



**Building Performance Digitalisation
and Dynamic Logbooks
for Future Value-Driven Services**

Deliverable 6.3

**Standards analysis and
contribution to standardisation**



**Funded by
the European Union**

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Contents

Abbreviations	6
Executive summary	7
1. Introduction	8
2. The standardization system	9
2.1. Introduction	9
2.2. Europe	9
2.3. International	10
2.4. National Standardisation Bodies in Europe	10
3. Standardization documents	12
3.1. Types of standardisation documents	12
3.2. Participation of Chronicle in standardisation documents	14
3.2.1. Participation in technical committees	14
3.2.2. CEN Workshop Agreements	15
3.3. Standardisation documents in public policies	17
3.3.1. General	17
3.3.2. The EPBD	18
3.3.3. The CPR	19
4. Standardisation groups and documents	21
4.1. Introduction	21
4.2. International technical groups	21
4.3. European technical groups	23
4.4. Standardization documents	24
4.4.1. General	24
4.4.2. EN 15978	25
4.4.3. Digital DoPC and digitalization of EPDs	25
4.4.4. Data management in BIM	25
4.4.5. Digital twins in the built environment	26
5. Results in the standardization system	27
5.1. Introduction	27
5.2. CEN Workshop Agreement	27
5.3. CEN/TC 371	29
5.4. CEN/TC 442/WG 12	30
5.5. A summary of the participation from CHRONICLE's partners	30

5.6. Research publications	32
5.6.1. Introduction.....	32
5.6.2. Digital twins	33
6. Dissemination activities	34
6.1. General.....	34
6.2. CHRONICLE’s final event at ENLIT	34
6.3. Workshop “Sustainability of buildings and transport infrastructures”	35
6.4. General Assembly of the “Conseil Européen des Economistes de la Construction (CEEC)”	35
6.5. Integrating research in standardization.....	36
6.6. Online Workshop on Standardization of EPCs	36
7. References	37
ANNEX A: Standardization references provided in January 2023	39
A.1 Introduction	39
A.2. International standardisation documents	39
A.2. European standardisation documents.....	54

Abbreviations

TERM	DESCRIPTION
CD	International Committee Draft (stage in ISO)
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardisation
CIB	Committee Internal Ballot (internal ballot in a standardisation TC or SC)
CPR	European Construction Products Regulation. It can refer to Regulation (EU) 305/2011 (old CPR) or to Regulation (EU) 2024/3110 (new CPR)
CWA	CEN Workshop Agreement (document issued by CEN)
DIS	Draft International Standard (stage in ISO)
EN	European Standard issued by CEN or CENELEC
EPB	Energy Performance of Buildings
EPBD	Energy Performance of Buildings Directive
FDIS	Final Draft International Standard (stage in ISO)
FprEN	Final Project of European Standard (stage in CEN)
IEC	International Electrotechnical Commission; and International standard issued by IEC
ISO	International Organization for Standardization; and International standard issued by ISO
NSB	National Standardisation Body
prEN	Project of European Standard (in CEN and CENELEC)
SC	Subcommittee
TC	Technical Committee
TR	Technical Report
TS	Technical Specification
UNE	Spanish Association for Standardization; and Spanish standard issued by UNE
WG	Working Group
WI	Work Item (stage in which a standardisation document is registered and the drafting starts)

Executive summary

This document describes the main standardization activities developed by CHRONICLE, including the publication of scientific articles related to published standards or projects under development. The following activities deserve to be highlighted:

1. **Publication of CWA 18304:2024 “Carbon bill of the refurbishment of buildings”**, which defined a standardized methodology to monetize the environmental impact of the refurbishment activities on a building by calculating the financial value of the related greenhouse gas emissions. This standardization document is available for download in [this link](#).
2. **Active participation in European standardization committees** such as CEN/TC 371 “Energy performance of buildings” and CEN/TC 442 “BIM”. In particular:
 - a. The proposal for a **new European standard** on “Energy performance requirements – Operational rating – **Framework for assessing operational rating**” (from CEN/TC 371/WG 5) made explicit reference to CHRONICLE in the WI proposal for a new European standard.
 - b. The proposal for a new European standard on **the Digital Declaration of Performance and Conformity (DoPC) for construction products** (from CEN/TC 442/WG 12) made explicit reference to CHRONICLE in the introduction of the draft.
3. Publication of two research papers related to the results of the project and their relation to standardization in indexed scientific journals:
 - a. [Seeking a definition of digital twins for construction and infrastructure management](#). Aragón, A.; et al. *Applied Sciences* (2025), 5(3), 1557. <https://doi.org/10.3390/app15031557>.
 - b. [Bridging interoperability gaps between lca and bim: analysis of limitations for the integration of EPD data in IFC](#). Aragón, A.; Spudys, P.; Pupeikis, D.; Nieto, Ó.; & Garcia Alberti, M. *Buildings* (2025), 15(15), 2760; <https://doi.org/10.3390/buildings15152760>.
4. Dissemination of the results of the project (related to policies and standards) in events and meetings such as:
 - a. Workshop on sustainability assessment applied to buildings and infrastructure hosted by UNE and sponsored by CIRCE (2025-11-11, Madrid).
 - b. Meetings of the Spanish Committee responsible for the EPBD, CTN-UNE 100, reporting the updates on CHRONICLE related to CEN/TC 371.
 - c. Committee of European Economic Co-operation (CEEC) General Assembly at Madrid, 2025-05-09.

This document also describes the related committees at international and European level, identifying the relevant groups in ISO and CEN. It also provides a list of standards published and under development, identified as relevant.

1. Introduction

Standardisation documents are, by definition, voluntary, but it is quite common that, for certain uses, public administration decide to *enforce* their application via regulations. In a regulated sector such as construction industry, with public bodies as one of the main procurers, including the result in an existing standardisation document can have an especially important impact in the market, especially when linked to EU or national policies.

In order to support the participation of CHRONICLE's partners in the standardization system this deliverable describes the functioning of the standardisation system. This information can be used to:

- Identify standardization documents relevant for the technical tasks of CHRONICLE.
- Disseminate the results of the project in the European and International standardisation environment. The goal is to make the information generated by the project available to industry and other market stakeholders (like software developers, architects, facility managers, construction companies, etc.), to public administrations and the end users of the building.

For this purpose, a first version of this deliverable was circulated to CHRONICLE's partners in January 2023, including a summary of the *state of the art*. In particular, it contained the following information:

- Guidance on standardization activities, including the use of standards in public policies (clauses 2 and 3).
- The main standardization TCs, SCs and WGs (clause).
- The relevant standards and projects, included as Annex A of this final deliverable.

This version of the deliverable includes the main results of task 6.6 related to standardization:

- Publication of the CWA 18304:2024 Carbon bill of the refurbishment of buildings, based on the results from CHRONICLE (see 5.2).
- Approval of the project for a future European standard on the assessment of the operational energy performance of buildings in CEN/TC 371 (see 5.3).
- Participation in the drafting of the proposal for a European standard for the digitalization of the Declaration of Performance and Conformity according to the new Construction Products Regulation (CRP-2024) in CEN/TC 442/WG 12 (see 5.4).
- Publications in research journals (see).
- Dissemination activities (see 6).

This deliverable D6.3 Standards analysis and contribution to standardisation is a companion to deliverable D6.4 Policy reform and regulatory recommendations, which is also available to the public.

2. The standardization system

2.1. Introduction

Standards are voluntary technical documents that set out requirements for a specific item, material, component, system or service, or describes in detail a particular method, procedure or best practice. Standards are developed and defined through a process of sharing knowledge and building consensus among technical experts nominated by interested parties and other stakeholders - including businesses, consumers and environmental groups, among others.

Participation is structured in Technical Committees (TCs), which are subdivided in Subcommittees (SCs) and/or Working Groups (WGs).

2.2. Europe

The framework of European standardisation policy is defined in [Regulation \(EU\) 1025/2012](#)¹, which sets certain obligations for the European standardisation bodies (CEN, CENELEC and ETSI).

Table 1 contains some general information about these standardisation bodies.

Table 1: European standardization bodies

Standardization body	Description
European Committee for Standardization (CEN)	CEN is a non-profit association whose members are the national standards bodies of 33 European countries. It develops standards in fields not related to electrotechnology nor telecommunications. It is the counterpart at European level of ISO
European Committee for Electrotechnical Standardization (CENELEC)	CENELEC is a non-profit association whose members are the national standards bodies of 33 European countries. It develops standards in fields related to electrotechnology. It is the counterpart at European level of IEC
European Telecommunications Standards Institute (ETSI)	ETSI is a non-profit organization with more than 800 member organizations worldwide. It develops standards for Information and Communications Technologies (ICT)

¹ This Regulation is currently under revision by the European Union

CEN committees are considered, in this first stage, more relevant for Chronicle. Thus, UNE will focus the follow up on them.

Participation is made via National Standardisation Bodies. Each partner should contact its NSB to be registered as an expert in a WG or participate in a TC or SC meeting.

2.3. International

ISO and IEC are independent, non-governmental international organizations with a membership of national standards bodies.

- [ISO website](#)
- [IEC website](#)

Through their members, ISO and IEC bring together experts to share knowledge and develop voluntary, consensus-based, market relevant International Standards, to support innovation and provide solutions to global challenges.

To remove technical barriers to trade, the international standardisation process ensures the compliance with the requirements of the Technical Barriers to Trade Agreement (TBT Agreement) of the World Trade Organization (WTO), namely: transparency, openness, impartiality, consensus, effectiveness, relevance, coherence and consideration of the concerns of developing countries.

ISO committees are considered more relevant for Chronicle. Thus, UNE focused the activities on them.

CEN and ISO have an agreement for technical co-operation to develop common documents: the **Vienna Agreement**. It was drawn up with the aim of preventing duplication of effort and reducing time when preparing standards. This agreement allows expertise to be focused and used in an efficient way to the benefit of international standardization. More information:

- [Guidelines supporting the practical implementation of the Vienna Agreement](#)
- [The Vienna Agreement - FAQs](#)

2.4. National Standardisation Bodies in Europe

The standardisation system is based on a ***national delegation principle***. This means that the National Standardisation Body (NSB) of each country is a member of the supra-national standardisation organizations and defines its position based on the input from industry, research bodies, NGOs, public administrations, etc. Each NSB will create a mirror group, to establish the national position, send comments and allocate experts in the WGs. In Spain, UNE is the National Standardisation Body.

The list below provides the name and link to each European NSB.

1. [Austria - Austrian Standards International \(ASI\)](#)
2. [Belgium - Bureau de Normalisation/Bureau voor Normalisatie \(NBN\)](#)
3. [Bulgaria - Bulgarian Institute for Standardization \(BDS\)](#)
4. [Croatia - Croatian Standards Institute \(HZN\)](#)
5. [Cyprus - Cyprus Organization for Standardisation \(CYS\)](#)
6. [Czech Republic - Czech Office for Standards, Metrology and Testing \(UNMZ\)](#)
7. [Denmark - Dansk Standard \(DS\)](#)
8. [Estonia - Estonian Centre for Standardisation and Accreditation \(EVS\)](#)
9. [Finland - Suomen Standardisoimisliitto r.y. \(SFS\)](#)
10. [France - Association Française de Normalisation \(AFNOR\)](#)
11. [Germany - Deutsches Institut für Normung \(DIN\)](#)
12. [Greece - National Quality Infrastructure System \(NQIS/ELOT\)](#)
13. [Hungary - Hungarian Standards Institution \(MSZT\)](#)
14. [Iceland - Icelandic Standards \(IST\)](#)
15. [Ireland - National Standards Authority of Ireland \(NSAI\)](#)
16. [Italy - Ente Italiano di Normazione \(UNI\)](#)
17. [Latvia - Latvian Standard Ltd. \(LVS\)](#)
18. [Lithuania - Lithuanian Standards Board \(LST\)](#)
19. [Luxembourg - Organisme Luxembourgeois de Normalisation \(ILNAS\)](#)
20. [Malta - The Malta Competition and Consumer Affairs Authority \(MCCAA\)](#)
21. [Netherlands - Nederlands Normalisatie-instituut \(NEN\)](#)
22. [Norway - Standards Norway \(SN\)](#)
23. [Poland - Polish Committee for Standardization \(PKN\)](#)
24. [Portugal - Instituto Português da Qualidade \(IPQ\)](#)
25. [Republic of North Macedonia - Standardization Institute of the Republic of North Macedonia \(ISRSM\)](#)
26. [Romania - Romanian Standards Association \(ASRO\)](#)
27. [Serbia - Institute for Standardization of Serbia \(ISS\)](#)
28. [Slovakia - Slovak Office of Standards Metrology and Testing \(UNMS SR\)](#)
29. [Slovenia - Slovenian Institute for Standardization \(SIST\)](#)
30. [Spain - Asociación Española de Normalización \(UNE\)](#)
31. [Sweden - Swedish Institute for Standards - SIS \(SIS\)](#)
32. [Switzerland - Schweizerische Normen-Vereinigung \(SNV\)](#)
33. [Turkey - Turkish Standards Institution \(TSE\)](#)
34. [United Kingdom - British Standards Institution \(BSI\)](#)

3. Standardization documents

3.1. Types of standardisation documents

A Standard is:

A document, established by consensus and approved by a recognized body that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context. They include requirements and/or recommendations in relation to products, systems, processes or services

All standards, independently of their origin (National, European or International), are developed under the basis of consensus and approved by the members of the organization according to strict, defined procedures and strict drafting timeframes. There are two main documents, in relation to their geographical scope, relevant for CHRONICLE:

- **European Standards:** documents that have been ratified by one of the three European Standardization Organizations (CEN, CENELEC or ETSI). To promote the Single Market of product and services the principle is one standard for all Europe. Their application is voluntary, but the adoption at national level as standard is mandatory. Note that the mandatory adoption only applies to EN standards, but not to other standardisation documents (like TR or TS).
- **International Standards:** documents that have been ratified by one of the two International Standardization Organizations (ISO or IEC). Their application is voluntary and the adoption at national level is also voluntary.

