SLOVENSKI STANDARD
SIST EN 15978:2011

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Trajnostnost gradbenih objektov - Vrednotenje učinkov ravnanja z okoljem v stavbah - Računska metoda

Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method

Nachhaltigkeit von Bauwerken - Bestimmung der umweltbezogenen Qualität von Gebäuden - Berechnungsmethode

Contribution des ouvrages de construction au développement durable - Evaluation de la performance environnementale des bâtiments - Méthode de calcul

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English Version

Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method

Contribution des ouvrages de construction au développement durable - Evaluation de la performance environnementale des bâtiments - Méthode de calcul

Nachhaltigkeit von Bauwerken - Bewertung der umweltbezogenen Qualität von Gebäuden - Berechnungsmethode

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Foreword

This document (EN 15978:2011) has been prepared by Technical Committee CEN/TC 350 “Sustainability of construction works”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by May 2012, and conflicting national standards shall be withdrawn at the latest by May 2012.

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Introduction

The purpose of this European Standard is to provide calculation rules for the assessment of the environmental performance of new and existing buildings.

This European Standard is part of a suite of European Standards, Technical Specifications and Technical Reports for the assessment of the environmental performance of buildings that together support quantification of the contribution of the assessed building to sustainable construction and sustainable development.

The environmental performance of a building is only one aspect of its sustainability. The social and economic performance of the building are also aspects of sustainability that should be assessed as part of a sustainability assessment. These are described in the framework standards (EN 15643-1, -2, and EN 15643-3, -4).

NOTE The environmental assessment at building level requires information from products and services (EN 15804).

The evaluation of technical and functional performance is beyond the scope of this European Standard. Technical and functional characteristics are taken into account here by reference to the functional equivalent, which also forms a basis for comparison of the results of assessments.

This European Standard is intended to support the decision-making process and documentation of the assessment of the environmental performance of a building. Although the assessment results are based on realistic scenarios, they may not fully reflect the actual and future performance of the building. Figure 1 illustrates how the assessment of the environmental performance takes place within the concept of the sustainability assessment of buildings.

