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पर्यावरणीय प्रबंधन पद्धतियाँ —  
ईको-डिजाइन को शामिल करने के लिए  
दिशानिर्देश

**Environmental Management  
Systems — Guidelines for  
Incorporating Eco-design**

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## NATIONAL FOREWORD

The Indian Standard which is identical to ISO 14006 : 2020 'Environmental management systems — Guidelines for incorporating eco-design' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Environmental Management Sectional Committee and approval of the Chemical Division Council.

This standard gives guidelines for assisting organizations in establishing, documenting, implementing, maintaining and continually improving their management of eco-design as part of an environmental management system (EMS).

This standard is intended to be used by organizations that have implemented an EMS in accordance with IS/ISO 14001, but it can also help in integrating eco-design using other management systems. The guidelines are applicable to any organization regardless of its type, size or product(s) provided.

This standard is applicable to product-related environmental aspects and activities that an organization can control and those it can influence.

The text of ISO standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words 'International Standard' appears referring to this standard, they should be read as 'Indian Standard'; and
- b) Comma (,) has been used as a decimal marker, while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

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# Introduction

## 0.1 Audience

This document is primarily aimed at organizations that have an environmental management system (EMS), such as that described in ISO 14001, whether or not combined with a quality management system (QMS). This document can also be useful for organizations that only have a QM, as well as for organizations without a formalized EMS or QMS, but that are interested in reducing adverse product-related environmental impacts.

NOTE In this document, the term “product” is understood to cover both goods and services (see [3.2.3](#)).

## 0.2 Concepts and definitions

Organizations are recognizing both the need to reduce adverse impacts on the environment from their product(s) and the need to include environmental considerations in design and development, applying life cycle thinking. This process is generally called “ecodesign”. Other terms that are used include “design for environment (DfE)”, “environmentally conscious design (ECD)”, “environmentally sustainable design” and “green design”. The term “ecodesign” is used throughout this document.

NOTE In this document, design and development is regarded as a process, and is referred to as simply “design and development”.

Ecodesign is defined in this document as a systematic approach, which considers environmental aspects in design and development with the aim to reduce adverse environmental impacts throughout the life cycle of a product. In this document it is understood that the EMS should take account of design and development, and, within that, ecodesign, with a view to enhancing product-related environmental performance.

Ecodesign should be applied to new and existing products, including the modification of processes as needed in delivering products.

## 0.3 Life cycle thinking and trade-offs

### 0.3.1 Life cycle thinking

Life cycle thinking is essential for ecodesign.

Life cycle thinking means the consideration of environmental aspects relevant to a product during its entire life cycle. This implies considering consecutive and interlinked stages, such as:

- material acquisition;
- design and development;
- manufacturing;
- delivery and installation;
- use (including reuse, maintenance, repair, remanufacturing, refurbishing and upgrading);
- end-of-life treatment;
- disposal.

NOTE In this document, the use of the term “life cycle” is different from other terms used in relation to products, e.g. the term “product life cycle (PLC)” describes the market stages of a product: introduction, growth, maturity and decline, and the term “product life cycle management (PLM)” describes a system used to manage the data and design process associated with the life of a product, from its design and development through to its manufacture and finally to its disposal.

### 0.3.2 Trade-offs

Inherent in ecodesign are trade-offs, which, in this document, implies balancing pros and cons between various product-related environmental requirements and alternative product solutions in order to make an informed decision on the basis of the net benefit to interested parties.

## 0.4 Why implement ecodesign?

Legislation, codes of conduct and customer demands associated with product-related environmental impacts are being implemented at an increasing rate worldwide. This is leading many organizations to focus on improving the environmental performance of their products across different life cycle stages. Such organizations need guidance on how to develop and implement systematic approaches to ecodesign, in order to achieve the organization's environmental objectives and to enable a continual improvement in the environmental performance of products. This will have an impact on design and development and will need to be managed within the EMS.

An organization and its product(s) have environmental impacts (e.g. climate change) that are derived from its environmental aspects. It can influence its product-related environmental aspects, e.g. energy consumption through decisions in design and development.

In order to be of benefit to the organization and to ensure that it achieves its environmental objectives, it is intended that ecodesign be carried out as an integral part of the business operations of the organization, particularly in design and development.

The reasons why an organization should integrate ecodesign into design and development include:

- a) increasing concern over damage to the environment, e.g. climate change, depletion of resources, loss of biodiversity, pollution;
- b) recognition of business opportunities related to resource efficiency and the circular economy (e.g. strategies to enable lower carbon and water use, as well as product-life-extension strategies including product reuse, repair, refurbishment and remanufacturing);
- c) life cycle thinking facilitates:
  - 1) the identification of product-related environmental requirements expressed by customers, and other external and internal interested parties;
  - 2) the avoidance of unintentionally shifting environmental impacts within the life cycle.

## 0.5 Why ecodesign in an EMS?

As stated in ISO 14001, an organization is expected to consider life cycle thinking when determining the environmental aspects of its activities, products and services that it determines it can either control or influence. A benefit of linking an EMS to design and development, therefore, is that it requires the identification of product-related environmental aspects and their associated environmental impacts at each life cycle stage.

## 0.6 What are the needs and considerations when integrating ecodesign in EMS?

The integration of ecodesign into design and development needs the support of top management (see [5.1](#)).

When ecodesign is implemented within an EMS, the person(s) responsible for the EMS should have an understanding of design and development (see [Clause 11](#)), product-related environmental issues and the requirements of interested parties. In this way, the integrity of the EMS is not jeopardized and the product-related environmental objectives can be achieved.

If ecodesign is not implemented within an EMS, the organization should provide product-related environmental training and guidance to those involved in design and development in order to ensure the integration of ecodesign into the process.

Implementing ecodesign requires a multidisciplinary approach with buy-in from all relevant business functions (e.g. marketing, sales, logistics, manufacturing) and external partners (e.g. recyclers, suppliers, consultants).

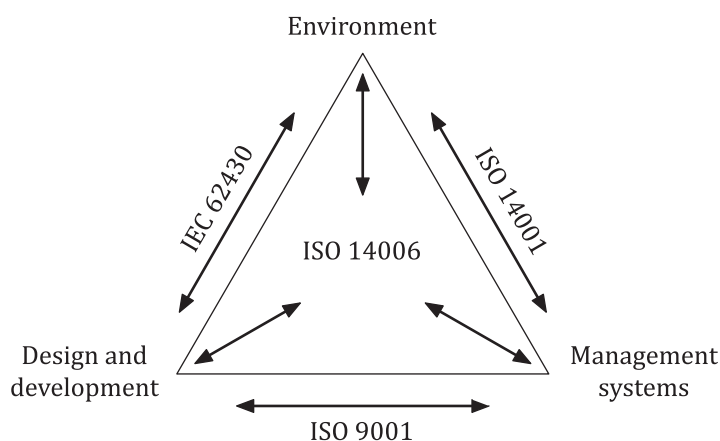
To incorporate ecodesign in the context of an EMS, aligned with the organization's business objectives, competence needs should be considered. This includes:

- a) understanding how products are being designed and developed;
- b) determining and evaluating the importance of the environmental aspects and the associated impacts of a product on the environment throughout its life cycle;
- c) determining the environmental significance in terms that designers can understand and apply;
- d) identifying appropriate measures to reduce the adverse effects of environmental impacts;
- e) understanding how ecodesign and its management fit within an EMS or are supported by an EMS.

### 0.7 Relationships with other documents

This document addresses three interrelated areas required for ecodesign within an EMS: environment, design and development, and management systems.

[Figure 1](#) illustrates the relationship between the three related International Standards, their scope of knowledge and their relationship with this document, which links all three areas and related documents. See also [Annex B](#).



**Figure 1 — Relationship between ISO 14001, ISO 9001, IEC 62430, this document and the organization's business functions**

ISO 14001 links the management of an organization's processes with environmental aspects and associated environmental impacts. It includes design management in ISO 14001:2015, 8.1 a).

ISO 9001:2015, 8.3, covers the design management process, but does not explicitly cover environmental impacts.

IEC 62430:2019 assists in the incorporation of an evaluation of environmental aspects and associated impacts into design and development, but, as such, it does not fully explain the activities involved within an environmental and business management framework, such as those described in ISO 14001.

This document provides guidelines to assist organizations in establishing a systematic and structured approach to the incorporation and implementation of ecodesign within an EMS, such as that described in ISO 14001. The guidelines are intended to be applicable to all organizations, regardless of type, size and product provided.

This document refers to the necessary information from the other International Standards, such that the appropriate processes and procedures can be put into place to implement structured and managed ecodesign under an EMS. By using this document, organizations can build on their existing management processes and competencies without necessarily having to implement or use all of the related International Standards.

When applying this document, it is intended that an organization always uses its existing processes and procedures as a starting point, and that it uses the guidelines in this document in a flexible and practical manner.

## **0.8 Overview, structure and guidance for reading**

[Clauses 4](#) to [10](#) show how ecodesign can be incorporated into and managed under an EMS. They provide guidelines for addressing ecodesign as part of an EMS in line with the structure of ISO 14001.

- [Clause 4](#) discusses the strategic issues, such as the context of the organization and the needs and expectations of interested parties of relevance to the business, management of the organization and EMS.
- [Clause 5](#) addresses the role of top management. It explains the potential benefits of ecodesign and discusses the strategic issues of relevance to business and management.
- The design and development activities of an organization are the focus of [Clauses 6](#) and [8](#). Although there are different ways of carrying out design and development, this document follows the method described in ISO 9001:2015, 8.3, supplemented by specific guidance related to ecodesign (see [8.1.1](#)).
- [Clause 7](#) addresses resources, competence, awareness, communication and documentation.
- [Clause 9](#) addresses internal audits.
- [Clause 10](#) addresses continual improvement.
- [Clause 11](#) gives guidance on how to get started with ecodesign.

