BS EN 16001:2009

BSI British Standards

Energy management systems — Requirements with guidance for use

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BSI British Standards

National foreword

This British Standard is the UK implementation of EN 16001:2009.

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Institute of Directors (IoD)
National Energy Foundation (NEF)
Chartered Institution of Building Services Engineers (CIBSE)
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The Carbon Trust (CT)
Association of Manufacturers of Domestic Appliances (AMDEA)
Major Energy Users Council (MEUC)
British Electrotechnical and Allied Manufacturers' Association (BEAMA)
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Foreword

This document (EN 16001:2009) has been prepared by CEN/CLC BT/TF 189 “Energy Management and related services – General requirements and qualification procedures”, the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2010, and conflicting national standards shall be withdrawn at the latest by January 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

The overall aim of this European standard is to help organizations establish the systems and processes necessary to improve energy efficiency. This should lead to reductions in cost and greenhouse gas emissions through systematic management of energy. This standard specifies requirements for an energy management system to enable an organization to develop and implement a policy and objectives which take into account legal requirements and information about significant energy aspects. It is intended to apply to all types and sizes of organizations irrespective of any geographical, cultural and social conditions. This standard applies to the activities under the control of an organization.

This standard for energy management systems can be used independently or integrated with any other management system. To facilitate its use, the structure of this standard is similar to the structure of ISO 14001.

The basis of the approach is shown in Figure 1. The success of the system depends on commitment from all levels and functions of the organization, and especially from top management. A system of this kind enables an organization to develop an energy policy, establish objectives and processes to achieve the policy commitments, take action as needed to improve its performance and demonstrate the conformity of the system to the requirements of this European standard.

There is an important distinction between this European standard, which describes the requirements for an organization's energy management system and can be used for certification/registration and/or self-declaration of an organization's energy management system, and a non-certifiable guideline intended to provide generic assistance to an organization for establishing, implementing or improving an energy management system. Energy management encompasses a full range of issues, including those with strategic and competitive implications. Demonstration of successful implementation of this European standard can be used by an organization to assure interested parties that an appropriate energy management system is in place.

NOTE This European standard is based on the methodology known as Plan-Do-Check-Act (PDCA). PDCA can be briefly described as follows:

— Plan: establish the objectives and processes necessary to deliver results in accordance with the organization's energy policy.

— Do: implement the processes.

— Check: monitor and measure processes against energy policy, objectives, targets, legal obligations and other requirements to which the organization subscribes, and report the results.

— Act: take actions to continually improve performance of the energy management system.

This European standard contains only those requirements that can be objectively audited.

This European standard does not establish absolute requirements for energy performance beyond the commitments in the energy policy of the organization and its obligation to comply with relevant legislation. Thus, two organizations carrying out similar operations but having different energy performance can both conform to its requirements.

Adoption of EN 16001:2009 will contribute to the setting up of a continuous improvement process that will lead to more efficient energy use. It will encourage organizations to implement an energy monitoring plan as well as energy analysis.

