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Energy management systems – Assessing energy management using ISO 50001:2018

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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.

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).

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

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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 Overview

This guidance document provides a method for determining the status of an organization’s energy management using an energy management performance score (EMPS). Measuring energy management and energy performance is expected to guide organizations to more effective energy management.

This document can be used by organizations which have implemented or are implementing an energy management system (EnMS) based on ISO 50001:2018, or any other system of energy management. Organizations which have not implemented an EnMS may use this document for determining their scoring status of structure, operation and/or energy performance. The EMPS can be used by:

- an organization to compare the status of its EnMS at two different points in time to determine progress;
- a multi-site implementation of ISO 50001:2018, to compare the status of the EnMS of two different sites;
- two different organizations for benchmarking purposes.

This document defines evaluation items and does not specify the order in which each evaluated item is implemented. This document does not provide guidance on the implementation of ISO 50001:2018. For information on implementing ISO 50001:2018, see ISO 50004 or ISO 50005.

The EMPS is the result of three evaluated elements, as shown in [Figure 1](#):

- structure management score (SMS);
- operation management score (OMS);
- target achievement score (TAS).

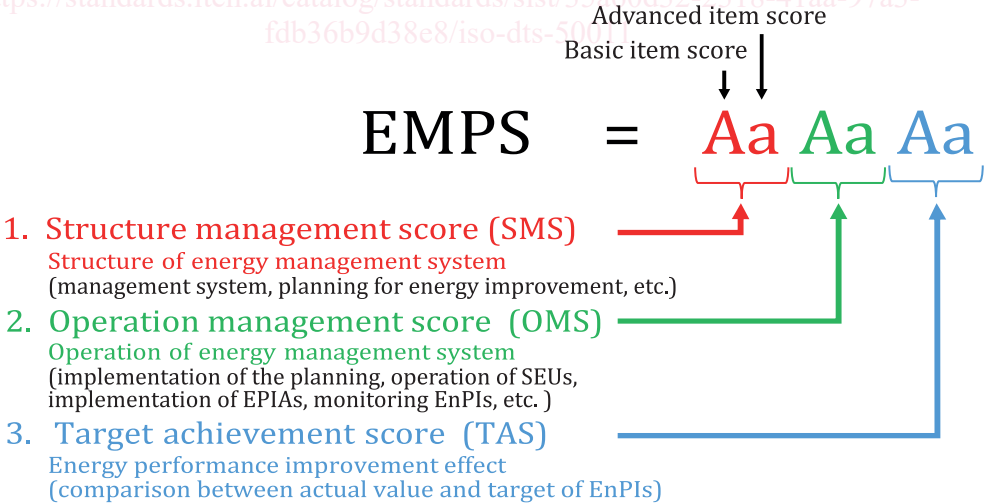


Figure 1 — Outline of the calculation method of the EMPS

The requirements of ISO 50001:2018 are represented by the basic items shown in [Tables 1, 3 and 5](#). An overview of the three components in the EMPS are shown in [Figure 2](#).

