clarification on exclusions of energy types;
- clarification of "energy review";

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- introduction of the concept of normalization of energy performance indicators [EnPI(s)] and associated energy baselines [EnB(s)];
- addition of details on the energy data collection plan and related requirements (previously energy measurement plan);
- clarification of text related to energy performance indicators [EnPI(s)] and energy baselines [EnB(s)] in order to provide a better understanding of these concepts.

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.

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Introduction

0.1 General

The purpose of this International Standard document is to enable organizations to establish the systems and processes necessary to continually improve energy performance, including energy efficiency, use and consumption. Implementation of this International Standard is intended to lead to reductions in greenhouse gas emissions and other related environmental impacts and energy cost through systematic management of energy. This International Standard is applicable to all types and sizes of organizations, irrespective of geographical, cultural or social conditions. Successful implementation depends on energy use and energy consumption. This document specifies the energy management system (EnMS) requirements for an organization. Successful implementation of an EnMS supports a culture of energy performance improvement that depends upon commitment from all levels and functions of the organization, and especially from top management. In many instances, this involves cultural changes within an organization.

This International Standard specifies energy management system (EnMS) requirements, upon which an organization can develop and implement an energy policy, and establish objectives, targets, and action plans which take into account legal requirements and information related to significant energy use. An EnMS enables an organization to achieve its policy commitments, take action as needed to improve its energy performance and demonstrate the conformity of the system to the requirements of this International Standard. This International Standard applies to the activities under the control of the organization, and application of this International Standard can be tailored to fit the specific requirements of the organization, including the complexity of the system, degree of documentation, and resources. This document applies to the activities under the control of the organization. Its application can be tailored to fit the specific requirements of the organization, including the complexity of its systems, degree of documented information and available resources. This document does not apply to product use by end-users outside of the scope and boundaries of the EnMS, nor does it apply to product design outside of facilities, equipment, systems or energy-using processes. This document does apply to the design and procurement of facilities, equipment, systems or energy-using processes within the scope and boundaries of the EnMS.

Development and implementation of an EnMS includes an energy policy, objectives, energy targets and action plans related to its energy efficiency, energy use, and energy consumption while meeting applicable legal requirements and other requirements. An EnMS enables an organization to set and achieve objectives and energy targets, to take actions as needed to improve its energy performance, and to demonstrate the conformity of its system to the requirements of this document.

0.2 Energy performance approach

This document provides requirements for a systematic, data-driven and facts-based process, focused on continually improving energy performance. Energy performance is a key element integrated within the concepts introduced in this document in order to ensure effective and measurable results over time. Energy performance is a concept which is related to energy efficiency, energy use and energy consumption. Energy performance indicators (EnPIs) and energy baselines (EnBs) are two interrelated elements addressed in this document to enable organizations to demonstrate energy performance improvement.

0.3 Plan-Do-Check-Act (PDCA) cycle

The EnMS described in this document is based on the Plan-Do-Check-Act (PDCA) continual improvement framework and incorporates energy management into everyday existing organizational practices, as illustrated in [Figure 1](#).

NOTE In the context of energy management, the PDCA approach can be outlined as follows:

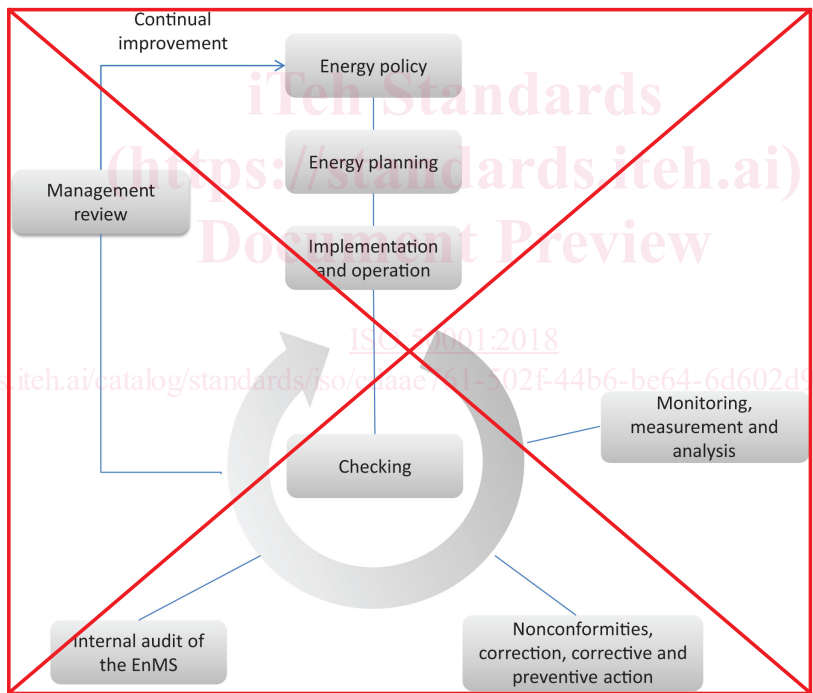
Plan: conduct the energy review and establish the baseline, energy performance indicators (EnPIs), objectives, targets and action plans necessary to deliver results that will improve energy performance in accordance with the organization's energy policy;

