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Circular ~~Economy~~ economy — Measuring and assessing circularity performance

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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 documents 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).

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. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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.

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.

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 ~~are~~, collectively, are causing serious damage to the capacity of ~~our~~the planet to continue to provide for the needs of future generations.^{[56][97]} Moreover, several planetary boundaries have already been reached or exceeded.

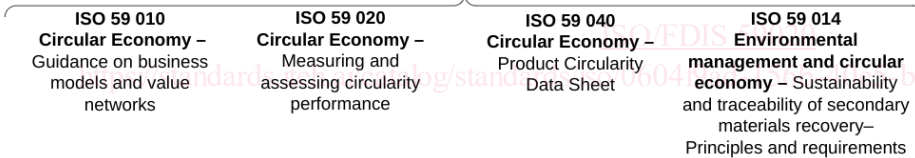
There is an increased understanding that a transition towards an economy that is more circular, based on a circular use of resources, can contribute to meeting ~~our~~current and future human needs (welfare, housing, nutrition, healthcare, mobility, etc.). Transitioning towards a circular economy can also contribute to the creation and sharing of more value within society and ~~stakeholders~~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 ~~stakeholders~~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 ~~documents~~standards (see ~~Figure 1~~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^[54].

~~The family of documents also considers organizations, such as government, industry, and non-profit organizations in contributing to the achievement of the UN Agenda 2030 for Sustainable Development~~^[36].

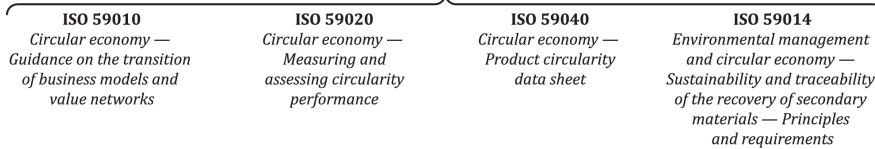
ISO 59 004 – Circular Economy – Terminology, principles and guidance for implementation



ISO TR 59 031 – Circular Economy – Performance based approaches

ISO TR 59 032 – Circular Economy – Review of business model implementation

ISO 59004, Circular economy – Vocabulary, principles and guidance for implementation



ISO/TR 59031, Circular economy – Performance-based approach – Analysis of case studies

ISO/TR 59032, Circular economy – Review of existing value networks

Figure 1 — ~~The~~ — ISO 59000 family of ~~documents~~standards

0.2 Relationship between this document, ISO 59004 and, ISO 59010 and this document

ISO 59004¹, ISO 59010² and ~~ISO 59020~~this document are interconnected, as shown in ~~Figure 2~~Figure 2, and support organizations in implementing a transition towards a circular economy.

