
**Energy performance of buildings —
Indicators, requirements, ratings and
certificates —**

**Part 1:
General aspects and application to the
overall energy performance**

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*Performance énergétique des bâtiments — Indicateurs, exigences,
appréciations et certificats —*

*Partie 1: Aspects généraux et application à la performance
énergétique globale*

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Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols and subscripts	8
4.1 Symbols.....	8
4.2 Subscripts.....	8
5 Description of the document	9
5.1 Brief overview of the document.....	9
5.2 Selection criteria between the possible options.....	9
5.3 Input and output data of new calculation methodologies.....	9
5.3.1 General.....	9
5.3.2 Input data.....	9
5.3.3 Output data.....	10
6 Relation between EPB features, indicators, requirements, ratings and certificates	10
7 Energy performance features and their indicators	11
7.1 General.....	11
7.2 Normalization to building size.....	12
7.3 Energy performances and their indicators.....	12
7.3.1 Overall energy performances.....	12
7.3.2 Partial energy performances.....	12
7.4 Ratios of identical/similar quantities as indicators for energy performances.....	13
8 Tailoring for requirements and for ratings	14
8.1 Two approaches.....	14
8.2 Project characteristics for tailoring.....	15
9 Energy performance requirements	15
9.1 General.....	15
9.2 Choice of the mix of requirements.....	16
9.3 Constant or variable value requirements.....	17
9.4 Actual strictness.....	17
9.5 Reporting template for the overall energy performance.....	17
10 EPB rating	18
10.1 General.....	18
10.2 EPB rating procedures.....	18
10.3 Reference values.....	19
10.3.1 General.....	19
10.3.2 Requirement as main reference value.....	19
10.3.3 Building stock as reference.....	20
11 Energy performance certificate	20
11.1 General.....	20
11.2 Content of the procedure for a building energy certificate.....	20
11.3 Content of the energy performance certificate.....	22
11.3.1 General.....	22
11.3.2 Default graphical representation model.....	22
11.4 Recommendations.....	23
12 Quality control	23
13 Compliance check	23

Annex A (normative) Input and method selection data sheet — Template	24
Annex B (informative) Input and method selection data sheet — Default choices	29
Bibliography	35

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[ISO 52003-1:2017](https://standards.iteh.ai/catalog/standards/sist/b379c06a-6852-4503-9aca-2372f6da960e/iso-52003-1-2017)

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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).

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 voluntary nature of standards, 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.

ISO 52003-1 was prepared by ISO Technical Committee TC 163, *Thermal performance and energy use in the built environment*, in collaboration with Technical Committee TC 205, *Building environment design*, and with the European Committee for Standardization (CEN) Technical Committee CEN/TC 89, *Thermal performance of buildings and building components*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This first edition of ISO 52003-1 cancels and replaces ISO 16343:2013, which has been technically revised.

The necessary editorial revisions were made to comply with the requirements for each EPB standard. The content of ISO 16343 has been reworked significantly, but it has been attempted not to lose any substantial original information, even though the original text has sometimes been strongly restructured and rephrased, and new content has been added throughout. The original text has been split into 2 parts: a normative standard and an informative technical report.

A list of all parts in the ISO 52003 series can be found on the ISO website.

Introduction

This document is part of a series aimed at the international harmonization of the methodology for assessing the energy performance of buildings. Throughout, this series is referred to as a “set of EPB standards”.

All EPB standards follow specific rules to ensure overall consistency, unambiguity and transparency.

All EPB standards provide a certain flexibility with regard to the methods, the required input data and references to other EPB standards, by the introduction of a normative template in [Annex A](#) and [Annex B](#) with informative default choices.

For the correct use of this document, a normative template is given in [Annex A](#) to specify these choices. Informative default choices are provided in [Annex B](#).

The main target groups for this document are architects, engineers and regulators.

