



BUSINESS PLAN
CEN/TC 247
BUILDING AUTOMATION, CONTROLS AND BUILDING MANAGEMENT

EXECUTIVE SUMMARY

Business Environment

Building automation and control systems (BACS) are digital technologies that enable smart buildings to provide human comfort and well-being at optimal operating costs and response to grid signals within the technical building management.

- Europe represents over 40% of BACS of the world market in 2021 and holds the largest share of the smart building market, followed by North America. ([BSRIA](#))
- Application sectors are all non-residential and residential types of buildings.
- Parties involved in the construction/building industry value chain over the lifetime of a building:
 - building owners, operators and occupants;
 - architects, design engineers, consultants and service providers;
 - manufacturers; wholesale/delivery channels; OEM's;
 - installers and system integrators.
- Parties influencing the construction value chain:
 - policymakers and regulatory bodies;
 - universities, research institutes, certification bodies and test labs;
 - European and national Associations in the building sector.

Benefits

To extend and refine the standards to be used in achieving the desired level of automation in smart zero-emission building (ZEB) in Europe, considering its very significant position in the international market.

- Since 1990, more than 40 standards were adopted, 30% of them at global ISO level.
- Confidence of building users in respect to BACS security, quality and performance.
- Supporting the European market in the green and digital transition of the building sector.
- Coherent application of European standards at national levels, and worldwide.

Priorities

To make European standards available to meet the EU 2030 targets related to:

- building control and management functions impacting occupants' well-being, building performance, resource efficiency to support green and human-centric building operation;
- open communication, modern integration and efficient control of technical building systems;
- confidence of building users, in respect of data exchange and cyber security;

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- digitalization of building processes with machine-processable information throughout the whole building life cycle;
- active buildings that interact with occupants and surrounding ecosystems, e.g. energy grid, mobility, city services, and are able to operate autonomously.

We seek future-oriented collaborators with knowledge and/or experience in building automation and smart buildings who are passionate about healthy, green, digital and resilient buildings.

1 BUSINESS ENVIRONMENT OF THE CEN/TC 247

1.1 Description of the Business Environment

Buildings are for people. Humans spend most of their time in buildings. Therefore, buildings play a major role for the well-being and development of people and society. Regarding the most important environmental aspects today and in the future - energy and carbon emissions, three pillars are of primary importance in buildings: the quality of the envelope, the quality of the technical building systems and the way they are managed. Building Automation and Control (BAC) is responsible for this third pillar as described in the scope and even in the name of CEN/TC 247: *Building Automation and Technical Building Management*. Demand-based BAC ensures comfort, health and productivity in buildings using the least energy necessary. This makes it possible to achieve high-performing and efficient buildings, reduce their carbon footprint and fight against climate change.

Buildings are a significant cost factor on the balance sheets of most companies and in the personal assets of many private households. The use of buildings has changed enormously due to greater work location flexibility. This development demands that buildings adapt quickly to modifications in the patterns of use and external environments. BAC and Technical Building Management including secure open data communication contribute significantly to improve the performance and flexibility of buildings, and to make their operation economical and cyber secure.

The state of the art in the field addressed by the scope of the CEN/TC 247 committee is for buildings to be equipped with BAC Systems or devices to monitor, interlock, control and to optimise systems or equipment for heating, air conditioning, cooling, lighting, blinds, fire and security, elevators etc.

Building automation and control systems (BACS) refer to the products, systems and services that monitor and automatically adjust the energy-using technologies in our homes and buildings to deliver a comfortable environment while optimising the energy consumption and reducing building carbon footprint. Building automation and control solutions can range from self-regulating valves on radiators to advanced technical building management systems in large buildings.

BACS form the “brain” and “nervous system” of the building, significantly increasing the overall building efficiency while optimising the functioning of the connected technical building systems and services. Each of these systems and services is key, but only the “brain” - BACS - is able to optimize overall efficiency and functionality. BACS optimize thermal comfort, air quality, lighting levels and operational efficiency while preventing spread of legionella and other pathogens. BACS are also the “intelligent nodes” in the smart integrated energy system. Demand response, consumption prediction, energy storage, management of distributed generation from renewables (e.g. solar rooftop PV) are all “smart functions” strongly connected to an optimally functioning building.

