

INTERNATIONAL STANDARD

ISO 50047

First edition
2016-11-01

Energy savings — Determination of energy savings in organizations

*Économies d'énergie — Détermination des économies d'énergie dans
les organismes*



Reference number
ISO 50047:2016(E)

© ISO 2016

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Preliminary considerations and boundaries	5
4.1 Preliminary considerations.....	5
4.2 Approaches to determining energy savings.....	5
4.2.1 Two approaches to determining energy savings.....	5
4.2.2 Organization-based approach.....	5
4.2.3 EPIA-based approach.....	6
4.3 Determining the boundaries.....	7
5 Energy accounting	8
5.1 General principles of energy accounting.....	8
5.2 Measurement of energy consumption and stocks.....	8
5.3 Types of energy with relatively insignificant consumption.....	9
5.4 Expressing energy consumption in common units.....	10
5.5 Primary and delivered energy.....	10
5.5.1 General.....	10
5.5.2 Conversion of delivered energy to primary energy.....	11
6 Data preparation for determination of energy savings	12
6.1 Selection of time periods.....	12
6.2 Establishing the energy baseline.....	12
6.3 Non-routine adjustments.....	13
6.4 Normalization for relevant variables.....	13
6.4.1 General principles.....	13
6.4.2 Methods of normalization.....	14
6.4.3 Summary of normalization methods.....	15
6.4.4 Determination of normalized energy consumption.....	15
7 Calculation of energy savings	18
7.1 General principles.....	18
7.2 EPIA-based approach to determining energy savings.....	20
7.2.1 General principles.....	20
7.2.2 Indirect energy effects.....	20
7.2.3 Avoiding double counting.....	21
7.3 Ensuring consistency between organization-based and EPIA-based approaches.....	21
8 Improving the accuracy of energy savings results	22
8.1 Data quality.....	22
8.2 Errors in determining energy savings.....	22
8.3 Acceptable uncertainty criteria.....	23
9 Reporting energy savings	23
9.1 General.....	23
9.2 Reporting considerations for groups of companies.....	23
9.3 Communicating energy savings results.....	23
Annex A (informative) Flowchart for determination of energy savings	25
Annex B (informative) Reconciliation between organization level and EPIA-based energy savings	26
Annex C (informative) Example of energy accounting in a cement plant	28
Annex D (informative) Example of normalization of energy consumption in a cement plant	32

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 World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is Technical Committee ISO/TC 301, *Energy management and energy savings*.

Introduction

This International Standard describes approaches for determining energy savings based on one of the following two approaches:

- a) an organization-based approach, i.e. a change in the amount of energy consumed by the organization, as measured within the organizational boundaries;
- b) an EPIA-based approach, i.e. aggregating energy savings from energy performance improvement actions (EPIAs) measured within the organizational boundaries.

Both approaches compare energy consumption for a defined period of time, the energy consumption in a baseline period and a reporting period of equivalent length. Guidance is given on reconciliation between the two approaches.

This International Standard also considers the following in the context of energy savings:

- the use of primary and delivered energy;
- methods for normalizing energy consumption;
- methods for aggregating energy savings from different types of energy.

The flowchart in [Annex A](#) shows the process for determining energy savings using this International Standard.

This International Standard is designed to be broadly consistent with the overall framework for the determination and reporting of energy savings in projects, organizations and regions set out in ISO 17743, as well as with the principles and guidelines given in ISO 50015 on the measurement and verification of energy performance of organizations.