TECHNICAL SPECIFICATION

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

Système de management de l'énergie — Évaluation du management de l'énergie au moyen de l'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).

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*.

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).

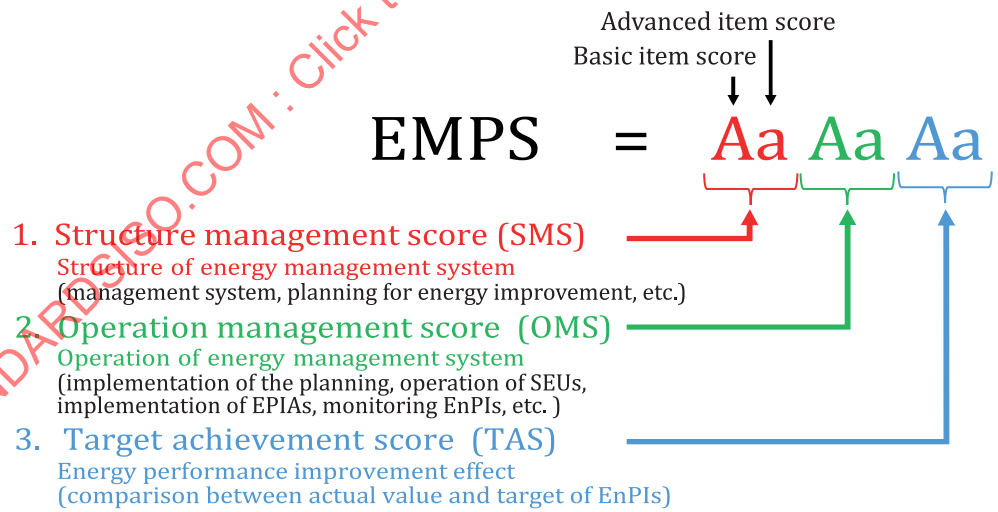


Figure 1 — Outline of the calculation method of the EMPS

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.

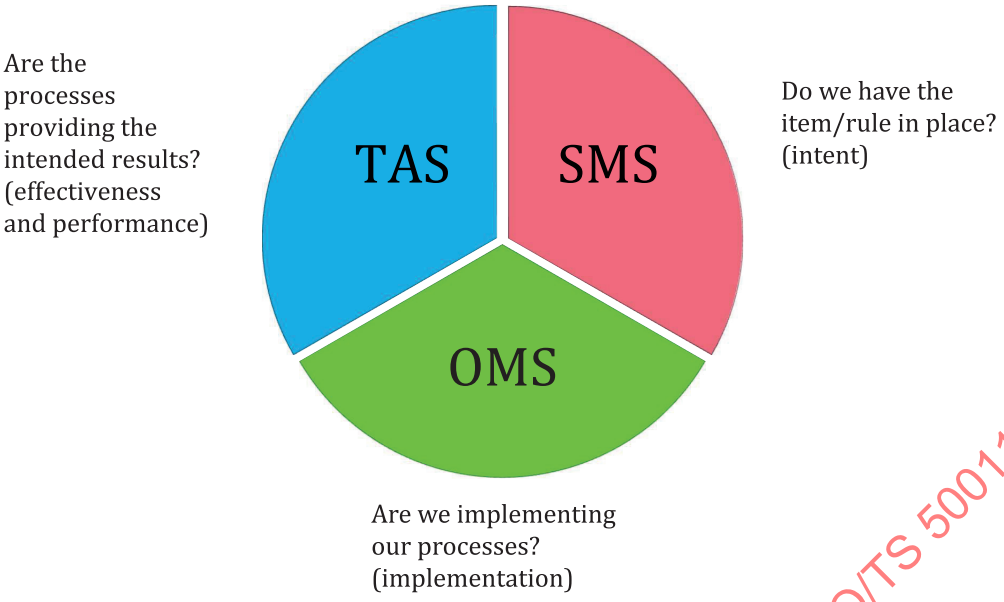


Figure 2 — Overview of SMS, OMS and TAS criteria

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.

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

EPIA energy performance improvement action

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.

5 Overview of measurement of EMPS

5.1 Structure of the EMPS

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 operation, maintenance and improvement of energy performance of an ISO 50001:2018 EnMS.