Building Management Systems (BMS) integrate and optimize all “smart” functions making buildings “smart” and future-proof, enabling building managers to have real-time access to data analytics (either edge, fog, or cloud computing technology), reporting and services, allowing for informed decision-making.

New technology is enabling new opportunities and redefining existing business models as well as providing cyber security. The regulatory framework, such as the Energy Performance of Buildings Directive (EPBD), Renewable Energy Directive, Cyber Security Act, Data Act, is accelerating this process. Complying with European and national regulations is one of the major challenges for the BAC industry.

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The following political, economic, technical, regulatory, legal, societal and/or international dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of this CEN/TC, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards:


- Reaching the objectives of the Paris Agreement is at the core of the EU Green Deal. The European Union committed itself to reduce the Union's economy-wide net greenhouse gas emissions by at least 55 % by 2030. The "Fit for 55" legislative package announced in the European Commission 2021 Work Programme aims to implement those objectives. Decarbonised, digitalised and smarter buildings are among the main objectives of the Renovation Wave.
- The ongoing recast of the Energy Performance of Buildings Directive (EPBD) is part of the "Fit for 55" package and addresses the following points closely related to BACS:
 - The enhanced climate and energy ambition of the Union requires a new vision for buildings: the **zero-emission building**, the very low energy demand of which is fully covered by energy from renewable sources. All new buildings should be zero-emission buildings, and as many existing buildings as possible should be transformed into zero-emission buildings by 2050. As of 2030, new buildings must be zero-emission buildings.
 - In recognition of the importance of good **indoor air quality** to ensure healthy buildings, the installation of measuring and control devices for the monitoring and regulation of indoor air quality is required in new buildings and in existing buildings undergoing major renovations.
 - The EPBD recast reinforces the **Smart Readiness Indicator** for large non-residential buildings as of 2026. The smart readiness indicator should be used to measure the capacity of buildings to use information and communication technologies and electronic systems to adapt the operation of buildings to the needs of the occupants and the grid and to improve the energy efficiency and overall performance of buildings.
 - New rules on **data interoperability** and **access to data** are to be laid down by the European Commission by means of an implementing act.
 - The obligation to have an energy performance certificate as well as current independent control systems are extended to include renovation passports and smart readiness indicators. **Simplified procedures** must be available for the updates of energy performance certificates and certificates must be issued in a digital format.
 - Smarter buildings are promoted, encouraging **more automation** to make them operate more efficiently. The threshold for the mandatory installation of building automation and control systems should be lowered for non-residential buildings as of 2030, and new residential buildings and residential buildings undergoing major renovations must be equipped with certain monitoring and control functionalities to improve and optimise their management and operation.
 - The **energy performance** of buildings should be calculated based on a **methodology** including factors that play an increasingly important role such as heating and cooling, air-conditioning installations, application of energy from renewable sources, building automation and control systems, smart solutions, lighting, shading, indoor air quality.
 - The agendas of the Digital Single Market and the Energy Union should be aligned and should serve common goals. The **digitalisation of the energy system** is quickly changing the energy landscape, from the integration of renewables to smart grids and smart-ready buildings. Targeted incentives should be provided to promote smart-ready systems


and digital solutions in the built environment, such as Building Information Modelling and Digital Twins.


- The revised Renewable Energy Directive encourages energy efficiency and circularity (e.g. facilitating the use of waste heat) and sets a benchmark of 49% of renewables in buildings.
- The strengthened Energy Efficiency Directive introduces a legal requirement to put energy efficiency first in planning and investment decisions.
- The vision is that in a climate-neutral Europe buildings will be:
 - healthy and foster well-being;
 - part of the energy system infrastructure;
 - highly-energy efficient;
 - circular in materials and use;
 - resilient to climate risks.
- The CEN/CENELEC Strategy 2030 published in January 2021 outlines a common vision and ambition for CEN and CENELEC and aims to address the long-term, disruptive challenges we face as a community of European standardizers. The aim of this Strategy 2030 is for CEN and CENELEC to rethink and optimise the way value for customers and stakeholders is created in a rapidly changing world.
- Released on 2 February 2022, the European Commission also aimed to develop a Standardisation Strategy that would strengthen the EU's global competitiveness; enable a resilient, green and digital economy; and enshrine democratic values in technology applications.


