



STRATEGIC BUSINESS PLAN ISO/TC 205

EXECUTIVE SUMMARY

ISO/TC 205, Building environment design is creating a system of international standards to address design and retrofit of the 'built environment'. The main design topics covered by the work of ISO/TC 205 are:

- the design of energy-efficient buildings
- building control systems design
- indoor air quality
- indoor thermal environment
- indoor acoustical environment
- indoor visual environment
- radiant heating and cooling systems
- heating and cooling systems
- building commissioning planning
- moisture in buildings

The initial intent of ISO/TC 205 was to address these topical areas separately, however the evolution of the industry and various jurisdictional entities have resulted in a collaboration with ISO/TC 163, Thermal performance and energy use in the built environment, to produce a set of standards addressing a holistic approach to design and performance of buildings for the 21st Century. Economics, energy efficiency, personal comfort, and productivity, and jurisdictional compliance are of primary importance to TC 205 in the development of its work programme.”

Healthy, sustainable buildings are those that create high quality indoor environments while minimizing their impacts on the outdoor environment. By the extensive adoption and use of international standards in the built environment, considerable savings in time, materials and money can be achieved. In addition, application of indoor environment standards will help to assure the health, productivity and well-being of building occupants. Emissions of CO₂ to the atmosphere could be reduced significantly through the application of international standards relating to the energy-efficient design of buildings and building mechanical equipment.

1. INTRODUCTION

1.1 *ISO technical committees and business planning*

The extension of formal business planning to ISO technical committees (ISO/TCs) is an important measure which forms part of a major review of business. The aim is to align the ISO work programme with expressed business environment needs and trends and to allow ISO/TCs to prioritize among different projects, to identify the benefits expected from the availability of international standards, and to ensure adequate resources for projects throughout their development.

1.2 *International standardization and the role of ISO*

The foremost aim of international standardization is to facilitate the exchange of goods and services through the elimination of technical barriers to trade.

Three bodies are responsible for the planning, development and adoption of international standards: [ISO](#) (International Organization for Standardization) is responsible for all sectors excluding electrotechnical, which is the responsibility of [IEC](#) (International Electrotechnical Committee), and most of the telecommunications technologies, which are largely the responsibility of [ITU](#) (International Telecommunication Union).

ISO is a legal association, the members of which are the national standards bodies (NSBs) of some 164 countries (organizations representing social and economic interests at the international level), supported by a Central Secretariat based in Geneva, Switzerland.

The principal deliverable of ISO is the [international standard](#).

An international standard embodies the essential principles of global openness and transparency, consensus and technical coherence. These are safeguarded through its development in an ISO technical committee (ISO/TC), representative of all interested parties, supported by a public comment phase (the ISO Technical Enquiry). ISO and its [technical committees](#) are also able to offer the ISO technical specification (ISO/TS), the ISO publicly available specification (ISO/PAS) and the ISO technical report (ISO/TR) as solutions to market needs. These ISO products represent lower levels of consensus and have therefore not the same status as an international standard.

ISO offers also the international workshop agreement (IWA) as a deliverable which aims to bridge the gap between the activities of consortia and the formal process of standardization represented by ISO and its national members. An important distinction is that the IWA is developed by ISO workshops and fora, comprising only participants with direct interest, and so it is not accorded the status of an international standard.

2. BUSINESS ENVIRONMENT OF THE ISO/TC

2.1 Description of the Business Environment

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

Due to the nature of the relationship between ISO TC 205 and TC 163 it was necessary to clearly define the scope of both TCs so that there could be no overlap and that the JWG could properly assign responsibility for standards in the 52000 family for the holistic approach to buildings. ISO 205 is therefore very clearly outlined as building design in the following scope that was developed by and approved by both TCs.

Scope:

Standardization in the design of new buildings and retrofit of existing buildings for acceptable indoor environment and practicable energy conservation and efficiency. Building environment design addresses the technical building systems and related architectural aspects, and includes the related design processes, design methods, design outcomes, and design-phase building commissioning. Indoor environment includes air quality, and thermal, acoustic, and visual factors.

Covering and including:

- aspects of sustainability related to indoor environmental quality and energy that can be addressed in the design of buildings and the design of retrofits of existing buildings;
- general principles of building environment design;
- design of energy-efficient buildings;
- building automation and control systems in building and retrofit design;
- indoor air quality in building and retrofit design;
- indoor thermal environment in building and retrofit design;
- indoor acoustical environment in building and retrofit design;
- indoor visual environment in building and retrofit design;
- design of heating and cooling systems including radiant; and
- application of methods of testing and rating the performance of building environmental equipment in the design of new buildings and retrofits.

