

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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

**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

This European Standard was approved by CEN on 19 March 2015.

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Contents

Page

Foreword.....	4
Introduction	5
1 Scope	9
2 Normative references	9
3 Terms and definitions	10
4 Abbreviations	19
5 The process for setting up the calculations required for the assessment.....	20
6 Purpose of the assessment.....	21
6.1 General.....	21
6.2 Expected users	21
7 Specification of the object of assessment.....	21
7.1 General.....	21
7.2 Functional equivalent.....	22
7.3 Reference study period	23
7.4 System boundary.....	24
7.4.1 General.....	24
7.4.2 Boundary of the before use stage (Modules A0-A5).....	25
7.4.3 Boundaries of the use stage (Modules B1 – B7)	28
7.4.4 Boundary of the end of life stage (Modules C1 – C4)	32
7.4.5 Boundary for the benefits and loads beyond the system boundary (Module D)).....	34
7.5 The building model.....	34
7.5.1 Purpose and information needed.....	34
7.5.2 Description of the physical characteristics of the building	35
8 Scenarios for defining the building life cycle.....	36
8.1 General.....	36
8.2 Requirements for scenarios	36
8.3 Time-related characteristics and associated scenarios.....	36
8.3.1 General.....	36
8.3.2 Climate conditions.....	37
8.3.3 Other specific requirements for scenarios	37
8.4 Scenarios for the pre-construction stage (Module A0).....	37
8.5 Scenarios for the product and construction process stages (Modules A1 – A5).....	37
8.6 Scenarios for use stage (modules B1 to B7)	38
8.6.1 General.....	38
8.6.2 Scenario related to use stage (except energy and water) – Module B1.....	38
8.6.3 Scenarios for maintenance, repair, replacement – Module B2, B3 and B4	38
8.6.4 Scenarios for refurbishment – Module B5	39
8.6.5 Scenarios for operational energy use – Module B6.....	39
8.6.6 Scenarios for operational water use (Module B7).....	39
8.7 Scenarios for the end of life stage (Modules C1 to C4)	40
8.7.1 General.....	40
8.7.2 Scenarios for deconstruction – Module C1	40
8.7.3 Scenarios for transport – Module C2.....	40
8.7.4 Scenarios for waste processing for reuse, recycling and energy recovery – Module C3	40
8.7.5 Scenarios for disposal – Module C4.....	40

8.8	Scenarios beyond the system boundary – Module D	40
9	Calculation of costs and income related to the building over its life cycle	41
9.1	General	41
9.2	Calculation of pre-construction costs.....	41
9.3	Calculation of construction costs	41
9.4	Calculation of costs of operation in use, maintenance and repair (B1-B3)	43
9.5	Calculating costs for replacements (B4).....	45
9.5.1	Components that will not be replaced under defined conditions	45
9.5.2	Replaceable components and costs	45
9.5.3	Cost of replacements	46
9.6	Calculation of energy costs (B6)	46
9.7	Calculation of costs of operational water use.....	47
9.8	Calculation of additional cost and income related information (information module D)	47
9.9	VAT	47
10	Selection of economic data for economic assessment	47
10.1	General	47
10.2	Specification of the discount rate.....	47
10.3	Escalation rates	48
10.4	Data quality	48
11	Calculation of the economic indicators	48
11.1	Methods for assessing the economic indicators	48
11.2	Calculation of the discount factor	49
11.3	Net Present Value (NPV), Net Present Cost (NPC)	49
11.4	Annual Cost and Annual Equivalent Value (AC or AEV)	49
11.5	Other economic indicators	49
11.6	Costs and related indicators	49
11.7	Calculation methods	49
12	Reporting of the assessment of results	50
12.1	General information on the assessment.....	50
12.2	General information on the object of assessment.....	50
12.3	Statement of boundaries and scenarios used in the assessment	51
12.4	Data sources	51
12.5	Expression of results	51
12.6	Communication of assessment results	52
13	Verification of results	52
Annex A	(informative) Example building description	54
Annex B	(informative) Exported energy – Case studies	56
B.1	General	56
B.2	Case 1	56
B.3	Case 2	57
B.4	Case 3	57
B.5	Case 4	58
Annex C	(informative) Additional indicators to assess the economic performance of buildings – Rules for assessment	60
C.1	General	60
C.2	Value stability and performance	60
C.2.1	General	60
C.2.2	Value stability in a short-term perspective.....	60
C.2.3	Value stability and performance in a medium-to long-term perspective	60
C.2.4	Additional economic indicators used in ISO 15686-5.....	61
Bibliography	62

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.

