Win the energy challenge with ISO 50001

ISO 50001
energy management

ISO in brief

ISO is the International Organization for Standardization. ISO has a membership of some 160* national standards bodies from countries large and small, industrialized, developing and in transition, in all regions of the world. ISO's portfolio of over 18 600* standards provides business, government and society with practical tools for all three dimensions of sustainable development: economic, environmental and social.

* In June 2011

ISO standards make a positive contribution to the world we live in. They facilitate trade, spread knowledge, disseminate innovative advances in technology, and share good management and conformity assessment practices.

ISO standards provide solutions and achieve benefits for almost all sectors of activity, including agriculture, construction, mechanical engineering, manufacturing, distribution, transport, medical devices, information and communication technologies, the environment, energy, quality management, conformity assessment and services.

ISO only develops standards for which there is a clear market requirement. The work is carried out by experts in the subject drawn directly from the industrial, technical and business sectors that have identified the need for the standard, and which subsequently put the standard to use. These experts may be joined by others with relevant knowledge, such as representatives of government agencies, testing laboratories, consumer associations and academia, and by international governmental and nongovernmental organizations.

An ISO International Standard represents a global consensus on the state of the art in the subject of that standard.

ISO 50001 — What is it?

ISO 50001:2011, *Energy management systems – Requirements with guidance for use,* is a voluntary International Standard developed by ISO (International Organization for Standardization).

ISO 50001 gives organizations the requirements for energy management systems (EnMS).

ISO 50001 provides benefits for organizations large and small, in both public and private sectors, in manufacturing and services, in all regions of the world.

ISO 50001 will establish a framework for industrial plants; commercial, institutional, and governmental facilities; and entire organizations to manage energy. Targeting broad applicability across national economic sectors, it is estimated that the standard could influence up to 60 % of the world's energy use.*

* This estimate is based on information provided in the section, "World Energy Demand and Economic Outlook", in the *International Energy Outlook 2010,* published by the US Energy Information Administration. This cites 2007 figures on global energy consumption by sector, including 7 % by the commercial sector (defined as businesses, institutions, and organizations that provide services), and 51 % by the industrial sector (including manufacturing, agriculture, mining, and construction). As ISO 50001 is primarily targeted at the commercial and industrial sectors, adding the above figures provides an approximate total of 60 % of global energy demand on which the standard could have a positive impact.

ISO 50001 — Why is it important?

Energy is critical to organizational operations and can be a major cost to organizations, whatever their activities. An idea can be gained by considering the use of energy through the supply chain of a business, from raw materials through to recycling.

In addition to the economic costs of energy to an organization, energy can impose environmental and societal costs by depleting resources and contributing to problems such as climate change.

The development and deployment of technologies for new energy sources and renewable sources can take time.

Individual organizations cannot control energy prices, government policies or the global economy, but they can improve the way they manage energy in the here and now. Improved energy performance can provide rapid benefits for an organization by maximizing the use of its energy sources and energy-related assets, thus reducing both energy cost and consumption. The organization will also make positive contributions toward reducing depletion of energy resources and mitigating worldwide effects of energy use, such as global warming.

ISO 50001 is based on the management system model that is already understood and implemented by organizations worldwide. It can make a positive difference for organizations of all types in the very near future, while supporting longer term efforts for improved energy technologies.

ISO 50001 — What will it do?

ISO 50001 will provide public and private sector organizations with management strategies to increase energy efficiency, reduce costs and improve energy performance.

The standard is intended to provide organizations with a recognized framework for integrating energy performance into their management practices. Multinational organizations will have access to a single, harmonized standard for implementation across the organization with a logical and consistent methodology for identifying and implementing improvements.

The standard is intended to accomplish the following:

- Assist organizations in making better use of their existing energy-consuming assets
- Create transparency and facilitate communication on the management of energy resources
- Promote energy management best practices and reinforce good energy management behaviours
- Assist facilities in evaluating and prioritizing the implementation of new energy-efficient technologies
- Provide a framework for promoting energy efficiency throughout the supply chain
- Facilitate energy management improvements for greenhouse gas emission reduction projects
- Allow integration with other organizational management systems such as environmental, and health and safety.

ISO 50001 — How does it work?

ISO 50001 is based on the ISO management system model familiar to more than a million organizations worldwide who implement standards such as ISO 9001 (quality management), ISO 14001 (environmental management), ISO 22000 (food safety), ISO/IEC 27001 (information security).

In particular, ISO 50001 follows the Plan-Do-Check-Act process for continual improvement of the energy management system.

These characteristics enable organizations to integrate energy management now with their overall efforts to improve quality, environmental management and other challenges addressed by their management systems.

ISO 50001 provides a framework of requirements enabling organizations to:

- Develop a policy for more efficient use of energy
- Fix targets and objectives to meet the policy
- Use data to better understand and make decisions concerning energy use and consumption
- Measure the results
- Review the effectiveness of the policy
- Continually improve energy management.