National standards can be considered but, as CHRONICLE is a EU-funded project and the methodology should be applicable regardless of the country in which the building is located, their impact was considered low.

The standardisation organizations also issue other types of documents, like Technical Specifications (TS) or Technical Reports (TR), which have a lower level of consensus and a faster drafting timeframe.

Table 2 summarizes the main characteristics of the standardization documents, also indicating their source (standardization organization).

Table 2: Characteristics of the different types of standardisation documents

Type	Int. code	European code	National code	Description
Standard	ISO IEC	EN	UNE, NF, BS, DIN, etc. When adopting EN or ISO standards: UNE-EN, NF-EN, UNE-ISO, NF-ISO, etc.	Elaboration: usually, within 3 years. Not possible to finish a EN standard during a research project, as the results need 18-24 months to be mature enough for standardisation and the consensus process is very strict. 2 official ballots in the TC. European: compulsory national adoption Revision: every 5 years
Technical specification	ISO/TS IEC/TS	CEN/TS CLC/TS	When adopting: UNE-CEN/TS, NF-CEN/TS, UNE-ISO/TS, NF-ISO/TS, etc.	Elaboration: usually, between 15 and 21 months. Very complicated to finish during a research project, as the results need 18-24 months to be mature enough for standardisation and the document needs to be approved in an established TC. 1 official ballot or internal approval in TC European: optional national adoption Revision: at 3 years (upgrading to EN or deletion)
Technical report	ISO/TR IEC/TR	CEN/TR CLC/TR	When adopting: UNE-CEN/TR, NF-CEN/TR, UNE-ISO/TR, NF-ISO/TR, etc.	Elaboration: usually, between 12 and 18 months. It is feasible to produce it during a research project but complicated, due to the requirements of the process and the need to be approved in an established TC. Internal approval in TC European: optional national adoption No revision required
Publicly Available Specification	ISO/PAS IEC PAS	<i>Not applicable</i>	When adopting: UNE-ISO/PAS, UNE-IEC/PAS, etc.	Elaboration: usually, between 12 and 18 months. Feasible to produce in a research project, but not possible in CEN. A CWA is similar option (see below) Internal approval in the Workshop European: optional national adoption Decision in 3 years: confirmation for other 3 years, revision or deletion. In year 6, upgrade to other type of standardisation document or deletion

Type	Int. code	European code	National code	Description
Workshop Agreement	IWA	CWA	Variable	Elaboration: free timeframe (usually between 12 and 18 months). Preferred option for research projects. Internal approval in the Workshop European: optional national adoption Decision in 3 years: confirmation for other 3 years, revision or deletion. In year 6, upgrade to other type of standardisation document or deletion

3.2. Participation of Chronicle in standardisation documents

3.2.1. Participation in technical committees

UNE informed CHRONICLE regarding the options to contribute to the standardisation system participating in technical committees (TC), subcommittees (SC) or working groups (WG). The main options are summarised below.

A. Participation as experts in current standardization working groups

This option is most suitable when new EN standards or TS (technical specifications) or TR (technical reports) start their development, and the project timeframe allows for a participation of several years. However, the timespan of the document development can be different to that of the project and the timing for the availability of suitable project results can be inadequate.

Partners can participate nominated by their NSB (see 2.4) or a *Project Liaison* between Chronicle and the Technical Committee can be established. Participation via NSB is the preferred option, as the project will also be able to influence at national level and prepare the position for the ballots.

CHRONICLE partners participated in several WGs, such as CEN/TC 371/WG 5 for operational energy performance and CEN/TC 442/WGs 9 and 12 for digitalization applied to the construction industry.

B. Proposal of modifications of existing standardisation documents

Chronicle can propose amendments to existing EN standards, TS (technical specifications) or TR (technical reports). This proposal can include the leadership of the process (for example, in a task group).

Suitable when some existing documents can be improved based on the results of the project or need to be modified. The revised document will not usually be published before the end of the project.

C. Proposal for the elaboration of new standardisation documents

This option is most adequate when there is a Technical Committee covering the scope of the project contribution, especially when this Technical Committee does not allow the elaboration of faster documents outside its structure (like the Workshop Agreement explained below). This document identifies several WG in which the results of Chronicle could have been presented.

Usually, the full development of these documents takes a time which is not compatible with the normal project duration, so it is not a suitable option. This option is more time consuming than the previous options and, this, is generally not considered feasible due to time restrictions. However, as UNE is the Secretariat of several related WG, this option was considered and a proposal for a European standard on operational energy efficiency of building was submitted for ballot in CEN/TC 371 'Energy performance of buildings' (see 5.3).

In addition, one of the main results of CHRONICLE, the CWA 18304:2024 Carbon bill of the refurbishment of buildings (see 5.2), was submitted to CEN/TC 350 'Sustainability of construction works' to be considered as a first draft for a potential European standard.

D. Submission of proposals for future consideration in standardization works

This option is recommended when none of the other options can be used, as there is no guarantee that this information will effectively be used in the future to take part in a new standard and could be finally disregarded.

3.2.2. CEN Workshop Agreements

A CEN Workshop Agreement (CWA) is the most widely used option for research and innovation projects like Chronicle, due the fast drafting and decision process.

CWA can also be developed in a TC, but usually is not the case and the drafting is made in a dedicated group, constituted as a "Workshop". Relevant CEN/TCs are informed about the proposed Workshop and any organization can participate in the group.

The document generated is approved directly by the members of the Workshop and published by CEN. The main requirement is that their content cannot conflict with existing standards and if the scope is under an existing TC, coordination with the committee is needed.

It should be noted that a CWA can be delivered free of charge to end users, with an agreement with CEN/CENELEC.

The process and criteria to develop a CEN/CENELEC Workshop Agreement (CWA) is defined in CEN/CENELEC Guide 29 (CEN/CENELEC, 2024) and summarised below.

1. **Initiative:** Any organization can contact a CEN Member to develop a CWA. The following documents should be presented:
2. Workshop Proposal Form.
3. Project Plan, including (if possible) a tentative calendar and the proposed content or structure for the CWA. The calendar should include a tentative date for the *kick-off meeting*.
4. A first draft can also be attached.
5. **Approval of the Workshop:** After internal review in CEN, the proposal sent to the Technical Board (BT) and to identified relevant CEN and/or CENELEC Technical Committees (TCs). In addition, CEN/CENELEC Management Centre (CCMC) announces the proposal for a new CEN Workshop (CEN/WS) on its website at least 30 days before the kick-off meeting, including the draft Project Plan, the Agenda and Venue, the proposed Chairperson and the proposed Secretariat, with information on how to submit comments to the Workshop Draft Project Plan.
6. **Kick-off meeting:** The CEN Member and CCMC explains how the CEN/WS will operate, and the Workshop Project Plan is revised and approved. The proposed Chairman should also be approved by participants.
7. **Draft and meetings:** The Secretariat will make available the drafts, the agenda and minutes of the meetings and any other relevant document. To ensure transparency, the documents are uploaded on CEN Documents (an electronic platform in which the documents generated are made available to experts). The WS will meet until consensus on a draft is achieved.
8. **Public consultation (optional):** In general, an open commenting phase (minimum 30 days and 60 days if it covers safety aspects) is then launched. CCMC will make the draft CWA available for external comments on the CEN website, to relevant TCs and will also notify the CEN Members. The comments shall be considered by the participants in the Workshop.
9. **Publication:** If agreement is reached amongst the WS participants on the final text of the CWA, the Secretariat submits the approved CWA to CCMC, to publish the document.
10. **Revision of the validity of the CWA:** Once published, a TC can decide to take on the responsibility for the maintenance of the CWA. In this case, the TC Secretariat will conduct the consultation for the review of the CWA after 3 years. After this period, the CWA can be confirmed for another 3 years, revised, withdrawn from the market. CWAs have a maximum lifetime of 6 years.

At any point in its lifecycle, a CWA can be transformed into another standardization deliverable (e.g. a TS or an EN), at the initiative of CEN Members or of a CEN and/or CENELEC Technical Body.

CHRONICLE successfully spearheaded a CWA covering the carbon bill of the refurbishment of buildings. This activity is described in 5.2.

3.3. Standardisation documents in public policies

3.3.1. General

Standards are **voluntary** documents providing technical specifications for products, services, and processes (see 3.1 for a more detailed definition). European standards are developed by one of the 3 European standardisation organisations (ESOs) described in clause 2.2.

Technical requirements given in EU legislation are **mandatory** for certain uses or cases. These technical requirements included in the legislation can make reference to standards for test methods or other criteria. This is the case of the EPBD (see 3.3.2) or the CPR (see 3.3.3).

The relation between the EU Commission and the ESOs is defined in Regulation (EU) No 1025/2012 on European standardisation (European Union, 2012), recently modified with Regulation (EU) 2022/2480 (European Union), which provides a legal framework allowing the European Commission to request ESOs to draft standards and standardisation deliverables for goods and services in support of EU policies and EU law, defines the support to the functioning of the European Standardisation System (ESS) and set out key criteria for the functioning of the ESS.

The use of standards in implementing legislation and public policy brings benefits to policy makers, including:

- broad market acceptance;
- simplification of legislation or policy;
- support to emerging technologies and the promotion of innovative approaches, without the need to change the regulatory framework;
- a close link to international standards, enabling international market access and thus promoting the global competitiveness of the European industry.

A particular case of standards included in EU legislation is **harmonised standards**, developed by an ESO following a Request (or Mandate) from the European Commission. 20% of all European standards are developed following a standardisation request. This is the case of the EPBD (see 3.3.2) or the CPR (see 3.3.3). More information about *Standardisation Requests* can be found in the [website of the European Commission covering standardisation requests / mandates](#).

Manufacturers, other economic operators, or conformity assessment bodies can use **harmonised standards** to **demonstrate** that products, services, or processes **comply with relevant EU legislation**. The publication of the reference of the harmonised standard in the Official Journal of the European Union (OJEU) is foreseen as a precondition for presumption of conformity or for other legal effect.

Deliverable 6.4 'Policy reform and regulatory recommendations' describes the current situation of the main EU regulations affecting CHRONICLE. The subclauses below describe the impact of standards in these policies.