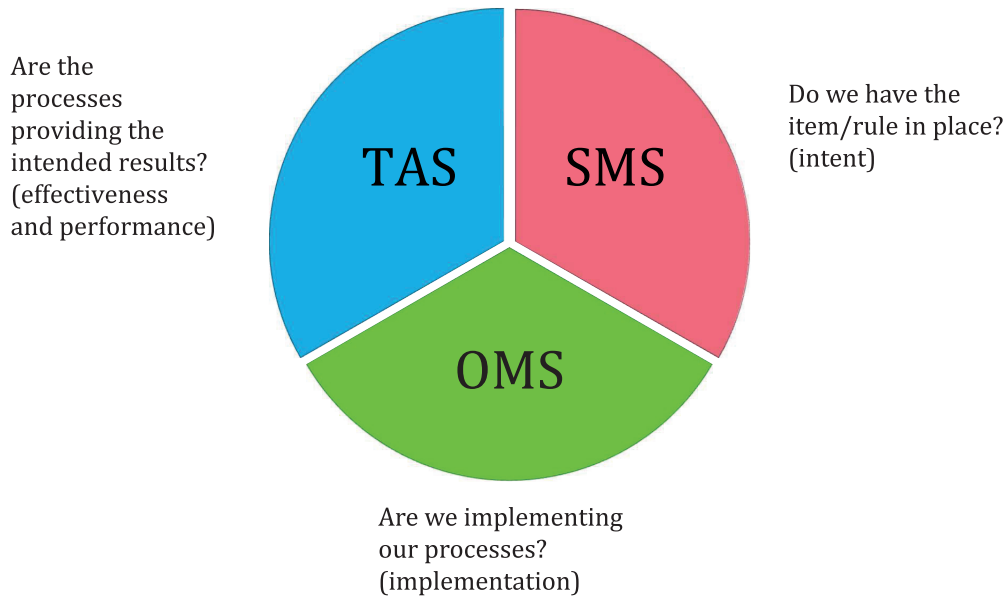


Figure 2 — Overview of SMS, OMS and TAS criteria

The results for the SMS, OMS and TAS are determined at four levels of score A, B, C and D. The highest score is A and the lowest score is D. In each element, basic items (see [Tables 1, 3 and 5](#)) and advanced items (see [Tables A.1, B.1 and C.1](#)) are addressed. The basic items and advanced items are scored separately. Although the advanced items are not included in the requirements of ISO 50001:2018, they provide additional opportunities for improving the organization’s energy management structure and operations.

To assist organizations with applying this document, it is strongly recommended that capital letters (A, B, C, D) are used for the basic categories of structure (SMS), operation (OMS) and performance (TAS). The capital letters are compared across time for internal use but can be compared with other interested parties. To facilitate the comparison, the items in [Tables 1, 3 and 5](#) cannot be modified. The use of colours also can help represent the status of the EnMS.

It is strongly recommended that the advanced items are represented by lower case letters (a, b, c, d). The same colour is used for the components (i.e. for both basic and advanced in each category the same colour is used) to assist with the visual representation. Since each organization applying this document can have different needs and objectives, the advanced items can be modified by the organization. The organization retains documented information on the advanced items to ensure transparency and allow for comparisons within the organization over time. That means that [Tables A.1, B.1 and C.1](#) are a starting part for use by the organization. The organization can add or remove items.

The structural elements of an EnMS conforming to ISO 50001:2018 are used as the criteria for SMS scoring. These criteria include, for example, context of the organization, energy policy, leadership commitment, internal audit and management review.

The operational elements of an EnMS conforming to ISO 50001:2018 are used as the criteria for OMS scoring. These criteria include, for example, measurement and management of energy performance, operation of facilities/equipment associated with significant energy uses (SEUs), design and procurement related to SEUs and energy supply, and management of actions to improve energy performance.

The TAS is evaluated based on achievement of energy target(s) established by the organization. Energy target(s) can be related to energy performance improvement including energy savings. Energy savings can be determined by the methods described in ISO 50047:2016, ISO 17741:2016 or ISO 17743:2016.

Energy performance improvement can be evaluated by the methods described in ISO 50006. An energy target can also be established based on benchmarks defined by the government or industry groups.

NOTE 2 The requirements for energy benchmarks defined by the government or industry groups are often based on absolute or specific energy consumption, without normalization or consideration of relevant variables. These do not always meet the requirements for evaluating energy performance improvement described in ISO 50001:2018.

0.2 Benefits

The benefits associated with use of this document are:

- for organizations:
 - a clear indication of areas for improvement in energy management;
 - a robust and holistic indicator(s) of energy performance;
 - alignment with ISO 50001:2018;
- for external authorities or organizations:
 - a robust and holistic indicator(s) of energy performance;
 - identification of best practices in different types of organizations;
 - promotion of ISO 50001:2018 in existing and new organizations.

