PLUS 50001

The ISO 50001 essentials — Energy management systems implementation guideline

Legal Notice for Standards

Canadian Standards Association (CSA) standards are developed through a consensus standards development process approved by the Standards Council of Canada. This process brings together volunteers representing varied viewpoints and interests to achieve consensus and develop a standard. Although CSA administers the process and establishes rules to promote fairness in achieving consensus, it does not independently test, evaluate, or verify the content of standards.

Disclaimer and exclusion of liability

This document is provided without any representations, warranties, or conditions of any kind, express or implied, including, without limitation, implied warranties or conditions concerning this document's fitness for a particular purpose or use, its merchantability, or its non-infringement of any third party's intellectual property rights. CSA does not warrant the accuracy, completeness, or currency of any of the information published in this document. CSA makes no representations or warranties regarding this document's compliance with any applicable statute, rule, or regulation.

IN NO EVENT SHALL CSA, ITS VOLUNTEERS, MEMBERS, SUBSIDIARIES, OR AFFILIATED COMPANIES, OR THEIR EMPLOYEES, DIRECTORS, OR OFFICERS, BE LIABLE FOR ANY DIRECT, INDIRECT, OR INCIDENTAL DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES, HOWSOEVER CAUSED, INCLUDING BUT NOT LIMITED TO SPECIAL OR CONSEQUENTIAL DAMAGES, LOST REVENUE, BUSINESS INTERRUPTION, LOST OR DAMAGED DATA, OR ANY OTHER COMMERCIAL OR ECONOMIC LOSS, WHETHER BASED IN CONTRACT, TORT (INCLUDING NEGLIGENCE), OR ANY OTHER THEORY OF LIABILITY, ARISING OUT OF OR RESULTING FROM ACCESS TO OR POSSESSION OR USE OF THIS DOCUMENT, EVEN IF CSA HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES.

In publishing and making this document available, CSA is not undertaking to render professional or other services for or on behalf of any person or entity or to perform any duty owed by any person or entity to another person or entity. The information in this document is directed to those who have the appropriate degree of experience to use and apply its contents, and CSA accepts no responsibility whatsoever arising in any way from any and all use of or reliance on the information contained in this document.

CSA is a private not-for-profit company that publishes voluntary standards and related documents. CSA has no power, nor does it undertake, to enforce compliance with the contents of the standards or other documents it publishes.

Intellectual property rights and ownership

As between CSA and the users of this document (whether it be in printed or electronic form), CSA is the owner, or the authorized licensee, of all works contained herein that are protected by copyright, all trade-marks (except as otherwise noted to the contrary), and all inventions and trade secrets that may be contained in this document, whether or not such inventions and trade secrets are protected by patents and applications for patents. Without limitation, the unauthorized use, modification, copying, or disclosure of this document may violate laws that protect CSA's and/or others' intellectual property and may give rise to a right in CSA and/or others to seek legal redress for such use, modification, copying, or disclosure. To the extent permitted by licence or by law, CSA reserves all intellectual property rights in this document.

Patent rights

Attention is drawn to the possibility that some of the elements of this standard may be the subject of patent rights. CSA shall not be held responsible for identifying any or all such patent rights. Users of this standard are expressly advised that determination of the validity of any such patent rights is entirely their own responsibility.

Authorized use of this document

This document is being provided by CSA for informational and non-commercial use only. The user of this document is authorized to do only the following:

If this document is in electronic form:
- load this document onto a computer for the sole purpose of reviewing it;
- search and browse this document; and
- print this document if it is in PDF format.

Limited copies of this document in print or paper form may be distributed only to persons who are authorized by CSA to have such copies, and only if this Legal Notice appears on each such copy.

In addition, users may not and may not permit others to
- alter this document in any way or remove this Legal Notice from the attached standard;
- sell this document without authorization from CSA; or
- make an electronic copy of this document.

If you do not agree with any of the terms and conditions contained in this Legal Notice, you may not load or use this document or make any copies of the contents hereof, and if you do make such copies, you are required to destroy them immediately. Use of this document constitutes your acceptance of the terms and conditions of this Legal Notice.

CANADIAN STANDARDS ASSOCIATION

CSA Standards Update Service

PLUS 50001
December 2011

Title: *The ISO 50001 essentials — Energy management systems implementation guideline*
Pagination: 84 pages (iv preliminary and 80 text), each dated **December 2011**

To register for e-mail notification about any updates to this publication

- go on-line to **shop.csa.ca**
- click on **E-mail Services** under **MY ACCOUNT**
- click on **CSA Standards Update Service**

The **List ID** that you will need to register for updates to this publication is **2421591**.

