# Global Circularity Protocol for Business

Version 1.0

Global Circularity Protocol for business

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# Foreword

**Business is entering a decisive decade**. Rising trade tensions, climate impacts, and resource volatility pose clear risks for business, yet circular strategies offer equally clear opportunities to enhance competitiveness, strengthen resilience, and unlock sustainable growth. How we value and manage resources will define whether businesses can thrive in the decisive decade ahead.

At the halfway point to 2030, the gap between ambition and delivery remains wide: while decarbonization is accelerating, material use and waste continue to rise, undermining both climate and nature goals. **Net zero cannot be achieved without circularity.**

The Global Circularity Protocol for Business provides a globally aligned, science-based framework to manage circular performance. It enables organizations to embed circularity at the heart of strategy while generating credible information for investors, stakeholders, and policymakers. Designed for organizations of all sizes and sectors, the GCP guides organizations in mapping value chains, assessing risks and opportunities, setting objectives, measuring performance across climate, nature, social and financial outcomes, and translating results into action. Its systems approach recognizes the interconnected impacts across corporate, environmental, economic, and social dimensions, positioning circular strategies as both an environmental imperative and a foundation for resilience and long-term profitability.

**The business case is compelling.** Today, extraction and processing of materials account for more than 55% of global greenhouse gas emissions, driving biodiversity loss and resource stress. By adopting circular strategies, through the GCP, organizations can reduce exposure to these risks, strengthen long-term competitiveness, and generate measurable impact - potentially avoiding 76 gigatons of $CO_2$ and saving up to 120 billion tons of materials over the next 25 years[1].

The road ahead requires bold leadership. The GCP empowers organizations to turn ambition into action, embed circularity at the core of strategy, and lead the transition to a resilient, future-fit economy that thrives within planetary boundaries.

**Peter Bakker,**
President and CEO,
WBCSD

The Global Circularity Protocol for Business delivers what the circular economy has long lacked: a globally harmonized framework for measuring, managing, and disclosing circular performance.

**Why does this matter?** For **business leaders**, the GCP addresses a critical market failure: the absence of standardized metrics that enable target-setting, benchmarking, and capital allocation. By embedding circularity into corporate strategy, the Protocol transforms compliance into competitive advantage, unlocking cost savings, innovation, and resilience in a resource-constrained world. For **policy makers**, the GCP offers a credible baseline for regulation, fiscal incentives, and impact measurement, enabling governments to steer markets toward sustainable production and consumption patterns.

The One Planet Network, hosted by the United Nations Environment Programme, is proud to have co-led an inclusive, two-year development effort alongside the World Business Council for Sustainable Development, that brought together over 80 organizations and 150+ experts from business, policy, and science across all regions to shape this first version of the Protocol. This collaborative effort reflects the multilateral ambitions of the Stockholm+50 Action Agenda and of the Global Strategy for Sustainable Consumption and Production launched by the United Nations in 2022.

**Our mission does not end here.** This first version of the GCP is a foundation, not a finish line. Your engagement is essential to scale this effort globally and deliver on its impact. Together we can build a global movement where thousands of organizations use the same approach to **Frame** their circular economy objectives, **Prepare** their data, **Measure** their progress, **Manage** their actions, and **Communicate** results with transparency and confidence. Put simply, by building competitiveness, we create a world where circularity is not an ideal but a measurable reality.

We invite organizations of all sizes, regions and sectors as well as stakeholders to **road-test the Protocol**, share feedback, and help us improve it, because scaling this effort can change how the global economy uses resources, cuts emissions, and builds resilience for generations to come.

**Jorge Laguna-Celis,**
Head of the One Planet Network Secretariat hosted by UNEP

# Quotes

**Tove Andersen**
President and CEO of TOMRA

The Global Circularity Protocol is important to TOMRA because it provides a common framework for businesses to measure progress on circularity initiatives. This is vital for ensuring that change can occur at scale, supporting relevant targets and policymaking going forward. With our 50-year experience, we look forward to contributing to its development in any way we can, says Tove Andersen, President and CEO of TOMRA

**Harald Tepper**
Global Lead of Circularity, Philips

At Philips, circularity is a powerful lever to reduce material use and our overall impact on climate and nature, while driving customer value and business success. Healthcare is a material-intensive industry. Embedding circular practices and innovations can help hospitals with reducing their environmental footprint while improving healthcare resilience and patient outcomes. That's why we collaborated and co-championed the Global Circularity Protocol. GCP1.0 offers a clear and unified approach to set ambitious and adequate goals for circularity – a much needed step towards a sustainable and healthy future.

**Yumi Otsuka**
Global Head of Sustainability, Toyota Motor Corporation

For years, Toyota has been committed to resource efficiency, including easy-to-dismantle design, waste management in the production process, and proper treatment of ELVs. There is no change in our commitment, even now when circular economy is conceptualized. The GCP, a useful framework to visualize circular initiatives in business, allows Toyota to strategize circular business models through stakeholder dialogue. Toyota alone cannot realize a circular economy future. We will intensify our joint efforts to accelerate implementation of and transition to circular economy.

**Bruno Pelli**
Global Director in Mining Technical Services, Vale

The GCP is a strategic enabler for resource-intensive sectors like mining to contribute meaningfully to global sustainability and energy transition goals. At Vale, advancing circularity means transforming extraction and processing systems to maximize material recovery, reduce environmental impact, and accelerate the shift toward low-carbon, circular production models that support resilient and future-ready supply chains

**Markus Reichling**
General Manager, Circular Economy, Panasonic

The consumption habits of most people in the world are not sustainable since we utilize more natural resources than our planet Earth is providing to us. For me, circular economy is the key response to this challenge, and resource efficiency is essential for our future business success. The 'Global Circularity Protocol' is a very beneficial framework to successfully manage our gradual transition from linear to circular businesses and to guide business organizations like Panasonic on this continuous learning journey

**Hege Sæbjørnsen**
Circular leader, Ingka Group

Disrupting linear systems takes courage, collaboration, and a willingness to learn. At Ingka Group, circularity is not just a sustainability goal – it's how we help to future-proof our business and protect the natural systems we all rely on. The Global Circularity Protocol offers us a shared language and clear direction to drive action across industries. I'm proud to support this work because building resilient, trusted value chains isn't just possible – it's essential

**Dr. Afke van Rijn**
Director-general for the Environment and International Affairs, Ministry of Infrastructure and Water Management of the Netherlands

The Global Circularity Protocol for Business enables meaningful action by giving companies a unified and harmonized way to measure and report their circularity efforts. This much-needed foundation supports businesses in embedding circularity at the heart of their operations and helps drive the transition across sectors. By providing access to reliable and comparable data, the Protocol can also unlock greater investment in circular business models. I look forward to seeing how the Protocol will evolve and accelerate our progress toward a more circular future

**Dr. Janez Potočnik**
Co- Chair, International Resource Panel (IRP)

The Global Circularity Protocol provides companies with the best available guidance on how to build circular business models in line with planetary boundaries. It is a vital tool which deserves development and attention in the quest to achieve sustainable resource management globally

**Dr. Sonia Dias**
Waste specialist and coordinator of the Circular Economy Thematic Chamber, WIEGO and Brazil's National Climate Change Forum (FBMC)

It is about time we reimagine the circular economy not only as a tool for climate mitigation but also for improving well-being and addressing inequality. Businesses have a role to play in raising the visibility of the contribution waste pickers make to circular economies and climate mitigation and should also make inclusivity a core dimension of circularity protocols as GCP does.

**Dr. Naoko Ishii**
Presidential Envoy for Global Commons, Center for Global Commons, Tokyo University

Planetary boundaries science informs us that we are totally out of balance with the natural system. For us humans to continue enjoying decent lives, we need to change our way of life towards circular one. GCP provides a key framework to measure, manage and disclose the circular performance of companies, which enables companies to move onto circular trajectory

**Davinah Milenge**
Chief Program Coordinator, Climate Change and Green Growth, African Development Bank

Small and medium-sized enterprises are the backbone of Africa's employment creation and green industrialization. By advancing common standards for businesses, this foundational work has the potential to strengthen SMEs' understanding of circular economy opportunities, expand their access to global markets, and accelerate the green transition at scale. The African Development Bank reaffirms its commitment to empowering the private sector to lead this transition across Africa and beyond.

**Lisa da Silva**
Global Lead, Circular Economy Finance, IFC/ World Bank Group

The circular economy offers a multi-trillion-dollar opportunity to build resilient, sustainable, and innovative economies that create quality jobs. IFC has committed over USD $1.7 billion to circularity across the life cycle of materials, but far more investment is needed to scale impact. The Global Circularity Protocol provides the standards, metrics and tools companies need to measure progress, build investor confidence and unlock private capital for sustainable growth

**Satoshi Yoshida**
Director for International Resource Circulation and Circular Economy, Ministry Of Environment of Japan

Circularity spaces today still lack robust frameworks, rules, and standards, impeding circular business models at scale across borders. There is a growing expectation that the GCP, which evolves overtime, will fill such gaps and create an enabling environment to invest circular businesses and strengthen cooperation and communication among stakeholders

**Noelia Garcia Nebra**
Head of Sustainability, International Standards Organization (ISO)

At ISO, we recognize the Global Circularity Protocol (GCP) as a valuable contribution to accelerating the transition to a circular economy, aligned with ISO's circular economy standards and focused on practical implementation. Through ongoing exchange and collaboration with the GCP team, we're working to ensure coherence and enable interoperable, scalable action

**Jérôme Stucki**
Head of Circular Economy and Resource Efficiency unit, UNIDO

Frameworks such as the GCP provide the measurement and accountability tools needed to help industries transition from a linear to a circular model, generating significant environmental, economic and social benefits. By establishing common metrics and reporting standards, the GCP promises to enable developing nations to better integrate into global value chains while building more resilient, competitive and circular industrial ecosystems.