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Energy management systems – Assessing energy management using ISO 50001:2018

1 Scope

This document gives guidance based on ISO 50001:2018 to measure the status of energy management in an organization. The measurement results are described by using three scores: structure management score (SMS), operation management score (OMS) and target achievement score (TAS). This document presents methodologies on how the basic and advanced scores can be calculated.

This document is applicable to organizations that are considering implementation, are implementing or have implemented an ISO 50001:2018 energy management system (EnMS) or any other system for energy management. It can be used to identify areas for improvement or to identify areas in which improvement has taken place.

This document is applicable to any organization or association (e.g. national energy authorities, energy intensive industries implementing advanced energy management to small and medium enterprises) regardless of its type, size or complexity, etc. This document does not apply to countries, regions or cities.

This document does not provide an interpretation of or modify the requirements of ISO 50001:2018.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 50001:2018, *Energy management systems — Requirements with guidance for use*

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms and definitions given in ISO 50001:2018 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 Terms and definitions

3.1.1

energy management performance score

EMPS

evaluation result of quantifying the status of energy management

Note 1 to entry: The status of energy management is a combination of the *structure management score* (3.1.2), *operation management score* (3.1.3) and *target achievement score* (3.1.4).

3.1.2
structure management score
SMS

evaluation result of quantifying the status of structural elements of energy management

Note 1 to entry: This evaluation result is determined at four levels (A, B, C, D) for basic scores and (a, b, c, d) for advanced scores.

3.1.3
operation management score
OMS

evaluation result of quantifying the status of operational elements of energy management

Note 1 to entry: This evaluation result is determined at four levels (A, B, C, D) for basic scores and (a, b, c, d) for advanced scores.

3.1.4
target achievement score
TAS

evaluation result of quantifying the achievement of energy target(s)

Note 1 to entry: The energy target(s) is established by the organization.

Note 2 to entry: This evaluation result is determined at four levels (A, B, C, D) for basic scores and (a, b, c, d) for advanced scores.

3.1.5
significant energy use
SEU

energy use accounting for substantial energy consumption and/or offering considerable potential for energy performance improvement

[SOURCE: ISO 50001:2018, 3.5.6, modified — Notes 1 and 2 to entry deleted.]

3.2 Abbreviated terms

EMPS energy management performance score

EnB energy baseline

EnMS energy management system

EnPI energy performance indicator

OMS operation management score

SEU significant energy use

SMS structure management score

TAS target achievement score

4 Objectives and boundary for the EMPS measurement

4.1 Understanding the objective of EMPS measurement

The main objective of using the EMPS is to measure and monitor the status of energy management in an organization to determine its progress. Additional objectives can be:

- a) to help to monitor the organization's activities for improving energy performance;

- b) to be part of green initiative(s) of the organization based on the expectations of its customers;
- c) to increase the organization's competitiveness;
- d) benchmarking with different parts of the organization to identify opportunities for improvement in their energy performance;
- e) benchmarking the organization's performance with other members of an industry association.

4.2 Determination of boundary for EMPS measurement

The boundaries for the EMPS should be within the energy management activities of the organization and the EnMS. The organization should determine and document the boundary appropriate to the measurement of the EMPS. Where an organization has already established an ISO 50001:2018 EnMS, the boundary for the EMPS measurement can be the same as the boundary of its ISO 50001:2018 EnMS.

In determining the boundary, the following should be considered:

- objective of the EMPS measurement;
- boundary of the EnMS;
- energy types used by the organization.

The EMPS is typically applied to all the energy management activities operated by the organization, to minimize the risk of choosing higher performing parts of the scope of the system. However, it can also be applied to distinct parts within an organization, to a multi-site organization or to more than one organization.