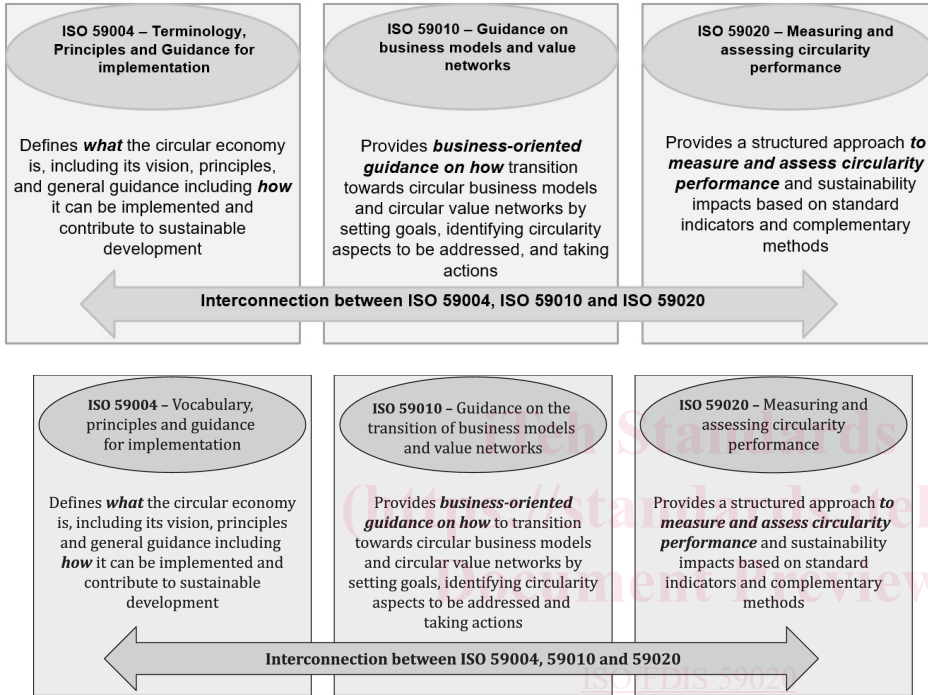


Figure 2 — Relationship between ISO 59004, ISO 59010 and ~~ISO 59020~~this document

0.3 Purpose and the outline of this document

The purpose of this document is to assist organizations in the collection of the necessary information and the calculation to enable circular economy practices that minimize resource use and optimize the circular flow of resources, ~~whilst~~while contributing to sustainable development.

The results provide an integrated view of circularity and sustainable development and are intended to be used to support the transition towards a circular economy. In contributing to sustainable development this document also considers the UN Agenda 2030^[5] ~~on Sustainable Development~~ and the Sustainable Development Goals ~~[6]~~^[6] ~~(SDGs)~~.

Terms, definitions, and principles are provided to help users and other ~~stakeholders~~interested parties interpret and apply the guidance. This document provides a platform for the development of more detailed circularity assessment standards that are appropriate for individual sectors.

¹ Under preparation.

² Under preparation.

Circular economy — Measuring and assessing circularity performance

1 Scope

This document ~~provides guidance and~~ specifies requirements ~~and gives guidance~~ to organizations for measuring and assessing a defined economic system to determine ~~its~~their circularity performance at a specific time. Measurement and assessment are performed by ~~the~~ collection and calculation of data with the help of mandatory and optional circularity indicators.

This document provides a framework to guide users within organizations of all types and sizes through the measurement and assessment process, including system boundary setting, ~~and~~ choice of indicators, as well as processing and interpreting data in a consistent and reproducible manner to generate meaningful and verifiable results.

The framework is applicable to multiple levels of an economic system, ranging from regional, ~~inter-organizational, interorganizational~~ and organizational to the product level.

To measure and assess social, environmental, and economic impacts that are caused by the actions of the organization to achieve circular goals and objectives, the document provides a list of complementary methods that can be used in addition to this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all ~~of~~ their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 59004³, *Circular economy* — ~~Terminology — Vocabulary~~, principles and guidance for implementation

ISO 59010⁴, *Circular economy* — ~~Guidance on the transition of business models and value networks~~ ~~(under development)~~.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 59004, ISO 59010 and the following apply.

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 circularity and the circular economy

3.1.1 circular economy

economic system that uses a systemic approach to maintain a circular flow of resources, by recovering, retaining or adding to their value, while contributing to sustainable development

Note 1 to entry: *Resources* (3.3.11) can be considered concerning both stocks and flows.

³ Under preparation. ~~Stage at the time of publication: ISO/DIS 59004:2023~~

⁴ Under preparation. ~~Stage at the time of publication: ISO/DIS 59010:2023~~

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Note 2 to entry: The inflow of virgin resources is kept as low as possible, and the circular flow of resources is kept as closed as possible to minimize *waste* (3.3.12), *losses* (3.3.13) and *releases* (3.3.14) from the economic system.

[SOURCE: ISO 59004:—, 3.1.1]

3.1.2 circular

aligned with the principles 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.