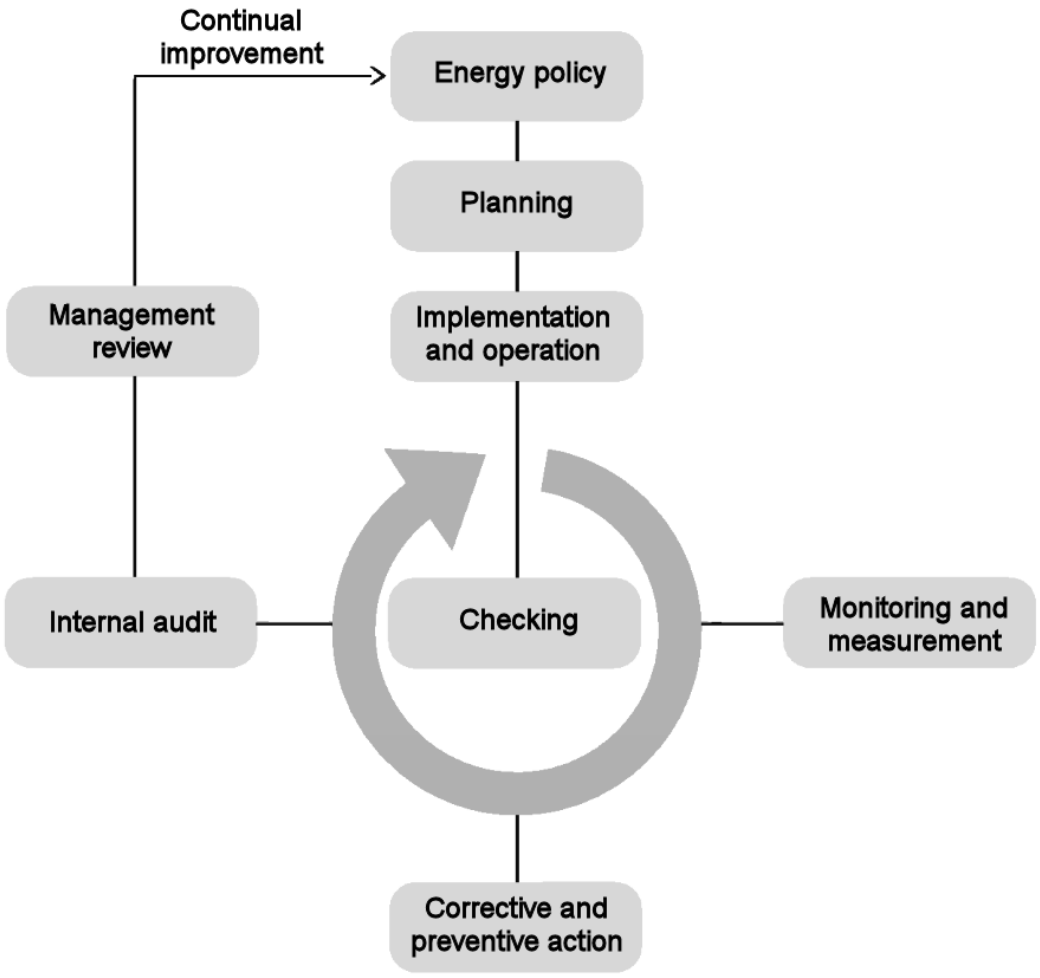

Figure 1 — Energy management system model for this standard

The requirements of this European standard can be aligned or integrated with those of other management systems, such as those for quality, environment, occupational health and safety, financial or risk management. It is therefore possible for an organization to adapt its existing management system(s) in order to establish an energy management system that conforms to the requirements of this European standard.

See website www.cen.eu for cross-references to other management systems standards.

The level of detail and complexity of the energy management system, the extent of documentation and the resources devoted to it depend on a number of factors, such as the size of an organization, the scope of the system, and the nature of its activities and products (including services). This may be the case in particular for small- and medium-sized enterprises.

For ease of use, the clause numbers in the body of this European standard and in Annex A have been related. For example, 3.3.3 and A.3.3 both deal with energy objectives, targets and programme(s), and 3.5.5 and A.5.5 both deal with internal audit of the energy management system.

1 Scope

This standard specifies requirements for establishing, implementing, maintaining and improving an energy management system. Such a system takes into account legal obligations with which the organisation must comply and other requirements to which it may subscribe. It enables the organization to take a systematic approach to the continual improvement of its energy efficiency.

This standard lays down requirements for continual improvement in the form of more efficient and more sustainable energy use, irrespective of the type of energy. This standard does not itself state specific performance criteria with respect to energy.

This standard is applicable to any organization that wishes to ensure that it conforms to its stated energy policy and to demonstrate such conformance to others. This can be confirmed by self-evaluation and self-declaration of conformance or by certification of the energy management system by an external organization.

2 Terms and definitions

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

2.1
energy
electricity, fuel, steam, heat, compressed air and other like media

NOTE Energy is an abstract concept. The international unit for energy is Joule (J).

2.2
energy use
manner or kind of application of energy

EXAMPLE Ventilation, heating, processes, production lines.

NOTE The quantity of the energy applied is expressed as energy consumption.

2.3
energy consumption
amount of energy used

NOTE 1 Energy consumption is a widely used term, although technically incorrect because energy is transformed or converted but cannot be consumed.

NOTE 2 The manner or kind of application of energy is expressed as energy use.

2.4
energy aspect
element of the organization's activities, goods or services that can affect energy use or energy consumption

NOTE An energy aspect is significant if it accounts for a high proportion of total energy consumption and has a potential for one or more of the following:

— More efficient energy use;

— Increased use of embedded renewable energy;

— Increased energy exchange with the rest of society.

2.5
energy factor
quantifiable and recurrent physical determinant of energy consumption

EXAMPLE Production throughput, temperature, humidity, wind speed, occupation rate.

2.6
energy management system
set of interrelated or interacting elements of an organization to establish energy policy and objectives and to achieve those objectives

2.7
energy target
detailed energy performance requirement, quantifiable, applicable to the organisation or parts thereof, that arise from the energy objective and that needs to be set and met in order to achieve those objectives

2.8
energy policy
statement by the organization of its intentions and principles in relation to its overall energy performance which provides a framework for action

2.9
energy objective
overall energy goal, consistent with the energy policy that the organization sets itself to achieve

2.10
energy efficiency
ratio between an output of an organization's activities, goods or services, and an input of energy

2.11
energy performance
measurable result of the organization's energy management system

NOTE In the context of the energy management system, results can be measured against the organization's energy policy, objectives, targets and other energy efficiency requirements.

2.12
energy management programme
action plan specifically aimed at achieving energy objectives and targets

2.13
organization
company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration that has the authority to control its energy use and consumption

2.14
preventive action
action to eliminate the cause of a potential nonconformity

2.15
corrective action
action to eliminate the cause of detected nonconformity

2.16
continual improvement
activities that result in improved energy performance and which are performed continually by the organization

2.17
procedure
specified way to carry out an activity or a process

2.18
top management
person or group of people who, at the highest level, direct and control the organization

2.19
document
information and its supporting medium

2.20
record
document stating results achieved or providing evidence of activities performed

2.21
audit
systematic, independent and documented process for obtaining evidence and evaluating it objectively to determine the extent to which the energy management system complies with the criteria set by the organization

2.22
auditor
person with the competence to conduct an audit

2.23
nonconformity
non-fulfilment of a requirement

2.24
interested party
person or group concerned with or affected by the energy performance of the organization

2.25
energy performance indicator
ratio chosen by the organization to monitor energy performance

3 Energy management system requirements

3.1 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 efficiency.