[Annex A](#) supplements [Clauses 4](#) to [5](#) and [9](#) to [11](#) by providing more detailed information on the strategic issues and the role of top management in ecodesign.

[Annex B](#) shows how this document relates to existing International Standards.

[Annex C](#) describes the basics of operational ecodesign activities in design and development.

[Annex D](#) clarifies the use of some concepts not defined in [Clause 3](#).



*Indian Standard***ENVIRONMENTAL MANAGEMENT SYSTEMS —  
GUIDELINES FOR INCORPORATING ECO-DESIGN****1 Scope**

This document gives guidelines for assisting organizations in establishing, documenting, implementing, maintaining and continually improving their management of ecodesign as part of an environmental management system (EMS).

This document is intended to be used by organizations that have implemented an EMS in accordance with ISO 14001, but it can also help in integrating ecodesign using other management systems. The guidelines are applicable to any organization regardless of its type, size or product(s) provided.

This document is applicable to product-related environmental aspects and activities that an organization can control and those it can influence.

This document does not establish specific environmental performance criteria.

**2 Normative references**

There are no normative references in this document.

**3 Terms and definitions**

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

**3.1 Terms related to organization and leadership****3.1.1****management system**

set of interrelated or interacting elements of an *organization* (3.1.5) to establish policies and *objectives* (3.2.9) and *processes* (3.3.4) to achieve those objectives

Note 1 to entry: A management system can address a single discipline or several disciplines (e.g. quality, *environment* (3.1.3), occupational health and safety, energy, financial management).

Note 2 to entry: The system elements include the organization's structure, roles and responsibilities, planning and operation, *performance* (3.4.9) evaluation and improvement.

Note 3 to entry: The scope of a management system can include the whole of the organization, specific and identified functions of the organization, specific and identified sections of the organization, or one or more functions across a group of organizations.

[SOURCE: ISO 14001:2015, 3.1.1]

**3.1.2**  
**environmental management system**  
**EMS**

part of the *management system* (3.1.1) used to manage *environmental aspects* (3.2.7), fulfil *legal and other requirements* (3.2.12), and address *risks and opportunities* (3.2.13)

[SOURCE: ISO 14001:2015, 3.1.2, modified — “legal and other requirements” has replaced “compliance obligations”.]

**3.1.3**  
**environment**

surroundings in which an *organization* (3.1.5) operates, including air, water, land, natural resources, flora, fauna, humans and their interrelationships

Note 1 to entry: Surroundings can be described in terms of biodiversity, ecosystems, climate or other characteristics.

Note 2 to entry: In the context of *ecodesign* (3.2.2), the environment includes the surroundings in which a *product* (3.2.3) system exists.

[SOURCE: ISO 14001:2015, 3.2.1, modified — The original Note 1 to entry has been deleted, Note 2 to entry has been renumbered as Note 1 to entry, and a new Note 2 to entry has been added.]

**3.1.4**  
**environmental policy**

intentions and direction of an *organization* (3.1.5) related to *environmental performance* (3.4.10), as formally expressed by its *top management* (3.1.6)

Note 1 to entry: An *ecodesign* (3.2.2) policy could be addressed within a broader business or environmental policy, or could be established a separate policy.

[SOURCE: ISO 14001:2015, 3.1.3, modified — Note 1 to entry has been added.]

**3.1.5**  
**organization**

person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its *objectives* (3.2.9)

Note 1 to entry: The concept of organization includes, but is not limited to, sole-trader, company, corporation, firm, enterprise, authority, partnership, charity or institution, or part or combination thereof, whether incorporated or not, public or private.

[SOURCE: ISO 14001:2015, 3.1.4]

**3.1.6**  
**top management**

person or group of people who directs and controls an *organization* (3.1.5) at the highest level

Note 1 to entry: Top management has the power to delegate authority and provide resources within the organization.

Note 2 to entry: If the scope of the *management system* (3.1.1) covers only part of an organization, then top management refers to those who direct and control that part of the organization.

[SOURCE: ISO 14001:2015, 3.1.5]

**3.1.7****interested party stakeholder**

person or *organization* (3.1.5) that can affect, be affected by, or perceive itself to be affected by a decision or activity

EXAMPLE Customers, communities, suppliers, regulators, non-governmental organizations, investors and employees.

Note 1 to entry: To “perceive itself to be affected” means the perception has been made known to the organization.

Note 2 to entry: The terms “interested party” and “stakeholder” are used interchangeably.

[SOURCE: ISO 14001:2015, 3.1.6, modified — The admitted term “stakeholder” and Note 2 to entry have been added.]

**3.1.8****sphere of influence**

range/extent of political, contractual, economic or other relationships through which an *organization* (3.1.5) has the ability to affect the decisions or activities of individuals or organizations

Note 1 to entry: The ability to influence does not, in itself, imply a responsibility to exercise influence.

Note 2 to entry: Where this term appears in this document, it is intended to be understood in the context of the guidance in ISO 26000:2010, 5.2.3 and 7.3.3.

[SOURCE: ISO 26000:2010, 2.19, modified — A reference to ISO 26000 has been added to Note 2 to entry for clarity.]

**3.2 Terms related to planning****3.2.1****design and development**

*process* (3.3.4) that transforms *requirements* (3.2.11) into a *product* (3.2.3)

Note 1 to entry: Design and development usually follows a series of steps, e.g. starting with an initial idea, transforming the idea into a formal specification, through to the creation of a new product, its possible redesign and consideration of end-of-life.

Note 2 to entry: Design and development can include taking a product idea from planning to product provision and review of the product. It can include considerations on business strategies, marketing, research methods and design aspects that are used. It includes improvements or modifications of existing products.

[SOURCE: IEC 62430:2019, 3.1.4]

**3.2.2****ecodesign**

systematic approach that considers *environmental aspects* (3.2.7) in *design and development* (3.2.1) with the aim to reduce adverse *environmental impacts* (3.2.8) throughout the *life cycle* (3.2.4) of a *product* (3.2.3)

Note 1 to entry: Other terminology used worldwide includes “environmentally conscious design (ECD)”, “design for environment (DfE)”, “green design” and “environmentally sustainable design”.

**3.2.3****product**

any goods or service

Note 1 to entry: This includes interconnected, interrelated goods or services.

Note 2 to entry: 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 3 to entry: 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, 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.

[SOURCE: ISO 14040:2006, 3.9, modified — Note 1 to entry has been added and the original Note 3 to entry has been deleted.]

### **3.2.4**

#### **life cycle**

consecutive and interlinked stages of a *product* ([3.2.3](#))

Note 1 to entry: Examples of interlinked stages for goods include: material acquisition, *design and development* ([3.2.1](#)), manufacturing, delivery, installation, use (including reuse, maintenance, repair, remanufacturing, refurbishing, upgrading), end-of-life treatment and disposal.

Note 2 to entry: Examples of interlinked stages of service include: design, commissioning of capabilities and provisioning, and ends with the decommissioning of capabilities.

[SOURCE: IEC 62430:2019, 3.2.1, modified — Notes 1 and 2 to entry have been modified, and Note 3 to entry has been deleted.]

### **3.2.5**

#### **life cycle stage**

element of a *life cycle* ([3.2.4](#))

Note 1 to entry: The phrase “life cycle phase” is sometimes used interchangeably with “life cycle stage”.

[SOURCE: IEC 62430:2019, 3.2.2, modified — The admitted term “life cycle phase” has been deleted and Note 1 to entry has been added instead.]

### **3.2.6**

#### **life cycle thinking**

consideration of the *environmental aspects* ([3.2.7](#)) relevant to a *product* ([3.2.3](#)) during its entire *life cycle* ([3.2.4](#))

Note 1 to entry: Some documents, e.g. ISO 14001, use the expression “life cycle perspective” to capture the notion of “life cycle thinking”. “Life cycle perspective” is used in, for example, ISO 14001, while “life cycle thinking” is used in IEC 62430:2019.

[SOURCE: ISO Guide 64:2008, 2.6, modified — “the environmental aspects relevant to a product during its entire” has replaced “all relevant environmental aspects (of a product) during the entire (product)” and Note 1 to entry has been added.]

**3.2.7****environmental aspect**

element of an *organization's* (3.1.5) activities or *products* (3.2.3) that interacts or can interact with the *environment* (3.1.3)

Note 1 to entry: An environmental aspect can cause (an) *environmental impact(s)* (3.2.8). A significant environmental aspect is one that has or can have one or more significant environmental impact(s).

Note 2 to entry: Significant environmental aspects are determined by the organization applying one or more criteria.

Note 3 to entry: Activities of the organization are those related to *design and development* (3.2.1).

[SOURCE: ISO 14001:2015, 3.2.2, modified — “or services” has been deleted and Note 3 to entry has been added.]

**3.2.8****environmental impact**

change to the *environment* (3.1.3), whether adverse or beneficial, wholly or partially resulting from an *organization's* (3.1.5) *environmental aspects* (3.2.7)

[SOURCE: ISO 14001:2015, 3.2.4]

**3.2.9****objective**

result to be achieved

Note 1 to entry: An objective can be strategic, tactical, or operational.