If you require assistance, please e-mail **techsupport@csa.ca** or call 416-747-2233.

Visit CSA's policy on privacy at **csagroup.org/legal** to find out how we protect your personal information.

Acknowledgments

CSA would like to thank those who supported the development of this Guideline, in particular the following organizations:
BC Hydro
Fortis BC
Hydro-Québec
Ministry of Energy — Ontario (MOE)
Natural Resources Canada (NRCan)
Ontario Power Authority (OPA)

CSA would like to thank those individuals who assisted in the development of this Guideline through reviews:

Karim Asani	Rogers
Peter Bassett	Energy Performance Services (EPS)
Mike Burke	Natural Resources Canada (NRCan)
Jon Feldman	Ontario Power Authority (OPA)
Bob Fraser	Natural Resources Canada (NRCan)
Senka Krsikapa	Ministry of Energy — Ontario (MOE)
Ron Morrison	Canadian Manufacturers and Exporters
Sarah Smith	Fortis BC
Kevin Wallace	BC Hydro

CSA would like to thank the consultant who developed the draft Guideline, ICF Marbek. In that regard, special thanks go to the following:
Michael DeWit
Richard Patterson
Mark Shewfelt

CSA Special Publication

PLUS 50001

The ISO 50001 essentials — Energy management systems implementation guideline

CANADIAN STANDARDS ASSOCIATION

Published in December 2011 by Canadian Standards Association
A not-for-profit private sector organization
5060 Spectrum Way, Suite 100, Mississauga, Ontario, Canada L4W 5N6
1-800-463-6727 • 416-747-4044

The Canadian Standards Association (CSA) prints its publications on Rolland Enviro100, which contains 100% recycled post-consumer fibre, is EcoLogo and Processed Chlorine Free certified, and was manufactured using biogas energy.

To purchase CSA Standards and related publications, visit CSA's Online Store at ***shop.csa.ca*** *or call toll-free 1-800-463-6727 or 416-747-4044.*

ISBN 978-1-55491-836-2
Project Managers: *Ahmad Husseini, Karyn Ferguson*

Contents

Annexes

Figures

PLUS 50001
The ISO 50001 essentials — Energy management systems implementation guideline

1 Introduction to this handbook

1.1 Why implement CAN/CSA-ISO 50001:11?

Efficient use of energy is a key component of a successful business. ISO 50001 — *Energy Management Systems* (*EnMS*) is a voluntary international framework for the management of energy. The objective of the new ISO 50001 Standard, and its Canadian implementation, is to provide a framework for organizations to save energy. Reducing energy consumption is one of the most significant ways to lower an organization's environmental impacts. As well, ensuring that energy is appropriately managed and consumed as efficiently as possible will help to ensure that Canadian businesses and organizations remain competitive in the global market.

Energy is critical to organizational operations and can be a major cost to organizations, whatever their activities. 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.

ISO 50001 is not just about doing energy projects; rather it is about having a systematic approach to energy management, including establishing needed management structures and establishing the right projects to improve energy performance. ISO 50001 provides 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. The Standard provides organizations with a logical and consistent methodology for identifying and implementing improvements.

To meet the Standard, organizations are required to develop an energy management system that is a systematic way to evaluate and move projects forward. An energy management system, as defined in ISO 50001, is a "set of interrelated or interacting elements to establish an energy policy and energy objectives, and processes to achieve those objectives. An EnMS involves the utilization of best practices, including baseline energy development, continual measurement and reporting disciplines, and the promotion of energy efficiency."

1.2 Objective of this handbook

This is the first edition of the *ISO 50001 essentials* handbook. The objective of this handbook is to provide user-friendly guidance to small and medium enterprises who wish to implement an ISO 50001-conformant EnMS and in the longer term to accomplish continual improvement in energy performance through effective operation and maintenance of an EnMS. While this handbook is aimed at the small and medium enterprise market, it is expected that organizations of all sizes will find it useful for developing an energy management system.

This handbook is intended to provide guidance to organizations on how to develop and implement a systematic approach to improving energy performance. If in the process of developing the system, "low hanging fruit" and obvious quick-win energy projects are identified, they are worth considering, but the system is the focus, not individual projects or short-term initiatives.

This handbook assumes that some organizations will choose to develop an EnMS over time and not (at least initially) choose to pursue full/strict conformance with all requirements of ISO 50001. The content presented here is provided to allow users to understand how to build an EnMS first and make the conformance decision second.

Larger, more complex organizations should also find this handbook of benefit for implementation of an EnMS as well, since the essentials for EnMS development, implementation, operation, and ongoing maintenance are the same regardless of organizational complexity. The details of an EnMS must always first be a reflection of the unique attributes of the organization it serves, including its complexity.