► Strategy 2030

 Goal 1: EU and EFTA recognize and use the strategic value of the European standardization system


 Goal 2: Our customers and stakeholders benefit from state-of-the-art digital solutions


 Goal 3: Increase the use and awareness of CEN and CENELEC deliverables


 Goal 4: The CEN and CENELEC system to be the preferred choice for standardization in Europe


 Goal 5: Strengthen our leadership and ambition at the international level


► European strategy

 Chapter 1: Leveraging the European standardization system – to deliver the twin green & digital transition & support the resilience of the single market

 Chapter 2: Upholding the integrity, inclusiveness and accessibility of the European standardization system

 Chapter 3: Global standards-setting: supporting the EU's leading position as a forerunner in key technologies and promoting EU core values

 Chapter 4: Cutting edge innovation

 Chapter 5: Ensuring future standardization expertise – the need for education and skills

1.2 Quantitative Indicators of the Business Environment

The following list of quantitative indicators describes the business environment in order to provide adequate information to support actions of the CEN /TC:

The construction ecosystem is quantified in the European Commission Annual Single Market Report 2021 <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52021SC0351> as follows:

24.9 million people employed ¹⁹⁹	9.6 % of EU value added (EUR 1,158 billion)	5.3 million firms 99.9% of SMEs
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- Buildings today account for 40% of energy consumed and 36% of its energy-related greenhouse gas emissions. In the EU, heating, cooling and domestic hot water account for 80% of the energy consumption in buildings. 85-95% of EU buildings are expected to still be standing in 2050 and 75% of EU buildings are not energy efficient.
- Policy measures on building automation and control solutions are cost-effective and can make a huge impact: the only transposition of the BACS measures in the revised EPBD would lead to savings corresponding to 14% of the total building energy consumption, with 64 Mt CO₂ annual savings and €36 billion energy bill savings triggered.
- Determined by means of building simulation ([eu.bac](#)) BACS can reduce thermal and electrical energy consumption up to:
 - 49% in wholesale and retail buildings;
 - 27% in residential buildings;
 - 41% in hotels and restaurants;
 - 52% in offices and lecture halls;
 - 26% in educational institutions and hospitals.
- The built environment has a significant impact on many sectors of the economy, on local jobs and quality of life. It requires vast amounts of resources and accounts for about 50% of all extracted material. The construction sector is responsible for over 35% of the EU's total waste generation and 33% of water consumption. ([European Commission](#))
- Globally the number of buildings deploying smart building technologies is forecast to reach 115 million in 2026. Up from 45 million in 2022, it represents a growth of more than 150% and reflects increasing demand for energy efficiency from businesses and residents alike, as energy costs spike. ([Juniper Research](#).) The analyst defines a smart building as a building that uses connectivity to enable economical use of resources, while creating a safe and comfortable environment for occupants. The study found that non-residential smart buildings will account for 90% of smart building spend globally in 2026. Juniper reports this dominance is due to the larger economies of scale in commercial premises driving spend, as well as the commercial focus of most smart building technologies. According to the study, global shipments of sensors used in smart buildings will exceed one billion annually in 2026 – up from 360 million in 2022 – representing a growth of 204%.
- A [March 2021 market report by Mind Commerce](#) predicts that up to 91% of all IoT platforms will contain some form of digital twinning capability by 2026.

