SLOVENSKI STANDARD
SIST EN 16627:2015

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Trajnostnost gradbenih objektov - Ocenjevanje ekonomskih lastnosti stavb - Računska metoda

Sustainability of construction works - Assessment of economic performance of buildings - Calculation methods

Nachhaltigkeit von Bauwerken - Bewertung der ökonomischen Qualität von Gebäuden - Berechnungsmethoden

Contribution des ouvrages de construction au développement durable - Evaluation de la performance économique des bâtiments - Méthodes de calcul

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Sustainability of construction works - Assessment of economic performance of buildings - Calculation methods

Contribution des ouvrages de construction au développement durable - Évaluation de la performance économique des bâtiments - Méthodes de calcul

Nachhaltigkeit von Bauwerken - Bewertung der ökonomischen Qualität von Gebäuden - Berechnungsmethoden

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Foreword

This document (EN 16627:2015) 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of an identical text or by endorsement, at the latest by December 2015 and conflicting national standards shall be withdrawn at the latest by December 2015.

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Introduction

The purpose of this European Standard is to provide calculation rules for the assessment of the economic performance of new and existing buildings as one part of an assessment of the sustainability of the building. It complements the European Standard EN 15643-4.

In EN 15643-4 the following economic assessment indicators are described:

This standard describes the methods and the rules for calculating the cash flows over the life cycle of buildings, with an emphasis on the field of life cycle costing. Principles developed in ISO 15686-5 are included, but have been adapted for sustainability assessment in the European context.

This standard describes two approaches to the calculation of economic performance:

a) Life Cycle Costing: Economic performance expressed in cost terms over the life cycle, taking account of negative costs related to energy exports and from re-use and recycling of parts of the building during its life cycle and at the end of life. Calculation of this indicator is mandatory for compliance with the standard.

b) Life cycle economic balance: Life Cycle Costing (see above) and in addition incomes over the life cycle and at the end of life. Calculation of this additional indicator is optional for compliance with the standard.

NOTE 1 Annex C describes a further optional approach, value stability.

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

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

NOTE 2 The economic assessment is undertaken at the building level. However, it requires technical and cost information about individual products and components within the building and its services and systems, including service life data, type and frequency of inspection, replacement, cleaning, maintenance and repair, and deconstruction and disposal. This information is used as input quantities for the calculation of cost in the life cycle of buildings.

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 economic 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 economic performance takes place within the concept of the sustainability assessment of buildings.