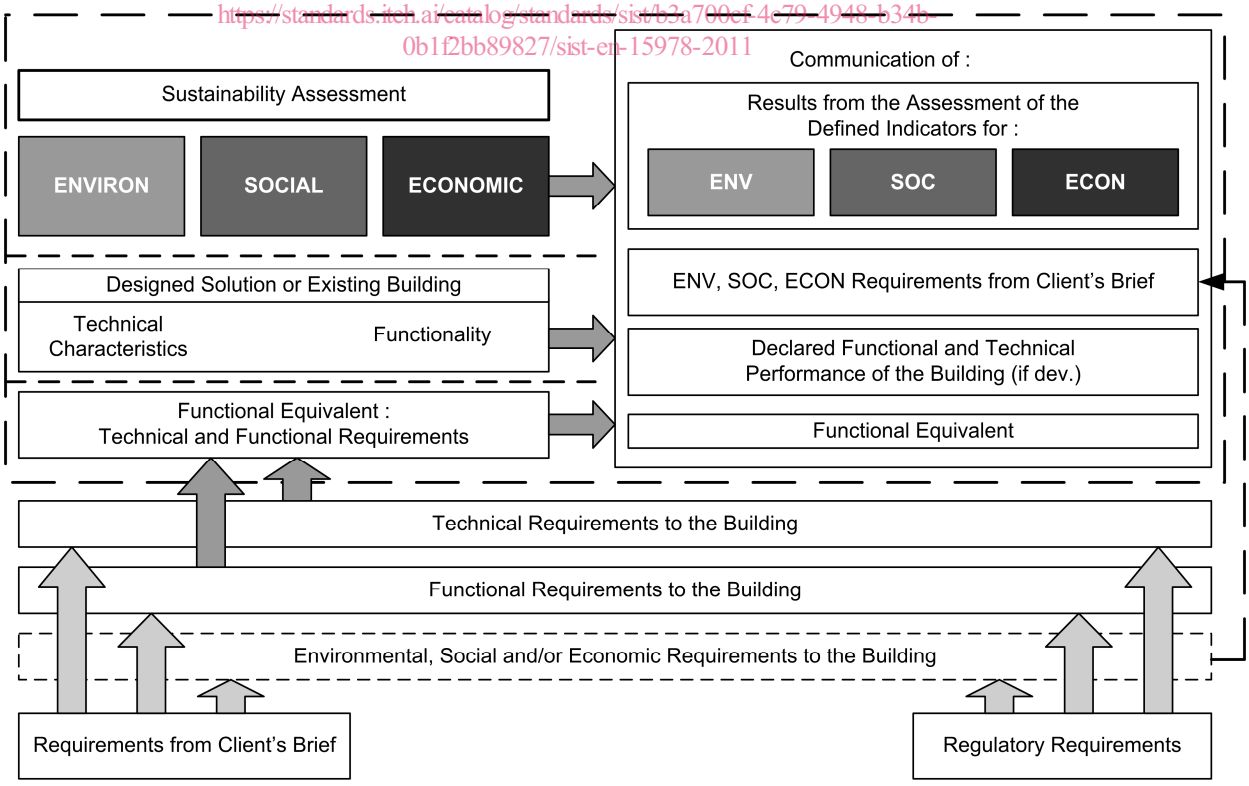

Figure 1 — Concept of sustainability assessment of buildings

In this European Standard, the assessment method for the quantitative evaluation of the environmental performance of the building is based on a life cycle approach. The general requirements for sustainability assessment of buildings are described in EN 15643-1 (the general framework standard). Other requirements for the assessment of environmental performance are given in EN 15643-2. Other standards developed by CEN/TC 350 in this area, and how they are related to this European Standard, are shown in Figure 2.