Excluded:

- other ergonomic factors;
- methods of measurement of air pollutants and of thermal, acoustic and lighting properties;
- thermal performance and energy needs in the built environment (ISO TC 163);
- methods of testing for performance and rating of building environmental equipment in existing buildings;
- inspecting or rating existing buildings; and, construction.

Covering also:

Standardization of the holistic assessment of the energy performance of new and existing buildings as well as building retrofits, in close collaboration with ISO/TC 163 by means of the ISO/TC163/WG4 Joint working group TC 163 & TC 205 Energy performance using holistic approach, including:

- terms and definitions;
- system boundaries for buildings and technical systems;

- assessment of the overall energy performance of buildings, taking into account
 - o the energy performance of building elements;
 - o building related systems (heating, cooling, domestic hot water, ventilation, lighting, system controls, transport, and other energy related systems);
 - o indoor and outdoor conditions;
 - o local energy production (on site and at district level);
 - o (use of) energy sources (including renewable);
 - o building commissioning;
- assessment of overall energy efficiency; and
- means of expressing the energy performance and energy performance certification of buildings.

All industry sectors identified with ISO/TC 205 are affected by economic, social, political and regulatory factors at both the national and regional levels. The market structures served by ISO/TC 205 are difficult to quantify given its wide-ranging scope. It is best to define these sectors and dynamics by the main areas of work covered by ISO/TC 205.

Energy-efficient buildings

This sector is defined by new construction and retrofit of existing construction of buildings. Specific elements currently addressed by the TC include the building fabric (or envelope) and energy-efficiency of heating, ventilation and cooling equipment.

A worldwide effort toward rational use of natural resources has increased the markets for energy- efficient buildings and building equipment. The building sector likely holds the greatest prospects for energy saving than any other through the design and construction of buildings with improved thermal performance and increased efficiency of mechanical equipment. However, national and regional authorities govern energy performance levels for buildings to a great extent. Preferably, the same system of standards should be adopted internationally.

Building control systems design

This sector is defined as products and systems for building automation and building management. The total global building automation market is estimated at USD 5 billion.

Rational allocation of natural resources will also affect the market for building automation and management products. These products are an important element in the efforts to reduce energy consumption in buildings. In addition, building automation products contribute significantly to improving a building's efficiency and flexibility of use, making them easier and more economical to operate. Technical factors include the extremely high rate of innovation in information and communications technology, the emerging use of artificial intelligence to optimize building system performance, and the challenge of integrating different automation and control systems in an application.

Indoor air quality

This area of work consists of the design of systems to provide outdoor air ventilation to enhance the indoor air environment. The intent is to both provide healthier working conditions with a minimum impact on the environment. The market suppliers for ventilation systems for indoor air consists of product manufacturers (responsible for the design, manufacture, and testing of products), installation and maintenance firms, and consulting engineers.

National and regional regulations typically govern indoor air quality, specifically acceptable levels of contaminants and performance criteria. The World Health Organization has also prescribed set measures for acceptable air quality.

Indoor thermal environment

This area of work is closely tied to the markets and the suppliers for energy-efficient buildings and indoor air quality.

Both economic and comfort elements affect the indoor thermal environment. National regulations covering indoor temperature and humidity, thermal radiation and ventilation air speed are not uniformly established. These 'comfort' factors are difficult to quantify and enforce.

Indoor acoustical environment

This area of work is comprised of all commercial buildings; specifically, of work spaces, such as offices, and learning spaces, such as schools, and other space where speech intelligibility or speech privacy are issues. Suppliers include manufacturers of equipment and components comprising the indoor environment and architectural and engineering design firms and consultants.

Economic and social factors affecting the acoustical market include an increase in commercial productivity goals and an increased concern for speech privacy. Classroom acoustics are also subject to an increase in national regulations.

Indoor visual environment

The area of work addressed by this segment includes all buildings, indoor spaces, building components (windows and other openings similar room, and surfaces), and lighting sources where the major concern is human occupancy. Suppliers include manufacturers of equipment and components comprising the indoor space and other stakeholders comprised of, but not limited to, architectural and lighting design firms and consultants

Related factors affecting the visual environment include human needs (social, physiological, psychological factors), the context (physical environment, economic, political, and regulatory factors), and architecture (). Human needs include task performance, visual comfort, and health, safety and well-being elements. The design considers the construction, renovation, installation, maintenance, operation and energy usage of the space. Architectural factors include the form, composition, style and applicable codes/standards relating to a space. The market for products and other factors comprising the visual environment is affected by national and regional regulations concerning lighting energy usage and application and to a limited extent regulated human needs factors. International standardization in the field of light and lighting is driven by technical committees from the International Commission on Illumination (CIE), ISO, CEN and IEC. Co-operation with these organizations is needed to make it possible to apply preferably the same documents and the same design process in different countries even under consideration of different national lighting practices.