Note 2 to entry: An objective can be expressed in other ways, e.g. as an intended outcome, a purpose, an operational criterion, as an *environmental objective* (3.2.10), or by the use of other words with similar meaning (e.g. aim, goal, or target).

[SOURCE: ISO 14001:2015, 3.2.5, modified — The original Note 2 to entry has been deleted and Note 3 to entry has been renumbered accordingly.]

**3.2.10****environmental objective**

*objective* (3.2.9) set by the *organization* (3.1.5) consistent with its *environmental policy* (3.1.4)

[SOURCE: ISO 14001:2015, 3.2.6]

**3.2.11****requirement**

need or expectation that is stated, generally implied or obligatory

Note 1 to entry: “Generally implied” means that it is custom or common practice for the *organization* (3.1.5) and *interested parties* (3.1.7) that the need or expectation under consideration is implied.

Note 2 to entry: A specified requirement is one that is stated, for example, in *documented information* (3.3.2).

Note 3 to entry: Requirements other than legal requirements become obligatory when the organization decides to comply with them.

[SOURCE: ISO 14001:2015, 3.2.8]

**3.2.12****legal and other requirements  
compliance obligations**

*legal requirements* (3.2.11) that an *organization* (3.1.5) has to comply with and other requirements that an organization has to or chooses to comply with

Note 1 to entry: Legal and other requirements are related to the *environmental management system* (3.1.2).

Note 2 to entry: Legal and other requirements can arise from mandatory requirements, such as applicable laws and regulations, or voluntary commitments, such as organizational and industry standards, contractual relationships, codes of practice and agreements with community groups or non-governmental organizations.

[SOURCE: ISO 14001:2015, 3.2.9, modified — The preferred term has been changed to “legal and other requirements”.]

### **3.2.13**

#### **risks and opportunities**

potential adverse effects (threats) and potential beneficial effects (opportunities)

[SOURCE: ISO 14001:2015, 3.2.11]

## **3.3 Terms related to support and operation**

### **3.3.1**

#### **competence**

ability to apply knowledge and skills to achieve intended results

[SOURCE: ISO 14001:2015, 3.3.1]

### **3.3.2**

#### **documented information**

information required to be controlled and maintained by an *organization* (3.1.5) and the medium on which it is contained

Note 1 to entry: Documented information can be in any format and media, and from any source.

Note 2 to entry: Documented information can refer to:

- the *environmental management system* (3.1.2), including related *processes* (3.3.4);
- information created in order for the organization to operate (can be referred to as documentation);
- evidence of results achieved (can be referred to as records).

[SOURCE: ISO 14001:2015, 3.3.2]

### **3.3.3**

#### **outsource**, verb

make an arrangement where an external *organization* (3.1.5) performs part of an organization's function or *process* (3.3.4)

Note 1 to entry: An external organization is outside the scope of the *management system* (3.1.1), although the outsourced function or process is within the scope.

[SOURCE: ISO 14001:2015, 3.3.4]

### **3.3.4**

#### **process**

set of interrelated or interacting activities which transforms inputs into outputs

Note 1 to entry: A process can be documented or not.

[SOURCE: ISO 14001:2015, 3.3.5]

### **3.3.5**

#### **supply chain**

those involved, through upstream and downstream linkages, in activities delivering value in the form of a *product* (3.2.3) to different *interested parties* (3.1.7)

Note 1 to entry: In practice, the expression “interlinked chain” applies from suppliers to those involved in end-of-life processing.

[SOURCE: ISO/TR 14062:2002, 3.9, modified — “processes and” has been deleted, “a product to different interested parties” has replaced “products to the user”, and Note 2 to entry has been deleted.]

### 3.3.6

#### value chain

entire sequence of activities or parties that create or receive value through the provision of a *product* (3.2.3)

Note 1 to entry: In this document, value chain is regarded as a broader concept than *supply chain* (3.3.5). The supply chain is a part of the value chain, but the value chain can also include other parties not directly involved in the supply chain.

[SOURCE: ISO 26000:2010, 2.25, modified — “create or receive value through the provision of a product” has replaced “provide or receive value in the form of products and services”, Notes 1 and 2 to entry have been deleted, and Note 1 to entry has been added.]

## 3.4 Terms related to performance evaluation and improvement

### 3.4.1

#### audit

systematic, independent and documented *process* (3.3.4) for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled

Note 1 to entry: An internal audit is conducted by the *organization* (3.1.5) itself, or by an external party on its behalf.

Note 2 to entry: Independence can be demonstrated by the freedom from responsibility for the activity being audited or freedom from bias and conflict of interest.

Note 3 to entry: “Audit evidence” consists of records, statements of fact or other information, which are relevant to the audit criteria and verifiable; and “audit criteria” are the set of *requirements* (3.2.11) used as a reference against which objective evidence is compared, as defined in ISO 19011:2018, 3.9 and 3.7, respectively.

[SOURCE: ISO 14001:2015, 3.4.1, modified — Note 2 to entry has been deleted, the notes renumbered accordingly, and Note 3 to entry has been updated to the revised edition of ISO 19011.]

### 3.4.2

#### conformity

fulfilment of a *requirement* (3.2.11)

[SOURCE: ISO 14001:2015, 3.4.2]

### 3.4.3

#### nonconformity

non-fulfilment of a *requirement* (3.2.11)

Note 1 to entry: Nonconformity relates to requirements in this document and additional *environmental management system* (3.1.2) requirements that an *organization* (3.1.5) establishes for itself.

[SOURCE: ISO 14001:2015, 3.4.3]

### 3.4.4

#### corrective action

action to eliminate the cause of a *nonconformity* (3.4.3) and to prevent recurrence

Note 1 to entry: There can be more than one cause for a nonconformity.

[SOURCE: ISO 14001:2015, 3.4.4]

**3.4.5**  
**continual improvement**

recurring activity to enhance *performance* ([3.4.9](#))

Note 1 to entry: Enhancing performance relates to the use of the *environmental management system* ([3.1.2](#)) to enhance *environmental performance* ([3.4.10](#)) consistent with the *organization's* ([3.1.5](#)) *environmental policy* ([3.1.4](#)).

Note 2 to entry: The activity need not take place in all areas simultaneously, or without interruption.

[SOURCE: ISO 14001:2015, 3.4.5]

**3.4.6**  
**indicator**

measurable representation of the condition or status of operations, management or conditions

Note 1 to entry: This document is concerned with indicators related to *products* ([3.2.3](#)).

[SOURCE: ISO 14031:2013, 3.15, modified — Note 1 to entry has been added.]

**3.4.7**  
**monitoring**

determining the status of a system, a *process* ([3.3.4](#)) or an activity

Note 1 to entry: To determine the status, there might be a need to check, supervise or critically observe.

[SOURCE: ISO 14001:2015, 3.4.8]

**3.4.8**  
**measurement**

*process* ([3.3.4](#)) to determine a value

[SOURCE: ISO 14001:2015, 3.4.9]

**3.4.9**  
**performance**

measurable result

Note 1 to entry: Performance can relate either to quantitative or qualitative findings.

Note 2 to entry: Performance can relate to the management of activities, *processes* ([3.3.4](#)), *products* ([3.2.3](#)) (including services), systems or *organizations* ([3.1.5](#)).

[SOURCE: ISO 14001:2015, 3.4.10]

**3.4.10**  
**environmental performance**

*performance* ([3.4.9](#)) related to the management of *environmental aspects* ([3.2.7](#))

Note 1 to entry: For an *environmental management system* ([3.1.2](#)), results can be measured against the *organization's* ([3.1.5](#)) *environmental policy* ([3.1.4](#)), *environmental objectives* ([3.2.10](#)) or other criteria, using *indicators* ([3.4.6](#)).

Note 2 to entry: This document is concerned with the environmental performance of *products* ([3.2.3](#)).

Note 3 to entry: ISO 14031 gives information on types of environmental performance indicators (EPEs) and provides guidance on usage of EPEs.

[SOURCE: ISO 14001:2015, 3.4.11, modified — Notes 2 and 3 to entry have been added.]



### 3.4.11 trade-off

decision-making actions that select from various *requirements* (3.2.11) and alternative solutions on the basis of net benefit to *interested parties* (3.1.7)

[SOURCE: ISO/IEC TR 29110-1:2016, 3.70, modified — “interested parties” has replaced “the stakeholders”.]

## 4 Context of the organization

### 4.1 Understanding the organization and its context

ISO 14001 requires the organization to determine external and internal issues that are relevant to its purpose and that affect its ability to achieve the intended outcomes of its EMS (see ISO 14001:2015, 4.1).

The design and development of an organization’s products is affected by a range of external issues (e.g. legislation, competition, market trends) and internal issues (e.g. cost, capabilities, resources).

External and internal product-related environmental issues can be different along a supply chain. For example, even if an organization uses a component with few significant environmental aspects from a supplier, there could be significant environmental aspects associated with the component’s raw material origins. By substituting such a material, the organization can cause other environmental aspects that could be significant.

It is therefore important to understand the organization, its context, value chain and potential trade-offs when substituting a material. To support the above, even though ISO 14001 does not require it in this context, life cycle thinking provides an understanding of the life cycle of a product and is valuable in determining external and internal product-related environmental issues.

### 4.2 Understanding the needs and expectations of interested parties

ISO 14001 requires the organization to determine (see ISO 14001:2015, 4.2):

- a) the interested parties that are relevant to the EMS;
- b) the relevant needs and expectations (i.e. requirements) of these interested parties;
- c) which of these needs and expectations become its legal and other requirements.