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- ~~— Do: implement the energy management action plans,~~
- ~~— Check: monitor and measure processes and the key characteristics of operations that determine energy performance against the energy policy and objectives, and report the results,~~
- ~~— Act: take actions to continually improve energy performance and the EnMS.~~

In the context of energy management, the PDCA approach can be outlined as follows.

- Plan:** understand the context of the organization, establish an energy policy and an energy management team, consider actions to address risks and opportunities, conduct an energy review, identify significant energy uses (SEUs) and establish energy performance indicators (EnPIs), energy baseline(s) (EnBs), objectives and energy targets, and action plans necessary to deliver results that will improve energy performance in accordance with the organization's energy policy.
- Do:** implement the action plans, operational and maintenance controls, and communication, ensure competence and consider energy performance in design and procurement.
- Check:** monitor, measure, analyse, evaluate, audit and conduct management review(s) of energy performance and the EnMS.
- Act:** take actions to address nonconformities and continually improve energy performance and the EnMS.



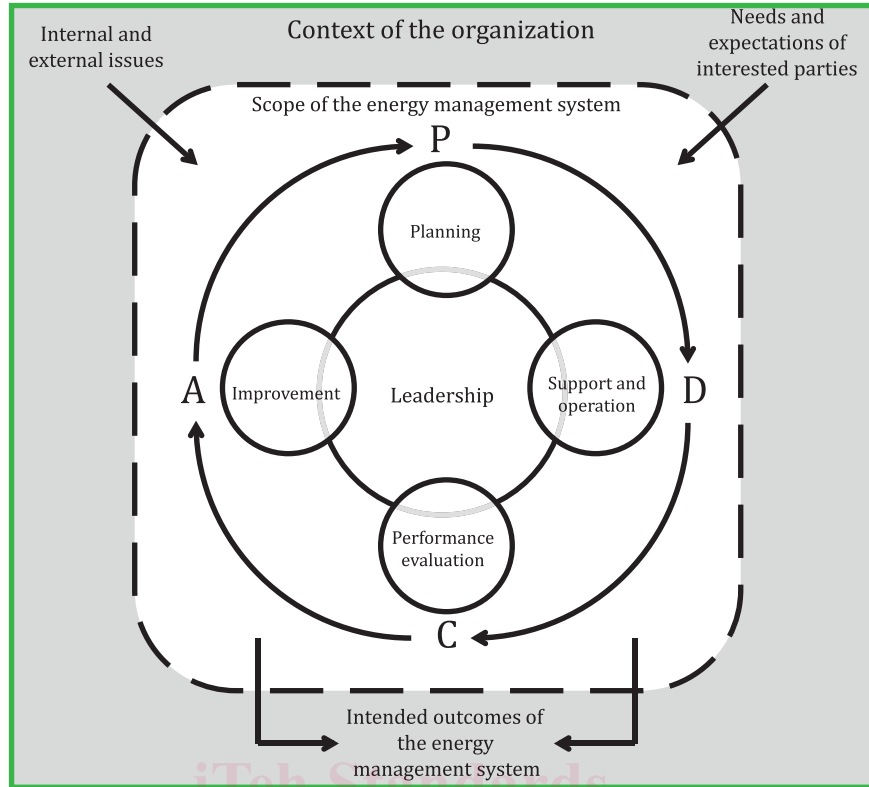


Figure 1 — ~~Energy management system model for this International Standard~~
Plan-Do-Check-Act Cycle

~~Worldwide application of this International Standard contributes to more efficient use of available energy sources, to enhanced competitiveness and to reducing greenhouse gas emissions and other related environmental impacts. This International Standard is applicable irrespective of the types of energy used.~~

<https://standards.iteh.ai/catalog/standards/iso/cdaae761-502f-44b6-be64-6d602d9d87fc/iso-50001-2018>

0.4 Compatibility with other management system standards

This ~~International Standard~~ document conforms to ISO's requirements for management system standards, including a high-level structure, identical core text, and common terms and definitions, thereby ensuring a high level of compatibility with other management system standards. This document can be used for certification, registration and self-declaration of an organization's EnMS. It does not establish absolute requirements for energy performance beyond the commitments in the energy policy of the organization and its obligation to comply with applicable legal requirements and other requirements. Thus, two independently; however, an organization can choose to combine its EnMS with other management systems, or integrate its EnMS in the achievement of other business, environmental or social objectives. Two organizations carrying out similar operations, but having different energy performance, can both conform to ~~its~~ the requirements of ISO 50001.

