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Sustainability in building construction — General principles

Développement durable dans la construction — Principes généraux

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15392 was prepared by Technical Committee ISO/TC 59, *Building construction*, Subcommittee SC 17, *Sustainability in building construction*.

Introduction

This International Standard presents general principles of sustainability related to buildings and other construction works. These general principles form the basis for a suite of standards intended to address specific issues and aspects of sustainability relevant to building and civil engineering of construction works.

The issue of sustainable development is broad and of global concern, and, as such, involves all communities and interested parties. Both current and future needs define the extent to which economic, environmental and social aspects are considered in a sustainable development process.

The built environment (buildings and civil engineering works) is a key element in determining quality of life, and contributes to cultural identity and heritage. As such, it is an important factor in the appreciation of the quality of the environment in which society lives and works.

The building and construction sector is highly important for sustainable development because:

— it is a key sector in national economies;

— it has a significant interface with poverty reduction through the basic economic and social services provided in the built environment and the potential opportunities for the poor to be engaged in construction, operation and maintenance;

— it is one of the single largest industrial sectors and, while providing value and employment, it absorbs considerable resources, with consequential impacts on economic and social conditions and the environment;

— it creates the built environment, which represents a significant share of the economic assets of individuals, organizations and nations, providing societies with their physical and functional environment;

— it has considerable opportunity to show improvement relative to its economic, environmental and social impacts.

Construction activities may or may not take place within a legal and regulatory, or other administrative framework present within a country or region. In either case, aspects of governance are relevant to sustainable development, in addition to those aspects related specifically to building construction. Well established administrative frameworks may contain requirements that can act as drivers and help to move the building and construction sector towards sustainability.

Over their life cycle, construction works absorb considerable resources and contribute to the transformation of areas. As a result, they can have considerable economic consequences, and impacts to the environment and human health.

While the challenge of sustainable development is global, the strategies for addressing sustainability in building construction are essentially local and differ in context and content from region to region. These strategies will reflect the context, the preconditions and the priorities and needs, not only in the built environment, but also in the social environment. This social environment includes social equity, cultural issues, traditions, heritage issues, human health and comfort, social infrastructure and safe and healthy environments. It may, in addition, particularly in developing countries, include poverty reduction, job creation, access to safe, affordable and healthy shelter, and loss of livelihoods.

Applying the principles of sustainability in building construction, including all related processes and activities, requires the direct and responsible involvement of all interested parties. While their legal responsibility and liability is subject to national or regional regulation, individual commitment and responsibility is voluntary. Nevertheless, this commitment is a basic principle of the application of sustainable development, including application in the building and construction sector.

Applying the concept of sustainability to specific buildings or other construction works includes an holistic approach, bringing together the global concerns and goals of sustainable development and the demands and requirements in terms of product functionality, efficiency and economy. Different target audiences will have a different perspective on these challenges and the preferred solutions.

This International Standard establishes internationally recognized principles for sustainability in building construction and establishes a common basis for communication of the information required. Interested parties, such as product manufacturers and designers will then be able to provide information. Such information can then be communicated internationally and to a wide range of target audiences, extending from policy makers and regulators to manufacturers, building owners and consumers.

The recipients of information can elaborate and interpret information according to their own perspective, reflecting other aspects of decision making, including fields of responsibility or constraints.

The concepts involved in sustainability are highly complex and under constant study. There are no definitive methods for measuring sustainability or confirming its accomplishment. These general principles do not provide a benchmark against which a claim of sustainability can be made. Nevertheless, they may be useful when considering the completeness and validity of claims of, or calls for, sustainability.

The aim of this International Standard is to set out the objectives for sustainability in building construction and from these derives general principles. For the current standardization work, see Figure 1. This International Standard forms the basis for deriving evaluation criteria and indicators for the assessment of the contribution of buildings to sustainable development, and it enables decision makers to apply the principles in their decision making.

This International Standard does not set the political agendas, or provide priorities related to specific concerns which are established in international agendas, e.g. Agenda 21. However, requirements and targets related to political goals can be related to the identified general principles for sustainability in building construction.

This International Standard is not intended to provide the basis for assessment of organizations or other stakeholders, but does acknowledge the importance of their role in the context of sustainability in building construction.