3.2 Energy policy

Top management shall establish, implement and maintain an energy policy for the organization. This energy policy shall state the organization's commitment for achieving improved energy performance. Top management shall ensure that the energy policy:

a) defines the scope and boundaries of the energy management system;

b) is appropriate to the nature and scale of, and impact on, the organization's energy use;

c) includes a commitment to continual improvement in energy efficiency;

d) includes a commitment to ensure the availability of information and of all necessary resources to achieve objectives and targets;

e) provides the framework for setting and reviewing energy objectives and targets;

f) includes a commitment to comply with all applicable requirements relating to its energy aspects, whether legally required or agreed to by the organization;

g) is documented, implemented, maintained and communicated to all persons working for and on behalf of the organization;

h) is regularly reviewed and updated;

i) is available to the public.

3.3 Planning

3.3.1 Identification and review of energy aspects

The organisation shall conduct an initial review of its energy aspects. The review of energy aspects shall be updated at predefined intervals. These reviews shall prioritise significant energy aspects for further analysis.

These reviews of energy aspects shall include the following:

a) past and present energy consumption and energy factors based on measurement and other data;

b) identification of areas of significant energy consumption, in particular of significant changes in energy use during the last period;

c) an estimate of the expected energy consumption during the following period;

d) identification of all persons working for and on behalf of the organization whose actions may lead to significant changes in energy consumption;

e) identification and prioritisation of opportunities for improving energy efficiency.

The organization shall maintain a register of opportunities for saving energy.

Each review shall be documented.

3.3.2 Legal obligations and other requirements

The organization shall:

a) identify and have access to the applicable legal requirements and other requirements to which the organization subscribes related to its energy aspects,

b) determine how these requirements apply to its energy aspects.

The organization shall ensure that these legal obligations and other requirements to which the organization subscribes are taken into account in the energy management system.

3.3.3 Energy objectives, targets and programme(s)

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 efficiency and to comply with applicable legal obligations and other requirements to which the organization subscribes. The organization shall set specific targets for those controllable parameters that have a significant impact on energy efficiency. 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 aspects identified in the review 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 programmes which shall include:

a) designation of responsibility;

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

The energy objectives, targets and programme(s) shall be documented and be updated at pre-determined intervals.

3.4 Implementation and operation

3.4.1 Resources, roles, responsibility and authority

Top management shall ensure the availability of resources essential to establish, implement, maintain and improve the energy management system. Resources include human resources, specialized skills, technology and financial resources.

Roles, responsibilities and authorities shall be defined, documented and communicated in order to facilitate effective energy management.

The organization’s top management shall designate a management representative who, irrespective of other responsibilities, shall have defined roles, responsibility and authority for:

a) ensuring that an energy management system is established, implemented and maintained in accordance with this standard;

b) reporting on the performance of the energy management system to top management for their review, with recommendations for improvement.

NOTE The management representative may be designated as energy manager.

3.4.2 Awareness, training and competence

The person designated in 3.4.1 shall be appropriately competent and qualified in energy and energy efficiency improvements.

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

a) the organization's energy policy and energy management programmes;

b) the energy management system requirements, including the activities of the organization to control energy use and improve energy performance;

c) the impact, actual or potential, with respect to energy consumption, of their activities and how their activities and behaviour contribute to the achievement of energy objectives and targets;

d) their roles and responsibilities in achieving the requirements of the energy management system;

e) the benefits of improved energy efficiency.

Personnel performing tasks which can cause significant impacts on energy consumption shall be competent on the basis of appropriate education, training and/or experience. It is the responsibility of the organization to ensure that such personnel are and remain competent. The organization shall identify training needs associated with the control of its significant energy aspects and the operation of its energy management system.

The organization shall also ensure that each level of management is informed and appropriately trained in the field of energy management in order to be able to establish pertinent objectives and targets and choose appropriate energy management tools and methodologies.

3.4.3 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 organization shall decide whether to communicate externally about its energy management system and energy performance. If the decision is to communicate externally, the organization shall establish, implement and document an external communication plan.

3.4.4 Energy management system documentation

The organization shall establish, implement and maintain information, in paper or electronic form, to:

a) describe the core elements of the energy management system and their interaction;

b) identify the location of related documentation including technical documentation.

3.4.5 Control of documents

The organization shall control records and other documents required by this standard to ensure that:

a) they are traceable and can be located;

b) they are periodically reviewed and revised as necessary;

c) the current versions are available at all relevant locations;

d) the documents are kept and maintained in such a way that they are easily accessible and protected against damage, loss or destruction; their retention time shall be established and documented;

e) obsolete documents are retained for legal and/or knowledge preservation purposes and suitably identified, or removed as appropriate.

3.4.6 Operational control

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

a) preventing situations that could lead to deviation from the energy policy, energy objectives and energy targets,

b) setting criteria for operation and maintenance of installations, equipment buildings and facilities,

c) energy considerations in the acquisition and purchase of equipment, raw materials and services; 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,

d) evaluation of energy consumption when considering the design, change or restoration of all assets which have the potential to significantly affect energy consumption, including buildings,

e) appropriate communication in this regard to personnel, and people acting on behalf of the organization and other relevant parties.

3.5 Checking

3.5.1 Monitoring and measurement

The organization shall establish and describe the monitoring, measuring and targeting requirements of its energy management programme. An energy metering plan shall be defined and implemented.

At defined intervals, the organization shall monitor, measure and record significant energy consumption and associated energy factors.

The organization shall ensure that the accuracy and repeatability of monitoring and measuring equipment used is appropriate to the task. Associated records shall be maintained.