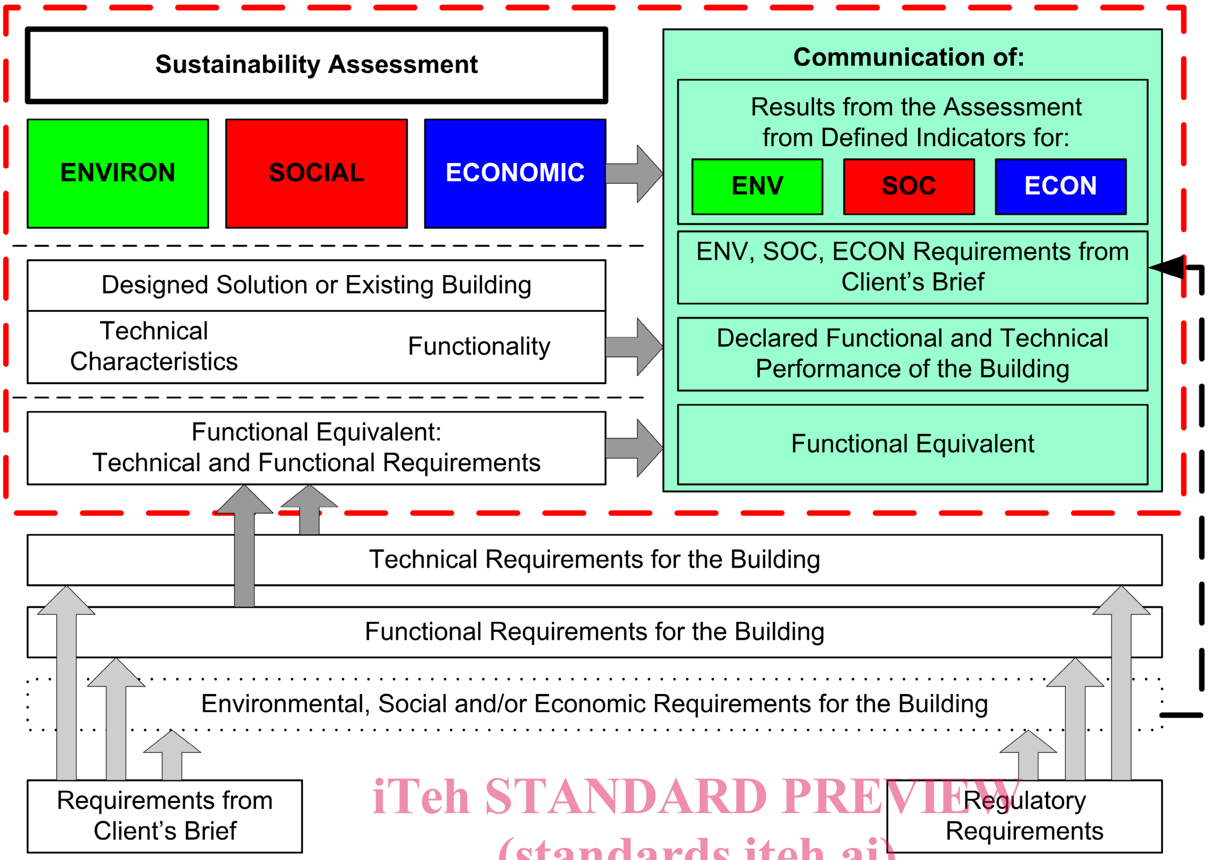

Figure 1 — Concept of sustainability assessment of buildings

In this European Standard, the assessment method for the quantitative evaluation of the economic performance of the building is based on a life cycle, cash flow approach. The general requirements for sustainability assessment of buildings are described in EN 15643-1 (the general framework standard).

It is important to use a consistent model for describing and recording the building and its life cycle for assessing the environmental, social and economic performance. The same reference study period is used for all three elements of the assessment.

Additional specific requirements for the assessment of economic performance are given in EN 15643-4, including additional pre-construction activity and costs such as site costs and professional fees, which are quantified and reported in the additional information module A0.

The calculation of economic indicators uses a model of the building and its life cycle with associated time and financial costs. An economic performance assessment supports a complete sustainability assessment, including an environmental or social performance assessment or both. The economic assessment can also provide data for:

— budgeting, by estimation of future maintenance or operational costs;

— tendering, e.g. by estimation of future cleaning costs sensitivity analysis, e.g. estimation of future energy costs (nominal values);

— estimating end of life costs and waste streams;

— specific economic analyses (e.g. cost benefit analysis);

— assigning cash flows to individual actors (landlord/tenant);

— applying methods of valuation (e.g. investment appraisal).

Other European Standards developed by CEN/TC 350 in this area, and how they are related to this European Standard, are shown in Figure 2.