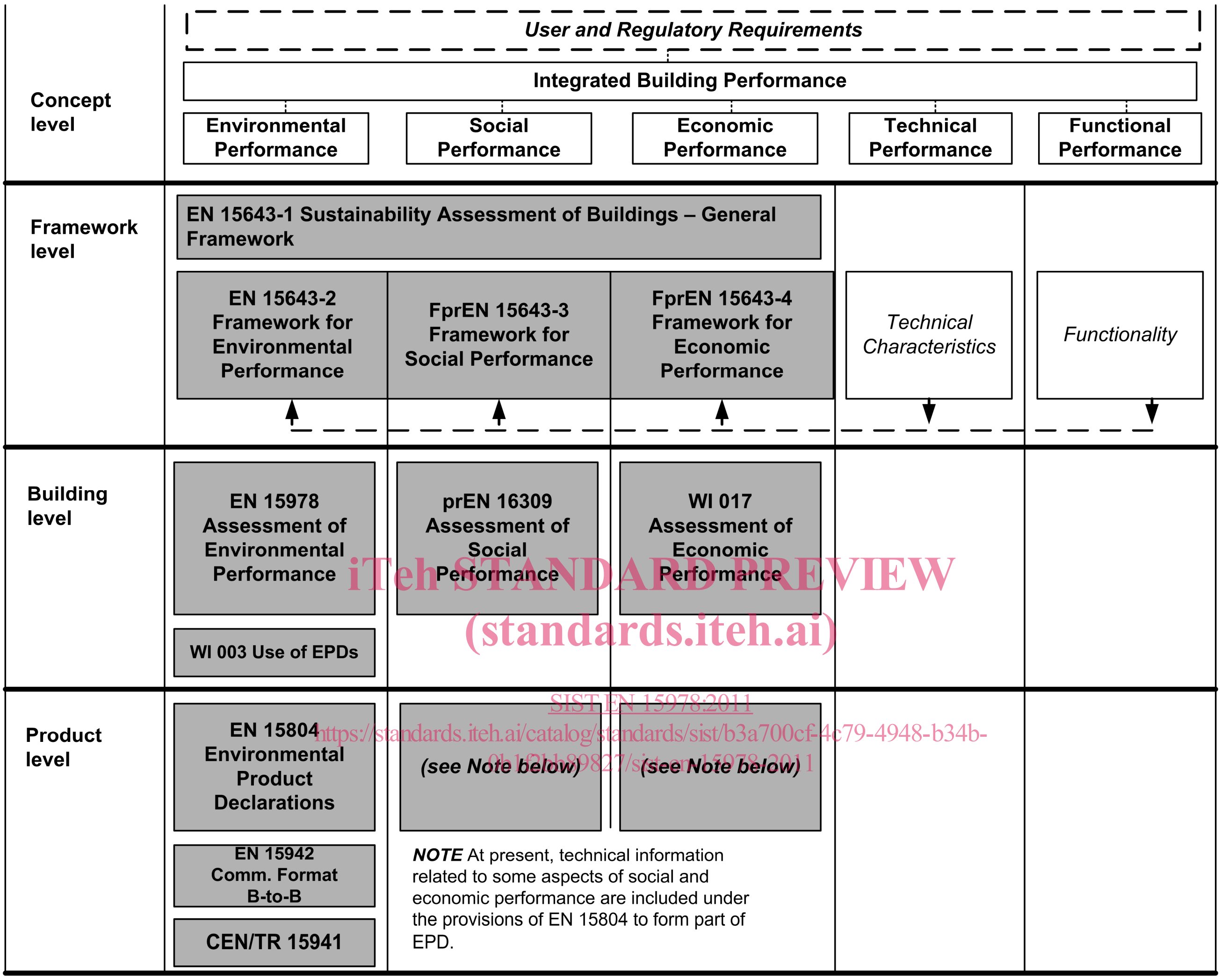

Figure 2 — Work program of CEN/TC 350

NOTE The grey boxes represent the work programme as presented in EN 15643-1.

1 Scope

This European Standard specifies the calculation method, based on Life Cycle Assessment (LCA) and other quantified environmental information, to assess the environmental performance of a building, and gives the means for the reporting and communication of the outcome of the assessment. The standard is applicable to new and existing buildings and refurbishment projects.

The standard gives:

— the description of the object of assessment;

— the system boundary that applies at the building level;

— the procedure to be used for the inventory analysis;

— the list of indicators and procedures for the calculations of these indicators;

— the requirements for presentation of the results in reporting and communication;

— and the requirements for the data necessary for the calculation.

The approach to the assessment covers all stages of the building life cycle and is based on data obtained from Environmental Product Declarations (EPD), their "information modules" (EN 15804) and other information necessary and relevant for carrying out the assessment. The assessment includes all building related construction products, processes and services, used over the life cycle of the building.

The interpretation and value judgments of the results of the assessment are not within the scope of this European Standard.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 15603, *Energy Performance of Buildings — Overall energy use and definition of energy ratings*

EN 15643-1, *Sustainability of construction works — Sustainability assessment of buildings — Part 1 General Framework*

EN 15643-2, *Sustainability of construction works - Assessment of buildings - Part 2: Framework for the assessment of environmental performance*

EN 15643-3, *Sustainability of construction works - Assessment of buildings - Part 3: Framework for the assessment of social performance*

EN 15643-4, *Sustainability of construction works - Assessment of buildings - Part 4: Framework for the assessment of economic performance*

EN 15804, *Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products*

ISO 15392, *Sustainability in Building Construction - General Principles*

ISO 15686-1:2010, *Building and constructed assets — Service life planning — Part 1: General principles*

ISO 15686-2, *Building and constructed assets — Service life planning — Part 2: Service life prediction procedures*

ISO 15686-7, *Building and constructed assets — Service life planning — Part 7: Performance evaluation for feedback of service life data from practice*

ISO 15686-8, *Building and constructed assets — Service life planning — Part 8: Reference service life and service-life estimation*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
building
construction works that have the provision of shelter for its occupants or contents as one of its main purposes and are usually enclosed and designed to stand permanently in one place

[ISO 6707-1:2004]

3.2
building fabric
all *construction products* that are fixed to the *building* in a permanent manner, so that the dismantling of the product changes the performance of the building and the dismantling or replacement of the product constitute construction operations

3.3
building-integrated technical system
installed technical equipment to support the operation of a *building*

NOTE This includes the *technical building system* and other systems e.g. for sanitation, security, fire safety, internal transport and building automation and control and IT communications, climate control systems and installations.