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5 Overview of measurement of EMPS

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5.1 Structure of the EMPS [ai/catalog/standards/sist/35a60d32-2318-41aa-97a3-fdb36b9d38e8/iso-dts-50011](https://standards.iteh.ai/catalog/standards/sist/35a60d32-2318-41aa-97a3-fdb36b9d38e8/iso-dts-50011)

The EMPS is a combination of basic scores and advanced scores. For the basic score, the SMS, OMS and TAS are each evaluated using four levels of scoring defined as A, B, C or D, where A is the highest and D is the lowest possible level. Levels are used to summarize the overall condition of the EnMS. These are more useful than the underlying numeric score because the evaluation criteria consider qualitative characteristics of the EnMS. For example, when each basic level is "A" for the SMS, OMS and TAS, the combined score for the basic items of the EMPS is "AAA". Similarly, when each advanced level is "b" the combined score for the advanced items of the EMPS is "bbb", resulting in a combined EMPS of "AbAbAb".

Criteria for the basic SMS are selected from requirements related to the structure of an ISO 50001:2018 EnMS. The organization should maintain documented information on the application of this document, if communicating with interested parties.

Criteria for the basic OMS are selected from requirements related to the effective maintenance and improvement of energy performance of an ISO 50001:2018 EnMS.

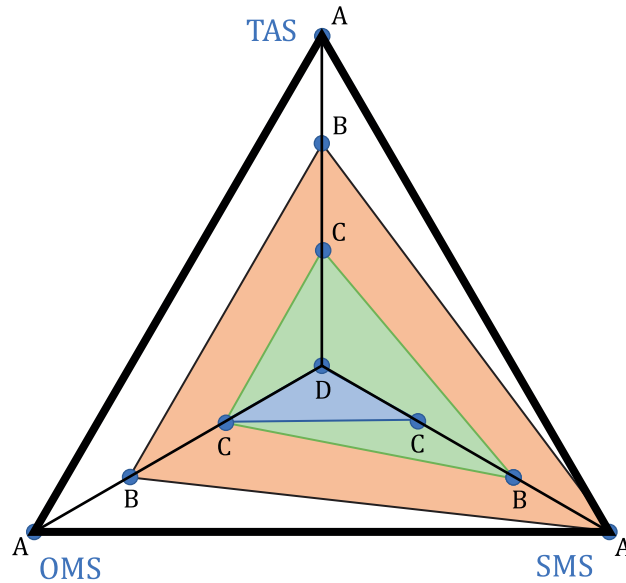
The energy targets are defined by the organization considering its current energy performance and potential for energy performance improvement. When the organization defines an energy target(s) in terms of energy savings, the methods described in ISO 50047, ISO 17741 or ISO 17743 can be used. When the organization defines an energy target(s) based on an EnPI, the methods described in ISO 50006 can be used.

5.2 Presentation of status

The results of evaluating the basic items for the SMS, OMS and TAS can be presented by using a visual representation such as a spider diagram. This allows for a visual presentation of the status of

energy management at a point in time. This type of visual representation also allows organizations to demonstrate progress over time (see [Figure 3](#)).

Additional information is available in [Annex A](#).



Key

- Blue triangle is period 1 showing initial status (CCD)
- Green triangle is period 2 showing improvement in the SMS and TAS (BCC)
- Orange triangle is period 3 showing improvement in the SMS, OMS and TAS (ABB)

NOTE This figure only shows the basic scores for the SMS, OMS and TAS.

Figure 3 — Example spider diagram

6 EMPS

6.1 General

The status of energy management of an organization is indicated by its EMPS. An overview of the EMPS and the method for its evaluation is shown in this clause.

6.2 SMS

The SMS for an organization is determined by evaluating structural elements of its energy management. The basic SMS is based on criteria selected from structural elements of ISO 50001:2018. The criteria for advanced items for the SMS are given in [Annex A](#).

The method for determining the basic SMS is described in [Clause 7](#).

6.3 OMS

The OMS for an organization is determined by evaluating operational elements of its energy management. The basic OMS is based on criteria selected from operational elements of ISO 50001:2018. The criteria for advanced items for the OMS are given in [Annex B](#).

The method for determining the basic OMS is described in [Clause 8](#).