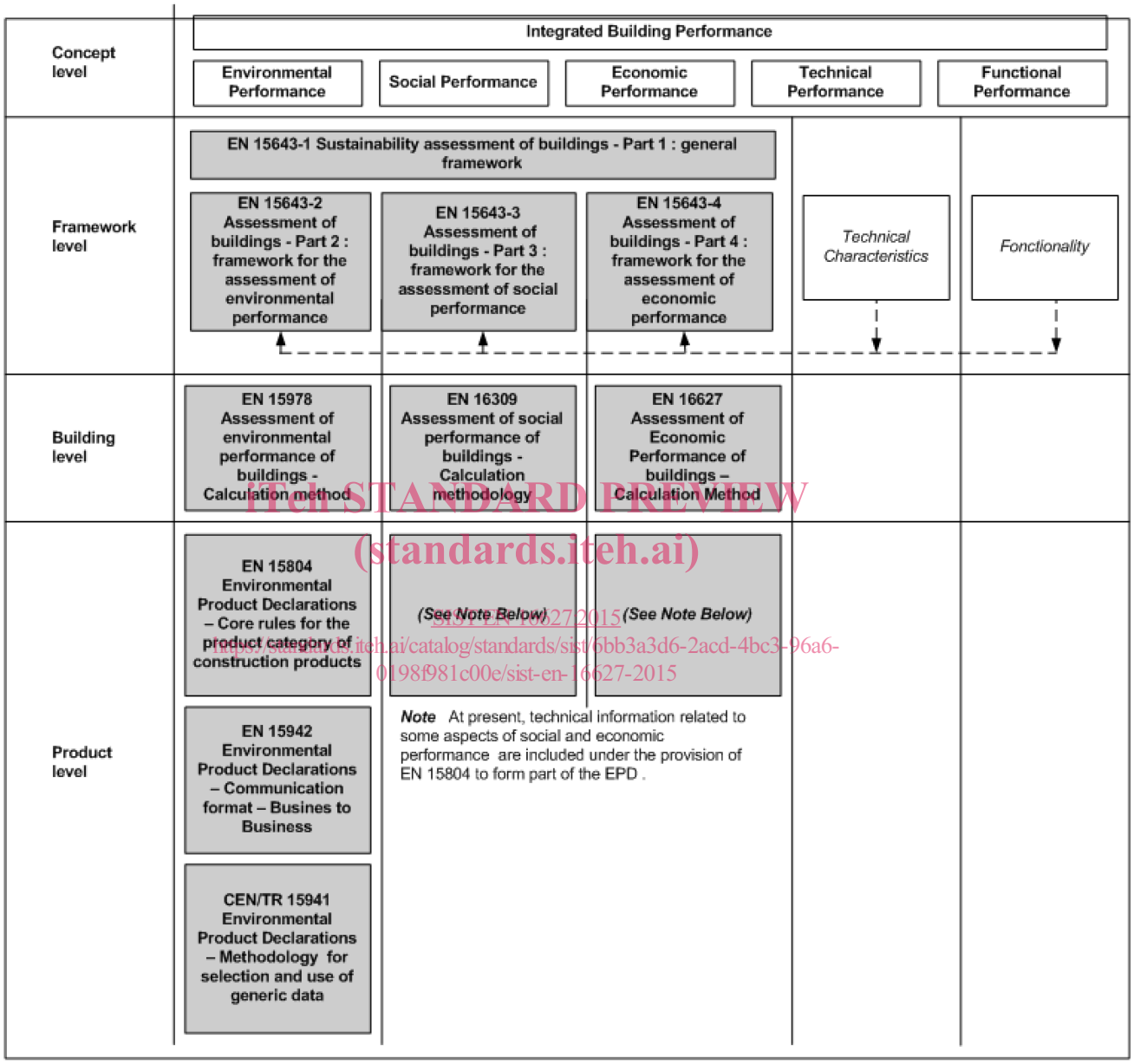

Figure 2 — Work program of CEN/TC 350

NOTE 3 This European Standard is intended for use to assess the economic aspects of sustainable performance of a building. This is a distinct activity from the Commission Delegated Regulation (EU) No 244/2012 of 16 January 2012 supplementing Directive 2010/31/EU of the European Parliament and of the Council on the energy performance of buildings, which is a methodology for the setting of energy performance standards in national and regional building regulations by Member States, and not for use on specific buildings.

NOTE 4 EN 15459 is the European Standard which provides a calculation method for the costs of heating systems and other systems that are involved in the energy use of a building. It does not address the calculation of the whole economic impact of a building.

1 Scope

This European Standard specifies the calculation methods, based on Life Cycle Costing (LCC) and other quantified economic information, to assess the economic performance of a building, and gives the means for the reporting and communication of the outcome of the assessment. This European Standard is applicable to new and existing buildings and refurbishment projects.

This European Standard gives:

— the description of the object of assessment;

— the system boundary that applies at the building level;

— the scope and procedure to be used for the 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 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 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 15603:2008, *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 15643-2:2011, *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 15643-4:2012, *Sustainability of construction works — Assessment of buildings — Part 4: Framework for the assessment of economic performance*

ISO 15392:2008, *Sustainability in building construction — General principles*

ISO 15686-1:2011, *Buildings and constructed assets — Service life planning — Part 1: General principles and framework*

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

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

ISO 15686-8:2008, *Buildings 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 terms and definitions given in EN 15643-2:2011, EN 15643-4:2012, ISO 15686-1:2011 and the following apply.

3.1
assembled system
part of works
component or set of components incorporated in the **construction works**

Note 1 to entry: Adapted from the definitions in the Construction Products Directive (CPD) Guidance Paper C and from the definition of "construction" in ISO 6707-1:2014, 5.5.6.

3.2
brief
written document that states the **client's** requirements for a construction project

[SOURCE: ISO 6707-2:2014, 3.1]

3.3
building
construction works that has the provision of shelter for its occupants or contents as one of its main purposes and is usually enclosed and designed to stand permanently in one place

[SOURCE: ISO 6707-1:2014, 3.1.3]

3.4
building fabric
all **construction products** that are fixed to the **building** in a permanent manner, so that the dismantling of the product decreases the performance of the building and the dismantling or replacement of the product constitute construction operations

3.5
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 undertaken

Note 1 to entry: Adapted from the definition of site in ISO 6707-1:2014, 3.1.6.

3.6
built environment
collection of **buildings**, **external works** (landscape area), infrastructure and other **construction works** within an area

Note 1 to entry: Adapted from the definition of environment in ISO 6707-1:2014, 10.3.

