



Technical Report

ISO/TR 59031

Circular economy — Performance-based approach — Analysis of case studies

*Economie circulaire — Approche basée sur la performance —
Analyse de cas pratiques*

**First edition
2026-03**

This document is a preview generated by EMS



COPYRIGHT PROTECTED DOCUMENT

© ISO 2026

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 General information	2
4.1 Objective.....	2
4.2 Selection of cases.....	3
4.3 How to use this document.....	3
5 Analysis of cases	4
5.1 Process to collect and analyse cases.....	4
5.2 Approaches taken in the use cases.....	5
5.2.1 General.....	5
5.2.2 Related aspects of the performance-based approach in the cases.....	5
5.2.3 Circular design.....	5
5.2.4 Extended producer responsibility.....	6
6 Case studies	7
6.1 Overview of cases.....	7
6.1.1 Items for describing each case.....	7
6.1.2 Criteria for selecting cases as exemplars and reporting.....	8
6.2 Business A — Sweden.....	8
6.2.1 General information.....	8
6.2.2 Quantitative information.....	9
6.2.3 Qualitative information.....	10
6.2.4 Replicability (how the case can be scaled up and applied in other contexts).....	10
6.2.5 Performance-based approaches.....	11
6.2.6 Description of the mechanical cycle.....	11
6.2.7 Description of the service cycle.....	11
6.2.8 Life cycle assessment.....	11
6.2.9 Greenhouse gas emissions.....	11
6.3 Circulô — Brazil.....	11
6.3.1 General information.....	11
6.3.2 Quantitative information.....	12
6.3.3 Qualitative information.....	13
6.3.4 Replicability (how the case can be scaled up and applied in other contexts).....	13
6.3.5 Performance-based approaches.....	13
6.3.6 Description of the mechanical cycle.....	14
6.3.7 Description of the service cycle.....	14
6.3.8 Life cycle assessment.....	14
6.3.9 Greenhouse gas emissions.....	15
6.4 Business B — France.....	15
6.4.1 General information.....	15
6.4.2 Quantitative information.....	15
6.4.3 Qualitative information.....	16
6.4.4 Replicability (how the case can be scaled up and applied in other contexts).....	16
6.4.5 Performance-based approaches.....	16
6.4.6 Description of the mechanical cycle.....	17
6.4.7 Description of the service cycle.....	17
6.4.8 Life cycle assessment.....	17
6.4.9 Greenhouse gas emissions.....	17
6.5 Michelin — France.....	18
6.5.1 General information.....	18
6.5.2 Quantitative information.....	18

ISO/TR 59031:2026(en)

6.5.3	Qualitative information	20
6.5.4	Replicability (how the case can be scaled up and applied in other contexts)	21
6.5.5	Performance-based approaches	21
6.5.6	Description of the mechanical cycle	22
6.5.7	Description of the service cycle	23
6.5.8	Life cycle assessment	24
6.5.9	Greenhouse gas emissions	25
6.6	Business C — Germany	26
6.6.1	General information	26
6.6.2	Quantitative information	26
6.6.3	Qualitative information	27
6.6.4	Replicability (how the case can be scaled up and applied in other contexts)	27
6.6.5	Performance-based approaches	27
6.6.6	Description of the service cycle	28
6.6.7	Life cycle assessment	28
6.6.8	Greenhouse gas emissions	28
6.7	Free Pack Net — Switzerland	28
6.7.1	General information	28
6.7.2	Quantitative information	30
6.7.3	Qualitative information	32
6.7.4	Replicability (how the case can be scaled up and applied in other contexts)	32
6.7.5	Performance-based approaches	32
6.7.6	Description of the mechanical cycle and the service cycle	33
6.7.7	Life cycle assessment	33
6.7.8	Greenhouse gas emissions	33
6.8	Kuradashi — Japan	34
6.8.1	General information	34
6.8.2	Quantitative information	34
6.8.3	Qualitative information	36
6.8.4	Replicability (how the case can be scaled up and applied in other contexts)	37
6.8.5	Performance-based approaches	37
6.8.6	Description of the mechanical cycle	37
6.8.7	Description of the service cycle	37
6.8.8	Life cycle assessment	38
6.8.9	Greenhouse gas emissions	38
7	Conclusion	38
	Bibliography	40

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).