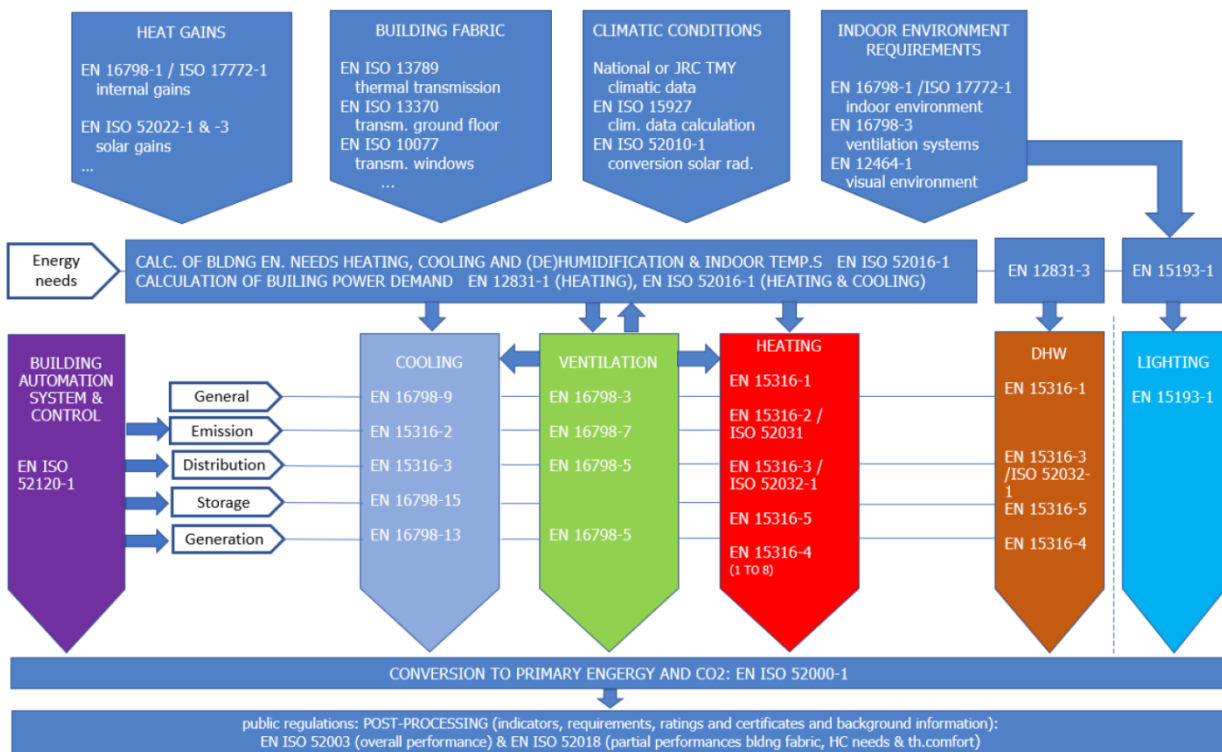
3.3.2. The EPBD

In December 2010, the European Commission approved the Mandate M/480 for the elaboration of standards for a methodology calculating the integrated energy performance of buildings and promoting the energy efficiency of buildings, in accordance with Directive 2010/31/EU (European Union, 2010). Several standardisation documents were published based on that Mandate.

Some of the EPB standards allow the definition of certain parameters or criteria in national annexes, which provide flexibility with respect to specific national or regional choices. The harmonized procedures in the EPB standards, defined at European level, need to be separated from the national or regional options (choices).

Figure 1 provides a detailed overview of EPB-2010 standards, i.e. those directly used for the overall EPB assessment by calculation and those containing EP calculation, pre-processing procedures or post-processing procedures.

Figure 1: Overview of the EPBD standards



The new EPBD recast was approved in 2024, intended to ensure a fully decarbonized EU building stock by 2050. The EPBD-2024 explicitly identifies digitalization (data exchange, smart readiness, digital logbooks, etc.) as a primary enabler for the *digital transition*, moving from static certification to dynamic, lifecycle-based management. These concepts are closely related to CHRONICLE’s activities and, in particular, with the ongoing developments in CEN/TC 371/WG 5.

The scope, impact and relation with CHRONICLE are described in D6.4.

3.3.3. The CPR

The [Regulation \(EU\) 305/2011 of construction products \(CPR\)](#) (European Union, 2011) has been one of the most important pieces of legislation for the building and civil engineering industry. It lays down harmonised conditions for the marketing of construction products in Europe, ensuring the smooth functioning of the Single Market and the free movement of construction products.

To achieve a common framework for construction products in the EU, the CPR uses harmonised technical specifications, which provide for a common technical language on how to test and declare the performance of construction products (e.g. reaction to fire, thermal conductivity or sound insulation).

In addition to these harmonised standards, CEN develop test and other supporting standards, which are referenced in the relevant harmonised standard.

The use of European harmonised standards becomes **mandatory** when they are cited in the Official Journal of the European Union (OJEU) and manufacturers of construction products covered by such standards shall issue a declaration of performance (DoP) with all the relevant information. With this DoP, the manufacturer assumes full responsibility for the compliance of the product with the performance declared and it is entitled to fix the **CE marking** to the product, indicating that it complies with the declared performance. The product can then freely circulate within the single market.

The CPR was revised in parallel to CHRONICLE's activities. In March 2022, the Commission presented a proposal for a new Regulation and launched a public consultation process, that ended in July. The draft included important improvements related to the green and digital transition of the construction industry. All documents are available in [this link](#).

The Regulation (EU) 2024/3110 laying down harmonised rules for the marketing of construction products (new CPR) (European Union, 2024) was finally published in December 2024. As in the old CPR, standards constitute a fundamental support for the assessment of the performance characteristics of construction products, now including the environmental sustainability and also the digitalization of performance characteristics. The digital Declaration of Performance and Conformity (DoPC) is a cornerstone of this new CPR. CHRONICLE has participated in the development of a horizontal standard on the digital DoPC, as described in 4.4.3 and 5.4.

The new CPR is one of the EU policies aimed at digitizing the product lifecycle management by introducing Digital Product Passports (DPP), together with the ecodesign Regulation (ESPR) (European Union, 2024) or the batteries Regulation (European Union, 2023). DPP will provide transparency and traceability, enabling stakeholders to access comprehensive information about their origin, materials and environmental impact of products.

UNE has participated in several actions related to the digitalization in the new CPR. The knowledge gained from these activities has been used to improve the approach for the standardization related to construction products in CHRONICLE:

- **Feasibility study for the CPR-DPP system:** Aitor Aragón (UNE) participated in the consortium that developed the Feasibility study on the establishment of the Construction Products Regulation (CPR) Digital Product Passport (DPP) system (European Commission: Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs. Cobuilder, Tecnalía and UNE Normalización Española, 2025) for the European Commission, published on May 2025.
- **Conference of the new CPR:** DG Grow (European Commission) hosted a Conference to present the new CPR in Brussels in October 2024 (European Commission, 2024). Aitor Aragón (UNE) participated on the panel for digitalization.

The scope, impact and relation with CHRONICLE activities of the new CPR are described in D6.4.

4. Standardisation groups and documents

4.1. Introduction

A first selection of TC, SC and WG was circulated to CHRONICLE partners in January 2023, to allow the selection of documents relevant for the project and also to prepare the standardization strategy, including the participation in the most relevant groups. This list was used to:

- Report gaps in the selection of issues and improve the list of groups and documents.
- Provide technical information to be used in other WP and tasks.
- Guide in the standardisation approach of the results of Chronicle.

The first selection of standardization documents circulated in 2023 is reproduced in Annex A.

4.2. International technical groups

IEC/TC 57 Power systems management and associated information exchange:

- WG 3 Telecontrol protocols
- WG 10 Power system IED communication and associated data models
- WG 15 Data and communication security

ISO/TC 59/SC 13 Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM):

- JWG 14 GIS-BIM interoperability
- WG 8 Information delivery manual
- WG 11 Product data for building services systems model

ISO/TC 59/SC 13/SC 17 Sustainability in buildings and civil engineering works:

- WG 4 Environmental performance of buildings

ISO/TC 86/SC 6 Testing and rating of air-conditioners and heat pumps:

- TG 13 Next generation of performance standards

ISO/TC 163 Thermal performance and energy use in the built environment:

- SC 1 Test and measurement methods

- SC 2 Calculation methods
- SC 3 Thermal insulation products, components and systems

ISO/TC 184/SC 4 Industrial data:

- JWG 16 Formats for visualization and other derived forms of product data
- JWG 24 Use of IEC CDD for ISO data dictionaries and ontologies

ISO/TC 184/SC 5 Interoperability, integration, and architectures for enterprise systems and automation applications:

- SG 7 Interoperability of simulation models on different platforms
- WG 5 Open systems application frameworks
- WG 10 Evaluation of energy efficiency and other relevant factors of a manufacturing system with respect to its environmental influence
- WG 16 Supply chain interoperability and integration (SCII)

ISO/TC 205 Building environment design:

- WG 2 Design of energy-efficient buildings
- WG 3 Building Automation and Control System (BACS) Design
- WG 5 Indoor thermal environment

ISO/TC 207 Environmental management:

- SC 4 Environmental performance evaluation
- SC 5 Life cycle assessment

ISO/TC 211 Geographic information/Geomatics:

- WG 1 Framework and reference model
- WG 4 Geospatial services
- WG 9 Information management

ISO/TC 268 Sustainable cities and communities

- WG 2 Integration and interaction framework for smart community infrastructures
- WG 4 Data exchange and sharing for smart community infrastructures

ISO/IEC JTC 1/WG 11 Smart cities

ISO/IEC JTC 1/SC 7 Software and systems engineering

- JWG 28 Common industry formats for usability-related information
- WG 7 Life cycle management
- WG 21 Information technology asset management

ISO/IEC JTC 1/SC 27 Information security, cybersecurity and privacy protection

ISO/IEC JTC 1/SC 41 Internet of things and digital twin

- WG 3 IoT Architecture
- WG 4 IoT Interoperability
- WG 5 IoT Applications
- WG 6 Digital twin

4.3. European technical groups

CEN/CLC/JTC 14 Energy management and energy efficiency in the framework of energy transition

- WG 1 Energy audits

CEN/TC 89 Thermal performance of buildings and buildings components

CEN/TC 156 Ventilation for buildings

- WG 21 Energy performance calculation of ventilation and cooling systems

CEN/TC 228 Heating systems and water-based cooling systems in buildings

- WG 1 General performance requirements of heating systems and sub-systems in buildings
- WG 4 Calculation methods and system performance and evaluation

CEN/TC 247 Building Automation, Controls and Building Management

- WG 4 Open System Data Transmission

- WG 6 Electronic control equipment for HVAC applications, integrated room automation, controls and management systems

CEN/TC 350 Sustainability of construction works

- WG 1 Environmental performance of buildings
- WG 3 Products Level
- WG 5 Social performance assessment of building
- WG 8 Sustainable refurbishment
- WG 10 Digitalization

CEN/TC 371 Energy performance of buildings

- WG 1 EPBD Standards group
- WG 5 Operational energy efficiency of buildings

CEN/TC 442 Building Information Modelling (BIM)

- WG 2 Exchange information
- WG 3 Information Delivery Specification
- WG 4 Support Dictionaries
- WG 8 Competence
- WG 9 Digital twins in the built environment
- WG 11 BIM practices for construction works
- WG 12 Digitalization of construction products performance characteristics

4.4. Standardization documents

4.4.1. General

The first selection of standardization documents was circulated to CHRONICLE partners in January 2022 to support them in the standardization activities and also to analyse their potential inclusion within the technical tasks of the project. This list is included in Annex A.

The list was updated in November 2024 to support the development of the CEN Workshop Agreement for the calculation of the carbon bill of the refurbishment of buildings. Scientific literature related to standardization was also considered and UNE spearheaded the drafting of scientific papers to support the dissemination of the results of CHRONICLE (see 5).

CHRONICLE identified several key standards under development, which have been followed by UNE and other partners. To focus the developments, only a very limited selection of documents was considered. CHRONICLE's participation is described below.

4.4.2. EN 15978

The energy performance of buildings Directive (EPBD) (see 3.3.2 and D6.4) including the mandatory global warming potential (GWP) assessment for the “carbon neutrality” of buildings using EN 15978 for the selection of data, for the scenario definition and for the calculation criteria. This international standard has been revised in parallel to the development of CHRONICLE. A new version should be published in December 2025 or January 2026, as the Formal Vote stage was approved in October 2026 (as EN 15978:2025 or EN 15978:2026 depending on the publication date).

CHRONICLE has been following the drafting of this European standard in CEN/TC 350/WG 1 as Aitor Aragón (UNE) is participating in the group.

The new version of the standard contains relevant improvements related to the assessment of the operational use of energy in buildings and to the contribution of green energies generated within the building boundaries.

4.4.3. Digital DoPC and digitalization of EPDs

CEN/TC 442/WG 12 is developing a horizontal standard to define a common data structure for the declaration of performance and conformity of construction products covered by a harmonized standard according to the new CPR (see 3.3.3). When product TCs integrate this standard in their harmonized standards, manufacturers will be able to generate structured formats for the provision of the performance characteristics of construction products. Aitor Aragón (UNE) is the Secretariat of this group and, therefore, CHRONICLE had updated information related to these developments. The proposal made explicit reference to CHRONICLE (see 5.4).

Environmental LCA-based data should follow the same structure, to ensure a interoperability. For this purpose, a revision of EN ISO 22057 should align with the draft developed by CEN/TC 442/WG 12 and also consider the limitations identified for the machine interpretation of the content identified in research (Aragón, y otros, 2025). The revision of ISO 22057 was approved in ISO/TC 59/SC 17 on August 2025, and the first meeting of the drafting group took place on October. Aitor Aragón (UNE) is participating in the revision and presented during the meeting the results of one of the papers generated in CHRONICLE (Aragón, Spudys, Pupeikis, Nieto, & Alberti, 2025).

