
**Energy management systems —
Measuring energy performance using
energy baselines (EnB) and energy
performance indicators (EnPI) —
General principles and guidance**

*Systèmes de management de l'énergie — Mesurage de la performance
énergétique à l'aide des performances énergétiques de référence
(PER) et d'indicateurs de performance énergétique (IPÉ) — Principes
généraux et lignes directrices*



This document is a preview generated by EBS



COPYRIGHT PROTECTED DOCUMENT

© ISO 2014

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Measurement of energy performance	4
4.1 General overview	4
4.2 Obtaining relevant energy performance information from the energy review	7
4.3 Identifying energy performance indicators.....	12
4.4 Establishing energy baselines.....	15
4.5 Using energy performance indicators and energy baselines.....	16
4.6 Maintaining and adjusting energy performance indicators and energy baselines.....	17
Annex A (informative) Information generated through the energy review to identify EnPIs and establish EnBs	18
Annex B (informative) EnPI boundaries in an example production process	19
Annex C (informative) Further guidance on energy performance indicators and energy baselines	21
Annex D (informative) Normalizing energy baselines using relevant variables	24
Annex E (informative) Monitoring and reporting on energy performance	28
Bibliography	33

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is Technical Committee ISO/TC 242, *Energy management*.

Introduction

This International Standard provides organizations with practical guidance on how to meet the requirements of ISO 50001 related to the establishment, use and maintenance of energy performance indicators (EnPIs) and energy baselines (EnBs) in measuring energy performance and energy performance changes. EnPIs and EnBs are two key interrelated elements of ISO 50001 that enable the measurement, and therefore management of energy performance in an organization. Energy performance is a broad concept which is related to energy consumption, energy use and energy efficiency.

In order to effectively manage the energy performance of their facilities, systems, processes and equipment, organizations need to know how energy is used and how much is consumed over time. An EnPI is a value or measure that quantifies results related to energy efficiency, use and consumption in facilities, systems, processes and equipment. Organizations use EnPIs as a measure of their energy performance.

The EnB is a reference that characterizes and quantifies an organization's energy performance during a specified time period. The EnB enables an organization to assess changes in energy performance between selected periods. The EnB is also used for calculation of energy savings, as a reference before and after implementation of energy performance improvement actions.

Organizations define targets for energy performance as part of the energy planning process in their energy management systems (EnMS). The organization needs to consider the specific energy performance targets while identifying and designing EnPIs and EnBs. The relationship between energy performance, EnPIs, EnBs and energy targets is illustrated in [Figure 1](#).

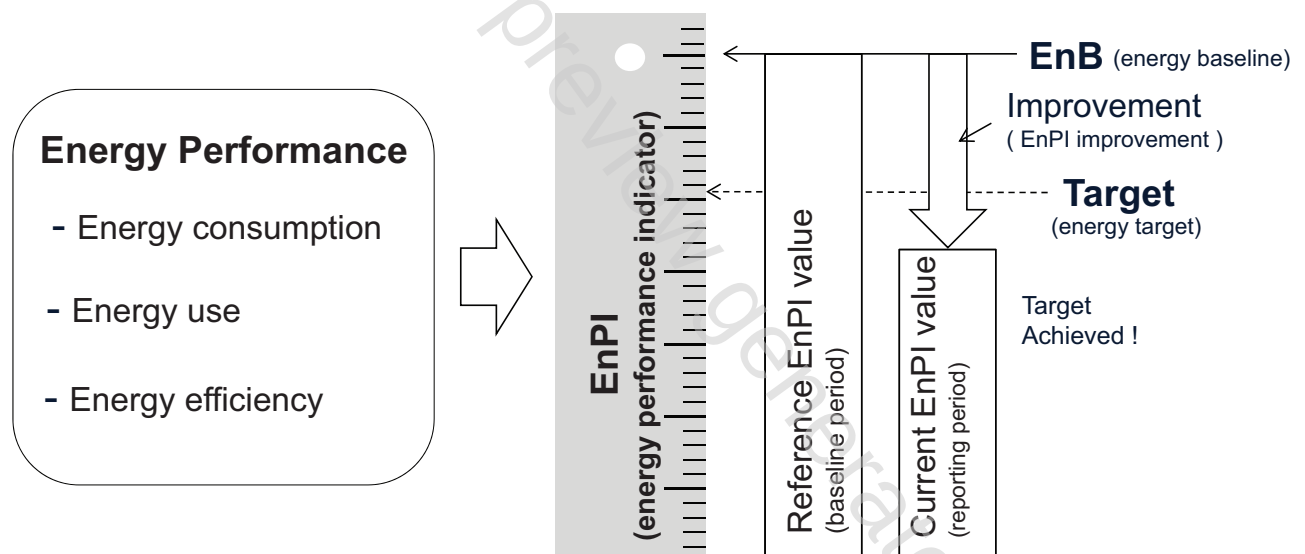


Figure 1 — Relationship between energy performance, EnPIs, EnBs and energy targets

This International Standard includes practical help boxes designed to provide the user with ideas, examples and strategies for measuring energy performance using EnPIs and EnBs.

The concepts and methods in this International Standard can also be used by organizations that do not have an existing EnMS. For example, EnPIs and EnBs can also be used at the facility, system, process or equipment level, or for the evaluation of individual energy performance improvement actions.

Ongoing commitment and engagement by top management is essential to the effective implementation, maintenance and improvement of the EnMS in order to achieve the benefits in energy performance improvement. Top management demonstrates its commitment through leadership actions and active involvement in the EnMS, ensuring ongoing allocation of resources including people to implement and sustain the EnMS over time.

Energy management systems — Measuring energy performance using energy baselines (EnB) and energy performance indicators (EnPI) — General principles and guidance

1 Scope

This International Standard provides guidance to organizations on how to establish, use and maintain energy performance indicators (EnPIs) and energy baselines (EnBs) as part of the process of measuring energy performance.

The guidance in this International Standard is applicable to any organization, regardless of its size, type, location or level of maturity in the field of energy management.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 50001:2011, *Energy management systems — Requirements with guidance for use*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 50001 and the following apply.

3.1

adjustment

process of modifying the energy baseline in order to enable energy performance comparison under equivalent conditions between the reporting period and the baseline period

Note 1 to entry: ISO 50001 requires adjustments to the EnB when EnPIs no longer reflect organizational energy use and consumption, or when there have been major changes to the process, operational patterns, or energy systems, or according to a predetermined method.

Note 2 to entry: Typically adjustments are made to account for changes in static factors.

Note 3 to entry: Predetermined methods typically reset the EnB at defined intervals.

3.2

baseline period

defined period of time used to compare energy performance with the reporting period

3.3

boundaries

physical or site limits and/or organizational limits as defined by the organization

EXAMPLE A process; a group of processes; a site; an entire organization; multiple sites under the control of an organization.

[SOURCE: ISO 50001:2011, 3.1]