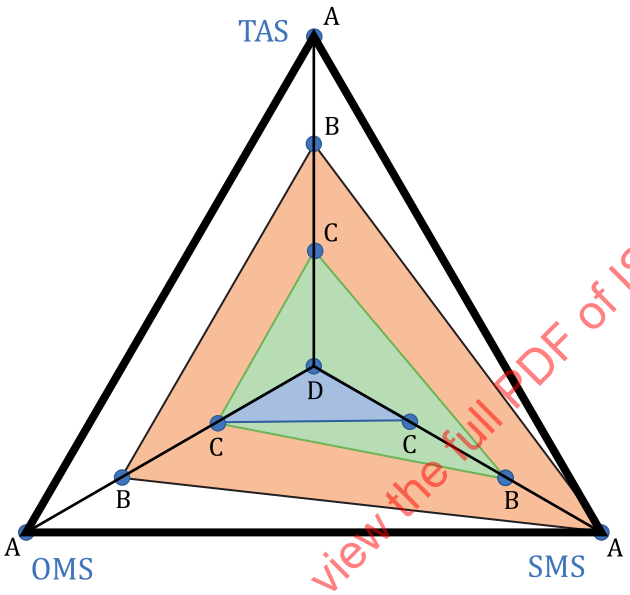
The energy targets are defined by the organization considering its current energy performance and potential for energy performance improvement. When the organization defines an energy target(s) in terms of energy savings, the methods described in ISO 50047, ISO 17741 or ISO 17743 can be used. When

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 are 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.

6.4 TAS

The TAS for an organization is determined by evaluating the degree of achievement of its energy target(s). The TAS is based on the energy target(s) established by the organization. The criteria for advanced items for the TAS are given in Annex C.

The period of time to achieve an energy target(s) can range from a short period of time (e.g. week, month) to multiple years. When an organization establishes an energy target(s) over multiple years, it should set annual milestones in its action plans and evaluate achievement relative to those annual milestones.

The method for determining the basic TAS is described in Clause 9.

7 Method for determination of SMS

7.1 General

The SMS should be determined by the following two criteria:

— Basic items: items for the structural elements of energy management based on the requirements of ISO 50001:2018.

— Advanced items: items for the structural element of energy management for achieving a higher level of improvement in energy performance as compared with basic items.

Organizations should evaluate the structure of their energy management as described in 7.2 and Annex A.

7.2 Basic items for SMS

Basic items for the SMS as described in Table 1 are based on the structural requirements in ISO 50001:2018. The criteria are evaluated and, if the organization has met the criterion, a point value of one (1) is assigned. If the criterion is not met, then a point value of zero (0) is assigned. No partial values are assigned (e.g. 0,5). After evaluating the criteria in Table 1, the basic SMS is determined by using the method described in 7.3.

Table 1 — Basic items for SMS

Item identification no.	Clause number in ISO 50001: 2018	Evaluation criteria (description of the reference state)	Possible points
SB-1	4.1	External issues that are relevant to the organization's purpose and that affect its ability to achieve the intended outcome(s) of its energy management and to improve its energy performance are determined.	1
		Internal issues that are relevant to the organization's purpose and that affect its ability to achieve the intended outcome(s) of its energy management and to improve its energy performance are determined.	1

