



D6.6 – Report on the contribution to standardization v1 (v1.0)



This project has received funding from the European LIFE Programme for Research and Innovation under grant agreement no 101077169. Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

Project Acronym: easySRI
Project Full Title: Improving and demonstrating the potential of SRI
Grant Agreement: 101077169
Project Duration: 36 months (01/11/2022 – 31/10/2025)

DELIVERABLE 6.6

Report on the contribution to standardization v1

Work Package: WP6 - Untapping the potential of smart technologies
Task: Task 6.4 - Standardization and Concertation actions
Document Status: V1.0
File Name: easySRI_D6.6_Revised_ASI_v1.0
Due Date: 30.04.2024
Submission Date: 30.04.2024
Lead Beneficiary: Austrian Standards International

Dissemination Level

Public

Confidential, only for members of the Consortium (including the Commission Services)

Authors List

Leading Author			
First Name	Last Name	Beneficiary	Contact e-mail
Ilija	Ilic	ASI	i.ilic@austrian-standards.at

Reviewers List

Reviewers			
First Name	Last Name	Beneficiary	Contact e-mail
Paul	Waide	WSEE	paul@waide-europe.eu
Wanda	Arena	CETMA	wanda.arena@cetma.it

Version History

v	Author	Date	Brief Description
0.1	Ilija Ilic	2024-02-06	Initial Draft
0.2	Ilija Ilic	2024-02-27	Revised Draft
0.3	Ilija Ilic	2024-03-25	Revised Draft
1.0	Ilija Ilic	2024-03-28	Final Version

Legal Disclaimer

This project has received funding from the European LIFE Programme for Research and Innovation under grant agreement no 101077169. Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

Copyright

© Austrian Standards International – Heinestraße 38, 1020 Vienna, Austria Copies of this publication – also of extracts thereof – may only be made with reference to the publisher.

Executive Summary

This report delves into the intricate landscape of standards relevant to Smart Readiness Indicators (SRIs), scrutinizing their impact on project outcomes and offering actionable recommendations to enhance project efficacy and sustainability.

Standardization serves as the cornerstone of modern projects, ensuring coherence, interoperability, and efficiency across diverse domains. In the context of Smart Readiness Indicators, adherence to standards is paramount for orchestrating complex systems and optimizing project performance. This introduction sets the stage for a deep dive into the nuanced interplay between standards and SRI.

A rigorous and systematic methodology underpins the analysis conducted in this report. Incorporating quantitative, qualitative, and semi-empirical approaches, the methodology enables a comprehensive exploration of the standards landscape relevant to SRIs. This multifaceted methodological framework ensures the reliability and validity of the ensuing findings.

The findings gleaned from the meticulous analysis illuminate the intricate tapestry of standards existing and under development in the realm of SRIs. Through a nuanced examination, the report identifies key standards and elucidates their implications for project outcomes. Furthermore, it uncovers gaps and shortcomings in the current standardization framework, shedding light on areas ready for intervention and improvement.

Informed by the discerning analysis of findings, this report presents a series of actionable recommendations tailored to optimize the impact of standards on project outcomes. These recommendations encompass strategies to address identified gaps, enhance alignment with project objectives and foster a culture of innovation and sustainability. By embracing these recommendations, stakeholders can navigate the complex standards landscape with confidence and purpose, ensuring the realization of project goals.

In conclusion, this report underscores the pivotal role of standardization in the context of Smart Readiness Indicators. By proactively engaging with standards and implementing the recommended strategies, stakeholders can unlock the full potential of SRIs, driving project success and advancing the broader goals of innovation and sustainability.

Table of Contents

1	Introduction	6
1.1	Scope and objectives of the deliverable	6
1.2	Structure of the deliverable	7
1.3	Relation to Other Tasks and Deliverables	7
2	Standardisation	9
2.1	Standardisation System	9
2.1.1	Standardization and Innovation	10
3	Methodology.....	11
3.1	General Approach.....	11
3.2	Desktop Research	11
3.2.1	Bulk Research	12
3.2.2	Interdisciplinary Detailed Research.....	12
3.2.3	Standardisation Survey.....	13
4	Conclusion.....	15
5	References	17
	Annex A - Results of Bulk Research.....	18
	Annex B – Interdisciplinary Detail Research	42
	Annex C – Standardization Survey	57

List of Figures

Figure 1 - The Integrated Approach: Standardization at the Service of Research and Innovation.....	10
--	----

List of Tables

Table 1 - Summary of the results from the Standardization Survey	13
--	----

List of Acronyms and Abbreviations

Term	Description
AI	Artificial Intelligence

ASI	Austrian Standards International
BACS	Building and Automation Control Systems
BIM	Building Information Modelling
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
EPC	Energy Performance Certificate
ETSI	European Telecommunication Standards Institute
IEC	International Electrotechnical Commission; International Standards issued by IEC
ISO	International Organization for Standardization; International Standard issued by ISO
NIST	National Institute of Standards and Technology
NSB	National Standardization Body
R&I	Research and Innovation
SRI	Smart Readiness Indicator

1 Introduction

1.1 Scope and objectives of the deliverable

The primary objective of this document is to elucidate the methodology employed in identifying relevant standards and best practices crucial for monitoring the project's progress and ensuring compliance with pertinent regulations. It aims to provide a comprehensive overview of the standardization landscape within the domains of building, construction, building management, and other pertinent areas relevant to the project's objectives.

Specifically, the document will delineate the following objectives:

- **Methodology Description:**

A detailed exposition of the methodology employed in identifying and evaluating relevant standards and best practices. Clarification of the steps taken to ensure compliance with regulations and standards set forth by European and International Standardization Organisations.

- **Standards Identification:**

Identification of relevant standards published or under development by esteemed organizations such as CEN, CENELEC, ISO, IEC, ETSI, NIST, and others. Comprehensive screening of the work programs of these organizations to compile an exhaustive overview of ongoing standardization activities.

- **Recommendations:**

Provision of recommendations for further focus areas within the project, based on the gap analysis and project findings.

Suggestions for enhancing compliance with standards and regulations, thereby fostering the uptake of project activities and results by the market.

- **Dissemination of Results:**

Ensuring effective communication of the document's findings, methodologies, and recommendations to stakeholders and relevant standardization communities. Facilitating collaboration between project stakeholders and standardization bodies to influence the revision of existing standards or the development of new ones.

1.2 Structure of the deliverable

The document follows a structured format comprising a general introduction, methodology of analysis, and conclusion with recommendations.

The general introduction sets the stage by elucidating the significance of standardization in the realm of Smart Readiness Indicators (SRI). It outlines how adherence to standards can enhance the credibility and effectiveness of SRI initiatives. Furthermore, it delineates the key areas of focus in the initial analysis for the report, providing a roadmap for the subsequent sections.

Following the introduction, the methodology of analysis is expounded upon. This section details the approach employed to evaluate the relevance of standards for the project. A comprehensive methodology integrating quantitative, qualitative, and semi-empirical techniques is described. Quantitative methods involve statistical analysis or data mining to quantify the prevalence and impact of different standards. Qualitative methods entail expert opinions or literature reviews to assess the quality and suitability of standards. Semi-empirical methods may involve practical experiments or case studies to validate the applicability of standards empirically. Together, these methodologies aim to gather insightful data to determine the most pertinent standards for the project's objectives and their effective integration.

Finally, the conclusion synthesizes the findings from the analysis and presents key insights. It offers recommendations for further development of the integration of standards into the project. These recommendations may include prioritizing specific standards or standardization bodies, strategies for ensuring ongoing compliance with standards, and identification of synergies between standards and project activities. The conclusion underscores the importance of continued attention to standardization within the project and outlines potential avenues for future research or action, to enhance the project's impact and effectiveness.

By following this structured approach, the document aims to provide a comprehensive analysis of standardization within the context of the project, offering insights and recommendations for optimizing the integration of standards to support the project's objectives related to Smart Readiness Indicators (SRI).

1.3 Relation to Other Tasks and Deliverables

The document relates with various tasks and deliverables within the project, each contributing essential data and insights:

- **T5.1 Evaluation Framework and Demonstration Planning & Preparation:**

The Validation Methodology and Plan, which forms the basis for system demonstration, serves as input. Data collected during validation/demonstration activities, include technical performance, reliability, and stakeholder engagement.

- **T5.2 Set up and Implementation of the easySRI Use Cases:**

Reports detailing demonstration activities and findings from implementing easySRI scenarios in different types of buildings across various countries. Identification of factors for improvement and of issues to address, both technological and non-technological.

- **T5.3 EasySRI Impact Assessment and Validation Results:**

Data analyzed under this task, addressing demonstration findings and system/component improvements. Benchmarking against technical and user acceptance KPIs. Validation report showcasing the overall impact of the easySRI solution on stakeholders.

Expected Outputs Provided to Other Deliverables/Tasks:

The document is designed to provide outputs that are valuable for other tasks and deliverables within the project:

- **T5.1 Evaluation Framework and Demonstration Planning & Preparation:**

Findings from the gap analysis and recommendations for further focus areas can inform the planning of validation activities.

- **T5.2 Set up and Implementation of the easySRI Use Cases:**

Recommendations for improvements and solutions for identified issues can guide the implementation of easySRI use cases.

- **T5.3 easySRI Impact Assessment and Validation Results:**

Validation report presenting the overall impact of the easySRI solution can serve as crucial feedback for refining the system in subsequent iterations within WP4.

- **T6.1 Translating easySRIs into Improvements for EU and National Policies and Initiatives:**

Insights regarding the compatibility of easySRI findings with existing policies and initiatives can inform strategies for integration into national legislations.

- **T6.2 Uptake of easySRI and Smart-ready Technologies:**

Recommendations and insights on business models and strategies for market uptake can guide the development of market-oriented strategies and contribute to WP7.

- **T6.3 Training Packages and Guidance for Certification:**

Technical manuals and training documents developed within this task can facilitate training sessions, workshops, and exploitation strategies within WP7.

- **D3.1 Review of the SRI methodology**

This report provides an in-depth examination of the legal framework, methodologies, and adaptations of the SRI.

- **D3.3 Technical and Financial indicators for SRTs**

This report outlines a comprehensive methodology utilized in the report, incorporating theoretical foundations, market research, and energy efficiency calculations, enriched by collaborative feedback from project partners.

By aligning its outputs with the needs of other tasks, the document ensures synergy across different aspects of the project, fostering efficient collaboration and progress towards project objectives. This report will serve as the basis for D6.7, which will encompass the final recommendations and outcomes from the project's work in connection with standardization.

2 Standardisation

2.1 Standardisation System

The Standardization system is structured according to “different layers or levels”, starting from the national level, up to the European and International levels. The three different levels of Standardization activities are strictly connected and are based on the principle that duplication and overlapping are to be avoided. At the European level, the Standardization system is defined and regulated by a specific EU Regulation 1025/2012, in which the European Parliament and the Council addressed Standardization by defining its role and underlying the role of Standardization to boost the competitiveness of enterprises by facilitating the free movement of goods and services, network interoperability, means of communication, technological development, and innovation. In addition to this, Standardization is considered an important tool to support innovation as it can be used to transfer the results of R&I into the market. Generally, Standardization supports social and economic development by developing voluntary European standards – or better Standardization deliverables – related to products, materials, services, organizations, and processes, and addressing their safety, quality, performance, interoperability, requirements, etc. In short, Standardization supports economic activity, boosts productivity, increases trade within the European Single Market, and allows businesses of all sizes, including SMEs, to access markets around the world. In this sense, standards are important tools to support SMEs’ competitiveness. Standardization is governed by the principles of consensus, openness, transparency, national commitment, and technical coherence.

The European Committee for Standardization (CEN) and the European Committee for Electrotechnical Standardization (CENELEC) are two private European non-profit organizations. Their mission is to support the needs of the market and the different stakeholders, such as industry and commerce, service providers, public authorities and regulators, academia and research centers, European trade associations and interest groups representing environmentalists, consumers, trade unions as well as small and medium enterprises, and other public and private institutions. Their aim is also to promote a unique European Standardization System, leading the implementation of best practices in Standardization around the world. With this specific regard, CEN and CENELEC support international Standardization and cooperate closely with the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). CEN membership is based on 34 National Standardization Bodies that represent CEN in their country and their country in CEN. CEN and its Members are committed to cooperating with key organizations at the national, European, and international levels for the development of sound partnership relations. The European Standardization community and network include more than 200,000 experts from different countries and different stakeholders, i.e., business, industry, and commerce; service providers; consumers, environmental and societal organizations; public authorities and regulators; and other public and private institutions. European standards – or more generally Standardization deliverables – are market-driven and voluntary. They are developed through a transparent, balanced, and consensus-based process in which relevant stakeholders are involved, to produce high-quality technical documents for products, materials, services, organizations, and processes. Standards may deal with quality, safety, security, interoperability, performance, accessibility, and environmental requirements. The European Standardization system is structured and organized into different Technical Committees (TCs), dealing with specific issues (e.g., CEN/TC 319 Maintenance), which are subdivided into Subcommittees (SCs) or Working Groups (WGs), according to the complexity of the areas of interest to be addressed. These TCs are included, with their respective mirror committees or working groups, in the structure of the different Standardization Organizations (National, European, and International), with their respective mirror committees.

The coherence of the European Standardization system is that all the members of CEN shall adopt EN standards as national standards and must withdraw existing national standards that conflict with them. Moreover, there are specific agreements between the European and International Standardization Organizations (e.g., CEN and ISO) as they have signed formal agreements to avoid duplication of efforts and promote the global relevance of standards, which allows the development and adoption in parallel of the respective standards, which have the same content and identification code. The technical collaboration between CEN and ISO was formalized back in 1991 thanks to the Vienna Agreement (VA). In this context, ASI – Austrian Organization for Standardization – is the Austrian national Standardization body. It represents Austria in CEN and ISO. It is a private, non-profit association founded in 1920 and appointed by the Austrian government and the European Union to develop, approve, and publish technical standards in all economic sectors (industry, trade, and services) except for the

electric and electro-technical ones. ASI carries out Standardization activities in all industrial, commercial, and service sectors. Like all Standardization bodies, ASI is also a meeting point between different stakeholders, such as the business world, research institutions, public administrations, universities, education and training authorities, consumers, and societal stakeholders. ASI has more than 4000 affiliates, among which there are many industrial associations representing large, small, medium, and micro-enterprises coming from all industrial sectors, except the electro-technical one.

2.1.1 Standardization and Innovation

Standardization is a valuable tool to support and boost innovation, as it can create a foundational framework from which innovators can design specific solutions. In fact, Standardization helps bridge the gap between research, innovation, and global market impact by building customer trust and confidence in new innovative solutions. Early standards development enables faster mass-market adoption of new technologies, products, and services.

European Framework Programs like Horizon Europe pay particular attention to the impact of research and innovation in developing, supporting, and implementing EU policies. They support the uptake of innovative solutions in industry and society to address global challenges. This strategic objective emphasizes the market relevance of standards when research and innovation are combined with Standardization.

Many funding calls under the Framework Programs request projects to contribute to Standardization. The main reasons for this approach are that Standardization may:

- Disseminate research and innovation knowledge to industry, society, and public administrations
- Facilitate market acceptance by enabling interoperability and compatibility of innovative solutions with existing products, services, systems, and processes
- Facilitate trade by diminishing technical barriers
- Facilitate technology transfer
- Support networking between different stakeholders, including scientific and commercial collaborators.

In addition to this, Standardization can be recognized simultaneously at the European and international levels thanks to the agreements in place between CEN, CENELEC, ISO, and IEC.

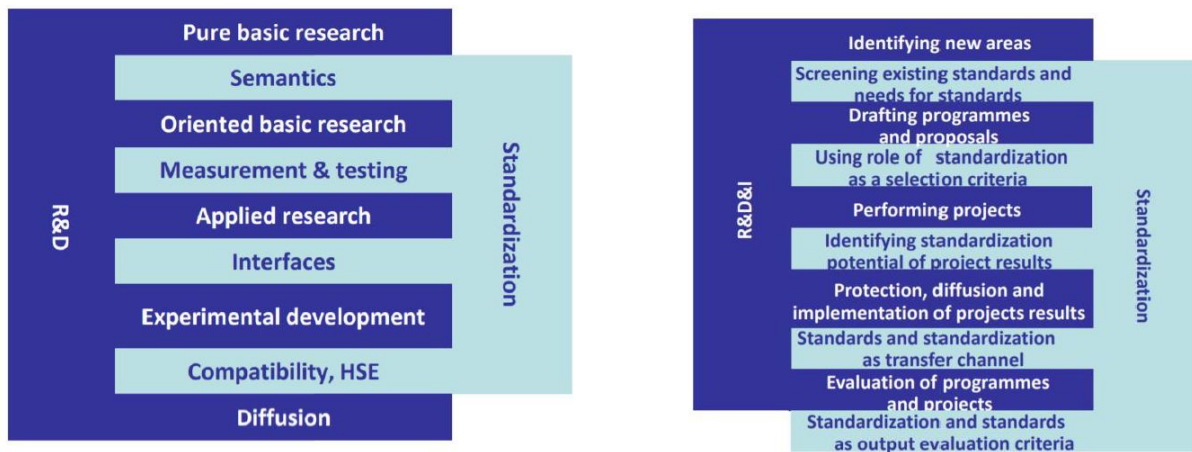


Figure 1 - The Integrated Approach: Standardization at the Service of Research and Innovation

Research projects can be invaluable to standardizers, and, conversely, research projects need to have state-of-the-art information on standards that are available or that are under development. In some cases, the standards activity itself may generate the need for additional research, for instance into the appropriate test methods for a product (see Figure 1).