Interested parties can have a range of existing and future concerns regarding product-related environmental issues throughout a life cycle. Consideration should be given to both internal (e.g. employees, top management, owners) and external interested parties (e.g. customers, regulators, NGOs, insurance and financial institutions).

Relevant interested parties and their requirements can be different across the different stages in the life cycle. For guidance, reference can be made to ISO 14004:2016, 4.2.

Those who manage the EMS should understand the product-related environmental issues and related requirements of the organization. Product-related environmental issues and requirements relevant to the organization, but outside of the scope of the EMS, should be managed within design and development.

Legal and other requirements can be different across the different stages in the life cycle of a product. The organization’s sphere of influence should be considered when determining which of these requirements the organization needs to comply with.

When addressing the issues identified according to 4.1 and deciding on which of the interested parties’ needs and expectations should be legal and other requirements according to 4.2, the organization should recognize that trade-offs will exist between product-related environmental issues and interested

parties' needs and expectations. As a consequence, the organization should recognize that there will be trade-offs in ecodesign and these should be resolved within in design and development, see [6.1](#) and [8.1](#).

### **4.3 Determining the scope of the environmental management system**

ISO 14001 requires the organization to determine the boundaries and applicability of the EMS to establish its scope (see ISO 14001:2015, 4.3).

When establishing the scope of an EMS related to ecodesign, an organization should consider its product-related environmental aspects, sphere of influence, and defined responsibilities within design and development. It is essential to include design and development within the scope of an EMS if it is related to ecodesign, since it has major influence on the product's environmental performance. The scope applies to every stage in the life cycle of a product. Although any stage and environmental aspect may be excluded according to an inability to influence or control, organizations are encouraged to consider opportunities associated with expanding their sphere of influence to reduce any adverse environmental impacts of their products.

While determining the scope, the organization should identify the boundaries of design and development (e.g. in-house or outsourced) and its applicability to the EMS, particularly in reference to its activities and products (new or redesigned), and including its authority and ability to exercise control and influence.

### **4.4 Environmental management system**

To achieve the intended outcomes, including enhancing its environmental performance, ISO 14001 requires the organization to establish, implement, maintain and continually improve an EMS (see ISO 14001:2015, 4.4).

The organization should integrate EMS requirements and life cycle thinking into its various business functions. Design and development should interact, as applicable, with business functions relevant to new and modified products (see [Clause 11](#)). Business functions can be internal (e.g. procurement, marketing, research and development, human resources, manufacturing, customer/after sales service, refurbishment, remanufacturing) or external (e.g. suppliers, consultants, distributors, vendors, service providers, recyclers).

**NOTE** In principle, most of the functions regarded as internal functions can be outsourced, but they could still be within the scope of the EMS.

## **5 Leadership**

### **5.1 Leadership and commitment**

#### **5.1.1 General**

ISO 14001 requires top management to demonstrate leadership and commitment to the EMS (see ISO 14001:2015, 5.1).

An organization's top management should ensure that the EMS incorporates ecodesign and is linked to business strategies.

Top management should ensure that strategies for ecodesign are planned, implemented, maintained and consider all stages in the life cycle of a product.

For each stage in the life cycle of a product, different resources (people, finance, training, etc.) can be required (see [7.1](#)). Top management should allocate appropriate resources to ensure the planning and implementation of ecodesign.

When defining the scope of an EMS or determining the significant environmental aspects, an important issue is what an organization and its management can control or influence. Many organizations and their top management tend to narrow the EMS scope, e.g. companies focusing only on their manufacturing systems.

However, an organization with a leadership that applies life cycle thinking can turn environmental challenges into potential new business opportunities and products. The result could be new or modified business models and products that can enable direct or indirect involvement by the organization in the different life cycle stages of the product to gain control and influence. Changing business models and products can also lead to closer collaboration between organizations within the value chain.

### 5.1.2 Benefits of conducting ecodesign

By integrating a consideration of environmental aspects and impacts into design and development, business benefits can be realized while reducing adverse environmental impacts throughout the life cycle of the product(s). Benefits for organizations, customers and other interested parties can include:

- a) economic benefits, e.g. through increased competitiveness, cost reductions, and attracting financing and investments;
- b) identification of new business opportunities, e.g. new products or new markets;
- c) promotion of innovation and creativity;
- d) identification of new business models;
- e) reduction in liability, e.g. through reduced insurance claims;
- f) identification of potential risks, e.g. resource scarcity;
- g) improved satisfaction of expectations related to product-related environmental performance;
- h) improved public image (both for the organization's image and/or brand);
- i) enhancement of employee motivation.

Organizations can achieve these benefits by implementing ecodesign, irrespective of their size, their geographical location, their culture and the complexity of their management systems. Due to these variations, the way that this is implemented can vary substantially but this will not affect the benefits that can be achieved. Not all these benefits will necessarily be realized simultaneously or in a short time scale, e.g. due to financial and technological limitations.

### 5.1.3 Strategic aspects of ecodesign

Top management should set the strategic direction of the organization in relation to ecodesign, as well as managing and evaluating the effectiveness of the ecodesign implementation. Both strategy and management activities are considered here on a general organizational level. In [Clauses 4 to 10](#), strategy and management are considered from a specific EMS perspective, whereas in [Clause 11](#) and [Annex C](#) they are seen from a specific product design perspective.

Top management should address two types of tasks to ensure that ecodesign is properly embedded in an organization. In strategic aspects and in internal processes, life cycle thinking should be considered.

- a) The first task concerns the strategic aspects of ecodesign, in particular with reference to:
  - 1) strategic product planning and integration of ecodesign into all relevant operations of the organization;
  - 2) allocating resources (human, technical and financial) for the planning, implementation and improvement of ecodesign;

- 3) changes in external market conditions, opportunities arising from technological developments and supply chain risks;
- 4) setting objectives for environmental performance;
- 5) promoting innovation;
- 6) establishing new business models;
- 7) contributing to value creation;
- 8) ensuring life cycle thinking is applied in design and development.

Previous management reviews can contribute substantially towards the strategic planning of ecodesign.

- b) Once the ecodesign strategy and the ecodesign focus have been set, the management of internal processes should include:
- 1) integration and implementation of the chosen ecodesign strategy in all relevant procedures, programmes and roadmaps;
  - 2) ensuring a cross-functional approach, to ensure that relevant life-cycle-related data are shared within business functions;
  - 3) involving organizations in the external value chain in the chosen ecodesign strategy, both upstream (suppliers) and downstream (after sales, service providers, recyclers);
  - 4) fostering two-way communication, both in the internal and external value chain.

In order to make sure that the processes above are implemented as intended, the setting up of a monitoring system that defines performance at each stage in the life cycle can be of great help.

For further information about the role of top management in ecodesign, see [Annex A](#).

## **5.2 Environmental and ecodesign policies**

### **5.2.1 Environmental policy**

ISO 14001 requires that top management establish, implement and maintain an environmental policy (see ISO 14001:2015, 5.2). The environmental policy should consider product-related environmental issues and ecodesign.

### **5.2.2 Ecodesign policy**

To enable top management to make a commitment to an ecodesign strategy, it is important that an ecodesign policy is established. This policy should include:

- a) an alignment with the nature, scale and significant environmental impacts of the products throughout their life cycle;
- b) a commitment to:
  - 1) fulfil applicable legal and other requirements (see [6.1.3](#)) relating to the environmental aspects of the organization's products;
  - 2) a continual improvement of ecodesign;
  - 3) a continual improvement of the environmental performance of the organization's products throughout their life cycle, not shifting adverse environmental impacts from one life cycle

stage to another or from one category to another, unless it results in a net reduction of negative environmental impacts throughout the life cycle of the product;

- c) a framework for setting and reviewing product-related environmental objectives.

The ecodesign policy should be maintained as documented information, communicated within the organization and made available to interested parties.

### 5.3 Organizational roles, responsibilities and authorities

ISO 14001 requires top management to ensure that the responsibilities and authorities for relevant roles are assigned and communicated within the organization (see ISO 14001:2015, 5.3).

Top management should ensure that ecodesign responsibilities are assigned and communicated within the organization. When defining roles and responsibilities, key interested parties should be engaged in design and development. Other functions of the organization should be engaged in the process of improving the environmental performance of the product (e.g. procurement, marketing, sales, production, product management, customer support).

Those with responsibility for the EMS and those responsible for design and development should implement ecodesign not only within their own organizations and departments, but also in the supply chain, where much of the design and development can be done, depending on their sphere of influence. All those with responsibilities for the EMS and for design and development, in the organization as well as the supply chain, should be provided with the resources, in terms of time and personnel, to achieve an efficient communication on ecodesign issues in the supply chain.

Organizations can have functions that communicate with the personnel of suppliers, customers or partners, but might not necessarily be exchanging information related to ecodesign. The responsibilities of these internal functions should be broadened to include communication on information related to ecodesign in the supply chain. These business functions could include the following.

- Procurement and the people responsible for sourcing materials or components. With ecodesign training, those involved will have many opportunities for conveying important product-related environmental requirements to suppliers.
- Second party auditor. Supplier or process audits often only concern quality, capacity, logistics or manufacturing, and traceability issues. Second-party auditors could be trained to audit product-related environmental requirements.
- The relevant managers who have responsibility for manufacturing, quality and logistics.

NOTE In a small company, the managing director could be responsible for all these functions. In a large company, these functions could be assigned to different senior roles.

Organizational competence on ecodesign will implicitly require an understanding of the life cycle stages of the organization's products, as well as the relevant environmental impacts and aspects in each stage (see [Clause 11](#) for further guidance).