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.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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.

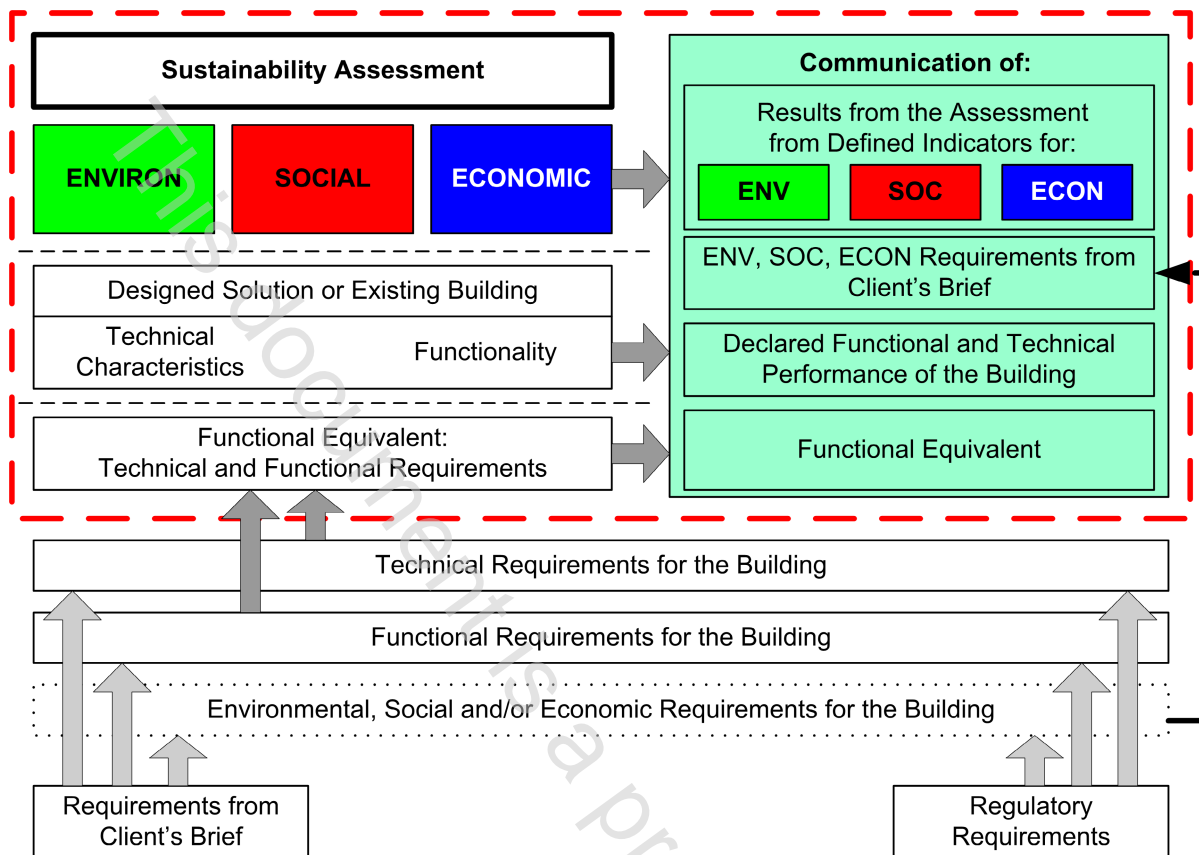


Figure 1 — Concept of sustainability assessment of buildings

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.