3 Methodology

3.1 General Approach

This chapter outlines a comprehensive methodology employed to assess the wide array of technical standards crucial for the successful implementation of Smart Readiness Indicator (SRI). The aim was to gather insights spanning various domains, including heating, cooling, automation control systems, artificial intelligence (AI) and etc., to enrich the project's scope and efficacy.

The methodology comprised three key phases:

Bulk Research: An extensive investigation was conducted to gain a broad understanding of the relevant technical standards essential for SRI. This initial phase aimed to establish a foundational knowledge base.

Interdisciplinary Detailed Research: Delving beyond conventional SRI considerations, this phase involved an in-depth exploration of standards in diverse technical areas, notably automation control systems, and AI. This interdisciplinary approach sought to uncover opportunities for leveraging standards to enhance project outcomes.

Survey: A survey was conducted to assess the application of standards by technical partners within the project and identify areas warranting focused attention. Insights gleaned from this survey provided valuable guidance for further refinement and optimization of project strategies.

These methodological steps served as the cornerstone for gathering comprehensive insights and formulating actionable recommendations to drive the project forward. By embracing a holistic approach to evaluating technical standards, stakeholders are empowered to navigate complexities effectively and realize the full potential of SRI implementation.

3.2 Desktop Research

In the pursuit of understanding the landscape of standards pertinent to the Smart Readiness Indicator (SRI) framework, a comprehensive desktop research project was undertaken. This research was structured into two distinct phases: bulk research and interdisciplinary detailed research. The primary goal was to identify and categorize a wide array of standards relevant to SRI, elucidating their significance within various domains.

The initial phase focused on conducting bulk research to identify a diverse range of standards associated with the Smart Readiness Indicator framework. This involved a systematic exploration of established standards across multiple sectors. The aim was to provide a broad overview of the standards landscape, highlighting their relevance to SRI. Through this process, a comprehensive spectrum of standards was delineated, encompassing key areas such as heating, cooling, lighting, and electricity, etc.

Following the bulk research, a more in-depth analysis was conducted through interdisciplinary detailed research. This phase involved a granular examination of standards identified in the previous stage, delving into their specific applicability and implications within the context of SRI. Each standard was scrutinized to ascertain its alignment with the objectives and criteria outlined by the Smart Readiness Indicator framework. Furthermore, interdisciplinary connections between standards across different domains were explored to understand their collective impact on SRI assessment and implementation.

Throughout both phases of research, particular emphasis was placed on delineating the scope of standards falling under the purview of Smart Readiness Indicator. This involved categorizing standards based on their relevance to key aspects of SRI, such as energy performance, building automation, digitalization, and user-centric functionalities. By mapping out the scope of standards within these areas, a comprehensive understanding was gained of the multifaceted requirements essential for SRI compliance and effectiveness.

3.2.1 Bulk Research

In the initial phase of the desktop research for the Smart Readiness Indicator (SRI) project, a comprehensive approach was adopted to gather a broad understanding of the topic. The following steps were undertaken to facilitate this process:

Extensive research was conducted to acquire a foundational knowledge base concerning SRI. This phase aimed to establish a comprehensive understanding of the overarching principles, objectives, and components of the Smart Readiness Indicator framework.

To systematically identify potentially relevant standards, keywords associated with various aspects of SRI were identified. These keywords encompassed crucial elements such as: heating, cooling, domestic hot water, ventilation, lighting, dynamic building envelope, electricity, electric vehicle charging, and monitoring and control. These terms served as the basis for conducting targeted searches across reputable standardization bodies including ISO, CEN, and ETSI, among others.

During the keyword-based search process, it was noted that certain queries returned an extensive number of results exceeding the display limit. Despite encountering this limitation, further refinement of search criteria was not feasible within the available parameters. As a result, the search outcomes were evaluated based on the initial set of keywords without additional restrictions.

Following the keyword-based search, a comprehensive list of standards and their respective committees was compiled. This involved identifying standards relevant to each area of interest, including heating, cooling, ventilation, lighting, electricity, electric vehicle charging, and monitoring and control. Additionally, committees associated with these standards were documented to provide insight into the governing bodies responsible for their development and maintenance.

Subsequently, an assessment was conducted to evaluate the relevance of identified committees in alignment with the intended outcomes of the SRI project. Committees deemed irrelevant to the project's objectives were systematically removed from the list, ensuring a focused and pertinent compilation of standards and associated entities.

The bulk research phase of the desktop research process laid the groundwork for identifying and categorizing standards relevant to the Smart Readiness Indicator framework. A comprehensive inventory of standards and associated committees was compiled by systematically exploring key areas and conducting targeted searches. This foundational research serves as a crucial resource for informing subsequent phases of the project, facilitating informed decision-making, and strategic planning regarding SRI implementation and compliance. The full list of the bulk research can be found in Annex A.

3.2.2 Interdisciplinary Detailed Research

During the Interdisciplinary Detail Research phase of the Smart Readiness Indicator (SRI) project, a focused examination was conducted to delve deeper into specific technical key areas identified as critical for the project's outcomes. The following steps were undertaken to facilitate this process.

A task meeting was convened wherein experts provided invaluable feedback on the findings of the bulk research. This feedback highlighted the importance of considering additional technical key areas crucial to the project's success. Among these key areas were Building Information Modelling (BIM), Building and Automation Control Systems (BACS), Energy Efficiency measures, and Artificial Intelligence (AI). The insights provided by experts guided the direction of the interdisciplinary research, ensuring comprehensive coverage of all pertinent domains.

Building upon the feedback received, the interdisciplinary desktop research focused on identifying relevant standards and associated committees within the key technical areas. This involved an extensive exploration of standards about BIM, Building and Automation Control Systems, Energy Efficiency, AI, and related fields. The objective was to evaluate the potential impact of these standards on the integration of SRI principles and functionalities.

Recognizing the extensive nature of standards within the identified interdisciplinary areas, efforts were made to streamline the selection process. Standards were evaluated based on their relevance to the objectives of easySRI and their potential to positively influence the desired project outcomes. Through this refinement process, a curated list of standards with the highest potential for enhancing SRI implementation was developed.

The final list of curated standards was disseminated for feedback from relevant stakeholders and experts. This iterative process served as a mechanism to validate the selection criteria and identify any potential gaps in the standards landscape. Stakeholder input played a crucial role in refining the list further and pinpointing areas where additional standardization efforts may be warranted to strengthen the efficacy of easySRI.

The Interdisciplinary Detail Research phase of the desktop research played a pivotal role in expanding the scope of standards considered for integration into the Smart Readiness Indicator framework. By incorporating feedback from experts and stakeholders, a curated list of standards relevant to key technical areas was developed. This list serves as a foundational resource for guiding subsequent standardization efforts and ensuring the alignment of easySRI with best practices and industry standards across diverse domains. Moving forward, ongoing collaboration and feedback mechanisms will be essential to address emerging challenges and optimize the effectiveness of SRI implementation. The results of the interdisciplinary detail research are to be found in Annex B.

3.2.3 Standardisation Survey

A standardization survey was conducted within the scope of the easySRI project, aimed at collecting empirical feedback from technical partners. This questionnaire was designed to discern potential standardization gaps pertinent to standards relevant to the project's thematic domain. The term "standardization gap" delineates technical deficiencies or impediments hindering the implementation of extant standards or the discernible necessity for the establishment of new standards within a defined field. The survey sought to identify areas where standards may be insufficient, due to technical inadequacies or obstacles in their practical application, thereby highlighting the necessity for further standardization efforts.

To assess the level of engagement and familiarity with standards pertinent to the easySRI project, participants were asked a series of questions regarding their utilization, perception, and awareness of relevant standards. These questions encompassed inquiries about their application of topical standards, identification of specific standards used, any encountered difficulties or barriers in their implementation, awareness of additional standards relevant to the project, and opinions on areas where standardization was either comprehensive or lacking. The responses provided valuable insights into the participants' experiences and perspectives regarding standards in the context of the easySRI project. Below in Table 1 is a summary findings obtained from the survey. The table is a summary of the answers received. The headlines indicate the question that were asked in the survey.

Table 1 - Summary of the results from the Standardization Survey

Application of Standards	Standards Used	Difficulties in Application	Awareness of Standards without Application	Areas Not Covered	Need for New Standards
Yes	OIB Guideline 6, EN ISO 52120-1:2022	EN ISO 52120-1:2022: Interpretation breadth, high susceptibility to errors, manipulation	Yes	Building automation and control systems	Yes
No	-	-	Yes	Smart technologies	No
Yes	EU Delegated Regulation (EU) 2020/2155	-	No	-	No
Yes	EN 52120:2021	-	Yes	-	Yes

According to the survey results, there are indications that some areas of the easySRI project are not yet sufficiently covered by standards or need novel standards.

- **Building automation and control systems:**

It has been identified that standards regarding the components of automation and control systems, as well as their programming and documentation, are crucial. Standardized documentation of the programming of building automation and control systems is essential for trustworthy market assessment.

- **Data standardization and exchange:**

It has been mentioned that the benefits of the building logbook depend on the standardization of data fields for data input from various sources and data exchange for various uses. Examples include building data models, inspection reports, energy audit reports, and renovation plans.

- **Security and quality in building automation:**

It has been pointed out that technical systems controlled by building automation often use components that no longer receive updates due to their age or have vulnerabilities. This suggests a need for standards for quality assurance and security in building automation.

- **Smart technologies:**

Smart technologies were mentioned as an area that is not yet sufficiently standardized. This suggests that new standards may be needed to address this emerging area appropriately. The need for new standards in the context of the easySRI project is particularly identified in building automation and control systems as well as smart technologies. These areas could benefit from specific standards to improve interoperability, security, and efficiency.

In conclusion, there's a clear need for new or improved standards within the easySRI project, particularly in building automation and control systems and smart technologies. Developing specific standards for these areas could enhance interoperability, security, and efficiency, ultimately improving the overall effectiveness of the SRI. The results are to be discussed and analyzed with the consortium- to make a well thought out decision on how to proceed.

A detailed overview of the standardization survey can be found in Annex C.

4 Conclusion

In conclusion, this report underscores the pivotal role of standardization within the framework of the Smart Readiness Indicators (SRI) project. Through a meticulous methodology encompassing bulk research, interdisciplinary detailed research, and a standardization survey, comprehensive insights have been garnered regarding the landscape of relevant standards and best practices.

The research illuminates the multi-layered nature of standardization, spanning national, European, and international levels, and engaging a diverse array of stakeholders. Guided by principles of consensus, openness, and technical coherence, the European Standardization System provides a foundational framework for fostering innovation, enhancing market competitiveness, and driving societal and economic development.

By aligning standardization efforts with other tasks and deliverables within the project, synergies have been established, facilitating efficient collaboration and progress toward project objectives. Insights gleaned from the standardization survey reveal areas where existing standards may be insufficient, particularly in building automation and control systems and smart technologies. These findings underscore the imperative for further standardization endeavors to address technical deficiencies and enhance interoperability, security, and efficiency within the SRI framework.

Looking ahead, sustained attention to standardization will be paramount to ensuring the credibility, effectiveness, and market acceptance of SRI initiatives. By harnessing existing standards, identifying gaps, and catalyzing the development of new standards where necessary, the project can maximize its impact and contribute to advancing the field of smart building technologies.

In summary, the integration of standardization principles and practices is intrinsic to the success of the SRI project, and ongoing collaboration with stakeholders and standardization bodies will be indispensable in realizing its full potential.

Based on the findings of the project and the identified gaps in standards, the following recommendations are proposed for advancing standardization efforts:

- **Proposal of New Standards:**

Proposing the development of new standards in key areas such as building automation and control systems, smart technologies, and data standardization and exchange. Collaborate with relevant stakeholders and standardization bodies to initiate the development process for these new standards, ensuring they address the specific needs and requirements identified within the project.

- **Recommendations to Update Existing Standards:**

Providing recommendations to established standardization committees, such as CEN, CENELEC, ISO, and IEC, to update certain standards to better align with the evolving needs of smart building technologies. Highlighting specific areas within existing standards where updates or revisions are needed, based on the project's findings and the experiences of technical partners attempting to apply these standards.

- **Closing Identified Gaps:**

Organizing workshops focused on finding and closing gaps in standards, particularly in areas such as building automation and control systems, security, and data standardization. The objective is to facilitate discussions among technical partners, industry experts, and standardization bodies to identify practical solutions and develop consensus around the necessary updates or new standards required to address these gaps.

- **Continuous Monitoring and Engagement:**

Establishing mechanisms for continuous monitoring of standardization developments in relevant domains and ongoing engagement with standardization bodies and stakeholders.

Staying informed about emerging technologies, trends, and best practices in smart building technologies to ensure that standardization efforts remain aligned with the latest advancements and industry needs.

The aim is to see which of those recommendations is feasible and which ones support the project's desired outcome most. Moving on further, it is to be decided with the consortium, especially the technical partners which of the recommendations shall be executed.

Furthermore, it is imperative to emphasize that these recommendations are preliminary findings based on the work accomplished thus far. The decision on which recommendations to pursue will be determined collaboratively with the consortium, particularly involving the partners in Task 6.4. The final decisions regarding the implementation of these recommendations will be documented in Deliverable 6.7, reflecting the project's chosen route and objectives.

5 References

- [1]. European Commission - Smart Readiness Indicator - Schulungs Diade - (2022) - Version 2.0
- [2]. <https://www.cencenelec.eu/european-standardization/>

Annex A - Results of Bulk Research

Table A 1 - Bulk Research Results ISO

Reference	Document title	Developing committee
ISO/WD TR 52016-4	Energy performance of buildings — Energy needs for heating and cooling, internal temperatures and sensible and latent heat loads — Part 4: Explanation and justification of ISO 52016-3	ISO/TC 163/SC 2/WG 15
ISO/PWI 15927-4	Hygrothermal performance of buildings — Calculation and presentation of climatic data — Part 4: Hourly data for assessing the annual energy use for heating and cooling	ISO/TC 163/SC 2/WG 16
ISO/AWI TR 52032-2	Energy performance of buildings — Energy requirements and efficiencies of heating, cooling and domestic hot water (DHW) distribution systems — Part 2: Explanation and justification of ISO 52032-1	ISO/TC 205/WG 9
ISO 11855-2:2021/Amd 1	Building environment design — Embedded radiant heating and cooling systems — Part 2: Determination of the design heating and cooling capacity — Amendment 1	ISO/TC 205/WG 8
ISO 11855-7:2019/PRF Amd 1	Building environment design — Design, dimensioning, installation and control of embedded radiant heating and cooling systems — Part 7: Input parameters for the energy calculation — Amendment 1	ISO/TC 205/WG 8
ISO 11855-8	Building environment design — Design, dimensioning, installation and control of embedded radiant heating and cooling systems — Part 8: Electrical heating systems	ISO/TC 205/WG 8
ISO/DIS 19967-2	Air to water Heat pumps — Testing and rating for performance — Part 2: Space heating and/or space cooling	ISO/TC 86/SC 6/WG 12
ISO/CD 19967-3	Air to water Heat pumps — Testing and rating for performance — — Part 3: Combined hot water supply and space heating and/or space cooling	ISO/TC 86/SC 6/WG 12
ISO 21978	Air to water heat pumps — Testing and rating at part load conditions and calculation of seasonal coefficient of performance for space heating	ISO/TC 86/SC 6/WG 12
ISO/AWI 20733-2	Seasonal performance ratings of water source heat pumps — Part 2: Heating seasonal calculations	ISO/TC 86/SC 6/WG 3
ISO/WD TR 52016-4	Energy performance of buildings — Energy needs for heating and cooling, internal temperatures and sensible and latent heat loads — Part 4: Explanation and justification of ISO 52016-3	ISO/TC 163/SC 2/WG 15
ISO/PWI 15927-4	Hygrothermal performance of buildings — Calculation and presentation of climatic data — Part 4: Hourly data for assessing the annual energy use for heating and cooling	ISO/TC 163/SC 2/WG 16
ISO/AWI TR 52032-2	Energy performance of buildings — Energy requirements and efficiencies of heating, cooling and domestic hot water (DHW) distribution systems — Part 2: Explanation and justification of ISO 52032-1	ISO/TC 205/WG 9
ISO/WD 22511-1	Design process of ventilative cooling systems — Part 1: Non-residential buildings	ISO/TC 205/WG 2
ISO 11855-2:2021/Amd 1	Building environment design — Embedded radiant heating and cooling systems — Part 2: Determination of the design heating and cooling capacity — Amendment 1	ISO/TC 205/WG 8