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 collectively are causing serious damage to the capacity of the planet to continue to provide for the needs of future generations.^[7] 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.^[8]

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

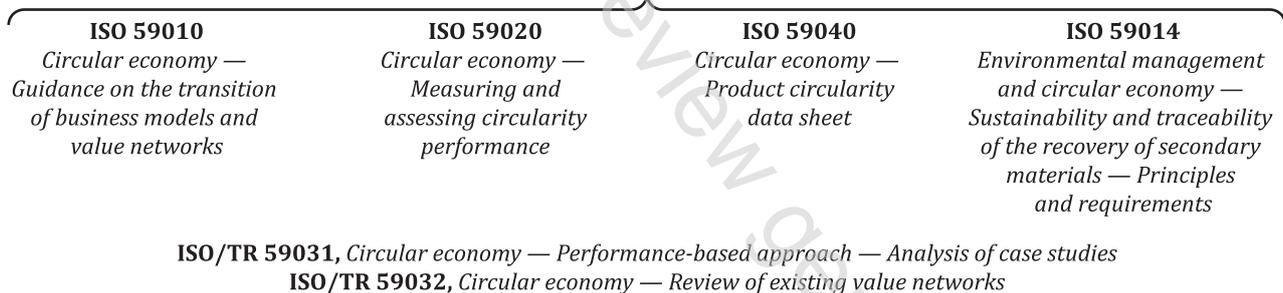


Figure 1 — ISO 59000 family of standards

0.2 Relationship between ISO 59004, ISO 59010 and ISO 59020

ISO 59004, ISO 59010 and ISO 59020 are interconnected, as shown in [Figure 2](#), and support organizations in implementing a transition towards a circular economy.

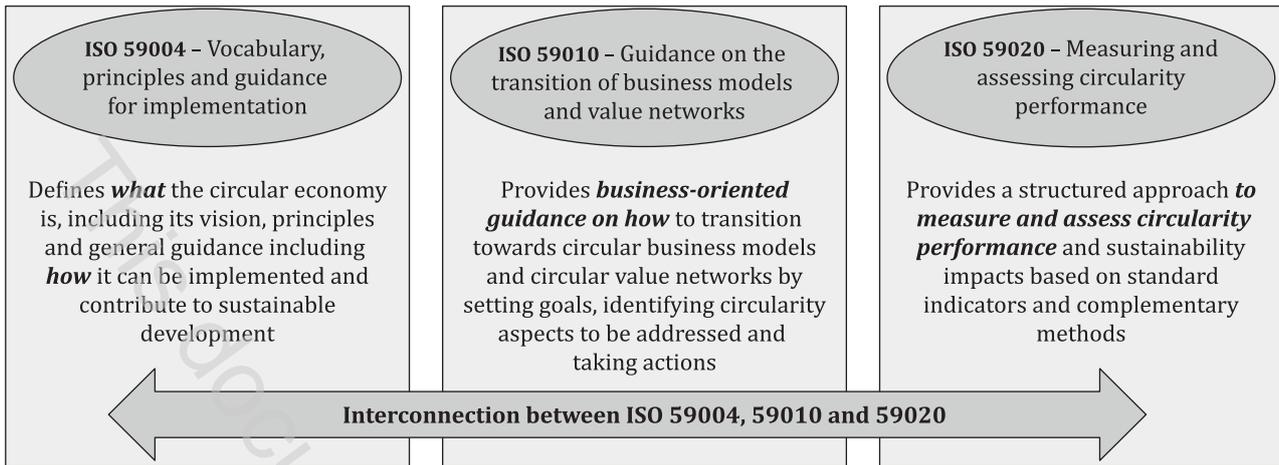


Figure 2 — Relationship between ISO 59004, ISO 59010 and ISO 59020

0.3 Introduction to performance-based approaches

Performance-based approaches, such as functional economy, service economy and product-as-a-service (PaaS) system, are currently acknowledged as being relevant for helping organizations to face the challenges in developing circular-economy-related approaches. Such business models can enable and strengthen their economic viability while simultaneously improving their environmental and societal impacts.