4.4.4. Data management in BIM

The main international standards for data management, EN ISO 19650, are currently under review. CHRONICLE is not actively participating in the drafting group, but UNE is following the documents generated (drafts and reports of meetings) to ensure alignment.

4.4.5. Digital twins in the built environment

The concept of digital twin is widely used in CHRONICLE. Therefore, the activities of CEN/TC 442/WG 9 'Digital twins in built environment' have great interest for the project. Aitor Aragón (UNE) is the Secretariat of this group and, therefore, CHRONICLE had updated information related to these developments.

The main activity in the last year has been the future standard EN 18162 'Building Information Modelling (BIM) - Digital twins applied to the built environment - Concept and definitions', which should be published in 2026. The group is currently preparing a proposal on Digital Building Logbooks, another topic of great interest for CHRONICLE.

5. Results in the standardization system

5.1. Introduction

The following subclauses describe the main results related to standardization, including the participation in several committees, such as CEN/TC 371 and CEN/TC 442, and the development of a CEN Workshop Agreement based on the results of the project.

5.2. CEN Workshop Agreement

CHRONICLE successfully proposed a CEN Workshop Agreement (CWA) providing guidance for the calculation of the “carbon bill” of building refurbishments: CWA 18304:2025 (CEN/CENELEC, 2025). The document is publicly available in this link: https://www.cencenelec.eu/media/CEN-CENELEC/CWAs/RI/2025/cwa-18304_2025.pdf. The Convenor of the Workshop was Miguel Gómez (CIRCE) and the Secretariat was Aitor Aragón (UNE).

The document defines a methodology to monetize the environmental impact of a building by calculating the financial value of its GHG emissions throughout its life cycle, comparing the refurbished and the non-refurbished situations.

The core purpose is to encourage renovations that reduce the carbon footprint by comparing the cost of emissions of a refurbished building against the cost of emissions if the building were left *unrefurbished*.

The carbon bill is defined as the net economic value of the total GHG emissions associated with the refurbishment of a building, calculated as the product of the Global Warming Potential (GWP) and the price of carbon credits.

The CWA is aligned with the Energy Performance of Buildings Directive (EPBD) and the main European standards, such as EN 15978 (European Committee for Standardization, 2011). The version recently approved of this standard, which should be published at the end of December 2025 as EN 15978:2025, was considered in the drafting.



Image 1: Frontpage of CWA 18304

The first proposal was circulated on December 2024 and the [announcement](#) was made by CEN/CENELEC on 2025-01-29 (CEN/CENELEC, 2025). The proposal was based on several CHRONICLE deliverables, such as D2.2 (Chronicle, 2024) and D4.3 (CHRONICLE, 2024).

This document is based on **CHRONICLE's deliverable 2.2**, “dynamic Level(s) approach for building and LC performance assessment” [13] and **deliverable 4.3** “tool suite for WLC assessment and climate neutral building renovation planning” [14]. It also considers other documents from the project, e.g. dealing with business requirements and the system architecture [15]. **CHRONICLE (Grant Agreement 101069722)** is an EU-funded research and innovation project which digitalizes building information and promotes the use of dynamic logbooks for future value-driven services. It aims to improve building performance to increase energy efficiency, comfort and well-being. The approach defined in the project has been tested in pilots located in five countries: Denmark, Greece, Ireland, Spain and Switzerland. Task 6.6 deals with standardization and has been collaborating in the standardization of operational energy performance assessments in CEN/TC 371/WG 5. In addition, it has been working in the definition of a digital twin to be used for building assessment purposes [16].

Image 2: Paragraph of the introduction of CWA 18304

The call for experts was a great success and many organizations not related to CHRONICLE found the proposal useful and decided to join the workshop. The organizations which submitted the form to participate in the drafting were:

The call for experts was a great success and many organizations not related to CHRONICLE found the proposal useful and decided to join the workshop. The organizations which submitted the form to participate in the drafting were:

- 1) Fundación CIRCE, Spain. Convenor: Miguel Gómez (member of CHRONICLE)
- 2) Asociación Española de Normalización (UNE), Spain. Secretariat: Aitor Aragón (member of CHRONICLE).
- 3) Association Française de Normalisation (AFNOR), France
- 4) Council for Aluminium in Building, United Kingdom.
- 5) Comitato Termotecnico Italiano (CTI), Italy.
- 6) Energie d'Architettura, Italy.
- 7) Environmental Coalition on Standards, Belgium.
- 8) Federation of European heating, ventilation and air conditioning associations (REHVA).
- 9) FederlegnoArredo, Italy.
- 10) Frederick University, Cyprus.
- 11) Geonardo Environmental Technologies, Hungary.
- 12) Green Building Council España (GBCE), Spain.
- 13) Hive Power, Switzerland.
- 14) Kaunas University of Technology, Lithuania.
- 15) Kone Industrial, Italy.
- 16) L'Union des Architectes (UNSFA), France.
- 17) Madaster, Germany.
- 18) METLEN Energy&Metals, Greece.
- 19) Polytechnic University of Castelo Branco, Portugal.
- 20) QUALIBAT, France.
- 21) Que Technologies, Greece.

- 22) R2M Solution Spain, Spain.
- 23) SNFA, France.
- 24) Svenskt Trä, Sweden.
- 25) Wienerberger, Austria.

The public commenting stage was launched on June 2025 until August 2025, making the [draft](#) available in CEN/CENELEC website (CEN/CENELEC, s.f.). The commenting period was circulated to some technical committees, such as CEN/TC 169 (document N2226 is included in the supporting material).

The last meeting took place on 2025-09-18 and the final draft was approved. However, the group approved to wait until the approval of FprEN 15978 before publishing the CWA, to ensure full alignment between both documents. The new version of EN 15978 (Formal Vote) was finally approved on 2025-10-23 and UNE launched the procedures for the publication of the CWA after that date.

CWA 18304:2025 (CEN/CENELEC, 2025) was approved (and made available online, free of charge) on 2025-11-12.

5.3. CEN/TC 371

Operational rating can be defined as classification of the energy performance based on measured amounts of delivered and exported energy in a building. The energy “metric” of a building is not obtained through calculations based on the design, but with the measurement of the actual energy consumption of the building unit using sensors, meters and IoT. Operational rating has two main characteristics:

- It delivers much more specific data, as the classification is conducted based on the actual energy consumption of the building and not with the use of standard data sets.
- It requires the use of special equipment and smart meters, which in most existing buildings in the Union are not yet available.

Operational rating can be considered as a complement to current EPCs (Energy Performance Certificates).

CHRONICLE actively participated in CEN/TC 371/WG 5. This WG was a proposal from a previous EU-funded research project, D²EPC (GA 892984). CHRONICLE and SmartLiving EPC continued the work of D²EPC and a handover event was held on September 2023 (CHRONICLE, 2023).

A **proposal for a new standard** was prepared in 2025 and presented under the title “Energy Performance of Buildings — Operational rating — Requirements for assessing operational rating”. The scope covers the requirements and methodologies for assessing the operational energy performance of buildings, by standardizing the process of calculating and reporting considering the actual operating conditions. The document should include data collection strategies; data analysis and validation; calculation

procedures; reporting requirements; and correction factors based on occupancy, climate conditions, and levels of service.

The proposal was approved on 8 December 2025. This project will be drafted during 2026.

5.4. CEN/TC 442/WG 12

The new CPR (European Union, 2024) requires the digitalization of the performance characteristics of products covered by a harmonized standard, as described in 3.3.3. The declaration of performance and conformity (DoPC) will now include additional information related to the product's environmental sustainability performance over its life-cycle and the new tests related to the release of dangerous substances to ground, water and air.

*Whereas (46) of the new CPR explicitly states that **digital technologies, which provide a significant potential for reducing administrative burden and costs for economic operators and authorities, while also fostering innovative and new business opportunities and models, are evolving at rapid pace. The uptake of digital technologies will also contribute significantly towards achieving the objectives of the Renovation Wave, including energy efficiency, life cycle assessments and monitoring and of the building stock.***

UNE presented, in 2024, a proposal to develop a new horizontal standard establishing the common data structure for this digital DoPC. CEN/TC 442/12 approved the creation of a new WG 12 to perform this task and Aitor Aragón (UNE and member of CHRONICLE) is the Secretariat. The proposal was the preliminary WI for the European standard 'Declaration of performance and conformity (DoPC) of construction products. Methodology, general requirements and criteria to develop data templates'. **The proposal included an explicit reference to CHRONICLE** (the full document is provided as supporting material):

*This document also considers the results of related studies covering the application of product data at building level, like the research projects **CHRONICLE (GA 101033778)** and **CIRPASS 2 (GA 101158775)**.*

The future standard is currently under development, and the Enquiry ballot should be launched in the first quarter of 2026.

This standard should have a strong impact on the digitalization of the construction value chain, and will be used for the digitalization annex of future harmonized standards.

5.5. A summary of the participation from CHRONICLE's partners

CHRONICLE's partners have participated in several standardization groups, including the Workshop on the Carbon bill of the refurbishment of buildings. These activities are summarized below.

CIRCE, has participated in the standardization activities, leading the development of the CEN Workshop Agreement (see 5.2). In particular, Miguel Gómez was the Convenor (coordinator) of the workshop for the carbon bill of the refurbishment of buildings. CIRCE has also participated in CEN/TC 371/WG 5 meetings to align the proposed European standard (see 5.3) with CHRONICLE's activities.

KTU has participated in standardization committees at national, European and international levels:

Membership in the technical committees of European and international standardization organizations: ISO/TC 163 – Thermal performance and energy use in the built environment (observer), and CEN/TC 371 – Energy performance of buildings (member).

Participation of technical committee representatives in European and international standardization organization working groups: CEN/TC 371/WG 5 – Operational rating of energy performance of buildings.

Prof. Dr. Andrius Jurelionis (KTU) is the Chairman of the Technical Committee LST TK 96 “Energy Performance of Buildings.” The scope of the Committee's activities covers standardization in the field of construction and civil engineering works, with the aim of developing systems, guidelines, supporting tools, and requirements to ensure the energy performance of buildings throughout their entire life cycle.

R2M has actively contributed to standardization activities, particularly in relation to the CWA on the “Carbon bill of the refurbishment of buildings” and in the openDBL conference in May 2025. The team has participated in the dedicated workshops, provided feedback on the draft versions, and reviewed the technical document to ensure consistency with CHRONICLE's approaches and results. This involvement has helped align the project's developments with emerging European guidelines for the quantification of carbon emissions in building refurbishment processes, thereby facilitating their future adoption by stakeholders in the sector.

Although the main involvements are specifically mentioned other CHRONICLE partners had varying involvement in the activities.

The participation of **UNE** is described in the subclauses above, including the Secretariat of:

Workshop for the carbon bill of the refurbishment of buildings (see 5.2 **Error! Reference source not found.**).

- CEN/TC 371/WG 5 for the assessment of the operational energy performance of buildings (see 5.3).
- CEN/TC 442/WG 9 for digital twins in the built environment (see 4.4.5).
- CEN/TC 442/WG 12 for the digitalization of performance characteristics of construction products (see 4.4.3 and 5.4).

The participation of UNE in other committees, such as CEN/TC 350, is 4.4.2.

5.6. Research publications

5.6.1. Introduction

CHRONICLE has actively participated in research activities. This deliverable highlights those related to standardization and policies.

Integration of environmental information in IFC

Title: Bridging interoperability gaps between LCA and BIM: analysis of limitations for the integration of EPD data in IFC (Aragón, Spudys, Pupeikis, Nieto, & Alberti, 2025).

Journal: [Buildings \(MDPI\)](https://doi.org/10.3390/buildings15152760). CiteScore of 4.4 (ranked 24/203 on Architecture, percentile 88%), Impact Factor of 3.1 (ranked 31/95 on Construction & building technology, percentile 68%), SJR 2024 of 0.652, and SNIP 2024 of 1.059.

Authors: Aitor Aragón (UNE), Paulius Spudys (KTU), Darius Pupeikis (KTU), Óscar Nieto and Marcos García Alberti.

Summary: This paper analyses the limitations of the current IFC schema (IFC 4.3 ADD2, published as EN ISO 16739-1:2024) related to machine interpretation of LCA-based environmental information. The research is founded on a comprehensive review of the scientific literature and standards, an analysis of published digital EPDs and IFC 4.3. The results were tested in one of the building pilots of the EU-funded project CHRONICLE. The results include concrete improvements to be implemented in the current IFC schema. This paper is based on a previous study on the common limitations of digital EPDs (Aragón & Alberti, Limitations of machine-interpretability of digital EPDs used for a BIM-based sustainability assessment of construction assets, 2024).