3.4
building site
specified area of land where a *building* is located or is defined to be located and *construction work* of the *building* and associated *external works* are or will be undertaken

NOTE Adapted from the definition of site in ISO 6707-1.

3.5
component
construction product (3.6) manufactured as a distinct unit to serve a specific function or functions

[ISO 6707-1:2004]

3.6
construction product
item manufactured or processed for incorporation in construction works

3.7
construction work
activities of forming a *construction works* (3.8)

[ISO 6707-1:2004]

3.8
construction works
everything that is constructed or results from construction operations

NOTE 1 This covers both *building* and civil engineering works, and both structural and non-structural elements.

NOTE 2 Adapted from the definition in ISO 6707-1.

3.9
design life
service life intended by the designer

[ISO 15686-1:2000]

3.10
environmental aspect
aspect of construction works, part of works, processes or services related to their life cycle that can cause change to the environment

NOTE 1 Examples for environmental aspects are: use of energy and mass flow, production and segregation of wastes, water use, land use, emissions to air.

NOTE 2 The examples added to the definition of environmental aspect in ISO 15392.

[ISO 21931-1:2010]

[EN 15643-1:2010]

3.11
environmental impact
change to the environment, whether adverse or beneficial, wholly or partially, resulting from environmental aspects

NOTE Derived from the definitions of impact and environmental impact in ISO 15392.

[ISO 21931-1:2010]

3.12
environmental performance
performance related to environmental impacts and environmental aspects

[ISO 15392:2008]

3.13
estimated service life
service life that a *building* or an *assembled system (part of works)* would be expected to have in a set of specific *in-use conditions*, determined from *reference service life data* after taking into account any differences from the *reference in use conditions*

[EN 15643-1:2010]

3.14
functional equivalent
quantified *functional requirements* and/or *technical requirements* for a *building* or an *assembled system (part of works)* for use as a basis for comparison

NOTE Adapted from the definition in ISO 21931-1:2010.

3.15
functional performance
performance related to the *functionality* of the *construction works* or an *assembled system (part of works)*, which is required by the client and/or by *users* and/or by regulations

NOTE Adapted from the definition in EN 15643-1:2010.

3.16
functional requirement
type and level of *functionality* of a building or assembled system which is required by the client and/or by *users* and/or by regulations

NOTE Adapted from the definition in EN 15643-1:2010.

3.17
functionality
suitability or usefulness for a specific purpose or activity

[EN 15643-1:2010]

3.18
indicator
quantifiable value related to environmental impacts/aspects

[EN ISO 14044:2006]

3.19
life cycle
consecutive and interlinked stages in the life of the object under consideration

[EN 15643-1:2010]

3.20
maintenance
combination of all technical and associated administrative actions during the *service life* to retain a *building* or an assembled system (part of works) in a state in which it can perform its required functions

NOTE Adapted from the definition in ISO 15686-1, ISO 6707-1 and in CPD Guidance Paper F.

[EN 15643-1:2010]

3.21
operational energy use
energy use of the *building-integrated technical systems* during use and operation of the *building*

NOTE Adapted from the definition in EN 15643-1:2010.

3.22
operational water use
water use of the *building-integrated technical systems* and of the *user*, as needed for the technically and functionally defined operation of the *building*

NOTE Adapted from the definition in EN 15643-1:2010.

3.23
recovery
waste treatment operation that serves a purpose in replacing other resources or prepares *waste* for such a use

NOTE Adapted from the definition in Directive 2008/98.

[EN 15643-1:2010]

3.24
recycling
any *recovery* operation by which waste materials are reprocessed into products, materials or substances either for the original purpose or other purposes

NOTE 1 Recycling operations include:

— *recycling* of organic substances;

— *recycling* of metals;

— *recycling* of other inorganic materials;

as defined in Directive 2008/98 Annex II.

