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SINGAPORE STANDARD

Energy management systems – Requirements with guidance for use

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This Singapore Standard was approved on 5 December 2018 by the Environment and Resources Standards Committee under the purview of the Singapore Standards Council.

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The Technical Committee on Energy, appointed by the Environment and Resources Standards Committee and responsible for the preparation of this standard, consists of representatives from the following organisations:

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The Working Group on Energy Management, appointed by the Technical Committee to assist in the preparation of this standard, comprises the following experts who contribute in their *individual capacity*:

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The organisations in which the experts of the Working Group are involved are:

Cushman & Wakefield
Energy Diagnostics & Solutions
G-Energy Global Pte Ltd
Johnson Controls (S) Pte Ltd
National Environment Agency
National Technological University
National University of Singapore
Petrochemical Corporation of Singapore Pte Ltd
Pfizer Asia Pte Ltd
PowerQ Technology Pte Ltd
Seagate Technology International
Singapore Accreditation Council

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National Foreword

This Singapore Standard was prepared by the Working Group on Energy Management appointed by the Technical Committee on Energy under the direction of the Environment and Resources Standards Committee.

This standard is identical with ISO 50001 : 2018 published by the International Organization for Standardization.

Attention is drawn to the possibility that some of the elements of this Singapore Standard may be the subject of patent rights. Enterprise Singapore shall not be held responsible for identifying any or all of such patent rights.

NOTE

1. *Singapore Standards (SSs) and Technical References (TRs) are reviewed periodically to keep abreast of technical changes, technological developments and industry practices. The changes are documented through the issue of either amendments or revisions.*

2. *An SS or TR is voluntary in nature except when it is made mandatory by a regulatory authority. It can also be cited in contracts making its application a business necessity. Users are advised to assess and determine whether the SS or TR is suitable for their intended use or purpose. If required, they should refer to the relevant professionals or experts for advice on the use of the document. Enterprise Singapore shall not be liable for any damages whether directly or indirectly suffered by anyone or any organisation as a result of the use of any SS or TR.*

3. *Compliance with a SS or TR does not exempt users from any legal obligations.*

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 documents 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).

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.

This document was prepared by Technical Committee ISO/TC 301, *Energy 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”;

— 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.

Introduction

0.1 General

The aim of this document is to enable organizations to establish the systems and processes necessary to continually improve energy performance, including energy efficiency, 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 of the organization, especially top management. In many instances, this involves cultural changes within an organization.

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 existing organizational practices, as illustrated in Figure 1.

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.

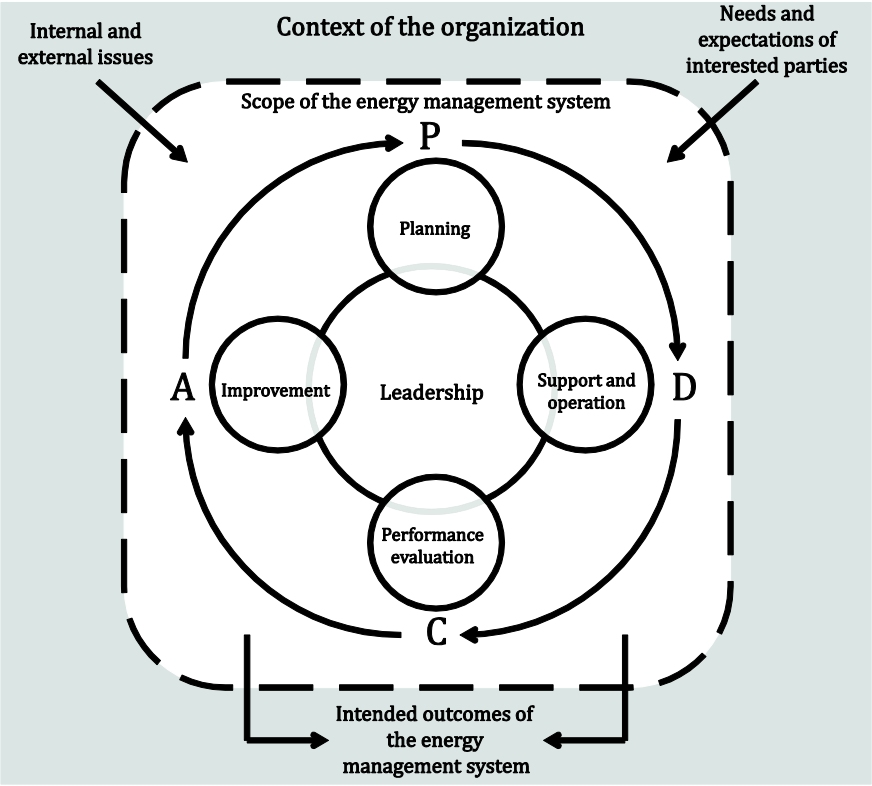

Figure 1 — Plan-Do-Check-Act Cycle

0.4 Compatibility with other management system standards

This 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 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 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;

— “should” indicates a recommendation;

— “can” indicates a possibility or a capability;

— “may” indicates a permission.

Information marked as “NOTE” is intended to assist the understanding or use of the document. “Notes to entry” used in Clause 3 provide additional information that supplements the terminological data and can contain requirements relating to the use of a term.

0.5 Benefits of this document

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.

Energy management systems — Requirements with guidance for use

1 Scope

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

This document:

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.

Annex A provides guidance for the use of this document. Annex B provides a comparison of this edition with the previous edition.

2 Normative references

There are no normative references in this document.