3.7
client
person or organization that requires a **building** to be provided, altered or extended and is responsible for initiating and approving the **brief**

[SOURCE: ISO 6707-1:2014, 8.3]

3.8
component
construction product manufactured as a distinct unit to serve a specific function or functions

[SOURCE: ISO 6707-1:2014, 6.1.3]

3.9
construction product
item manufactured or processed for incorporation in **construction works**

Note 1 to entry: Construction products are items supplied by a single responsible body.

Note 2 to entry: Adapted from the definition in ISO 6707-1:2014, 6.1.2 according to the recommendation of ISO/TC59/AHG Terminology.

3.10
construction work
activities of forming a **construction works**

[SOURCE: ISO 6707-1:2014, 7.1.1]

3.11
construction works
everything that is constructed or results from construction operations

Note 1 to entry: This covers both **building** and civil engineering works, and both structural and non-structural elements.

Note 2 to entry: Adapted from the definition in ISO 6707-1:2014, 3.1.1.

3.12
decommissioning
activities that change a **building** or an **assembled system (part of works)** from an operational status to a non-operational status

3.13
delivered energy
total energy, expressed per energy carrier, supplied to the **technical building system** through the system boundary to satisfy the uses taken into account (heating, cooling, ventilation, domestic hot water, lighting, appliances etc.) or to produce electricity

Note 1 to entry: For active solar and wind energy systems the incident solar radiation on solar panels or on solar collectors or the kinetic energy of wind is not part of the energy balance of the building. Renewable energy produced on site is part of the delivered energy.

Note 2 to entry: Delivered energy can be calculated for defined energy uses or it can be measured.

[SOURCE: EN 15603:2008, 3.3.4]

3.14
design life
service life intended by the designer

[SOURCE: ISO 15686-1:2011, 3.3]

3.15
disposal
waste treatment operation other than **recovery**

Note 1 to entry: Adapted from the definition in Directive 2008/98/EC.

3.16
durability
ability to maintain required **technical performance** throughout the **service life** subject to specified **maintenance**, under the influence of foreseeable actions

Note 1 to entry: Foreseeable actions are related to “normal” agents that could be expected to act on the works or parts thereof). Potential degradation agents include, for example, temperature, humidity, water, UV radiation, abrasion, chemical attack, biological attack, corrosion, weathering, frost, freeze–thaw and fatigue.

Note 2 to entry: Adapted from the definition on CPD Guidance Paper F and in ISO 6707-1:2014, 9.3.82.

3.17
economic aspect
aspect of **construction works**, **part of works**, processes or services related to their **life cycle** that can cause change to economic conditions

[SOURCE: ISO 15392:2008, 3.9]

3.18
economic impact
any change to the economic conditions, whether adverse or beneficial, wholly or partially resulting from **economic aspects**

Note 1 to entry: Derived from the definitions of impact and economic impact in ISO 15392:2008, 3.13.1.

3.19
economic performance
performance related to **economic impacts** and **economic aspects**

Note 1 to entry: Adapted from the definition of "environmental performance " in ISO 15392:2008, 3.12.

3.20
energy carrier
substance or phenomenon that can be used to produce mechanical work or heat or to operate chemical or physical processes

Note 1 to entry: Adapted from the definition in EN 15603:2008, 3.3.2.

3.21
environmental aspect
aspect of **construction works**, **part of works**, processes or services related to their **life cycle** that can cause change to the environment

EXAMPLE Use of energy and mass flow, production and segregation of wastes, water use, land use, emissions to air.

Note 1 to entry: The examples added to the definition of environmental aspect in ISO 15392:2008, 3.10.

[SOURCE: ISO 21931-1:2010, 3.3]

3.22
environmental impact
any change to the environment, whether adverse or beneficial, wholly or partially resulting from **environmental aspects**

Note 1 to entry: Derived from the definitions of impact and environmental impact in ISO 15392:2008, 3.13 and 3.13.2.

[SOURCE: ISO 21931-1:2010, 3.4]

3.23
environmental performance
performance related to **environmental impacts** and **environmental aspects**

[SOURCE: ISO 15392:2008, 3.12]

3.24
environmental risk assessment
process of systematic estimation of the probability of a particular set of circumstances and its negative environmental consequences and process of comparing the estimation results against given criteria to determine their environmental significance

3.25
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**

[SOURCE: ISO 15686-1:2011, 3.7]

3.26
external works
construction works external to the building structure but within the **building**'s site

3.27
financial value
aggregate of costs and revenues of **economic aspects** expressed in monetary units

3.28
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 1 to entry: Adapted from ISO 21931-1:2010, 3.7.

3.29
functional performance
performance related to the **functionality** of a **construction works** or an **assembled system (part of works)**, which is required by the **client**, **users** and/or by regulations

Note 1 to entry: Adapted from the definition in ISO 15686-10:2010, 3.11.