Image 3: Frontpage of the paper on IFC

Date of publication: 5th of August 2025.

License: Creative Commons CC-BY.

DOI: <https://doi.org/10.3390/buildings15152760>

UNE and KTU participated in this paper. The full document is included as additional information to this deliverable.

This paper was presented to the working group in charge of ISO 22057 (ISO/TC 59/SC 17/WG 5) on 2025-10-07. A reference was also published by buildingSMART Spain: <https://www.buildingsmart.es/2025/10/02/transferencia-de-la-informaci%C3%B3n-de-las-declaraciones-ambientales-de-producto-dap-a-ifc/>

5.6.2. Digital twins

Title of the paper: Seeking a definition of digital twins for construction and infrastructure management (Aragón, y otros, 2025).

Journal: [Applied Sciences \(MDPI\)](#). 5.5 of CiteScore and 2.5 of Impact Factor .

Authors: Aitor Aragón (UNE), Mathieu Arquier, Onur Behzat Tokdemir, Alejandro Enfedaque, Marcos García Alberti, Fabien Lieval, Eduard Loscos, Rubén Muñoz Pavón, Dan Marius Novischi, Pablo Vicente Legazpi, Ángel Yagüe.

Summary: This paper explores the definition of “digital twin” (DTw) used by IT companies, industry and in international standards. The research included the analysis of the evolution of technologies preceding DTw, including a detailed description of the various platforms used to manage the data. The paper discusses the benefits and challenges for the actual use of DTw, based on several case studies. CHRONICLE participated in the study providing information related to the standardization of digital twins in the built environment.



Image 4: Frontpage of the paper on ISO 22057

Date of publication: 4th of February 2025.

License: Creative Commons CC-BY.

DOI: <https://doi.org/10.3390/app15031557>

UNE participated in this paper. The full document is included as additional information to this deliverable.

6. Dissemination activities

6.1. General

UNE has conducted several dissemination activities related to standardization and policies related to CHRONICLE. These activities have been coordinated with other partners. Some of these events are described below.

UNE also presented CHRONICLE to several Spanish standardization committees and, in particular, CTN-UNE, Spanish mirror committee of CEN/TC 371 (see 5.3).

Workshops and presentations to stakeholders

6.2. CHRONICLE's final event at ENLIT

Date and location: 18-20 November 2025, Bilbao Exhibition Centre in Bilbao.

Hosted by ENLIT Europe.

CHRONICLE's participation: Miguel Gómez (CIRCE), the Convenor of the CEN Workshop on the carbon bill of the refurbishment of buildings, presented the recently published CWA 18304:2024 (see 5.2).

Website of the event: <https://www.chronicle-project.eu/2025/09/23/chronicle-final-event-at-enlit/>



Image 5: Picture of CHRONICLE's presentation at ENLIT

6.3. Workshop “Sustainability of buildings and transport infrastructures”

Date and location: 11 November 2025, UNE headquarters in Madrid. Hybrid.

Hosted by UNE and sponsored by CIRCE, both members of CHRONICLE.

CHRONICLE’s participation: Miguel Gómez, Convenor of the CEN Workshop “Carbon bill” and Technical Manager of Fundación CIRCE, described the development of the CWA for the calculation of the carbon bill of the refurbishment of buildings (see 5.2).

The presentation is included in the supporting documentation.

Website of the event: <https://www.une.org/la-asociacion/eventos/encuentro-une-sostenibilidad-edificios-infraestructura-transporte>

Reference in CHRONICLE’s website: <https://www.chronicle-project.eu/2025/10/31/event-sustainability-of-buildings-and-transport-infrastructures/>



Image 6: Picture of the workshop

6.4. General Assembly of the “Conseil Européen des Economistes de la Construction (CEEC)”

Date and location: 9 May 2025, Chamber of Technical Architects of Madrid.

Hosted by the Chamber of Technical Architects of Madrid.

CHRONICLE’s participation: Aitor Aragón (UNE) presented the European standards related to the calculation of the Global Warming Potential (GWP) of buildings. It included the activities related to the CWA (see 5.2).

The presentation is included in the supporting documentation.



Image 7: Picture of CEEC's General Assembly

6.5. Integrating research in standardization

Date and location: 12 December 2024. CCMC headquarters at Brussels. Hybrid.

CHRONICLE's participation: Aitor Aragón (UNE) presented application of standardization within EU-funded research activities. CHRONICLE was mentioned as one of the examples. The presentation will be provided as supporting documentation.

Website of the event: <https://www.youtube.com/watch?v=z8j6EYrXvs4>

6.6. Online Workshop on Standardization of EPCs

Date and location: 28 September 2023. Online.

Hosted by CHRONICLE and D²EPC.

CHRONICLE's participation: Aitor Aragón (UNE) presented the transfer the standardization activities from a previous project, D²EPC, to CHRONICLE. These activities were related to the standardization of operational EPCs and, in particular, CEN/TC 371/WG 5 (see 5.3).

Website of the event: <https://www.chronicle-project.eu/2023/09/20/workshop-on-standardisation-of-epcs-28-sept/>

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ANNEX A: Standardization references provided in January 2023

A.1 Introduction

This annex provides the first selection of European and international standardisation documents, both published and under development, circulated within Chronicle in January 2023. The goal of this selection was to:

- Gather feedback from the partners to identify gaps in the selection, to improve the list of groups and documents.
- Provide technical information to be used in other WP and tasks.
- Guide in the standardisation approach of the results of Chronicle.

A.2. International standardisation documents

The following tables contains the international standards and projects related with Chronicle.

Table A.1: International standardisation published documents

Code	Title	Committee
ISO/IEC 10165-1:1993	Information technology — Open Systems Interconnection — Management Information Services — Structure of management information: Management Information Model	ISO/IEC JTC 1
ISO/IEC 10165-2:1992	Information technology — Open Systems Interconnection — Structure of management information: Definition of management information	ISO/IEC JTC 1
ISO/IEC 24643:2020	Architecture for a distributed real-time access system	ISO/IEC JTC 1
ISO/IEC 14762:2009	Information technology — Functional safety requirements for Home and Building Electronic Systems (HBES)	ISO/IEC JTC 1/SC 25
ISO/IEC TR 14543-4:2002	Information technology — Home Electronic System (HES) architecture — Part 4: Home and building automation in a mixed-use building	ISO/IEC JTC 1/SC 25

Code	Title	Committee
ISO/IEC TR 15044:2000	Information technology — Terminology for the Home Electronic System (HES)	ISO/IEC JTC 1/SC 25
ISO/IEC TR 29108:2013	Information technology — Terminology for intelligent homes	ISO/IEC JTC 1/SC 25
ISO/IEC 27001:2022	Information security, cybersecurity and privacy protection — Information security management systems — Requirements	ISO/IEC JTC 1/SC 27
ISO/IEC 27400:2022	Cybersecurity — IoT security and privacy — Guidelines	ISO/IEC JTC 1/SC 27
ISO/IEC 27555:2021	Information security, cybersecurity and privacy protection — Guidelines on personally identifiable information deletion	ISO/IEC JTC 1/SC 27
ISO/IEC TS 27570:2021	Privacy protection — Privacy guidelines for smart cities	ISO/IEC JTC 1/SC 27
ISO/IEC 22603-1:2021	Information technology — Digital representation of product information — Part 1: General requirements	ISO/IEC JTC 1/SC 31
ISO/IEC 19637:2016	Information technology — Sensor network testing framework	ISO/IEC JTC 1/SC 41
ISO/IEC 20005:2013	Information technology — Sensor networks — Services and interfaces supporting collaborative information processing in intelligent sensor networks	ISO/IEC JTC 1/SC 41
ISO/IEC 20924:2021	Information technology — Internet of Things (IoT) — Vocabulary	ISO/IEC JTC 1/SC 41
ISO/IEC 21823-1:2019	Internet of things (IoT) — Interoperability for IoT systems — Part 1: Framework	ISO/IEC JTC 1/SC 41
ISO/IEC 21823-2:2020	Internet of things (IoT) — Interoperability for IoT systems — Part 2: Transport interoperability	ISO/IEC JTC 1/SC 41
ISO/IEC 21823-3:2021	Internet of things (IoT) — Interoperability for IoT systems — Part 3: Semantic interoperability	ISO/IEC JTC 1/SC 41

Code	Title	Committee
ISO/IEC 21823-4:2022	Internet of things (IoT) — Interoperability for IoT systems — Part 4: Syntactic interoperability	ISO/IEC JTC 1/SC 41
ISO/IEC 29182-1:2013	Information technology — Sensor networks: Sensor Network Reference Architecture (SNRA) — Part 1: General overview and requirements	ISO/IEC JTC 1/SC 41
ISO/IEC 29182-2:2013	Information technology — Sensor networks: Sensor Network Reference Architecture (SNRA) — Part 2: Vocabulary and terminology	ISO/IEC JTC 1/SC 41
ISO/IEC 29182-3:2014	Information technology — Sensor networks: Sensor Network Reference Architecture (SNRA) — Part 3: Reference architecture views	ISO/IEC JTC 1/SC 41
ISO/IEC 29182-4:2013	Information technology — Sensor networks: Sensor Network Reference Architecture (SNRA) — Part 4: Entity models	ISO/IEC JTC 1/SC 41
ISO/IEC 29182-5:2013	Information technology — Sensor networks: Sensor Network Reference Architecture (SNRA) — Part 5: Interface definitions	ISO/IEC JTC 1/SC 41
ISO/IEC 29182-6:2014	Information technology — Sensor networks: Sensor Network Reference Architecture (SNRA) — Part 6: Applications	ISO/IEC JTC 1/SC 41
ISO/IEC 29182-7:2015	Information technology — Sensor networks: Sensor Network Reference Architecture (SNRA) — Part 7: Interoperability guidelines	ISO/IEC JTC 1/SC 41
ISO/IEC 30128:2014	Information technology — Sensor networks — Generic Sensor Network Application Interface	ISO/IEC JTC 1/SC 41
ISO/IEC 30141:2018	Internet of Things (IoT) — Reference Architecture	ISO/IEC JTC 1/SC 41
ISO/IEC 30161:2020	Internet of Things (IoT) — Requirements of IoT data exchange platform for various IoT services	ISO/IEC JTC 1/SC 41

Code	Title	Committee
ISO/IEC 30161-2 ED1	Internet of Things (IoT) – Data exchange platform for IoT services – Part 2: Transport interoperability between nodal points	ISO/IEC JTC 1/SC 41
ISO/IEC 30162:2022	Internet of Things (IoT) — Compatibility requirements and model for devices within industrial IoT systems	ISO/IEC JTC 1/SC 41
ISO/IEC 30162:2022 ED1	Internet of Things (IoT) - Compatibility requirements and model for devices within Industrial IoT systems	ISO/IEC JTC 1/SC 41
ISO/IEC 30163:2021	Internet of Things (IoT) — System requirements of IoT/SN technology-based integrated platform for chattel asset monitoring supporting financial services	ISO/IEC JTC 1/SC 41
ISO/IEC 30165:2021	Internet of Things (IoT) — Real-time IoT framework	ISO/IEC JTC 1/SC 41
ISO/IEC 30173 ED1	Digital Twin - Concepts and terminology	ISO/IEC JTC 1/SC 41
ISO/IEC 30178 ED1	Internet of Things (IoT) - Data format, value and coding	ISO/IEC JTC 1/SC 41
ISO/IEC 30179 ED1	Internet of Things (IoT) - Overview and general requirements of IoT system for ecological environment monitoring	ISO/IEC JTC 1/SC 41
ISO/IEC 30181 ED1	Internet of Things (IoT) – Functional architecture for resource ID interoperability	ISO/IEC JTC 1/SC 41
ISO/IEC TR 22417:2017	Information technology — Internet of things (IoT) use cases	ISO/IEC JTC 1/SC 41
ISO/IEC TR 30148:2019	Internet of Things (IoT) — Technical requirements and application of sensor network for wireless gas meters.	ISO/IEC JTC 1/SC 41
ISO/IEC TR 30166:2020	Internet of things (IoT) — Industrial IoT	ISO/IEC JTC 1/SC 41
ISO/IEC TR 30172 ED1	Digital Twin - Use cases	ISO/IEC JTC 1/SC 41