Table 1 *(continued)*

Item identification no.	Clause number in ISO 50001: 2018	Evaluation criteria (description of the reference state)	Possible points
SB-2	4.2	The interested parties that are relevant to energy performance and its energy management are determined.	1
		The relevant energy requirements of the identified interested parties are determined.	1
		The identified needs and expectations related to energy, which the organization addresses through its energy management, are determined.	1
		The applicable legal requirements and other requirements are accessible.	1
		The applicable legal requirements and other requirements are taken into account and reviewed at defined intervals.	1
		The organization has determined how the applicable legal requirements and other requirements apply to its energy efficiency, energy use and energy consumption.	1
SB-3	4.3, 5.1 a)	The boundaries and applicability of energy management are determined to establish the organization's scope.	1
		In determining the energy management scope, the external and internal issues of ISO 50001:2018, 4.1, are considered.	1
		In determining the energy management scope, the requirements of ISO 50001:2018, 4.2, are considered.	1
		The authority to control its energy efficiency, energy use and energy consumption, within the scope and boundaries, is ensured.	1
		The EnMS scope and boundaries are maintained as documented information.	1
		No energy type within the scope and boundaries is excluded.	1
SB-4	4.4	Energy management, including the processes needed and their interactions, is established and implemented.	1
		Energy management, including the processes needed and their interactions, is maintained.	1
		Energy management, including the processes needed and their interactions, is continually improved.	1
SB-5	5.1	The energy policy, objectives and energy targets are established and are compatible with the strategic direction of the organization.	1
		The energy management requirements are integrated with the organization's business processes.	1
		Action plans are approved and implemented.	1
		The resources needed for energy management are made available.	1
		The importance of effective energy management and of conforming to the energy management requirements is communicated.	1
		Energy management achieves the intended outcome(s).	1
		Continual improvement of energy performance and energy management is promoted.	1
		The energy management team is formed.	1
		The EnPI(s) appropriately represent(s) energy performance.	1

Table 1 *(continued)*

Item identification no.	Clause number in ISO 50001: 2018	Evaluation criteria (description of the reference state)	Possible points
		Processes to identify and address changes affecting energy management and energy performance are established and implemented.	1
SB-6	5.2	An energy policy that is appropriate to the purpose of the organization is established.	1
		An energy policy that provides a framework for setting and reviewing objectives and energy targets is established.	1
		An energy policy that includes a commitment to ensure the availability of information and necessary resources to achieve the objectives and energy targets is established.	1
		An energy policy that includes a commitment to satisfy applicable legal requirements and other requirements related to energy efficiency, energy use and energy consumption is established.	1
		An energy policy that includes a commitment to continual improvement of energy performance and energy management is established.	1
		An energy policy that supports the procurement of energy efficient products and services that impact energy performance and design activities that consider energy performance improvement is established.	1
		The energy policy is available as documented information, communicated within the organization, available to interested parties, and periodically reviewed and updated as necessary.	1
SB-7	5.3	The responsibilities and authorities for relevant roles are assigned and communicated within the organization.	1
		The responsibility and authority to the energy management team for ensuring that energy management is established are assigned.	1
		The responsibility and authority to the energy management team for ensuring that energy management is implemented are assigned.	1
		The responsibility and authority to the energy management team for ensuring that energy management is maintained are assigned.	1
		The responsibility and authority to the energy management team for ensuring that energy management is continually improved are assigned.	1
		The responsibility and authority to the energy management team for ensuring that energy management conforms to the requirements of ISO 50001:2018 are assigned.	1
		The responsibility and authority to the energy management team for implementing the energy action plans to continually improve energy performance are assigned.	1
		The responsibility and authority to the energy management team for reporting on the performance of energy management and improvement of energy performance to top management at determined intervals are assigned.	1

Table 1 *(continued)*

Item identification no.	Clause number in ISO 50001: 2018	Evaluation criteria (description of the reference state)	Possible points
		The responsibility and authority to the energy management team for establishing criteria and methods needed to ensure that the operation and control of energy management are effective are assigned.	1
SB-8	6.1	In planning for energy management, the organization considers the issues referred to in SB-1 and the requirements referred to in SB-2.	1
		In planning for energy management, the organization reviews its activities and processes that can affect energy performance.	1
		Planning is consistent with the energy policy and leads to actions that result in continual improvement in energy performance.	1
		Risks and opportunities that need to be addressed to ensure that the EnMS can achieve the intended outcome(s), prevent or reduce undesired effects and achieves continual improvement are determined.	1
		The organization plans actions to address energy risks and opportunities.	1
		The organization plans how to integrate and implement the actions from the identified risks into its energy management and energy performance processes.	1
		The organization plans how to evaluate the effectiveness of these actions.	1
SB-9	6.2	Objectives and energy targets are established at relevant functions and levels within the organization and are consistent with the energy policy.	1
		Objectives and energy targets are measurable.	1
		Objectives and energy targets take into account applicable requirements.	1
		Objectives and energy targets consider SEUs.	1
		Objectives and energy targets take into account opportunities to improve energy performance.	1
		Energy action plans are established.	1
		Energy action plans are maintained.	1
		The action plans include information on what will be done.	1
		The action plans include information on what resources will be required.	1
		The action plans include information on who will be responsible.	1
		The action plans include information on when they will be completed.	1
		The action plans describe how the results will be evaluated, including the method(s) used to verify energy performance improvement.	1
		The organization considers how action plans can be integrated into its business processes.	1
		Documented information on objectives, energy targets and action plans is retained.	1