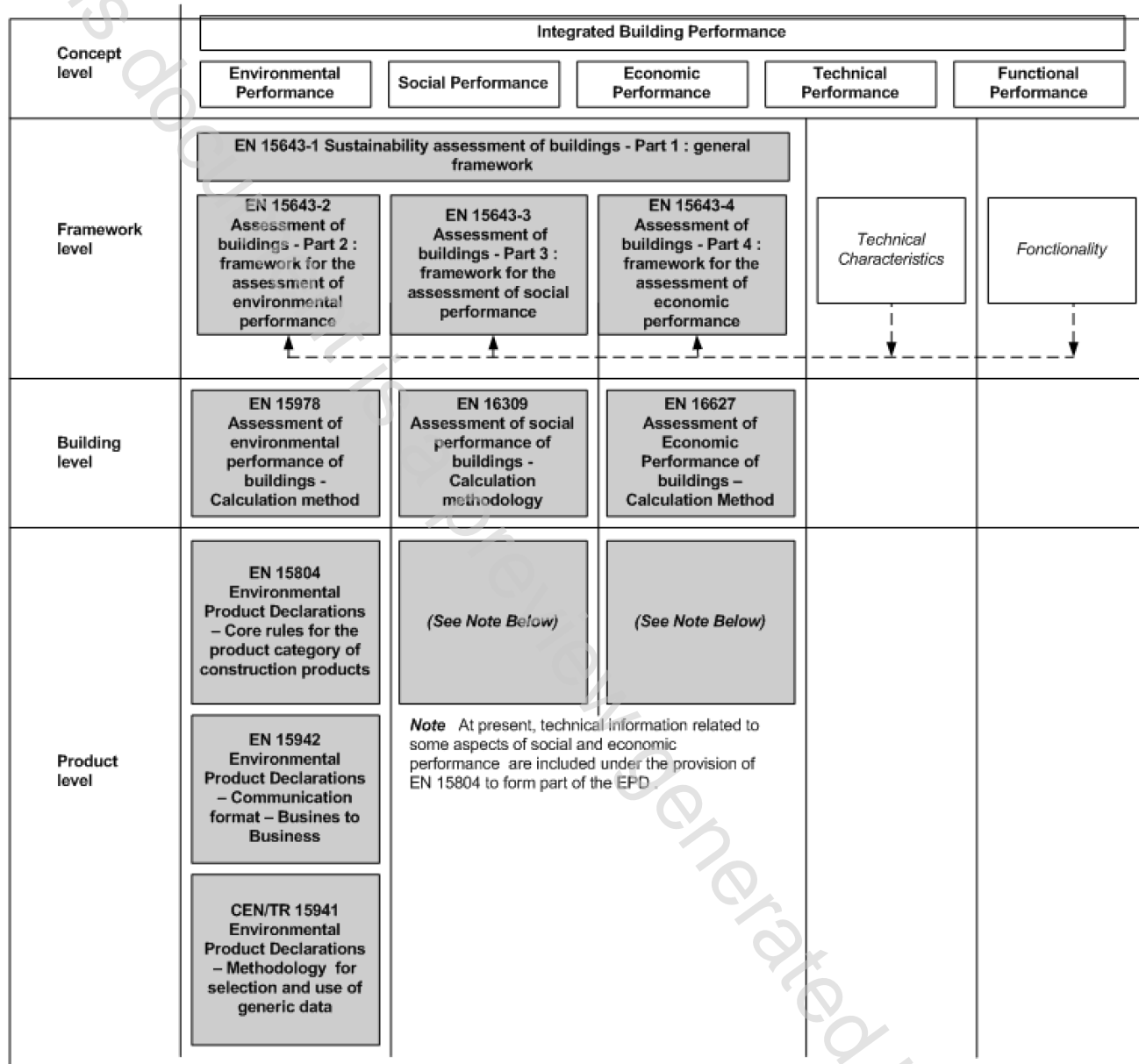


Figure 2 — Work program of CEN/TC 350

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.

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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.