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Energy Management — —

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Contents

Page

Foreword

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ISO 50001 was prepared by Technical Committee ISO/PC 242, *Energy Management.*

Introduction

Energy Management — —

1   Scope

This standard specifies requirements for an energy management system, which enables an organization to take a systematic approach to the continual improvement of energy efficiency and energy performance. It does not itself state specific performance criteria with respect to energy. This standard applies to all organizations.

2   Normative references

To be completed later.

3   Terms and definitions

To be completed later

4   Energy management system requirements

4.1   General requirements

The organization shall:

a) establish, document, implement and maintain an energy management system in accordance with the requirements of this Standard.

b) define and document the scope and the boundaries of its energy management system.

c) determine and document how it will meet the requirements of this standard in order to achieve continual improvement of its energy performance.

4.2   Management responsibility

Top management shall demonstrate commitment to the energy management system and to continually improve its effectiveness by:

−   establishing the energy policy,
−   identifying the scope and boundaries to be addressed by the energy management system and their application throughout the organization,
−   determining criteria and methods needed to ensure that both the operation and control of these processes are effective,
−   including energy considerations in long-term planning, if applicable,
−   communicating to the organization the importance of energy management,
−   ensuring energy objectives are established and met,

–   providing the resources needed to establish, implement, maintain and improve the management system for energy, and

–   conducting management reviews.

4.2.1   Roles, responsibility and authority

Top management shall appoint an energy management representative with the appropriate skills and training, and the responsibility and authority to:

a)   ensure the energy management system is established, implemented and maintained in accordance with this International Standard;

b)   report to top management on the performance of the energy management system;

c)   report to top management on improvements in energy performance indicators;

d)   appoint members of the energy management system team with the approval of management

e)   plan and direct energy management activities designed to support the organization's energy policy and goals.

f)   define and communicate responsibilities and authorities in order to facilitate effective energy management.

Note: the requirement for a team needs further discussion.

4.3   Energy policy

Top management shall define and document its policy for managing energy. The energy policy shall

a)   address all significant energy uses,

b)   be appropriate to the defined scope and boundaries of the energy management system,

c)   be relevant to the nature and scale of energy use, and

d)   be consistent with the policies of other management systems.

In defining the energy policy, top management shall state its commitment to:

a)   meeting the requirements of this standard,

b)   legal, and other requirements to which the organization subscribes,

c)   continual improvement in energy performance.

The policy shall:

–   provide the framework for setting goals and targets,
–   be available to the public,
–   be documented, implemented and maintained, and
–   understood by those working for or on behalf of the organization, and
–   be regularly reviewed, and updated as needed.

4.4 Planning

4.4.1 Energy Review/profile

The organization shall establish, implement and maintain a documented procedure for developing and maintaining an energy profile. The energy profile shall be consistent with the defined scope of the energy management system. The energy profile shall be updated at defined intervals and made available for use in energy planning.

4.4.1.1 Identification of past and present energy use (baseline assessment)

The initial energy profile shall establish the energy baseline for an appropriate time period to include significant energy uses and factors affecting such use. The energy baseline shall be recorded. Changes in energy performance shall be measured against the energy baseline. Adjustments to the baseline shall be made only when normalized energy performance indicators no longer reflect organizational energy use. [determine what should be in the baseline]

The organization shall:

− identify the facilities, equipment, processes and personnel working for or on behalf of the organization that significantly affect energy consumption and demand, and cost [significant energy uses]
− identify other relevant variables affecting energy consumption
− establish energy performance indicators
− record the method(s) for identifying these significant energy uses
− review the identified significant energy uses on a regular basis and
− modify the list of significant energy uses as operational and facility changes occur.
− Identify and prioritize opportunities for improving energy performance

4.4.2 Legal and other requirements

The organization shall identify, maintain, and have access to the applicable legal requirements and other requirements to which the organization subscribes that relate to its energy uses and performance.

4.4.3 Objectives Targets, and action plans

The organization shall establish, implement and maintain documented energy objectives and targets, at the relevant functions and levels within the organization.

The objectives and targets shall be consistent with the energy policy, including the commitments to improvements in energy performance and to comply with applicable legal obligations and other requirements to which the organization subscribes. The energy objectives and target(s) shall be measurable and documented, and a time frame set for achievement.

When establishing targets, the organization shall consider the significant energy uses identified in the review/profile as well as its technological options, its financial, operational and business conditions, legal requirements and the views of interested parties.