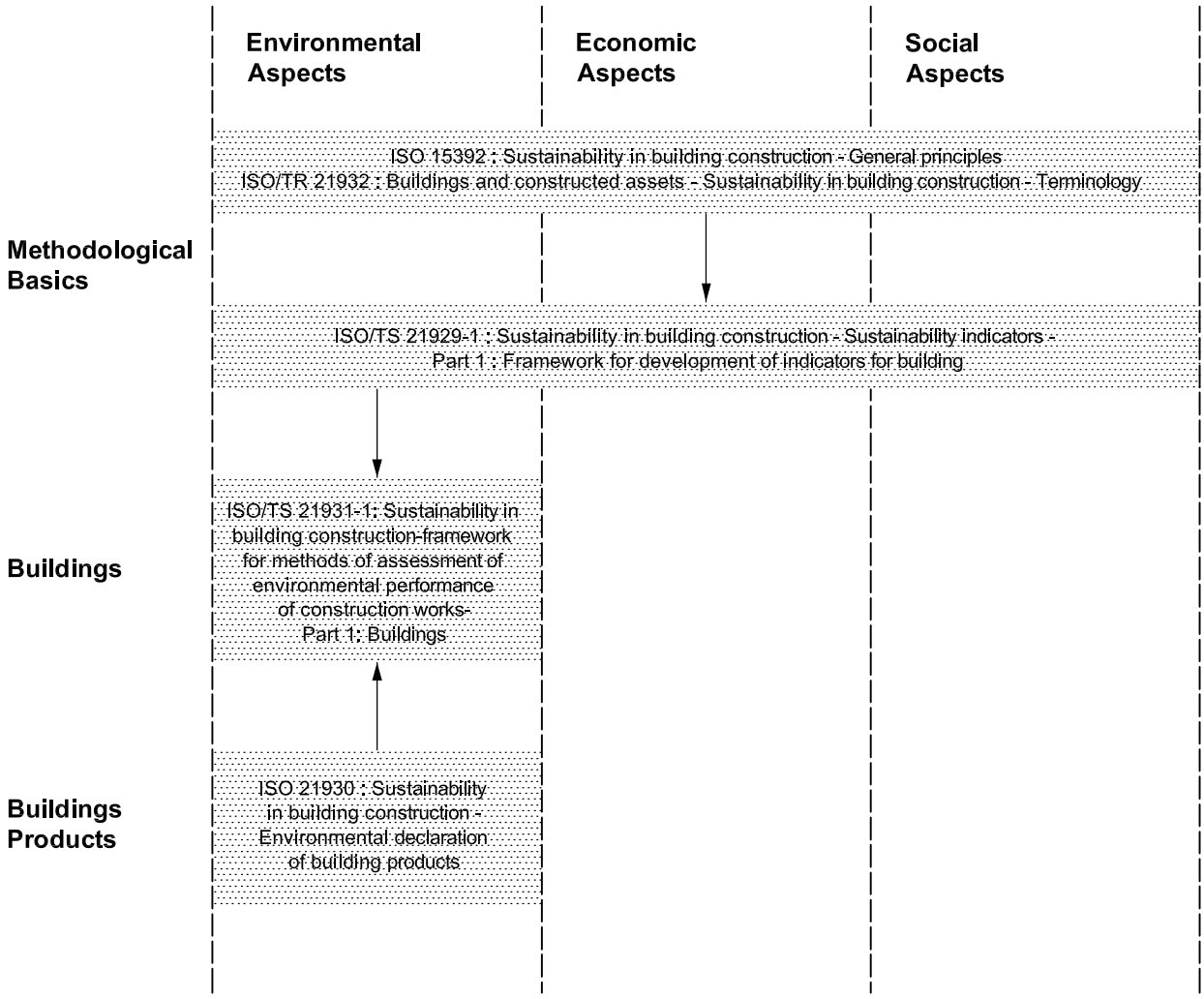


Figure 1 — Suite of related International Standards for sustainability in buildings and construction works

NOTE For a description of the suite of International Standards, see Annex A. This suite of standards currently contains the documents indicated in Figure 1.

Intended users of the suite of International Standards include (in alphabetical order): builders, certification bodies, clients, contractors, designers, facility managers, fund providers, governmental and non-governmental organizations associated with the United Nations (NGOs), insurers, manufacturers, owners, planners, policy makers, promoters, real estate agents, regulators, researchers, standards developers, users (tenants as well as public), etc.

Sustainability in building construction — General principles

1 Scope

This International Standard identifies and establishes general principles for sustainability in building construction. It is based on the concept of sustainable development as it applies to the life cycle of buildings and other construction works, from their inception to the end of life.

This International Standard is applicable to buildings and other construction works individually and collectively, as well as to the materials, products, services and processes related to the life cycle of buildings and other construction works.

This International Standard does not provide levels (benchmarks) that can serve as the basis for sustainability claims.

This International Standard is not intended to provide the basis for assessment of organizations or other stakeholders.

NOTE 1 The principles established in this International Standard are intended to be applied broadly in the context of buildings and other construction works. Specific applications are the subject of other related international standards.

NOTE 2 Buildings and other construction works are designed to meet numerous requirements, expressed and established in national and international standards or regulations. None of these requirements is replaced or changed by this International Standard.

NOTE 3 Social responsibility aspects relative to organizations will be addressed in ISO 26000 [1)].

2 Normative references

The following references documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the references document (including any amendments) applies.

ISO 6707-1:2004, *Building and civil engineering — Vocabulary — Part 1: General terms*

ISO 14050, *Environmental management — Vocabulary*

ISO/TS 21929-1, *Sustainability in building construction — Sustainability indicators — Part 1: Framework for development of indicators for buildings*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6707-1 and ISO 14050 and the following apply.

NOTE 1 Terms are not defined where they retain their normal dictionary definition.

NOTE 2 Where bold type is used in a definition, this indicates a cross-reference to another concept defined in this clause, and the numbered reference for the concept is given in parentheses.

1) Under preparation.

NOTE 3 For an elaboration on the terms used to designate various concepts related to products of the building and construction sector, see Annex B.

3.1
access to services
availability and accessibility of services outside the building

NOTE Services can include public transportation, parking, entertainment, health-care, water and energy supply, etc.

3.2
accessibility
ability of a space to be entered with ease

NOTE 1 Requirements for accessibility will depend on the users' needs, as well as to activities during the **life cycle** (3.15) of the **building** (3.4), e.g. **construction work** (3.7), maintenance and deconstruction.

NOTE 2 "Barrier-free use of buildings" would relate to requirements for accessibility related to the needs of users with reduced mobility.

NOTE 3 Adapted from the definition of "accessibility" in ISO 6707-1.

3.3
areas of concern
areas of protection
protection area, sing
aspect(s) of the economy, the environment or the society that can be impacted by **construction works** (3.8), goods or services

EXAMPLES Asset value, cultural heritage, resources, human health and comfort, social infrastructure.