ISO 11855-7:2019/PRF Amd 1	Building environment design — Design, dimensioning, installation and control of embedded radiant heating and cooling systems — Part 7: Input parameters for the energy calculation — Amendment 1	ISO/TC 205/WG 8
ISO 11855-8	Building environment design — Design, dimensioning, installation and control of embedded radiant heating and cooling systems — Part 8: Electrical heating systems	ISO/TC 205/WG 8
ISO/DIS 19967-2	Air to water Heat pumps — Testing and rating for performance — Part 2: Space heating and/or space cooling	ISO/TC 86/SC 6/WG 12
ISO/CD 19967-3	Air to water Heat pumps — Testing and rating for performance — — Part 3: Combined hot water supply and space heating and/or space cooling	ISO/TC 86/SC 6/WG 12
ISO/AWI 16358-1	Air-cooled air conditioners and air-to-air heat pumps — Testing and calculating methods for seasonal performance factors — Part 1: Cooling seasonal performance factor	ISO/TC 86/SC 6/WG 1
ISO/AWI 20733-1	Seasonal performance ratings of water source heat pumps — Part 1: Cooling seasonal performance	ISO/TC 86/SC 6/WG 3
ISO/DIS 5222-2	Heat recovery ventilators and energy recovery ventilators — Testing and calculating methods for seasonal performance factor — Part 2: Sensible cooling recovery seasonal performance factors of heat recovery ventilators	ISO/TC 86/SC 6/WG 10
ISO/AWI TR 52032-2	Energy performance of buildings — Energy requirements and efficiencies of heating, cooling and domestic hot water (DHW) distribution systems — Part 2: Explanation and justification of ISO 52032-1	ISO/TC 205/WG 9
ISO/CD 8144-1	Thermal insulation — Mineral wool mats for ventilated roof spaces — Part 1: Specification for applications with restricted ventilation	ISO/TC 163/SC 3/WG 19
ISO/CD 8144-2	Thermal insulation — Mineral wool mats for ventilated roof spaces — Part 2: Specification for horizontal applications with unrestricted ventilation	ISO/TC 163/SC 3/WG 19
ISO/WD 21075	Design and assessment process of whole-building mechanical ventilation systems in residential buildings	ISO/TC 205/WG 2
ISO/CIE DIS 8995-1	Light and lighting — Lighting of work places — Part 1: Indoor	ISO/TC 274/JWG 5
ISO/IEC AWI 27090	Cybersecurity — Artificial Intelligence — Guidance for addressing security threats and failures in artificial intelligence systems	ISO/IEC JTC 1/SC 27/WG 4
ISO/IEC TR 27563:2023	Security and privacy in artificial intelligence use cases — Best practices	ISO/IEC JTC 1/SC 27/WG 5
ISO/IEC WD 27091	Cybersecurity and Privacy — Artificial Intelligence — Privacy protection	ISO/IEC JTC 1/SC 27/WG 5
ISO/IEC CD TR 23888-1	Artificial intelligence for multimedia — Part 1: Vision and scenarios	ISO/IEC JTC 1/SC 29/WG 2
ISO/IEC 38507:2022	Information technology — Governance of IT — Governance implications of the use of artificial intelligence by organizations	ISO/IEC JTC 1/SC 42
ISO/IEC AWI TS 17847	Information technology — Artificial intelligence — Verification and validation analysis of AI systems	ISO/IEC JTC 1/SC 42/JWG 2
ISO/IEC AWI TR 18988	Artificial intelligence — Application of AI technologies in health informatics	ISO/IEC JTC 1/SC 42/JWG 3
ISO/IEC AWI TS 22440	Artificial intelligence — Functional safety and AI systems — Requirements	ISO/IEC JTC 1/SC 42/JWG 4

ISO/IEC AWI 23282	Artificial Intelligence — Evaluation methods for accurate natural language processing systems	ISO/IEC JTC 1/SC 42/JWG 5
ISO/IEC 22989:2022	Information technology — Artificial intelligence — Artificial intelligence concepts and terminology	ISO/IEC JTC 1/SC 42/WG 1
ISO/IEC 22989:2022/AWI Amd 1	Information technology — Artificial intelligence — Artificial intelligence concepts and terminology — Amendment 1	ISO/IEC JTC 1/SC 42/WG 1
ISO/IEC 23053:2022	Framework for Artificial Intelligence (AI) Systems Using Machine Learning (ML)	ISO/IEC JTC 1/SC 42/WG 1
ISO/IEC 23053:2022/AWI Amd 1	Framework for Artificial Intelligence (AI) Systems Using Machine Learning (ML) — Amendment 1	ISO/IEC JTC 1/SC 42/WG 1
ISO/IEC 42001	Information technology — Artificial intelligence — Management system	ISO/IEC JTC 1/SC 42/WG 1
ISO/IEC AWI 42102	Information technology — Artificial intelligence — Taxonomy of AI system methods and capabilities	ISO/IEC JTC 1/SC 42/WG 1
ISO/IEC DIS 42005	Information technology — Artificial intelligence — AI system impact assessment	ISO/IEC JTC 1/SC 42/WG 1
ISO/IEC DIS 42006	Information technology — Artificial intelligence — Requirements for bodies providing audit and certification of artificial intelligence management systems	ISO/IEC JTC 1/SC 42/WG 1
ISO/IEC 24668:2022	Information technology — Artificial intelligence — Process management framework for big data analytics	ISO/IEC JTC 1/SC 42/WG 2
ISO/IEC 8183:2023	Information technology — Artificial intelligence — Data life cycle framework	ISO/IEC JTC 1/SC 42/WG 2
ISO/IEC AWI TR 42103	Information technology — Artificial intelligence — Overview of synthetic data in the context of AI systems	ISO/IEC JTC 1/SC 42/WG 2
ISO/IEC CD TR 5259-6	Artificial intelligence — Data quality for analytics and machine learning (ML) — Part 6: Visualization framework for data quality	ISO/IEC JTC 1/SC 42/WG 2
ISO/IEC DIS 5259-1	Artificial intelligence — Data quality for analytics and machine learning (ML) — Part 1: Overview, terminology, and examples	ISO/IEC JTC 1/SC 42/WG 2
ISO/IEC DIS 5259-2	Artificial intelligence — Data quality for analytics and machine learning (ML) — Part 2: Data quality measures	ISO/IEC JTC 1/SC 42/WG 2
ISO/IEC DIS 5259-3	Artificial intelligence — Data quality for analytics and machine learning (ML) — Part 3: Data quality management requirements and guidelines	ISO/IEC JTC 1/SC 42/WG 2
ISO/IEC DIS 5259-4	Artificial intelligence — Data quality for analytics and machine learning (ML) — Part 4: Data quality process framework	ISO/IEC JTC 1/SC 42/WG 2
ISO/IEC DIS 5259-5	Artificial intelligence — Data quality for analytics and machine learning (ML) — Part 5: Data quality governance framework	ISO/IEC JTC 1/SC 42/WG 2
ISO/IEC 23894:2023	Information technology — Artificial intelligence — Guidance on risk management	ISO/IEC JTC 1/SC 42/WG 3

ISO/IEC 24029-2:2023	Artificial intelligence (AI) — Assessment of the robustness of neural networks — Part 2: Methodology for the use of formal methods	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC AWI 24029-3	Artificial intelligence (AI) — Assessment of the robustness of neural networks — Part 3: Methodology for the use of statistical methods	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC AWI 42105	Information technology — Artificial intelligence — Guidance for human oversight of AI systems	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC AWI TR 42106	Information technology — Artificial intelligence — Overview of differentiated benchmarking of AI system quality characteristics	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC AWI TS 22443	Information technology — Artificial intelligence — Guidance on addressing societal concerns and ethical considerations	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC CD 12792	Information technology — Artificial intelligence — Transparency taxonomy of AI systems	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC CD TS 6254	Information technology — Artificial intelligence — Objectives and approaches for explainability and interpretability of ML models and AI systems	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC DTS 12791	Information technology — Artificial intelligence — Treatment of unwanted bias in classification and regression machine learning tasks	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC DTS 8200	Information technology — Artificial intelligence — Controllability of automated artificial intelligence systems	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC PWI 17866	Artificial intelligence — Best practice guidance for mitigating ethical and societal concerns	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC PWI 18966	Artificial intelligence — Oversight of AI systems	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC PWI 42108	Artificial intelligence — Operational design domain (ODD) for AI systems	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC TR 24027:2021	Information technology — Artificial intelligence (AI) — Bias in AI systems and AI aided decision making	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC TR 24028:2020	Information technology — Artificial intelligence — Overview of trustworthiness in artificial intelligence	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC TR 24029-1:2021	Artificial Intelligence (AI) — Assessment of the robustness of neural networks — Part 1: Overview	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC TR 24368:2022	Information technology — Artificial intelligence — Overview of ethical and societal concerns	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC TR 5469	Artificial intelligence — Functional safety and AI systems	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC TS 25058	Systems and software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) — Guidance for quality evaluation of artificial intelligence (AI) systems	ISO/IEC JTC 1/SC 42/WG 3
ISO/IEC 5338	Information technology — Artificial intelligence — AI system life cycle processes	ISO/IEC JTC 1/SC 42/WG 4
ISO/IEC 5339	Information technology — Artificial intelligence — Guidance for AI applications	ISO/IEC JTC 1/SC 42/WG 4

ISO/IEC AWI TR 20226	Information technology — Artificial intelligence — Environmental sustainability aspects of AI systems	ISO/IEC JTC 1/SC 42/WG 4
ISO/IEC AWI TR 21221	Information technology – Artificial intelligence – Beneficial AI systems	ISO/IEC JTC 1/SC 42/WG 4
ISO/IEC DTR 24030	Information technology — Artificial intelligence (AI) — Use cases	ISO/IEC JTC 1/SC 42/WG 4
ISO/IEC PWI 42109	Information technology — Artificial intelligence — Human-machine teaming	ISO/IEC JTC 1/SC 42/WG 4
ISO/IEC PWI 42113	Information technology — Artificial intelligence — Evaluation metrics for AI use cases and applications	ISO/IEC JTC 1/SC 42/WG 4
ISO/IEC TR 24030:2021	Information technology — Artificial intelligence (AI) — Use cases	ISO/IEC JTC 1/SC 42/WG 4
ISO/IEC DTR 17903	Information technology — Artificial intelligence — Overview of machine learning computing devices	ISO/IEC JTC 1/SC 42/WG 5
ISO/IEC FDIS 5392	Information technology — Artificial intelligence — Reference architecture of knowledge engineering	ISO/IEC JTC 1/SC 42/WG 5
ISO/IEC NP 42111	Information technology — Artificial intelligence — Guidance on artificial intelligence (AI) lightweight modelling	ISO/IEC JTC 1/SC 42/WG 5
ISO/IEC NP TS 42110	Information technology — Artificial intelligence — AI inference framework for AI systems	ISO/IEC JTC 1/SC 42/WG 5
ISO/IEC PWI 42107	Information technology — Artificial intelligence — AI lightweight modeling	ISO/IEC JTC 1/SC 42/WG 5
ISO/IEC PWI 42112	Information technology — Artificial intelligence — Guidance on model training efficiency optimization of machine learning system	ISO/IEC JTC 1/SC 42/WG 5
ISO/IEC TR 24372:2021	Information technology — Artificial intelligence (AI) — Overview of computational approaches for AI systems	ISO/IEC JTC 1/SC 42/WG 5
ISO/IEC TS 4213:2022	Information technology — Artificial intelligence — Assessment of machine learning classification performance	ISO/IEC JTC 1/SC 42/WG 5
ISO/IEC PWI 11935	Telecommunications and information exchange between systems — Artificial intelligence enabled networking	ISO/IEC JTC 1/SC 6/WG 7
ISO/CD TR 12786	Intelligent transport systems — Big data and artificial intelligence supporting intelligent transport systems — Use cases	ISO/TC 204/WG 20
ISO/PWI TS 24853	Intelligent transport systems — Integrated transport information, management and control — General information of audio-based artificial intelligence (AI) road hazard information system (ARHIS)	ISO/TC 204/WG 9
ISO/AWI TS 8100-10	Lifts for the transport of persons and goods — Part 10: Building Information Modelling	ISO/TC 178/WG 13
ISO/PWI TS 23775	Light and lighting — Building information modelling properties for lighting — Daylight louver systems	ISO/TC 274/JWG 1
ISO/TS 7127:2023	Light and lighting — Building information modelling properties for lighting — Lighting systems	ISO/TC 274/JWG 1

ISO/WD 20734	Building Environment Design — Daylighting design procedure for indoor visual environment	ISO/TC 205/JWG 12
ISO 52127-1:2021	Energy performance of buildings — Building management system — Part 1: Module M10-12	ISO/TC 205/WG 3
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/TC 205/WG 3
ISO 52120-1:2021	Energy performance of buildings — Contribution of building automation, controls and building management — Part 1: General framework and procedures	ISO/TC 205/WG 3
ISO/TR 52120-2:2021	Energy performance of buildings — Contribution of building automation, controls and building management — Part 2: Explanation and justification of ISO 52120-1	ISO/TC 205/WG 3
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/WG 9
ISO/AWI TR 52032-2	Energy performance of buildings — Energy requirements and efficiencies of heating, cooling and domestic hot water (DHW) distribution systems — Part 2: Explanation and justification of ISO 52032-1	ISO/TC 205/WG 9
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/WG 9
ISO/PWI 24646	Building Environment Design – Indoor environment – User well-being and satisfaction through outcome-based building design	ISO/TC 205/WG 1
ISO 24365:2022	Radiators and convectors — Methods and rating for determining the heat output	ISO/TC 205/WG 8
ISO/CD 24359-1	Building commissioning process planning — Part 1: New buildings	ISO/TC 205/WG 10
ISO/AWI TS 23764	Methodology for achieving non-residential zero-energy buildings (ZEBs)	ISO/TC 205/WG 2
ISO/TS 23764:2021	Methodology for achieving non-residential zero-energy buildings (ZEBs)	ISO/TC 205/WG 2
ISO 23045:2008	Building environment design — Guidelines to assess energy efficiency of new buildings	ISO/TC 205/WG 2
ISO/WD 22511-1	Design process of ventilative cooling systems — Part 1: Non-residential buildings	ISO/TC 205/WG 2
ISO 22510:2019	Open data communication in building automation, controls and building management — Home and building electronic systems — KNXnet/IP communication	ISO/TC 205
ISO 22185-1:2021	Diagnosing moisture damage in buildings and implementing countermeasures — Part 1: Principles, nomenclature and moisture transport mechanisms	ISO/TC 205/JWG 11
ISO/FDIS 22185-2	Diagnosing moisture damage in buildings and implementing countermeasures — Part 2: Assessment of conditions	ISO/TC 205/JWG 11
ISO/PWI 22185-3	Diagnosing moisture damage in buildings and implementing countermeasures — Part 3: Addressing known moisture damage conditions	ISO/TC 205/JWG 11
ISO/PWI 22094	Integration of nature and biodiversity in building design - General principles	ISO/TC 205/WG 7

ISO/WD 21075	Design and assessment process of whole-building mechanical ventilation systems in residential buildings	ISO/TC 205/WG 2
ISO 19455-1:2019	Planning for functional performance testing for building commissioning — Part 1: Secondary hydronic pump, system and associated controls	ISO/TC 205/WG 10
ISO 19454:2019	Building environment design — Indoor environment — Daylight opening design for sustainability principles in visual environment	ISO/TC 205/JWG 12
ISO 18566-1:2017	Building environment design — Design, test methods and control of hydronic radiant heating and cooling panel systems — Part 1: Vocabulary, symbols, technical specifications and requirements	ISO/TC 205/WG 8
ISO 18566-2:2017	Building environment design — Design, test methods and control of hydronic radiant heating and cooling panel systems — Part 2: Determination of heating and cooling capacity of ceiling mounted radiant panels	ISO/TC 205/WG 8
ISO 18566-3:2017	Building environment design — Design, test methods and control of hydronic radiant heating and cooling panel systems — Part 3: Design of ceiling mounted radiant panels	ISO/TC 205/WG 8
ISO 18566-4:2017	Building environment design — Design, test methods and control of hydronic radiant heating and cooling panel systems — Part 4: Control of ceiling mounted radiant heating and cooling panels	ISO/TC 205/WG 8
ISO 18566-6:2019	Building environment design — Design, test methods and control of hydronic radiant heating and cooling panel systems — Part 6: Input parameters for the energy calculation	ISO/TC 205/WG 8
ISO 17800:2017	Facility smart grid information model	ISO/TC 205/WG 3
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/WG 2
ISO 16818:2008	Building environment design — Energy efficiency — Terminology	ISO/TC 205
ISO 16817:2017	Building environment design — Indoor environment — Design process for the visual environment	ISO/TC 205/JWG 12
ISO 16814:2008	Building environment design — Indoor air quality — Methods of expressing the quality of indoor air for human occupancy	ISO/TC 205
ISO/DIS 16813	Building environment design — Indoor environment — General principles	ISO/TC 205/WG 1
ISO 16813:2006	Building environment design — Indoor environment — General principles	ISO/TC 205
ISO/PWI 16813-2	Building environment design — Indoor environment — Part 2: Computational design	ISO/TC 205/WG 1
ISO 16484-1	Building automation and control systems (BACS) — Part 1: Project specification and implementation	ISO/TC 205/WG 3
ISO 16484-1:2010	Building automation and control systems (BACS) — Part 1: Project specification and implementation	ISO/TC 205/WG 3
ISO/DIS 16484-2	Building automation and control systems (BACS) — Part 2: Hardware	ISO/TC 205/WG 3
ISO 16484-2:2004	Building automation and control systems (BACS) — Part 2: Hardware	ISO/TC 205/WG 3
ISO 16484-3:2005	Building automation and control systems (BACS) — Part 3: Functions	ISO/TC 205/WG 3