The organization shall establish and maintain energy management action plans for achieving its objectives and targets. The energy management action plans shall include:

a) designation of responsibility;

b) the means and time frame by which individual targets are to be achieved.

The energy management action plans shall be documented and kept up to date.

(Note: Need further discussion on "Action Plans" vs Projects and Programmes)

4.5 Implementation and operation

4.5.1 Awareness, Training and Competence

The organization shall ensure that any person(s) performing tasks for it or on its behalf that are related to significant energy uses identified by the organization is (are) competent on the basis of appropriate education, training or experience, and shall retain associated records.

The organization shall ensure that its employees and all relevant persons working on its behalf are and remain aware of:

a) the importance of conformity with the energy policy, procedures and with the relevant requirements of the EMS,

b) the significant energy uses associated with their work, and the potential consequences of departure from specified procedures.

c) their roles and responsibilities in achieving the requirements of the EMS and

d) the benefits of improved energy performance.

The organization shall identify training needs associated with the control of its significant energy uses and the operation of its energy management system. It shall provide training or take other action to meet these needs, and shall retain associated records.

The organization shall also ensure that each level of management is adequately informed and trained in the field of energy management in order to be able to choose appropriate energy management actions.

4.5.2 Design

The organization shall assess and record the significant energy uses when specifying, designing, modifying or renovating energy consuming systems, equipment and/or buildings. The evaluation of the possibilities of improving energy efficiency shall be incorporated into the design activities at all stages of the project.

4.5.3 Operational control

The organization shall identify and plan those operations that are associated with the significant energy uses and ensure consistency with its energy policy, energy objectives and energy targets.

This includes:

a) setting criteria for the energy efficient operation and maintenance of those items (?) with significant energy use,

b) operating and maintaining in accordance with documented operational criteria,

c) monitoring and measuring,

d) correcting situations that could lead to deviation from the documented operating criteria,

e) appropriate communication of the operational controls to personnel, and people acting on behalf of the organization and other relevant parties.

4.5.4 Documentation requirements

4.5.4.1 General requirements

The organization shall establish, implement and maintain information, in paper or electronic form, to describe the core elements of the energy management system and their interaction and to identify the location of related documentation including technical documentation.

The documentation shall include:

a) the energy policy statement;

b) energy objectives and targets;

c) plans for achieving the energy goals and targets;

d) documented procedures required by this International Standard, and;

e) documents needed by the organization to ensure the effective planning, operation, and control of its significant energy-related processes and equipment.

NOTE   The degree of documentation can vary for different organizations for the following reasons:

a) Scale of the organization and type of activities

b) Complexity of the processes and their interactions

c) Competence of personnel

4.5.4.2 Control of documents

Documents required by the management system for energy shall be controlled.

Documented procedure(s) shall be established to define the controls needed to:

a)   periodically review and update as necessary;

b)   ensure that changes and current revision status of documents are identified;

c)   ensure that current versions of applicable documents are accessible in locations where operations important to the efficient implementation of the EMS are ongoing;

d)   ensure that documents remain legible and readily identifiable;

e)   ensure documents of external origin determined by the organization to be necessary for the planning and operation of the EMS are identified and their distribution controlled;

f)   prevent the unintended use of obsolete documents, and apply suitable identification to them if they are retained for any purpose.

4.5.5 Communication

The organization shall communicate internally with regard to its energy performance and the energy management system. This shall ensure that all persons working for and on behalf of the organization can take an active part in the energy management and the improvement of the energy performance.

The organisation should ensure that personnel at all levels within the organisation are encouraged and facilitated to make proposals for improvements, and submit relevant comments on the EMS.

The organization shall decide whether to communicate externally about its energy management system and energy performance, and shall document its decision. If the decision is to communicate externally, the organization shall establish and implement a method for this external communication.

4.5.6   Purchasing

4.5.6.1   Purchasing of energy efficient equipment

The organization shall establish and maintain procedures to incorporate and assess the energy consumption when purchasing energy consuming equipment.

When purchasing energy consuming equipment having a significant impact on the total energy consumption, the organization should inform suppliers that purchasing is partly evaluated on the basis of energy efficiency.

4.5.6.2   Purchasing of energy

The organization shall define or agree to specifications in the following areas, as applicable:

   a)   energy quality,

   b)   availability,

   c)   capacity,

   d)   variation over specified time,

   e)   billing parameters, and

   f)   environmental impact.

The organization shall review and approve energy purchasing specifications (such as requests for proposals, quotes or qualifications) for adequacy prior to release.