The organization shall, in each practicable instance, establish the relationships between energy consumption and its associated energy factors and shall, at defined intervals, assess actual versus expected energy consumption.

The organization shall maintain records of all significant accidental deviations from expected energy consumption, including causes and remedies.

Relationships between energy consumption and energy factors shall be reviewed at defined intervals and revised if necessary.

The organisation shall wherever possible compare their energy performance indicators against similar organisations or situations, externally and internally.

3.5.2 Evaluation of compliance

Consistent with its commitment to compliance, the organization shall periodically evaluate compliance with legal obligations and other requirements to which the organization subscribes that are relevant to the scope of this standard. The organization shall keep records of the results of the periodic evaluations.

3.5.3 Nonconformity, corrective action and preventive action

The organization shall identify and manage non-conformance, initiating corrective and preventive action in a suitable manner within a specified time limit. The organization shall retain all relevant documentation in accordance with legal and/or documented time frames.

NOTE It is left to the organization to decide how action is to be taken on non-conformance, including criteria for determining when non-conformance is of such a nature that action is required.

3.5.4 Control of records

The organization shall establish, implement and maintain records as necessary to demonstrate conformity to the requirements of the energy management system and of this standard. The records shall demonstrate the performance achieved and the effectiveness of the energy management system.

The organization shall 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.

3.5.5 Internal audit of the energy management system

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

a) conforms to the energy policy, objectives, targets and energy management programme, and all other requirements of this standard;

b) is compliant with relevant legal obligations and other requirements to which the organization subscribes;

c) is effectively implemented and maintained.

An audit schedule shall be planned, taking into consideration the significance of the parts of the management system 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.

Audits of the energy management system 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 conformance to this standard.

Audit results shall be documented and reported to top management.

3.6 Review of the energy management system by top management

3.6.1 General

Top management shall review the organization’s energy management system at planned intervals to ensure continuing suitability, adequacy and effectiveness. Records of management reviews shall be maintained.

3.6.2 Inputs to management review

Inputs to the management review shall include:

a) follow-up actions from previous management reviews;

b) review of energy aspects and the energy policy;

c) evaluation of legal compliance and changes in legal obligations and other requirement to which the organisation subscribes;

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

e) energy management system audit results;

f) status of corrective and preventive actions;

g) the overall energy performance of the organisation;

h) projected energy consumption for the following period;

i) recommendations for improvement.

3.6.3 Outputs from management review

Outputs from the management review shall include any decisions 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) changes to objectives, targets or other elements of the energy management system, consistent with the organization’s commitment to continual improvement;

d) allocation of resources.

Annex A
(informative)

Guidance on the use of this European standard

A.1 General requirements

The implementation of an energy management system specified by this standard is intended to result in improved energy efficiency. Therefore, this standard is based on the premise that the organization will periodically review and evaluate its energy management system to identify opportunities for improvement and their implementation. The rate, extent and timescale of this continual improvement process are determined by the organization in the light of economic and other circumstances. Improvements in the energy management system are intended to result in improvements in energy performance.

This standard requires the organization to:

a) establish an appropriate energy policy;

b) identify the energy aspects arising from the organization's activities;

c) identify applicable legal requirements and other requirements to which the organization subscribes;

d) identify priorities and set appropriate energy objectives and targets;

e) establish a relevant structure and programme(s) to implement the policy and achieve objectives and meet targets;

f) facilitate planning, control, monitoring, preventive and corrective actions, auditing and review activities to ensure both that the policy is complied with and that the energy management system remains appropriate.

The organization should carry out an initial review, to identify areas of energy use and opportunities for improvement. This resulting information provides the basis for setting the energy management work programme, objectives and targets.

A.2 Energy policy

The energy policy is the driver for implementing and improving the organization's energy management system. The policy reflects the commitment of top management with respect to energy so that the organization is able to maintain and enhance its efforts continually to achieve improved energy efficiency and strive to adapt energy consumption to its energy needs.

All management initiatives require clarity in terms of direction and relationship to strategic goals of the organization. This energy policy should take the form of an official, publicly available statement of the organizations commitment to achieve energy management objectives and to reduce energy related emissions. Absence of top-level commitment means that the energy policy will not become fully integrated into the underlying culture of the organization. An unofficial policy may be destabilised by a change in personnel or activities. Therefore the energy policy may integrate with existing policies to provide continuity and ongoing relevance to the organization.

The policy forms the basis for the setting of energy targets and it should be sufficiently clear to be capable of being understood by internal and external parties, i.e. employees, customers, public authorities, investors, etc.

The organization should ensure that there is a consistent thread running from the energy policy to identified areas of significant energy consumption, through the targets set and extending to include plans of action and key figures, to allow the efforts to be concentrated in the areas where optimum effect is achieved.

Where the organization operates at several locations, the policy may be limited to include the activities at only some of those locations. This should be explicitly stated in the energy policy. Within the parts of the organization covered, the policy should encompass all processes and activities. If the energy policy does not specify any delineation, it is to be assumed that it applies to the entire organization, irrespective of the place of operation.

An energy policy should therefore:

a) commit the organization to address the products, processes and other activities which affect the significant energy consumption, i.e. the areas which account for the highest energy consumption or which offer the most considerable potential for energy savings;

b) commit the organization to continual improvement of its energy efficiency and investigation of alternative and renewable sources of energy; this means that, at the same time, the policy forms the framework for setting energy targets and continually reviewing them as the targets set are achieved or the need for changes arises;

c) commit the organization to adhere to applicable laws and regulations which are relevant to the energy use of the organization; where appropriate, any other agreements which the organization has made and which affect the energy use should also appear in the policy;

d) be communicated to all persons who work for, or on behalf of, the organization and should be readily available to the public.