ISO/DIS 16484-4	Building automation and control systems (BACS) — Part 4: Control applications	ISO/TC 205/WG 3
ISO 16484-5:2022	Building automation and control systems (BACS) — Part 5: Data communication protocol	ISO/TC 205/WG 3
ISO 16484-6:2020	Building automation and control systems (BACS) — Part 6: Data communication conformance testing	ISO/TC 205/WG 3
ISO 13675:2013	Heating systems in buildings — Method and design for calculation of the system energy performance — Combustion systems (boilers)	ISO/TC 205/WG 9
ISO 13612-1:2014	Heating and cooling systems in buildings — Method for calculation of the system performance and system design for heat pump systems — Part 1: Design and dimensioning	ISO/TC 205/WG 9
ISO 13612-2:2014	Heating and cooling systems in buildings — Method for calculation of the system performance and system design for heat pump systems — Part 2: Energy calculation	ISO/TC 205/WG 9
ISO 13153:2012	Framework of the design process for energy-saving single-family residential and small commercial buildings	ISO/TC 205/WG 2
ISO 11855-1:2021	Building environment design — Embedded radiant heating and cooling systems — Part 1: Definitions, symbols, and comfort criteria	ISO/TC 205/WG 8
ISO 11855-1:2021/Amd 1:2023	Building environment design — Embedded radiant heating and cooling systems — Part 1: Definitions, symbols, and comfort criteria — Amendment 1	ISO/TC 205/WG 8
ISO 11855-2:2021	Building environment design — Embedded radiant heating and cooling systems — Part 2: Determination of the design heating and cooling capacity	ISO/TC 205/WG 8
ISO 11855-2:2021/Amd 1:2023	Building environment design — Embedded radiant heating and cooling systems — Part 2: Determination of the design heating and cooling capacity — Amendment 1	ISO/TC 205/WG 8
ISO 11855-3:2021	Building environment design — Embedded radiant heating and cooling systems — Part 3: Design and dimensioning	ISO/TC 205/WG 8
ISO 11855-3:2021/Amd 1:2023	Building environment design — Embedded radiant heating and cooling systems — Part 3: Design and dimensioning — Amendment 1	ISO/TC 205/WG 8
ISO 11855-4:2021	Building environment design — Embedded radiant heating and cooling systems — Part 4: Dimensioning and calculation of the dynamic heating and cooling capacity of Thermo Active Building Systems (TABS)	ISO/TC 205/WG 8
ISO 11855-4:2021/Amd 1:2023	Building environment design — Embedded radiant heating and cooling systems — Part 4: Dimensioning and calculation of the dynamic heating and cooling capacity of Thermo Active Building Systems (TABS) — Amendment 1	ISO/TC 205/WG 8
ISO 11855-5:2021	Building environment design — Embedded radiant heating and cooling systems — Part 5: Installation	ISO/TC 205/WG 8
ISO 11855-5:2021/Amd 1:2023	Building environment design — Embedded radiant heating and cooling systems — Part 5: Installation — Amendment 1	ISO/TC 205/WG 8

ISO 11855-6:2018	Building environment design — Design, dimensioning, installation and control of embedded radiant heating and cooling systems — Part 6: Control	ISO/TC 205/WG 8
ISO 11855-6:2018/Amd 1:2023	Building environment design — Design, dimensioning, installation and control of embedded radiant heating and cooling systems — Part 6: Control — Amendment 1	ISO/TC 205/WG 8
ISO 11855-7:2019	Building environment design — Design, dimensioning, installation and control of embedded radiant heating and cooling systems — Part 7: Input parameters for the energy calculation	ISO/TC 205/WG 8
ISO 11855-7:2019/Amd 1	Building environment design — Design, dimensioning, installation and control of embedded radiant heating and cooling systems — Part 7: Input parameters for the energy calculation — Amendment 1	ISO/TC 205/WG 8
ISO 11855-8:2023	Building environment design — Design, dimensioning, installation and control of embedded radiant heating and cooling systems — Part 8: Electrical heating systems	ISO/TC 205/WG 8
ISO/DTR 5863	Integrative design of the building envelope — General principles	ISO/TC 205/WG 1
ISO/WD 37190	Guidance for practical implementation of ISO 37155 series for supervising at each life cycle phase of smart community infrastructures	ISO/TC 268/SC 1/WG 2
ISO/AWI 37187	Smart community infrastructures — Requirements for data framework and functions based on city information modeling platform	ISO/TC 268/SC 1/WG 4
ISO/DIS 37175	Smart community infrastructures — Operation and maintenance of utility tunnels	ISO/TC 268/SC 1/WG 7
ISO/NP 37194	Smart community infrastructures — Disaster risk reduction — Guidance for the process of selecting seismometer systems suitable for specific purposes	ISO/TC 268/SC 1
ISO/PWI 37186	Smart community infrastructure — Guidance on data acquisition and utilization of resident communities to address health emergency	ISO/TC 268/SC 1
ISO/DIS 37179	Smart community infrastructures — Disaster risk reduction — Basic framework for the implementation of disaster risk reduction	ISO/TC 268/SC 1/WG 6
ISO/TR 37178:2023	Smart community infrastructures — Data exchange and sharing for the lamppost network in smart community	ISO/TC 268/SC 1/WG 4
ISO/PWI 37177.2	Guidance for practical implementation of ISO 37155 series for supervising at each life cycle phase of smart community infrastructures	ISO/TC 268/SC 1
ISO/DIS 37176	Smart community infrastructure — Responsiveness assessment and maturity model	ISO/TC 268/SC 1/WG 1
ISO/PRF 37174	Smart community infrastructures — Disaster risk reduction — Guidance for implementing seismometer systems	ISO/TC 268/SC 1/WG 6
ISO 37173:2023	Smart community infrastructure — Guidance for the development of smart building information systems	ISO/TC 268/SC 1/WG 4
ISO/TS 37172:2022	Smart community infrastructures — Data exchange and sharing for community infrastructures based on geographic information	ISO/TC 268/SC 1/WG 4
ISO/TR 37171:2020	Report of pilot testing on the application of ISO smart community infrastructures standards	ISO/TC 268/SC 1

ISO 37170:2022	Smart community infrastructures — Data framework for infrastructure governance based on digital technology in smart cities	ISO/TC 268/SC 1/WG 4
ISO 37166:2022	Smart community infrastructures — Urban data integration framework for smart city planning (SCP)	ISO/TC 268/SC 1/WG 4
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/WG 5
ISO 37156:2020	Smart community infrastructures — Guidelines on data exchange and sharing for smart community infrastructures	ISO/TC 268/SC 1
ISO 37155-1:2020	Framework for integration and operation of smart community infrastructures — Part 1: Recommendations for considering opportunities and challenges from interactions in smart community infrastructures from relevant aspects through the life cycle	ISO/TC 268/SC 1/WG 2
ISO 37155-2:2021	Framework for integration and operation of smart community infrastructures — Part 2: Holistic approach and the strategy for development, operation and maintenance of smart community infrastructures	ISO/TC 268/SC 1/WG 2
ISO/DIS 37153	Smart community infrastructures — Maturity model for assessment and improvement	ISO/TC 268/SC 1/WG 1
ISO 37153:2017	Smart community infrastructures — Maturity model for assessment and improvement	ISO/TC 268/SC 1/WG 1
ISO/TR 37152:2016	Smart community infrastructures — Common framework for development and operation	ISO/TC 268/SC 1
ISO/DIS 37151	Smart community infrastructures — Principles and requirements for performance metrics	ISO/TC 268/SC 1/WG 1
ISO/TS 37151:2015	Smart community infrastructures — Principles and requirements for performance metrics	ISO/TC 268/SC 1/WG 1
ISO/TR 37150:2014	Smart community infrastructures — Review of existing activities relevant to metrics	ISO/TC 268/SC 1/WG 1
ISO/NP TS 24916	Smart community infrastructures --Guidance for practical implementation of ISO/TS 37172:2022	ISO/TC 268/SC 1/WG 4
ISO/TR 6030:2022	Smart community infrastructures – Disaster risk reduction – Survey results and gap analysis	ISO/TC 268/SC 1/WG 6

Table A 2 - Excerpt of Bulk Research EN

Committee	Reference	Title
CEN/CLC/JTC 14	prEN 16325	Guarantees of Origin related to energy - Guarantees of Origin for Electricity, gaseous hydrocarbons, Hydrogen, and heating & cooling
CEN/CLC/JTC 14	EN 16325:2013+A1:2015	Guarantees of Origin related to energy - Guarantees of Origin for Electricity
CEN/CLC/JTC 14	EN 16212:2012	Energy Efficiency and Savings Calculation, Top-down and Bottom-up Methods
CEN/CLC/JTC 17	FprEN 62282-3-400:2022	Fuel cell technologies - Part 3-400: Stationary fuel cell power systems - Small stationary fuel cell power system with combined heat and power output

CEN/CLC/JTC 17	EN 50465:2015	Gas appliances - Combined heat and power appliance of nominal heat input inferior or equal to 70 kW
CEN/TC 10	EN ISO 25745-3:2015	Energy performance of lifts, escalators and moving walks - Part 3: Energy calculation and classification of escalators and moving walks (ISO 25745-3:2015)
CEN/TC 10	EN ISO 25745-2:2015	Energy performance of lifts, escalators and moving walks - Part 2: Energy calculation and classification for lifts (elevators) (ISO 25745-2:2015, Corrected version 2015-12-15)
CEN/TC 10	EN ISO 25745-1:2023	Energy performance of lifts, escalators and moving walks - Part 1: Energy measurement and verification (ISO 25745-1:2023)
CEN/TC 106	EN 203-2-6:2005	Gas heated catering equipment - Part 2-6: Specific requirements - Hot water heaters for beverage
CEN/TC 109	prEN 15502-2-7	Heating boilers - Part 2-7: Specific standard for gas-fired central heating units
CEN/TC 109	prEN 15502-2-2	Gas-fired central heating boilers - Part 2-2: Specific standard for type B1 appliances
CEN/TC 109	FprCEN/TS 15502-3-1	Gas-fired central heating boilers - Part 3-1: H2NG and ACCF - Expansion of EN 15502-2-1:2022
CEN/TC 109	EN 303-7:2006	Heating boilers - Part 7: Gas-fired central heating boilers equipped with a forced draught burner of nominal heat output not exceeding 1 000 kW
CEN/TC 109	EN 303-3:1998/AC:2006	Heating boilers - Part 3: Gas-fired central heating boilers - Assembly comprising a boiler body and a forced draught burner
CEN/TC 109	EN 303-3:1998/A2:2004	Heating Boilers - Part 3 : Gas-fired heating boilers - Assembly comprising a boiler body and a forced draught burner
CEN/TC 109	EN 303-3:1998	Heating boilers - Part 3: Gas-fired central heating boilers - Assembly comprising a boiler body and a forced draught burner
CEN/TC 109	EN 15502-2-3:2023	Gas-fired central heating boilers - Part 2-3: Specific standard for hybrid units combining a gas-fired boiler and an electrical heat pump in a product
CEN/TC 109	EN 15502-2-2:2014	Gas-fired central heating boilers - Part 2-2: Specific standard for type B1 appliances
CEN/TC 109	EN 15502-2-1:2022/prA1	Gas-fired central heating boilers - Part 2-1: Specific standard for type C appliances and type B2, B3 and B5 appliances of a nominal heat input not exceeding 1 000 kW
CEN/TC 109	EN 15502-2-1:2022+A1:2023	Gas-fired central heating boilers - Part 2-1: Specific standard for type C appliances and type B2, B3 and B5 appliances of a nominal heat input not exceeding 1 000 kW
CEN/TC 109	EN 15502-2-1:2022	Gas-fired central heating boilers - Part 2-1: Specific standard for type C appliances and type B2, B3 and B5 appliances of a nominal heat input not exceeding 1 000 kW
CEN/TC 109	EN 15502-1:2021/prA1	Gas-fired heating boilers - Part 1: General requirements and tests
CEN/TC 109	EN 15502-1:2021/AC:2022	Gas-fired heating boilers - Part 1: General requirements and tests
CEN/TC 109	EN 15502-1:2021+A1:2023	Gas-fired heating boilers - Part 1: General requirements and tests
CEN/TC 109	EN 15502-1:2021	Gas-fired heating boilers - Part 1: General requirements and tests
CEN/TC 109	EN 13836:2006	Gas fired central heating boilers - Type B boilers of nominal heat input exceeding 300 kW, but not exceeding 1 000 kW
CEN/TC 109	EN 13203-2:2022	Gas-fired domestic appliances producing hot water - Part 2: Assessment of energy consumption
CEN/TC 110	EN 1216:1998/A1:2002	Heat exchangers - Forced circulation air-cooling and air-heating coils - Test procedures for establishing the performance
CEN/TC 110	EN 1216:1998	Heat exchangers - Forced circulation air-cooling and air-heating coils - Test procedures for establishing the performance
CEN/TC 110	EN 1148:1998/A1:2005	Heat exchangers - Water to water heat exchangers for district heating - Test procedures for establishing the performance data

CEN/TC 110	EN 1148:1998	Heat exchangers - Water to water heat exchangers for district heating - Test procedures for establishing the performance data
CEN/TC 113	prEN 17625	Roof-top units
CEN/TC 113	prEN 12900	Refrigerant compressors - Rating conditions, tolerances and presentation of performance data
CEN/TC 113	EN 16583:2022/prA1	Heat exchangers - Hydronic room fan coils units - Determination of the sound power level
CEN/TC 113	EN 16583:2022	Heat exchangers - Hydronic room fan coils units - Determination of the sound power level
CEN/TC 113	EN 16147:2017+A1:2022	Heat pumps with electrically driven compressors - Testing, performance rating and requirements for marking of domestic hot water units
CEN/TC 113	EN 15879-1:2011	Testing and rating of direct exchange ground coupled heat pumps with electrically driven compressors for space heating and/or cooling - Part 1: Direct exchange-to-water heat pumps
CEN/TC 113	EN 15218:2022	Air conditioners and liquid chilling packages with evaporatively cooled condenser and with electrically driven compressors for space cooling - Terms, definitions, test conditions, test methods and requirements
CEN/TC 113	EN 14825:2022/prA1	Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling, commercial and process cooling - Testing and rating at part load conditions and calculation of seasonal performance
CEN/TC 113	EN 14825:2022	Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling, commercial and process cooling - Testing and rating at part load conditions and calculation of seasonal performance
CEN/TC 113	EN 14511-4:2022	Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors - Part 4: Requirements
CEN/TC 113	EN 14511-3:2022/prA1	Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors - Part 3: Test methods
CEN/TC 113	EN 14511-3:2022	Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors - Part 3: Test methods
CEN/TC 113	EN 14511-2:2022/prA1	Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors - Part 2: Test conditions
CEN/TC 113	EN 14511-2:2022	Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors - Part 2: Test conditions
CEN/TC 113	EN 14511-1:2022	Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors - Part 1: Terms and definitions
CEN/TC 113	EN 1397:2021	Heat exchangers - Hydronic room fan coil units - Test procedures for establishing the performance
CEN/TC 113	EN 12102-2:2019	Air conditioners, liquid chilling packages, heat pumps, process chillers and dehumidifiers with electrically driven compressors - Determination of the sound power level - Part 2: Heat pump water heaters
CEN/TC 113	EN 12102-1:2022	Air conditioners, liquid chilling packages, heat pumps, process chillers and dehumidifiers with electrically driven compressors - Determination of the sound power level - Part 1: Air conditioners, liquid chilling packages, heat pumps for space heating and cooling, dehumidifiers and process chillers
CEN/TC 113	CEN ISO/TS 16491:2012	Guidelines for the evaluation of uncertainty of measurement in air conditioner and heat pump cooling and heating capacity tests (ISO/TS 16491:2012)
CEN/TC 129	FprEN 16477-2	Painted glass for internal use - part 2: product standard