This document contains the requirements used to assess conformity. An organization that wishes to demonstrate conformity with this document can do so by:

- making an evaluation and self-declaration, or
- seeking confirmation of its conformance or self-declaration by interested parties, such as customers, or
- seeking certification/registration of its EnMS by an external organization.

In this document, the following verbal forms are used:

- “shall” indicates a requirement;

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- “should” indicates a recommendation;
- “can” indicates a possibility or a capability;
- “may” indicates a permission.

~~This International Standard is based on the common elements of ISO management system standards, ensuring a high level of compatibility notably with~~ Information marked as “NOTE” is intended to assist the understanding or use of ~~ISO 9001~~ the document. “Notes to entry” used in [Clause 3](#) provide additional information that supplements the terminological data ~~and ISO 14001~~ can contain requirements relating to the use of a term.

~~NOTE Annex B shows the relationship between this International Standard and ISO 9001:2000, ISO 14001:2004 and ISO 22000:2005.~~

0.5 Benefits of this document

~~An organization can choose to integrate this International Standard with other management systems, including those related to quality, the environment and occupational health and safety~~ Effective implementation of this document provides a systematic approach to improvement of energy performance that can transform the way organizations manage energy. By integrating energy management into business practice, organizations can establish a process for continual improvement of energy performance. By improving energy performance and associated energy costs, organizations can be more competitive. In addition, implementation can lead organizations to meet overall climate change mitigation goals by reducing their energy-related greenhouse gas emissions.

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Energy management systems — Requirements with guidance for use

1 Scope

This ~~International Standard~~ document specifies requirements for establishing, implementing, maintaining and improving an energy management system, whose purpose (EnMS). The intended outcome is to enable an organization to follow a systematic approach in achieving continual improvement of energy performance, including energy efficiency, energy use and consumption, and the EnMS.

~~This International Standard specifies requirements applicable to energy use and consumption, including measurement, documentation and reporting, design and procurement practices for equipment, systems, processes and personnel that contribute to energy performance.~~ document:

~~This International Standard applies to all variables affecting energy performance that can be monitored and influenced by the organization. This International Standard does not prescribe specific performance criteria with respect to energy.~~

~~This International Standard has been designed to be used independently, but it can be aligned or integrated with other management systems.~~

~~This International Standard is applicable to any organization wishing to ensure that it conforms to its stated energy policy and wishing to demonstrate this to others, such conformity being confirmed either by means of self-evaluation and self-declaration of conformity, or by certification of the energy management system by an external organization.~~

- a) is applicable to any organization regardless of its type, size, complexity, geographical location, organizational culture or the products and services it provides;
- b) is applicable to activities affecting energy performance that are managed and controlled by the organization;
- c) is applicable irrespective of the quantity, use, or types of energy consumed;
- d) requires demonstration of continual energy performance improvement, but does not define levels of energy performance improvement to be achieved;
- e) can be used independently, or be aligned or integrated with other management systems.

~~This International Standard also provides, in Annex A, informative guidance on its use~~ provides guidance for the use of this document. Annex B provides a comparison of this edition with the previous edition.

2 Normative references

~~No normative references are cited. This clause is included in order to retain clause numbering identical with other ISO management system standards.~~ There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
boundaries

~~physical or site limits and/or organizational limits as defined by the organization~~

~~EXAMPLE A process, a group of processes, a site, an entire organization, multiple sites under the control of an organization.~~

3.2
continual improvement

~~recurring process which results in enhancement of energy performance and the energy management system~~

~~Note 1 to entry. The process of establishing objectives and finding opportunities for improvement is a continual process.~~

~~Note 2 to entry. Continual improvement achieves improvements in overall energy performance, consistent with the organization's energy policy.~~

3.3
correction

~~action to eliminate a detected nonconformity (3.21)~~

~~Note 1 to entry. Adapted from ISO 9000:2005, definition 3.6.6.~~

3.4
corrective action

~~action to eliminate the cause of a detected nonconformity (3.21)~~

~~Note 1 to entry. There can be more than one cause for a nonconformity.~~

~~Note 2 to entry. Corrective action is taken to prevent recurrence whereas preventive action is taken to prevent occurrence.~~