The energy policy may form part of a wider environmental policy or any other relevant organization policy and may include commitment to life cycle costing. The commitment of the organization specifically with respect to energy should, however, always appear in the wider policy.

A.3 Planning

A.3.1 Identification and review of energy aspects

The purpose of identifying the energy aspects of the organization is to understand the areas of significant energy consumption, i.e. the buildings, equipment and processes which account for the greatest energy use or which offer the most potential for energy savings.

The organization should maintain a register of opportunities for saving energy, thereby reducing costs and carbon dioxide emissions. For each opportunity in the register, where possible, the following should be identified as a minimum:

— the energy aspect to which it relates;

— its value in financial and/or carbon dioxide terms;

— action required;

— estimated or actual cost;

— for completed items, date completed and actual outcome.

The identification of energy aspects is critical in understanding where energy is used within the organization and forms the basis for prioritising the efforts to reduce energy consumption. The organization that intends to implement an energy management system should start by establishing its current position with regard to

energy consumption by means of an initial review of energy aspects. This is the fundamental cornerstone for establishing and maintaining an energy management system that is tailored to the organization's energy aspects.

Each review of energy aspects shall include:

a) Past and present energy consumption and energy factors based on measurement and other data:

Energy consumption should be associated with data on production levels and/or other factors that would have affected energy consumption. The degree of detail depends on the size of the organization and the energy consumption, but should as a minimum include energy inputs (electricity, oil, natural gas or other) and energy use (drying, pumping, air conditioning, lighting, or other). Where the organization operates at several facilities, the energy supply and the energy consumption of each facility should be reviewed individually. Trends in energy consumption over previous years should be reviewed and form the basis for setting targets and assessing whether previous targets have been achieved. Information on energy consumption, which is already available, can be used in the review, e.g. energy bills, meter readings, building management energy reports or other existing information. Where there is no other information available, the consumption may be determined by means such as name plate data, current readings, running hours, etc.

NOTE 1 It is advised that name plate data be used with extreme care, as it rarely corresponds to actual use. Name plate data is typically specified for worst case or standard test conditions.

NOTE 2 Use of appropriate sub metering may assist the energy manager to derive further information of energy use and consumption (e.g. sub metering for different buildings, floors and departments).

b) Identification of areas of significant energy consumption, in particular of significant changes in energy use during the past period:

These areas should be subjected to a more detailed review. The significant energy consumption is that which accounts for a high proportion of the total energy consumption of the organization. The review should also be applied to other areas that offer considerable potential for energy savings. It is up to the organization to assess which energy consumption is significant. It is essential that the organization is able to substantiate why the energy consumption is regarded as significant.

c) An estimate of the expected energy consumption during the following period:

The estimate may be based on available data, derived from relevant:

1) meter readings,

2) hours run,

3) name plate data,

4) compiled utility bills (if necessary, checked for consistency with actual meter readings),

5) planned operational changes.

d) Identification of all persons working for and on behalf of the organization whose actions may lead to significant changes in energy consumption:

Their role, responsibilities and authority should be clarified. This also includes personnel that have an indirect but significant influence on energy consumption, e.g. purchasing, design and training staff.

e) Identification of opportunities for improving energy efficiency:

In addition to the identification of opportunities for improving energy efficiency, the organization may already have initiatives planned to improve energy performance. The combination of existing opportunities and newly

identified opportunities from the review should form the basis for setting targets and energy management programmes. Often the greatest opportunities for improved energy efficiency will come from no-cost housekeeping measures i.e. training personnel to turn off equipment when not in use, promotion and awareness of energy performance in personnel's work practices, etc.

The organization should consider updating the review at pre-defined intervals. Updated reviews should where possible be based on actual measurements. In updated reviews, there should be progressively more detailed analysis of all the areas of energy use. Account should be taken of essential changes of the energy aspects of the organization, e.g. expansion of production, plant modifications, changes of the organization, staff qualifications and job descriptions etc. The purpose of this is to allow the organization to assess progress during the past review period, and identify possible initiatives for the coming period.

The review shall be documented.

A.3.2 Legal obligations and other requirements

The organization needs to identify the applicable legal requirements and other requirements to which the organization subscribes related to its energy aspects.

These may include:

a) national and international legal requirements;

b) state/provincial/departmental legal requirements;

c) local governmental legal requirements.

Examples of other requirements to which the organization may subscribe include, if applicable:

d) emissions trading requirements,

e) agreements with customers,

f) non-regulatory guidelines,

g) voluntary principles or codes of practice,

h) voluntary energy agreements,

i) requirements of trade associations,

j) agreements with community groups or non-governmental organizations,

k) public commitments of the organization or its parent organization,

l) corporate/company requirements.

The determination of how legal obligations and other requirements to which the organization subscribes apply to the organization's energy aspects is usually accomplished in the process of identifying such requirements. The organization should prepare and maintain a list of the pertinent energy legislation and other requirements, which affect the organization's activities, products or services. It may not be necessary, therefore, to have a separate or additional procedure in order to make this determination.

However, the organisation should identify who has the responsibility for reviewing all legal obligations and other requirements to which the organisation subscribes. The organisation should describe how it:

— communicates relevant information to the appropriate persons,

— keeps up to date on new laws and regulations,

— updates their register of applicable legislation at pre-defined intervals.