**Dr. Victoria Santos**
Coordinator of the Just Transition, Institute for Climate and Society (iCS)

The Global Circularity Protocol for Business represents a milestone by establishing a global framework to integrate circular economy principles into organizational strategies across material and resource flows, financial, reporting, and social dimensions. It contributes to climate mitigation and adaptation by providing global metrics and guidelines that help companies transition toward regenerative production and consumption models. The participation of the Instituto Clima e Sociedade (iCS) contributed to the incorporation of the perspectives of the Global South, ensuring that the circular transition is inclusive, just, and adapted to the productive and social realities of developing countries. In addition, iCS is committed to supporting the implementation of a pilot project with Brazilian companies, strengthening the practical application of the Protocol in the national context. This collaboration reinforces iCS's commitment to connecting global agendas on climate, industry, and finance with concrete and transformative solutions for Brazil and Latin America.

**Dr. Patrick Schröder**
Senior Research Fellow, Environment and Society Centre, Chatham House

In a time of geopolitical tensions and waning commitment from governments to address climate change, the Global Circularity Protocol for Business provides a shared compass for action and trust across borders. Multistakeholder coalitions of this kind are vital to keep the circularity transformation on track and ensure value chains remain resilient and future-ready

**Dr. Teresa Domenech**
Founder Director, UCL Circular Economy Lab

The GCP is a critical piece to enable the transformation of Circularity from the conceptual realm to its real-world implementation at scale. The GCP provides the tools, measuring frameworks and harmonized approaches to adopt circularity in organizations, aiming at measurable reductions of primary material use and associated GHG emissions. The GCP signifies a step change in the business landscape towards circularity

**Dr. Heinz Schandl**
Director, CSIRO's Circular Economy for Missions Initiative

As a researcher and policy advisor, I see the Global Circularity Protocol as a crucial bridge between measurement and transformation, providing the consistent indicators and governance mechanisms needed to steer business innovation towards a truly circular economy

**Dr. Hong-Quan Nguyen**
Associate Professor, Vietnam National University - Ho Chi Minh

The Global Circularity Protocol for Business serves as a strategic framework to unlock circular economy potential within green and decarbonization transitions. In the Global South, it not only enhances business competitiveness and innovation but also promotes integrated human–nature values through ecosystem restoration and resource regeneration, thereby encouraging multi-level policy alignment and cross-sector collaboration.

**Dr. Nancy Bocken**
Professor in Sustainable Business & Circular Economy, Maastricht University

The transition to a circular economy offers a powerful opportunity to tackle climate change, biodiversity loss, resource scarcity, waste and social challenges, and the Global Circularity Protocol (GCP) has a vital role to play. The GCP supports businesses in their adoption of unified approaches to driving and measuring the impact of circular initiatives and is an important enabler of circular innovation.

# Executive summary

### *What is the Global Circularity Protocol for Business and who is it for?*

The first version of the Global Circularity Protocol for Business (GCP) is a global voluntary framework to provide organizations with a standardized approach to measure, manage, and communicate their impacts to investors, regulators, customers, and value chain partners.

It supports business organisations of all sizes, sectors, and geographies, whether multinational corporations or SMEs, understand how to generate value in ways that support the transition to circular economic systems.

### *The business opportunity*

The information made available through the application of the Protocol will support businesses in building resilience, reducing costs and enhancing competitiveness. Benefits include:

- Measurement and management of material flows across complex value chains;
- Generation of comparable and decision-useful data;
- Identification of opportunities for circular innovation;
- Links between circular strategies and measurable outcomes across climate, nature, social equity and financial value creation.

### *Progressive user journey*

The GCP proposes a **step-by-step operational methodology applicable at different scales, from a single product to an organization's global systems**. It consists of a five-stage user journey, with flexible guidance to accommodate all contexts and capabilities. Its standardized scopes and indicators ensure the credibility and comparability of what organizations measure and report. Guidance ranges from defining use cases and boundaries, to selecting indicators, analyzing results and preparing external disclosures.

1. **FRAME your objectives:** Identify the objectives and use case for your impact assessment.
2. **PREPARE your circularity assessment:** Define boundaries, map the value chain, and identify risks and opportunities.
3. **MEASURE your progress on circular approaches to value creation:** Select indicators to assess risks, opportunities and impacts, demonstrate progress and implement processes to collect the necessary data.
4. **MANAGE your circularity performance:** Translate results into action by analyzing results, prioritizing interventions, applying improvements and establishing effective governance structures.
5. **COMMUNICATE with external stakeholders:** Share results with external stakeholders, including investors, regulators, business-to-business (B2B) customers and suppliers.

This journey is adaptable to an organization's diverse needs, ambitions and data availability, allowing it to start small (such as with a single product or material) and scale up to organization-wide reporting.

The Protocol defines three progressive levels of use – **Level 1 – Initiation**, **Level 2 – Expansion and Level 3 – Consolidation** – enabling organizations to advance from foundational to comprehensive

assessments. The GCP's iterative approach supports continuous improvement and learning, regardless of the starting point.

Through a common language and methodology, the GCP provides data and measures whose analysis could help accelerate an organization's shift away from the linear economy. By showing where to strengthen circularity efforts, not just as a compliance requirement, but as a strategic driver of growth and resilience.

### *Interoperability and key principles*

The GCP's key principles are **completeness, consistency, interoperability, inclusiveness, modularity, simplicity and practical applicability**. These principles ensure that the Protocol is actionable, relevant and feasible for real-world implementation.

A cornerstone of the GCP is its **interoperability** – aligning circularity data and insights with leading sustainability frameworks, such as the Global Reporting Initiative (GRI), the GHG Protocol, International Financial Reporting Standards (IFRS) S1/S2, European Sustainability Reporting Standards (ESRS) and Integrated Reporting. This alignment enables organizations that adopt the GCP to use its outcomes to reflect circularity disclosures in other environmental, social and governance (ESG) processes. This reduces reporting burdens and enhances data consistency.

### *Transformative impact*

The 2024 GCP Impact Analysis quantifies the transformative potential of the widespread adoption of the GCP:

- **Accelerating maturity** – Adoption could double the pace at which businesses reach advanced circularity maturity levels;
- **Material savings** – The GCP could yield cumulative global material reductions of 100–120 billion metric tons by 2050, equal to one year's current global material consumption;
- **Climate impact –** It could initiate emissions reductions of 6–7% per year between 2026 and 2050, translating to 67–76 gigatons $CO_2e$ avoided – about 1.3x–1.5x current annual global emissions;
- **Nature impact –** It could lead to 11–12% annual reductions in $PM_{2.5}$ pollution between 2026 and 2050, contributing to public health gains.

These insights reaffirm that the GCP can inform businesses on the basis of what they measure. Data collected through the application of the GCP can empower businesses to **drive circularity through impact-based decisions and by acting as a catalyst for global systems change**.

### *Governance and multistakeholder process*

The GCP is anchored in a robust, multistakeholder governance structure to ensure scientific rigor, credibility and independence. Its development has involved over 80 organizations and more than 150 experts, coordinated by the World Business Council for Sustainable Development in strategic partnership with the One Planet Network (hosted by UNEP).

Three advisory committees (business, policy and scientific) provided strategic guidance and review, ensuring that this first version of the Protocol is practical, robust and globally relevant. More information on the development of the GCP is available in the GCP website.

### *Continuous improvement and future versions*

This first version of the GCP is the starting point of a dynamic, multi-year journey, mirroring the maturation path of the Greenhouse Gas Protocol, which has grown to become the global reference for climate accounting. Future iterations of the Protocol will integrate lessons learned from its use and adoption, and the full development of those elements that do not appear in the first version.

Areas for integration in future iterations of the Protocol include establishing a science-based target-setting methodology for circularity across all sectors, integrating product-design standards and implications, developing a "Clean the Loop" module focused on pollution and toxicity, and covering marketing, advertising, consumer information and behavioral change aspects.

Supplements to the GCP will target additional audiences and provide sector-specific guidance, for example by deepening integration with the finance community through new indicators that capture circular risk and value in corporate finance, and by developing a comprehensive and targeted circularity policy framework for policymakers.

However, the ultimate effectiveness of the GCP thrives on collaboration. We invite all stakeholders – from pioneering organizations and policymakers, to researchers and financial experts – to contribute ideas, pilot methodologies and share lessons learned. This collective engagement ensures that future editions will remain globally relevant, practical and effective, actively accelerating the critical transition to a just and regenerative circular economy.

# Introduction

## What is the Global Circularity Protocol for Business

The Global Circularity Protocol for Business (GCP) accelerates the transition to a circular economy by providing a global framework for measuring, managing and communicating an organization's circular performance and its impacts. The GCP guides organizations in their transition to a circular economy with a step-by-step journey that places at its core the measurement of material flows that enter, move through and exit an organization's operational boundaries.

It enables them to embed circularity at the heart of their strategy while communicating decision-useful information that fosters trust and comparability externally, helping investors confidently direct capital toward scaling circular initiatives.

Designed to serve organizations of all sizes, sectors and geographies, the GCP offers a comprehensive approach to integrating circularity into strategy, operations and performance management. The GCP's standardized scopes for material flows and indicators will also enable the comparability of assessment results.

| | |
|---|---|
| ***Frame*** *your GCP objective* | ***Frame*** *your objectives*: Identify the objectives and use case for your circular performance and impact assessment. This stage provides guidance on clarifying the purpose, selecting the appropriate level of assessment and identifying the stakeholders who should be involved. |
| ***Prepare*** *your circularity assessment* | ***Prepare*** *your GCP circular performance and impact assessment*: Define boundaries, map the value chain and identify risks and opportunities. The material prioritization methodology, informed by the GCP's standardized scopes for material flows supports organizations in prioritizing materials for their assessment by focusing on impacts, risks, opportunities and value chain hotspots. |
| ***Measure*** *your circularity performance* | ***Measure*** *your circular performance and impact*: Select indicators and collect data. The circular performance and impact measurement methodology links circular strategies to measurable outcomes across climate, nature, social equity and financial value creation. |
| ***Manage*** *your circularity performance* | ***Manage*** *your circular performance and impact*: Translate results into roadmap by analyzing results, prioritizing interventions, applying improvements and establishing effective governance structures. |
| ***Communicate*** *with external stakeholder* | ***Communicate*** *with external stakeholders:* Share results with external stakeholders, including investors, regulators, business-to-business (B2B) customers and suppliers. A structured reporting and disclosure methodology, providing decision-useful reporting for investors, regulators, customers and value chain partners. |

### *Rooted in systems thinking and a comprehensive approach to a circular economy*

The Global Circularity Protocol for Business uses a ***systems thinking*** approach, recognizing that material use and impact are not isolated events, but shaped by interactions across four interconnected systems (corporate, environmental, economic and social systems).[2] The GCP reflects this *systems thinking* approach with the introduction of a standardized scope framework for the operational boundaries that categorizes the material flows to the level of the organization's control and the interaction with the systems.