## 6 Planning

### 6.1 Actions to address risks and opportunities

#### 6.1.1 General

ISO 14001 requires the organization to establish, implement and maintain the processes needed to address risks and opportunities (see ISO 14001:2015, 6.1.1).

In an EMS (as well as a QMS and most other management systems), ecodesign needs to address risks and opportunities. Risks and opportunities should be considered from two perspectives:

- a) when planning actions to address identified risks and opportunities, ecodesign should be considered as a way to manage the risks and opportunities;
- b) the risks and opportunities associated with ecodesign should be identified and adequately managed.

An EMS should have a process for identifying and managing risks and opportunities. The process should include risks and opportunities associated with design and development. Ecodesign should be considered when deciding how to prevent or reduce undesired effects. See 8.1.1 for further guidance on managing risks and opportunities in design and development.

Design and development that incorporates ecodesign is normally driven by a combination of risks and opportunities. Risks and opportunities related to environmental aspects (see 6.1.2), legal and other requirements (see 6.1.3), additional issues (see 4.1), and needs and expectations (see 4.2) should be determined and addressed in order to:

- give assurance that the EMS for ecodesign can achieve its intended outcomes;
- prevent or reduce undesired effects, including the potential for external environmental conditions to affect the organization;
- achieve continual improvement.

Table 1 illustrates potential risks and opportunities related to ecodesign.

**Table 1 — Potential risks and opportunities related to ecodesign**

Example	Risk (potential adverse effects)	Opportunity (potential beneficial effects)
Lack of material	Restriction of supply, or increased costs Need to use alternative material with increased extraction impacts	Control of material flow Redesign of product to use a more commonly available material
Spare parts	Increased prices Poor reliability of existing parts	Control of parts in use Change in customer behaviour Increase reliability of existing parts
New legal requirements	Out of the market Additional testing of products	Opportunity to gain markets by innovation Redesign to reduce failures that need to be addressed by testing

### 6.1.2 Environmental aspects

ISO 14001 requires that within the defined scope of the EMS, the organization shall determine the environmental aspects of its products and related activities that it can control and those that it can influence, and their associated environmental impacts, considering a life cycle perspective (see ISO 14001:2015, 6.1.2).

The process of identifying and evaluating environmental aspects should explicitly include the life cycle of the product(s) to be designed or redesigned. The purpose is to determine which aspects have or could have a significant impact on the environment. This generally follows the stages defined below.

- a) Understanding the life cycle of the product(s).

- b) Identifying the environmental aspects related to the life cycle of the product(s) that can be controlled or influenced by the organization.

For each life cycle stage, the organization should identify environmental aspects, both inputs (e.g. use of materials, energy, water, other resources) and outputs (e.g. waste, emissions, others), that result in environmental impacts (e.g. pollution of air, water and soil, climate change).

- c) Evaluating the environmental aspects to determine their significance.

In order to determine which aspects are significant, the organization should establish a method, based mainly on environmental criteria, which should take into account as many types of environmental impacts as possible. The result of the evaluation should be reproducible and consistent.

When designing or redesigning a product, the evaluation of the significance of environmental aspects may be done on the basis of, for example, a previous model of the product, a similar product on the market, or a prototype.

During design and development, the organization should consider all relevant environmental aspects, ensuring that the significant ones are taken into account when setting its environmental objectives.

### 6.1.3 Legal and other requirements (i.e. compliance obligations)

ISO 14001 requires the identification of and access to applicable legal and other requirements (see ISO 14001:2015, 6.1.3).

The organization should pay special attention to requirements related to the environmental aspects of its products throughout their life cycle. These requirements should be taken into account in design and development (see [8.1](#)).

These legal and other requirements can include:

- requirements from interested parties related to the organization and its products;

**EXAMPLE 1** Product-related environmental legislation; information provided by societal and investor expectations, suppliers, non-governmental organizations, financing entities and insurance companies; customer needs, trends and expectations.

- future policy developments;

**EXAMPLE 2** New legislation concerning product specifications; product information to the customer; packaging and labels for application in the near future; restrictions and obligations resulting from national and international regulations.

- environmental standards related to products;

**EXAMPLE 3** National or international standards on environmental labelling; voluntary agreements.

- product requirements established by the business organizations to which the organization belongs or originating from opportunities identified through the organization's environmental considerations for its product strategy.

This activity can be done after or in parallel with the identification of environmental aspects. For all identified and adopted legal and other requirements, the resulting risks and opportunities associated with design and development should be identified and managed.

### 6.1.4 Planning action

ISO 14001 requires an organization to plan actions to address its significant environmental aspects, legal and other requirements, and risks and opportunities (see ISO 14001:2015, 6.1.4).

An organization should consider and plan how to use ecodesign to address significant environmental aspects, legal and other requirements, and risks and opportunities, as determined in [6.1.1](#). The organization should plan to take action in a variety of ways using its EMS or other business processes, such as ecodesign. The organization should also determine the effectiveness of the actions taken.

When planning actions, the organization should consider the technological options and feasibility, and financial, operational and business requirements. Planning actions should include managing risks and opportunities associated with design and development, see [8.1.1](#).

When planning actions, the organization should be aware that, within design and development, it will be necessary to make trade-offs between product-related environmental requirements and other requirements, such as quality and costs.

## **6.2 Environmental objectives and planning to achieve them**

ISO 14001 requires the organization to establish environmental objectives and plan how to achieve them (see ISO 14001:2015, 6.2).

The objectives of an organization should be focused on improving the environmental performance of its products throughout their life cycle.

Objectives related to the environmental aspects of a product can be:

- broad-based (applicable to a group of products, e.g. reducing energy in the use phase by 10 %);
- product-specific (see [8.1](#)), e.g. repair within one hour (product), cutting down the number of physical lectures by use of digital interactive media to reduce travel and fuel consumption (service);
- related to interested parties' requirements, e.g. substitution of critical raw material.

To ensure that legal and other requirements are not compromised, it is important to integrate ecodesign objectives into design and development objectives (e.g. relating to function, accessibility and maintenance) in order to avoid conflicts between them.

When setting the plan to achieve ecodesign objectives, the organization should decide the extent of resources required, define responsibility for the personnel involved and set the timeframe by which these objectives will be met. The results should be reviewed at appropriate stages by relevant functions to check if the objectives are met. If the objectives are not met, action should be taken.

## **7 Support**

### **7.1 Resources**

ISO 14001 requires the organization to determine and provide the resources needed for the establishment, implementation, maintenance and continual improvement of the EMS (see ISO 14001:2015, 7.1).

The organization should determine and provide the resources needed for the establishment of ecodesign within design and development, and the implementation and improvement of ecodesign, which may include infrastructure, technology, information systems, competencies, finances, etc.

### **7.2 Competence**

ISO 14001 requires the organization to determine and build necessary competence and determine the need for education or training, or the hiring or contracting of competent persons (see ISO 14001:2015, 7.2).

When identifying ecodesign competence needs, the organization should take into account any people (from the organization or working on its behalf) who are responsible for design and development (see [Clause 11](#)). The organization should ensure that these people are aware of, and have knowledge



of, environmental aspects and impacts related to products throughout their life cycle. People should have access to, and competence in applying, methods and tools for the identification and evaluation of environmental aspects of products, and for the identification of environmental improvement strategies. The ecodesign competence of those involved in design and development should be based on education or training that could be external or internal. Competencies should be evaluated periodically.

The organization should also ensure that the design and development team has the competence to identify appropriate measures and information to reduce the environmental impacts of a product.

Those with responsibility for the EMS should be able to explain and describe environmental significance in terms that designers can understand and apply. They also need to understand how ecodesign and its management fit within an EMS or can be supported by an EMS.

NOTE For competencies needed in design and development to deliver ecodesign, see [Clause 11](#).

### 7.3 Awareness

ISO 14001 requires the organization to ensure that persons doing work under the organization's control are aware of the environmental policy and EMS in order to contribute to the improvement of the environmental performance of the organization (see ISO 14001:2015, 7.3).

The people involved with the EMS should be aware of the ecodesign policy and how design and development impacts on the environment throughout the life cycle of the product(s).

### 7.4 Communication

ISO 14001 requires the organization to establish, implement and maintain the processes needed for internal and external communications relevant to the EMS (see ISO 14001:2015, 7.4).

An effective strategy covers both external and internal communication. The organization should pay attention to and should address the following aspects of communication, taking action when appropriate:

- a) internal communication on the products' environmental performance among the various levels and functions of the organization, bottom-up, top-down and horizontal, including those directly and indirectly responsible for design and development;
- b) relevant communication from and to external interested parties (e.g. suppliers, customers, regulators, NGOs, organizations in the value chain); this communication supports collaboration among various interested parties in relation to the analysis of relevant environmental aspects covering the life cycle and, in addition, sharing this information facilitates the development of solutions that only become evident when different organizations come together with the purpose of minimizing the overall environmental impacts (especially when production is not the life cycle stage with the highest environmental impact);
- c) informing the different parties involved in the life cycle of the product (e.g. suppliers, users, distributors, recyclers) of the necessary actions to improve environmental performance beyond the production stage: this information can include guidance about the proper use, maintenance and end-of-life of the product, and can be given in user manuals (e.g. paper, digital format), disassembly instructions or other support documents.

This communication can include information related to:

- relevant inputs (e.g. consumption of materials, energy, water, other resources) and outputs (e.g. waste, emissions, others) throughout the life cycle that covers material acquisition, manufacturing, delivery, use, maintenance, repair, remanufacturing, refurbishing, upgrading, end-of-life treatment, and disposal;
- compliance with legal and other requirements (e.g. energy efficiency labels);
- environmental labels and declarations.