[SOURCE: ISO 59004:—, 3.1.13]

3.1.3 circularity

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

[SOURCE: ISO 59004:—, 3.1.15]

3.1.4 circularity aspect

element of an organization's activities or solutions that interacts with the *circular economy* (3.1.1)

EXAMPLE Durability, recyclability, reusability, repairability, recoverability.

Note 1 to entry: Circularity aspects should be considered in relation to the principles, as well as the organization's objectives, goals and actions, for the implementation of a circular economy.

[SOURCE: ISO 59004:—, 3.6.1]

3.2 Terms related to system, boundary and scope

3.2.1 system boundary

boundary representing physical, process, temporal and geographical limits of what is included and what is not included in an assessment

[SOURCE: ISO 21931-2:2019, 3.3.13]

3.2.2 system in focus

system that is defined by selected *system boundaries* (3.2.1) and is the subject of a *circularity measurement* (3.3.2) and a *circularity assessment* (3.3.3)

Note 1 to entry: Four system levels are being used for measuring and assessing *circularity performance* (3.3.1(3.1.3)-): regional, ~~inter-organizational~~ interorganizational, organizational and product level.

[SOURCE: ISO 59004:—, 3.1.23]

3.3 Terms related to measurement and assessment

3.3.1

circularity performance

degree to which a set of *circularity aspects* (3.1.4) align with the objectives and principles for a *circular economy* (3.1.1)

[SOURCE: ISO 59004:—, 3.6.3]

3.3.2

circularity measurement

process to help determine the *circularity performance* (3.3.1) through collection, calculation or compilation of data or information

[SOURCE: ISO 59004:—, 3.6.4]

3.3.3

circularity assessment

evaluation and interpretation of results and impacts from a *circularity measurement* (3.3.2)

Note 1 to entry: Assessment includes consideration of the sustainability ~~impacts~~aspects and can apply *complementary methods* (3.3.7) such as life cycle assessment.

[SOURCE: ISO 59004:—, 3.6.5]

3.3.4

circularity indicator

metric used to measure one or more *circularity aspects* (3.1.4)

Note 1 to entry: A circularity indicator can represent a measurable aspect or combination of aspects of a *resource* (3.3.11), a solution, a process or an action.

[SOURCE: ISO 59004:—, 3.6.6]

3.3.5

quantitative indicator

measure based on numeric data that can be used for mathematical calculations and statistical analysis

Note 1 to entry: The input data can be directly measured or otherwise obtained.

Note 2 to entry: Quantitative input data are based on a physical or economic unit of measurement.

3.3.6

qualitative indicator

measure derived from a checklist or descriptive scale without any quantification

Note 1 to entry: Qualitative indicators can be categorized into classes that can be assigned numeric values.

3.3.7

complementary method

method, approach or standard that is used together with *circularity measurement* (3.3.2) to provide a *circularity assessment* (3.3.3)

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3.3.8

primary data

data obtained from known direct measurement or from implicitly or explicitly defined calculations based on data originating from such direct measurement or calculations

[SOURCE: ISO 14033:2019, 3.1.5, ~~modified — “or calculations” added.~~]

3.3.9

secondary data

data obtained in other ways than *primary data* (3.3.8)

~~EXAMPLES: — EXAMPLE~~ Literature, public or commercial databases, statistics, modelling or simulation.

[SOURCE: ISO 14033:2019, 3.1.6, modified ~~— examples have been — Example~~ added.]

3.3.10

aggregation

process of combining data from various sources

[SOURCE: ISO/IEC 29182-2:2013, 2.4.2]

3.3.11

resource

asset from which a solution 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, virgin resources, recoverable resources and recovered resources.

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.

[SOURCE: ISO 59004:—, 3.1.5]

3.3.12

waste

resource (3.3.11) that is no longer considered to be an asset as it, at the time, provides insufficient value to the holder.

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, 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 and not recovered for another use, can be considered a waste.