Use by or for regulators: In case the document is used in the context of national or regional legal requirements, mandatory choices may be given at national or regional level for such specific applications. These choices (either the informative default choices from [Annex B](#) or choices adapted to national/regional needs, but in any case following the template of [Annex A](#)) can be made available as national annex or as separate (e.g. legal) document (national data sheet).

NOTE 1 So in this case:

- the regulators will specify the choices;
- the individual user will apply the document to assess the energy performance of a building, and thereby use the choices made by the regulators.

Topics addressed in this document can be subject to public regulation. Public regulation on the same topics can override the default values in [Annex B](#). Public regulation on the same topics can even, for certain applications, override the use of this document. Legal requirements and choices are in general not published in standards but in legal documents. In order to avoid double publications and difficult updating of double documents, a national annex may refer to the legal texts where national choices have been made by public authorities. Different national annexes or national data sheets are possible, for different applications.

It is expected, if the default values, choices and references to other EPB standards in [Annex B](#) are not followed due to national regulations, policy or traditions, that:

- national or regional authorities prepare data sheets containing the choices and national or regional values, according to the model in [Annex A](#). In this case a national annex (e.g. NA) is recommended, containing a reference to these data sheets;
- or, by default, the national standards body will consider the possibility to add or include a national annex in agreement with the template of [Annex A](#), in accordance to the legal documents that give national or regional values and choices.

Further target groups are parties wanting to motivate their assumptions by classifying the building energy performance for a dedicated building stock.

More information is provided in the Technical Report accompanying this document (ISO/TR 52003-2).

The overall and partial EPB indicators, i.e. the quantitative output of EPB assessments, can be used for different purposes:

- 1) Requirements: to set public or private requirements regarding the energy performance of buildings.
- 2) Decisions: to facilitate decisions or actions in the private or public domain.

- 3) Information and communication: for building designers, owners, operators, users, policy makers and citizens (as sellers or renters, as prospective buyers or tenants).

This document and ISO/TR 52003-2 deal with several of these uses, which can generically be described as the post-processing of the outputs of the EPB assessment methods (see [5.1](#)).

The main focus of the actual (normative) standard, i.e. this document, is on basic concepts and relations and on the actions that need to be taken. The accompanying (informative) technical report, i.e. ISO/TR 52003-2, provides extensive further information to support actors in a judicious implementation. For optimal understanding, both documents are therefore best read side-by-side, clause-by-clause.

This document and ISO/TR 52003-2 are complemented by

- ISO 52018-1 and ISO/TR 52018-2 that deal with partial EPB requirements related to thermal energy balance and fabric features, and
- CEN EPB standards that deal with the same topics for specific technical building systems, servicing specific types of energy use (such as heating, cooling, ventilation, domestic hot water and lighting).

Much of the content of these texts may be commonplace to those experienced in the domain. However, it has been decided to document basic considerations with a view to fully informing any interested party, including novices in the field. The texts thus partly serve as “institutional memory”. The aim is to contribute to well-informed choices and also to any future revision of a regulation (choice of the mix of EPB features and indicators, variable or constant value requirements and/or rating references, actual requirement strictness).

[Table 1](#) shows the relative position of this document within the set of EPB standards in the context of the modular structure as set out in ISO 52000-1.

NOTE 2 In ISO/TR 52000-2, the same table can be found with, for each module, the numbers of the relevant EPB standards and accompanying technical reports that are published or in preparation.

The modules represent EPB standards, although one EPB standard may cover more than one module and one module may be covered by more than one EPB standard, for instance, a simplified and a detailed method respectively. See also [Clause 2](#) and [Tables A.1](#) and [B.1](#).