A.3.3 Energy objectives, targets and programme(s)

Setting objectives and targets provides the means for transforming policy into action. The organization should ensure that the objectives and targets are consistent with the energy policy and the significant energy aspects. Objectives and targets should be reviewed and revised periodically, e.g. in connection with the management review or through the periodical revision of the energy management programmes, etc. Setting energy targets ensures that the organization has defined success criteria so that progress towards improved energy efficiency can be measured.

Targets should be:

a) ambitious, so as to commit the organization to continual improvement;

b) realistic, so that they can be achieved within the specified time limits;

c) specific and measurable.

As a minimum targets should be established for each of the significant energy aspects identified by the review. Some targets may apply to equipment or facilities (e.g. a specific production line), while others may address the energy consumption of departments (e.g. transport and logistics department), training or energy awareness, additional measurement and monitoring.

Energy reduction targets could be expressed through energy performance indicators such as energy consumption per item, per kg, per m^2 or equivalent, thus making the energy target largely independent of variations of activity.

The purpose of establishing energy management programmes is to ensure that the organization achieves its objectives and targets. The energy management programmes should detail how the organization plans to improve energy efficiency and should contain a description of the tasks and resources required for their implementation. To avoid duplication of resources, energy management programmes should be incorporated into normal business operations.

The organization should consider the possibilities of using the Best Available Technology (BAT) when establishing its energy management programmes. When establishing such programmes, the following should be identified and addressed:

— What are the priority activities and projects to be initiated, i.e. what actions will deliver the greatest improvements considering the available resources?

— What is to be achieved and what is the timescale for delivery, i.e. define the core objective of the action and when it is to be achieved?

— Who has the responsibility and what resources are required to implement the action plans, i.e. who has overall responsibility and authority to ensure that plans are implemented, what personnel are required and what funding is needed?

— How are the energy management programmes to be monitored and revised, i.e. how is progress to be monitored and management informed when the objective is achieved or not and how are improvements in energy efficiency to be documented?

— Do energy management programmes reflect the energy policy, objectives and targets together with legal and other obligations?

Energy management programmes should be documented and reviewed regularly to ensure they are up to date and relevant.

A.4 Implementation and operation

A.4.1 Resources, roles, responsibility and authority

The successful implementation of an energy management system calls for a commitment from all persons working for or on behalf of the organization.

This commitment should begin at the highest levels of management. Accordingly, top management should establish the organization's energy policy and ensure that the energy management system is implemented. As part of this commitment, top management should designate a specific management representative with defined responsibility and authority for implementing the energy management system. The management representative should also have the responsibility for reporting to top management on the performance and results of the system.

Top management should also ensure that adequate resources are allocated to the implementation and operation of the energy management system. Resources include human resources, specialized skills, technology and financial resources.

The operation of the energy management system should be the responsibility of experienced employees having the appropriate authority, skills and resources. It is also important that the key energy management system roles and responsibilities are well defined and communicated to all persons working for or on behalf of the organization.

A.4.2 Awareness, training and competence

The organization should identify the awareness, knowledge, understanding and skills needed by any person with the responsibility and authority to perform tasks on its behalf. Those persons identified by the organization whose work could impact on significant energy consumption should be competent to perform the tasks to which they are assigned. Competency is assessed based on acquiring the relevant balance of education, training and/or experience. The company should define the criteria so as to know when competence has been achieved.

Training programmes should be established and reviewed. Training records should be maintained.

The organization should require that contractors working on its behalf are able to demonstrate that their employees have the requisite competence and/or appropriate training.

A.4.3 Communication

Effective communication is essential to ensure the successful implementation and operation of the energy management system. Relevant and regular information on the energy management system contributes to motivating and committing employees to comply with the organization's energy policy and take an active part in achieving the organization's energy objectives and targets.

Internal communication should address issues including:

— energy policy and the objectives and targets of the organization;

— opportunities for individuals to contribute;

— information about current energy use and the trends within the organization;

— compliance with legal obligations and other requirements to which the organization subscribes;

— opportunities for improvement, both organizationally and individually;

— financial benefits from energy management activities, other benefits i.e. environmental, social etc.;

— contact persons to approach for further details.

The organization should ensure that personnel at all levels within the organization are encouraged and facilitated to make proposals for improvements, and submit relevant comments on the energy management system. Such proposals and comments should be reviewed and responded to. The organization can establish, implement and maintain a plan for communicating internally with personnel. The plan may include the following:

a) who has the responsibility for internal communication regarding the energy management system;

b) relevant information on the establishment, implementation and operation of the energy management system;

c) the means of communicating information (internal meetings, seminars, staff magazines, intranet, e-mail, energy boards, awareness campaigns, etc.).

If the decision is to communicate externally, the organization shall establish, implement and document an external communication plan outlining:

— who has the responsibility for external communication regarding the energy management system;

— the means of communicating information.

Records of communication activities should be maintained.

A.4.4 Energy management system documentation

The level of detail within the system documentation should be sufficient to describe the energy management system and the interrelation between its processes, systems and activities. It should also provide direction on where to obtain more detailed information on the operation of such system elements. This documentation may be integrated with the documentation of other management systems implemented by the organization. The extent of the energy management system documentation may differ from one organization to another, depending on:

a) the size and type of organization and its activities, products or services;

b) the complexity of processes and their interactions;

c) the competence of personnel.