ISO 50001 can be implemented individually or integrated with other management system standards.

ISO 50001 — Who can it benefit ?

Like all ISO management system standards, ISO 50001 has been designed for implementation by any organization, whatever its size or activities, whether in public or private sectors, regardless of its geographical location.

ISO 50001 does not fix targets for improving energy performance. This is up to the user organization, or to regulatory authorities. This means than any organization, regardless of its current mastery of energy management, can implement ISO 50001 to establish a baseline and then improve on this at a rhythm appropriate to its context and capacities.

ISO 50001 — To certify or not ?

Like all ISO management system standards, ISO 50001 can be implemented solely for the internal and external benefits it provides the user organizations and the latter's stakeholders and customers. Certification by an independent auditor of conformity of the user's energy management system to ISO 50001 is not a requirement of the standard itself. To certify or not is a decision to be taken by the ISO 50001 user, unless imposed by regulation.

Alternatives to independent (third party) certification are to invite the organization's customers to verify its implementation of ISO 50001 in conformity with the standard (second party verification), or to self-declare its conformity.

ISO 50001 — What's in the standard?

The content of ISO 50001 is structured as follows:

Foreword

Introduction (extract from ISO 50001)

"The purpose of this International Standard is to enable organizations to establish the systems and processes necessary to improve energy performance, including energy efficiency, use, and consumption. Implementation of this standard is intended to lead to reductions in greenhouse gas emissions, energy cost, and other related environmental impacts, through systematic management of energy. This International Standard is applicable to all types and sizes of organizations irrespective of geographical, cultural or social conditions. Successful implementation depends on commitment from all levels and functions of the organization, and especially from top management.

"This International Standard specifies requirements of an energy management system (EnMS) for an organization to develop and implement an energy policy, establish objectives, targets, and action plans, which take into account legal requirements and information related to significant energy use. An EnMS enables an organization to achieve its policy commitments, take action as needed to improve its energy performance and demonstrate the conformity of the system to the requirements of this International Standard. Application of this International Standard can be tailored to fit the requirements of an organization — including the complexity of the system, degree of documentation, and resources — and applies to the activities under the control of the organization.

"This International Standard is based on the Plan-Do-Check-Act continual improvement framework and incorporates energy management into everyday organizational practices.

"NOTE: This approach can be briefly described as follows.

- ***Plan:*** *conduct the energy review and establish the baseline, energy performance indicators (EnPIs), objectives, targets and action plans necessary to deliver results in accordance with opportunities to improve energy performance and the organization's energy policy.*
- ***Do:*** *implement the energy management action plans.*
- ***Check:*** *monitor and measure processes and the key characteristics of its operations that determine energy performance against the energy policy and objectives and report the results.*
- ***Act:*** *take actions to continually improve energy performance and the EnMS.*