Table 1 — Position of this document (in casu M1-4) within the modular structure of the set of EPB standards

Sub-module	Overarching		Building (as such)		Technical Building Systems									
	Descriptions		Descriptions		Descriptions	Heating	Cooling	Ventilation	Humidification	Dehumidification	Domestic hot water	Lighting	Building automation and control	PV, wind, ..
sub1		M1		M2		M3	M4	M5	M6	M7	M8	M9	M10	M11
1	General		General		General									
2	Common terms and definitions; symbols, units and subscripts		Building energy needs		Needs								a	
3	Applications		(Free) Indoor conditions without systems		Maximum load and power									
4	Ways to express energy performance	ISO 52003-1	Ways to express energy performance		Ways to express energy performance									
5	Building categories and building boundaries		Heat transfer by transmission		Emission and control									
6	Building occupancy and operating conditions		Heat transfer by infiltration and ventilation		Distribution and control									
7	Aggregation of energy services and energy carriers		Internal heat gains		Storage and control									
8	Building zoning		Solar heat gains		Generation and control									

Table 1 (continued)

Overarching		Building (as such)		Technical Building Systems										
Sub-module	Descriptions		De-scriptions	De-scriptions	Heat-ing	Cool-ing	Ven-tila-tion	Hu-mid-ifi-cati-on	De-hu-mid-ifica-tion	Do-mes-tic hot water	Light-ing	Build-ing auto-ma-tion and control	PV, wind, ..	
sub1		M1		M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	
9	Calculated energy performance		Building dynamics (thermal mass)		Load dispatching and operating conditions									
10	Measured energy performance		Measured energy performance		Measured energy performance									
11	Inspection		Inspection		Inspection									
12	Ways to express indoor comfort													
13	External environment conditions													
14	Economic calculation													

^a The shaded modules are not applicable

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Energy performance of buildings — Indicators, requirements, ratings and certificates —

Part 1: General aspects and application to the overall energy performance

1 Scope

The set of EPB assessment standards produces a great number of overall and partial EPB indicators as outputs. This document provides general insight to both private parties and public regulators (and all stakeholders involved in the regulatory process) on how to make good use of these outputs for different purposes (post-processing).

This document describes the relation between the EPB indicators and the EPB requirements and EPB ratings, and it discusses the importance of project-specific, tailored values as requirement or reference for certain EPB indicators. This document also includes a couple of possible EPB labels and it lists the different steps to be taken when establishing an EPB certification scheme.

This document provides standardized tables for reporting in a structured and transparent manner the choices that are to be made with respect to overall EPB requirements. The tables are non-restrictive, thus allowing for full regulatory flexibility. This document does not provide such tables for partial EPB requirements (related to the fabric or technical buildings systems), as this is dealt with in other documents.

NOTE [Table 1](#) in the Introduction shows the relative position of this document within the set of EPB standards in the context of the modular structure as set out in ISO 52000-1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7345:1987, *Thermal insulation — Physical quantities and definitions*

ISO 52000-1:2017, *Energy performance of buildings — Overarching EPB assessment — Part 1: General framework and procedures*

NOTE Default references to EPB standards other than ISO 52000-1 are identified by the EPB module code number and given in [Annex A](#) (normative template in Table A.1) and [Annex B](#) (informative default choice in Table B.1).

EXAMPLE EPB module code number: M5-5, or M5-5.1 (if module M5-5 is subdivided), or M5-5/1 (if reference to a specific clause of the standard covering M5-5).

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7345 and ISO 52000-1 and the following apply

ISO 52003-1:2017(E)

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

NOTE The terms of ISO 52000-1 that are indispensable for the understanding of this document are repeated here.

3.1 Building

3.1.1

assessed object

building, part of a building or portfolio of buildings that is the object of the energy performance assessment

Note 1 to entry: The assessed object comprises all spaces and technical systems which may contribute to or influence the energy performance assessment.

Note 2 to entry: The assessed object may include one or several building units, if these are not individually object of the energy performance assessment.

Note 3 to entry: A distinction may be made between, e.g. a designed building, new building after construction, existing building in the use phase and existing building after major renovation.