Fully aligned with the Ellen MacArthur Foundation's ***circular economy principles***[3] the GCP supports strategies that design out waste and pollution, keep products and materials in use at the highest value and regenerate natural systems. In that sense, the GCP circular performance assessment not only aims to reduce reliance on virgin or non-renewable resources and minimize waste (close the loop) but also aims at the reduction in overall material consumption and the extension of the useful life of products (narrow and slow the loop). In addition, the GCP also adopts a holistic sustainability approach by connecting circularity with climate, nature and social impact to ensure that circular practices deliver genuine sustainability benefits (impact of the loop). Finally, the GCP supports organizations in quantifying the economic value generated through circular strategies to further position circularity as a key driver of competitiveness and value creation (value the loop).

### *Resource focus in version 1*

In this context, GCP v1.0 defines the list of material categories (biomass, metals, non-metallic minerals, fossil resources, plastics, critical raw minerals and hazardous materials) that organizations should focus on to identify the resources and components present in each material flow when preparing their circular performance and impact assessment.

While the GCP recognizes the critical importance and interconnectedness of resources in enabling circularity, it does not consider all of these resources in the GCP v1.0. Water is not included in this categorization of materials as water flows represent significant flows and would dominate the other material flows for the assessment. Water can have its own circularity assessment (see CTI v4.0[4]), which aims to lower freshwater demand and ensure water resource availability for all users and the environment. GCP v1.0 includes fossil resources in the material categories only when used as feedstock and not energy carriers (i.e., not for energy purposes). As most organizations already have metrics in place to measure renewable energy consumption for business operations, GCP does not include the % renewable energy indicator in this version.

This choice establishes a clear and actionable starting point for the GCP and leaves room for future versions of the Protocol to expand this definition. Circularity in this version focuses specifically on the cycling of physical materials and processes. Future iterations will explore how to more explicitly link circularity metrics and climate impacts.

### *Built for collaboration, designed for scale*

Optimizing material circularity requires collaborative action. The GCP's design aims to facilitate collaborative action across circular value networks[5] and enable organizations to act now by engaging partners, suppliers, customers, policymakers, logistics and waste management actors to close, narrow and extend loops, scaling solutions for R-strategies (refuse, rethink, reduce, reuse, repair, refurbish, remanufacture, repurpose, recycle and recover) and impact reduction. Unlike a traditional value chain, a circular one adopts a holistic perspective, recognizing the interconnectedness of all life-cycle stages and multi-sector relationships. This systemic approach fosters knowledge sharing, identifies new opportunities and helps make circularity a pervasive driver

of business strategy. It also encourages continuous improvement, guiding organizations to use circularity metrics to inform product design, procurement, innovation and investment, positioning circularity as a key driver of competitiveness and value creation.

As the development of sustainable value chains is not a static goal but a continuous journey, the GCP helps organizations set targets, track improvements and refine their strategies over time, moving from fragmented pilots to scalable transformation.

The ability of organizations to contribute to a circular economy depends on multiple factors, including regulatory environments, customer expectations, available technologies and broader market conditions. As a result, organizations approach circularity from different starting points. Industry, size and geography strongly shape how they engage with circularity: multinationals can leverage scale and resources to implement advanced systems, but face complex supply chains and regulatory hurdles; small and medium-sized enterprises (SMEs) are often more agile and innovative, but may lack capacity or digital infrastructure; and organizations in the Global South play central roles in recycling and resource recovery while navigating systemic challenges such as informality, economic shocks and local constraints. Recognizing these differences, the GCP supports all types of actors, offering guidance and flexible approaches that accommodate varying capabilities, contexts and stages of circularity implementation.

### *GCP principles*

The GCP design principles are the foundational values that guide the Protocol's development and its intended application. As circularity performance and impact measurement is a new and evolving space for many businesses, these principles draw on established practices from financial and sustainability reporting and accounting principles, while addressing the unique needs of a circular economy. They also reflect a collaborative development process, shaped by input from stakeholders across business, policy and academia to ensure the Protocol is both practical and robust.

- **Completeness:** Account for and report on all material use in the chosen scope. Disclose and justify any specific exclusions;
- **Consistency:** Use common and cross-sector language, guidance and metrics;
- **Interoperability:** Build and align with existing circularity standards and frameworks (refer to the below box);
- **Inclusiveness**: Accommodate organizations regardless of their size or geographic location, striving for positive impact in any community or region;
- **Modularity**: Address different business needs and challenges while preserving the coherence of the overall framework;
- **Simplicity**: Ensure metrics are simple and guidance streamlines processes, decision-making and data collection;
- **Practical applicability:** Ensure the methodology and guidance are actionable, relevant, and feasible for real-world implementation.

## Interoperability

The GCP's design strives for interoperability, supporting the alignment of circularity data and insights with other sustainability reporting and performance management systems.

### *The GCP builds on the foundation of WBCSD's CTI*

The GCP's circular performance assessment methodology builds on WBCSD's Circular Transition Indicators (CTI).[6] CTI has provided the foundation for indicators to assess an organization's circular performance and its sustainability impacts. CTI guides for fashion and textiles, built environment, electronics and chemicals are available for additional guidance on certain indicators, as they provide sector-specific insights on data sources and calculation approaches. While these guides follow a different structure and do not cover the full set of indicators included in the GCP, they offer complementary detail for overlapping indicators and are therefore usable alongside Stage 3. Measure where relevant. The CTI will not be further developed as the GCP now continues the work initiated under CTI.

### *Alignment with other frameworks and standards*

The GCP aligns with widely recognized sustainability and disclosure frameworks, including the Global Reporting Initiative (GRI), International Organization for Standardization (ISO) 59020, ISO 59004, GHG Protocol, International Financial Reporting Standards (IFRS) S1/S2, European Sustainability Reporting Standards (ESRS) and Integrated Reporting <IR>. This alignment enables organizations to integrate circularity into existing environmental, social and governance (ESG) processes and use a single source of data for all reporting channels, enhancing consistency and reducing the overall reporting burden and potential for duplication.

Where possible, the GCP aligns with existing standards. In areas where standards are lacking or competing, it seeks to identify and adopt best practices. Looking ahead, the GCP aims to play a key role in driving greater harmonization. While using the GCP does not equate to automatic compliance, it enhances preparedness by helping organizations identify disclosure gaps and generate consistent, decision-useful data on circularity. GCP Stage 5. Communicate highlights these links with external stakeholders to guide integration into existing ESG strategies.

## Why use the GCP?

### *The business opportunity behind the circular economy*

The extraction and use of natural resources are fundamental to the global economy – fueling progress, innovation and prosperity. Yet this is becoming increasingly unstable. According to the International Resource Panel (IRP), the increased extraction and processing of materials already account for more than 55% of global greenhouse gas (GHG) emissions and over 90% of biodiversity and water stress impacts.[7] This trajectory is not only environmentally unsustainable – it is economically reckless. Safeguarding future prosperity and resilience as resource scarcity grows requires an urgent and fundamental shift in how we value, use and manage resources.

This amplifies pressure across global value chains, as businesses face mounting physical risks from climate change, tightening environmental regulations and increasing volatility in resource availability and prices. The WBCSD's *2025 Business Barometer* highlights that, amid geopolitical uncertainty, businesses are maintaining transition investments and focusing on solutions that support long-term competitiveness.[8]

The business opportunity lies in responding to this challenge by redesigning systems, business models and operations and how we value, use and manage resources is at the very heart of this transformation. The circular economy reframes resource use as a value driver by keeping products and materials in use for as long as possible, designing out waste and pollution and regenerating natural systems. It moves business beyond the linear "take-make-waste" model or the "disposable economy", toward a system that is more resilient, efficient and future-fit,[9] offering a major macroeconomic opportunity. Adopting circular economy practices offers businesses a range of tangible advantages.[10] By conserving resources and minimizing waste, organizations can reduce operational costs while improving efficiency. These savings can directly increase profit margins and strengthen long-term competitiveness. Circular approaches also mitigate risks, whether from resource scarcity, supply chain disruptions or evolving regulatory requirements, such as extended producer responsibility. Beyond financial benefits, businesses can gain reputational and brand value, positioning themselves as sustainability leaders. This, in turn, enhances their attractiveness as employers, supports innovation and collaboration across industries and helps ensure resilience despite future market and policy shifts.

A fundamental transformation of how to design, use, manage and (re-)circulate materials has started, the definition of the circular economy, but to truly leverage the dual opportunity of sustainable long-term returns and improved mitigation of resource-related risks, annual investment amounts will need to improve on the 2021 peak of USD $41 billion.[11]

The transition to a circular economy, and the required transformational capital, will benefit from the Global Circularity Protocol for Business, much like the Greenhouse Gas Protocol (GHG Protocol) has accelerated the energy transition.[12] Due to the lack of harmonized tools and guidance to measure and compare performance, financial markets currently struggle to assess circular performance and impacts across portfolios and policymakers face significant data gaps and do not have a common baseline for the development of government policies.[13] These fragmentation issues obscure value creation, hinder the measurement of policy impact and the deployment of fiscal support to scale the circular transition, and slow the systemic shift businesses need.