3.4
building
construction works (3.8) that has the provision of shelter for its occupants or contents as one of its main purposes; usually partially or totally enclosed and designed to stand permanently in one place

[ISO 6707-1:2004, definition 3.1.3]

3.5
built environment
collection of man-made or induced physical objects located in a particular area or region

NOTE 1 When treated as a whole, the built environment typically is taken to include **buildings** (3.4), external works (landscaped areas), **infrastructure** (3.6) and other **construction works** (3.8) within the area under consideration.

NOTE 2 Derived from the definition of "environment" in ISO 6707-1.

3.6
civil engineering works
infrastructure
civil engineering project US
construction works (3.8), comprising a structure, such as a dam, bridge, road, railway, runway, utilities, pipeline, or sewerage system, or the result of operations such as dredging, earthwork, geotechnical processes, but excluding a **building** (3.4) and its associated site works

NOTE 1 Associated siteworks are included in US civil engineering projects.

NOTE 2 Derived from the definition of "civil engineering works" in ISO 6707-1:2004.

3.7
construction work
activities of forming a **construction works** (3.8)

[ISO 6707-1:2004, definition 7.1.1]

3.8
construction works
everything that is constructed or results from construction operations

[ISO 6707-1:2004, definition 3.1.1]

3.9
economic aspect
aspect of **construction works** (3.8), parts of works, processes or services related to their **life cycle** (3.15) that can cause a change to economic conditions

3.10
environmental aspect
aspect of **construction works** (3.8), parts of works, processes or services related to their **life cycle** (3.15) that can cause a change to the environment

NOTE Adapted from ISO 14001.

3.11
environmental declaration
claim which indicates the **environmental aspects** (3.10) of any good(s) or service(s)

NOTE 1 An environmental declaration may take the form of a statement, symbol or graphic on a product or package label, in product literature, in technical bulletins, in advertising or in publicity, amongst other things.

NOTE 2 Adapted from the definition of environmental declaration in ISO 14025.

3.12
environmental performance
performance (3.16) related to **environmental impacts** (3.13.2) and **environmental aspects** (3.10)

NOTE The environmental performance is influenced by all processes related to the **life cycle** (3.15) of the object of consideration.

3.13
impact
any change that may be adverse or beneficial

3.13.1
economic impact
impact (3.13) to the economy, wholly or partially resulting from **economic aspects** (3.9)

3.13.2
environmental impact
impact (3.13) to the environment, wholly or partially resulting from **environmental aspects** (3.10)

NOTE Adapted from ISO 14001.

3.13.3
social impact
impact (3.13) to society or quality of life, wholly or partially resulting from **social aspects** (3.19)

3.14
indicator
quantitative, qualitative or descriptive measure

NOTE Adapted from ISO 14050.

3.15
life cycle
consecutive and interlinked stages of the object of consideration

NOTE 1 Adapted from the definition of life cycle contained in ISO 14040.

NOTE 2 For consideration of **environmental impacts** (3.13.2) and **environmental aspects** (3.10), the life cycle comprises all stages, from raw material acquisition or generation of natural resources to final disposal.

NOTE 3 For consideration of **economic impacts** (3.13.1) and **economic aspects** (3.9), in terms of costs, the life cycle comprises all stages from construction to decommissioning. A period of analysis can be chosen to be different from the life cycle, see ISO 15686-5.

3.16
performance
ability to fulfil required functions under intended use conditions or behaviour when in use

NOTE 1 Derived from the definition of performance in ISO 6707-1.

NOTE 2 The required functions address both the functionality requirements as well as the technical requirements.

3.17 product

3.17.1
product
construction product
building product
⟨building and civil engineering⟩ item manufactured or processed for incorporation in **construction works** (3.8)

NOTE Derived from the definition of product in ISO 6707-1.

3.17.2
product
⟨environmental management⟩ any goods or service

[ISO 14025:2006, definition 3.11]

3.18
service life
period of time after installation during which a **construction works** (3.8) or its parts meet or exceed the performance requirements.

NOTE Derived from the definition of service life in ISO 6707-1.

3.19
social aspect
aspect of **construction works** (3.8), parts of works, processes or services related to their **life cycle** (3.15) that can cause a change to society or quality of life

3.20
sustainability
state in which components of the ecosystem and their functions are maintained for the present and future generations

NOTE 1 Sustainability is the goal of **sustainable development** (3.21) and can result from the application of the concept of sustainable development.

NOTE 2 In building construction, it relates to how the attributes of the activities, **products** (3.17.1) (3.17.2) or services used in the **construction work** (3.7), or the use of the **construction works** (3.8), contribute to the maintenance of ecosystem components and functions for future generations.

NOTE 3 While the challenge of sustainability is global, the strategies for sustainability in building construction are local and differ in context and content from region to region.

NOTE 4 "Components of the ecosystem" includes plants and animals, as well as humans and their physical environment. For humans, this includes a balancing of key elements of human needs: the economic, environmental, social and cultural conditions for societies' existence.

3.21
sustainable development
development that meets the needs of the present without compromising the ability of future generations to meet their own needs

NOTE 1 According to the Report of the World Commission on Environment and Development [18], sustainable development contains two key concepts: 1) the concept of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given; and 2) the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

NOTE 2 Sustainable development concerns all resources providing a better quality of life, equally for present and future generations. Sustainable development also aims to eradicate poverty and gives priority to the needs of the poor.

4 General

Sustainability is a state that requires that humans carry out their activities in a way that protects the functions of the earth's ecosystem as a whole.

NOTE According to the World Commission on Environment and Development, sustainability can be described as a state in which humankind is living within the carrying capacity of the earth.

Sustainability is the global goal of sustainable development, as defined by the Report of the World Commission on Environment and Development [18], and applied to buildings and other construction works.

Addressing sustainability in buildings and other construction works includes the interpretation and consideration of sustainable development in terms of its three primary aspects – economic, environmental, and social aspects – while meeting the requirements for technical and functional performance of the construction works.