CEN/TC 129	EN ISO 14438:2002	Glass in building - Determination of energy balance value - Calculation method (ISO 14438:2002)
CEN/TC 129	EN 572-9:2004	Glass in building - Basic soda lime silicate glass products - Part 9: Evaluation of conformity/Product standard
CEN/TC 129	EN 410:2011	Glass in building - Determination of luminous and solar characteristics of glazing
CEN/TC 129	EN 1863-2:2004	Glass in building - Heat strengthened soda lime silicate glass - Part 2: Evaluation of conformity/Product standard
CEN/TC 129	EN 1748-2-2:2004	Glass in building - Special basic products - Glass ceramics - Part 2-2: Evaluation of conformity/Product standard
CEN/TC 129	EN 1748-1-2:2004	Glass in building - Special basic products - Borosilicate glasses - Part 1-2: Evaluation of conformity/Product standard
CEN/TC 129	EN 15682-2:2013	Glass in building - Heat soaked thermally toughened alkaline earth silicate safety glass - Part 2: Evaluation of conformity/Product standard
CEN/TC 129	EN 15681-2:2017	Glass in Building - Basic alumino silicate glass products - Part 2: Product standard
CEN/TC 129	EN 14449:2005	Glass in building - Laminated glass and laminated safety glass - Evaluation of conformity/Product standard
CEN/TC 129	EN 14321-2:2005	Glass in building - Thermally toughened alkaline earth silicate safety glass - Part 2: Evaluation of conformity/Product standard
CEN/TC 129	EN 14179-2:2005	Glass in building - Heat soaked thermally toughened soda lime silicate safety glass - Part 2: Evaluation of conformity/Product standard
CEN/TC 129	EN 14178-2:2004	Glass in building - Basic alkaline earth silicate glass products - Part 2: Evaluation of conformity/Product standard
CEN/TC 129	EN 13024-2:2004	Glass in building - Thermally toughened borosilicate safety glass - Part 2: Evaluation of conformity/Product standard
CEN/TC 129	EN 1279-5:2018	Glass in building - Insulating glass units - Part 5: Product standard
CEN/TC 129	EN 1279-1:2018	Glass in Building - Insulating glass units - Part 1: Generalities, system description, rules for substitution, tolerances and visual quality
CEN/TC 129	EN 12337-2:2004	Glass in building - Chemically strengthened soda lime silicate glass - Part 2: Evaluation of conformity/Product standard
CEN/TC 129	EN 12150-2:2004	Glass in building - Thermally toughened soda lime silicate safety glass - Part 2: Evaluation of conformity/Product standard
CEN/TC 129	EN 1096-4:2018	Glass in building - Coated glass - Part 4: Product standard
CEN/TC 129	EN 1036-2:2008	Glass in building - Mirrors from silver-coated float glass for internal use - Part 2: Evaluation of conformity; product standard
CEN/TC 130	EN 442-2:2014	Radiators and convectors - Part 2: Test methods and rating
CEN/TC 130	EN 442-1:2014	Radiators and convectors - Part 1: Technical specifications and requirements
CEN/TC 130	EN 215:2019	Thermostatic radiator valves - Requirements and test methods
CEN/TC 130	EN 16430-1:2014	Fan assisted radiators, convectors and trench convectors - Part 1: Technical specifications and requirements
CEN/TC 130	EN 16313:2013	Connections for heating and cooling appliances - Detachable connection with outside threaded pipe G ¾ A and inside cone
CEN/TC 130	EN 14037-5:2016	Free hanging heating and cooling surfaces for water with a temperature below 120°C - Part 5: Open or closed heated ceiling surfaces - Test method for thermal output
CEN/TC 130	EN 14037-4:2016	Free hanging heating and cooling surfaces for water with a temperature below 120°C - Part 4: Pre-fabricated ceiling mounted radiant panels - Test method for cooling capacity
CEN/TC 130	EN 14037-3:2016	Free hanging heating and cooling surfaces for water with a temperature below 120°C - Part 3: Prefabricated ceiling mounted radiant panels for space heating - Rating method and evaluation of radiant thermal output

CEN/TC 130	EN 14037-2:2016	Free hanging heating and cooling surfaces for water with a temperature below 120°C - Part 2: Pre-fabricated ceiling mounted radiant panels for space heating - Test method for thermal output
CEN/TC 130	EN 14037-1:2016	Free hanging heating and cooling surfaces for water with a temperature below 120°C - Part 1: Pre-fabricated ceiling mounted radiant panels for space heating - Technical specifications and requirements
CEN/TC 130	EN 1264-5:2021	Water based surface embedded heating and cooling systems - Part 5: Determination of the thermal output for wall and ceiling heating and for floor, wall and ceiling cooling
CEN/TC 130	EN 1264-4:2021	Water based surface embedded heating and cooling systems - Part 4: Installation
CEN/TC 130	EN 1264-3:2021	Water based surface embedded heating and cooling systems - Part 3: Dimensioning
CEN/TC 130	EN 1264-2:2021	Water based surface embedded heating and cooling systems - Part 2: Floor heating: Methods for the determination of the thermal output using calculations and experimental tests
CEN/TC 130	EN 1264-1:2021	Water based surface embedded heating and cooling systems - Part 1: Definitions and symbols
CEN/TC 131	EN 267:2020	Forced draught burners for liquid fuels
CEN/TC 131	EN 12514:2020	Components for supply systems for consuming units with liquid fuels
CEN/TC 156	prEN 16573 rev	Ventilation for Buildings - Performance testing of components for residential buildings - Multifunctional balanced ventilation units for single family dwellings, including heat pumps
CEN/TC 156	prEN 12599 rev	Ventilation for buildings - Test procedures and measurement methods to hand over air conditioning and ventilation systems
CEN/TC 156	prCEN/TS XXX	Ventilative cooling systems
CEN/TC 156	FprCEN/TS XXX	Natural and hybrid ventilation systems in non-residential buildings
CEN/TC 156	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 16798-5-2:2017	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	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 16798-1:2019	Energy performance of buildings - Ventilation for buildings - Part 1: Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics - Module M1-6
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 16798-13:2017	Energy performance of buildings - Ventilation for buildings - Part 13: Calculation of cooling systems (Module M4-8) - Generation
CEN/TC 156	EN 16573:2017	Ventilation for Buildings - Performance testing of components for residential buildings - Multifunctional balanced ventilation units for single family dwellings, including heat pumps
CEN/TC 156	EN 15650:2010	Ventilation for buildings - Fire dampers
CEN/TC 156	EN 14134:2019	Ventilation for buildings - Performance measurement and checks for residential ventilation systems

CEN/TC 156	EN 13141-7:2021	Ventilation for buildings - Performance testing of components/products for residential ventilation - Part 7: Performance testing of ducted mechanical supply and exhaust ventilation units (including heat recovery)
CEN/TC 156	EN 13141-4:2021	Ventilation for buildings - Performance testing of components/products for residential ventilation - Part 4: Aerodynamic, electrical power and acoustic performance of unidirectional ventilation units
CEN/TC 156	EN 13141-11:2015	Ventilation for buildings - Performance testing of components/products for residential ventilation - Part 11: Supply ventilation units
CEN/TC 156	EN 12599:2012	Ventilation for buildings - Test procedures and measurement methods to hand over air conditioning and ventilation systems
CEN/TC 156	CEN/TR 14788:2006	Ventilation for buildings - Design and dimensioning of residential ventilation systems
CEN/TC 156		EN 16798-1-3 Energy performance of buildings – Indoor environmental parameters – Part 1.3: Design and assessment of indoor air quality
CEN/TC 164	prEN 14367 rev	Non controllable backflow preventer with different pressure zones - Family C, type A
CEN/TC 164	EN 14367:2005	Non controllable backflow preventer with different pressure zones - Family C, type A
CEN/TC 169	EN 14255-2:2005	Measurement and assessment of personal exposures to incoherent optical radiation - Part 2: Visible and infrared radiation emitted by artificial sources in the workplace
CEN/TC 171	EN 835:1994	Heat cost allocators for the determination of the consumption of room heating radiators - Appliances without an electrical energy supply, based on the evaporation principle
CEN/TC 171	EN 834:2013/AC:2015	Heat cost allocators for the determination of the consumption of room heating radiators - Appliances with electrical energy supply
CEN/TC 171	EN 834:2013	Heat cost allocators for the determination of the consumption of room heating radiators - Appliances with electrical energy supply
CEN/TC 176	EN 1434-6:2022	Thermal energy meters - Part 6: Installation, commissioning, operational monitoring and maintenance
CEN/TC 176	EN 1434-5:2022	Thermal energy meters - Part 5: Initial verification tests
CEN/TC 176	EN 1434-4:2022	Thermal energy meters - Part 4: Pattern approval tests
CEN/TC 176	EN 1434-2:2022	Thermal energy meters - Part 2: Constructional requirements
CEN/TC 176	EN 1434-1:2022	Thermal energy meters - Part 1: General requirements
CEN/TC 176	CEN/TR 16911:2015	Heat meters - Recommendations for circulation water in industrial and district heating systems and their operation
CEN/TC 180	EN 17082:2019	Domestic and non-domestic gas-fired forced convection air heaters for space heating not exceeding a net heat input of 300 kW
CEN/TC 181	FprEN 521	Specifications for dedicated liquefied petroleum gas appliances - Portable vapour pressure liquefied petroleum gas appliances
CEN/TC 181	EN 624:2011	Specification for dedicated LPG appliances - Room sealed LPG space heating equipment for installation in vehicles and boats
CEN/TC 181	EN 521:2019+AC:2019	Specifications for dedicated liquefied petroleum gas appliances - Portable vapour pressure liquefied petroleum gas appliances
CEN/TC 181	EN 17476:2021+A1:2022	Specifications for dedicated liquefied petroleum gas appliances - LPG vapour pressure appliances incorporating a horizontal cartridge in the chassis
CEN/TC 181	EN 15033:2006	Room sealed storage water heaters for the production of sanitary hot water using LPG for vehicles and boats

CEN/TC 182	prEN 378-3 rev	Refrigerating systems and heat pumps - Safety and environmental requirements - Part 3: Installation site and personal protection
CEN/TC 182	prEN 378-2 rev	Refrigerating systems and heat pumps - Safety and environmental requirements - Part 2: Design, construction, testing, marking and documentation
CEN/TC 182	prEN 378-1 rev	Refrigerating systems and heat pumps - Safety and environmental requirements - Part 1: Basic requirements, definitions, classification and selection criteria
CEN/TC 182	EN 378-4:2016+A1:2019	Refrigerating systems and heat pumps - Safety and environmental requirements - Part 4: Operation, maintenance, repair and recovery
CEN/TC 182	EN 378-3:2016+A1:2020	Refrigerating systems and heat pumps - Safety and environmental requirements - Part 3: Installation site and personal protection
CEN/TC 182	EN 378-2:2016	Refrigerating systems and heat pumps - Safety and environmental requirements - Part 2: Design, construction, testing, marking and documentation
CEN/TC 182	EN 378-1:2016+A1:2020	Refrigerating systems and heat pumps - Safety and environmental requirements - Part 1: Basic requirements, definitions, classification and selection criteria
CEN/TC 182	EN 14276-2:2020/prA1	Pressure equipment for refrigerating systems and heat pumps - Part 2: Piping - General requirements
CEN/TC 182	EN 14276-2:2020	Pressure equipment for refrigerating systems and heat pumps - Part 2: Piping - General requirements
CEN/TC 197	EN 16644:2014	Pumps - Rotodynamic pumps - Glandless circulators having a rated power input not exceeding 200 W for heating installations and domestic hot water installations - Noise test code (vibro-acoustics) for measuring structure- and fluid-borne noise
CEN/TC 197	EN 16297-1:2012	Pumps - Rotodynamic pumps - Glandless circulators - Part 1: General requirements and procedures for testing and calculation of energy efficiency index (EEI)
CEN/TC 228	prEN 17956	Heating systems and water based cooling systems in buildings - Energy efficiency classes for technical insulation systems - Calculation method and applications
CEN/TC 228	prEN 17671	Heating systems and water based cooling systems in buildings - Design for water- based cooling systems
CEN/TC 228	prEN 15316-5 rev	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	prEN 14336 rev	Heating systems in buildings - Installation and commissioning of water based heating systems
CEN/TC 228	prEN 12831-3 rev	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	prEN 12831-1 rev	Energy performance of buildings - Method for calculation of the design heat load - Part 1: Space heating load, Module M3-3
CEN/TC 228	FprEN ISO 11855-8	Building environment design - Design, dimensioning, installation and control of embedded radiant heating and cooling systems - Part 8: Electrical heating systems (ISO/FDIS 11855-8:2023)
CEN/TC 228	EN ISO 11855-5:2021/A1:2023	Building environment design - Embedded radiant heating and cooling systems - Part 5: Installation - Amendment 1 (ISO 11855-5:2021/Amd 1:2023)
CEN/TC 228	EN ISO 11855-5:2021	Building environment design - Embedded radiant heating and cooling systems - Part 5: Installation (ISO 11855-5:2021)
CEN/TC 228	EN ISO 11855-4:2021/A1:2023	Building environment design - Embedded radiant heating and cooling systems - Part 4: Dimensioning and calculation of the dynamic heating and cooling capacity of Thermo Active Building Systems (TABS) - Amendment 1 (ISO 11855-4:2021/Amd 1:2023)

CEN/TC 228	EN ISO 11855-4:2021	Building environment design - Embedded radiant heating and cooling systems - Part 4: Dimensioning and calculation of the dynamic heating and cooling capacity of Thermo Active Building Systems (TABS) (ISO 11855-4:2021)
CEN/TC 228	EN ISO 11855-3:2021/A1:2023	Building environment design - Embedded radiant heating and cooling systems - Part 3: Design and dimensioning - Amendment 1 (ISO 11855-3:2021/Amd 1:2023)
CEN/TC 228	EN ISO 11855-3:2021	Building environment design - Embedded radiant heating and cooling systems - Part 3: Design and dimensioning (ISO 11855-3:2021)
CEN/TC 228	EN ISO 11855-2:2021/prA1	Building environment design - Embedded radiant heating and cooling systems - Part 2: Determination of the design heating and cooling capacity - Amendment 1 (ISO 11855-2:2021/DAM 1:2023)
CEN/TC 228	EN ISO 11855-2:2021	Building environment design - Embedded radiant heating and cooling systems - Part 2: Determination of the design heating and cooling capacity (ISO 11855-2:2021)
CEN/TC 228	EN ISO 11855-1:2021/A1:2023	Building environment design - Embedded radiant heating and cooling systems - Part 1: Definitions, symbols, and comfort criteria - Amendment 1 (ISO 11855-1:2021/Amd 1:2023)
CEN/TC 228	EN ISO 11855-1:2021	Building environment design - Embedded radiant heating and cooling systems - Part 1: Definitions, symbols, and comfort criteria (ISO 11855-1:2021)
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	EN 15450:2007	Heating systems in buildings - Design of heat pump heating systems
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 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 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 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 15316-4-5:2017	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 15316-4-4:2017	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 15316-4-3:2017	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	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 15316-4-2:2017	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 15316-4-1:2017	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 15316-3:2017	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 15316-2:2017	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 15316-1:2017	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	EN 14337:2005	Heating Systems in buildings - Design and installation of direct electrical room heating systems
CEN/TC 228	EN 14336:2004	Heating systems in buildings - Installation and commissioning of water based heating systems
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 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 12828:2012+A1:2014	Heating systems in buildings - Design for water-based heating systems
CEN/TC 228	EN 12171:2002	Heating systems in buildings - Procedure for the preparation of documents for operation, maintenance and use - Heating systems not requiring a trained operator
CEN/TC 228	EN 12170:2002	Heating systems in buildings - Procedure for the preparation of documents for operation, maintenance and use - Heating systems requiring a trained operator
CEN/TC 228	CEN/TR 15378-4:2017	Energy performance of buildings - Heating systems and DHW in buildings - Part 4: Explanation and justification of EN 15378-3, Module M3-10, M8-10
CEN/TC 228	CEN/TR 15378-2:2017	Energy performance of buildings - Heating systems and DHW in buildings - Part 2: Explanation and justification of EN 15378-1, Module M3-11 and M8-11
CEN/TC 228	CEN/TR 15316-6-9:2017	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 6-9: Explanation and justification of EN 15316-4-8, Module M3-8-8
CEN/TC 228	CEN/TR 15316-6-8:2017	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 6-8: Explanation and justification of EN 15316-4-5 (District heating and cooling), Module M3-8-5, M4-8-5, M8-8-5, M11-8-5
CEN/TC 228	CEN/TR 15316-6-3:2017	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 6-3: Explanation and justification of 15316-3, Module M3-6, M4-6, M8-6
CEN/TC 228	CEN/TR 15316-6-2:2017	Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 6-2: Explanation and justification of EN 15316-2, Module M3-5, M4-5
CEN/TC 247	EN 17690-1:2023	Components for BAC control loop - Sensors - Part 1: Room temperature sensors
CEN/TC 247	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 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 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	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 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	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 269	prEN 12952-1 rev	Water-tube boilers and auxiliary installations - Part 1: General
CEN/TC 269	EN 12952-1:2015	Water-tube boilers and auxiliary installations - Part 1: General
CEN/TC 294	prEN 1434-3	Thermal energy meters - Part 3: Data exchange and interfaces
CEN/TC 294	EN 1434-3:2015	Heat meters - Part 3: Data exchange and interfaces
CEN/TC 295	prEN 16510-2-7	Residential solid fuel burning appliances - Part 2-7: Combination appliances fired by wood logs and pellets
CEN/TC 295	prEN 16510-2-5	Residential solid fuel burning appliances - Part 2-5: Slow heat release appliances
CEN/TC 295	prEN 15821 rev	Multi-firing sauna stoves fired by natural wood logs - Requirements and test methods
CEN/TC 295	EN 16510-2-6:2022	Residential solid fuel burning appliances - Part 2-6: Mechanically by wood pellets fed room heaters, inset appliances and cookers
CEN/TC 295	EN 16510-2-4:2022	Residential solid fuel burning appliances - Part 2-4: Independent boilers - Nominal heat output up to 50 kW
CEN/TC 295	EN 16510-2-3:2022	Residential solid fuel burning appliances - Part 2-3: Cookers
CEN/TC 295	EN 16510-2-2:2022	Residential solid fuel burning appliances - Part 2-2: Inset appliances including open fires
CEN/TC 295	EN 16510-2-1:2022	Residential solid fuel burning appliances - Part 2-1: Room heaters
CEN/TC 295	EN 15821:2010	Multi-firing sauna stoves fired by natural wood logs - Requirements and test methods
CEN/TC 295	EN 15544:2023	One off Kachelgrundöfen/Putzgrundöfen (tiled/mortared stoves) - Dimensioning
CEN/TC 295	CEN/TS 15883:2009	Residential solid fuel burning appliances - Emission test methods
CEN/TC 299	prEN 16905-3	Gas-fired endothermic engine driven heat pumps - Part 3: Test conditions
CEN/TC 299	prEN 12309-2	Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 2: Safety
CEN/TC 299	FprEN 16905-4	Gas-fired endothermic engine driven heat pumps - Part 4: Test methods
CEN/TC 299	FprEN 16905-2	Gas-fired endothermic engine driven heat pumps - Part 2: Safety
CEN/TC 299	FprEN 12309-6	Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 6: Calculation of seasonal performances
CEN/TC 299	FprEN 12309-3	Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 3: Requirements, test conditions and test methods
CEN/TC 299	EN 16905-5:2022	Gas-fired endothermic engine driven heat pumps - Part 5: Calculation of seasonal performances in heating and cooling mode
CEN/TC 299	EN 16905-4:2017	Gas-fired endothermic engine driven heat pumps - Part 4: Test methods
CEN/TC 299	EN 16905-3:2017	Gas-fired endothermic engine driven heat pumps - Part 3: Test conditions
CEN/TC 299	EN 16905-2:2020	Gas-fired endothermic engine driven heat pumps - Part 2: Safety
CEN/TC 299	EN 16905-1:2023	Gas-fired endothermic engine driven heat pumps - Part 1: Terms and definitions
CEN/TC 299	EN 12309-7:2014	Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 7: Specific provisions for hybrid appliances
CEN/TC 299	EN 12309-6:2014	Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 6: Calculation of seasonal performances