Recognizing the urgency and ambition from the private sector, the World Business Council for Sustainable Development (WBCSD) introduced the initiative to develop the GCP at the United Nations Stockholm+50 meeting in 2022. Following strong stakeholder support, WBCSD partnered with the One Planet Network (OPN) Secretariat, hosted by the United Nations Environment Programme (UNEP), to formally initiate the development of the Protocol in June 2023.

### *A strategic advantage*

The GCP helps businesses turn circular strategies into measurable advantage by enabling them to:

- **Measure and manage material flows across complex value chains** to reduce exposure to resource shocks and allowing for credible, forward-looking disclosure that goes beyond mere compliance;
- **Generate decision-useful and comparable data to strengthen internal and external transparency, accountability and trust,** to align with investor and regulatory expectations on circular performance and its impacts, reducing regulatory risks and attracting new sources of capital;
- **Identify opportunities for circular innovation in products, services and business models,** driving resource efficiency across operations and value chains and allowing businesses to position themselves strategically and unlocking financial value in a resource-constrained global market characterized by volatility;

- **Link circular strategies to concrete, measurable outcomes across climate, nature and social equity**, allowing for evidence- and impact-based, verifiable sustainability claims that build trust with consumers, value chain partners and policymakers and strengthen alignment with global sustainability objectives.

### *Transformative impact*

The *2024 GCP Impact Analysis*[14] quantifies the transformative potential of the widespread adoption of the GCP:

- **Accelerating maturity –** Adoption could double the pace at which businesses reach advanced circularity maturity levels;
- **Material savings –** The GCP could yield cumulative global material reductions of 100–120 billion metric tons by 2050, equal to one year's current global material consumption;
- **Climate impact –** It could initiate emissions reductions of 6–7% per year between 2026 and 2050, translating to 67–76 gigatons $CO_2e$ avoided – about 1.3x–1.5x current annual global emissions;
- **Nature impact –** It could lead to 11–12% annual reductions in $PM_{2.5}$ pollution between 2026 and 2050, contributing to public health gains.

These insights reaffirm that the GCP goes far beyond measurement, empowering businesses to drive circularity through impact-based decisions and acting as a catalyst for global systems change.

By embedding the GCP in corporate strategy and disclosure, organizations can improve performance, shape markets, influence regulation and contribute to a regenerative, future-fit economy.

## How to use the GCP

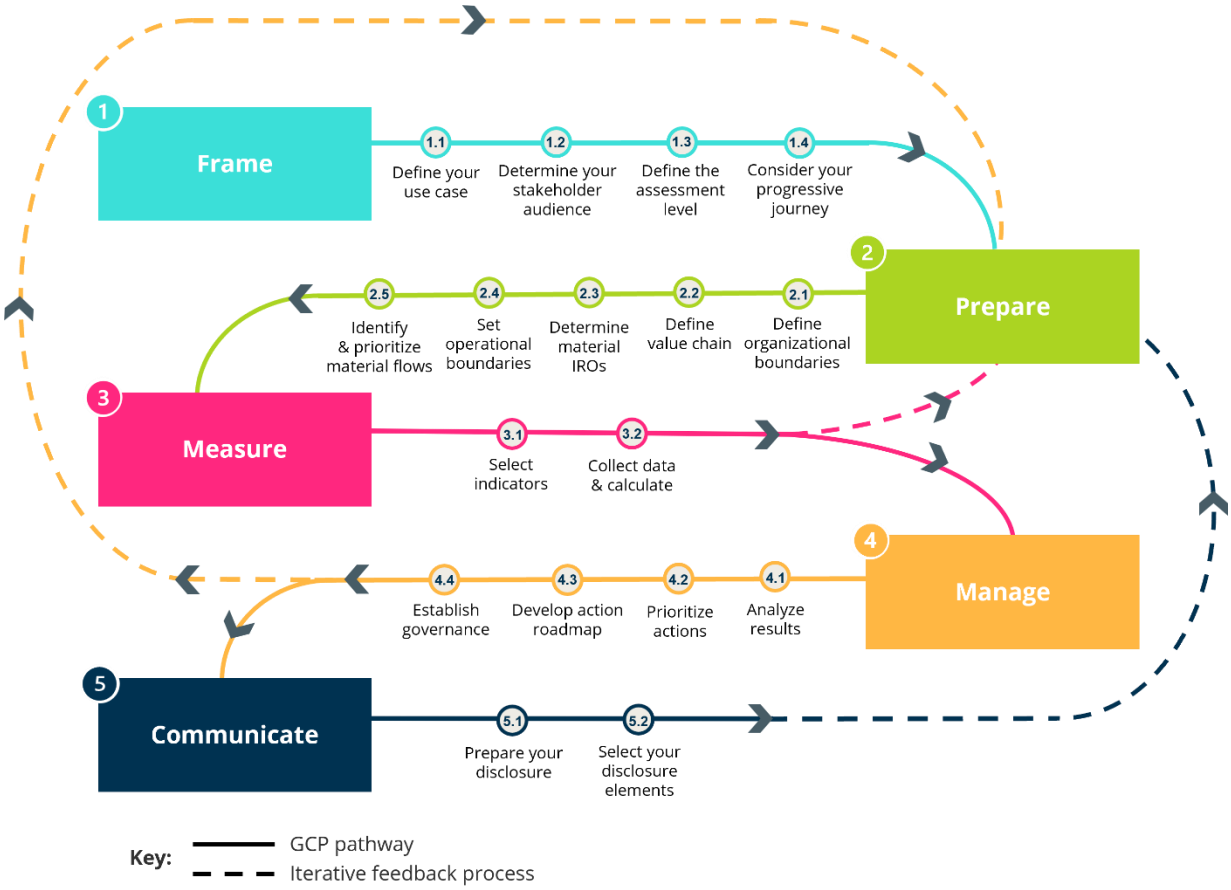
### *A flexible user journey*

The GCP user journey is a series of summarized steps that follow five stages. It offers a structured yet flexible framework that adapts to diverse needs, ambitions, readiness and levels of data availability to meet organizations wherever they are on their journey. This approach allows them to start with smaller-scale assessments, such as an internal steering exercise on a single product, and build all the way up to organization-wide reporting and disclosure. It enables the integration of circular strategies at the scale and stage that best fits the business.

Importantly, achieving a fully circular value chain is not the end goal for a business – the GCP assumes that a business that is part of the circular economy transition is undergoing a continuous process of learning and refinement to achieve sustainability, with circular economy principles an important part of their toolbox. The GCP does not assign value judgments to starting points; instead, it equips organizations to assess where they stand, identify areas for progress and prioritize actions that reduce dependence on virgin and non-renewable resources. The iterative nature of the Protocol supports the transition from linear to circular systems, helping them build resilience and unlock both short- and long-term opportunities.

Applying the framework flexibly means that, depending on your organization's desired vision, not all sections (Figure 1 displays the full pathway) are required and an organization can make different choices in terms of scope, selection of indicators or management plan. As indicated below, the GCP is also an iterative process, with many opportunities to go back to previous stages to achieve continuous improvement.

## Figure 1: Overview of the GCP user journey




***Note**: Stage 2. Prepare is applicable in different orders depending on the specific use case applied.*

***Note**: In version 1 of the GCP, Stage 5. Communicate exclusively focuses on reporting and disclosure and thus is not considered for resource risk management and internal steering.*

### *A progressive user journey: initiation, expansion and consolidation*

An organization's ability to transition to a circular economy varies widely depending on regulation, market conditions, technology and customer expectations. Factors such as industry, size and geography shape their approaches: large multinationals have resources but face complex systems; small and medium-sized enterprises (SMEs) are agile but often resource-constrained.

While the GCP offers a comprehensive framework, organizations with limited data, expertise or capacity can adopt a phased approach by prioritizing the most applicable areas first. To support this, the GCP defines three levels of use: initiation, expansion and consolidation. This approach provides a pathway for organizations to start, prioritize foundational elements, and grow their positive impact, according to their current expertise, experience, or data availability. More details on

this staged approach can be found in Stage 1. Frame – 1.4 Consider your progressive user journey and Annex 2: The GCP progressive user journey.

### *The GCP 5-stage journey*

#### Stage 1. Frame

*1.1 Define your use case* – Identify the relevant use case to help determine how you use the GCP; examples include:

- External reporting and disclosure of the circular economy performance of a business unit or function;
- Portfolio steering on a product level;
- Risk assessment for a single material.

*1.2 Determine your stakeholder audience* – Identify those stakeholders your organization's activities impact and their specific interests in circularity data*:*

- Investors, decision-makers, customers, regulators, policymakers and other stakeholders requiring transparent and comparable circular performance data;
- Product managers, portfolio managers and internal decision-makers in organizations;
- Sustainability, supply chain and procurement managers, and risk management professionals.

*1.3 Define the assessment level* – Select the appropriate assessment level at which you will conduct the circular performance assessment, while also determining the subject of the analysis (referred to as subject under assessment), ensuring that your organization's assessment produces consistent, meaningful and comparable results.

#### Stage 2. Prepare

*2.1 Define organizational boundaries* – Specify which subsidiaries, business units or geographical locations you are including in your organization's assessment.

*2.2 Define your value chain and identify circularity hotspots* – Map the activities and processes associated with material flows and products, from extraction to end-of-life management. Through this section, use the guiding principles to identify which parts of your organization's value chain(s) to include in the assessment.

*2.3 Define your organization's material impacts, risks and opportunities (IRO) related to resource use and circularity* – Conduct a double materiality assessment on the environmental interactions and value chain interactions associated with your organization's value chains to identify the material IROs.

*2.4 Set operational boundaries for material flows* – Identify which material IROs are within your organization's direct control or indirect control. Reporting on operational scopes ensures consistent and transparent reporting, allowing for the accurate tracking of progress while disclosing to external stakeholders in a comparable way.