NOTE   The applicability of this section may vary from market to market.

4.5.7   Contingency planning

The organization shall establish, document and maintain a procedure for identifying and responding to any energy supply or other potential disasters. This procedure shall seek to prevent or mitigate the consequences of any such occurrence and consider the continuity of the business operations.

4.6   Checking performance

4.6.1   Monitoring and measurement

The organization shall plan and implement the monitoring, measurement, analysis and improvement processes needed to:

   a)   To demonstrate the performance of the energy management system

   b)   To demonstrate the energy efficiency performance of the organization

At planned intervals, the organization shall measure, monitor and record significant uses that affect the Energy performance indicators (EPIs) and evaluate the results. The organization shall identify and describe the measuring and monitoring requirements of its energy management action plans.

The organization shall ensure that the monitoring and measurement equipment related to the Energy Performance Indicators provides data which is accurate and repeatable and remains so

Records of monitoring and measurement shall be maintained (XX)

Energy performance indicators (EPIs) shall be regularly monitored to measure the effectiveness of the management system for energy.

4.6.2 Evaluation of legal/other compliance

At planned intervals, the organization shall evaluate compliance with legal obligations and other requirements to which the organization subscribes that are relevant to the scope of the management system for energy and record the results. Records of the evaluation shall be maintained (XX)

4.6.3 Management system audit

At planned intervals, the organization shall carry out management system audits to ensure that the management system for energy:

− conforms to the energy policy, objectives, action plans, and all other requirement of the standard
− is effectively, implemented and maintained.

An audit schedule shall be planned, taking into consideration the status and importance of the processes and areas to be audited, as well as the results of previous audits.

The selection of auditors and conduct of audits shall ensure objectivity and the impartiality of the audit process.

The management responsible for the area being audited shall ensure that actions are taken without undue delay to eliminate detected nonconformities and their causes. Follow-up activities shall include the verification of the actions taken and the reporting of verification results.

Management system audits of the management system for energy are carried out by, or at the request of, the organization itself, for internal purposes and may be the basis for a self declaration of adherence to the management system for energy.

4.6.4 Nonconformities, corrective, preventive and improvement actions

4.6.4.1 Nonconformities

Where management system for energy nonconformities are identified, they shall be corrected and action taken to mitigate their impact.

4.6.4.2 Corrective and preventive action

A process shall be established to define requirements for the corrective and preventive action of the management system for energy:

a) Reviewing nonconformities or potential nonconformities

b) Determining the causes of nonconformities or potential nonconformities

c) Evaluating the need for action to ensure that nonconformities do not occur or reoccur

d) Determining and implementing the appropriate action needed

e) Recording the results of actions taken

f)   Reviewing the effectiveness of the action taken

Preventive and corrective actions shall be appropriate to the risks encountered.

Records of corrective and preventive actions shall be maintained.

4.6.4.3   Improvement

At planned intervals the organization shall evaluate the opportunities for improvement of:

1)   the effectiveness of the management system for energy and

2)   the energy efficiency performance.

The organization shall identify the responsibility and authority and allocate resources for improvement.

4.6.5   Control of records

The organization shall establish, implement and maintain records as necessary to demonstrate conformity to the requirements of the EMS and of this International Standard. The records shall demonstrate the performance achieved and the effectiveness of the EMS.

The organization shall establish, implement and maintain procedures to define the necessary controls needed for record management.

Records shall be and remain legible, identifiable and traceable to the relevant activity, product or service for the established retention period.

4.7   Review of the energy management system by top management

4.7.1   Management review inputs

At planned intervals top management shall review the organization's energy management system performance to ensure continuing suitability, adequacy and effectiveness.

Top management shall consider its commitment to continual improvement in decisions related to actions taken or to be taken.

Records of management review shall be maintained.

Inputs to the management review shall include:

a) energy management action plan reviews, energy diagnoses/review results, energy management system audits results; (this includes changes to EPIs)

b)   evaluation of legal and other compliance and any changes to legal requirement

c) the energy performance of the organization (how are we doing relative to EPIs);

d) the status of corrective and preventive actions

e) the performance of the management system for energy

f) the extent to which energy objectives and targets have been met;

g) recommendations for improvement

h) follow up actions from previous management reviews

4.7.2   Management review outputs

Outputs from the management review shall include any decision or actions related to:

a)   the improvement in the energy performance of the organization since the last review,

b)   changes to the energy policy,

c)   decisions regarding the energy performance of the organization

d)   decisions regarding the energy management system

e)   the validity/suitability of EPIs

f)   changes to the objectives, targets or other elements of the management system for energy   consistent with the organization's commitment to continual improvement

g)   allocation of resources.