The basis of this approach is shown in Figure 1. *(next page)*

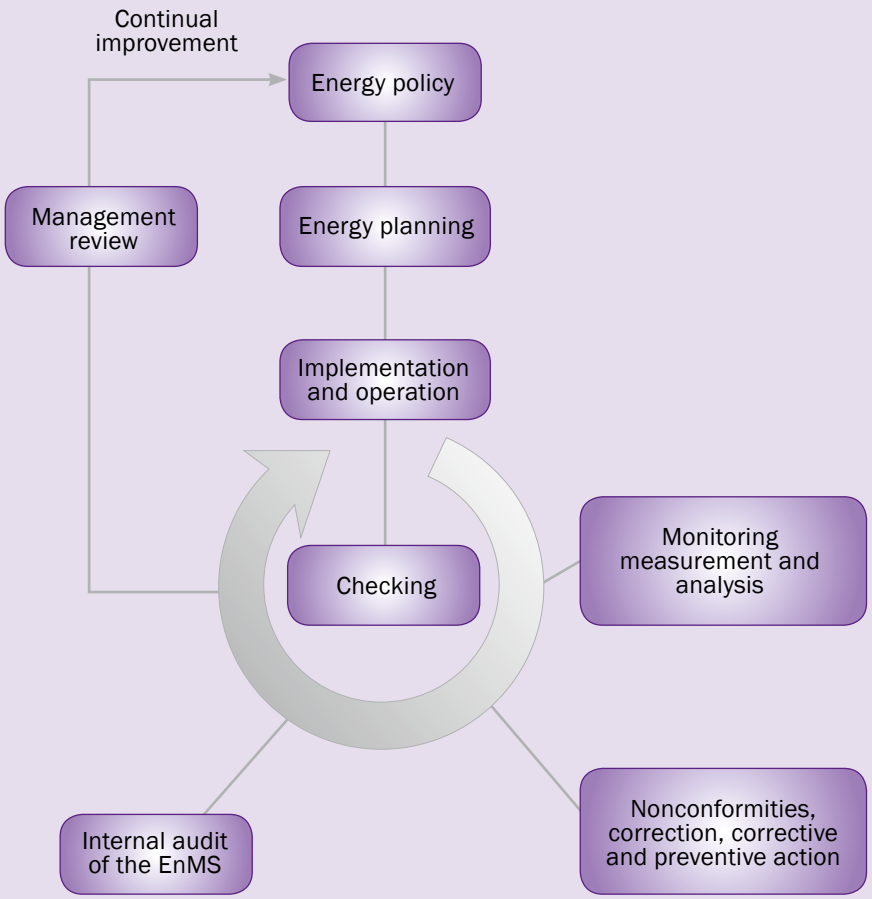


Figure 1: Energy management system model.

"Worldwide application of this International Standard contributes to more efficient use of available energy sources, enhanced competitiveness, and to reduce greenhouse gases emissions and other related environmental impacts. This International Standard is applicable irrespective of the types of energy used.

"This International Standard can be used for certification, registration and self-declaration of an organization's EnMS. It does not establish absolute requirements for energy performance beyond the commitments in the energy policy of the organization and its obligation to comply with applicable legal requirements and other requirements. Thus, two organizations carrying out similar operations, but having different energy performance, can both conform to its requirements.

"The document is based on the common elements found in all of ISO's management system standards, ensuring a high level of compatibility with ISO 9001 (quality management) and ISO 14001 (environmental management). The organization can choose to integrate ISO 50001 with other management systems such as quality, environment, occupational health and safety, and other."

1 Scope

2 Normative references

3 Terms and definitions

4 Energy management system requirements

4.1 General requirements

4.2 Management responsibility

4.2.1 Top management

4.2.2 Management representative

4.3 Energy policy

4.4 Energy planning

4.4.1 General

4.4.2 Legal and other requirements

4.4.3 Energy review

4.4.4 Energy baseline

4.4.5 Energy performance indicators

4.4.6 Energy objectives, energy targets and energy management action plans

4.5 Implementation and operation

4.5.1 General

4.5.2 Competence, training and awareness

4.5.3 Communication

4.5.4 Documentation

4.5.5 Operational control

4.5.6 Design

4.5.7 Procurement of energy services, products, equipment and energy

4.6 Checking

4.6.1 Monitoring, measurement and analysis

4.6.2 Evaluation of legal requirements and other requirements

4.6.3 Internal audit of the EnMS

4.6.4 Nonconformities, correction, corrective, and preventive action

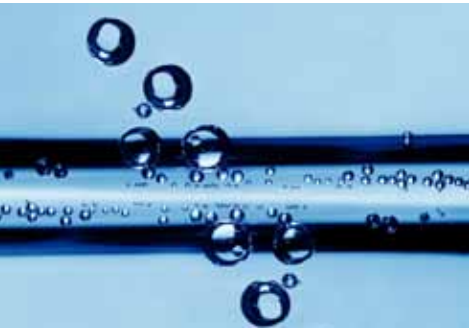
4.6.5 Control of records

4.7 Management review

4.7.1 General

4.7.2 Input to management review

4.7.3 Output from management review



In addition, ISO 50001 includes informative annexes giving guidance on how to implement the above requirements and a table comparing the requirements of ISO 50001 with other ISO management system standards.

ISO 50001 — How was it developed ?

The request to ISO to develop an international energy management standard came from the United Nations Industrial Development Organization (UNIDO) which had recognized industry's need to mount an effective response to climate change and to the proliferation of national energy management standards.

ISO, in turn, had identified energy management as one of the top five fields for the development of International Standards and, in 2008, created a project committee, ISO/PC 242, *Energy management*, to carry out the work. ISO/PC 242 was led by ISO members for the United States (American National Standards Institute – ANSI) and Brazil (Associação Brasileira de Normas Técnicas – ABNT).

Experts from the national standards bodies of 44 ISO member countries participated within ISO/PC 242 in the development of ISO 50001, with another 14 countries as observers. The standard also benefitted from the participation of development organizations including UNIDO and the World Energy Council (WEC).

ISO 50001 has been able to draw on numerous national or regional energy management standards, specifications and regulations, including ones developed in China, Denmark, Ireland, Japan, Republic of Korea, Netherlands, Sweden, Thailand, the USA and the European Union.

Resources

- **ISO's Website** *www.iso.org*
  (in English and French, with top levels in Russian and individual publications in other languages) The "**Hot topics**" section includes "**Energy**", "**Climate change**" and "**Sustainable development**"
- ***ISO Focus+* magazine** *www.iso.org/iso/isofocus+*
  (10 editions annually in English and French)
- **ISO videos** *www.youtube.com/PlanetISO*
- **ISO Café** *www.iso.org/isocafe*

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