Table 1 *(continued)*

Item identification no.	Clause number in ISO 50001: 2018	Evaluation criteria (description of the reference state)	Possible points
SB-10	7.1	The resources for the establishment of energy management are determined and provided.	1
		The resources for the implementation of energy management are determined and provided.	1
		The resources for the maintenance of energy management are determined and provided.	1
		The resources needed for the continual improvement of energy performance and energy management are determined and provided.	1
SB-11	7.2	The organization determines the necessary competence of person(s) doing work under its control that affects its energy performance and energy management.	1
		The organization ensures that persons are competent based on appropriate education, training, skills or experience.	1
		The organization, where applicable, takes actions to acquire the necessary competence, and evaluate the effectiveness of the actions taken.	1
		The organization retains appropriate documented information as evidence of competence.	1
SB-12	7.5	The organization's energy management includes the documented information required by ISO 50001:2018.	1
		The organization's energy management includes documented information determined by the organization as being necessary for the effectiveness of energy management and to demonstrate energy performance improvement.	1
SB-13	9.2	The organization conducts internal audits of energy management at planned intervals.	1
		Internal audits of energy management provide information on whether the energy management improves energy performance.	1
		Internal audits of energy management provide information on whether the energy management conforms to the organization's own requirements for its energy management.	1
		Internal audits of energy management provide information on whether energy management conforms to the energy policy, objectives and energy targets established by the organization.	1
		Internal audits of energy management provide information on whether energy management conforms to ISO 50001:2018.	1
		Internal audits of energy management provide information on whether energy management is effectively implemented and maintained.	1
		The organization plans, establishes, implements and maintains (an) audit programme(s) including the frequency, methods, responsibilities, planning requirements and reporting, which take into consideration the importance of the processes concerned and the results of previous audits.	1
		The organization defines the audit criteria and scope for each audit.	1
		The organization selects auditors and conducts audits to ensure objectivity and the impartiality of the audit process.	1

Table 1 *(continued)*

Item identification no.	Clause number in ISO 50001: 2018	Evaluation criteria (description of the reference state)	Possible points
		The organization ensures that the results of the audits are reported to relevant management.	1
		The organization takes appropriate actions based on the results of the internal audits.	1
		The organization retains documented information as evidence of the implementation of the audit programme(s) and the audit results.	1
SB-14	9.3	Top management reviews the EnMS at planned intervals to ensure its continuous suitability, adequacy and effectiveness and alignment with the strategic direction of the organization.	1
		The management review includes consideration of the status of actions from previous management reviews.	1
		The management review includes consideration of changes in external and internal issues and associated risks and opportunities that are relevant to energy management.	1
		The management review includes consideration of information on energy management performance, including trends in nonconformities and corrective actions.	1
		The management review includes consideration of information on energy management performance, including trends in monitoring and measurement results.	1
		The management review includes consideration of information on energy management performance, including trends in audit results.	1
		The management review includes consideration of information on energy management performance, including trends in results of the evaluation of compliance with legal requirements and other requirements.	1
		The management review includes consideration of information on energy management performance, including trends in opportunities for continual improvement, including those for competence.	1
		The management review includes consideration of how the energy policy reflects the organization.	1
		The energy performance inputs to the management review include the extent to which objectives and energy targets have been met.	1
		The energy performance inputs to the management review include energy performance and energy performance improvement based on monitoring and measurement results including the EnPI(s).	1
		The energy performance inputs to the management review include the status of the energy action plans.	1
		The outputs of the management review include decisions related to continual improvement opportunities.	1
		The outputs of the management review include decisions related to any need for changes to energy management.	1
		The decisions taken during the management review relate to opportunities to improve energy performance.	1

