



**International  
Standard**

**ISO 59004**

**Circular economy — Vocabulary,  
principles and guidance for  
implementation**

*Économie circulaire — Vocabulaire, principes et  
recommandations pour la mise en œuvre*

**First edition  
2024-05**

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Published in Switzerland

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## Foreword

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

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights.

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 323, *Circular economy*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

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# Introduction

## 0.1 Background

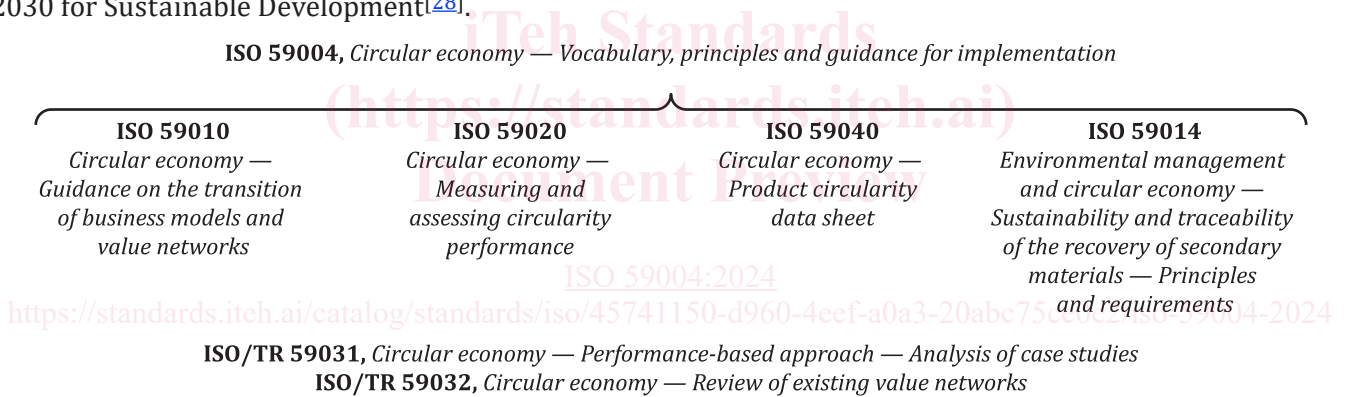
The global economy is “linear” as it is mainly based on extraction, production, use and disposal. This linear economy leads to resource depletion, biodiversity loss, waste and harmful losses and releases, all of which collectively are causing serious damage to the capacity of the planet to continue to provide for the needs of future generations.<sup>[27]</sup> Moreover, several planetary boundaries have already been reached or exceeded.

There is an increased understanding that a transition towards an economy that is more circular, based on a circular use of resources, can contribute to meeting current and future human needs (welfare, housing, nutrition, healthcare, mobility, etc.). Transitioning towards a circular economy can also contribute to the creation and sharing of more value within society and interested parties, while natural resources are managed to be replenished and renewed and in a sustainable way, securing the quality and resilience of ecosystems.

Organizations recognize many potential reasons to engage in a circular economy (e.g. delivering more ambitious and sustainable solutions; improved relationships with interested parties; more effective and efficient ways to fulfil voluntary commitments or legal requirements; engaging in climate change mitigation or adaptation; managing resource scarcity risks, increasing resilience in the environmental, social and economic systems), while contributing to satisfying human needs.

The ISO 59000 family of standards (see [Figure 1](#)) is designed to harmonize the understanding of the circular economy and to support its implementation and measurement. It also considers organizations, such as government, industry and non-profit, in contributing to the achievement of the United Nations (UN) Agenda 2030 for Sustainable Development<sup>[28]</sup>.

ISO 59004, *Circular economy — Vocabulary, principles and guidance for implementation*



**Figure 1 — ISO 59000 family of standards**

## 0.2 Relationship between this document, ISO 59010 and ISO 59020

This document, ISO 59010 and ISO 59020 are interconnected, as shown in [Figure 2](#), and support organizations in implementing a transition towards a circular economy.