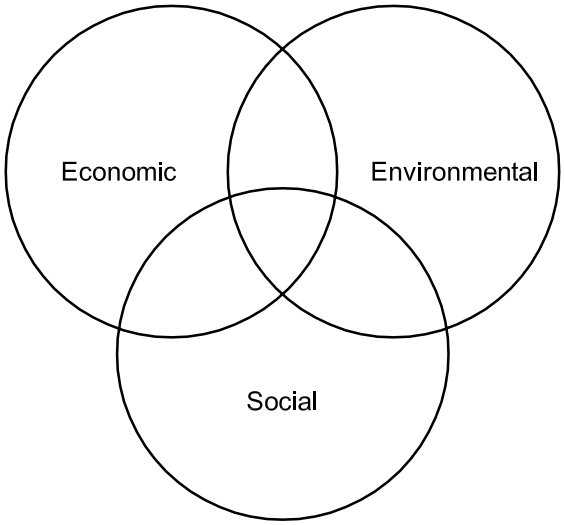


Figure 2 — Primary aspects of sustainability

These aspects are inextricably linked to each other and interdependent, as indicated in Figure 2, and a dynamic balance exists between them, which may be fragile or enduring. They have no particular precedence and this International Standard gives them equal importance.

Each aspect needs to be addressed in a systemic way, often involving prioritization. Prioritization relates to specific concerns such as protection goals, derived from economic, environmental and social needs.

This International Standard does not set priorities and the aspects are presented here, and typically throughout this document, in alphabetical order without indication of importance. The overlapping of the spheres is purely illustrative of the common, but not necessarily equally shared, influence. In any particular circumstance, the degree of overlap will vary and may lead to a positive impact in one sphere while resulting in an adverse impact in the other(s). The overall aim is to minimize adverse impacts while providing the required value.

An interpretation and consideration of the primary aspects of sustainability may require consideration of areas of concern such as asset value, cultural heritage, resources, human health and comfort, and social infrastructure. These different areas of concern should be taken into account when selecting and applying indicators (see ISO/TS 21929-1).

The application of sustainability to building construction needs to reflect the context in terms of goals, priorities, preconditions, possibilities and constraints (such as poverty, accessibility and access to services). This International Standard does not provide the prioritization, but recognizes that an application will balance the aspects according to overarching goals of development targets.

NOTE Areas of concern are sometimes referred to collectively as “Areas of Protection” or individually as a “protection area”.

5 Sustainability in buildings and other construction works

5.1 General

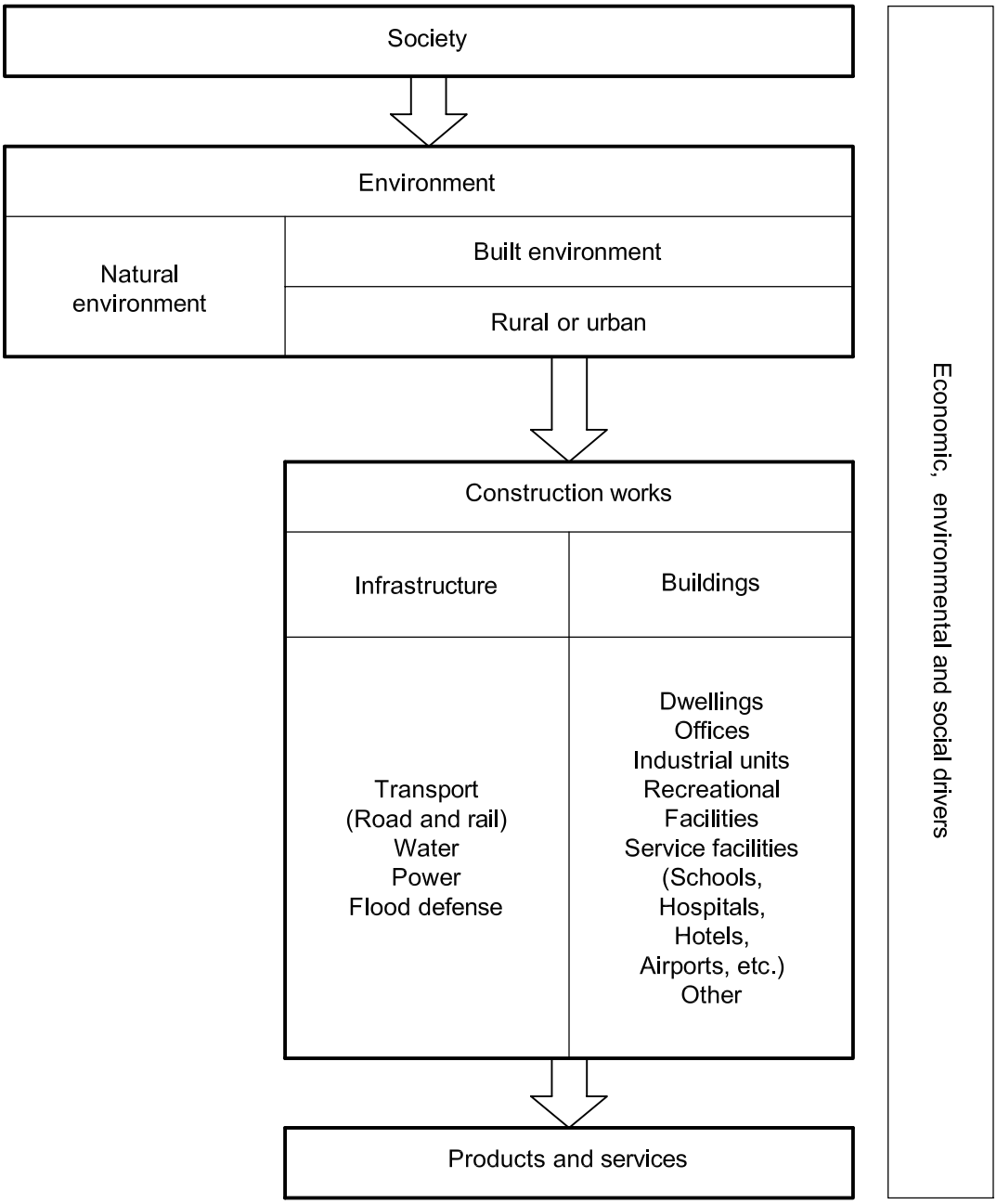
Sustainable development of buildings and other construction works brings about the required performance and functionality with minimum adverse environmental impact, while encouraging improvements in economic and social (and cultural) aspects at local, regional and global levels. Sustainable development of buildings and other construction works may include consideration of buildings and infrastructure individually and collectively, as well as consideration of single products, functional components, services and processes related to their life cycle.