There are several International Standards that can support organizations to address and shape external communications, e.g. ISO 14020, ISO 14021, ISO 14024, ISO 14025, ISO 14026 and ISO/TS 14027, which include the principles, examples and requirements for environmental labels and declarations, or ISO 14063, which provides general information about environmental communication.

## **7.5 Documented information**

The requirements in ISO 14001:2015, 7.5, fully cover the needs for ecodesign. There is no additional guidance provided in this document.

# **8 Operation**

## **8.1 Operational planning and control**

### **8.1.1 General**

ISO 14001 requires the organization to establish, implement, control and maintain the processes needed to meet EMS requirements. Consistent with a life cycle perspective, ISO 14001 requires the organization to include, for example, the establishment of controls, as appropriate, to ensure that its environmental requirement(s) is (are) addressed in design and development, considering each stage in the life cycle of the product(s). (See ISO 14001:2015, 8.1.)

The sphere of influence of the organization should be considered in the planning and control of ecodesign.

In order to ensure that ecodesign is carried out under specified conditions, the organization should:

- establish, implement and maintain (a) documented procedure(s) to incorporate ecodesign into design and development (see [Clause 11](#));
- communicate applicable procedures and requirements to external interested parties, e.g. suppliers, contractors.

If the organization outsources design and development to an external organization, it should inform the external organization about ecodesign approaches to ensure consistency with internal procedures.

### **8.1.2 Integrating ecodesign into design and development**

#### **8.1.2.1 Design and development planning**

ISO 9001 requires the organization to establish, implement and maintain a process for design and development. When planning design and development, ISO 9001 requires the organization to determine the stages and controls for design and development. (See ISO 9001:2015, 8.3.1 and 8.3.2.)

Ecodesign should be an integral part of design and development planning. Specifically, the organization should determine how environmental considerations, including risks and opportunities, are managed. Within design and development, there are likely to be trade-offs between product-related environmental requirements and other requirements in the different life cycle stages. Managing risks, opportunities and trade-offs should be an integral part of design and development.

Environmental criteria should be used in the review, verification and validation stages. They should be part of the environmentally related responsibilities within design and development.

#### **8.1.2.2 Design and development inputs**

ISO 9001 requires the organization to determine the requirements essential for the product to be developed, e.g. functional and performance requirements, statutory and regulatory requirements.

When there is a risk for conflicting inputs, ISO 9001 requires such conflicts to be resolved. (See ISO 9001:2015, 8.3.3.)

The inputs related to ecodesign should include:

- environmental requirements that respond to the expected output of the ecodesign, duly considering legal and other applicable requirements;
- risks and opportunities to the environment or to organizations related to the design of the product (see [6.1.1](#)).

### 8.1.2.3 Design and development controls

ISO 9001 requires the organization to apply controls to design and development to ensure, for example, that results to be achieved are defined, reviews of the result from design and development are conducted, and that verification and validation activities are carried out as needed (see ISO 9001:2015, 8.3.4).

At suitable stages, systematic reviews of design and development should be performed in accordance with planned arrangements.

The review should verify that there are no shifts of adverse environmental impacts from one stage in the life cycle to another, or from one type to another, and that design and development has not generated any new significant environmental aspects in comparison to the initial environmental aspects, unless it results in a net reduction of negative environmental impacts throughout the life cycle.

To assess improvements, the methods, assumptions and criteria used for the initial identification and evaluation of the environmental aspects of the product (see [6.1.2](#)) should be consistent with the ones used during the design and development review. Whenever necessary, the identification and evaluation of the product's environmental aspects should be updated.

Verification should be done by checking the detailed design, sometimes a prototype, against the environmental objectives set by the design specification and the product-related environmental performance data.

Validation should be done through evaluating the environmental performance of the final product against the product specification in normal use conditions.

### 8.1.2.4 Design and development outputs

ISO 9001 requires the organization to ensure that the design and development outputs meet the input requirements, include the acceptance criteria and specify the characteristics essential for the intended purpose, safety and proper provision (see ISO 9001:2015, 8.3.5).

The outputs from design and development should be provided in a form suitable for verification against design and development inputs, such as the environmental product specification. This specification should address the environmental objectives and targets for the product and the key information for improving environmental performance of the product throughout its life cycle.

This output information can be included in the documents intended for the parties involved in the life cycle of the product (see [7.4](#)).

NOTE Information for improving environmental performance can include instructions for recyclers, users, maintenance people, etc.

### 8.1.2.5 Design and development changes

ISO 9001 requires the organization ensure, to the extent necessary, that there is no adverse impact on conformity to requirements (see ISO 9001:2015, 8.3.6).

Risks and opportunities associated with the design and development changes should be considered. If applicable, actions should be taken. Documented information on identified risks and opportunities, and the actions taken to manage them, should be retained.

## **8.2 Emergency preparedness and response**

The requirements in ISO 14001:2015, 8.2, on emergency preparedness and response are not relevant to this document. However, lessons from product-related environmental emergencies (e.g. product recalls due to leaking oil) should be fed back into design and development to eliminate or reduce potential future adverse environmental impacts.

## **9 Performance evaluation**

### **9.1 Monitoring, measurement, analysis and evaluation**

#### **9.1.1 General**

ISO 14001 requires the organization to monitor, measure, analyse and evaluate its environmental performance (see ISO 14001:2015, 9.1.1).

Monitoring and measurement should include information needed to assess the fulfilment of the organization's ecodesign objectives. Information needed for verification should be considered.

In order to monitor and measure the progress of the environmental performance of the product, in accordance with ISO 14031, two categories of indicators can be used:

- management performance indicators, which show progress regarding the management of ecodesign or the integration of ecodesign in the organization;
- operational performance indicators, which show progress in the environmental performance of the products.

Indicators can be determined differently for each life cycle stage.

When design and development is outsourced, monitoring, measuring, analysing and evaluation is the responsibility of the organization that outsourced the process. In the contractual agreement, the external provider may have the responsibility to provide data, information, analysis and performance indicators.

#### **9.1.2 Evaluation of compliance**

There is no additional guidance on this subclause. The requirements in ISO 14001:2015, 9.1.2, fully cover the needs for ecodesign.

## **9.2 Internal audit**

ISO 14001 requires the organization to establish, implement and maintain (an) internal audit programme(s) and conduct internal audits to provide information on whether the EMS has achieved its intended outcomes (see ISO 14001:2015, 9.2).

Internal audit should include auditing ecodesign. It should address environmental aspects, potential environmental impacts, risks and opportunities (considering the organization's sphere of influence) and issues that have been identified according to [4.1](#) and [4.2](#). Results of previous internal and external audits, and other related environmental performance results (e.g. monitoring and measurement), should be considered in the audit programme. Outsourced design and development that incorporates ecodesign should have audit provisions as controls, which should also be considered in the planning of the audit programme. Audits of outsourced process related to ecodesign can often be conducted as process audits and product audits, rather than full system audits.

### 9.3 Management review

ISO 14001 requires top management to review the organization's EMS to ensure its continuing suitability, adequacy and effectiveness (see ISO 14001:2015, 9.3).

The management review should assess opportunities to improve the performance of the ecodesign within the context of the EMS. The output of the management review should include appropriate decisions and actions to be taken.

## 10 Improvement

### 10.1 General

ISO 14001 requires the organization to determine opportunities for the improvement of its EMS (see ISO 14001:2015, 10.1).

The organization should implement the necessary actions to achieve the intended outcomes of ecodesign.

### 10.2 Nonconformity and corrective action

ISO 14001 requires that when a nonconformity occurs the organization should react, evaluate, implement and take actions to address it (see ISO 14001:2015, 10.2).

Examples of nonconformities related to ecodesign are:

- not meeting specified ecodesign requirements;
- not fulfilling legislative requirements on products;
- not meeting ecodesign objectives.

Requirements in all stages in the life cycle should be considered.

When nonconformities are identified, corrective or preventive actions can be taken by the organization through redesigning its products or processes.

### 10.3 Continual improvement

ISO 14001 requires the organization to continually improve the suitability, adequacy and effectiveness of the EMS to enhance environmental performance (see ISO 14001:2015, 10.3).

The EMS should take account of design and development and, within that, ecodesign, with a view to enhancing product-related environmental performance. Examples of what should be considered include:

- ensuring the EMS picks up relevant environmental aspects (new and changed) and other issues (see [4.1](#) and [4.2](#));
- lessons learned in ecodesign, which can be used to enhance the EMS and product-related environmental performance;
- lessons learned from resolving product-related environmental trade-offs made within design and development.

## 11 Ecodesign activities in design and development

### 11.1 General

This clause gives introductory guidance on how ecodesign can be integrated into design and development. IEC 62430:2019 provides specific guidance on how to incorporate ecodesign in design and development.

### 11.2 Design and development

Design and development typically consist of the following activities:

- identification of requirements (from different interested parties) into a product specification;
- transformation of the specification into product functions;
- combination of functions into product concepts (concept development);
- evaluation, refinement and selection of (a) final product concept(s);
- refinement of the selected concept(s) into the final product(s).

The activities above can be performed in-house, outsourced or a combination of the two.

Design and development involves improving existing products alongside the creation of new products.

Ecodesign should be applied to new products as well as to the redesign of existing products, including the modification of processes as needed in delivering them.

### 11.3 How to get started with ecodesign

The starting point with ecodesign is to ensure that those with responsibility for the EMS understand the following (see [Clause 4](#)):

- design and development;
- in particular, their organization's approach and terminology, so they know how and when they can influence it;
- in addition, the concepts of life cycle thinking and product-related environmental requirements.