Code	Title	Committee
ISO/IEC TR 30174:2021	Internet of Things (IoT) — Socialized IoT system resembling human social interaction dynamics	ISO/IEC JTC 1/SC 41
ISO/IEC TR 30176:2021	Internet of Things (IoT) — Integration of IoT and DLT/blockchain: Use cases	ISO/IEC JTC 1/SC 41
ISO 12655:2013	Energy performance of buildings — Presentation of measured energy use of buildings	ISO/TC 163
ISO 17772-1:2017	Energy performance of buildings — Indoor environmental quality — Part 1: Indoor environmental input parameters for the design and assessment of energy performance of buildings	ISO/TC 163
ISO 18523-1:2016	Energy performance of buildings — Schedule and condition of building, zone and space usage for energy calculation — Part 1: Non-residential buildings	ISO/TC 163
ISO 18523-2:2018	Energy performance of buildings — Schedule and condition of building, zone and space usage for energy calculation — Part 2: Residential buildings	ISO/TC 163
ISO 24144:2023	Thermal insulation — Test methods for specific heat capacity of thermal insulation for buildings in the high temperature range — Differential scanning calorimetry (DSC) method	ISO/TC 163
ISO 7345:2018	Thermal performance of buildings and building components — Physical quantities and definitions	ISO/TC 163
ISO 9229:2020	Thermal insulation — Vocabulary	ISO/TC 163
ISO 12241:2022	Thermal insulation for building equipment and industrial installations — Calculation rules	ISO/TC 163/SC 2
ISO 12241:2022	Thermal insulation for building equipment and industrial installations — Calculation rules	ISO/TC 163/SC 2

Code	Title	Committee
ISO 13786:2017	Thermal performance of building components — Dynamic thermal characteristics — Calculation methods	ISO/TC 163/SC 2
ISO 15099:2003	Thermal performance of windows, doors and shading devices — Detailed calculations	ISO/TC 163/SC 2
ISO 6946:2017	Building components and building elements — Thermal resistance and thermal transmittance — Calculation methods	ISO/TC 163/SC 2
ISO 21105-1:2019	Performance of buildings — Building enclosure thermal performance verification and commissioning — Part 1: General requirements	ISO/TC 163/SC 3
ISO 10303-1:2021	Industrial automation systems and integration — Product data representation and exchange — Part 1: Overview and fundamental principles	ISO/TC 184/SC 4
ISO 10303-42:2019	Industrial automation systems and integration — Product data representation and exchange — Part 42: Integrated generic resource: Geometric and topological representation	ISO/TC 184/SC 4
ISO 10303-43:2018	Industrial automation systems and integration — Product data representation and exchange — Part 43: Integrated generic resource: Representation structures	ISO/TC 184/SC 4
ISO 10303-44:2019	Industrial automation systems and integration — Product data representation and exchange — Part 44: Integrated generic resource: Product structure configuration	ISO/TC 184/SC 4
ISO 10303-45:2019	Industrial automation systems and integration — Product data representation and exchange — Part 45: Integrated generic resource: Material and other engineering properties	ISO/TC 184/SC 4
ISO 15531-1:2004	Industrial automation systems and integration — Industrial manufacturing management data — Part 1: General overview	ISO/TC 184/SC 4

Code	Title	Committee
ISO 15531-31:2004	Industrial automation systems and integration — Industrial manufacturing management data — Part 31: Resource information model	ISO/TC 184/SC 4
ISO 15531-32:2005	Industrial automation systems and integration — Industrial manufacturing management data: Resources usage management — Part 32: Conceptual model for resources usage management data	ISO/TC 184/SC 4
ISO 15531-42:2005	Industrial automation systems and integration — Industrial manufacturing management data — Part 42: Time Model	ISO/TC 184/SC 4
ISO 23247-1:2021	Automation systems and integration — Digital twin framework for manufacturing — Part 1: Overview and general principles	ISO/TC 184/SC 4
ISO 23247-2:2021	Automation systems and integration — Digital twin framework for manufacturing — Part 2: Reference architecture	ISO/TC 184/SC 4
ISO 23247-3:2021	Automation systems and integration — Digital twin framework for manufacturing — Part 3: Digital representation of manufacturing elements	ISO/TC 184/SC 4
ISO 23247-4:2021	Automation systems and integration — Digital twin framework for manufacturing — Part 4: Information exchange	ISO/TC 184/SC 4
ISO 23952:2020	Automation systems and integration — Quality information framework (QIF) — An integrated model for manufacturing quality information	ISO/TC 184/SC 4
ISO/TR 18828-1:2018	Industrial automation systems and integration — Standardized procedures for production systems engineering — Part 1: Overview	ISO/TC 184/SC 4
ISO/TR 24463:2021	Digital validation by effective use of simulation	ISO/TC 184/SC 4
ISO/TR 24464:2020	Automation systems and integration — Industrial data — Visualization elements of digital twins	ISO/TC 184/SC 4

Code	Title	Committee
ISO/TS 29002- 10:2009	Industrial automation systems and integration — Exchange of characteristic data — Part 10: Characteristic data exchange format	ISO/TC 184/SC 4
ISO/TS 29002- 20:2010	Industrial automation systems and integration — Exchange of characteristic data — Part 20: Concept dictionary resolution services	ISO/TC 184/SC 4
ISO/TS 29002- 31:2009	Industrial automation systems and integration — Exchange of characteristic data — Part 31: Query for characteristic data	ISO/TC 184/SC 4
ISO/TS 29002- 4:2009	Industrial automation systems and integration — Exchange of characteristic data — Part 4: Basic entities and types	ISO/TC 184/SC 4
ISO/TS 29002- 5:2009	Industrial automation systems and integration — Exchange of characteristic data — Part 5: Identification scheme	ISO/TC 184/SC 4
ISO/TS 29002- 6:2010	Industrial automation systems and integration — Exchange of characteristic data — Part 6: Concept dictionary terminology reference model	ISO/TC 184/SC 4
ISO 20140- 1:2019	Automation systems and integration — Evaluating energy efficiency and other factors of manufacturing systems that influence the environment — Part 1: Overview and general principles	ISO/TC 184/SC 5
ISO 20140- 2:2018	Automation systems and integration — Evaluating energy efficiency and other factors of manufacturing systems that influence the environment — Part 2: Environmental performance evaluation process	ISO/TC 184/SC 5
ISO 20140- 3:2019	Automation systems and integration — Evaluating energy efficiency and other factors of manufacturing systems that influence the environment — Part 3: Environmental performance evaluation data aggregation process	ISO/TC 184/SC 5

Code	Title	Committee
ISO 20140-5:2017	Automation systems and integration — Evaluating energy efficiency and other factors of manufacturing systems that influence the environment — Part 5: Environmental performance evaluation data	ISO/TC 184/SC 5
ISO 16813:2006	Building environment design — Indoor environment — General principles	ISO/TC 205
ISO 16814:2008	Building environment design — Indoor air quality — Methods of expressing the quality of indoor air for human occupancy	ISO/TC 205
ISO 16817:2017	Building environment design — Indoor environment — Design process for the visual environment	ISO/TC 205
ISO 16818:2008	Building environment design — Energy efficiency — Terminology	ISO/TC 205
ISO 17800:2017	Facility smart grid information model	ISO/TC 205
ISO 19454:2019	Building environment design — Indoor environment — Daylight opening design for sustainability principles in visual environment	ISO/TC 205
ISO 23045:2008	Building environment design — Guidelines to assess energy efficiency of new buildings	ISO/TC 205
ISO 52031:2020	Energy performance of buildings — Method for calculation of system energy requirements and system efficiencies — Space emission systems (heating and cooling)	ISO/TC 205
ISO 52032-1:2022	Energy performance of buildings — Energy requirements and efficiencies of heating, cooling and domestic hot water (DHW) distribution systems — Part 1: Calculation procedures	ISO/TC 205
ISO/TR 16822:2016	Building environment design — List of test procedures for heating, ventilating, air-conditioning and domestic hot water equipment related to energy efficiency	ISO/TC 205

Code	Title	Committee
ISO/TS 23764:2021	Methodology for achieving non-residential zero-energy buildings (ZEBs)	ISO/TC 205
ISO 19104:2016	Geographic information — Terminology	ISO/TC 211
ISO 19150- 2:2015	Geographic information — Ontology — Part 2: Rules for developing ontologies in the Web Ontology Language (OWL)	ISO/TC 211
ISO 19150- 2:2015/Amd 1:2019	Geographic information — Ontology — Part 2: Rules for developing ontologies in the Web Ontology Language (OWL) — Amendment 1	ISO/TC 211
ISO 19150- 4:2019	Geographic information — Ontology — Part 4: Service ontology	ISO/TC 211
ISO/TS 19115- 3:2016	Geographic information — Metadata — Part 3: XML schema implementation for fundamental concepts	ISO/TC 211
ISO/TS 19150- 1:2012	Geographic information — Ontology — Part 1: Framework	ISO/TC 211
ISO/TS 19157- 2:2016	Geographic information — Data quality — Part 2: XML schema implementation	ISO/TC 211
ISO/TS 19158:2012	Geographic information — Quality assurance of data supply	ISO/TC 211
ISO/TS 19166:2021	Geographic information — BIM to GIS conceptual mapping (B2GM)	ISO/TC 211
ISO 37100:2016	Sustainable cities and communities — Vocabulary	ISO/TC 268
ISO 37105:2019	Sustainable cities and communities — Descriptive framework for cities and communities	ISO/TC 268
ISO 37106:2021	Sustainable cities and communities — Guidance on establishing smart city operating models for sustainable communities	ISO/TC 268

Code	Title	Committee
ISO 37110:2022	Sustainable cities and communities — Management requirements and recommendations for open data for smart cities and communities — Overview and general principles	ISO/TC 268
ISO 37122:2019	Sustainable cities and communities — Indicators for smart cities	ISO/TC 268
ISO 37156:2020	Smart community infrastructures — Guidelines on data exchange and sharing for smart community infrastructures	ISO/TC 268/SC 1
ISO 37160:2020	Smart community infrastructure — Electric power infrastructure — Measurement methods for the quality of thermal power infrastructure and requirements for plant operations and management	ISO/TC 268/SC 1
ISO/TR 37152:2016	Smart community infrastructures — Common framework for development and operation	ISO/TC 268/SC 1
ISO/TS 37151:2015	Smart community infrastructures — Principles and requirements for performance metrics	ISO/TC 268/SC 1
ISO/TS 37172:2022	Smart community infrastructures — Data exchange and sharing for community infrastructures based on geographic information	ISO/TC 268/SC 1
ISO 22263:2008	Organization of information about construction works — Framework for management of project information	ISO/TC 59/SC 13
ISO/TR 23262:2021	GIS (geospatial) / BIM interoperability	ISO/TC 59/SC 13
ISO/TS 12911:2012	Framework for building information modelling (BIM) guidance	ISO/TC 59/SC 13
ISO 15686-1:2011	Buildings and constructed assets — Service life planning — Part 1: General principles and framework	ISO/TC 59/SC 14

Code	Title	Committee
ISO 15686-4:2014	Building Construction — Service Life Planning — Part 4: Service Life Planning using Building Information Modelling	ISO/TC 59/SC 14
ISO 15686-5:2017	Buildings and constructed assets — Service life planning — Part 5: Life-cycle costing	ISO/TC 59/SC 14
ISO 15928-5:2013	Houses — Description of performance — Part 5: Operating energy	ISO/TC 59/SC 15
ISO 15392:2019	Sustainability in buildings and civil engineering works — General principles	ISO/TC 59/SC 17
ISO 16745-1:2017	Sustainability in buildings and civil engineering works — Carbon metric of an existing building during use stage — Part 1: Calculation, reporting and communication	ISO/TC 59/SC 17
ISO 21678:2020	Sustainability in buildings and civil engineering works — Indicators and benchmarks — Principles, requirements and guidelines	ISO/TC 59/SC 17
ISO 21929-1:2011	Sustainability in building construction — Sustainability indicators — Part 1: Framework for the development of indicators and a core set of indicators for buildings	ISO/TC 59/SC 17
ISO 21931-1:2022	Sustainability in buildings and civil engineering works — Framework for methods of assessment of the environmental, social and economic performance of construction works as a basis for sustainability assessment — Part 1: Buildings	ISO/TC 59/SC 17
ISO 6707-1:2020	Buildings and civil engineering works — Vocabulary — Part 1: General terms	ISO/TC 59/SC 2
ISO 6707-3:2017	Buildings and civil engineering works — Vocabulary — Part 3: Sustainability terms	ISO/TC 59/SC 2
ISO 6707-4:2021	Buildings and civil engineering works — Vocabulary — Part 4: Facility management terms	ISO/TC 59/SC 2