For sustainability in building construction, the **objectives** (5.2) and **principles** (5.3) should be considered in their entirety, without regard to the prioritization of aspects. The extent, to which these objectives and principles can properly be addressed, also depends on the scope and the scale of the project. The significance and magnitude of impacts also may depend on and change with the life cycle stage under consideration.

Many sustainable development objectives do not directly relate to, and yet are clearly influenced by, the built environment. Instead of referring to absolute attributes, such as “sustainable construction” or “sustainable building”, it is more appropriate to discuss the extent to which the built environment and its elements support and contribute to sustainable development.

The contribution of buildings and construction works to sustainable development can be considered on several levels, including a whole industrial sector, an enterprise, a community, a building stock, a group of buildings, or an individual building or construction works. The sustainability of buildings and other construction works also involves the recognition of their interdependency with products (see Annex B), as well as with their context. Figure 3 illustrates how requirements from the society’s concerns of sustainability relate to the built environment, construction works and products.

A concern related to construction is that sustainability does not sufficiently address construction as a broader process or mechanism for the realization of human settlements. Besides addressing biophysical and economic considerations, sustainable construction needs to explicitly embrace the human dimension and involve issues relevant to adequate provision for basic needs such as shelter, and issues such as poverty, and threats to cultural values and inequalities, related to gender, ability, and generational or regional differences.



NOTE 1 The arrows represent the origin and direction of requirements.

NOTE 2 For an elaboration of the terms used to designate various concepts related to products of the building and construction sector, see Annex B.

NOTE 3 The environment comprises the natural and the built environment.

NOTE 4 Requirements from stakeholders are, in this figure, to be interpreted as economic, environmental and social drivers, with drivers to include priorities and requirements as well as constraints.

Figure 3 — Requirements posed to the built environment, its parts and related drivers

5.2 Objectives

Whilst applying the concept of sustainability to buildings and other construction works, and at the same time promoting sustainable development, the objectives are:

— improvement of the construction sector and the built environment;

NOTE 1 Sectors interacting with and supporting the construction sector are to be addressed by the objectives where relevant, e.g. real estate sector, financial and insurance sector, transportation, etc.

— reduction of adverse impacts while improving value, where impacts as well as value may be judged against any combination of the three primary aspects of sustainability;

NOTE 2 "Value" embraces performance, but is conceptually broader and is not intended to refer solely to "economic value".

— stimulation of a pro-active approach;

— stimulation of innovation;

— decoupling of economic growth from increasing adverse impacts on the environment and/or society;

— reconciliation of contradictory interests or requirements arising from short-term and long-term planning or decision making.

5.3 Principles

5.3.1 General

The principles applied to reach the objectives are, without indication of importance and in alphabetical order: continual improvement, equity, global thinking and local action, holistic approach, involvement of interested parties, long term consideration, precaution and risk, responsibility, and transparency.

5.3.2 Continual improvement

This principle encompasses the improvement of all aspects of sustainability related to the built environment including the buildings and other construction works over time. It includes the performance of construction works as well as processes, and addresses means of assessment, verification, monitoring and communication.

5.3.3 Equity

This principle encompasses the balanced and objective consideration of intergenerational, interregional and intra-societal ethics, including environmental protection, economic efficiency and social needs.

5.3.4 Global thinking and local action

This principle encompasses the consideration of the global consequences of local actions taking account of local and regional concerns, to ensure that:

a) when acting locally, the regional and global relevance and consequences are considered;

b) when establishing and applying global strategies, the local implications, relevance, demands and resources are considered.

5.3.5 Holistic approach

This principle encompasses the inclusion of all relevant and related aspects of sustainability when considering and assessing sustainability aspects of buildings and other construction works. A holistic approach addresses all aspects of sustainability over the life cycle of the building or other construction works.

5.3.6 Involvement of interested parties

This principle encompasses the taking into account of the contribution and requirements of interested parties relative to their respective areas of responsibility, and the timing of their involvement.

NOTE Due to the nature of the building and construction sector and its products, a wide range of stakeholders has interest in this industrial sector and its outputs. These stakeholders may demonstrate significant differences in their appreciation and understanding of the building sector. Such differences explain the multiplicity of views that exist in the interpretation of sustainable development in the context of building and construction, particularly in terms of scope, content, level of detail, priorities, etc.

5.3.7 Long-term consideration

This principle encompasses the taking into account of the short-, medium- and long-term implications in decision making.

As a minimum, it includes the following:

a) performance over time (as the ability of fulfilling a defined level of function throughout the use phase);

b) life cycle thinking (i.e. considering the consequences of a choice made in one stage of the life cycle on the other stages);

c) legacy – the consideration of the impacts that are handed down as a result of development. The legacy may extend well beyond the physical boundaries of the development.