CEN/TC 299	EN 12309-5:2014	Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 5: Requirements
CEN/TC 299	EN 12309-4:2014	Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 4: Test methods
CEN/TC 299	EN 12309-3:2014	Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 3: Test conditions
CEN/TC 299	EN 12309-2:2015/AC:2015	Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 2: Safety
CEN/TC 299	EN 12309-2:2015	Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 2: Safety
CEN/TC 299	EN 12309-1:2023	Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 1: Terms and definitions
CEN/TC 312	EN ISO 9806:2017	Solar energy - Solar thermal collectors - Test methods (ISO 9806:2017)
CEN/TC 312	EN ISO 9488:2022	Solar energy - Vocabulary (ISO 9488:2022)
CEN/TC 312	EN 12977-5:2018	Thermal solar systems and components - Custom built systems - Part 5: Performance test methods for control equipment
CEN/TC 312	EN 12977-2:2018	Thermal solar systems and components - Custom built systems - Part 2: Test methods for solar water heaters and combisystems
CEN/TC 312	EN 12977-1:2018	Thermal solar systems and components - Custom built systems - Part 1: General requirements for solar water heaters and combisystems
CEN/TC 312	EN 12976-2:2019	Thermal solar systems and components - Factory made systems - Part 2: Test methods
CEN/TC 312	EN 12976-1:2021	Thermal solar systems and components - Factory made systems - Part 1: General requirements
CEN/TC 312	EN 12975:2022	Solar collectors - General requirements
CEN/TC 335	EN ISO 20049-1:2020	Solid biofuels - Determination of self-heating of pelletized biofuels - Part 1: Isothermal calorimetry (ISO 20049-1:2020)
CEN/TC 335	CEN ISO/TS 20049-2:2022	Solid biofuels - Determination of self-heating of pelletized biofuels - Part 2: Basket heating tests (ISO/TS 20049-2:2020)
CEN/TC 338	EN ISO 11085:2015	Cereals, cereals-based products and animal feeding stuffs - Determination of crude fat and total fat content by the Randall extraction method (ISO 11085:2015)
CEN/TC 402	EN 17645:2022	Domestic swimming pools - Environmental performance efficiency - Performance evaluation, methodology, and classification of the use of outdoor pools and their equipment
CEN/TC 46	prEN 16647-2	Alcohol powered flueless fireplaces – Safety requirements and test methods- Part 2: Automatically operated decorative fireplaces for domestic use
CEN/TC 46	prEN 16647-1	Alcohol powered flueless fireplaces – Safety requirements and test methods- Part 1: Manually operated decorative fireplaces for domestic use
CEN/TC 46	prEN 1-2	Residential liquid fuel burning appliances - Part 2: Flued oil stoves with vaporizing burners
CEN/TC 46	prEN 1-1	Residential liquid fuel burning appliances - Part 1: General requirements and test methods
CEN/TC 46	EN 1:1998	Flued oil stoves with vaporizing burners
CEN/TC 46	EN 16647:2015	Fireplaces for liquid fuels - Decorative appliances producing a flame using alcohol based or gelatinous fuel - Use in private households
CEN/TC 48	EN 26:2023	Gas-fired instantaneous water heaters for the production of domestic hot water
CEN/TC 48	EN 26:2015	Gas-fired instantaneous water heaters for the production of domestic hot water

CEN/TC 49	FprEN 30-1-4	Domestic cooking appliances burning gas - Part 1-4: Safety- Appliances having one or more burners with an automatic burner control system
CEN/TC 49	EN 30-1-4:2012	Domestic cooking appliances burning gas - Safety - Part 1-4: Appliances having one or more burners with an automatic burner control system
CEN/TC 49	EN 30-1-3:2003+A1:2006	Domestic cooking appliances burning gas - Part 1-3: Safety - Appliances having a glass ceramic hotplate
CEN/TC 49	EN 30-1-2:2023	Domestic cooking appliances burning gas - Part 1-2: Safety - Appliances having forced-convection ovens
CEN/TC 49	EN 30-1-1:2021/prA2	Domestic cooking appliances burning gas - Part 1-1: Safety - General
CEN/TC 49	EN 30-1-1:2021	Domestic cooking appliances burning gas - Part 1-1: Safety - General
CEN/TC 57	prEN 304	Heating boilers - Test code for heating boilers for atomizing oil burners
CEN/TC 57	prEN 303-2	Heating boilers - Part 2: Heating boilers with forced draught burners - Special requirements for boilers with atomizing oil burners
CEN/TC 57	FprEN 17692	Central heating boilers - Specification for indirectly heated unvented (closed) pressurized buffer tanks - Requirements, testing and marking
CEN/TC 57	EN 304:2017	Heating boilers - Test code for heating boilers for atomizing oil burners
CEN/TC 57	EN 303-6:2019/FprA1	Heating boilers - Part 6: Heating boilers with forced draught burners - Specific requirements for the domestic hot water operation and energy performance of water heaters and combination boilers with atomizing oil burners of nominal heat input not exceeding 70 kW
CEN/TC 57	EN 303-6:2019	Heating boilers - Part 6: Heating boilers with forced draught burners - Specific requirements for the domestic hot water operation and energy performance of water heaters and combination boilers with atomizing oil burners of nominal heat input not exceeding 70 kW
CEN/TC 57	EN 303-5:2021+A1:2022	Heating boilers - Part 5: Heating boilers for solid fuels, manually and automatically stoked, nominal heat output of up to 500 kW - Terminology, requirements, testing and marking
CEN/TC 57	EN 303-4:1999	Heating boilers - Part 4: Heating boilers with forced draught burners - Special requirements for boilers with forced draught oil burners with outputs up to 70 kW and a maximum operating pressure of 3 bar - Terminology, special requirements, testing and marking
CEN/TC 57	EN 303-2:2017	Heating boilers - Part 2: Heating boilers with forced draught burners - Special requirements for boilers with atomizing oil burners
CEN/TC 57	EN 303-1:2017	Heating boilers - Part 1: Heating boilers with forced draught burners - Terminology, general requirements, testing and marking
CEN/TC 57	EN 15456:2008	Heating boilers - Electrical power consumption for heat generators - System boundaries - Measurements
CEN/TC 57	EN 15332:2019/FprA1	Heating boilers - Energy assessment of hot water storage tanks
CEN/TC 57	EN 15332:2019	Heating boilers - Energy assessment of hot water storage tanks
CEN/TC 57	EN 15270:2007	Pellet burners for small heating boilers - Definitions, requirements, testing, marking
CEN/TC 57	EN 15036-2:2006	Heating boilers - Test regulations for airborne noise emissions from heat generators - Part 2: Flue gas noise emissions at the outlet of the heat generator
CEN/TC 57	EN 15036-1:2006	Heating boilers - Test regulations for airborne noise emissions from heat generators - Part 1: Airborne noise emissions from heat generators
CEN/TC 57	EN 15035:2006	Heating boilers - Special requirements for oil fired room sealed units up to 70 kW

CEN/TC 57	EN 14394:2005+A1:2008	Heating boilers - Heating boilers with forced draught burners - Nominal heat output not exceeding 10 MW and maximum operating temperature of 110 °C
CEN/TC 57	EN 13842:2004	Oil fired forced convection air heaters - Stationary and transportable for space heating
CEN/TC 62	FprEN 509	Decorative fuel-effect gas appliances
CEN/TC 62	EN 509:1999	Decorative fuel-effect gas appliances
CEN/TC 62	EN 14829:2007	Independent gas-fired flueless space heaters for nominal heat input not exceeding 6 kW
CEN/TC 62	EN 14438:2006	Gas-fired insets for heating more than one room
CEN/TC 62	EN 13278:2013	Open fronted gas-fired independent space heaters
CEN/TC 62	EN 1266:2002	Independent gas-fired convection heaters incorporating a fan to assist transportation of combustion air and/or flue gases
CEN/TC 89	prCEN ISO/TR 52016-4	Energy performance of buildings - Energy needs for heating and cooling, internal temperatures and sensible and latent heat loads - Part 4: Explanation and justification of ISO 52016-3
CEN/TC 89	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 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	EN ISO 52016-3:2023	Energy performance of buildings - Energy needs for heating and cooling, internal temperatures and sensible and latent heat loads - Part 3: Calculation procedures regarding adaptive building envelope elements (ISO 52016-3:2023)
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 15927-6:2007	Hygrothermal performance of buildings - Calculation and presentation of climatic data - Part 6: Accumulated temperature differences (degree-days) (ISO 15927-6:2007)
CEN/TC 89	EN ISO 15927-5:2004/A1:2011	Hygrothermal performance of buildings - Calculation and presentation of climatic data - Part 5: Data for design heat load for space heating - Amendment 1 (ISO 15927-5:2004/Amd 1:2011)
CEN/TC 89	EN ISO 15927-5:2004	Hygrothermal performance of buildings - Calculation and presentation of climatic data - Part 5: Data for design heat load for space heating (ISO 15927-5:2004)
CEN/TC 89	EN ISO 15927-4:2005	Hygrothermal performance of buildings - Calculation and presentation of climatic data - Part 4: Hourly data for assessing the annual energy use for heating and cooling (ISO 15927-4:2005)
CEN/TC 89	EN ISO 12631:2017	Thermal performance of curtain walling - Calculation of thermal transmittance (ISO 12631:2017)
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		Thermal performance of buildings – In-situ measurement of building element or component in calorimeter test cell – Part 1: Data collection aggregate heat loss test
CLC/BTTF 132-2	prEN 50156-1	Electrical equipment for furnaces and ancillary equipment - Part 1: Requirements for application design and installation
CLC/BTTF 132-2	EN 50156-2:2015	Electrical equipment for furnaces and ancillary equipment - Part 2: Requirements for design, development and type approval of safety devices and subsystems
CLC/BTTF 132-2	EN 50156-1:2015	Electrical equipment for furnaces and ancillary equipment - Part 1: Requirements for application design and installation
CLC/SR 23J	EN IEC 61058-2-5:2021	Switches for appliances - Part 2-5: Particular requirements for change-over selectors
CLC/SR 23J	EN IEC 61058-2-1:2021	Switches for appliances - Part 2-1: Particular requirements for cord switches

CLC/SR 33	EN 60110-1:1998	Power capacitors for induction heating installations - Part 1: General
CLC/SR 40	EN 60738-1-2:2008	Thermistors - Directly heated positive step-function temperature coefficient - Part 1-2: Blank detail specification - Heating element application - Assessment level EZ
CLC/SR 47	EN IEC 63373:2022	Dynamic on-resistance test method guidelines for GaN HEMT based power conversion devices
CLC/SR 47	EN IEC 60749-15:2020	Semiconductor devices - Mechanical and climatic test methods - Part 15: Resistance to soldering temperature for through-hole mounted devices
CLC/SR 47	EN 60749-32:2003	Semiconductor devices - Mechanical and climatic test methods - Part 32: Flammability of plastic-encapsulated devices (externally induced)
CLC/SR 47	EN 60749-31:2003	Semiconductor devices - Mechanical and climatic test methods - Part 31: Flammability of plastic-encapsulated devices (internally induced)
CLC/SR 48B	EN 60512-12-5:2006/corrigendum Dec. 2006	Connectors for electronic equipment - Tests and measurements - Part 12-5: Soldering tests - Test 12e: Resistance to soldering heat, soldering iron method
CLC/SR 48B	EN 60512-12-5:2006	Connectors for electronic equipment - Tests and measurements - Part 12-5: Soldering tests - Test 12e: Resistance to soldering heat, soldering iron method
CLC/SR 48B	EN 60512-12-4:2006/corrigendum Dec. 2006	Connectors for electronic equipment - Tests and measurements - Part 12-4: Soldering tests - Test 12d: Resistance to soldering heat, solder bath method
CLC/SR 48B	EN 60512-12-4:2006	Connectors for electronic equipment - Tests and measurements - Part 12-4: Soldering tests - Test 12d: Resistance to soldering heat, solder bath method
CLC/SR 68	EN 60404-14:2002	Magnetic materials - Part 14: Methods of measurement of the magnetic dipole moment of a ferromagnetic material specimen by the withdrawal or rotation method
CLC/SR 91	EN IEC 61189-2-801:2023	Test methods for electrical materials, printed boards and other interconnection structures and assemblies - Part 2-801: Thermal conductivity test for base materials
CLC/SR 94	prEN IEC 61810-7-10	Electrical relays - Tests and measurements - Part 10: Heating
CLC/TC 20	EN IEC 60754-3:2019	Test on gases evolved during combustion of materials from cables - Part 3: Measurement of low level of halogen content by ion chromatography
CLC/TC 20	EN 61442:2005	Test methods for accessories for power cables with rated voltages from 6 kV (Um = 7,2 kV) up to 36 kV (Um = 42 kV)
CLC/TC 20	EN 60754-2:2014	Test on gases evolved during combustion of materials from cables - Part 2: Determination of acidity (by pH measurement) and conductivity
CLC/TC 20	EN 60754-1:2014	Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content
CLC/TC 20	EN 50483-5:2009	Test requirements for low voltage aerial bundled cable accessories - Part 5: Electrical ageing test
CLC/TC 205	EN IEC 63044-3:2018	Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) - Part 3: Electrical safety requirements
CLC/TC 205	EN 50090-5-3:2016	Home and Building Electronic Systems (HBES) - Part 5-3: Media and media dependent layers - Radio Frequency for HBES Class 1
CLC/TC 205	EN 50090-1:2011	Home and Building Electronic Systems (HBES) - Part 1: Standardization structure
CLC/TC 210	EN 50370-2:2003	Electromagnetic compatibility (EMC) - Product family standard for machine tools - Part 2: Immunity
CLC/TC 210	EN 50370-1:2005	Electromagnetic compatibility (EMC) - Product family standard for machine tools - Part 1: Emission

CLC/TC 23BX	EN IEC 60669-2-1:2022	Switches for household and similar fixed electrical installations - Part 2-1: Particular requirements - Electronic control devices
CLC/TC 23BX	EN 50428:2005	Switches for household and similar fixed electrical installations - Collateral standard - Switches and related accessories for use in home and building electronic systems (HBES)
CLC/TC 34	EN 60240-1:1994	Characteristics of electric infra-red emitters for industrial heating - Part 1: Short wave infra-red emitters
CLC/TC 64	HD 60364-7-753:2014/AC:2014	Low-voltage electrical installations - Part 7-753: Requirements for special installations or locations - Heating cables and embedded heating systems
CLC/TC 64	HD 60364-7-753:2014	Low-voltage electrical installations - Part 7-753: Requirements for special installations or locations - Heating cables and embedded heating systems
CLC/TC 64	HD 60364-7-703:2005	Electrical installations of buildings - Part 7-703: Requirements for special installations or locations - Rooms and cabins containing sauna heaters
CLC/TC 64	HD 60364-4-42:2011	Low voltage electrical installations - Part 4-42: Protection for safety - Protection against thermal effects
CLC/TC 72	EN IEC 60730-2-9:2019	Automatic electrical controls - Part 2-9: Particular requirements for temperature sensing control.
CLC/TC 72	EN IEC 60730-2-8:2020	Automatic electrical controls for household and similar use - Part 2-8: Particular requirements for electrically operated water valves, including mechanical requirements
CLC/TC 72	EN IEC 60730-2-7:2020	Automatic electrical controls - Part 2-7: Particular requirements for timers and time switches
CLC/TC 72	EN IEC 60730-2-22:2020	Automatic electrical controls - Part 2-22: Particular requirements for thermal motor protectors
CLC/TC 72	EN IEC 60730-2-15:2019	Automatic electrical controls - Part 2-15: Particular requirements for automatic electrical air flow, water flow and water level sensing controls
CLC/TC 72	EN IEC 60730-2-14:2019	Automatic electrical controls - Part 2-14: Particular requirements for electric actuators
CLC/TC 72	EN IEC 60730-2-13:2018	Automatic electrical controls - Part 2-13: Particular requirements for humidity sensing controls
CLC/TC 72	EN IEC 60730-2-12:2019	Automatic electrical controls - Part 2-12: Particular requirements for electrically operated door locks
CLC/TC 72	EN IEC 60730-2-11:2020	Automatic electrical controls - Part 2-11: Particular requirements for energy regulators
CLC/TC 72	EN 60730-2-5:2015	Automatic electrical controls - Part 2-5: Particular requirements for automatic electrical burner control systems
CLC/TC 72	EN 60730-1:2011	Automatic electrical controls for household and similar use - Part 1: General requirements
CLC/TC 72	EN 60730-1:1995/corrigendum Aug. 2007	Automatic electrical controls for household and similar use - Part 1: General requirements
CLC/TC 72	EN 60730-1:1995	Automatic electrical controls for household and similar use - Part 1: General requirements
CLC/TC 82	EN 62979:2017	Photovoltaic module - Bypass diode - Thermal runaway test
CLC/TC 9X	EN 50162:2004	Protection against corrosion by stray current from direct current systems