Customers of the products and services defined for all markets above include:

- Consumers: building owners, operators, and occupants
- Governments: public authorities responsible for regulations covering the affected markets

- Industries: independent building institutes, industry associations and other research institutes
- Others: academic establishments, independent testing laboratories and accrediting bodies, national and regional standardization organizations (non-governmental), architects and consulting engineers

2.2 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 ISO/TC:

It is estimated that the annual impact of the building industry is over USD 1 trillion worldwide. Buildings are the largest user of energy and therefore the greatest contributor to CO₂ emissions and greenhouse gases. With building heating, ventilating, and air-conditioning consuming a third of energy used in buildings, alternative systems or strategies to reduce energy use are needed. The challenge to TC 205 is to standardize methodology that creates healthy and productive indoor environments that minimize energy use and the resulting impact on the environment.

3. BENEFITS EXPECTED FROM THE WORK OF THE ISO/TC

By the extensive adoption and use of international standards in the built environment, considerable savings in time, materials and moneys can be achieved. In addition, application of indoor environment standards will help to assure the health, productivity and well being of building occupants. Healthy, sustainable buildings are those that create high quality indoor environments while minimizing their impacts on the outdoor environment. Emissions of CO₂ to the atmosphere could be reduced significantly through the application of international standards relating to the energy-efficient design of buildings and building mechanical equipment.

The international standards under development by ISO/TC 205 will be suitable for adoption by national and regional regulatory authorities and in trade or building documents and codes.

Extensive adoption of International Standards authored by ISO/TC 205 will assist the built environment markets in developing countries and assist sustainable development in developed countries.

4. REPRESENTATION AND PARTICIPATION IN THE ISO/TC

4.1 Membership

<https://isotc.iso.org/livelink/livelink?func=Committees.memberslist&objid=8847652>

4.2 Analysis of the participation

ISO/TC 205 has representation from the major developed countries and is encouraging more participation from developing countries. The experts appointed to the working groups are, as far as practical, evenly divided between academia, industry, national standards organizations, researchers and independent consultants. There is no perceived dominance by any particular group.

5. OBJECTIVES OF THE ISO/TC AND STRATEGIES FOR THEIR ACHIEVEMENT

5.1 Defined objectives of the ISO/TC

Based on the considerations above, the ISO/TC pursues the following objectives and strategic directions for its future work:

The primary objective of TC 205 is to develop voluntary international standards and guidelines for the establishment of a common worldwide approach to building design processes that will lead to good quality environment in all types of buildings, without excessive cost in financial or environmental terms, while spurring international trade and commerce. They will serve as tools to manage building environment design programs and provide an internationally recognized framework to evaluate these programs.

Due to the holistic approach to buildings which is represented in the ISO 52000 series and the defined scope previously outlined, TC 205 will be in the position of serving the following roles:

1. Remain a member of the JWG between TCs 205 and 163 as long as the WG exists
2. Serve as the Secretariat and member of the newly created JAG (Joint Advisory Group) whose responsibility is to recommend which standards will become part of the 52000 series. These standards can be created by either of the partner TCs, the current JWG or other ISO TCs, if applicable.
3. Develop standards to achieve the objectives of the TC as defined.

When implemented, these standards will ensure:

- consistency in building environment design practice;
- harmonization in national building environment design standards within an international framework;
- simplified registrations, and labelling and resolution of conflicting requirements;
- a single system for all trans-national subsidiaries; and
- guidelines for indoor environmental excellence.

These standards cover each of the design components of the built environment within the scope. These design components are for:

- energy-efficient buildings;
- building automation management products and systems;
- indoor air quality;
- thermal environment;
- acoustic environment
- visual environment.
- mechanical systems
- commissioning planning
- moisture in buildings

These standards will describe processes for developing criteria for the respective areas above. However, they are not intended to limit the possible design solutions that meet the design criteria. It is intended to produce standards without excessive cost in financial or environmental terms, while spurring international trade and commerce. The standards must take account of the following:

- Be achievable in all climates.

Achieving an adequate built environment depends heavily on the external conditions. The problems of the different climates within a country, let alone a continent, are very significant, especially in respect of thermal comfort and humidity.

- Not involve unreasonable expense.

The processes covered in the standards should be standardized in such a way to encourage optimal environments within the budgetary limitations of a project

- Give full account of the environmental impacts of their requirements.

The world as a whole is facing substantial problems as a result of climate change and resource depletion. Since energy use in buildings is a significant contributor to this problem, standards for the built environment must give buildings' environmental impact full consideration.

- Not cause conflict with other existing standards.