Organizations that have already implemented Plan-Do-Check-Act based management systems for other technical disciplines should find the structure, approaches, and content familiar and be able to recognize the unique differences associated with an ISO 50001-conformant EnMS.

This Guideline does not assume that the reader has experience in either ISO standards or energy management. Rather, it aims to provide practical advice to allow companies to adopt and certify to the Standard as they choose.

1.3 CAN/CSA-ISO 50001 2011 edition

CAN/CSA-ISO 50001:11 is the first edition of the ISO 50001 Standard, *Energy management systems — Requirements with guidance for use*. It was released in June 2011, and is the first national energy management systems standard for Canada. The Standard is available for purchase at CSA's website.

1.4 Reference documents and sources

While this document is an original work, it has been inspired by numerous other energy, environmental, and quality management documents. CSA's PLUS 14000, *The ISO 14000 essentials — A practical guide to implementing the ISO 14000 Standards,* served as an initial source template for the development of this document and has been used extensively where commonalities exist.

Where documents are referenced directly, the appropriate document is indicated in the References section of each Clause of the Standard. Many of the concepts described in this document are tangentially inspired by a combination of other sources. These general sources are listed here:

- DIN EN 16001:2009, *Energy Management Systems in Practice*
- Georgia Tech Manufacturing Extension Partnership
- International Organization for Standardization (ISO): various background materials on ISO 50001
- International Performance Measurement and Verification Protocol (IPMVP 2010)
- Natural Resources Canada: *Dollars to $ense Workshop Resources*
- ISO Technical Committee Energy Management (TC242) materials and works

The authors of this document have participated in ISO 50001 pilot implementation efforts with 3M and Natural Resources Canada and include participants on ISO Technical Committee, Energy Management (TC242), the ISO committee that developed ISO 50001 and seeks to facilitate its use. Part of the collected wisdom included in this document is a direct result of participating in these activities. The content of this document has also incorporated input from a panel of energy management experts assembled by CSA.

In addition to the content of this Essentials document, the background sources noted above provide added content on EnMSs. The following are examples of the wide array of energy management guidance documentation and information for those wishing to access added sources (Internet searches for these titles will provide added background information and where applicable, sources for purchase):

- ANSI/IEEE 739:1995, *Recommended practice for energy management in industrial and commercial facilities*
- ANSI/MSE 2000:2008, *A Management System for Energy*
- ANSI/ASHRAE 189.1:2009, *Standard for the Design of High Performance Green Buildings*
- BESS project http://www.bess-project.info/
- China GB/T 15587:1995, *Guides for energy management in industrial enterprise*

- China GB/T 23331:2009, *Energy management system requirements*
- Global Superior Energy Performance Partnership and the Clean Energy Ministerial
- *Ireland Energy Management Systems IS 393:2005 Technical Guideline* (December 2006)
- *Netherlands Energy Management System Specification with Guidance for Use*, June 2004 publication of SenterNovem
- Sustainable Energy Ireland, "Energy Map"
- Sustainable Energy Ireland, *Strategic Guide for Hotels, Energy Management*
- United Kingdom BIP 2011:2003, *Continual Improvement through Auditing* (Integrated Management Systems Series)
- United Kingdom HB 1091:2002, *Implementing and Operating* (Integrated Management System Series)
- UNIDO Energy Management System Guide for Implementation
- United States Department of Energy Superior Energy Performance program

1.5 Layout of this handbook

This handbook on ISO 50001:2011 consists of the following four sections:

1 — Introduction to this handbook
The first section discusses the intent and layout of the handbook.

2 — ISO 50001:2011 and other related documents
The second section introduces the ISO 50001:2011 Standard and discusses its relationship to other related documents.

3 — Implementation and use
The third section includes information on topical areas related to the application of the ISO 50001:2011 requirements.

4 — Energy management system
The fourth section includes the text of the ISO 50001:2011 requirements Clauses (ISO 50001 is structured so that all requirements of the Standard are provided within Clause 4). This is supplemented by guidance on practical aspects for implementing key parts of an Energy Management System. Additionally, this section includes examples from a fictional company, ABC Inc.

This section is organized as follows:

Layout of Section 4 of this handbook

4.X.X Code reference title
This is a direct excerpt from the CAN/CSA-ISO 50001:11 Standard document.

Establishing an energy management system

Discusses the practical aspects of each requirement Clause of ISO 50001 and uses the associated icon throughout this handbook.

ABC Inc. example

ABC Inc. is a fictional company that has been developed for the purposes of demonstrating how ISO 50001 implementation could work in a typical company. The example follows ABC Inc. through its process of implementing ISO 50001.