At this stage, it is important to identify:

- existing product-related environmental knowledge and experience within the organization (see [7.2](#));
- the fundamental needs for ecodesign education or training for those interested parties that might be involved (see [7.2](#) and [7.3](#));
- the requirements for product-related environmental activities. Many organizations can have an understanding of specific product-related requirements focused on tackling one environmental aspect in the life cycle, e.g. increased renewable materials in the production stage and/or decreased energy use in transportation. However, ecodesign is a broader approach that considers all appropriate environmental aspects across a product's life cycle stages (see [6.1.3](#)).

Finally, it is important that the organization's top management empowers those with responsibility for the EMS to establish collaborations between design and development and other business functions (see [5.1](#)). This includes securing resources for awareness and education or training needed for the implementation of ecodesign (see [Clause 7](#)).

## 11.4 Establishing a plan to incorporate ecodesign into design and development

The following aspects should be considered when incorporating ecodesign into design and development:

- understanding design and development (see [11.2](#));
- understanding how design and development is organized (e.g. in-house or outsourced) (see [Clause 4](#));
- understanding the life cycle concept (see 0.3, [6.1.2](#) and [7.2](#));
- understanding the relevant life cycles of individual products and business models (see [Clause 4](#) and [6.1](#));
- understanding which are the most important requirements from internal and external interested parties (see [4.2](#));
- understanding the key environmental impacts of the products, and where they occur in the life cycle (see [6.1](#));
- understanding which environmental aspects should be considered in design and development (see [6.1](#));
- determining the resource needs (e.g. competence, data, budget) (see [Clause 7](#));
- developing and implementing the plan (see [6.1.4](#) and [8.1](#));
- reviewing and continually improving the plan (see [Clauses 9](#) and [10](#)).

## **Annex A** **(informative)**

### **Top management and strategic issues on ecodesign**

#### **A.1 General**

For many organizations, ecodesign has become important because of its potential to reduce costs (e.g. by reduced energy and material use), meet legal obligations, and reduce the environmental impact of an organization and its products. Simultaneously, expectation is growing among customers for the environmental impacts of products to be reduced in line with concerns over, for example, climate change, resource depletion and pollution.

An ecodesign approach can contribute to having a competitive advantage and can be essential for the long-term success of the organization. Therefore, ecodesign should be a part of design and development and should be integrated into the organization's EMS. This annex provides supplementary information to that provided in [Clause 5](#) on the role of top management when incorporating ecodesign within an EMS, such as that described in ISO 14001.

#### **A.2 Factors that influence ecodesign**

When establishing ecodesign strategies, it is important to consider, for example, the following factors:

- a) those that encourage organizations to improve the environmental performance of their products, for example:
  - 1) environmental legislation;
  - 2) environmental opinions and the perception of customers and other interested parties;
  - 3) activities of the competition;
  - 4) environmental requirements as expressed by non-governmental organizations;
- b) those that provide organizations with the necessary financial, technological or resource support to improve the environmental performance of their products, for example:
  - 1) increased interest of the financial world in environmental matters, particularly in regard to investment opportunities;
  - 2) contributions from upstream and downstream interested parties (e.g. suppliers, recyclers);
  - 3) environmental knowledge of research institutions, universities and trade associations;
  - 4) developments in technology.

Interested parties can have an important role in cooperating with the organization to formulate its strategy and the way it can offer new products that fulfil societal needs. Interested parties are also important to the subsequent implementation of such strategic objectives; often this requires the establishment of new partnerships or alliances.



## A.3 Strategic aspects of ecodesign

### A.3.1 Strategic product planning

An exploration of the factors influencing and supporting ecodesign and the relationship with interested parties as mentioned in [A.2](#) provide input into strategic product planning. This input should be balanced against technical, economic and societal aspects, as highlighted by the United Nations Sustainable Development Goals (UN SDGs). Once this has been considered, the priorities for ecodesign can be set. These priorities may include the following:

- a) environmental focus, e.g. on emissions, toxicity or circular economy issues;
- b) organizational focus, e.g. on legal compliance, cost reduction or increasing market share (or combinations of these);
- c) customer focus, which can vary greatly from primary interest in price to primary interest in product features or in aesthetic design.

The ecodesign priorities can be further specified so that they properly reflect the intentions of the organization. This can be of help to structure further incorporation of ecodesign into design and development (see [Clause 6](#)).

### A.3.2 Setting ecodesign objectives

The setting of ecodesign objectives depends primarily on the policy and strategy of the organization with regard to ecodesign (see [A.2](#)). It can take a defensive attitude or a proactive one. It can put emphasis on ecodesign that correlates with a cost reduction or a focus on selling more through bringing environmentally conscious products to the market. Irrespective of the strategy chosen, ecodesign objectives should be measurable, have a timeline and indicate who is responsible for their achievement. Tangible forms for improvement/reduction can include amounts or percentages of emissions or relevant physical parameters.

### A.3.3 Promoting innovation and new business development

Innovation is a way for an organization to improve its competitiveness; experience with proactive organizations of all sizes has shown that an ecodesign strategy can offer a stimulus for innovation. The strategic environmental choices made by the organization, the monitoring of core activities of competitors in the field and the dialogue with its interested parties provide the foundation for enhancing innovation. The principles of ecodesign, such as functionality and life cycle thinking, pollution prevention, doing more with less and change of the traditional mindset, can also provide the inspiration for developing new ways of doing business.

### A.3.4 Contributing to value creation

The value of products is determined through their functionality, which can be physical, economic, intangible and emotional. Ecodesign can have a positive impact on functionality, as follows:

- a) energy consumption and material use are linked to physical functionality, e.g. smaller, lighter products;
- b) material and energy reduction, less packaging and transport, and products designed for easier disassembly are related to economic functionality, e.g. lower transport cost, lower energy cost to user;
- c) material aesthetics and durability can be elements of emotional functionality.

Ecodesign can contribute substantially to value creation in parallel to its primary purpose of lowering the environmental impact of products. Societal developments, perceptions of interested parties and, in particular, of customers determine to a large extent the potential value creation of ecodesign. An

analysis of such issues will show what dimensions of ecodesign are to be addressed in a comprehensive ecodesign strategy.

### **A.3.5 Review of ecodesign objectives**

Top management should regularly review whether the ecodesign objectives, as highlighted in [A.3.2](#), are achieved in relation to the products launched in the market and whether they remain appropriate. A detailed set of issues that can be addressed is given in [6.1](#) and [8.1](#). A review can be used at the beginning of the implementation of ecodesign. A review of external developments can assist in reformulating the ecodesign strategies already in place. Such developments can include the following:

- a) a new environmental policy or legislation;
- b) the changing attitudes or demands of customers;
- c) new issues raised by interested parties;
- d) ecodesign activities by competitors.

## **A.4 Management of ecodesign**

### **A.4.1 Implementation of the chosen ecodesign strategy**

Implementing the ecodesign strategy means that management should address ecodesign issues in operational planning and control. To be effective, it is essential that environmental aspects are integrated into design and development at both a management and design level (see [Clauses 6, 8](#) and [11](#)). This means that ecodesign issues should be built into management thinking, reporting and practice.

Once the strategic direction and the objectives for the ecodesign of products have been set, top management should support the implementation and maintenance of the activities required to achieve the environmental objectives.

Top management actions should enable the effective implementation of procedures, programmes, roadmaps and targets, including the allocation of sufficient financial and human resources (see also [7.1](#)). An effective integration programme engages functions in the complete internal value chain, in particular those involved in design and development, but also marketing, sales, production, environment, procurement and service functions.

### **A.4.2 Cross-functional approach**

**A.4.2.1** The success of integrating environmental aspects into design and development in an organization is enhanced by the involvement of relevant disciplines and organizational functions, such as design, production, engineering, marketing, environment, quality, purchasing, service delivery, etc. These functions often involve a varying number of people, depending on the size of the organization.

The aim of a cross-functional approach is to ensure that all relevant organizational functions contribute and commit to environmental improvement in the earliest stages of design and development and stay involved throughout the process, up to and including market launch and product review. The key tasks and participants (in brackets) of the organizational functions involved in implementing ecodesign are indicated in [A.4.2.2](#) and [A.4.2.3](#).

**A.4.2.2** For the short term:

- a) researching and implementing creative solutions in design and development (product planners, developers, designers);
- b) investigating and providing information on the technical feasibility of alternative designs, manufacturing, materials or processes (developers, designers);

- c) investigating and documenting environmental aspects and the environmental validation of proposed solutions/improvement (environmental specialists);
- d) communications and commitment from the internal value chain (purchasing, marketing and sales, environmental specialists);
- e) communications and commitment from the external value chain (suppliers, retailers, customers, recyclers, disposers);
- f) collecting and documenting data on materials and components/sub-assemblies and informing suppliers about the organization's environmental requirements (purchasing managers);
- g) checking the technical performance of a supplier's production or the end-of-life processes (purchasing, engineers).

#### **A.4.2.3** For the long term:

- a) establishing baseline environmental measurement systems based on previous product generations, competitors' products, etc. (management);
- b) considering and tracking new developments in legislation, environmental regulations, competitors, etc. (environmental specialists);
- c) increasing environmental awareness through training and education (environmental specialists, trainers);
- d) assessing future activities and customers' needs, and providing strategic information on the direction of product development and the pricing of the end product (product managers, marketing and sales managers).