Examples of documents include:

— statements of policy, objectives and targets;

— information on significant energy aspects;

— work instructions;

— process information;

— organizational charts;

— internal and external standards;

— records;

— technical documentation such as installation and equipment drawings, energy and utilities distribution drawings, maintenance plans, equipment operations manuals, etc;

— results of energy reviews;

— action plans with follow up indicators.

Any decision to document procedures should be based on consideration of:

— the consequences of not doing so;

— the need to demonstrate compliance with legal and with other requirements to which the organization subscribes;

— the need to ensure that the activity is undertaken consistently;

— the advantages of doing so, which can include, easier implementation through communication and training;

— easier maintenance and revision, less risk of ambiguity and deviations, demonstrability and visibility;

— the requirements of this standard.

A.4.5 Control of documents

The intent of Subclause 3.4.5 is to ensure that the organization establishes and maintains documents in a manner sufficient to implement the energy management system. The primary focus of the organization should be on improved energy performance and on effective implementation of the energy management system, not on a complex document control system. However, documents specifically mentioned under this standard should be subject to a procedure for ensuring:

a) that all relevant energy management system documents can be identified with respect to originator, the process, system or activity covered, contact persons, etc.; these documents should be reviewed regularly and revised as necessary, with any revisions subject to a formal approvals procedure;

b) that current versions of the relevant documents are available in work areas where the relevant activity is being performed;

c) that documents which are no longer applicable are marked clearly as such or removed.

Documents may be in hard copy or electronic form, depending on the most expedient manner of making documents available to employees who are to use them.

A.4.6 Operational control

The organization should evaluate operations that are associated with its identified significant energy aspects and ensure that they are conducted in a way that will control and reduce their energy consumption, in order to fulfil the requirements of its energy policy and meet its objectives and targets. This should include all parts of its operations, especially the operation, maintenance, design and procurement of plant, equipment, facilities, and raw materials and any other areas that could affect its significant energy aspects.

Often opportunities for improved performance will arise from the continual identification and implementation of no cost housekeeping measures e.g. shutdown equipment when not in use.

Procedures for operation and maintenance should include:

— housekeeping procedures and checklists to avoid and minimise wastage;

— operating and maintenance plans for machinery, equipment and facilities;

— description of service intervals for the pertinent equipment, including what is subject to servicing;

— identification of departments and personnel responsible for operation and maintenance of the equipment;

— schedules for inspection of the relevant equipment and description of how the inspection is to take place.

Energy conscious design ensures that energy efficient alternatives are considered when designing any new or modified equipment, plant, facilities or buildings which have the potential to impact on the significant energy aspects. This includes design of new production lines, utilities and facilities, etc, where it is feasible and economically practicable to do so. In general terms, this could be covered by awareness and training to all personnel as covered in Subclause 3.4.2.

Energy conscious design should ensure that:

— a thorough analysis of the energy demands is performed at the very first stage of design projects;

— an energy assessment is subsequently carried out during relevant design stages where appropriate (tenders, initial detailed design, final design, equipment selection, delivery, commissioning, etc.);

— the tasks of the people responsible in relation to energy conscious design are clearly defined.

Energy conscious procurement ensures that energy consumption is considered when decisions are made for the purchase of machinery, equipment, raw materials and services. Where procurement has the potential to impact to a significant degree on the significant energy consumption, then energy efficiency should become part of the evaluation criteria. In general terms, this could be covered by awareness and training to all personnel as covered in Subclause 3.4.2.

Suggested procedures should include:

— procurement policies where applicable;

— purchasing guidelines i.e. criteria to be followed if proposed products have the potential to increase energy consumption by more than prescribed levels;

— detailed energy assessments as required;

— payback criteria and calculation methods, i.e. financial appraisal;

— life cycle costing;

— vetted list of approved energy efficient spare parts and/or store of such parts.

When undertaking energy efficiency assessments, whether in the design or purchasing of equipment that will affect significant energy aspects, the following should be established:

— criteria for when assessments are required;

— those responsible for performing the assessment;

— the resources (time and financial) available;

— investigation into the economic and technical energy efficient alternatives;

— those responsible for the review and approval of the assessment;

— those responsible for making final decisions on the options available.

There can be varying levels of assessment, depending on the criteria the organization establishes. The greater the energy consumption, the more reason to focus on the possibilities of reducing the consumption by designing and/or procuring the most energy efficient equipment on the market.

These procedures should apply to all parties performing work on behalf of the organization, including contractors, consultants, etc. The procedures should therefore describe:

— communication to external contractors, service companies, consultants, etc.;

— how required documented actions have been recorded.

By informing suppliers of the energy policy and procurement procedures the organization will encourage dialogue with the supplier regarding the possibility of improving energy efficiency.

A.5 Checking

A.5.1 Monitoring and measurement

Monitoring and measurement is the management of energy consumption by means of regular comparisons of actual and expected consumption.

Monitoring and measurement should be appropriate to the needs of the organization and should facilitate the analysis of energy consumption (on for example processes, compressed air, heating and lighting), variations over time, achievement of targets, etc. This means that the significant energy consumption should be assessed and evaluated at a frequency that allows deterioration of energy efficiency to be detected, investigated and rectified.

It may be useful to monitor energy consumption through energy performance indicators (EPI), e.g. kWh per unit of production and/or kWh per m2 floor area.

Energy consumption may not be directly proportional to energy factors. The organization should use the most accurate practicable method of calculating ‘expected’ consumption.