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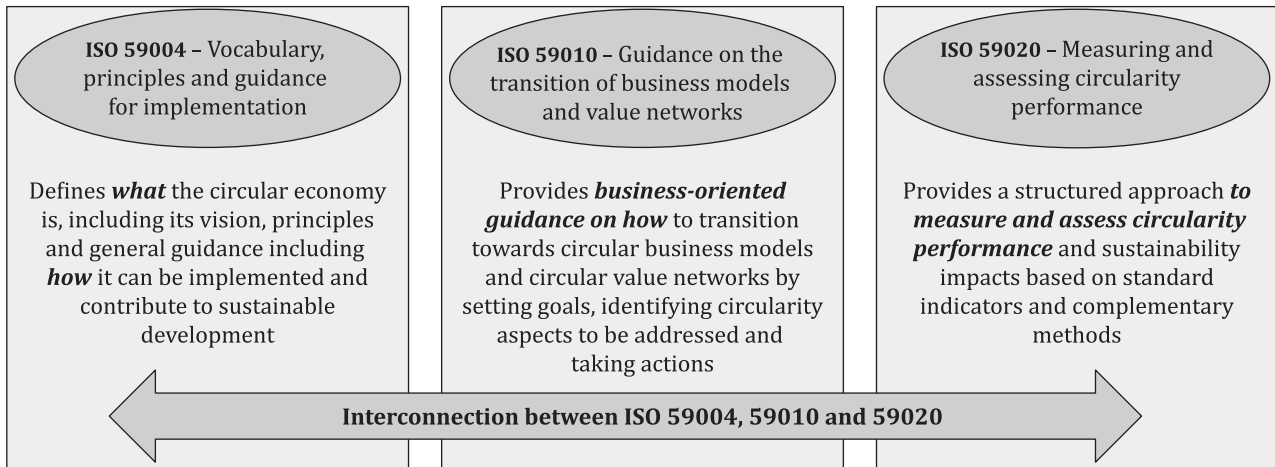


Figure 2 — Relationship between this document, ISO 59010 and ISO 59020

### 0.3 Purpose and the outline of this document

This document gives guidance for any kind of organization. It describes the main terms and definitions (see [Clause 3](#)), a circular economy vision (see [Clause 4](#)), the circular economy principles (see [Clause 5](#)), provides practical guidance on actions that contribute to a circular economy (see [Clause 6](#)) and guidance to implement a circular economy in any kind of organization (see [Clause 7](#)).

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# Circular economy — Vocabulary, principles and guidance for implementation

## 1 Scope

This document defines key terms, establishes a vision and principles for a circular economy, and gives guidance, including possible actions, for an organization to implement.

It is applicable to organizations seeking to understand and commit or contribute to a circular economy while contributing to sustainable development. These organizations can be either private or public, acting individually or collectively, regardless of type or size, and located in any jurisdiction, or position within a specific value chain or value network.

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

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

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

### 3.1 Terms related to a circular economy

**3.1.1 circular economy**  
*economic system (3.1.2) that uses a systemic approach to maintain a circular flow of resources (3.1.6), by recovering, retaining or adding to their value (3.1.7), while contributing to sustainable development (3.1.11)*

Note 1 to entry: *Resources (3.1.5)* can be considered concerning both stocks and flows.

Note 2 to entry: The inflow of *virgin resources (3.3.2)* is kept as low as possible, and the circular flow of resources is kept as closed as possible to minimize *waste (3.3.6)*, *losses (3.3.7)* and *releases (3.3.8)* from the economic system.

**3.1.2 economic system**

*system (3.1.22) by which a society organizes and allocates resources (3.1.5)*

Note 1 to entry: The economic system can vary depending upon the geographic region or governmental jurisdiction.

Note 2 to entry: This can include the regulation of resources and the production, use and disposal of these resources.

**3.1.3 social system**

*system (3.1.22) by which human beings are expected to undertake different types of tasks in order to achieve common goals within a society*

### 3.1.4

#### **environmental system**

*systems* (3.1.22) of the natural environment that interact, encompassing biotic and abiotic components

Note 1 to entry: In particular, this includes the atmosphere, *biosphere* (3.1.19), hydrosphere, cryosphere, pedosphere and lithosphere.