~~Note 3 to entry. Adapted from ISO 9000:2005, definition 3.6.5~~

3.5
energy

~~electricity, fuels, steam, heat, compressed air, and other like media~~

~~Note 1 to entry. For the purposes of this International Standard, energy refers to the various forms of energy, including renewable, which can be purchased, stored, treated, used in equipment or in a process, or recovered.~~

~~Note 2 to entry. Energy can be defined as the capacity of a system to produce external activity or perform work.~~

3.6
energy baseline

~~quantitative reference(s) providing a basis for comparison of energy performance~~

~~Note 1 to entry. An energy baseline reflects a specified period of time.~~

~~Note 2 to entry. An energy baseline can be normalized using variables which affect energy use and/or consumption, e.g. production level, degree days (outdoor temperature), etc.~~

~~Note 3 to entry. The energy baseline is also used for calculation of energy savings, as a reference before and after implementation of energy performance improvement actions.~~

3.7
energy consumption

~~quantity of energy applied~~

3.8**energy efficiency**

~~ratio or other quantitative relationship between an output of performance, service, goods or energy, and an input of energy~~

~~EXAMPLE Conversion efficiency, energy required/energy used, output/input, theoretical energy used to operate/energy used to operate.~~

~~Note 1 to entry. Both input and output need to be clearly specified in quantity and quality, and be measurable.~~

3.9**energy management system****EnMS**

~~set of interrelated or interacting elements to establish an energy policy and energy objectives, and processes and procedures to achieve those objectives~~

3.10**energy management team**

~~person(s) responsible for effective implementation of the energy management system activities and for delivering energy performance improvements~~

~~Note 1 to entry. The size and nature of the organization, and available resources, will determine the size of the team. The team may be one person, such as the management representative.~~

3.11**energy objective**

~~specified outcome or achievement set to meet the organization's energy policy related to improved energy performance~~

3.12**energy performance**

~~measurable results related to energy efficiency (3.8), energy use (3.10) and energy consumption (3.7)~~

~~Note 1 to entry. In the context of energy management systems, results can be measured against the organization's energy policy, objectives, targets and other energy performance requirements.~~

~~Note 2 to entry. Corrective action is taken to prevent recurrence whereas preventive action is taken to prevent occurrence.~~

3.13**energy performance indicator****EnPI**

~~quantitative value or measure of energy performance, as defined by the organization~~

~~Note 1 to entry. EnPIs could be expressed as a simple metric, ratio or a more complex model.~~

3.14**energy policy**

~~statement by the organization of its overall intentions and direction of an organization related to its energy performance, as formally expressed by top management~~

~~Note 1 to entry. The energy policy provides a framework for action and for the setting of energy objectives and energy targets.~~

3.15**energy review**

~~determination of the organization's energy performance based on data and other information, leading to identification of opportunities for improvement~~

~~Note 1 to entry. In other regional or national standards, concepts such as identification and review of energy aspects or energy profile are included in the concept of energy review.~~

~~3.16~~

~~energy services~~

~~activities and their results related to the provision and/or use of energy~~

~~3.17~~

~~energy target~~

~~detailed and quantifiable energy performance requirement, applicable to the organization or parts thereof, that arises from the energy objective and that needs to be set and met in order to achieve this objective~~

~~3.18~~

~~energy use~~

~~manner or kind of application of energy~~

~~EXAMPLE Ventilation, lighting, heating, cooling, transportation, processes, production lines.~~

~~3.19~~

~~interested party~~

~~person or group concerned with, or affected by, the energy performance of the organization~~

~~3.20~~

~~internal audit~~

~~systematic, independent and documented process for obtaining evidence and evaluating it objectively in order to determine the extent to which requirements are fulfilled~~

~~SEE.~~

~~3.21~~

~~nonconformity~~

~~non fulfilment of a requirement~~

~~[SOURCE: ISO 9000:2005, definition 3.6.2]~~

~~3.22~~

~~organization~~

~~company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration and that has the authority to control its energy use and consumption~~

~~Note 1 to entry. An organization can be a person or a group of people.~~

~~3.23~~

~~preventive action~~

~~action to eliminate the cause of a potential *nonconformity* (3.21)~~

~~Note 1 to entry. There can be more than one cause for a potential nonconformity.~~

~~Note 2 to entry. Preventive action is taken to prevent occurrence, whereas corrective action is taken to prevent recurrence.~~

~~Note 3 to entry. Adapted from ISO 9000:2005, definition 3.6.4.~~

~~3.24~~

~~procedure~~

~~specified way to carry out an activity or a process~~

~~Note 1 to entry. Procedures can be documented or not.~~

~~Note 2 to entry. When a procedure is documented, the term “written procedure” or “documented procedure” is frequently used.~~

~~Note 3 to entry. Adapted from ISO 9000:2005, definition 3.4.5.~~