There are two types of potential conflict: a) within ISO/TC 205 and b) elsewhere. Within ISO/TC 205, the standards developed shall not contradict one another. The effect of implementing one standard must not prevent another being met. The easiest example of this is in ventilation/energy, where the conflict of high airflow for indoor air quality against low airflow for energy must be addressed. But noise comes into this too, since many solutions to air quality problems may result in elevated noise levels. Another area might concern daylighting/solar protection and cooling requirements. Beyond ISO/TC 205 there are many related activities in other standards bodies. Given that these will be applied in many ISO countries, there is a problem with any overlap or contradiction between the two potential standards. Therefore, standards shall be developed only for areas that are not covered elsewhere, and only in such a way as not to cause conflict with existing work. Consideration shall be given to co-operation with other bodies wherever possible.

Provide a process which allows consideration of available information on health effects and comfort factors and give full account of the impacts of their requirements

- Indicate design requirements, without indicating anything about technical solutions.

The purpose of this group of standards is to establish processes that encourage optimal indoor environments. These must be achievable and so they must be set with consideration given to techniques. However they shall not indicate the preferred solution; this is not their role.

- Be applicable to all buildings, at different levels.

The scope does not restrict the range of buildings to be covered. Different building types will therefore need to be considered and choices taken for each according to its needs. The standardized processes may even allow differing levels for health effects as the occupancy time will vary. The standardized processes must allow different levels for comfort since this is affected by activities within the building.

5.2 Identified strategies to achieve the ISO/TC's defined objectives

General approach and priorities

All working groups have as a priority the development of standards in accordance with the guidance of general principles established by ISO/TC 205/WG 1.

ISO/TC 205 will implement the Vienna Agreement parallel procedure, when and where possible, so as not to duplicate standardization work in this area

ISO/TC 205 will work by electronic correspondence to be as efficient as possible. The working groups organize their work and the necessary meetings themselves. The TC intends to hold a yearly plenary session.

Each working group has identified particular areas of focus for standards development. National viewpoints communicated by delegations from different countries are taken into consideration in the development of working drafts. National exceptions are to be avoided wherever possible, but the TC will always be cognizant of the concept of "global relevance".

No specific research needs have been identified. Where the TC has noted that there are several diverging national and regional standards (e.g. for indoor air quality), and the TC would like to replace them with an international standard, it may be necessary to obtain funding to research the varying requirements to find the best practices.

Organization and structure

The general organizational approach is to develop standards through WGs. This allows total flexibility while coordinating with our partner TC 163 in developing the holistic approach to buildings and the built environment. The number and duration of the WG is directly related to the work being done. Therefore, the current organization may or may not resemble that outlined in this business plan as represented due to the fact that WGs are disbanded if there is no work to be done and are established just as rapidly. The current organization and span of work is below.

Project leaders within the working groups have been assigned where the working group has multiple work items. The work in ISO/TC 205 as well as in its working groups is conducted in English.

Current Structure and focus of work

AG-1 Joint Advisory Group TC 163-TC 205-Coordination 52000 family (JAG)
WG 1 General Principles
WG 2 Design of Energy-Efficient Buildings
WG 3 Building Automation and Control Systems (BACS) Design
WG 5 Indoor Thermal Environment
WG 7 Indoor Visual Environment
WG 8 Radiant Heating and Cooling Systems
WG 9 Heating/Cooling Systems
WG 10 Commissioning
JWG 11 Moisture Damage

Joint working groups under the responsibility of another committee

ISO/TC 163/WG 4, Joint ISO/TC 163 - ISO/TC 205 WG: Energy performance of buildings using holistic approach

Deletions from the previous Business Plan:

WG 4 Indoor Environment No current work and therefore not active
WG 6 Acoustical Environment. This effort was moved to a different TC entirely

6. FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE ISO/TC WORK PROGRAMME

The stakeholders of ISO/TC 205 must realize the necessity and benefits of standardizing building environment design and be committed to the implementation of such standardization.

Of primary concern to ISO/TC 205 is that it does not overlap its activities with those of existing ISO technical committees, particularly ISO/TC 163. Close liaison with other ISO and CEN technical committees covering the built environment is crucial to the success of ISO/TC 205.

7. STRUCTURE, CURRENT PROJECTS AND PUBLICATIONS OF THE ISO/TC

Information on ISO online

The link below is to the TC's page on ISO's website:

<https://www.iso.org/committee/54740.html>

Click on the tabs and links on this page to find the following information:

- About (Secretariat, Committee Manager, Chair, Date of creation, Scope, etc.)
- Contact details
- Structure (Subcommittees and working groups)
- Liaisons
- Meetings
- Tools
- Work programme (published standards and standards under development)

Reference information

[*Glossary of terms and abbreviations used in ISO/TC Business Plans*](#)

[*General information on the principles of ISO's technical work*](#)