- eu.bac – the European Building Automation and Controls Association set up the European Certification Scheme for Building Automation and a European Energy Efficiency Label for Home Controls and Building Automation Products and Systems. The eu.bac Certification Mark (eu.bac Cert) assures users the conformity of products and systems defined in European Standards, e.g. EN 15500 in the certification and labelling for Electronic Individual Zone Controllers. Over the past 3 years 1000 BACS products were eu.bac certified. eu.bac Cert is used by all building automation manufacturers in Europe and is mandatory in France.
- EN 15232:2017 (new EN ISO 52120) *Impact of building automation, controls and technical building management* was referenced in the EPBD Directive (EU) 2018/844 implementation Guidelines of the European Commission and the BACS Class B is required for new buildings in the Italian building regulations. This standard is also referred to in the EPBD 2018 Compliance Verification Package. It is the basis for the Smart Readiness Indicator (SRI) assessment methodology.
- The Ecodesign Lot 38 refers to the following CEN/TC 247 standards as the principal standards for the study: EN ISO 16484 *Building automation and control systems (BACS)*, EN 15232, EN 16947 *Building management system*, EN 16946 *Inspection of building automation, controls and technical building management* and EN 15500 *Control for heating, ventilation and air conditioning applications*. The BACS scope in the study is defined according to the EN 15232 energy control functions.
- EN ISO 52120 (former EN 15232), EN ISO 52127 (former EN 16947) and EN 12098 *Controls for heating systems*, are CEN/TC 247 standards that belong to the set of EPB standards developed under Mandate 480 (M480, Mandate to CEN, CENELEC and ETSI for the elaboration and adoption of standards for a methodology calculating the integrated energy performance of buildings and promoting the energy efficiency of buildings) and are cited in all of them. Member States of the European Union shall describe their national calculation methodology following the national annexes of the overarching standards, namely ISO 52000-1, ISO 52003-1, ISO 52010-1, ISO 52016-1, and ISO 52018-1. CEN/TC 371 ensure the development and maintenance of a coherent set of standards on Energy Performance of Buildings with active involvement and commitment of the five parallel CEN/TCs who have the technical expertise and competence regarding specific technological fields under the holistic approach:
 - CEN/TC 89 Thermal performance of buildings and building components;
 - CEN/TC 156 Ventilation for buildings;
 - CEN/TC 169 Light and lighting;
 - CEN/TC 228 Heating systems and water based cooling systems in buildings;
 - CEN/TC 247 Building automation, controls and building management.
- An increasing part of the set of EPB standards is developed and maintained under the Vienna Agreement in collaboration with ISO, in particular with ISO/TC 163/WG 4, *Energy performance of buildings* using holistic approach, the Joint Working group of ISO/TC 163 *Thermal performance and energy use in the built environment* and ISO/TC 205 *Building environment design*. The collaboration aims at a coherent and complete set of EPB standards as the (EN) ISO 52000 family of standards.
- ASHRAE has assigned more than 1300 Vendor IDs for BACnet to date. The manufacturers who use a Vendor ID are located in over 50 countries. This makes BACnet the most widespread and used protocol for building automation today.
- The KNX Association has over 500 members worldwide who actively use the KNX standard.

2 BENEFITS EXPECTED FROM THE WORK OF THE CEN/TC

Advantages of the standards for building owners, operators, occupants, consultants, service providers, manufacturers, policy-makers and regulatory bodies (most of them worldwide) include:

- response to recent changes and major innovations in the field addressed by the scope of the CEN committee, e.g. smart zero-emission buildings, sector-coupling and BIM;
- new or enhanced information structures/models that feed digital tools and certification in the built environment and cross-sectoral;
- modern standards for integration and control of technical building systems and services, supporting efficient design, construction and operation of buildings;
- improved building performance in new and existing buildings in support of relevant social, safety, health or environmental concerns addressed by the EU Green Deal & Digital Decade;
- design and operational cost savings through digitalization of building processes;
- energy and carbon emissions reduction through implementation of the EPB standards;
- standardized terminology and definitions;
- improved quality levels for all market players, e.g. providing product standards and test specifications;
- wider adoption of BACS standards (most of them worldwide);
- more harmonized / coherent application of European standards at national levels, and worldwide;
- support for European legislation, e.g. Ecodesign, EPBD, SRI, Smart Standards;
- guidance for European and national policymakers, and market surveillance authorities in the implementation of the EPBD, e.g. give guidance on how to ensure compliance with the BACS requirements;
- contribution to other European Standards, e.g. EPB standards, smart grid standards.