Table 1 *(continued)*

Item identification no.	Clause number in ISO 50001: 2018	Evaluation criteria (description of the reference state)	Possible points
		The decisions taken during the management review relate to changes in the energy policy.	1
		The decisions taken during the management review relate to changes of the EnPI(s) or EnB(s).	1
		The decisions taken during the management review relate to any need for changes in objectives, energy targets, action plans or other elements of energy management and actions to be taken if they are not achieved.	1
		The decisions taken during the management review relate to opportunities to improve integration with business processes.	1
		The decisions taken during the management review relate to the allocation of resources.	1
		The decisions taken during the management review relate to the improvement of competence, awareness and communication.	1
		The decisions taken during the management review are retained as documented information as evidence of the results of management reviews.	1
SB-15	10.2	The suitability of energy management is continually improved.	1
		The adequacy of energy management is continually improved.	1
		The effectiveness of energy management is continually improved.	1
		Maximum number of points	**111**

7.3 Scoring method for the basic SMS items

The scoring method for the basic SMS items uses the following steps:

— Step 1: Record the number of criteria met (“x”) from Table 1.

— Step 2: Calculate the percentage score for the basic items using Formula (1):

$$P_{SMS} = \frac{x}{p_{max}} \times 100 \quad (1)$$

where

P_{SMS} is the percentage score for the basic SMS items;

x is the total points achieved by the organization from Table 1;

p_{max} is 111, which is the sum of the maximum number of points from Table 1.

— Step 3: Using the result from Formula (1), determine the level of the SMS basic component based on the ranges identified in Table 2.

Table 2 — Conversion table for SMS basic component score

SMS level	SMS range
A	≥ 80 %
B	≥ 60 % and < 80 %
C	≥ 40 % and < 60 %
D	< 40 %

8 Method for determination of OMS

8.1 General

The OMS should be determined by the following two criteria:

— Basic items: items for the operational elements of energy management based on the requirements of ISO 50001:2018.

— Advanced items: items for advanced operational elements of energy management to achieve a higher level of improvement in energy performance as compared with basic items.

Organizations should evaluate their operations for energy management as described in 8.2 and Annex B.

8.2 Basic items for OMS

Basic items for the OMS reflecting the requirements related to operation in ISO 50001:2018 are described in Table 3.

The organization should evaluate the operating state of energy management according to the basic items for the OMS. The criteria are evaluated and, if the organization has met the criterion, a point value of one (1) is assigned. If the criterion is not met, then a point value of zero (0) is assigned. No partial values are assigned (e.g. 0,5). After evaluating the criteria in Table 3, the score for the basic OMS is determined by using the method described in 8.3.

Table 3 — Basic items for OMS

Item identification no.	Clause number in ISO 50001:2018	Evaluation criteria (description of the reference state)	Possible Points
OB-1	5.1	Leadership and commitment for continual improvement of energy performance are demonstrated by top management.	1
		Top management demonstrates its leadership and commitment for continual improvement of the effectiveness of energy management.	1
		Top management directs and supports persons contributing to the effectiveness of energy management and to energy performance improvement.	1
		Top management supports other relevant management roles to demonstrate their leadership as it applies to their areas of responsibility.	1
OB-2	6.2	The objectives and energy targets are monitored.	1
		The objectives and energy targets are communicated.	1
		The objectives and energy targets are updated as appropriate.	1
		Documented information on the objectives and energy targets is retained.	1

Table 3 *(continued)*

Item identification no.	Clause number in ISO 50001: 2018	Evaluation criteria (description of the reference state)	Possible Points
OB-3	6.3	Current types of energy are identified during the energy review.	1
		Past and current energy use(s) and consumption are evaluated during the energy review.	1
		SEUs are identified based on the analysis from the energy review.	1
		Relevant variables for each SEU are determined.	1
		Current energy performance for each SEU is determined.	1
		The organization identifies the person(s) doing work under its control that influence or affect each SEU.	1
		Opportunities for improving energy performance are determined and prioritized.	1
		Future energy use(s) and energy consumption are estimated.	1
		The energy review is updated at defined intervals, as well as in response to major changes in facilities, equipment, systems or energy-using processes.	1
		Documented information on the methods and criteria used to develop the energy review is maintained, and documented information of its results is retained.	1
OB-4	6.4	The organization determines EnPIs appropriate for measuring and monitoring its energy performance and for demonstrating energy performance improvement.	1
		The organization establishes appropriate EnPI(s) by analysing data on relevant variables that significantly affect energy performance.	1
		The method for determining and updating the EnPI(s) is maintained as documented information.	1
		EnPI value(s) are reviewed and compared to their corresponding EnB(s), as appropriate.	1
		The EnPI value(s) and the related data are retained as documented information.	1
OB-5	6.5	Information on EnB(s), relevant variable data and modifications to EnB(s) are retained as documented information.	1
		(An) EnB(s) is established using the information from the energy review(s), and taking into account a suitable period of time.	1
		Where the organization has data indicating relevant variables affect energy performance, the organization carries out normalization of the EnPI(s) and their corresponding EnB(s).	1
		EnB(s) are revised in the case of one or more of the following: a) EnB(s) no longer reflect the organization's energy performance; b) there have been major changes to static factors; c) according to a pre-determined method.	1
		Documented information of EnB(s), relevant variable data and modifications to EnB(s) is retained.	1