*2.5 Identify and prioritize your materials* – Identify the materials and products that have material impacts in your organization's defined organizational boundaries.

#### Stage 3. Measure

*3.1 Select indicators* – Consider monitoring indicators, such as percentage circular inflow and outflow, to gain valuable insights into your organization's progress on circular material use.

Depending on your organization's strategic goals, use case and stakeholder needs, additional indicators may provide decision-useful insights.

*3.2 Collect data and calculate* – Gather data points for each indicator, including from internal data sources. Document the methodologies, data sources, gaps and assumptions used in the calculations. With the data collected, perform the calculations as guided by the indicators.

### Stage 4. Manage

*4.1 Analyze* – Contextualize your circular performance assessment results to identify patterns, inefficiencies and opportunities for action. Compare results across business units, product lines and value chain stages to identify where targeted interventions can drive the greatest impact. Tracking progress over time allows for thorough evaluations, strategy adjustments and staying in line with internal targets and industry levels.

*4.3 Develop an action roadmap* – Identify hotspots and areas of strategic importance based on your organization's exposure to circular risks and opportunities, enabling you to focus efforts on high-impact areas and developing actionable roadmaps to improve circular performance. The combination of the analysis and prioritization sections culminates in the formulation of targets and tangible actions that ensure transparency and accountability.

*4.4 Establish governance* – Define strategic priorities, roles and responsibilities, cross-functional collaboration, targets, accountability mechanisms and data structures to embed circularity as a shared organizational priority rather than confining it to sustainability teams. Monitor progress via regular reporting, performance reviews and corrective actions, and maintain comprehensive internal documentation.

### Stage 5. Communicate

*5.1 Prepare your disclosure* – Consider your target audience, the decision usefulness and apply reporting principles to communicate about the most effective narrative

*5.2 Select your disclosure elements* – Use the detailed, practical guidance provided, applying it according to your defined level of assessment, reporting scope, and accounting principles. Structure your disclosures in line with the four key disclosure pillars. Tailor your communications to different stakeholder groups, using the audience-specific recommendations.

**Note**

It is recommended to obtain third-party assurance of your data and disclosures to enhance credibility and build trust with stakeholders. This involves engaging an independent assurer to verify the accuracy and completeness of your reporting. Guidance on obtaining third party assurance is not included in GCP v1.0.

## GCP governance

To guarantee scientific rigor, credibility, independence and continuity, the Global Circularity Protocol for Business is anchored in a robust governance structure.

The advisory bodies provide strategic guidance and review the work co-developed by the Technical Working Group, which brings together more than 80 organizations and over 150 experts. At its core are three Advisory Committees – business, policy and scientific – each of which includes experts from diverse regions who provide technical and strategic input.

The Steering Committee (ExCo), jointly represented by the WBCSD and UNEP-hosted One Planet Network (OPN) as co-developers, oversee the GCP.

This governance model ensures balanced decision-making and trust by combining scientific integrity, business relevance and practical usability, while reflecting diverse stakeholder perspectives – including voices from both the Global North and South across business, policy and finance. In doing so, it safeguards the Protocol's credibility, contextual applicability and long-term scalability. For more details on the composition of the Advisory Committees, please see the Acknowledgements.

## Evolving to meet the future

This first version of the GCP is a starting point: it introduces the core concepts, methodologies and indicators needed to begin measuring and advancing circularity. It provides a common language and a credible foundation for organizations to take strides in addressing their circularity performance.

It is not a timeless, all-encompassing framework; the intention is to build it out further in future iterations as it gains adoption and momentum, by enabling organizations to begin the journey with clarity, transparency and confidence. Thus, the aim is to set realistic expectations of what it is and what it is not (yet).

We invite businesses to engage with this first iteration by:

- Applying the core methodologies to baseline and improve circularity performance;
- Collaborating with stakeholders to strengthen comparability and interoperability across sectors and geographies;
- Sharing feedback and lessons learned, so that the Protocol evolves in step with real-world needs.

The Future versions section describes in more detail how the Protocol will expand and its scope deepen over time.

# Stage 1. Frame

This stage supports your organization in framing the objectives of the circular performance and impact assessment, setting up cross-functional teams and securing the necessary buy-in from internal stakeholders. It also presents the different levels of assessment that you can use in the GCP, inviting your organization to select the most appropriate scope.

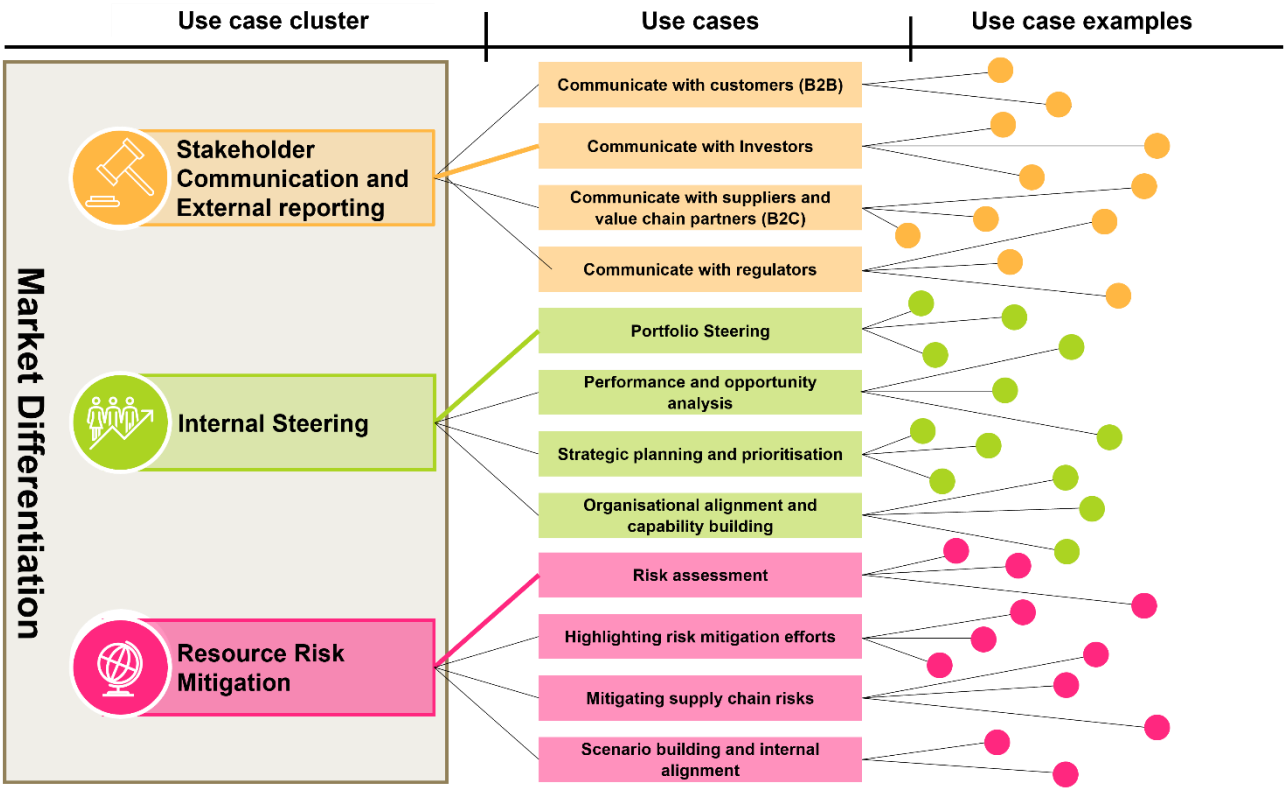
## 1.1 Define your use case

The GCP helps you define your organization's vision for circularity by proposing three strategic use cases. Each use case represents a customized pathway through the Protocol. The three strategic use cases are for illustrative purposes and do not represent an exhaustive list of potential GCP applications. Note that you can complete these at a material, product or organization level.

- **Resource risk mitigation**: This use case focuses on identifying and mitigating risks associated with material flows. It involves reducing reliance on critical materials, mitigating risks from supply chain disruptions and resource scarcity, and improving material sourcing by implementing strategies to secure access to non-virgin and renewable materials. This enhances supply chain resilience through diversification and closed-loop systems, ensuring compliance with regulations related to critical raw materials and responsible sourcing. This approach differentiates your organization through resilient and responsible sourcing practices, building trust with stakeholders.
- **Internal steering**: This use case applies the GCP to drive internal decision-making and improve operational efficiency. It involves optimizing product portfolios, services and activities through data-driven insights, prioritizing investments in circular product design, sustainable sourcing and enhanced recovery systems. This approach leads to improved product design focused on durability, reuse, repairability and recyclability, minimizing waste and maximizing resource efficiency; furthermore, it facilitates circular production by reducing the use of virgin non-renewable materials and increasing production effectiveness, potentially creating new business models. Ultimately, this use case enhances resource efficiency, reduces material use and environmental impact, and aligns internal key performance indicators (KPIs) across teams, fostering a culture of continuous improvement and differentiating your organization's products, services and activities through mature sustainability practices leading to enhanced performance.
- **External stakeholder communication and reporting**: This use case focuses on transparently communicating your organization's circularity performance to stakeholders, building trust and credibility through standardized, comparable reporting. This enhances investor, policymaker and decision-maker confidence, attracts environmentally conscious customers, ensures compliance with evolving regulations and demonstrates proactive engagement with regulatory bodies. Furthermore, it strengthens supply chain relationships by improving transparency and collaboration, ultimately positioning your organization as a circularity leader and gaining a competitive advantage. This differentiates your brand through a demonstrable commitment to sustainability and transparency, attracting investors and partners who share your organization values and goals.

By determining the use case, your organization can effectively leverage GCP to achieve its strategic goals and create significant value for the business and stakeholders. Refer to Annex 1 for more detailed use case examples.