Comparison between actual and expected consumption will highlight unexpected deviations and may allow hidden waste to be detected.

It is accepted that the organization will not necessarily have sufficiently comprehensive metering installed, and that introducing it will potentially be costly, time-consuming, and disruptive. However, where appropriate, it should have a demonstrable plan for improving the provision of meters.

The organization should be able to justify the relevance of the measurement frequency applied in relation to the identified energy consumption.

EXAMPLE Based on the nature and scale of the organisation, different measurement intervals may be used. For some organizations weekly intervals would be appropriate. Some may wish to operate real-time, per shift, daily, monthly or less frequent measurements.

Examples of monitoring and measurement include the following activities:

— ongoing monitoring and recording of the significant energy consumption and associated energy factors;

— summarising the significant energy consumption in the form of key figures;

— comparison of actual and expected energy consumption;

— intervention in the case of deviation from the expected energy consumption;

— records of significant deviations from expected energy consumption, their causes (when established) and remedies.

NOTE This activity can directly contribute to the register of energy-saving opportunities.

The organization should plan monitoring and measuring of all significant energy consumption and energy factors. These plans should include a description of the following:

a) how significant energy consumption and energy factors are measured and recorded;

b) the extent of monitoring, including the frequency of measurements; calibration and maintenance of measuring equipment;

c) roles and responsibilities of relevant personnel;

d) how expected energy consumption is calculated in relation to energy factors.

NOTE There is a requirement to review, at defined intervals, the relationships between energy factors and energy consumption. This is to ensure that consumption is always being assessed against current best achievable performance. In practice the relationships may be reviewed as circumstances dictate, for example, as soon as a project is carried out which has an effect on energy efficiency.

A.5.2 Evaluation of compliance

The organization should establish, implement and maintain procedures for monitoring the conformity of the energy management system with legal obligations and other requirements to which the organization subscribes, relating to the significant energy consumption. Records of these results should be maintained to demonstrate conformance. For control of records see Subclause 3.5.4.

A.5.3 Nonconformity, corrective action and preventive action

The organization should ensure that non-conformances are investigated and appropriately actioned. Non-conformances exist when the organization's energy policy, objectives, targets, programmes or documented procedures are not complied with.

The organization should:

a) identify the cause of the non-conformance;

b) take the appropriate action to correct the non-conformance;

c) initiate the action required to prevent recurrence of the non-conformance;

d) change the documented procedures if necessary to ensure that they are consistent with new initiatives or actions;

e) identify who is responsible for recording non-conformances and how they are recorded, and ensure that the process of corrective and preventive action is initiated;

f) retain all relevant documentation in accordance with legal and/or documented time frames.

A.5.4 Control of records

The purpose of recording is to ensure that the necessary documentation is provided to substantiate the achievement of targets, action plans and other requirements of the energy management system.

The extent of the documentation may vary according to each organization's requirements. These records may include:

a) information about relevant laws and regulations;

b) applicable training records;

c) relevant energy management communication material to all stakeholders such as press releases, awareness campaigns, presentations, websites, awards, etc.;

d) significant energy consumption and energy performance indicators;

e) records of installation, inspection, maintenance and calibration of measuring equipment;

f) communication of energy policy to contractors, subcontractors and suppliers;

g) dates of inspection and servicing of energy using equipment;

h) procurement of energy efficiency equipment;

i) design activities which have considered energy efficiency;

j) results of audits;

k) management reviews.

All records kept should be legible, identifiable, traceable and readily retrievable. These records should support the processes of the energy management system.

A.5.5 Internal audit of the energy management system

The purpose of an internal audit is to carry out a systematic review of the energy management system and assess whether the system operates in accordance with the organization’s own requirements together with those of the energy management system standard. An internal audit procedure should address requirements for defining the scope of the audits, the frequency and scheduling of audits, how audits are to be conducted and the training required for auditors. The procedure should also consider how audit findings are recorded and reported and how any required corrective action is managed.

Examples of subjects for consideration by internal auditing include:

a) effective and efficient implementation of energy management programmes, processes and systems;

b) opportunities for continual improvement;

c) capability of processes and systems;

d) effective and efficient use of statistical techniques;

e) use of information technology.

Internal audits may be performed by employees of the organization and/or by external parties appointed by the organization. In both cases the person or persons performing the audits shall be qualified, experienced, impartial and independent of the area of the organization to be audited.

The energy management system should typically be reviewed and audited on an annual basis as a minimum. The results of the internal audit should be documented and communicated to senior management.

A.6 Review of the energy management system by top management

The purpose of the management review is to ensure continual improvement and adaptation of the system so that the system operates in line with company energy policy. The review implies that the individual elements and overall operation of the energy management system are evaluated in a critical manner in relation to the ability of the system to comply with the energy policy and achieve the energy targets. It should be the top management of the organization that reviews the system at specified intervals.

By extending management review beyond verification of the energy management system, the outputs of management review can be used by top management as inputs to improvement processes. Top management can use this review process as a powerful tool in the identification of opportunities for energy efficiency and system performance improvement. The schedule of reviews should facilitate the timely provision of data in the context of strategic planning for the organization. Selected output should be communicated to demonstrate to the people in the organization how the management review process leads to new objectives that will benefit the organization.

The organisation may find it beneficial to produce a performance statement, summarising how the organisation has continually improved its energy performance, and/or met its stated policy and energy targets.

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