Annex A
(informative)

Guidance on the use of this International Standard

A.1 General requirements

What is the intention of the standard? How to start in case of no previous system. Some details on what should be included throughout the entire standard. Some further discussion on scope and boundaries of energy management systems. (ISO 14001 – A.1, KS A 4000 – A.1, prEN 16001 – A.1)

A.2 Roles, responsibility and authority

The energy management system team shall include, as appropriate, representatives from functional areas dealing with the selection, procurement, consumption, reliability, disposal and environmental impacts of fuels, water and energy systems. Representative areas may include but are not limited to: purchasing, accounting, engineering, design, production, maintenance, facilities management, environmental, and external service providers, as appropriate.

A.3 Energy policy

Include some detail on what should be included in an energy policy (ex. Commitment, long term goals, awareness, approach to applying policy, and review.) How it should be communicated. Linkages to other policies.

A.4 Planning

In the process of selecting goals, targets and action plans, the organization should consider:
a) finances,
b)alternative energy resources,
c)maintenance and infrastructure needs,
d)operational requirements and constraints,
e)quality and appropriateness of energy resources,
f) environmental impacts,
g)safety and health issues,
h) available human and technical resources, and
i) ability to measure improvement in energy performance.
The action plans should have a suitable level of analysis, including:
–before-project energy use,
–projected energy and non-energy benefits,
–identified means of verifying results, using standard measurement and verification protocols where available,
– implementation and maintenance costs, which includes the cost of capital equipment, labor, operation, financing, risk, measurement and verification, and
– life-cycle costs.

A.5 Energy Review/profile

Discuss linking energy goals with organizational strategy. Ensure business and energy objectives are aligned. Identify simple methods vs more sophisticated energy strategy planning. (MSE 2000 A.5.4, A6.4; KS A 4000 – A.2.3)

A.5.1.1 Identification of past and present energy use (baseline assessment)

Identify specific areas of significant energy use, how to evaluate, where to look for energy consumption. How to include impacts and risks.

Need to address identifying significant energy use; energy-related water use; best practices for selecting data interval for establishing a baseline; information on in-depth analysis, including financial analysis, before making implementation decision

A.5.2 Identification of legal and other requirements

Internal benchmarks should be encouraged. External benchmarks are encouraged where available.

Planned intervals for measuring and monitoring may not be the same as those for legal and other. Planned intervals are determined by the organization.

In the process of selecting goals, targets and action plans, the organization should consider:
a) finances,
b) alternative energy resources,
c) maintenance and infrastructure needs,
d) operational requirements and constraints,
e) quality and appropriateness of energy resources,
f) environmental impacts,
g) safety and health issues,
h) available human and technical resources, and
i) ability to measure improvement in energy performance.
The action plans should have a suitable level of analysis, including:
– before-project energy use,
– projected energy and non-energy benefits,
– identified means of verifying results, using standard measurement and verification protocols where available,
– implementation and maintenance costs, which includes the cost of capital equipment, labor, operation, financing, risk, measurement and verification, and
– life-cycle costs.

A.5.3 Implementation and operation

A.5.3.1 Awareness, Training and Competence

Discuss who should be competent in terms of energy management. If a procedure is required, more about what should be included. Add details on how to assess competency and what should be included in any records.

A.5.3.2 Design

Discuss what is meant by systems integration and optimization (consumption against requirements, minimizing losses in distribution, conversion efficiency.) Expand on systems design including new facilities or modification. Discuss how to include energy consumption/efficiency considerations when selecting or changing equipment and processes (matching of equipment to design requirements, connect to energy policy).

A.5.3.3 Operational control

Discuss how operations can be conducted in support of control and reduction of energy consumption.

A.5.4 Purchasing

Discuss links to Design. Include the importance of consideration of life cycle in equipment and outsourced services purchasing decisions.

A.5.5 Contingency planning

Discuss some detail as to what should be included in a contingency plan

A.5.6 Checking performance

A.5.6.1   Monitoring and measurement

Include guidance on frequency of measurement and reporting (how to ensure delivery of information to appropriate person/place).

A.5.6.2   Management system audit

Auditor objectivity and impartiality can be demonstrated by the freedom from responsibility for the activity being audited.