3 PARTICIPATION IN THE CEN/TC

All the CEN national members are entitled to nominate delegates to CEN Technical Committees and experts to Working Groups, ensuring a balance of all interested parties. Participation as observers of recognized European or international organizations is also possible under certain conditions. To participate in the activities of this CEN/TC, please contact the national standards organization in your country.

We welcome diverse participants from the building industry, e.g. manufacturers, integrators, design engineers, building operators, researchers and educators, with knowledge and/or experience in building automation and smart buildings. We seek future-oriented collaborators who are passionate about healthy, green, intelligent and resilient buildings.

4 OBJECTIVES OF THE CEN/TC AND STRATEGIES FOR THEIR ACHIEVEMENT

4.1 Defined objectives of the CEN/TC 247

The future working environment of CEN/TC 247 will be significantly impacted by the ongoing twin green and digital transition. The following strategic objectives define the contribution of CEN/TC 247 towards 2030 EU climate goals. These objectives are future-oriented and target the state of Building Automation in 2030.

The TC will upkeep the relevant existing TC standards and elaborate by 2030 a set of European Standards in the building sector to address the role of building automation and management in smart buildings, i.e. an environment-conscious building adapting over its life-time to changes in usage and functional expectations including the following aspects:

1. building control products and systems including circular economy elements;
2. open communication, data exchange (e.g. EN ISO 16757 *Data structures for electronic product catalogues for building services*) and, interoperability in buildings and to surrounding ecosystems, e.g. electricity grid, mobility integration;
3. building control and management functions impacting occupants' health, building performance, energy and resource efficiency to support green, digital and human-centric building operation, e.g. KPI reporting;
4. BACS-related information structures supporting digitalization of building processes with machine-processable information through the whole building life cycle, e.g. BACS products, features, services and functions for use in the BIM process and digital twins; as well as in any building-related digital tools and certificates, e.g. the Smart Readiness Indicator, Digital Building Logbook;
5. practical guides for participants in the construction value chain, e.g. compliance checklists for meeting EU regulatory requirements.

The following aspects are excluded as they are being developed in other standardization committees. However, at the same time the CEN/TC 247 will liaise with these other standardization committees and collaborate in their work by providing the necessary inputs and interfaces.

- A. Building Information Modeling (CEN/TC 442); **CEN/TC 247 will provide the content, i.e. interface and inputs to the BIM process** (refer the example in Figure 1 below)
- B. Circular economy (IEC/TC 111); CEN/TC 247 will link it to management of energy resources in the building
- C. Smart grid (IEC/TC 57); CEN/TC 247 will support demand-side flexibility, e.g. self-consumption, interaction with grid, optimization with defined goals, as a smart grid will not be efficient without smart buildings

Building Information Modeling (BIM) Associations and Standardization Organizations