Table 3 *(continued)*

Item identification no.	Clause number in ISO 50001: 2018	Evaluation criteria (description of the reference state)	Possible Points
OB-6	6.6	Key characteristics of the organization's operations affecting energy performance are identified, measured, monitored and analysed at planned intervals.	1
		An energy data collection plan is defined and implemented appropriately to the organization's size, complexity, resources, and measurement and monitoring equipment.	1
		The plan specifies the data necessary to monitor the key characteristics and states how and at what frequency the data are collected and retained.	1
		The plan includes data related to: a) SEUs (relevant variables, energy consumption and operational criteria); b) static factors, if applicable; c) data specified in action plans.	1
		Data collection plans are reviewed at defined intervals and updated as appropriate.	1
		Equipment used for measurement of key characteristics provides data which are accurate and repeatable.	1
		Documented information on measurement, monitoring and other means of establishing accuracy and repeatability is retained.	1
OB-7	7.3	Persons doing work under the organization's control are aware of the energy policy.	1
		Persons doing work under the organization's control are aware of their contribution to the effectiveness of energy management, including the achievement of objectives and energy targets, and the benefits of improved energy performance.	1
		Persons doing work under the organization's control are aware of the impact of their activities or behaviour with respect to energy performance.	1
		Persons doing work under the organization's control are aware of the implications of not conforming with the EnMS requirements.	1
OB-8	7.4	The internal and external communications relevant to the energy management are determined.	1
		The organization determines: — on what it will communicate; — when, with whom and how to communicate; — who communicates.	1
		The organization ensures that the information communicated is consistent with the information generated within the EnMS.	1
		A process by which any person(s) doing work under the organization's control can make comments or suggest improvements to the EnMS and to energy performance is established and implemented.	1
		Retaining documented information of the suggested improvements is considered.	1

Table 3 *(continued)*

Item identification no.	Clause number in ISO 50001: 2018	Evaluation criteria (description of the reference state)	Possible Points
OB-9	7.5	An appropriate identification and a description (e.g. a title, date, author or reference number) are used.	1
		An appropriate format (e.g. language, software version, graphics) and media (e.g. paper, electronic) are used.	1
		An appropriate review and approval for suitability and adequacy of documented information is ensured.	1
		Documented information required by the EnMS is controlled to make it available and suitable for use, where and when it is needed.	1
		Documented information required by the EnMS is controlled to make it adequately protected (e.g. from loss of confidentiality, improper use, loss of integrity).	1
		The following activities, as applicable, are addressed: — distribution, access, retrieval and use; — storage and preservation, including preservation of legibility; — control of changes (e.g. version control); — retention and disposition.	1
		Documented information of external origin necessary for the EnMS is identified, as appropriate, and controlled.	1
OB-10	8.1	The organization establishes criteria for the processes, including the effective operation and maintenance of facilities, equipment, systems and energy-using processes, where their absence can lead to a significant deviation from the intended energy performance.	1
		The criteria for the processes to relevant person(s) doing work under the control of the organization are communicated.	1
		The organization implements control of the processes in accordance with the criteria, including operating and maintaining facilities, equipment, systems and energy-using processes in accordance with established criteria.	1
		The organization retains documented information to the extent necessary to have confidence that the processes have been carried out as planned.	1
		The organization controls planned changes and reviews the consequences of unintended changes, taking actions to mitigate any adverse effects, as necessary.	1
		Management criteria for the operation and maintenance of SEUs are defined, and the results of the operation and maintenance are recorded.	1
		Outsourced SEUs or processes related to the organization's SEUs are controlled.	1