### 3.1.5

#### **resource**

asset from which a *solution* (3.2.1) is created or implemented

Note 1 to entry: Depending on the context, reference to “resource” includes “raw material”, “feedstock”, “material” or “component”.

Note 2 to entry: For the purpose of this document, asset refers to physical resources such as *natural resources* (3.3.1), *virgin resources* (3.3.2), *recoverable resources* (3.3.3) and *recovered resources* (3.3.5).

Note 3 to entry: Resource includes any energy type (e.g. the energy content or energy potential of materials).

Note 4 to entry: Resources can be considered concerning both stocks and flows.

### 3.1.6

#### **circular flow of resources**

systematic cycling of the provision and use of *resources* (3.1.5) within multiple *technical* (3.1.20) or *biological cycles* (3.1.21)

Note 1 to entry: The biological and technical cycles represent loops into the complex *system* (3.1.22) of resource flows in the economy.

### 3.1.7

#### **value**

gain(s) or benefit(s) from satisfying needs and expectations, in relation to the use and conservation of *resources* (3.1.5)

EXAMPLE Revenue, savings, productivity, sustainability, satisfaction, empowerment, engagement, experience, public health, trust.

Note 1 to entry: Value is relative to, and determined by the perception of, those *interested party(ies)* (3.4.2) able to capture it.

Note 2 to entry: Value can be financial or non-financial, e.g. social, environmental, other gains or benefits.

Note 3 to entry: Value is dynamic over time.

[SOURCE: ISO 56000:2020, 3.7.6, modified — “gain(s) or benefit(s)” replaced “gains” and “use and the conservation of resources” replaced “resources used” in the definition. “public health” added to the example. “those interested party(ies) able to capture it” replaced “the organization and interested parties” in Note 1 to entry. Example added in Note 2 to entry. Notes 3 to 5 to entry deleted. New Note 3 to entry added.]

### 3.1.8

#### **recover value**

*process* (3.5.5) to recuperate the *value* (3.1.7) of the object of consideration

### 3.1.9

#### **retain value**

*process* (3.5.5) to maintain the *value* (3.1.7) of the object of consideration

### 3.1.10

#### **add value**

*process* (3.5.5) to increase the *value* (3.1.7) of the object of consideration

**3.1.11**

**sustainable development**

development that meets the environmental, social and economic needs of the present without compromising the ability of future generations to meet their own needs

Note 1 to entry: Derived from the Brundtland Report<sup>[27]</sup>.

[SOURCE: ISO Guide 82:2019, 3.2]

**3.1.12**

**resilience**

ability to endure, resist, adapt to or recover from disruptive events or conditions, whether natural or anthropogenic

Note 1 to entry: Resilience of an *ecosystem* (3.1.17) relates to its ability to resist or rebuild itself after some form of disruption without shifting into a qualitatively different state.

**3.1.13**

**principle**

fundamental basis for decision-making or behaviour

[SOURCE: ISO 26000:2010, 2.14]

**3.1.14**

**circular**

aligned with the *principles* (3.1.13) for a *circular economy* (3.1.1)

Note 1 to entry: Objectives and goals for a circular economy can be defined with respect to the principles for a circular economy.

**3.1.15**

**circularity**

degree of alignment with the *principles* (3.1.13) for a *circular economy* (3.1.1)

**3.1.16**

**environment**

surroundings in which an *organization* (3.4.1) operates, including air, water, land, *natural resources* (3.3.1), flora, fauna, humans, and their interrelationships

Note 1 to entry: Surroundings can be described in terms of biodiversity, *ecosystems* (3.1.17), climate or other characteristics.

[SOURCE: ISO 14001:2015, 3.2.1 modified — Note 1 to entry deleted and Note 2 to entry renumbered accordingly.]

**3.1.17**

**ecosystem**

dynamic complex of communities of plants, animals and microorganisms and their non-living *environment* (3.1.16), interacting as a functional entity

[SOURCE: ISO 14050:2020, 3.2.3]

**3.1.18**

**technosphere**

sphere or realm of human technological activity which results in a technologically modified *environment* (3.1.16)

[SOURCE: ISO 21930:2017, 3.8.4, modified — Note 1 to entry deleted.]