NOTE 2 Recycling does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations or other recovery operations as defined in Directive 2008/98 Annex II.

NOTE 3 Adapted from [EN 15643-1:2010].

3.25
reference study period
period over which the time-dependent characteristics of the object of assessment are analysed

NOTE In some cases, the reference study period may differ significantly from the design life of the building.

3.26
refurbishment
modification and improvements to an existing *building* in order to bring it up to an acceptable condition

[ISO 6707-1:2004]

[EN 15643-1:2010]

3.27
renewable resource
resource that is grown, naturally replenished or naturally cleansed, on a human time scale

NOTE A renewable resource is capable of being exhausted, but may last indefinitely with proper stewardship. Examples include; trees in forests, grasses in grassland and fertile soil.

[ISO 21930:2007]

[EN 15643-1:2010]

3.28
repair
returning an item to an acceptable condition through the renewal, replacement or mending of worn, damaged or degraded parts

[ISO 6707-1:2004]

[EN 15643-1:2010]

3.29
required service life
service life required by the client or through regulations

[EN 15643-1:2010]

3.30
re-use
any operation through which products or components that are not *waste* are used again for the same purpose for which they were conceived or used for other purposes without reprocessing

NOTE Adapted from the definition in Directive 2008/98.

[EN 15643-1:2010]

3.31
scenario
collection of assumptions and information concerning an expected sequence of possible future events

[EN 15643-1:2010]

3.32
secondary material
any material recovered from a previous use or from waste which substitutes primary materials

NOTE 1 Secondary material is measured at the point where the secondary material enters the system from another system.

NOTE 2 Materials recovered from previous use or from waste from one product system and used as an input in another product system are secondary materials.

NOTE 3 Examples of secondary materials (to be measured at the system boundary) are recycled metal, crushed concrete, glass cullet, recycled wood chips, recycled plastic.

[EN 15643-1:2010]

3.33
service life
working life
period of time after installation during which a *building* or an assembled system (part of works) meets or exceeds the *technical requirements* and *functional requirements*

NOTE Adapted from the definition in ISO/DIS 15686-1:2008.

[EN 15643-1:2010]

3.34
system boundary
interface in the assessment between a *building* and its surroundings or other product systems

NOTE 1 System boundary defines what is included and what is not included in the assessment.

NOTE 2 Adapted from the definition in [EN 15643-1:2010].

3.35
technical building system
technical equipment for heating, cooling, ventilation, hot water, lighting or for a combination thereof

NOTE Adapted from the definition in the Energy Performance of Buildings Directive 2010/31.

[EN 15643-1:2010]

3.36
technical performance
performance related to the capability of a *construction works* or an *assembled system (part of works)* to fulfil its required functions under the intended use conditions

NOTE Derived from the definition of "building performance" in ISO 6707-1.

[EN 15643-1:2010]

3.37
technical requirement
type and level of technical characteristics of a *construction works* or an assembled system (part of works), which are required or are a consequence of the requirements made either by the client, and/or by the *users* and/or by regulations

NOTE Adapted from the definition in EN 15643-1:2010.

3.38
transparency
open, comprehensive and understandable presentation of information

[EN ISO 14044:2006]

[EN 15643-1:2010]

3.39
user
person or organisation for which a *building* is designed (including building owner, manager and occupants)

NOTE Adapted from the definition in ISO 6707-1.

[EN 15643-1:2010]

3.40
waste
substance or object which the holder discards or intends to discard, or is required to discard

NOTE Adapted from the definition in Directive 2008/98.

[EN 15643-1:2010]

4 Abbreviations

ADP_elements – Abiotic resource Depletion Potential for elements

ADP_fossil fuels - Abiotic resource Depletion Potential of fossil fuels

AP – Acidification Potential of land and water

EPD - Environmental Product Declaration

ESL - Estimated Service Life

GWP – Global Warming Potential