Table 3 *(continued)*

Item identification no.	Clause number in ISO 50001: 2018	Evaluation criteria (description of the reference state)	Possible Points
OB-11	8.2	The organization considers energy performance improvement opportunities and operational control in the design of new, modified and renovated facilities, equipment, systems and energy-using processes that can have a significant impact on its energy performance over the planned or expected operating lifetime.	1
		Where applicable, the results of the energy performance consideration are incorporated into specification, design and procurement activities.	1
		Documented information of the design activities related to energy performance is retained.	1
OB-12	8.3	The organization establishes and implements criteria for evaluating energy performance over the planned or expected operating lifetime when procuring energy using products, equipment and services which are expected to have a significant impact on the organization's energy performance.	1
		When appropriate, suppliers are informed that energy performance is one of the evaluation criteria for procurement.	1
		The organization defines and communicates specifications for ensuring the energy performance of procured equipment and services.	1
		The specifications for the purchase of energy are defined and communicated.	1
OB-13	9.1	The organization determines what needs to be monitored and measured for energy performance and the EnMS, including at a minimum the following key characteristics: a) the effectiveness of the action plans in achieving objectives and energy targets; b) EnPI(s); c) operation of SEUs; d) actual versus expected energy consumption.	1
		The organization determines the methods for monitoring, measurement, analysis and evaluation for energy performance and the EnMS, as applicable, to ensure valid results.	1
		The organization determines when the monitoring and measurement are performed for energy performance and the EnMS.	1
		The organization determines when the results from monitoring and measurement are analysed and evaluated for energy performance and the EnMS.	1
		Energy performance and the effectiveness of the EnMS is evaluated.	1
		Improvement in energy performance is evaluated by comparing EnPI value(s) against the corresponding EnB(s).	1
		The organization investigates and responds to significant deviations in energy performance.	1
		Documented information on the results of the investigation and response is retained.	1

Table 3 *(continued)*

Item identification no.	Clause number in ISO 50001: 2018	Evaluation criteria (description of the reference state)	Possible Points
		Appropriate documented information on the results from monitoring and measurement is retained.	1
OB-14	9.1.2	Compliance with legal requirements and other requirements is evaluated.	1
		Documented information on the results of the evaluation of compliance and any actions taken is retained.	1
OB-15	10.1	When a nonconformity is identified, the organization reacts to the nonconformity.	1
		When a nonconformity is identified, the organization evaluates the need for action to eliminate the cause(s) of the nonconformity, in order that it does not recur or occur elsewhere.	1
		When a nonconformity is identified, the organization implements any action needed to correct it.	1
		When a nonconformity is identified, the organization reviews the effectiveness of any corrective action taken.	1
		When a nonconformity is identified, the organization makes changes to the EnMS, if necessary.	1
		Corrective actions are appropriate to the effects of the encountered nonconformities.	1
		Documented information is retained on the nature of nonconformities, any subsequent action taken and the results of any corrective action.	1
OB-16	10.2	Continual energy performance improvement is demonstrated.	1
		Maximum number of points	**84**

8.3 Scoring method for basic OMS items

The scoring method for the basic OMS items uses the following steps:

— Step 1: Record the number of criteria met (“x”) from Table 3.

— Step 2: Calculate the percentage score for the basic items using Formula (2):

$$P_{OMS} = \frac{x}{p_{max}} \times 100 \quad (2)$$

where

P_{OMS} is the percentage score for the basic OMS items;

x is the total points achieved by the organization from Table 3;

p_{max} is 84, which is the sum of the maximum number of points from Table 3.

— Step 3: Using the result from Formula (2), determine the level of the OMS basic component based on the ranges identified in Table 4.

Table 4 — Conversion table for OMS basic component score

OMS level	OMS range
A	≥ 80 %
B	≥ 60 % and < 80 %
C	≥ 40 % and < 60 %
D	< 40 %

9 Method of determination of TAS

9.1 General

The TAS should be determined by the following two criteria:

— Basic items: items for the energy performance of the energy targets based on the requirements of ISO 50001:2018.