   NOTE The legacy can be physical (e.g. the buildings and infrastructure), environmental (e.g. environmental benefit or damage), social (e.g. cultural heritage, skills, capacity building) or economic (e.g. employment, economic growth).

5.3.8 Precaution and risk management

This principle encompasses the avoidance of risks by applying the precautionary principle, or considering the most unfavourable impacts through risk management.

— Precaution (avoidance of risks)

  The precautionary principle aims to avoid risks – it sets concerns of future generations as the basis for the analysis of risk potentials.

  NOTE Adoption of new technologies or new products should include a precautionary perspective without unduly compromising innovation.

— Risk management (management of identified risks)

  Risk management is a set of coordinated activities including risk assessment, risk treatment, risk acceptance and risk communication.

5.3.9 Responsibility

This principle encompasses the moral responsibility for, rather than legal or financial consequences of, actions carried out by individuals or groups of individuals.

The development of local skills and institutional capacity supports the sustainability of construction works.

5.3.10 Transparency

This principle encompasses the presentation of information in a manner that is open, comprehensive and understandable and, like the underlying data, traceable, with verifiable credibility.

NOTE For sustainability of buildings and other construction works, transparency relates to information about products as well as decision-making processes. For that purpose, an appropriate review and verification route of relevant documentation may need to be established.

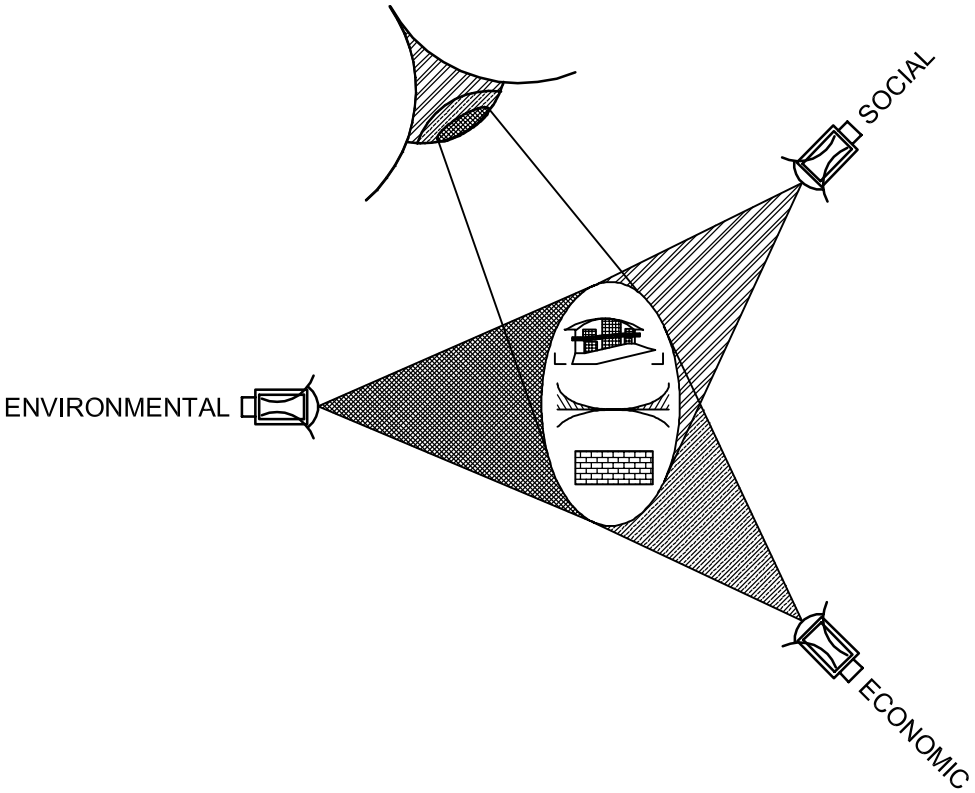
6 Guidance on the application of the general principles

6.1 General

This International Standard gives the aspects of sustainability equal importance. When addressing sustainability in buildings and other construction works, the objectives and principles should be considered and applied to enable appropriate decision making that meets the needs in the current context. Such application of this International Standard in a given regional, societal and economic context can lead to temporal strategies specific to existing conditions. (e.g. the response of developing countries and their strategies in developing sustainability agendas may be very different from those of developed economies).

NOTE 1 The decision making usually relates to planning, design, management and deconstruction processes. Typical phases of a project development are: project inception including the description of the project's characteristics; project development calculation and acquisition of the land or existing building; project conception including feasibility and profitability analysis; planning; construction; marketing; use and refurbishment or redevelopment.

NOTE 2 While this International Standard remains at the level of identifying the objectives and principles of sustainability in building construction, guidance on the application of these general principles is under preparation.



NOTE The lamps in this figure indicate that sustainability aspects of the construction works are being made "visible" for the observer. Depending on the observers' view-point and depending on their individual priorities and value judgements, the perception of the information may be filtered, leading to the situation that different target audiences draw different conclusions from the same information.

Figure 4 — Integrated consideration of primary aspects of sustainability related to a building or other construction works

As indicated in Figure 4, addressing sustainability involves the parallel and integrated consideration of the primary aspects of sustainability – economic, environmental and social – in relation to the construction works.

6.2 Economic aspects

Particular aspects of the construction works, parts of works, processes or services related to their life cycle, can interact with economic impacts, or economic legacy, which extends beyond the life of the construction works. These relate to costs and benefits that measure the impact to the economy, wholly or partially resulting from activities, products or services used in the construction work or in the use of the construction works. Besides direct and short-term economic considerations, economic aspects incorporate life cycle considerations that measure the long-term economic impacts, or economic legacy.