Annex B – Interdisciplinary Detail Research

Table A 3 - Interdisciplinary Detailed Research Key Area: SRI

Standard Number	Title	Scope	Technical Committee	Relevance to easySRI Project
EN 16798-1:2019	Energy performance of buildings - Ventilation for buildings - Part 1: Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics - Module M1-6	This document specifies requirements for indoor environmental parameters for thermal environment, indoor air quality, lighting and acoustics and specifies how to establish these parameters for building system design and energy performance calculations. This European Standard includes design criteria for the local thermal discomfort factors, draught, radiant temperature asymmetry, vertical air temperature differences and floor surface temperature.	CEN/TC 371	Provides requirements for indoor environmental parameters crucial for SRI calculation.
EN 15232:2017	Energy Performance of Buildings - Energy performance of buildings - Part 1: Impact of Building Automation, Controls and Building Management - Modules M10-4,5,6,7,8,9,10	This European Standard specifies: - a structured list of control, building automation and technical building management functions which contribute to the energy performance of buildings; functions have been categorized and structured according to building disciplines and so called Building automation and control (BAC); - a method to define minimum requirements or any specification regarding the control, building automation and technical building management functions contributing to energy efficiency of a building to be implemented in building of different complexities; - a factor based method to get a first estimation of the effect of these functions on typical buildings types and use profiles; - detailed methods to assess the effect of these functions on a given building. Table 1 shows the relative position of this standard within the set of EPB standards in the context of the modular structure as set out in EN ISO 52000-1.	CEN/TC 371	Addresses building automation and control functions, aligning with easySRI's goal of introducing ML services for building system evaluation.
CEN/TR 16798-2:2017	Energy performance of buildings - Ventilation for buildings - Part 2: Interpretation of the requirements in EN 16798-1 - Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics (Module M1-6)	This document deals with the indoor environmental parameters for thermal environment, indoor air quality, lighting and acoustic. The document explains how to use EN 16798-1 for specifying indoor environmental input parameters for building system design and energy performance calculations. The document specifies methods for long term evaluation of the indoor environment obtained as a result of calculations or measurements.	CEN/TC 371	Complementary to EN 16798-1, aids in the practical application of indoor environmental input parameters for building system design.

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)	This European Standard applies to the design, energy performance of buildings and implementation of ventilation, air conditioning and room conditioning systems for non-residential buildings subject to human occupancy, excluding applications like industrial processes	CEN/TC 371	Relevant, especially for non-residential buildings, as it provides performance requirements for ventilation systems.
EN ISO 52000-1:2017	Energy performance of buildings — Overarching EPB assessment — Part 1: General framework and procedures	ISO 52000-1:2017 establishes a systematic, comprehensive and modular structure for assessing the energy performance of new and existing buildings (EPB) in a holistic way. It is applicable to the assessment of overall energy use of a building, by measurement or calculation, and the calculation of energy performance in terms of primary energy or other energy-related metrics. It takes into account the specific possibilities and limitations for the different applications, such as building design, new buildings 'as built', and existing buildings in the use phase as well as renovation.	ISO/TC 163	Essential for easySRI, establishes a general framework for assessing energy performance in a holistic way.
ISO 17772:2017	Energy performance of buildings — Indoor environmental quality — Part 1: Indoor environmental input parameters for the design and assessment of energy performance of buildings	ISO 17772-1:2017 specifies requirements for indoor environmental parameters for thermal environment, indoor air quality, lighting and acoustics and specifies how to establish these parameters for building system design and energy performance calculations. It includes design criteria for the local thermal discomfort factors, draught, radiant temperature asymmetry, vertical air temperature differences and floor surface temperature.	ISO/TC 163	Complementary to EN 16798-1, provides additional insights into indoor environmental quality, crucial for SRI assessment.
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)	The set of EPB assessment standards produces a great number of overall and partial EPB indicators as outputs. This document provides general insight to both private parties and public regulators (and all stakeholders involved in the regulatory process) on how to make good use of these outputs for different purposes (post-processing). This document describes the relation between the EPB indicators and the EPB requirements and EPB ratings, and it discusses the importance of project-specific, tailored values as requirement or reference for certain EPB indicators.	ISO/TC 163	Important for understanding the relationship between EPB indicators, requirements, and ratings, aligning with easySRI's goal to update standards.
ISO 23386	Building information modelling and other digital processes used in construction - Methodology to describe, author and maintain properties in interconnected data dictionaries (ISO 23386:2020)	This document establishes the rules for defining properties used in construction and a methodology for authoring and maintaining them, for a confident and seamless digital share among stakeholders following a BIM process	ISO/TC 59/SC 13	Relevant for the project's focus on digital processes and a web platform, aligning with the goal of easy data sharing in a BIM process.

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)	This European Standard specifies the common methodology and the requirements for inspection of air conditioning systems in buildings for space cooling and/or heating and/or ventilation systems from an energy use standpoint.	CEN/TC 371	Important for easySRI, provides guidelines for inspecting ventilation and air conditioning systems, ensuring effective system performance.
ISO 12006-3:2021	Building construction - Organization of information about construction works - Part 3: Framework for object-oriented information (ISO 12006-3:2022)	This document specifies a language-independent information model which can be used for the development of dictionaries used to store or provide information about construction works. The model is extended by instantiating content, such as further objects and their relationships, allowing the content to serve as an ontology, taxonomy, meronomy, lexicon and thesaurus. This document provides the description of an API allowing the interconnection of data dictionaries as described in ISO 23386.	ISO/TC 59/SC 13	Relevant, especially if the project involves a digital platform, as it provides a framework for organizing information about construction works.

Table A 4 - Interdisciplinary Detailed Research Key Area BIM

Standard Number	Title	Scope	Technical Committee	Relevance to easySRI Project
ISO 19650-1:2018	Organization and digitization of information about buildings and civil engineering works, including building information modeling (BIM) - Information management using building information modelling	Standard for managing information across the life cycle of a built asset using BIM	ISO/TC 59/SC 13	Provides a standard for managing information across the life cycle of a built asset using BIM, relevant for structured information management in smart buildings.
ISO 19650-2:2018	Organization and digitization of information about buildings and civil engineering works, including building information modeling (BIM) - Delivery phase of the assets	Focus on the information management during the operational phase of the asset	ISO/TC 59/SC 13	Focuses on information management during the operational phase of the asset, crucial for ongoing monitoring of smart features and energy efficiency in buildings.
ISO 29481-1:2018	Building information modeling - Information delivery manual - Part 1: Methodology and format	Defines a methodology for creating an Information Delivery Manual (IDM) and specifies the format of an IDM	ISO/TC 59/SC 13	Defines a methodology for creating an Information Delivery Manual (IDM) and specifies the format of an IDM, essential for standardized information delivery in easySRI.

ISO 29481-2:2017	Building information modeling - Information delivery manual - Part 2: Interaction framework	Describes the framework for representing the information exchanges between stakeholders	ISO/TC 59/SC 13	Describes the framework for representing information exchanges between stakeholders, important for effective communication and data exchange in easySRI.
ISO 16739:2020	Industry Foundation Classes (IFC) for data sharing in the construction and facility management industries	A neutral file format that allows the exchange of information between different software applications	ISO/TC 59/SC 13	Establishes Industry Foundation Classes (IFC) for data sharing, promoting interoperability among software applications, relevant for easySRI's data exchange needs.
ISO 12006-3:2022	Building construction - Organization of information about construction works - Part 3: Framework for object-oriented information	Provides a framework for the development of information models for construction works	ISO/TC 59/SC 13	Provides a framework for the development of information models for construction works, supporting the organization of information related to building systems.
ISO 23386:2020	Building information modelling - Data templates	Specifies the structure and format of data templates for the exchange of information	ISO/TC 59/SC 13	Specifies the structure and format of data templates for information exchange, relevant for easySRI in terms of digital processes and standardized data sharing.
ISO 29481-3:2022	Building information modelling - Information delivery manual - Part 3: Data schema	Defines the structure for the exchange of information within the context of building information modelling	ISO/TC 59/SC 13	Defines the structure for the exchange of information within the context of building information modeling, crucial for standardized data exchange in easySRI.
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)	Provides guidelines for the development and execution of a BIM execution plan (BEP)	ISO/TC 59/SC 13	Offers guidelines for the development and execution of a BIM execution plan (BEP), relevant for planning and executing the digitization of information in easySRI.

ISO 19650-4:2022	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	This document specifies the detailed process and criteria for decision makings when executing an information exchange as specified by the ISO 19650 series to ensure the quality of the resulting project information model or asset information model.	ISO/TC 59/SC 13	Specifies the detailed process and criteria for decision-making during information exchange, ensuring the quality of information models in projects like easySRI.
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 - Security-minded approach to information management	Organization and digitization of information about buildings and civil engineering works, including BIM	ISO/TC 59/SC 13	Addresses a security-minded approach to information management, crucial for safeguarding digital assets and maintaining data integrity in projects like easySRI.

Table A 5 - Interdisciplinary Detailed Research Key Area A.I.

Standard Number	Title	Scope	Technical Committee	Relevance to easySRI Project
ISO/IEC 27001:2022	Information security, cybersecurity and privacy protection - Information security management systems - Requirements	Specifies the requirements for establishing, implementing, maintaining, and continually improving an information security management system	ISO/IEC JTC 1/SC 27	Specifies the requirements for establishing, implementing, maintaining, and continually improving an information security management system. Relevant for easySRI in ensuring the security of data and information related to building systems and energy performance.
ISO/IEC 27701:2019	Security techniques - Extension to ISO/IEC 27001 and ISO/IEC 27002 for privacy information management - Requirements and guidelines	Provides requirements and guidance for establishing, implementing, maintaining, and continually improving a Privacy Information Management System (PIMS)	ISO/IEC JTC 1/SC 27	Provides requirements and guidance for establishing, implementing, maintaining, and continually improving a Privacy Information Management System (PIMS). Relevant for easySRI in managing privacy considerations associated with smart building data.

ISO/IEC 27002:2022	Information security, cybersecurity and privacy protection - Information security controls	Provides guidelines for information security controls applicable to the provision and use of cloud services	ISO/IEC JTC 1/SC 27	Provides guidelines for information security controls applicable to the provision and use of cloud services. Relevant for easySRI if the project involves cloud-based services for data storage or processing.
ISO/IEC 38500	Information technology - Governance of IT for the organization	Provides principles and a model for an organization's corporate governance of information technology	ISO/IEC JTC 1/SC 40	Provides principles and a model for an organization's corporate governance of information technology. Relevant for easySRI in establishing governance practices for the effective management of smart building information.
ISO/IEC 20000-1:2018	Information technology - Service management - Part 1: Service management system requirements	This document specifies requirements for an organization to establish, implement, maintain and continually improve a service management system (SMS)	ISO/IEC JTC 1/SC 40	Specifies requirements for an organization to establish, implement, maintain, and continually improve a service management system (SMS). Relevant for easySRI in managing services related to the smart readiness of buildings.
ISO/IEC TR 38502:2017	Information technology- Governance of IT- Framework and model	The purpose of this document is to provide information on a framework and model that can be used to establish the boundaries and relationships between governance and management of an organization's current and future use of IT.	ISO/IEC JTC 1/SC 40	Provides information on a framework and model that can be used to establish boundaries and relationships between governance and management of an organization's use of IT. Relevant for easySRI in defining governance and management structures for IT aspects.
ISO/IEC 38503:2021	Information technology - Governance of IT - Assessment of the governance of IT	This document includes approaches for conducting the assessment, the criteria against which the assessment can be made, guidance on the evidence that can be used for the assessment, as well as a method for determining the maturity of the organization's governance of IT.	ISO/IEC JTC 1/SC 42	Includes approaches for conducting the assessment, criteria, and guidance on evidence for assessing the governance of IT. Relevant for easySRI in evaluating and ensuring the effective governance of smart building information and systems.

ISO/IEC TR 24028:2020	Information technology - Artificial intelligence - Overview of trustworthiness in artificial intelligence	<p>This document surveys topics related to trustworthiness in AI systems, including the following:</p> <ul style="list-style-type: none"> — approaches to establish trust in AI systems through transparency, explainability, controllability, etc.; — engineering pitfalls and typical associated threats and risks to AI systems, along with possible mitigation techniques and methods; and — approaches to assess and achieve availability, resiliency, reliability, accuracy, safety, security and privacy of AI systems. <p>The specification of levels of trustworthiness for AI systems is out of the scope of this document.</p>	ISO/IEC JTC 1/SC 42	Surveys topics related to trustworthiness in AI systems. Relevant for easySRI if the project involves the use of AI for data analysis or decision-making in the context of smart building information.
ISO/IEC TR 20547-1:2020	Information technology - Big data reference architecture - Part 1: Framework and application process	This document describes the framework of the big data reference architecture and the process for how a user of the document can apply it to their particular problem domain.	ISO/IEC JTC 1/SC 42	Describes the framework of the big data reference architecture. Relevant for easySRI if the project involves the handling and analysis of large datasets related to smart building information.
ISO/IEC 30105-8:2022	Information technology - IT Enabled Services-Business Process Outsourcing (ITES-BPO) lifecycle processes - Part 8: Continual performance improvement (CPI) of ITES-BPO	This document specifies a continual performance improvement (CPI) methodology and its major elements, which extend the already-defined continual improvement process (TEN8) in ISO/IEC 30105-1. This document helps ITES-BPO service providers to improve their performance by assessing service delivery	ISO/IEC JTC 1/SC 42	Specifies a continual performance improvement (CPI) methodology for ITES-BPO lifecycle processes. Relevant for easySRI if the project involves outsourcing or managing IT-enabled services related to smart building data.
ISO/IEC 33020:2019	Information technology - Process assessment - Process measurement framework for assessment of process capability	This document defines a process measurement framework that supports the assessment of process capability, in accordance with the requirements of ISO/IEC 33003.	ISO/IEC JTC 1/SC 7	Defines a process measurement framework that supports the assessment of process capability. Relevant for easySRI if the project aims to assess and improve the capability of processes related to smart building information.

Table A 6 - Interdisciplinary Detailed Research Key Area Energy Efficiency

Standard Number	Title	Scope	Technical Committee	Relevance to easySRI Project
ISO 50001:2018	Energy management systems - Requirements with guidance for use	This document specifies requirements for establishing, implementing, maintaining and improving an energy management system (EnMS). The intended outcome is to enable an organization to follow a systematic approach in achieving continual improvement of energy performance and the EnMS.	ISO/TC 301	Specifies requirements for establishing, implementing, maintaining, and improving an energy management system (EnMS). Relevant for easySRI in achieving continual improvement of energy performance in smart and energy-efficient buildings.

<p>EN ISO 52016-1:2017</p>	<p>Energy performance of buildings - Energy needs for heating and cooling, internal temperatures, and sensible and latent heat loads</p>	<p>ISO 52016-1:2017 specifies calculation methods for the assessment of:</p> <ul style="list-style-type: none"> a) the (sensible) energy need for heating and cooling, based on hourly or monthly calculations; b) the latent energy need for (de-)humidification, based on hourly or monthly calculations; c) the internal temperature, based on hourly calculations; d) the sensible heating and cooling load, based on hourly calculations; e) the moisture and latent heat load for (de-)humidification, based on hourly calculations; f) the design sensible heating or cooling load and design latent heat load using an hourly calculation interval; g) the conditions of the supply air to provide the necessary humidification and dehumidification. 	<p>CEN/TC 371</p>	<p>Specifies calculation methods for assessing energy needs for heating and cooling, internal temperatures, and heat loads. Relevant for easySRI in understanding and quantifying the energy performance of buildings, a key aspect of the project.</p>
----------------------------	--	--	-------------------	---

ISO/DIS 16813	Building environment design - Indoor environment - General principles	ISO16813:2006 establishes the general principles of building environment design taking into account healthy indoor environment for the occupants, and protecting the environment for future generations.	ISO/TC 163	Establishes general principles of building environment design, considering healthy indoor environments and environmental protection. Relevant for easySRI to ensure that smart building features contribute to a healthy and sustainable indoor environment.
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	The set of EPB assessment standards produces a great number of overall and partial EPB indicators as outputs, which can be used for different purposes. ISO 52018-1:2017 deals with the use as requirement of partial EPB indicators related to the fabric and related to the thermal balance of the building.	CEN/TC 89	Deals with indicators for partial EPB requirements related to thermal energy balance and fabric features. Relevant for easySRI in understanding and assessing the thermal performance of building elements, which is integral to the project's goals.

