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**Energy efficiency and renewable  
energy sources — Common  
international terminology —**

**Part 1:  
Energy efficiency**

**iTeh STANDARD PREVIEW**  
*Efficacité énergétique et sources d'énergie renouvelables —  
Terminologie internationale commune —  
Partie 1: Efficacité énergétique*  
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## 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](http://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](http://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 ISO/IEC JPC2, *Energy efficiency and renewable energy sources — Common terminology*.

ISO/IEC 13273 consists of the following parts, under the general title *Energy efficiency and renewable energy sources — Common international terminology*:

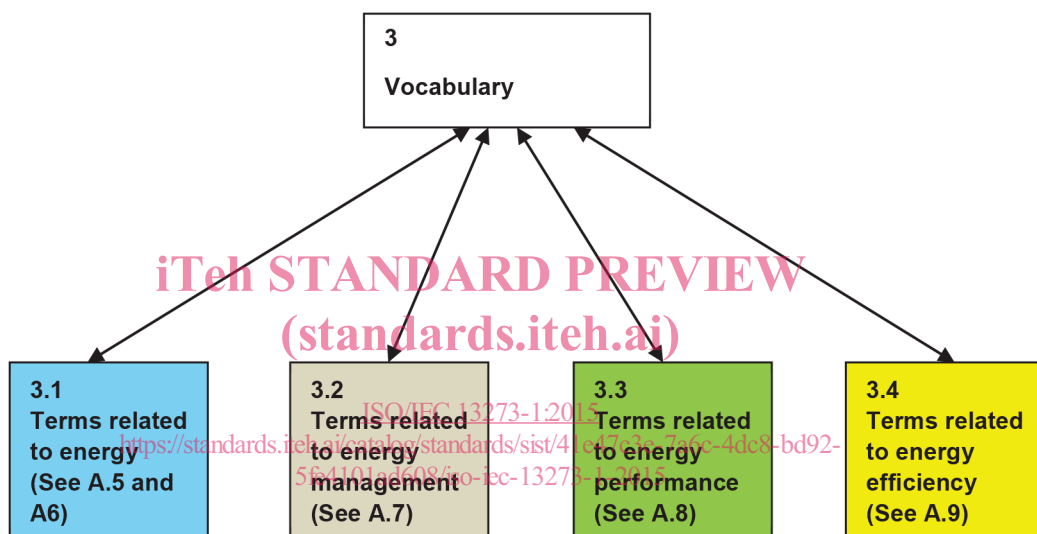
- *Part 1: Energy efficiency*
- *Part 2: Renewable energy sources*

## Introduction

The aim of this part of ISO/IEC 13273 is to support activities related to energy and that deal with energy efficiency. The terms were selected based upon their relevance and transverse nature. This International Standard is a horizontal standard in accordance with IEC Guide 108. It addresses the fundamental principles and concepts of energy efficiency and energy management terminology, which is relevant to a number of technical committees, with the goal of improving coherence and common characteristics for energy terms. This International Standard does not address terms specific to topics such as environmental sustainability or nuclear energy but rather transverse energy terminology.

It is intended to be of help to technical practitioners and other interested parties who either use or develop International Standards in these subject fields.

With the growth in the number of International Standards that directly or indirectly relate to energy, there is an increasing need for an agreement on common language in the domain.



**Figure 1 — Vocabulary structure**

This part of ISO/IEC 13273 deals with concepts belonging to the general subject field of energy and, within that, transverse concepts in the field of energy efficiency. For renewable energy sources see ISO/IEC 13273-2.

The arrangement of terms and definitions in this International Standard is based upon concept systems that show corresponding relationships among energy efficiency and renewable energy sources concepts (see Figures A.4 to A.8 for additional diagrams on each group of terms). This arrangement provides users with a structured view of transverse energy concepts and facilitates their understanding. This terminology promotes a common understanding among all parties involved in energy efficiency and facilitates effective communication. This part of ISO/IEC 13273 includes terms and definitions that are commonly used in energy efficiency. The organization of terms is illustrated in Figure 1. This International Standard is a first effort in the development of a complete set of terms related to energy, and will be updated as further terms and definitions are agreed upon. (See [Clause A.3](#), [Figure A.4](#)).

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# Energy efficiency and renewable energy sources — Common international terminology —

## Part 1: Energy efficiency

### 1 Scope

This part of ISO/IEC 13273 contains transverse concepts and their definitions in the subject field of energy efficiency. This horizontal standard is primarily intended for use by technical committees in the preparation of standards in accordance with the principles laid down in IEC Guide 108.

One of the responsibilities of a technical committee is, wherever applicable, to make use of horizontal standards in the preparation of its publications. The contents of this horizontal standard will not apply unless specifically referred to or included in the relevant publications.