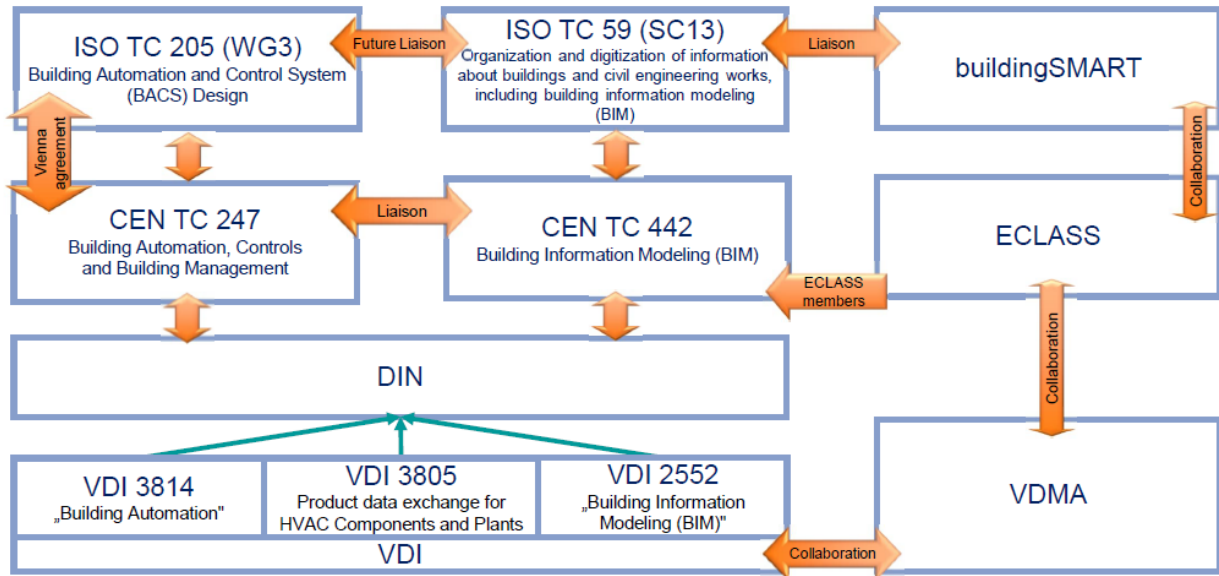


Figure 01 - Example of liaisons in BIM standardisation

The set of CEN/TC 247 standards will cover both non-residential and residential buildings and smart standardization will be applied.

The application and use of each standard by professionals and regulators in Europe will indicate the progress in achieving the objectives and shall be revised on a regular basis.

4.2 Identified strategies to achieve the CEN/TC's defined objectives

- Revise the Business Plan (BP) to confirm the identity and set the 2030 scope of CEN/TC 247.
- Develop a strategic Work Program (SWP) giving the direction of CEN/TC 247 contribution towards 2030 EU climate goals.
- Evaluate the gaps and build a Collaboration Plan (CP) to identify potential cross-collaborations (e.g. with other TCs) for achieving the objectives of CEN/TC 247.
- Review the structure and/or way of working in the CEN/TC 247.
- Engage and involve more and diverse contributors to the work of CEN/TC 247 via CEN/CENELEC, industry consortia, R & I community; attract the younger generation to build together with them the future of standardization in 2030 and beyond.
- Use CEN/CENELEC smart standards to facilitate wider collaboration and use of standards.
- Integrate R&I outcomes in the TC standards, e.g. SmartBuilt4EU, Smart2B.
- Address work on horizontal topics (e.g. sector coupling) within ESOs.

4.3 Environmental aspects

The future working environment of CEN/TC 247 will be significantly impacted by the ongoing twin green and digital transition. The main EU initiatives and regulations that will shape the work of the CEN/TC 247 are the European Green Deal, the Europe Fit for the Digital Age, Energy System Integration Strategy and the Data Strategy, and in particular the Fit for 55 Package including the Energy Performance of Buildings Directive. Topics such as the agile standardisation in a digital market, smart buildings and the Smart Readiness Indicator (SRI) will be at the heart of our TC activities. This fast-advancing environmental regulatory framework necessitates the definition and regular update of a strategic Work Program in the CEN/TC 247.

Every New Work Item Proposal (NWIP) shall include consideration of the environmental aspects listed above and, in particular, seek alignment to the EPBD recast requirements related to Building Automation and the Smart Readiness Indicator, with focus on building operational efficiency.

The application and use of each standard by professionals and regulators in Europe will indicate the progress in achieving the objectives and shall be revised on a regular basis.

5 FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE CEN/TC 247 WORK PROGRAMME

Several factors are influencing the quality and duration of standards development as well as their spread in the market:

- It is difficult to recruit and maintain an adequate number of experts in “smart buildings” projects where a continuous high level of expertise is required
- Experts from the “baby-boom” generation are leaving the workforce
- Validation of a test method is dependent upon funding being available to undertake the necessary pre/co-normative research
- Inefficient communication on horizontal topics
- “Teething” problems in the application of smart standards
- Standards are difficult to market and resources for marketing purposes are scarce