Table A 7 - Interdisciplinary Detailed Research Key Area Building Environmental Design

Standard Number	Title	Scope	Technical Committee	Relevance to easySRI Project
EN ISO 16484-2:2004	Building automation and control systems (BACS) - Part 2: Hardware (ISO 16484-2:2004)	This part of the standard specifies the requirements for the hardware to perform the tasks within a BACS. It provides the terms, definitions, and abbreviations for the understanding of Part 2 and Part 3. Part 2 relates only to physical items/devices, i.e.: operator stations and other human system interface devices; devices for management functions; control devices, automation stations and application specific controllers; field devices and their interfaces	CEN/TC 247	Specifies requirements for the hardware of Building Automation and Control Systems (BACS). Relevant for easySRI in understanding and implementing the hardware components necessary for building automation and control.

EN ISO 16484-3:2005	Building automation and control systems (BACS) - Part 3: Functions (ISO 16484-3:2005)	ISO 16484-3:2005 specifies the requirements for the overall functionality and engineering services to achieve building automation and control systems. It defines terms, which shall be used for specifications and it gives guidelines for the functional documentation of project/application specific systems. It provides a sample template for documentation of plant/application specific functions, called BACS points list.	CEN/TC 247	Specifies requirements for the overall functionality and engineering services of Building Automation and Control Systems (BACS). Relevant for easySRI in understanding the functional aspects of BACS and its engineering services.
EN 14908-5:2009	Open Data Communication in Building Automation, Controls and Building Management Implementation Guideline - Control Network Protocol - Part 5: Implementation	This specification provides mechanisms through which various vendors of networked control systems in commercial building automation, control, and building management may exchange information in a standardised way. This specification contains all the information necessary to facilitate the exchange of data and control information in an interoperable fashion using EN 14908-1 and its associated data-transport media specifications.	CEN/TC 247	Provides mechanisms for exchanging information in a standardized way for networked control systems in building automation. Relevant for easySRI if the project involves interoperable communication between different vendors' control systems.
EN ISO 16484-1:2010	Building automation and control systems (BACS) - Part 1: Project specification and implementation (ISO 16484-1:2010)	This standard specifies the general principles of project planning and execution and the integration of other systems into the BA systems. It describes the phases required for the project, such as planning: definition of the project requirements; technical processing (engineering): detailed planning of the functions and hardware; installation: assembly and commissioning of the BA system; completion: Handover, acceptance and completion.	CEN/TC 247	Specifies general principles of project planning, execution, and integration of other systems into Building Automation and Control Systems (BACS). Relevant for easySRI in understanding the project phases and integration of various systems.
EN 14908-1:2014	Open Data Communication in Building Automation, Controls and Building Management - Control Network Protocol - Part 1: Protocol Stack	This European Standard applies to a communication protocol for networked control systems in commercial Building Automation, Controls and Building Management. The protocol provides peer-to-peer communication for networked control and is suitable for implementing both peer-to-peer and master-slave control strategies.	CEN/TC 247	Applies to a communication protocol for networked control systems in commercial Building Automation, Controls, and Building Management. Relevant for easySRI if the project involves peer-to-peer and master-slave control strategies.

EN 14908-2:2014	Open Data Communication in Building Automation, Controls and Building Management - Control Network Protocol - Part 2: Twisted Pair Communication	This European Standard specifies the control network protocol (CNP) free-topology twisted-pair channel for networked control systems in commercial Building Automation, Controls and Building Management and is used in conjunction with EN 14908-1:2014.	CEN/TC 247	Specifies the control network protocol (CNP) free-topology twisted-pair channel for networked control systems. Relevant for easySRI if the project utilizes twisted-pair communication in the BACS.
EN 14908-3:2014	Open Data Communication in Building Automation, Controls and Building Management - Control Network Protocol - Part 3: Power Line Channel Specification	This European Standard specifies all the information necessary to facilitate the exchange of data and control information over the power line medium for networked control systems in commercial Building Automation, Controls and Building Management.	CEN/TC 247	Specifies the power line channel for exchanging data and control information in networked control systems. Relevant for easySRI if the project involves power line communication for control systems in buildings.
EN 14908-4:2014	Open Data Communication in Building Automation, Controls and Building Management - Control Network Protocol - Part 4: IP Communication	This European Standard specifies the transporting of the Control Network Protocol (CNP) packets for commercial Building Automation, Controls and Building Management over Internet Protocol (IP) networks using a tunnelling mechanism wherein the CNP packets are encapsulated within IP packets	CEN/TC 247	Specifies the transporting of the Control Network Protocol (CNP) packets over Internet Protocol (IP) networks. Relevant for easySRI if the project involves the use of IP networks for communication in building automation and control.
EN 16946-1:2017	Energy Performance of Buildings - Inspection of Automation, Controls and Technical Building Management - Part 1: Module M10-11	This European Standard defines guidelines for the inspection of installed and operational functions of Building Automation, Controls and Technical Building Management System including its configuration. Table 1 shows the relative position of this standard within the set of EPB standards in the context of the modular structure as set out in EN ISO 52000-1:2017.	CEN/TC 247	Defines guidelines for the inspection of installed and operational functions of Building Automation, Controls, and Technical Building Management System. Relevant for easySRI in the inspection and assessment of BACS functionalities.
EN ISO 22510:2020	Open data communication in building automation, controls and building management - Home and building electronic systems - KNXnet/IP communication (ISO 22510:2019)	This document defines the integration of KNX protocol implementations on top of Internet protocol (IP) networks, called KNXnet/IP. It describes a standard protocol for KNX devices connected to an IP network, called KNXnet/IP devices. The IP network acts as a fast (compared to KNX twisted pair transmission speed) backbone in KNX installations.	CEN/TC 247	Defines the integration of KNX protocol implementations on top of Internet protocol (IP) networks. Relevant for easySRI if the project involves the integration of KNX devices on IP networks for building automation and control.

EN 14908-7:2019	Open communication in building automation, controls and building management - Control Network Protocol - Part 7: Communication via internet protocols	This document specifies a communication protocol for networked control systems. The protocol provides peer-to-peer communication for networked control using web-services.	CEN/TC 247	Specifies a communication protocol for networked control systems using web-services. Relevant for easySRI if the project utilizes web-services for peer-to-peer communication in building automation and control.
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, Corrected version 2022-09)	This document offers a systematic approach to categorize, specify, estimate, and assess the influence of various functions related to control, building automation, and technical building management on the energy performance of buildings.	CEN/TC 247	Offers a systematic approach to categorize, specify, estimate, and assess the influence of various functions related to control, building automation, and technical building management on the energy performance of buildings.
EN ISO 52127-1:2021	Energy performance of buildings - Building management system - Part 1: Module M10-12 (ISO 52127-1:2021)	This document specifies operational activities, overall alarming, fault detection and diagnostics, reporting, monitoring, energy management functions, functional interlocks and optimizations to set and maintain energy performance of buildings.	CEN/TC 247	Specifies operational activities, alarming, fault detection, diagnostics, reporting, monitoring, energy management functions, and optimizations for building management systems. Relevant for easySRI in managing energy performance.
EN 13321-1:2021	Open data communication in building automation, controls and building management - Home and building electronic system - Part 1: Product and system requirements	This document specifies, as for Home or Building Electronic Systems (HBES) for the domain of Building Automation and Control System Application and Building Management (BACS), common rules for a class of multi-application bus systems where the functions are decentralised and linked through a common communication process	CEN/TC 247	Specifies common rules for multi-application bus systems in Home or Building Electronic Systems (HBES) for Building Automation and Control System Application and Building Management (BACS). Relevant for easySRI if using decentralized bus systems.
EN 14908-9:2021	Open Data Communication in Building Automation, Controls and Building Management - Control Network Protocol - Part 9: Wireless Communication in ISM bands	This document specifies an adaptation layer for the control network protocol (CNP), as described in EN 14908-1 to utilize wireless communication network. This document defines the services of the wireless communication provided to CNP layer for delivering data and commands towards and from sensors, actuators, etc.	CEN/TC 247	Specifies an adaptation layer for the control network protocol (CNP) to utilize wireless communication. Relevant for easySRI if the project involves wireless communication for networked control systems in building automation.

EN 14908-8:2021	Open Data Communication in Building Automation, Controls and Building Management - Control Network Protocol - Part 8: Communication using Broadband over Power Line Networks - with internet protocols	This document specifies a communication protocol for networked control systems. The protocol provides peer-to-peer communication for networked control using web-services. This document describes services in layer 1 and layer 2. The layer 1 (physical layer) specification describes the MAC sub-layer interface to the physical layer.	CEN/TC 247	Specifies a communication protocol for networked control systems using Broadband over Power Line Networks. Relevant for easySRI if the project involves the use of Broadband over Power Line Networks for communication in building automation.
EN ISO 16484-6:2020	Building automation and control systems (BACS) - Part 6: Data communication conformance testing (ISO 16484-6:2020)	<p>This standard provides a comprehensive set of procedures for verifying the correct implementation of each capability claimed on a BACnet PICS including:</p> <ul style="list-style-type: none"> (a) support of each claimed BACnet service, either as an initiator, executor, or both, (b) support of each claimed BACnet object-type, including both required properties and each claimed optional property, (c) support of the BACnet network layer protocol, (d) support of each claimed data link option, and (e) support of all claimed special functionality. 	CEN/TC 247	Provides procedures for verifying the correct implementation of each capability claimed on a BACnet PICS. Relevant for easySRI in ensuring the correct implementation of BACnet capabilities for building automation and control systems.
EN 17609:2022	Building automation and control systems - Control applications	This document specifies control applications and function blocks focusing on but not limited to lighting, solar protection and HVAC applications. It describes how energy performance, comfort, and operational requirements of buildings are translated into functional specifications for integrated plant and room control.	CEN/TC 247	Specifies control applications and function blocks focusing on lighting, solar protection, and HVAC applications. Relevant for easySRI in understanding and specifying control applications that contribute to energy performance and comfort.

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	This document is applicable to electronic control equipment for heating systems with direct electrical emission, which have an integrated outside compensated function and or optimum start/stop function.	CEN/TC 247	Applicable to electronic control equipment for heating systems with direct electrical emission. Relevant for easySRI if the project involves control equipment for electrical heating systems with a focus on energy performance.
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	This document is applicable to electronic control equipment for heating systems with water as the heating medium and a supply water temperature up to 120 °C. This control equipment controls the distribution and/or the generation of heat in relation to the outside temperature and time and other reference variables.	CEN/TC 247	Applicable to electronic control equipment for heating systems with water as the heating medium. Relevant for easySRI if the project involves control equipment for hot water heating systems with a focus on energy performance.
EN 14908-6:2022	Open Data Communication in Building Automation, Controls and Building Management - Control Network Protocol - Part 6: Application elements	This specification provides mechanisms through which various vendors of networked control systems in commercial building automation, control, and building management may exchange information in a standardised way.	CEN/TC 247	Specifies mechanisms for exchanging information in a standardized way for networked control systems in building automation. Relevant for easySRI if the project involves standardized information exchange for building control systems.
EN 17690-1:2023	Components for BAC control loop - Sensors - Part 1: Room temperature sensors	This document specifies requirements and test methods for room temperature sensors used to control the room temperature. This document covers wall mounted and flush mounted room temperature sensors.	CEN/TC 247	Specifies requirements and test methods for room temperature sensors used to control the room temperature. Relevant for easySRI if the project involves the use of room temperature sensors in building automation and control systems.
EN ISO 16484-5:2022	Building automation and control systems (BACS) - Part 5: Data communication protocol (ISO 16484-5:2022)	The purpose of this document is to define data communication services and protocols for computer equipment used for monitoring and control of HVAC&R and other building systems and to define, in addition, an abstract, object-oriented representation of information communicated between such equipment, thereby facilitating the application and use of digital control technology in buildings.	CEN/TC 247	Defines data communication services and protocols for computer equipment used for monitoring and control of HVAC&R and other building systems. Relevant for easySRI if the project involves digital control technology for buildings.

Annex C – Standardization Survey

Table A 8 - Results of the Standardization Survey

Apply Relevant Standards?	Standards Used	Difficulties Applying Standards	Difficult Standards and Specific Barriers	Aware of Standards Not Applied	Further Standards Aware Of	Areas Covered by Standards	Areas Not Covered by Standards	Need for New Standard	Involvement in Standardization	Additional Comments
Yes	EN 16212:2012; OIB Guideline 6; EN ISO 52120-1:2022; BACS	Some difficult to apply	EN ISO 52120-1:2022: too much range of interpretation. High risk of errors and manipulation. Results depend largely on the person applying the standard. Assessment results are hardly comparable.	No		Various areas including EPC, BIM, energy requirements, heating/cooling systems, control technology, automation systems, building logbook	-	-	-	Conclusion of easySRI deliverable D3.2: Standardization plays a key role in the realization of energy savings through building automation and control, and thus in the success of SRI assessment in the area of energy efficiency.
No	-	-	-	Yes	-	Energy performance certificate, energy requirements, thermal quality of buildings, heating/cooling systems, BIM, additional subject areas influencing energy certificate, sustainability, control technology, automation systems, smart technologies	-	-	-	-
Yes	Delegated Regulation (EU) 2020/2155; EN 52120:2021	All easy to apply	-	No	-	EPC, sustainability, heating/cooling systems, BIM, additional subject areas influencing energy certificate	-	Yes	-	-

Apply Relevant Standards?	Standards Used	Difficulties Applying Standards	Difficult Standards and Specific Barriers	Aware of Standards Not Applied	Further Standards Aware Of	Areas Covered by Standards	Areas Not Covered by Standards	Need for New Standard	Involvement in Standardization	Additional Comments
Yes	EN 52120:2021	All easy to apply	Yes	Yes	EN16946, EN16947	EPC, BIM, energy requirements, heating/cooling systems, control technology, automation systems, sustainability	-	Yes	-	Yes, there is currently no SRI-related standard.

In your view, which main areas of knowledge relevant to the easySRI project are already mostly covered by standards?

[Weitere Details](#)

- Energy performance certificate 4
- BIM (Building information mode... 3
- Energy requirements and therm... 3
- Heating/cooling systems 4
- Subject area of control technolo... 1
- Additional subject areas that infl... 0
- Sustainability 2
- Sonstiges 0

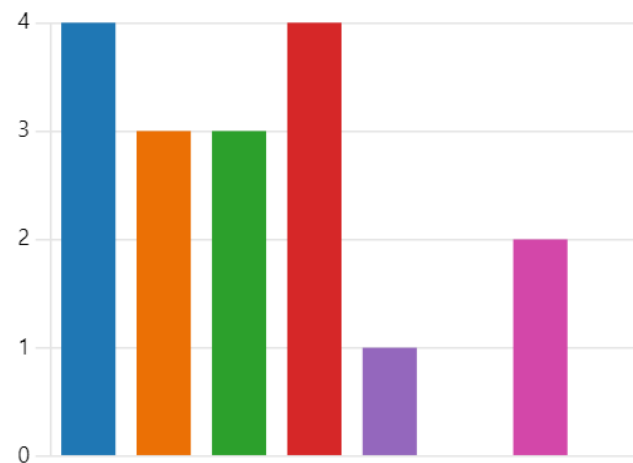


Figure A 1 - Results of Standardization Survey - Overview of covered areas by standards

In your view, which main areas of knowledge relevant to the easySRI project are not covered by standardization yet?

[Weitere Details](#)

- Energy performance certificate 1
- BIM (Building information mode... 2
- Energy requirements and therm... 1
- Heating/cooling systems 1
- Subject area of control technolo... 3
- Additional subject areas that infl... 2
- Sustainability 2
- Sonstiges 1

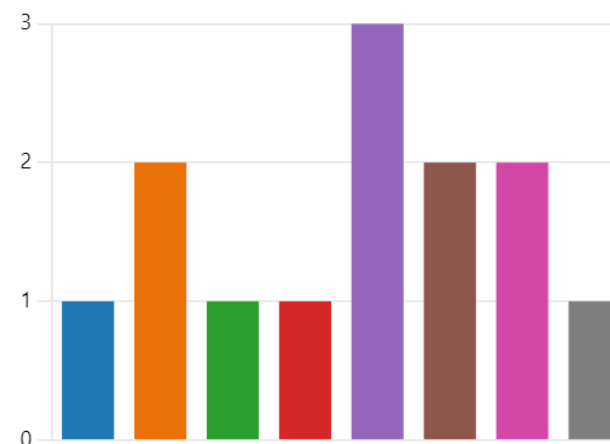


Figure A 2 - Results of Standardization Survey - Overview of areas yet to be covered by standards

Improving and demonstrating the potential



<https://www.easysri.eu/en/>



<https://www.linkedin.com/company/easysri>



https://twitter.com/sri_easy



<https://www.youtube.com/@easysri2022>



This project has received funding from the European LIFE Programme for Research and Innovation under grant agreement no 101077169. Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.