[SOURCE: ISO 52000-1:2017, 3.1.1]

3.1.2

building

construction as a whole, including the fabric and all technical building systems, where energy may be used to condition the indoor environment, to provide domestic hot water and illumination and other services related to the use of the building

Note 1 to entry: The term refers to the physical building as a whole, or to all parts thereof, that at least include the spaces and technical building systems that are relevant for the energy performance assessment.

Note 2 to entry: Parts of a building can be physically detached, but are on the same building site. For example: a canteen or a guard house or one or more classrooms of a school in a detached part of a building; or an essential space in a dwelling (e.g. bedroom).

[SOURCE: ISO 52000-1:2017, 3.1.2]

3.1.3

building category

unit category

classification of buildings and/or building units related to their main use or their special status, for the purpose of enabling differentiation of the energy performance assessment procedures and/or energy performance requirements

EXAMPLE Buildings officially protected as part of a designated environment or because of their special architectural or historical merit, buildings used as places of worship and for religious activities, residential buildings, (a) single-family houses of different types; (b) apartment blocks; (c) offices; (d) educational buildings; (e) hospitals; (f) hotels and restaurants; (g) sports facilities; (h) wholesale and retail trade services buildings; (i) data centres; (j) other types of energy-consuming buildings.

Note 1 to entry: Building regulations often make a distinction between building categories.

Note 2 to entry: The building category, for instance, may determine if energy performance assessment is mandatory (e.g., not for religious or historic buildings) and which are the minimum energy performance requirements (e.g., for new buildings); in some countries measured energy performance of a building is prescribed for specific categories of buildings (e.g., apartment buildings, large public buildings), etc. Another type of categorization is the distinction between new and existing and renovated buildings.

Note 3 to entry: Many buildings or building units of a given (use) category contain spaces of different (use) categories; for instance an office building may contain a restaurant; see [3.1.11](#).

Note 4 to entry: The allocation of a building category may also have a strong impact on other parts of the building regulations, for instance on safety (e.g., emergency exits, strength of floor) or indoor environmental quality (e.g., minimum ventilation rates).

[SOURCE: ISO 52000-1:2017, 3.1.3]

3.1.4 building element

integral component of the technical building systems or of the fabric of a building

[SOURCE: ISO 52000-1:2017, 3.1.4]

3.1.5 building fabric

all physical elements of a building, excluding technical building systems

EXAMPLE 1 Roofs, walls, floors, doors, gates and internal partitions.

EXAMPLE 2 It includes elements both inside and outside of the thermal envelope, including the thermal envelope itself.

Note 1 to entry: The fabric determines the thermal transmission, the thermal envelope airtightness and (nearly all of) the thermal mass of the building (apart from the thermal mass of furniture and technical building systems). The fabric also makes the building wind and water tight. The building fabric is sometimes described as the building as such, i.e. the building without any technical building system.

[SOURCE: ISO 52000-1:2017, 3.1.5]

3.1.6 building portfolio

set of buildings and common technical building systems whose energy performance is determined taking into account their mutual interactions

Note 1 to entry: An example of common equipment is an energy generation system (PV panels, wind turbine, cogen unit, boiler, etc.) serving the building portfolio.

[SOURCE: ISO 52000-1:2017, 3.1.6]

3.1.7 building thermal zone thermal zone

internal environment with assumed sufficiently uniform thermal conditions to enable a thermal balance calculation according to the procedures in the standard under EPB module M2-2

Note 1 to entry: The EPB standard under module M2-2 is ISO 52016-1.

[SOURCE: ISO 52000-1:2017, 3.1.7]

3.1.8 building unit

section, floor or apartment within a building which is designed or altered to be used separately from the rest of the building

EXAMPLE A shop in a shopping mall, an apartment in an apartment building or a rentable office space in an office building.

Note 1 to entry: The building unit can be the assessed object.

[SOURCE: ISO 52000-1:2017, 3.1.8]