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ILNAS-EN 17680:2023

**Sustainability of construction works -
Evaluation of the potential for
sustainable refurbishment of buildings**

Nachhaltigkeit von Bauwerken -
Bewertung des Potentials zur
nachhaltigen Modernisierung von
Gebäuden

Contribution des ouvrages de
construction au développement durable
- Évaluation du potentiel d'une
réhabilitation contribuant au

08/2023



National Foreword

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Sustainability of construction works - Evaluation of the potential for sustainable refurbishment of buildings

Contribution des ouvrages de construction au développement durable - Évaluation du potentiel d'une réhabilitation contribuant au développement durable d'un bâtiment

Nachhaltigkeit von Bauwerken - Bewertung des Potentials zur nachhaltigen Sanierung von Gebäuden

This European Standard was approved by CEN on 2 July 2023.

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European foreword

This document (EN 17680:2023) 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of an identical text or by endorsement, at the latest by February 2024, and conflicting national standards shall be withdrawn at the latest by February 2024.

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Introduction

This document forms a part of a series of European Standards written by CEN/TC 350, that provide a system for the sustainability assessment of buildings using a life cycle approach. The sustainability assessment quantifies impacts and aspects for environmental, social and economic performance of buildings using quantitative and qualitative indicators, both of which are measured without value judgement. The purpose of this series of European Standards is to enable comparability of the results of assessments. This series of European Standards does not set benchmarking or levels of performance. European (and other) countries face big challenges transforming the existing building stock to environmentally, economically and socially feasible buildings for the future within a low carbon society and a higher focus on resource efficiency as a contribution to sustainable development. The transformation and reduction of environmental impacts of existing buildings should be done in a cost-effective manner and hence the refurbishment should be accessible and sustainable in all senses (i.e. environmental, social and economic). The need for refurbishment emerges due to the increasing demands for better-quality housing and the quest for energy efficiency of commercial and industrial buildings.

In concept, the integrated building performance incorporates environmental, social and economic performance as well the technical and functional performance, and these are intrinsically related to each other, as illustrated in Figure 3. This document defines a simple method for qualifying the considerations to be made in relation to evaluating the potential of refurbishing an existing building and serves to determine the most sustainable and cost-effective approach to improve performance to comply with national regulatory requirements, among other things. In the interest of conserving resources, options for extended use and refurbishment are to be examined intensively and, if suitable, are to be given preference over new construction. This document is a part of the framework of standards for sustainability of buildings as shown in Figure 1.

This document is primarily designed to support the strategic decision process on how to refurbish existing building(s) in a sustainable way, taking into consideration that not all buildings should be refurbished if the existing conditions of a building do not permit. A starting point for decisions on (further) handling of existing buildings is a comprehensive analysis. This includes a building diagnosis to determine damage and deficiency as well as an assessment of the current technical and functional performance. The potential for an improvement in building performance and (as far as possible) the effort required for this are assessed. An alignment with requirements and possibilities resulting from future user requirements or possible uses, the changing environment concerning politics and legislation, market situation, environmental conditions and social values, as well as technical progress, is possible. The results of the analysis can be used to make fundamental decisions on how to deal with existing buildings. If refurbishment or repurposing are viable options, these can be investigated using the results of a building diagnosis and being subjected to a sustainability assessment in accordance with EN 15643.

In this document, a procedure is offered to support the methodology for assessing performance characteristics of existing building based on an indicator system and classification levels. Examples are given in an informative annex.

Framework level	Sustainability Assessment			Technical characteristics	Functionality
	EN 15643 Sustainability of Construction Works – Framework for Assessment of Buildings and Civil Engineering Works			Service Life Planning – Principles ISO 15686-1	
Works level	EN 15978 Assessment of Environmental Performance of Buildings	EN 16309 Assessment of Social Performance of Buildings	EN 16627 Assessment of Economic Performance of Buildings	EN ISO 52000 Energy Performance of Buildings	
	EN 17680 Assessment of Options for Sustainable Refurbishment of Buildings				
	EN 17472 Sustainability Assessment of Civil Engineering Works				
Product level	EN 15804 + A2 Environmental Product Declarations – Core Rules for Construction Products			Service Life Prediction Procedures ISO 15686-2,	
	EN 15942 Communication Format B-to-B			Feedback from Practice ISO 15686-7,	
	EN 15941 Data Quality			Reference Service Life & Service Life Estimation ISO 15686-8	
	EN 17672 Rules for B-to-C Communication				
	EN ISO 22067 Data templates for the use of EPDs in BIM				
	CEN/TR 16790 Guidance for EN 15804				
	CEN/TR 17005 Additional Indicators				

Figure 1 — Framework standards for sustainability of buildings

Refurbishment can be seen as an opportunity, not only to modernize a building's aesthetic, but also to enhance its overall technical and functional (usability) performance, and its potential contribution to the surrounding environment and local community.

The transformation should be done in a cost-effective manner and hence the refurbishment should be sustainable. This document gives a simple method for which buildings to be given first priority for a sustainable refurbishment also taking into consideration that not all buildings should be refurbished.

Benefits of sustainable refurbishment in comparison to deconstruction and redevelopment are:

- reduced landfill disposal;
- contribution to extending whole building lifetime;
- reduced environmental footprint through greater conservation and reuse of materials;
- contributing to lower life cycle costs;
- reduction in overall embodied environmental impact relative to new building.

Other benefits may include:

- retention of community infrastructure;
- additional benefits of local economic development;
- neighbourhood renewal and well-being for all stakeholders;
- protection for built cultural heritage;
- better adaptation to climate change (e.g. limiting the solar gain in summer).

1 Scope

This document provides a strategy and methodology for sustainable refurbishment of an existing building and evaluation of the potential of sustainable refurbishment, as a means of contributing to the circular economy, to support the decision-making process. Sustainable refurbishment aims to close the gap between current performance and current requirements fulfilling national regulations, and contribute to meet sustainability goals which maximize the environmental, social and economic performance. It also aims to allow the adaptability to fulfil future needs. It can be used for a building or part(s) of a building, as well as a portfolio of buildings. This document gives a methodology for assessing performance characteristics of existing buildings in terms of:

- a) technical aspects;
- b) adaptability;
- c) usability;
- d) social aspects;
- e) energy and water (operational impacts);
- f) quality of indoor environment (including health aspects);
- g) economic feasibility;
- h) climate change resilience;
- i) embodied environmental impacts.

The document describes the work to be done in main applicable categories of a 6 steps process:

- Step 0: Establish brief of the object of the assessment
- Step 1: Evaluating the building
- Step 2: Sustainable deconstruction
- Step 3: Sustainable construction process
- Step 4: Sustainable commissioning
- Step 5: Sustainable in use

NOTE In this document, the users are people and organizations using the building, including the facility management. In some buildings, visitors are also important users and need to be taken in to account.

This approach is generic for all types of buildings. At present this document does not cover civil engineering work and it does not give benchmarks for the evaluation.

This document enables a strategy to be made for sustainable refurbishment of the whole building, part of a building or a portfolio of buildings.

Assessment of the impacts of sustainable refurbishment of buildings is covered by calculation methods described in EN 15978, EN 16309 and EN 16627.