NOTE The consideration of economic aspects is closely linked to the areas of concern "asset value" and "economic resources". Depending on the position and the viewpoints of the interested parties, the focus can be placed on different economic aspects, e.g. investment, cash flow, market value, profitability, economic legacy, etc. These different viewpoints and interests are taken into account when selecting and applying appropriate indicators (see ISO/TS 21929-1) and they are inherently linked to the development of the property values and life cycle costs.

6.3 Environmental aspects

Particular aspects of the construction works, parts of works, processes or services related to their life cycle, can interact with the environment. These relate to current use of the earth's resources; consider impacts on the quality and the quantity of resources as well as local, regional and global ecosystems; and incorporate life cycle assessment to evaluate the impact to the environment, wholly or partially resulting from activities, products or services used in the construction work or in the use of the construction works. This should include any legacy left by the construction works.

NOTE The consideration of environmental aspects is closely linked to the areas of concern "the environment" and "resources". Concerning all life cycle stages, the consideration of environmental aspects requires description and assessment of the use of resources as well as the impacts on the local and global environment, including risks to the environment. These different areas of concern are taken into account when selecting and applying indicators (see ISO/TS 21929-1) and in describing and assessing the environmental performance of buildings (see ISO/TS 21931-1).

6.4 Social aspects

Particular aspects of the construction works, parts of works, processes or services related to their life cycle can interact with society or quality of life. These relate to intergenerational ethics (impact upon future generations) and recognize the inherent value of ecosystems, traditions and cultures. Impacts to society or quality of life, wholly or partially resulting from activities, products or services used in the construction work or in the use of the construction works involve impacts on local culture and the provision for basic human rights and human needs, and should include any legacy left by the construction works.

NOTE The consideration of social aspects is closely linked to the areas of concern "social infrastructure", "cultural heritage" and "human health and comfort". In describing and assessing construction works consideration is given, where relevant, to the aspects of health and comfort and the socio-economic as well as the cultural value of the property. Social aspects may relate to individuals (e.g. the users of a building) and/or to groups of people (e.g. local society). These different aspects are taken into account when selecting and applying indicators (see ISO/TS 21929-1) and for the description and assessment of the consideration (optional) of human comfort and health according to assessment of environmental performance of buildings (see ISO/TS 21931-1).

Annex A
(informative)

Suite of standards for sustainability in building construction

The suite of International Standards for sustainability in building construction, developed by ISO/TC 59/SC 17, includes the following documents.

a) *Sustainability in building construction — General principles* (ISO 15392) (this document)

While the general principles outline a holistic view, the usefulness of standards and other documents with a partial scope, or with a more directed focus, is recognized. Sustainable development in buildings and other construction works however implies the systemic consideration of the three primary aspects of sustainability.

b) *Buildings and constructed assets — Sustainability in building construction — Terminology* [ISO/TR 21932[2)]]

Communication is important in the implementation and operation of the concept of sustainable development in buildings and other construction works. In the interest of common understanding and standardization, consistent word usage is beneficial in helping to eliminate the major barrier to effective technical communication.

Terminology should be based principally upon the definitions developed in the standards of ISO/TC59/SC17, and used in complement with those concepts and definitions that originate from the general terminology on building and civil engineering within ISO/TC 59 contained in ISO 6707-1.

NOTE Terminology related to environmental management issues, such as environmental declarations for products and life cycle assessment of product systems, originates and is used based on the concepts and the definitions in the standards of ISO/TC 207.

c) *Sustainability in building construction — Sustainability indicators — Part 1: Framework for development of indicators for buildings* (ISO/TS 21929-1)

The three main functions of indicators are quantification, simplification and communication. Indicators are figures or other measures, which enable information on a complex phenomenon to be simplified into a form that is relatively easy to use and understand.

d) *Sustainability in building construction — Environmental declaration of building products* (ISO 21930)

Declarations provide a standardized format for the communication of information about products. Such declarations provide input data and information for the assessment of performance of buildings and other construction works.

NOTE Environmental declarations according to ISO 21930 and ISO 14025 are declarations with specific focus on environmental impact. Declarations for other sustainability aspects are being developed (service life declarations, product declarations, etc.).

e) *Sustainability in building construction — Framework for methods of assessment for environmental performance of construction works — Part 1: Buildings* (ISO/TS 21931-1)

2) Under preparation.

Assessment methods provide a common and verifiable set of criteria and targets to enable measurement, demonstration and evaluation of performance of buildings, which can contribute to the formulation of procurement and/or improvement strategies and prioritization.

NOTE Methods for the assessment of environmental performance of buildings according to ISO/TS 21931-1 are assessments with specific focus on environmental aspects. Methods for assessing performance related to other aspects and for other types of construction works exist or are being developed (energy performance, economic performance, indoor climate, etc.).

These International Standards form a suite in the sense that the general principles are reflected and applied to the specific scope of the other standards. Environmental declarations of building products provide information that is, alongside other information, applied in the assessment of the environmental performance of a building. The communication of information between assessment modules, or between involved actors, stakeholders and decision makers, can benefit from the sustainability indicators. The suite of International Standards currently has a strong focus on buildings and on environmental aspects. The consideration of other sustainability aspects and other construction works will complete the suite of standards on sustainability in building construction.