Indeed, in a performance-based approach, the revenue stream of an organization or group of organizations is less dependent on the amount of product or “service unit” delivered and more related to the real impact or outcome of their activities on the customers or beneficiaries. These impacts can be economic and/or social and/or environmental. The performance-based approach has the potential to contribute to the decoupling of economic development from the negative impacts of resource use.

EXAMPLE A car is one of several possible solutions to meet the mobility need of travelling from point A to point B, which is the desired outcome.

Performance-based approaches within a circular economy are currently well documented from a theoretical point of view; however, there seems to be a lack of operational reference for their implementation. Many organizations therefore state that while such approaches are interesting, they are not applicable to their business model and they would require a dramatic transition in their business model, which would threaten their existence in the short term (even if their situation in the long term can be improved). Providing examples of transitions to a performance-based economic model across a range of businesses and companies can bring valuable insight and aid new organizations and economic players to transition to a circular economy (regardless of their size or status). To ensure that this document is a useful tool for promoting changes in business models, the barriers that impede the adoption of a performance-based approach are detailed.

For consistency with the scope of ISO 59010, which covers specific issues of circular economy, this document does not aim to illustrate the many actions, measures and strategies for the implementation of a circular economy within an organization. Instead, it addresses a key question involving the decoupling of revenues from the use of material resources. Decoupling is critical as it reduces the impact of the “rebound-effect” in which reducing the environmental impact of a product has limited effect because one way or another the organization needs to sell more products to grow or survive, which can negate the benefits of circular economy initiatives on resource preservation.

This question of growth is central in this document: it shows how some organizations have managed (at least partially) to make PaaS consistent with sustainable financial results and the preservation of material or intangible resources. In these examples, there are no environmental or social constraints to abide to for mutual development of these three aspects of sustainable development. Of course, achieving synergy from these three aspects demands significant redesigning of all the aspects of an economic model (how to produce value in new ways, ensuring these are valued by customers and, hence, financially rewarding, how the new business models affect work within the organizations, and the relationships between the various stakeholders and the significant time investment needed prior to implementation). This document

complements ISO 59010, which provides a guidance on circular-economy-compliant business models, in particular the service economy cited in this document.

When the sale of performance is considered, the question of assessment is essential. The assessment covers, for instance, not only environmental impacts such as carbon dioxide (CO₂) emissions, but also other aspects such as resource conservation, wellness and intangible resource or value development (e.g. attractiveness of a territory for upcoming investment, reinforcement of relationship between partners for new projects). While a product-service system business model has the potential to improve environmental performance or decrease the environmental impact, the superiority is not always guaranteed (e.g. user mis-behaviour). There is no accepted approach for quantifying this superiority at present. The outputs of using ISO 59020, which centres on the issue of metrics and assessment of circular economy, are essential. This document highlights to what extent they are or can be relevant for the assessment of the contracted performance in each case.

Circular economy — Performance-based approach — Analysis of case studies

1 Scope

This document provides an analysis of various case studies for the implementation of specific aspects of the circular economy in organizations, regardless of their status. This document specifically focuses on performance-based approaches such as functional economy, service economy, product-as-a-service (PaaS) and other performance-based approaches.

This document mainly describes a selection of use cases of operational implementation of such performance-based approaches as observed in different organizations. It stresses the challenging context faced by concerned organizations in changing their economic and business models. This document depicts cultural, organizational and industrial changes induced by the move of business models toward a performance-based approach. It emphasizes to what extent the total economic value can increase and how this is converted into revenue streams for the concerned organizations.

This document does not apply to the implementation of any circular economy domain of actions (circular design, recycling; responsible purchase policy, etc.), but focuses on the systemic level of development of economic models based on the commercialization of various performance aspects.

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 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 performance-based approach

economic models relying on the sales of solutions with the aim to ensure usage intensity, useful effects or results to be achieved

Note 1 to entry: Solutions are a combination of services and products that cannot be separated.

3.2 reuse, verb

use a product or its component parts after their initial use, for the same purpose for which they were originally designed

Note 1 to entry: Utilization intended by the original design can involve either single-use or multiple-uses by the initial user or customer over time.

Note 2 to entry: Minor treatment (e.g. cleaning) of the product can be needed by the user to allow for reuse.

Note 3 to entry: In some cases, resources, such as water, are considered as a product, in which case, the purpose of "original design" is not applicable.