**Figure 2: Overview of use case categories and use cases (non-exhaustive)**




***Note**: Highlighted bold lines represent the 3 example use cases explored in this stage; Annex 1 explores the use case examples in detail.*

## 1.2 Determine your stakeholder audience

Identifying the stakeholders for whom the assessment is the most relevant is an important part of framing the process. These can include external stakeholders such as investors, customers, regulators, policymakers and others requiring transparent and comparable circularity data. It can also include internal stakeholders, including product and portfolio managers, sustainability teams, supply chain and procurement functions and risk management professionals. Clarifying these groups and their specific interests ensures the assessment speaks to the right priorities and delivers meaningful insights.

Additionally, when organizing a circular performance assessment and framing its scope, it is helpful to involve teams such as sustainability, operations, finance, procurement, business units and products from the outset. Early engagement can facilitate access to the right data, build internal buy-in and streamline the assessment process. Establishing a cross-functional working group or steering committee at the start may further strengthen collaboration and support effective coordination throughout the assessment.

Additional stakeholders may emerge whom you should take into consideration. For more in-depth guidance on setting up a solid governance structure and fostering internal collaboration, please refer to Stage 4. Manage.

## 1.3 Define the assessment level

This section offers guidance on selecting the appropriate assessment level to conduct a GCP circular performance assessment. It also supports the determination of the subject under assessment to ensure that it yields consistent, meaningful and comparable results.

Your organization should select one of the following levels of assessment – material/resource, product or business unit/organization level – considering the purpose of the analysis and your selected use case. You might use an organization-level assessment to comply with the requirements of corporate sustainability reporting mandated by national regulations and use other levels for internal monitoring and decision-making.

You can approach circular performance assessments progressively. Your organization might find it practical to begin at the material/resource or product, service and activity level and then expand to the business unit or organization level over time.

***Note***

- **Material/resource level:** Choose a specific material/material group for the assessment. The material can be present in several products. An example use case is a risk assessment for a single material.
- **Product, service and activity level:** Chose one product, service or activity for the assessment. An example use case is portfolio steering on a product, service, activity level.
- **Organization or business unit level:** Choose all operations in an organization or across units of a certain number of business. An example use case is stakeholder communication and external reporting.

Annex 1 provides information on these three use case clusters.

***Examples***

**The different assessment levels**

***Material/resource level:*** *An electronics company chooses to assess circularity at the material level, focusing on a selection of specific raw materials (e.g., neodymium, copper, plastic) in its products due to supply risk and strategic importance. This is an example of an internal assessment.*

***Product, service and activity level:*** *A car manufacturer assesses the benefits of a circularity initiative for an electric vehicle (EV) battery take-back scheme by selecting the assessment level as a product, in this case an EV battery and all materials required to build one. Examples of service and activity include a subscription service for cars or a refurbishment/ repair service.*

***Organization or business unit level:*** *A technology company operating in multiple areas – such as consumer electronics, energy storage and automotive systems – conducts the assessment to report on its performance as a whole or focus on a specific business unit to track the performance of that unit.*

***Example***

**Case study: An electronics manufacturer assesses its circularity performance over the previous year for external reporting and disclosure**

*The organization aims to disclose the performance of the entire organization. The assessment level is therefore the organization level.*

## 1.4 Consider your progressive user journey

To facilitate a staged implementation of the GCP's stages (see the GCP 5-stage journey) while ensuring consistency and comparability in circular performance and impact measurement results, the GCP sets out three levels that define a clear roadmap from starting with the foundational elements of the GCP to fully capturing the value of a circular and impact assessment based on the GCP.

- **Initiation (Level 1)** is for organizations that are just starting to measure their circular economy performance and/or must focus their efforts for other reasons. At this level, organizations are free to define themselves which impacts, risks and opportunities should be assessed and only have to focus on material flows that are under their direct control, such as procured materials or product components.
- **Expansion (Level 2)** is for organizations that have laid the foundation and want to grow their impact, by applying a more complete set of metrics in their assessment and by including stakeholders in defining impacts, risks and opportunities that should be the focus of the assessment (for assessments at the level of an organization)
- **Consolidation (Level 3)** is for organizations with sufficient value chain data that can also include impact assessments and material flows that are under indirect control in their assessments.

Note, an organization may have different user journeys for different products or materials (i.e., one product is at initiation, another product is at expansion).

Your organization should select one of the three levels based on your data availability, expertise or capacity. The detailed criteria for moving from one level to another is available in Annex 2.

### Table 1: The 3 levels of the progressive user journey

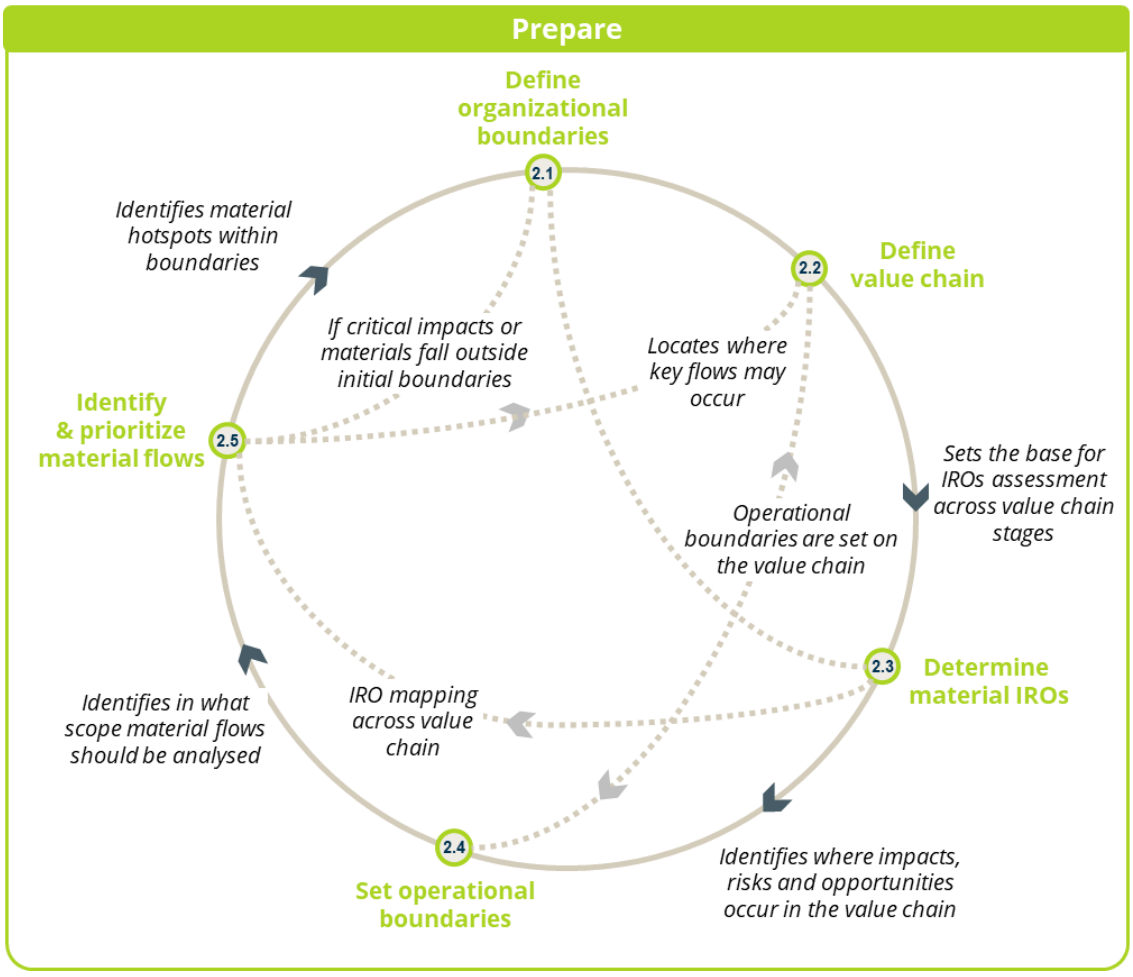
<table>
<tr><th rowspan="2">Stage</th><th colspan="3">The 3 levels</th></tr>
<tr><th>Initiation<br>(level 1)</th><th>Expansion<br>(level 2)</th><th>Consolidation<br>(level 3)</th></tr>
<tr><td>Prepare –<br>Operational boundaries</td><td colspan="2">Organizations focus in their assessment on material flows that are under their direct control</td><td>Organizations include both material flows under their direct control and under indirect control (where relevant) in their assessments</td></tr>
<tr><td>Prepare –<br>Impacts, risks, opportunities</td><td>Organizations decide themselves which impacts, risks and opportunities to investigate in their assessment</td><td colspan="2">For assessments at the organization level: organizations identify which impacts, risks and opportunities to investigate in their assessments through stakeholder consultation</td></tr>
<tr><td>Measure –<br>Select indicators</td><td>At least 1 core metric that measures the circularity of material flows or the intensity of material use is included in the assessment.</td><td>All core metrics that measure the circularity of material flows and the intensity of material use are included in the assessment.</td><td>All core metrics that measure circular performance are included in assessment, as well as relevant impact metrics (e.g. GHG emissions, biodiversity, etc.).</td></tr>
</table>

# Stage 2. Prepare

This stage guides organizations in preparing their circular performance and impact assessment (refer to Stage 3. Measure) by defining your system boundaries - including organizational and operational boundaries - mapping your value chain and identifying circularity hotspots, determining material impacts, risks and opportunities, and identifying and prioritizing material flows.

While the applicability of each section is inclusive, you can determine which sections are the most pertinent to your organization's needs, allowing for a tailored and efficient circular performance assessment. Refer to Stage 1. Frame to review how sub-sections in this can fulfill various use cases.

## Figure 3: Applicability and outcomes of Stage 2. Prepare



## 2.1 Define organizational boundaries

This section provides guidance for organizations to select an approach to define their organization's *organizational boundaries*, i.e., the operations the organization owns or controls.