Table A.2: International standardisation documents under development (in January 2023)

Reference	Title	Drafting body
ISO/IEC CD 5087-2	Information technology — City data model — Part 2: City level concepts	ISO/IEC JTC 1
ISO/IEC DIS 17917	Smart cities — Guidance to establishing a decision-making framework for sharing data and information services	ISO/IEC JTC 1
ISO/IEC PWI 5217	Guidance on smart city digital infrastructure design	ISO/IEC JTC 1
ISO/IEC PWI TS 10267-3	Information technology—Data use in smart cities — Part 3: Measurement, evaluation and reporting	ISO/IEC JTC 1
ISO/IEC 27005:202 2	Information security, cybersecurity and privacy protection — Guidance on managing information security risks	ISO/IEC JTC 1/SC 27
ISO/IEC CD 27031	Information technology — Cybersecurity — Information and communication technology readiness for business continuity	ISO/IEC JTC 1/SC 27
ISO/IEC CD 27402.2	Cybersecurity — IoT security and privacy — Device baseline requirements	ISO/IEC JTC 1/SC 27
ISO/IEC CD 27403.2	Cybersecurity – IoT security and privacy – Guidelines for IoT-domotics	ISO/IEC JTC 1/SC 27
ISO/IEC DIS 27032	Cybersecurity — Guidelines for Internet security	ISO/IEC JTC 1/SC 27
ISO/IEC AWI 30149	Internet of things (IoT) — Trustworthiness framework	ISO/IEC JTC 1/SC 41
ISO/IEC AWI 30172	Digital Twin — Use cases	ISO/IEC JTC 1/SC 41

Reference	Title	Drafting body
ISO/IEC AWI 30173	Digital twin — Concepts and terminology	ISO/IEC JTC 1/SC 41
PWI JTC1-SC41-7	Digital Twin – Maturity model	ISO/IEC JTC 1/SC 41
PWI TR JTC1-SC41-11	Digital Twin - Correspondence measure of DT twinning	ISO/IEC JTC 1/SC 41
ISO/PWI 52007-1	Energy performance of buildings — Indoor environmental quality — Part 1: Indoor environmental input parameters for the design and assessment of energy performance of buildings	ISO/TC 163
ISO/AWI 8000-2	Data quality — Part 2: Vocabulary	ISO/TC 184/SC 4
ISO/AWI 8000-210	Data quality — Part 210: Part 210: Sensor data: Data quality characteristics	ISO/TC 184/SC 4
ISO/NP 8000-200	Data quality — Part 200: Transaction data: Quality of transaction data	ISO/TC 184/SC 4
ISO/PWI TR 4758	Ontology for geometry and topology	ISO/TC 184/SC 4
ISO/CD 20140-5	Automation systems and integration — Evaluating energy efficiency and other factors of manufacturing systems that influence the environment — Part 5: Environmental performance evaluation data	ISO/TC 184/SC 5
ISO/PWI 16518	Cooperative digital networking for manufacturing software systems	ISO/TC 184/SC 5
ISO/AWI TR 5242	Technical analysis for a new perspective on thermal comfort	ISO/TC 205
ISO/PWI 20734	Building environment design — Daylighting design procedure for indoor visual environment	ISO/TC 205
ISO/PWI 24359-1	Building commissioning process planning — Part 1: New buildings	ISO/TC 205

Reference	Title	Drafting body
ISO/WD 16813	Building environment design — Indoor environment — General principles	ISO/TC 205
ISO/WD TR 5863	Integrative design of the building envelope — General principles	ISO/TC 205
ISO/PWI 19171	Geographic information — Handling urban objects in smart cities	ISO/TC 211
ISO/PWI TR 37115	Sustainable cities and communities — Use Cases on Lower-Carbon Emission Cities	ISO/TC 268
ISO 37170:2022	Smart community infrastructures — Data framework for infrastructure governance based on digital technology in smart cities	ISO/TC 268/SC 1
ISO/AWI 37151	Smart community infrastructures — Principles and requirements for performance metrics	ISO/TC 268/SC 1
ISO/CD 37173	Smart city infrastructure — Development guidelines for information-based system of smart building	ISO/TC 268/SC 1
ISO/PWI 37185	Smart community infrastructures — Requirements for credible supply and use of renewable energy	ISO/TC 268/SC 1
ISO 12911 (to be published in February, 2023)	Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) — Framework for specification of building information modelling (BIM) implementation	ISO/TC 59/SC 13
ISO/AWI TR 16214	Geospatial and BIM review of vocabularies	ISO/TC 59/SC 13
ISO/DIS 7817	Building information modelling — Level of information need — Concepts and principles	ISO/TC 59/SC 13
ISO/NP 16757-4	Product Data for Building Services System Models — Part 4: Dictionaries for product catalogues	ISO/TC 59/SC 13

Reference	Title	Drafting body
ISO/NP 16757-5	Product Data for Building Services System Models — Part 5: Product catalogue exchange format	ISO/TC 59/SC 13
ISO/PWI 15686-4	Building Construction — Service Life Planning — Part 4: Service Life Planning using Building Information Modelling	ISO/TC 59/SC 14
ISO/FDIS 15928-6	Houses — Description of performance — Part 6: Sustainable development contributions	ISO/TC 59/SC 15
ISO/PRF 21928-2	Sustainability in buildings and civil engineering works — Sustainability indicators — Part 2: Framework for the development of indicators for civil engineering works	ISO/TC 59/SC 17
ISO 6707-3:2022	Buildings and civil engineering works — Vocabulary — Part 3: Sustainability terms	ISO/TC 59/SC 2

A.2. European standardisation documents

The following tables contains the European standards and projects related with Chronicle.

Table A.3: European standardisation published documents

Reference	Title	Committee
EN 16247-5:2015	Energy audits - Part 5: Competence of energy auditors	CEN/CLC/JTC 14
EN 17267:2019	Energy measurement and monitoring plan - Design and implementation - Principles for energy data collection	CEN/CLC/JTC 14
EN 16247-1:2022	Energy audits - Part 1: General requirements	CEN/CLC/JTC 14
EN 16247-2:2022	Energy audits - Part 2: Buildings	CEN/CLC/JTC 14
EN 15900:2010	Energy efficiency services - Definitions and requirements	CEN/CLC/JWG 3

Reference	Title	Committee
EN 16212:2012	Energy Efficiency and Savings Calculation, Top-down and Bottom-up Methods	CEN/CLC/JWG 3
EN 16798-13:2017	Energy performance of buildings - Ventilation for buildings - Part 13: Calculation of cooling systems (Module M4-8) - Generation	CEN/TC 156
EN 16798-15:2017	Energy performance of buildings - Ventilation for buildings - Part 15: Calculation of cooling systems (Module M4-7) - Storage	CEN/TC 156
EN 16798-17:2017	Energy performance of buildings - Ventilation for buildings - Part 17: Guidelines for inspection of ventilation and air conditioning systems (Module M4-11, M5-11, M6-11, M7-11)	CEN/TC 156
EN 16798-3:2017	Energy performance of buildings - Ventilation for buildings - Part 3: For non-residential buildings - Performance requirements for ventilation and room-conditioning systems (Modules M5-1, M5-4)	CEN/TC 156
EN 16798-5-1:2017	Energy performance of buildings - Ventilation for buildings - Part 5-1: Calculation methods for energy requirements of ventilation and air conditioning systems (Modules M5-6, M5-8, M6-5, M6-8, M7-5, M7-8) - Method 1: Distribution and generation	CEN/TC 156
EN 16798-5-2:2017	Energy performance of buildings - Ventilation for buildings - Part 5-2: Calculation methods for energy requirements of ventilation systems (Modules M5-6, M5-8, M6-5, M6-8, M7-5, M7-8) - Method 2: Distribution and generation	CEN/TC 156

Reference	Title	Committee
EN 16798-7:2017	Energy performance of buildings - Ventilation for buildings - Part 7: Calculation methods for the determination of air flow rates in buildings including infiltration (Modules M5-5)	CEN/TC 156
EN 16798-9:2017	Energy performance of buildings - Ventilation for buildings - Part 9: Calculation methods for energy requirements of cooling systems (Modules M4-1, M4-4, M4-9) - General	CEN/TC 156
EN 15193-1:2017+A1:2021	Energy performance of buildings - Energy requirements for lighting - Part 1: Specifications, Module M9	CEN/TC 169
CEN/TR 12831-2:2017	Energy performance of buildings - Method for calculation of the design heat load - Part 2: Explanation and justification of EN 12831-1, Module M3-3	CEN/TC 228
CEN/TR 12831-4:2017	Energy performance of buildings - Method for calculation of the design heat load - Part 4: Explanation and justification of EN 12831-3, Module M8-2, M8-3	CEN/TC 228
EN 12831-1:2017	Energy performance of buildings - Method for calculation of the design heat load - Part 1: Space heating load, Module M3-3	CEN/TC 228
EN 12831-3:2017	Energy performance of buildings - Method for calculation of the design heat load - Part 3: Domestic hot water systems heat load and characterisation of needs, Module M8-2, M8-3	CEN/TC 228
EN 15316-1:2017	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 1: General and Energy performance expression, Module M3-1, M3-4, M3-9, M8-1, M8-4	CEN/TC 228

Reference	Title	Committee
EN 15316-2:2017	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 2: Space emission systems (heating and cooling), Module M3-5, M4-5	CEN/TC 228
EN 15316-3:2017	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 3: Space distribution systems (DHW, heating and cooling), Module M3-6, M4-6, M8-6	CEN/TC 228
EN 15316-4-1:2017	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-1: Space heating and DHW generation systems, combustion systems (boilers, biomass), Module M3-8-1, M8-8-1	CEN/TC 228
EN 15316-4-10:2017	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-10: Wind power generation systems, Module M11-8-7	CEN/TC 228
EN 15316-4-2:2017	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-2: Space heating generation systems, heat pump systems, Module M3-8-2, M8-8-2	CEN/TC 228
EN 15316-4-2:2017/AC:2017	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-2: Space heating generation systems, heat pump systems, Module M3-8-2, M8-8-2	CEN/TC 228
EN 15316-4-3:2017	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-3: Heat generation systems, thermal solar and photovoltaic systems, Module M3-8-3, M8-8-3, M11-8-3	CEN/TC 228

Reference	Title	Committee
EN 15316-4-4:2017	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-4: Heat generation systems, building-integrated cogeneration systems, Module M8-3-4, M8-8-4, M8-11-4	CEN/TC 228
EN 15316-4-5:2017	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-5: District heating and cooling, Module M3-8-5, M4-8-5, M8-8-5, M11-8-5	CEN/TC 228
EN 15316-4-8:2017	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-8: Space heating generation systems, air heating and overhead radiant heating systems, including stoves (local), Module M3-8-8	CEN/TC 228
EN 15316-5:2017	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 5: Space heating and DHW storage systems (not cooling), Module M3-7, M8-7	CEN/TC 228
EN 15378-1:2017	Energy performance of buildings - Heating systems and DHW in buildings - Part 1: Inspection of boilers, heating systems and DHW, Module M3-11, M8-11	CEN/TC 228
EN 15378-3:2017	Energy performance of buildings - Heating and DHW systems in buildings - Part 3: Measured energy performance, Module M3-10, M8-10	CEN/TC 228
EN 15459-1:2017	Energy performance of buildings - Economic evaluation procedure for energy systems in buildings - Part 1: Calculation procedures, Module M1-14	CEN/TC 228

Reference	Title	Committee
CEN ISO/TR 52120-2:2022	Energy performance of buildings - Contribution of building automation, controls and building management - Part 2: Explanation and justification of ISO 52120-1 (ISO/TR 52120-2:2021)	CEN/TC 247
CEN ISO/TR 52127-2:2021	Energy performance of buildings - Building automation, controls and building management - Part 2: Explanation and justification of ISO 52127-1 (ISO/TR 52127-2:2021)	CEN/TC 247
CEN/TR 12098-6:2016	Controls for heating systems - Part 6: Accompanying TR prEN 12098-1:2015 - Modules M3-5,6,7,8	CEN/TC 247
CEN/TR 12098-7:2016	Controls for heating systems - Part 7: Accompanying TR prEN 12098-3:2015 - Modules M3-5,6,7,8	CEN/TC 247
CEN/TR 12098-8:2016	Controls for heating systems - Part 8: Accompanying TR prEN 12098-5:2015 - Modules M3-5,6,7,8	CEN/TC 247
CEN/TR 15500-2:2016	Energy Performance of Buildings - Control for heating, ventilating and air-conditioning applications - Part 2: Accompanying TR prEN 15500-1:2015 - Modules M3-5,M4-5,M5-5	CEN/TC 247
CEN/TR 16946-2:2016	Energy Performance of Buildings - Inspection of Building Automation, Controls and Technical Building Management - Part 2: Accompanying TR prEN 16946-1:2015 - Modules M10-11	CEN/TC 247
EN 12098-5:2017	Energy Performance of Buildings - Controls for heating systems - Part 5: Start-stop schedulers for heating systems - Modules M3-5,6,7,8	CEN/TC 247

