ICS 91.140.10 SLOVENSKÁ TECHNICKÁ NORMA November 2017

STN	**Energetická hospodárnosť budov Vykurovacie systémy a chladiace systémy s vodou ako teplonosnou látkou v budovách Časť 1: Postupy ekonomického hodnotenia energetických systémov v budovách**	**STN EN 15459-1** 06 0004

Energy performance of buildings - Economic evaluation procedure for energy systems in buildings - Part 1: Calculation procedures, Module M1-14

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 10/17

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English Version

Energy performance of buildings - Economic evaluation procedure for energy systems in buildings - Part 1: Calculation procedures, Module M1-14

Performance énergétique des bâtiments - Procédure d'évaluation économique des systèmes énergétiques des bâtiments - Partie 1 : Méthode de calcul, Module M1-14

Energieeffizienz von Gebäuden - Heizungsanlagen und wassergeführte Kühlanlagen in Gebäuden - Teil 1: Wirtschaftlichkeitsberechnungen für Energieanlagen in Gebäuden, Modul M1-14

This European Standard was approved by CEN on 27 February 2017.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Page

European foreword

This document (EN 15459-1:2017) has been prepared by Technical Committee CEN/TC 228 “Heating systems and water based cooling systems in buildings”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2017, and conflicting national standards shall be withdrawn at the latest by November 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 15459:2007.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

EN 15459, *Energy performance of buildings — Economic evaluation procedure for energy systems in buildings*, is composed with the following parts:

— *Part 1: Calculation procedures, Module M1-14*;

— *Part 2: Explanation and justification of EN 15459-1, Module M1-14* [CEN/TR].

The revision kept the main principles of the calculation unchanged, but the structure of the document was changed. Informative content was removed to the accompanying Technical Report CEN/TR 15459-2. The values may be altered in a national annex.

The main changes compared to EN 15459:2007 are:

a) addition of the payback period and the addition of costs due to the end of life of the building;

b) update based on the evolution of the annual costs over a specific time period;

c) informative content is removed to the accompanying Technical Report CEN/TR 15459-2.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This European Standard is part of a series of standards aiming at international harmonization of the methodology for the assessment of the energy performance of buildings, called “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 standard a normative template is given in Annex A to specify these choices. Informative default choices are provided in Annex B.

CEN/TC 228 deals with heating systems in buildings. Subjects covered by CEN/TC 228 are:

— energy performance calculation for heating systems;

— inspection of heating systems;

— design of heating systems;

— installation and commissioning of heating systems.

This standard gives a method for the economic calculation of the building envelope and others building related systems covered by the EPB standards.

This method can be used, fully or partly, for the following applications:

— consider economic feasibility of energy saving options in buildings;

— compare different solutions of energy saving options in buildings (plant types, fuels…);

— evaluate economic performance of an overall design of the building (for example, trade-off between energy demand and energy efficiency of heating systems);

— assess the effect of possible energy conservation measures on an existing heating system, by economic calculation of the cost of energy use with and without the energy conservation measure.

For the correct use of this standard, Annex A will be used to specify the choices with the required input data. Information and guidance on use of the monthly and annual methods are provided in Annex B. In case the standard 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, in particular for the application within the context of EU Directives transposed into national legal requirements. These choices can be made available as National Annex or as separate (e.g. legal) document. It is expected, if the default values and choices in Annex A are not followed due to national regulations, policy or traditions, that:

— either the national standardization body will consider the possibility to add or include a National Annex in agreement with the template of Annex A;

— or the national or regional authorities will, in the building regulations, reference the standard and prepare data sheets containing the national or regional choices and values, in agreement with the template of Annex A.

The user should refer to other European Standards or to national documents for input data and detailed calculation procedures not provided by this standard, especially dynamic economical calculation are

not detailed in this standard. The methods to calculate the building energy demand are provided by EN 15603.

NOTE Sensitivity of results increase depending on the number of parameters that are under consideration (lifetime, financial rates, ratio of price rise rates,…) and as numerous are the parameters that change when comparing different solutions, as difficult will be the conclusions that rise when economic results are compared between solutions.

Economical results are closely related to the project under consideration, and no general conclusion should be drawn from such results.

1 Scope

This European Standard provides a calculation method for the economic issues of heating systems and other systems that are involved in the energy demand and consumption of the building. It applies to all types of new and existing buildings.

The fundamental principles and terminology are explained in the standard.

The main items of the standard will be:

— the definitions and the structure of the types of costs which should be taken into account for the calculation of the economic efficiency of saving options in buildings;

— data needed for definition of costs related to systems under consideration;

— the calculation method(s);

— expression of the result of the economic study.