### 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.

This clause has been maintained to match the numbering of ISO/IEC 13273-2 and for potential future use.

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### 3 Terms and definitions

#### 3.1 Terms related to energy

##### 3.1.1 energy E

capacity of a system to produce external activity or to perform work

Note 1 to entry: Commonly the term energy is used for electricity, fuel, steam, heat, compressed air and other like media.

Note 2 to entry: Energy is commonly expressed as a scalar quantity.

Note 3 to entry: Work as used in this definition means external supplied or extracted energy to a system. In mechanical systems, forces in or against direction of movement; in thermal systems, heat supply or heat removal.

[SOURCE: 1986 World Energy Conference Energy Terminology glossary, modified – The word “the” at the beginning of the description was removed, the symbols were added as was the Note 1 to entry from ISO 50001:2011.]

##### 3.1.2 energy carrier

substance or medium that can transport energy

EXAMPLE Electricity, hydrogen, fuels.

### 3.1.3

#### **feedstock energy**

*energy* (3.1.1) of material used for purposes other than producing work or activity

EXAMPLE Crude oil injected into steel smelting is for deoxidization but it contributes to the energy content in a limited manner.

Note 1 to entry: Care is necessary to ensure that the energy content of materials is properly accounted for in the energy balance.

### 3.1.4

#### **energy source**

material, natural resource or technical system from which *energy* (3.1.1) can be extracted or recovered

Note 1 to entry: A press spring, flywheel, or battery are examples of a technical system used as an energy source.

### 3.1.5

#### **energy storage**

action or method used to accumulate, retain and release *energy* (3.1.1) for later use in an *energy using system* (3.1.9)

Note 1 to entry: Energy storage is an important concept in terms of renewable energy, see ISO/IEC 13273-2, 3.1.5 for additional information.

### 3.1.6

#### **primary energy**

*energy* (3.1.1) that has not been subjected to *energy conversion* (3.1.7)

Note 1 to entry: Primary energy can be either a non-renewable or renewable energy or a combination of both.

[SOURCE: ISO 16818-3.177:2008, modified – the word “any” was deleted and the term energy conversion and reference was added; the phrase “or transformation process” was deleted; Note 1 to entry was added.]

### 3.1.7

#### **energy conversion**

transformation of one *energy carrier* (3.1.2)-to another energy carrier or work

Note 1 to entry: The term “energy transformation” can be used in this sense.

### 3.1.8

#### **cogeneration**

*energy conversion* (3.1.7) from the same source into two or more utilized forms of energy in one common controlled process

Note 1 to entry: Combined heat and power (CHP) is a specific implementation of cogeneration used for the simultaneous production of heat and electricity.

### 3.1.9

#### **energy using system**

physical items with defined *system boundaries* (3.3.2), using *energy* (3.1.1)

EXAMPLE Facility, building, part of a building, machine, equipment, product, etc.

### 3.1.10

#### **energy end user**

individual or a group of individuals or organization with responsibility for operating an *energy using system* (3.1.9)

### 3.1.11

#### **final energy**

*energy* (3.1.1) as delivered to an *energy using system* (3.1.9)

Note 1 to entry: This concept is sometimes referred to as delivered energy.



Note 2 to entry: See also [Annex B](#).

### 3.1.11.1

#### applied energy

*energy* ([3.1.1](#)) used for the intended purpose of the *energy using system* ([3.1.9](#))

Note 1 to entry: to entry The system boundaries can be chosen based on the purpose of the energy using system..

Note 2 to entry: See also [Annex B](#).

### 3.1.11.2

#### system energy loss

*final energy* ([3.1.11](#)) which is not *applied energy* ([3.1.11.1](#))

Note 1 to entry: See also [Annex B](#)

#### 3.1.11.2.1

##### recovered energy

*energy* ([3.1.1](#)) that is withdrawn from *system energy loss* ([3.1.11.2](#)) to become *applied energy* ([3.1.11.1](#)) at another *energy using system* ([3.1.9](#))

Note 1 to entry: See also [Annex B](#).

#### 3.1.11.2.2

##### lost energy

*system energy loss* ([3.1.11.2](#)) that is not recovered energy

Note 1 to entry: See also [Annex B](#).

### 3.1.12

#### energy use

manner or kind of application of *energy* ([3.1.1](#))

EXAMPLE Ventilation; lighting; heating; cooling; transportation; processes; production lines.

Note 1 to entry: Characteristics of energy use include, but are not limited to, the purpose of the use, source(s) choice and application.

[SOURCE: ISO 50001:2011, 3.18, modified –added Note 1 to entry.]

### 3.1.13

#### energy consumption

quantity of *energy* ([3.1.1](#)) applied

Note 1 to entry: This is not *applied energy* ([3.1.11.1](#)).