### *Why set organizational boundaries?*

Setting your organizational boundaries will map the activities of the value chain life cycle that your organization owns and controls. While this is relevant for the three levels of assessment (product, material, organization), you should determine the organizational boundaries only for the subject under assessment (see Map the activities inside and outside your organizational boundaries).

Note, for setting operational boundaries (refer to 2.4 Set your operational boundaries for material flows), the organizational boundaries guide you in defining which material flows are under your direct control, i.e., the parts of the value chain your organization owns and controls (scope A and B) versus those under its indirect control (scope C), i.e., those related to your organization's value chain, but that it doesn't own or control.

To set your organizational boundaries, you need to select a consolidation approach that will define which operations, subsidiaries or joint ventures you will include in your assessment.

**How to select a consolidation approach to set organizational boundaries?**

Your organization should select a consolidation approach established by global frameworks such as the GHG Protocol: financial control approach (i.e., alignment with financial reporting), operational control approach or equity share approach. See the GHG Protocol note below for details.

### *How to choose your consolidation approach?*

- If you have already selected a consolidation approach (from the GHG Protocol or based on regulations like CSRD or national jurisdictions), you should use the same to remain consistent between your various sustainability assessments (or explain why they deviate).
- If you have not selected a consolidation approach:
  - You may simply consider aligning with your organization's financial reporting boundaries (financial control approach) or aligning with external requirements (regulations like CSRD, global frameworks like IFRS S1 or national jurisdiction);
  - Alternatively, you can use the following considerations to support your decision-making based on the subject under assessment:
    - Over which operations do I have operational or financial control?
    - Which parts of my organization (subsidiaries, joint ventures, partnerships) contribute to the material flows that my organization wants to assess?
    - What are the operations that directly contribute or have the potential to contribute, to the circularity of my material flows?

In any case, consistency in using the approach year after year when measuring the circularity performance is key to enabling comparability and transparency when communicating.

***Note***

***The GHG Protocol – Setting organizational boundaries***

Under the GHG Protocol, organizations can choose between the control and the equity share approach.

**Control approach**

Organizations can choose between the **financial control and operational control** criteria.

- Financial control: This approach includes all business operations where the organization has the power to make financial and operational decisions to generate profit. This could be because the organization has majority ownership, receives most of the financial benefits or bears the most financial risks.
- Operational control: This approach includes all business operations where the organization or one of its subsidiaries has the direct authority to set and implement day-to-day operational policies.

**Equity share approach**

This approach considers the organization's percentage of ownership in each business operation. The organization's organizational boundaries would include a proportional share of each operation based on its equity stake.

Future versions of the GCP will include updated approaches in line with Greenhouse Gas Protocol (GHGP) revisions.

See the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard, Revised Edition (2004)[15] for additional guidance on the distinctions between the approaches.

## 2.2 Define the value chain and identify circularity hotspots

This section guides you through the steps to define your value chain for your circular performance and impact assessment, with the aim to map the activities, stakeholders and circularity hotspots associated.

Guidelines and regulatory requirements (e.g., OECD Guidelines for Multinational Enterprises on Responsible Business Conduct; CSRD and ISO 59010 on Circular Value Network) are increasingly mandating the defining and disclosing of elements of your value chain.

A detailed understanding of the value chain, including circularity hotspots, inherently defines the *operational boundaries* (i.e., which activities are under direct control and which activities can have external influences, e.g., indirect control) that are relevant for circularity performance measurement, management and communication of the subject under assessment.

### *Value chain definition*

*Value chain* refers to the full set of interconnected activities (i.e., primary and secondary activities), stakeholders and actors across the value chain life-cycle stages (Figure 4) associated with the subject of your circular performance assessment.

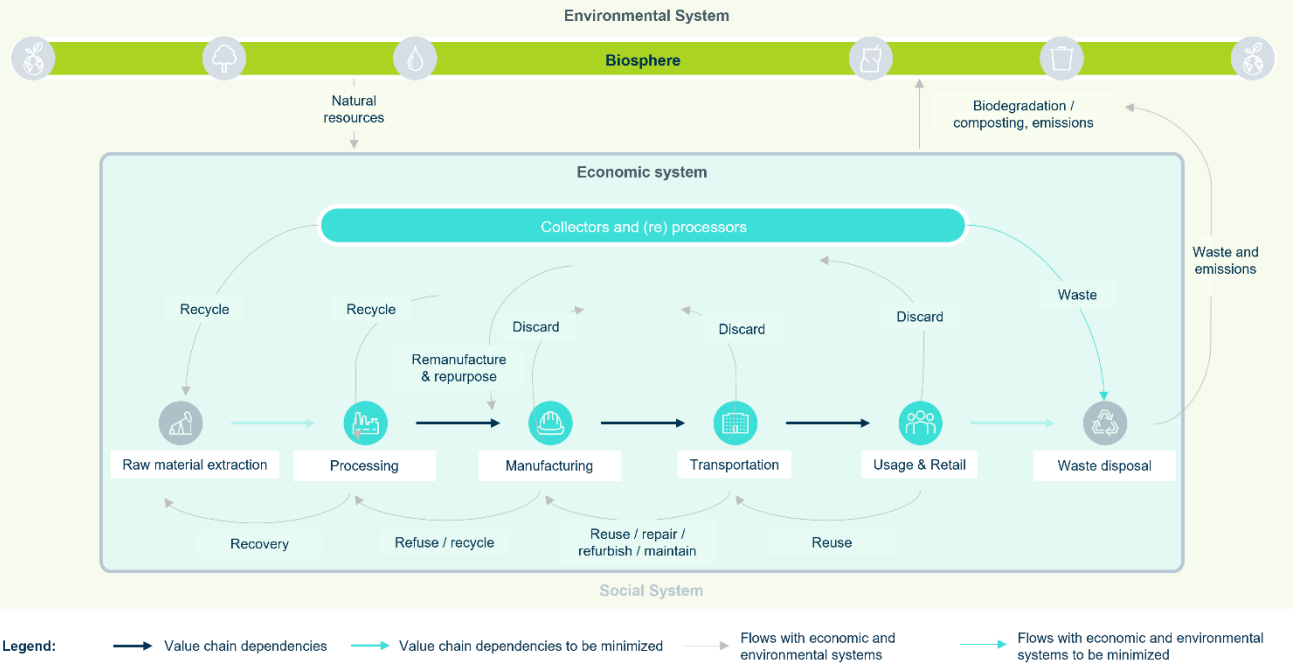
The value chain includes:

- Physical processes across the value chain life-cycle stages (interconnected primary and secondary activities) including the organization' own operations:
    a. *Primary activities* are directly involved in raw material extraction, manufacturing, processing, transportation, use and retail, recovery and waste disposal, associated with the material, product or service, e.g., production processes, logistics;
    b. *Secondary activities* support the primary activities; they significantly influence resource use and circularity contributions across the broader economic system, e.g., procurement, human resources, technology development, technology innovation.
- Stakeholders undertaking these activities (e.g., suppliers, service providers, users, waste handlers);
- Actors that can influence them (e.g., regulators, investors, consumers, civil society).

The value chain is therefore embedded in a broader environmental and economic context and includes all interacting systems (Figure 4), meaning those its operations enable or influence across the value chain life cycle.[16]

> ***Note***
>
> In the context of a circular economy, the value chain aims to be circular rather than linear, recognizing the feedback, material recovery, reverse logistics and continuous creation of shared value that are essential to enabling circularity.[17]
>
> *Value chain* in the singular refers to an integrated system, acknowledging that organizations may operate across multiple distinct value chains.[18]

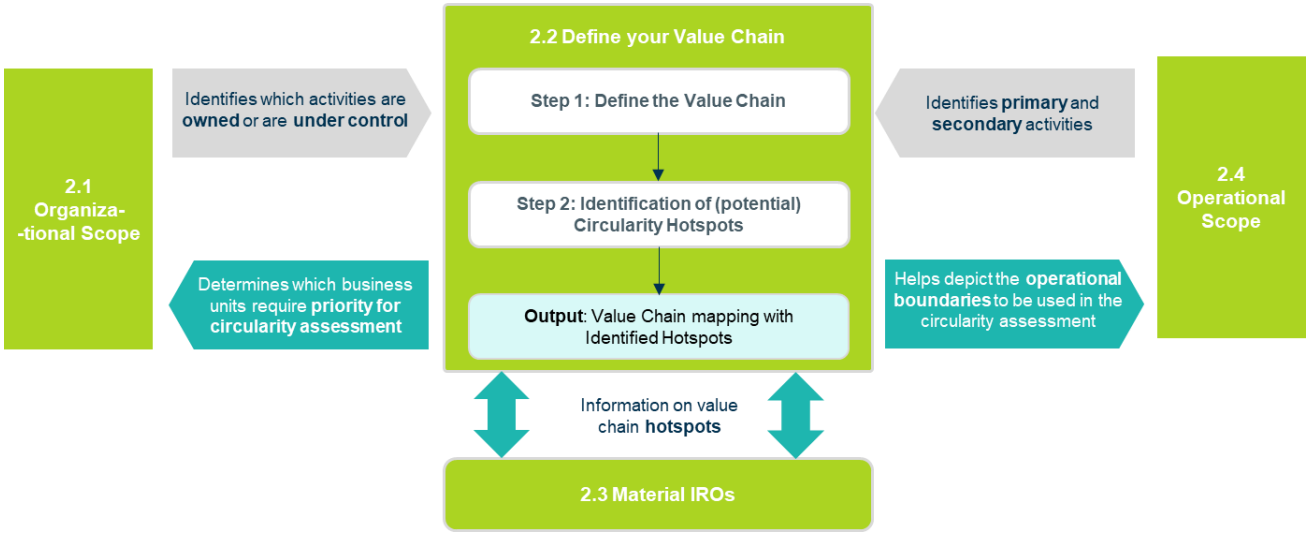
## Figure 4: Adapted value chain life-cycle stages (cradle-to-cradle) highlighting circularity hotspots, corresponding with systems interacting with circular material flows




### *How to define your value chain and circularity hotspots*

Based on the value chain definition and guiding principles, the following steps provide guidance in defining your value chain and identifying the circularity hotspots. These steps build on and inform the sections on Organizational boundaries; Operational Boundaries and Impacts, Risks and Opportunities of Stage 2. Prepare (see Figure 5).