— Advanced items: items for demonstrating and/or achieving a higher level of improvement in energy performance as compared with basic items, which may include EnPIs pertaining to other aspects of energy management.

Organizations should evaluate their energy performance as described in 9.2 and Annex C.

9.2 Basic items for TAS

The organization should evaluate its energy performance improvement as a result of implemented actions.

NOTE 1 When the organization has established a reduction in energy consumption as one of its energy targets, ISO 50047, ISO 17741 or ISO 17743 can be referenced for additional information on calculation of energy savings.

NOTE 2 When the organization has established a change in EnPI value as its energy target, the calculation method for improvement in energy performance can be as described in ISO 50006.

The organization should evaluate the energy performance state of energy management according to the basic items for the TAS. The criteria are evaluated and, if the organization has met the criterion, a point value is assigned based on the possible point column. No partial values are assigned (e.g. 1,5). After evaluating the criteria in Table 5, the score for the basic TAS items is determined by using the method described in 9.3.

Table 5 — Basic items for TAS

Item identification no.	Evaluation criteria	Possible points	
TB-1	Calculate T_1 using Formula (3)	0 to < 40 %	1 point
		≥ 40 to < 60 %	2 points
		≥ 60 to < 80 %	3 points
		≥ 80 to 100 %	4 points
TB-2	Calculate T_2 using Formula (4)	0 to < 40 %	1 point
		≥ 40 to < 60 %	2 points
		≥ 60 to < 80 %	3 points
		≥ 80 to 100 %	4 points
TB-3	Energy target results are available as documented information.		2
	Maximum number of points		**10**

$$T_1 = \frac{v}{n} \times 100 \tag{3}$$

where

v is the number of energy targets verified in the specified time period;

n is the number of energy targets set for the same specified time period.

$$T_2 = \frac{z}{n} \times 100 \tag{4}$$

where

z is the number of energy targets achieved in the specified time period;

n is the number of energy targets set for the same specified time period.

Evaluate the TAS based on the conversion values in Table 6.

9.3 Scoring method for basic TAS items

The scoring method for the basic TAS items uses the following steps:

— Step 1: Record the number of criteria met (“x”) from Table 5.

— Step 2: Calculate the percentage score for the basic items using Formula (5).

$$P_{TAS} = \frac{x}{p_{max}} \times 100 \tag{5}$$

where

P_{TAS} is the percentage score for the basic TAS items;

x is the total points achieved by the organization from Table 5;

p_{max} is 10, which is the sum of the maximum number of points from Table 5.

— Step 3: Using the result from Formula (5), determine the level of the TAS basic component based on the ranges identified in Table 6.

Table 6 — Conversion table for TAS basic component score

TAS level	TAS range
A	≥ 90 % and ≤ 100 %
B	≥ 70 % and < 90 %
C	≥ 50 % and < 70 %
D	< 50 %

If the organization is subject to legal requirements and other requirements related to energy savings, the TAS can be converted according to those requirements. The conversion table for the TAS emphasizes the commitment of the organization to energy performance improvement by reducing the range to achieve a score of "A".

10 Advanced scoring

10.1 General

Annexes A, B and C have the advanced items that organizations can consider. The organization should review the advanced items and determine those which apply, and those which do not apply, and whether there are any additional items that should be added. Once the items are agreed, those items should be used for at least two points in time to allow for the progress to be determined. The organization agrees and records the point value for each item.

The scoring method for the advanced items uses the following steps:

— Step 1: Record the number of criteria met ("x") from the agreed advanced items table.

— Step 2: Record the maximum number of points available from the agreed advanced items table.

— Step 3: Calculate the percentage score for the basic items using Formula (6):

$$P_{\text{Advanced}} = \frac{x}{p_{\max}} \times 100 \tag{6}$$

where

P_{Advanced} is the percentage score for the advanced items;

x is the total points achieved by the organization from agreed advanced items;

$p_{\max}$ is the sum of the maximum number of points from the advanced item Table A.1, Table B.1 or Table C.1.

— Step 4: Using the result from Formula (6), determine the level of the advanced component based on the ranges identified in Table 7.