Reference	Title	Committee
EN 15500-1:2017	Energy Performance of Buildings - Control for heating, ventilating and air conditioning applications - Part 1: Electronic individual zone control equipment - Modules M3-5, M4-5, M5-5	CEN/TC 247
EN 16946-1:2017	Energy Performance of Buildings - Inspection of Automation, Controls and Technical Building Management - Part 1: Module M10-11	CEN/TC 247
EN 17609:2022	Building automation and control systems - Control applications	CEN/TC 247
EN ISO 52120-1:2022	Energy performance of buildings - Contribution of building automation, controls and building management - Part 1: General framework and procedures (ISO 52120-1:2021)	CEN/TC 247
EN ISO 52127-1:2021	Energy performance of buildings - Building management system - Part 1: Module M10-12 (ISO 52127-1: 2021)	CEN/TC 247
CEN/TR 12098-6:2022	Energy performance of buildings - Controls for heating systems - Part 6: Accompanying TR EN 12098-1:2022 - Modules M3-5,6,7,8	CEN/TC 247
CEN/TR 12098-7:2022	Energy performance of buildings - Controls for heating systems - Part 7: Accompanying TR EN 12098-3:2022 - Modules M3-5,6,7,8	CEN/TC 247
EN 12098-1:2022	Energy performance of buildings - Controls for heating systems - Part 1: Control equipment for hot water heating systems - Modules M3-5, 6, 7, 8	CEN/TC 247
EN 12098-3:2022	Energy performance of buildings - Controls for heating systems - Part 3: Control equipment for electrical heating systems - Modules M3-5,6,7,8	CEN/TC 247
EN 16883:2017	Conservation of cultural heritage - Guidelines for improving the energy performance of historic buildings	CEN/TC 346

Reference	Title	Committee
CEN/TR 15941:2010	Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data	CEN/TC 350
CEN/TR 16970:2016	Sustainability of construction works - Guidance for the implementation of EN 15804	CEN/TC 350
CEN/TR 17005:2016	Sustainability of construction works - Additional environmental impact categories and indicators - Background information and possibilities - Evaluation of the possibility of adding environmental impact categories and related indicators and calculation methods for the assessment of the environmental performance of buildings	CEN/TC 350
EN 15643:2021	Sustainability of construction works - Framework for assessment of buildings and civil engineering works	CEN/TC 350
EN 15804:2012+A2: 2019	Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products	CEN/TC 350
EN 15942:2021	Sustainability of construction works - Environmental product declarations - Communication format business-to-business	CEN/TC 350
EN 15978:2011	Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method	CEN/TC 350
EN 16309:2014+A1: 2014	Sustainability of construction works - Assessment of social performance of buildings - Calculation methodology	CEN/TC 350
EN 16627:2015	Sustainability of construction works - Assessment of economic performance of buildings - Calculation methods	CEN/TC 350

Reference	Title	Committee
EN 17472:2022	Sustainability of construction works - Sustainability assessment of civil engineering works - Calculation methods	CEN/TC 350
EN ISO 22057:2022	Sustainability in buildings and civil engineering works - Data templates for the use of environmental product declarations (EPDs) for construction products in building information modelling (BIM) (ISO 22057:2022)	CEN/TC 350
CEN ISO/TR 52000-2:2017	Energy performance of buildings - Overarching EPB assessment - Part 2: Explanation and justification of ISO 52000-1 (ISO/TR 52000-2:2017)	CEN/TC 371
CEN/TS 16628:2014	Energy Performance of Buildings - Basic Principles for the set of EPB standards	CEN/TC 371
CEN/TS 16629:2014	Energy Performance of Buildings - Detailed Technical Rules for the set of EPB-standards	CEN/TC 371
EN 17423:2020	Energy performance of buildings - Determination and reporting of Primary Energy Factors (PEF) and CO2 emission coefficient - General Principles, Module M1-7	CEN/TC 371
EN ISO 52000-1:2017	Energy performance of buildings - Overarching EPB assessment - Part 1: General framework and procedures (ISO 52000-1:2017)	CEN/TC 371
EN 17412-1:2020	Building Information Modelling - Level of Information Need - Part 1: Concepts and principles	CEN/TC 442
EN ISO 19650-1:2018	Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling - Part 1: Concepts and principles (ISO 19650-1:2018)	CEN/TC 442

Reference	Title	Committee
EN ISO 19650-2:2018	Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling - Part 2: Delivery phase of the assets (ISO 19650-2:2018)	CEN/TC 442
EN ISO 19650-3:2020	Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling - Part 3: Operational phase of the assets (ISO 19650-3:2020)	CEN/TC 442
EN ISO 19650-5:2020	Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling - Part 5: Security-minded approach to information management (ISO 19650-5:2020)	CEN/TC 442
EN ISO 21597-1:2020	Information container for linked document delivery - Exchange specification - Part 1: Container	CEN/TC 442
EN ISO 21597-2:2021	Information container for linked document delivery - Exchange specification - Part 2: Link types	CEN/TC 442
EN ISO 23386:2020	Building information modelling and other digital processes used in construction - Methodology to describe, author and maintain properties in interconnected data dictionaries (ISO 23386:2020)	CEN/TC 442
EN ISO 23387:2020	Building information modelling (BIM) - Data templates for construction objects used in the life cycle of built assets - Concepts and principles (ISO 23387:2020)	CEN/TC 442

Reference	Title	Committee
EN 17632-1:2022	Building information modelling (BIM) - Semantic modelling and linking (SML) - Part 1: Generic modelling patterns	CEN/TC 442/WG 4
CEN ISO/TR 52003-2:2017	Energy performance of buildings - Indicators, requirements, ratings and certificates - Part 2: Explanation and justification of ISO 52003-1 (ISO/TR 52003-2:2017)	CEN/TC 89
CEN ISO/TR 52010-2:2017	Energy performance of buildings - External climatic conditions - Part 2: Explanation and justification of ISO 52010-1 (ISO/TR 52010-2:2017)	CEN/TC 89
CEN ISO/TR 52016-2:2017	Energy performance of buildings - Energy needs for heating and cooling, internal temperatures and sensible and latent heat loads - Part 2: Explanation and justification of ISO 52016-1 and ISO 52017-1 (ISO/TR 52016-2:2017)	CEN/TC 89
CEN ISO/TR 52018-2:2017	Energy performance of buildings - Indicators for partial EPB requirements related to thermal energy balance and fabric features - Part 2: Explanation and justification of ISO 52018-1 (ISO/TR 52018-2:2017)	CEN/TC 89
CEN ISO/TR 52019-2:2017	Energy performance of buildings - Hygrothermal performance of building components and building elements - Part 2: Explanation and justification (ISO/TR 52019-2:2017)	CEN/TC 89
CEN ISO/TR 52022-2:2017	Energy performance of buildings - Thermal, solar and daylight properties of building components and elements - Part 2: Explanation and justification (ISO/TR 52022-2:2017)	CEN/TC 89
EN ISO 10211:2017	Thermal bridges in building construction - Heat flows and surface temperatures - Detailed calculations (ISO 10211:2017)	CEN/TC 89

Reference	Title	Committee
EN ISO 13370:2017	Thermal performance of buildings - Heat transfer via the ground - Calculation methods (ISO 13370:2017)	CEN/TC 89
EN ISO 13786:2017	Thermal performance of building components - Dynamic thermal characteristics - Calculation methods (ISO 13786:2017, Corrected version 2018-03)	CEN/TC 89
EN ISO 13789:2017	Thermal performance of buildings - Transmission and ventilation heat transfer coefficients - Calculation method (ISO 13789:2017)	CEN/TC 89
EN ISO 14683:2017	Thermal bridges in building construction - Linear thermal transmittance - Simplified methods and default values (ISO 14683:2017)	CEN/TC 89
EN ISO 52003-1:2017	Energy performance of buildings - Indicators, requirements, ratings and certificates - Part 1: General aspects and application to the overall energy performance (ISO 52003-1:2017)	CEN/TC 89
EN ISO 52010-1:2017	Energy performance of buildings - External climatic conditions - Part 1: Conversion of climatic data for energy calculations (ISO 52010-1:2017)	CEN/TC 89
EN ISO 52016-1:2017	Energy performance of buildings - Energy needs for heating and cooling, internal temperatures and sensible and latent heat loads - Part 1: Calculation procedures (ISO 52016-1:2017)	CEN/TC 89
EN ISO 52017-1:2017	Energy performance of buildings - Sensible and latent heat loads and internal temperatures - Part 1: Generic calculation procedures (ISO 52017-1:2017)	CEN/TC 89

Reference	Title	Committee
EN ISO 52018-1:2017	Energy performance of buildings - Indicators for partial EPB requirements related to thermal energy balance and fabric features - Part 1: Overview of options (ISO 52018-1:2017)	CEN/TC 89
EN ISO 52022-1:2017	Energy performance of buildings - Thermal, solar and daylight properties of building components and elements - Part 1: Simplified calculation method of the solar and daylight characteristics for solar protection devices combined with glazing (ISO 52022-1:2017)	CEN/TC 89
EN ISO 52022-3:2017	Energy performance of buildings - Thermal, solar and daylight properties of building components and elements - Part 3: Detailed calculation method of the solar and daylight characteristics for solar protection devices combined with glazing (ISO 52022-3:2017)	CEN/TC 89
EN ISO 6946:2017	Building components and building elements - Thermal resistance and thermal transmittance - Calculation methods (ISO 6946:2017, Corrected version 2021-12)	CEN/TC 89
EN ISO 50001:2018	Energy management systems - Requirements with guidance for use (ISO 50001:2018)	CLC/TC 17

Table A.4: European standardisation documents under development (in January 2023)

Reference	Title	Drafting body
prEN 16798-3	Energy performance of buildings - Ventilation for buildings - Part 3: For non-residential buildings - Performance requirements for ventilation and room-conditioning systems (Modules M5-1, M5-4)	CEN/TC 156/WG 20
EN 12831-3:2017/prA 1	Energy performance of buildings - Method for calculation of the design heat load - Part 3: Domestic hot water systems heat load and characterisation of needs, Module M8-2, M8-3	CEN/TC 228/WG 4
prEN 15316-4-2	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-2: Space heating generation systems, heat pump systems, Module M3-8-2, M8-8-2	CEN/TC 228/WG 4
prEN 15316-5	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 5: Space heating and DHW storage systems (not cooling), Module M3-7, M8-7	CEN/TC 228/WG 4
prEN 15978-1	Sustainability of construction works - Methodology for the assessment of performance of buildings - Part 1: Environmental Performance	CEN/TC 350/WG 1
prEN 15941	Sustainability of construction works - Data quality for environmental assessment of products and construction works - Selection and use of data	CEN/TC 350/WG 3
prEN 15978-2	Sustainability of construction works - Methodology for the assessment of buildings - Part 2: Social performance	CEN/TC 350/WG 5
PWI	Connection between the contributions of CEW to sustainability and achievement of the SDGs	CEN/TC 350/WG 6
prEN 17680	Sustainability of construction works - Evaluation of the potential for sustainable refurbishment of buildings	CEN/TC 350/WG 8
prCEN/TS 16628 rev	Energy Performance of Buildings - Basic Principles for the set of EPB standards	CEN/TC 371/WG 1

Reference	Title	Drafting body
prCEN/TS 16629 rev	Energy Performance of Buildings - Detailed Technical Rules for the set of EPB-standards	CEN/TC 371/WG 1
FprEN ISO 19650-4	Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling - Part 4: Information exchange (ISO/FDIS 19650-4:2022)	CEN/TC 442
prEN ISO 22014	Library objects for architecture, engineering, and construction	CEN/TC 442
FprEN 17549-2	Building information modelling - Information structure based on EN ISO 16739 1 to exchange data templates and data sheets for construction objects - Part 2: Configurable construction objects and requirements	CEN/TC 442/WG 2
prEN ISO 19650-6	ISO 19650-6: Organization and digitization of information about buildings and civil engineering works, including building information modelling -- Information management using building information modelling - Part 6: Health and Safety	CEN/TC 442/WG 3
prEN XXX	Building information modelling (BIM) - Data templates for construction objects used in the life cycle of built assets - Data templates based on European standards and technical specifications	CEN/TC 442/WG 4

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