### 3.1.19

#### **biosphere**

part of the *environmental system* (3.1.4) that is capable of supporting life

[SOURCE: BSI 8001:2017, 2.7, modified — “environmental system” added and “in which living organisms exist” deleted.]

### 3.1.20

#### **technical cycle**

cycle(s) within the *social system* (3.1.3) through which *resources* (3.1.5) are used, recovered, restored and utilized within existing or new *solutions* (3.2.1)

Note 1 to entry: Resources flow into and within a technical cycle, which involves activities such as sharing, maintenance, *reuse* (3.5.17), *repair* (3.5.16), *remanufacturing* (3.5.21) and *recycling* (3.5.24).

### 3.1.21

#### **biological cycle**

cycle(s) through which biological nutrients are utilized by living organisms and subsequently restored into or within the *biosphere* (3.1.19) in a way that rebuilds *ecosystem* (3.1.17) *resilience* (3.1.12) and natural capital and enables the regrowth of *renewable resources* (3.3.10)

Note 1 to entry: Such cycles can involve, at various stages, *cascading* (3.3.15), *composting* (3.3.18), *anaerobic digestion* (3.3.17) or the extraction of bio-chemicals.

Note 2 to entry: Natural capital refers to the renewable and *non-renewable* (3.3.7) *natural resources* (3.3.1) (e.g. plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people, including various ecosystem services such as producing oxygen, capturing carbon dioxide, purifying water, nutrient cycling, etc.

### 3.1.22

#### **system**

set of interrelated or interacting elements

[SOURCE: ISO 9000:2015, 3.5.1]

### 3.1.23

#### **system in focus**

*system* (3.1.22) that is defined by selected system boundaries and is the subject of a *circularity measurement* (3.6.4) and a *circularity assessment* (3.6.5)

Note 1 to entry: Four system levels are being used for measuring and assessing *circularity performance* (3.6.3): regional, interorganizational, organizational and product level.

## 3.2 Terms related to solutions

### 3.2.1

#### **solution**

*product* (3.2.2) or *service* (3.2.3), or a combination thereof, that fulfils a need of an *interested party* (3.4.2)

### 3.2.2

#### **product**

physical-based object designed for or utilized with a purpose

Note 1 to entry: A product can be, for example:

- goods of any type;
- hardware (e.g. engine mechanical part, spare parts, consumables);
- electrical or electronic hardware devices or components (e.g. computers, communication equipment and sensors);
- processed materials (e.g. lubricant, cement).

### 3.2.3

#### service

activity designed or executed with a purpose

Note 1 to entry: Services have intangible elements. Provision of a service can involve, for example:

- an activity performed on a tangible *product* (3.2.2) supplied to a *customer* (3.4.3) (e.g. automobile to be repaired; the income statement needed to prepare a tax return);
- the creation of ambience for the customer (e.g. in hotels and restaurants).

Note 2 to entry: Knowledge transfer and financial management as well as digital software tools or programs and databases are considered as services.

### 3.2.4

#### life cycle

consecutive and interlinked stages in the life of a *solution* (3.2.1)

Note 1 to entry: The interlinked stages can include acquisition of *natural resources* (3.3.1), design, production, transportation or delivery, use, *reuse* (3.5.17), *remanufacturing* (3.5.21) and *recycling* (3.5.24).

Note 2 to entry: Within a *circular economy* (3.1.1), traditional linear life cycle understanding is transformed by the thinking that a life cycle can consist of several *end of use* (3.5.29) (e.g. multiple use cycles) and eventually ends at the *end of life* (3.5.30, 3.5.31).