[SOURCE: ISO 50001:2011, 3.7, modified to add Note 1 to entry]

### 3.1.14

#### energy intensity

quotient describing the total *energy consumption* ([3.1.13](#)) per unit of economic output

EXAMPLE Gigajoule per euro of GDP (gross domestic product); gigajoule per unit of turnover.

### 3.1.15

#### specific energy consumption

quotient describing the total *energy consumption* ([3.1.13](#)) per unit of output or service

EXAMPLE Gigajoule (GJ) per tonne of steel, annual kilowatt hour (kWh) per square metre (m<sup>2</sup>), litres (l) of fuel per kilometre (km), etc.

## 3.2 Terms related to energy management systems

### 3.2.1

#### **energy management system**

##### **EnMS**

set of interrelated or interacting elements to establish an *energy policy* (3.2.2) and *energy objectives* (3.2.3), and processes and procedures to achieve those objectives

[SOURCE: ISO 50001:2011, 3.9]

### 3.2.2

#### **energy policy**

statement by the organization of its overall intentions and direction of an organization related to its *energy performance* (3.3.1) as formally expressed by top management

Note 1 to entry: The energy policy provides a framework for action and for the setting of energy objectives and energy targets.

[SOURCE: ISO 50001:2011, 3.14]

### 3.2.3

#### **energy objective**

specified outcome or achievement set to meet the organization's *energy policy* (3.2.2) related to improved *energy performance* (3.3.1)

[SOURCE: ISO 50001:2011, 3.11]

### 3.2.4

#### **energy target**

detailed and quantifiable *energy performance* (3.3.1) requirement, applicable to the organization or parts thereof, that arises from the *energy objective* (3.2.3) and that needs to be set and met in order to achieve this objective

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[SOURCE: ISO 50001:2011, 3.17]

### 3.2.5

#### **energy review**

determination of the organization's *energy performance* (3.3.1) based on data and other information leading to identification of opportunities for improvement

[SOURCE: ISO 50001:2011, 3.15, modified – Note 1 to entry has been deleted since it only applied to management systems and was not transverse.]

### 3.2.6

#### **energy action plan**

decided actions to achieve the specified *energy targets* (3.2.4) and *energy objective* (3.2.3)

Note 1 to entry: Action plans may include designation of responsibilities, arrangements (means), method for verification and timeframe in support of the energy policy.

### 3.2.7

#### **energy management team**

person(s) accountable for effective implementation of the *energy management system* (3.2.1) activities and for delivering *energy performance* (3.3.1) improvements

Note 1 to entry: The size and nature of the organization, and available resources, will determine the size of the team. The team may be one person, such as the management representative.

[SOURCE: ISO 50001:2011, 3.10]

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### 3.3 Terms related to energy performance

#### 3.3.1

##### **energy performance**

measurable results related to *energy efficiency* (3.4.1), *energy use* (3.1.12) and *energy consumption* (3.1.13)

[SOURCE: ISO 50001:2011, 3.12, modified – Note 1 and Note 2 to entry have been deleted since the notes were specific to energy management and not transverse.]

#### 3.3.2

##### **system boundaries**

physical or site limits as defined for a stated purpose

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

Note 1 to entry: The system boundaries are chosen based on the purpose of the energy using system.

#### 3.3.3

##### **energy measurement**

verifiable and repeatable process to obtain a quantifiable value(s) in relation to *energy performance* (3.3.1)

#### 3.3.4

##### **energy metering**

applying a device measuring *energy* (3.1.1) or other data in relation to *energy use* (3.1.12)

[SOURCE: CEN-CLC/TR 16103:2010, 4.7.2-modified deleted “other consumption” added “other data in relation with energy use after energy.”]

#### 3.3.5

##### **measurement and verification**

##### **M&V**

process of energy measurement to reliably determine data in relation to energy performance for defined system boundaries

#### 3.3.6

##### **energy performance indicator**

##### **EnPI**

quantitative value or measure of *energy performance* (3.3.1)

Note 1 to entry: Note1 to entry: EnPIs for an energy management system (EnMS) are defined by the organization.

Note 2 to entry: EnPIs could be expressed as a simple metric, ratio or a more complex model.

[SOURCE: ISO 50001:2011, 3.13, modified – Deleted the phrase “as defined by the organization” at the end of the description and added it as Note 1 to entry, moving Note 1 to entry to Note 2 to entry.]

#### 3.3.7

##### **energy performance improvement action**

##### **EPIA**

action or measure (or group of actions or measures) implemented or planned within an organization intended to achieve *energy performance* (3.3.1) improvement through technological, management, behavioural, economic, or other changes

#### 3.3.8

##### **energy baseline**

quantitative reference(s) providing a basis for comparison of *energy performance* (3.3.1)

Note 1 to entry: An energy baseline can be normalized using variables affecting energy use and/or consumption such as production level, degree days (outdoor temperature), etc.