### **A.4.3 Involving the value chain**

Value chain management covers both the external and internal value chain. Managing the external value chain deals with interactions with suppliers, sub-contractors, transportation companies, trade and retailers, customers, recyclers, waste managers and other end-of-life actors. These interactions can have a different character, depending on the influence the organization has on the value chain. Tasks that may be considered with value chain management are the following:

- a) increasing the amount and quality of environmental information and awareness among suppliers and customers;
- b) benchmarking the environmental performance of actors in the value chain;
- c) specifying and discussing environmental requirements for organizations within the value chain (e.g. the use of supplier standards or environmental measurement systems);
- d) involving suppliers and recyclers in the redesign of products;
- e) establishing programmes in relation to the reuse and recycling of packaging, materials, components/sub-assemblies or the whole product.

### **A.4.4 Internal and external communication**

A communication strategy is an integral part of the process of both internal and external value chain management.

Internal communication could involve providing information to employees on the following:

- a) the organization's policy and programmes;
- b) successful environmental projects or products;

- c) opportunities to personally contribute;
- d) training courses on environmental issues, programmes and tools;
- e) how performance in the sustainability field will be considered in the regular appraisals.

Such communication can also involve mechanisms that obtain feedback from employees on design and development issues.

External communication can be an opportunity for enhancing the value and benefits of integrating environmental aspects of the organization's operations. This communication can be to interested parties, such as customers and suppliers, and can include information on the following:

- benefits for customers, suppliers and society;
- product properties (performance, environmental aspects, etc.);
- proper use, transport, maintenance and end-of-life management.

NOTE For further information on environmental communication, see ISO 14063.

#### **A.4.5 Reviewing ecodesign activities at an organizational level**

In order to make a chosen ecodesign strategy, operational responsibilities, a timeline and deliverables are needed. Once these elements are in place, a measurement of how ecodesign has evolved in the organization can be taken. There are many forms of such measurement, from very simple to very sophisticated ones. Whatever form is chosen, a performance measurement will allow for a variety of issues to be addressed, such as corrective actions and appraisals or incentives for the people responsible.

## Annex B (informative)

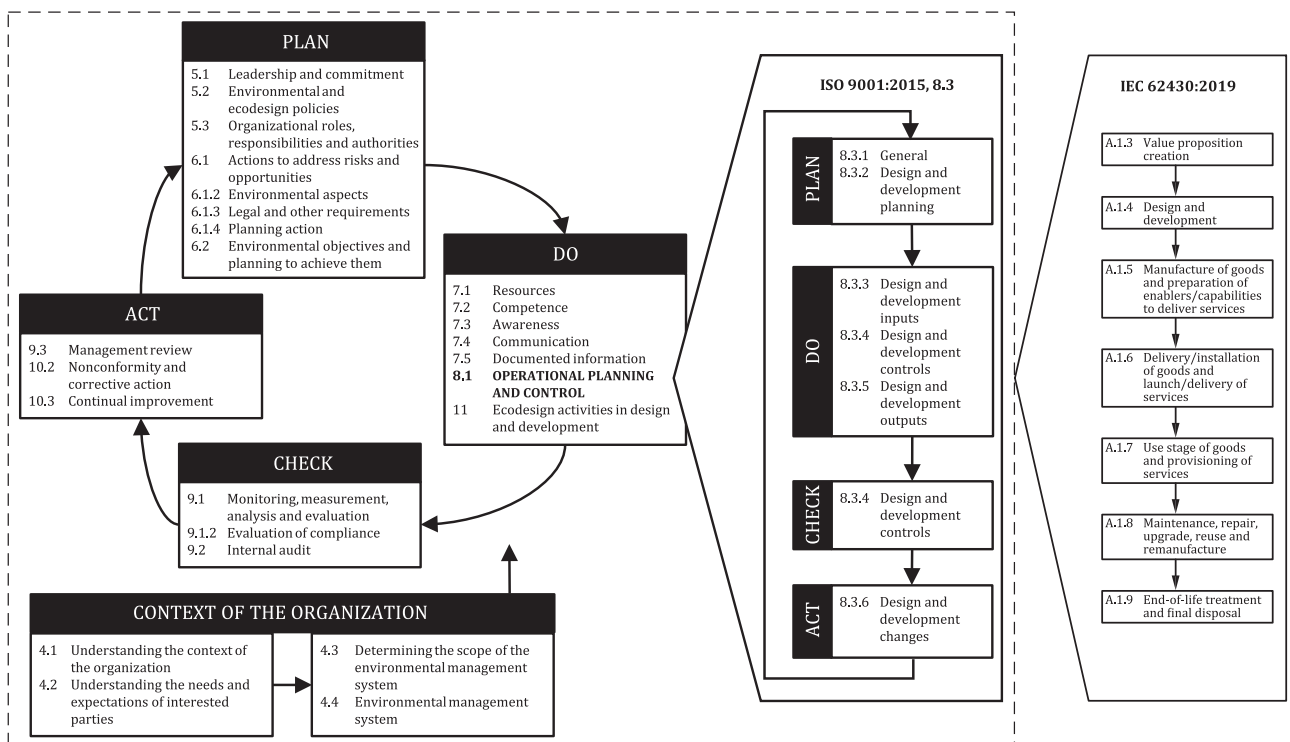
### Correlation of this document with other International Standards on ecodesign

An overview of the relationship between this document and ISO 14001, ISO 9001 and IEC 62430 is given in [Figure 1](#).

[Figure B.1](#) further illustrates how all the elements of ISO 9001 and IEC 62430 that are necessary for ecodesign link to this document (especially into [8.1](#)).

NOTE ISO 9001 addresses quality issues only, not environmental issues or ecodesign, and views issues from an organization's perspective. IEC 62430 explicitly addresses ecodesign at the designer level within the context of design and development, whereas this document addresses ecodesign from an organizational level. Hence, ISO 9001 and IEC 62430 have different approaches to value creation within design and development (see [Figure B.1](#)). In ISO 9001, value creation is seen within the context of organizational issues and the needs and expectations of interested parties rather than as a design and development issue. In IEC 62430, on the other hand, value creation is addressed as part of design and development.

To fulfil the intentions described in [8.1](#), the product solution resulting from design and development should achieve a balance between the various environmental aspects as described in IEC 62430, including relevant requirements from interested parties, and other requirements and functions that are typically included in design and development based on ISO 9001. Such functions can include technical requirements, quality, performance, safety, economic aspects, ethical and social values, and technical and business risks.



**Figure B.1 — Interrelationship between this document and other International Standards on ecodesign**

## **Annex C** **(informative)**

### **Ecodesign and design and development**

NOTE For further guidance on ecodesign and design and development, see IEC 62430:2019.

#### **C.1 General**

Organizations performing ecodesign should establish, implement and maintain it as an integral part of design and development. It should be also be reflected in the organization's policies and strategies. A product has environmental impacts in all of its life cycle stages and these impacts can be influenced through design and development. Design decisions improving a specific life cycle stage can adversely affect environmental impacts at other stages of the life cycle of the product. Organizations should ensure that considerations for the environmental impact of a single stage do not adversely alter or influence the overall environmental impacts related to a product.

#### **C.2 Life cycle thinking**

Ecodesign should be based on the concept of life cycle thinking.

Life cycle thinking is effectively initiated as early as possible in design and development, since that is when the greatest opportunities exist to make improvements to the product and to reduce any consequential adverse environmental impacts.

#### **C.3 Incorporation of ecodesign into design and development**

Design and development requires a balance between the various environmental aspects, including interested parties' requirements and other requirements, such as functions, technical requirements, quality, performance, economic aspects, ethical and social values, and technical and business risks.

The organization evaluates various design and development approaches with the aim of reducing the adverse environmental impacts caused by the product over its entire life cycle. The following list provides examples of possible design and development tasks:

- a) specifying the functions of the product;
- b) determining the relevant environmental parameters, taking into account legal and other interested parties' requirements and significant environmental aspects;
- c) determining improvement objectives for the environmental parameters;
- d) setting environmental targets for the environmental parameters based on the improvement objectives;
- e) creating a specification of the product that addresses the environmental targets;
- f) creating solutions to realize the specification of the product while taking into account other design considerations.

Design and development varies depending on products and organizations. There are various approaches to incorporating environmental aspects into design and development.

## Annex D (informative)

### Clarification of concepts

In addition to the terms and definitions given in [Clause 3](#), a clarification of selected concepts is provided in this annex to prevent misunderstanding.

- The words “appropriate” and “applicable” are not interchangeable. “Appropriate” means suitable (for, to) and implies some degree of freedom, while “applicable” means relevant or possible to apply and implies that if it can be done, it needs to be done.
- The word “consider” means it is necessary to think about the topic but it can be excluded, whereas “take into account” means it is necessary to think about the topic but it cannot be excluded.
- “Continual” indicates a duration that occurs over a period of time but with intervals of interruption (unlike “continuous”, which indicates duration without interruption). “Continual” is therefore the appropriate word to use when referring to improvement.
- In this document, the word “effect” is used to describe the result of a change to the organization. The phrase “environmental impact” refers specifically to the result of a change to the environment.
- The word “ensure” means the responsibility can be delegated but not the accountability.
- This document uses the term “interested party”. The term “stakeholder” is a synonym as it represents the same concept.
- In this document, the expression “life cycle of a product” is used to imply the environmental impacts over the life cycle, to avoid confusion with “product life cycle”, which in marketing and economics often refers to the sales profile during the economic life length of a product.
- The definitions of the terms “life cycle” and “life cycle stage” are slightly different in different standards. In this document, the definitions are harmonized with the definitions in IEC 62430.

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