This European Standard is part of the method for calculation of economic performance of energy saving options in buildings (e.g. insulation, better performing generators and distribution systems, efficient lighting, renewable sources, combined heat and power…).

The scope of this specific part is to standardize:

— the required inputs;

— the required outputs;

— the calculation formulas;

— the type of energy systems concerned with the energy performance of the building.

NOTE 1 This is the revision of EN 15459:2007. The revision has been made consistent with the EU regulation on cost-optimal. This revision includes the definition of payback for investment, and inclusion of the costs due to the deconstruction of the building. The method presenting annualized costs has been suppressed.

NOTE 2 This standard does not consider financial advantages for higher productivity, higher attractiveness for tenants due to higher indoor comfort, when relevant for comparison of different options.

Table 1 shows the relative position of this standard within the set of EPB standards in the context of the modular structure as set out in EN ISO 52000-1.

NOTE 3 In CEN 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.

NOTE 4 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 standard, within the modular structure of the set of EPB standards

Overarching			Building (as such)		Technical Building Systems										
	Descriptions			**Descriptions**		**Descriptions**	**Heating**	**Cooling**	**Ventilation**	**Humidification**	**Dehumidification**	**Domestic Hot water**	**Lighting**	**Building automation and control**	**Electricity production**
sub1		**M1**	**sub1**	**M2**	**sub1**		**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**M10**	**M11**
1	General		1	General	**1**	General	15316–1					15316–1			
2	Common terms and definitions; symbols, units and subscripts		2	Building Energy Needs	**2**	Needs						12831–3			
3	Applications		3	(Free) Indoor Conditions without Systems	**3**	Maximum Load and Power	12831–1					12831–3			
4	Ways to Express Energy Performance		4	Ways to Express Energy Performance	**4**	Ways to Express Energy Performance	15316–1					15316–1			
5	Building Functions and Building Boundaries		5	Heat Transfer by Transmission	**5**	Emission and control	15316–2	15316–2							
6	Building Occupancy and Operating Conditions		6	Heat Transfer by Infiltration and Ventilation	**6**	Distribution and control	15316–3	15316–3				15316–3			

Overarching			Building (as such)		Technical Building Systems										
	Descriptions			**Descriptions**		**Descriptions**	**Heating**	**Cooling**	**Ventilation**	**Humidification**	**Dehumidification**	**Domestic Hot water**	**Lighting**	**Building automation and control**	**Electricity production**
sub1		**M1**	**sub1**	**M2**	**sub1**		**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**M10**	**M11**
7	Aggregation of Energy Services and Energy Carriers		7	Internal Heat Gains	**7**	Storage and control	15316–5					15316–5 15316–4–3			
8	Building Partitioning		8	Solar Heat Gains	**8**	Generation									
					8–1	Combustion boilers	15316–4–1					15316–4–1			
					8–2	Heat pumps	15316–4–2	15316–4–2				15316–4–2			
					8–3	Thermal solar Photovoltaics	**15316–4–3**					**15316–4–3**			**15316–4–3**
					8–4	On-site cogeneration	15316–4–4					15316–4–4			15316–4–4
					8–5	District heating and cooling	15316–4–5	15316–4–5							15316–4–5
					8–6	Direct electrical heater	15316–4–9					15316–4–9			
					8–7	Wind turbines									15316–4–10
					8–8	Radiant heating, stoves	15316–4–8								

Overarching			Building (as such)		Technical Building Systems										
	Descriptions			**Descriptions**		**Descriptions**	**Heating**	**Cooling**	**Ventilation**	**Humidification**	**Dehumidification**	**Domestic Hot water**	**Lighting**	**Building automation and control**	**Electricity production**
sub1		**M1**	**sub1**	**M2**	**sub1**		**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**M10**	**M11**
9	Calculated Energy Performance		9	Building Dynamics (thermal mass)	**9**	Load dispatching and operating conditions	15316–1								
10	Measured Energy Performance		10	Measured Energy Performance	**10**	Measured Energy Performance	15378–3					15378–3			
11	Inspection		11	Inspection	**11**	Inspection	15378–1					15378–1			
12	Ways to Express Indoor Comfort		12	–	**12**	BMS									
13	External Environment Conditions														
14	Economic Calculation	15459–1													
NOTE The shaded modules are not applicable.															

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.

EN ISO 7345:1995, *Thermal insulation — Physical quantities and definitions (ISO 7345:1987)*

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