### 3.2.5

#### life cycle perspective

life cycle thinking

consideration of the *circularity aspects* (3.6.1) relevant to a *solution* (3.2.1) during its *life cycle* (3.2.4) which includes consideration of the relevant environmental, social and economic impacts

Note 1 to entry: The main idea in applying a life cycle perspective is to improve the *circularity performance* (3.6.3) of a solution by considering its use of *resources* (3.1.5) and related emissions in relation to relevant environmental, social and economic impacts. This can facilitate links between the economic, social and environmental dimensions within an *organization* (3.4.1) and through its entire *value chain* (3.5.2).

Note 2 to entry: In measuring and assessing the circularity performance of a *system* (3.1.22), a life cycle perspective should be applied.

Note 3 to entry: This perspective should include all stages of *technical* (3.1.20) or *biological cycles* (3.1.21) over appropriate timescales that are related to that system.

## 3.3 Terms related to resources

### 3.3.1

#### natural resource

*resource* (3.1.5) occurring in nature

Note 1 to entry: Natural resources usually have not been subjected to any human-related processing or modification.

Note 2 to entry: Natural resources are acquired or extracted from the *environment* (3.1.16) or nature (the geosphere or *biosphere* (3.1.19)) into the *technosphere* (3.1.18) and emissions to air, water or land are released from the technosphere into the environment.

### 3.3.2

#### virgin resource

primary resource

*natural resource* (3.3.1) or energy that is used as a *resource* (3.1.5) for the first time as input in a *process* (3.5.5) or for creating a *solution* (3.2.1)

Note 1 to entry: Virgin resources can be either a *renewable resource* (3.3.10) or *non-renewable resource* (3.3.11).

Note 2 to entry: Using virgin resources to produce a material does not result in that material being considered a virgin resource when first used. However, in this case, other terminology is used depending on the context, i.e. “virgin material” or “primary material”.

### 3.3.3

#### **recoverable resource**

*resource* (3.1.5) that can be recovered and used again after it has already been processed or used

Note 1 to entry: Recovery can be undertaken to *recover* (3.1.8), *retain* (3.1.9) or *add value* (3.1.10).

Note 2 to entry: A recoverable resource can provide no *value* (3.1.7) and be considered *waste* (3.3.6).

### 3.3.4

#### **non-recoverable resource**

*resource* (3.1.5) that cannot be recovered and used again after it has been processed or used

Note 1 to entry: Resources can be non-recoverable at time due to technological, economical, environmental, social or regulatory infeasibility.

### 3.3.5

#### **recovered resource**

secondary resource

*resource* (3.1.5) that is obtained from one that has already been processed or used

Note 1 to entry: Recovery can be undertaken to *recover* (3.1.8), *retain* (3.1.9) or *add value* (3.1.10).

Note 2 to entry: A recovered resource can provide no *value* (3.1.7) to the *holder* (3.4.5) and be considered *waste* (3.3.6).

Note 3 to entry: Other terminology used, depending on the context, includes “secondary material.”

### 3.3.6

#### **waste**

*resource* (3.1.5) that is no longer considered to be an asset as it, at the time, provides insufficient *value* (3.1.7) to the *holder* (3.4.5)

Note 1 to entry: The holder can choose to retain, discard or transfer the waste.

Note 2 to entry: Value can be assigned to waste as a result of a need from another *interested party* (3.4.2), at which point the resource is no longer considered waste.

Note 3 to entry: The assignment of value to waste as a resource is linked, in part, to the available technology (e.g. landfill mining).

Note 4 to entry: Some regulations require the holder to dispose of certain types of waste, while others assign value to waste.

Note 5 to entry: Because resources include the energy content or energy potential of materials, such energy, when liberated during a *process* (3.5.5) and not recovered for another use, can be considered a waste.

### 3.3.7

#### **losses**

unmanaged outflows of a *resource* (3.1.5) from the *system in focus* (3.1.23) that are not recovered

Note 1 to entry: For the purpose of measuring *circularity performance* (3.6.3), losses can be estimated.

Note 2 to entry: Losses can happen at any stage of the *life cycle* (3.2.4), such as wear and tear in the use stage (e.g. tire abrasion, microplastic).

### 3.3.8

#### **releases**

managed emissions to air and discharges to water or land from the *system in focus* (3.1.23)

Note 1 to entry: Releases can be solid, liquid or gaseous.