The application of this suite of International Standards will lead to the development of means to be used when seeking to achieve the objectives of sustainable development in buildings and other construction works reflecting these general principles. Such means may take the form of:

- information in terms of environmental impact, e.g. environmental product declarations;
- integrated planning tools:
  - multi-attribute decision-making tools;
  - integrated consideration of quantitative and qualitative information;
  - holistic consideration of spheres of sustainability;
  - life cycle of the building or construction works;
    - service life and performance requirements;
    - life cycle cost assessment;
    - life cycle environmental assessment;
    - inclusion of use-phase concerns in project planning;
  - product and process view;
  - perspectives of interested parties and governance issues;
  - urban planning;
  - risk management.

The work of ISO/TC59/SC17 is related to a large number of other International Standards.

These are within ISO/TC 59 Building construction:

ISO 6707-1, *Building and civil engineering — Vocabulary — Part 1: General terms*

ISO 15686-1, *Buildings and constructed assets — Service life planning — Part 1: General principles*

ISO 15686-5, *Buildings and constructed assets — Service life planning — Part 5: Life cycle costing*

ISO 15686-6, *Buildings and constructed assets — Service life planning — Part 6: Procedures for considering environmental impacts*

ISO 15686-8, *Buildings and constructed assets — Service life planning — Part 8: Reference service life and service-life estimation*

From other ISO technical committees, these are:

ISO 9000 series on *Quality management systems*

ISO 14000 series on *Environmental management systems*

ISO 14001, *Environmental management systems — Requirements with guidance for use*

ISO 14025, *Environmental labels and declarations — Type III environmental declarations — Principles and procedures*

ISO 14031:1999, *Environmental management — environmental performance evaluation — Guidelines*

ISO 14040, *Environmental management — Life cycle assessment — Principles and framework*

ISO Guide 64*, Guide for addressing environmental issues in product standards*

Annex B
(informative)

Products of the building and construction sector

This annex provides a discussion reflecting various terms used to designate a number of essential concepts related to products of the building and construction sector.

The concept of *"***product**" (3.17), when used within the construction sector, typically refers to a distinct item having a form and shape, which is used in the construction of a building or other construction works.

The use of the terms *"*building product*"* and *"*construction product*"* is common and they are used interchangeably to represent the same concept. The term "product" also relates to, and is often also used interchangeably with, other frequently used terms and concepts within the field of building construction.

This partly arises from the fact that there are a variety of different interested parties who look at the items used to construct a building from varying perspectives and at different stages of the product or building life cycle.

A manufacturer of items, such as timber or bricks, will refer to them as products, building materials or building products, while an architect or a builder may refer to them as building materials, components or elements of a building. Similarly, a manufacturer of a prefabricated wall system or window may refer to it as a product or component, while an architect or builder may refer to it as a building element, kit or assembly.

In ISO 6707-1:2004, many of these related concepts are defined as follows.

— *material*

  substance that can be used to form **product(s)** or **construction works**

— *product*

  item manufactured or processed for incorporation in **construction works**

— *component*

  product manufactured as a distinct unit to serve a specific function or functions

— *assembly*

  set of related **component(s)** attached to each other

— *building element*

  major functional part of a **building**

  EXAMPLE Foundation, floor, roof, service(s).

— *construction*

  assembled or complete part of **construction works** that results from work on-site

As can be seen in looking at these concepts in groups, the first three relate primarily to what would be the smaller pieces or items of a building, while the last three relate primarily to what would be considered the larger parts of the structure.

The concept of “product” is also present within the suite of International Standards developed in ISO/TC 59/SC 17 when used in relation to the environmental management field and the assessment of a “product system” or “service system”. In such cases, in addition to “goods”, the concept of a “product” is used in a broader manner to also include processes and services that may be subject to analysis.

It is critical that these distinct concepts and the terminology used within both fields are clearly understood to limit any misunderstanding or confusion in the language and discussions within the context of sustainable development.

In ISO 14040:2006, many concepts related to “products” and the “product system” are defined, including the following.

a) *life cycle*

consecutive and interlinked stages of a **product system**, from raw material acquisition or generation from natural resources to final disposal

b) *product system*

collection of **unit processes** with elementary and **product flows**, performing one or more defined functions, and which models the **life cycle** of a **product**

c) *product*

any goods or service

NOTE 1 The product can be categorized as follows:

— services (e.g. transport);

— software (e.g. computer program, dictionary);

— hardware (e.g. engine mechanical part);

— processed materials (e.g. lubricant).

NOTE 2 Services have tangible and intangible elements. Provision of a service can involve, for example, the following:

— an activity performed on a customer-supplied tangible product (e.g. automobile to be repaired);

— an activity performed on a customer-supplied intangible product (e.g. the income statement needed to prepare a tax return);

— the delivery of an intangible product (e.g. the delivery of information in the context of knowledge transmission);

— the creation of ambience for the customer (e.g. in hotels and restaurants).

Software consists of information and is generally intangible and can be in the form of approaches, transactions or procedures.

Hardware is generally tangible and its amount is a countable characteristic. Processed materials are generally tangible and their amount is a continuous characteristic.

NOTE 3 Adapted from ISO 14021:1999 and ISO 9000:2005.

d) *product flow*

products entering from or leaving to another **product system**

e) *intermediate product*

output from a **unit process** that is **input** to other unit processes that require further transformation within the system

f) *co-product*

any of two or more **products** coming from the same **unit process** or **product system**

g) *unit process*

smallest element considered in the **life cycle inventory analysis** for which **input** and **output** data are quantified

h) *functional unit*

quantified performance of a **product system** for use as a reference unit

i) *system boundary*

set of criteria specifying which **unit processes** are part of a **product system**

NOTE The term “system boundary” is not used in this International Standard in relation to LCIA[3)].

j) *allocation*

partitioning the **input** or **output** flows of a **process** or a **product system** between the product system under study and one or more other product systems

3) LCIA is the abbreviation for life cycle impact assessment.

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4) Under preparation.

5) Under preparation.

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