## Figure 5: High-level approach in defining your value chain



### Step 1: Defining your organization's value chain

#### 1. Map the activities inside your organizational boundaries

Determined by your *organizational boundaries*, identify primary and secondary activities, stakeholders and actors, categorized by the value chain life-cycle stages relevant to your subject under assessment. These activities, stakeholders and actors are within your organization's direct control or where your organization has a proportional share of the operation (refer to Stage 2. Prepare on setting organizational boundaries*).*

While mapping your organization's activities, prepare for the circularity hotspot identification (see point 1 under Stage 2.2 step 2 – Identify circularity hotspots) in business units by assessing the:

- Geography related to activities;
- Material volumes;
- Use of critical raw materials;
- Environmental and social risks.

You can refer to LCA ISO 14044 for life-cycle stages,[19] i.e., cradle-to-cradle; when possible, identify their geographies.

#### 2. Map the activities outside your organizational boundaries

Building on your organization's activities, stakeholders and actors identified in your organizational boundaries, extend the value chain mapping to include primary and secondary activities associated with the subject under assessment outside of your organization's own operations (i.e., along the value chain). This map should expand on the network of stakeholders and actors associated with subject under assessment.

Organizations should adopt a phased approach in defining their value chain:

- Start with activities from direct relationships (readily available data from contractual relationships). Following the Science Based Targets Network (SBTN) framework, you should map upstream activities until you cover 67% of spend or volume reflected in your procurement activities.[20] Note, you should aim to map a comparable proportion of downstream activities reflected in the volume or revenue of materials/products sold so that you map at least two-thirds (~67%) of the total mass of materials, parts, components or products crossing your organizational boundaries.
- Extend to activities further upstream or downstream in your organization. While the aim is to capture all stages of the product or material life cycle, mapping highly complex supply chains down to the $n^{th}$ tier is challenging, particularly for lower-tier suppliers. Therefore, you should determine the appropriate extent of mapping based on the identified circularity hotspots (step 2) as well as the assessment of impacts, risks and opportunities.

The mapping of the activities within and outside your organizational boundaries will help you define the material flows under your direct control and indirect control when setting your operational boundaries (see Table 2).

Value chain mapping is an iterative process; organizations should ensure the sharing of the data collected and preliminary findings with both internal and external stakeholders to validate the accuracy and completeness of the information. This allows for corrections and refinements based on diverse perspectives and expertise.

You can use a process flowchart to visually represent your value chain.

***Note***

Leverage previous exercises done for other sustainability frameworks (e.g., GHG Protocol, Science Based Targets initiative (SBTi), Science Based Targets Network (SBTN) or allow this exercise to support integration into the other frameworks you might use.

### Table 2: Mapping value chain elements to your operational boundaries

| Scopes for operational boundaries | Material flows under direct control | | Material flows under indirect control | Contribution to the circular economy through System Impact (scope in development for GCP v2) |
|---|---|---|---|---|
| **Denotation** | Scope A | Scope B | Scope C | Scope D |
| **Description** | Flows to and from the **environmental system** | Flows **entering in and exiting the organization** | Flows across the **end-to-end value chain** | Flows in **other parts of the economic system** |
| **Relevance of the Value Chain mapping for operational boundaries** | Identify activities related to resource extraction and waste management in organization-owned/controlled assets, facilities (e.g., own operations) | Identify value chain activities with direct suppliers and direct clients - focusing on where the organization has significant influence (e.g., through contracts, partnerships, or collaborative initiatives). | Identify value chain activities with indirect suppliers and the broader economic system. Highlight areas where the organization's influence is limited, requiring collaborative efforts with other actors in the end-to-end value chain, to improve material efficiency. | Identify value chain activities associated to the post-use stages of the material lifecycle, to enable identification of contributions to the circular economy through the organization's own product design, take-back programs, or other initiatives aimed at driving circularity across other value chains within the broader economic system. |

### Step 2: Identification of circularity hotspots

Circularity hotspots are areas with significant potential for resource recovery, reuse, regeneration or the reduction of material usage; the aim is to "uncover" where these activities are occurring. To identify circularity hotspots across the value chain, conduct the assessment on a stage-by-stage life-cycle basis, with the intent of mapping where the greatest resource use, waste generation, environmental impact and circular opportunities occur. This involves combining material flow assessment with context-specific factors to validate, such as circular enabling or limiting conditions at each stages location.

#### Screening for circularity hotspots

Circularity hotspots in the value chain have one or more of the characteristics listed below. The following examples relate to intervention points listed in the Stage 3. Measure, i.e., for which the GCP provides indicators your organization can use to measure performance and impact.

*Circularity hotspots related to material circularity*

- **High resource consumption (e.g., raw materials):** Screening for high-resource consumption is important because it directly pinpoints areas of inefficiency and unsustainable practices. This includes screening for and comparing resource use for each material to similar practices in the relevant sector. By initially identifying high-consumption

areas allows for targeted interventions, circular business case development and improved resource management.

- **High waste generation in the life-cycle stage:** Screening for high waste generation is essential because waste represents resource losses and environmental impacts. Identifying waste hotspots allows for the implementation of waste reduction strategies, improved recycling processes and the minimizing of waste by designing for durability, repairability and recyclability.
- **Waste products causing significant issues in waste and recycling:** Assessing your waste streams to identify products and materials that are causing significant problems during collection, recycling or end-of-life treatment (e.g., hazardous materials) allows for the development and implementation of targeted solutions to improve sorting technologies, specialized treatment facilities and alternative disposal methods for overall waste management, while reducing environmental impacts. Refer to the C2C Material Health Assessment – Restricted Substances List for guidance in the elimination of hazardous substances.[21]
- **Use of critical materials[22] (with supply chain risks or limited substitutes)**: Screening for the use of critical raw materials is important because it highlights potential supply chain vulnerabilities and environmental and social risks associated with their extraction and processing. Identifying critical materials enables the exploration of alternative materials, the design of recycling routes and the development of more resilient supply chains.

*Circularity hotspots related to value and impact*

- **Significant GHG emissions or pollutants (e.g., air, water, soil emissions)**: Screening for significant emissions and pollutants is critical to achieving circularity. Identifying emissions sources allows for the implementation of circular economy solutions prioritizing reducing, reusing and recycling materials and resources. Refer to frameworks such as SBTN for guidance on reducing nature-related risks and impacts.[23]
- **Social impacts related to the organization's circular transition:** Screening for social and human rights risks regarding the organization's own or value chain workforce (e.g., child or forced labor, health and safety, informality), consumers and end-users (e.g., health and safety, affordability) and local communities (e.g., access to resources, contributions to economic development). It is particularly important to recognize value chain actors involved in the uptake of circular solutions in the Global South.
- **Value leakage to uncover circularity opportunities:** Identify and quantify potential value leakage from waste streams, materials and by-products that your organization has not fully used or recovered across your operations. This is typically a result of operational and economic barriers to use, inefficient recycling infrastructure or lack of awareness of potential synergies. Developing and implementing circular strategies and industrial symbiosis opportunities can help unlock revenue streams and reduce waste disposal costs.

The output for this section is the value chain map (of subject under assessment) in the form of a visual representation of value chain life-cycle stages, with relevant activities, stakeholders and actors corresponding with identified circularity hotspots.

The value chain mapping with circularity hotspots supports 2.3 impacts, risks and opportunities assessment and helps depict the operational boundaries you will use in the circular performance assessment.

## 2.3 Determine your organization's material impacts, risks and opportunities

This section provides practical guidance on assessing material impacts, risks and opportunities (IROs) related to resource use and circularity. It outlines a double materiality approach, addressing both how your business affects and is affected by environmental and social factors. This assessment underpins effective circularity measurement and management in later stages of the GCP.

As IRO assessments can require a significant amount of resources, this section is recommended for users doing more advanced organization-level assessments (see also the progressive levels of use of the GCP described in Stage 1.4 Consider your progressive user journey). In all other cases, users may decide to use another approach to identify impacts, risks and opportunities to underpin their circular economy performance assessment than the double-materiality assessment described in this section.

***Note***

*Material* here refers to materiality as defined by GRI and IFRS S1 and ESRS.[24] The relevance of topics or information that reflect an organization's substantial actual and potential impacts on the environment and society and the organization's capacity to create, preserve or diminish in value over time, ensuring an organization focuses on issues most relevant to sustainable development and informed decision-making. It does not refer to the material of a resource or a product.

### *High-level approach to determine material IROs*

There is a high-level, three-step process for assessing resource use and circularity-related IROs:

- **Identification** – For each hotspot in the value chain, identify and describe actual and potential positive and negative impacts, risks and opportunities related to circularity/resource use.
- **Significance assessment** – Assess the significance of each IRO using qualitative and quantitative methods. Evaluate the significance across short-, medium- and long-term time frames, considering the perspectives of all affected stakeholders.
- **Prioritization** – Based on assessed significance, distinguish between material and less material IROs by applying cut-off thresholds.

This approach is rooted in leading frameworks such as ESRS, GRI and International Sustainability Standards Board (ISSB) IFRS S1/S2.[25] While these steps are topic-agnostic, you can tailor them for circularity by using circularity-specific IRO libraries and circularity-specific scenarios (if relevant).

Table 3 maps key circularity considerations and example tools and frameworks to aid in conducting each step. The GCP will include more detailed methodologies in future versions.

## Table 3: Mapping circularity guidance on impact, risk and opportunity assessment to IRO steps

| IRO step[26] | Circularity aspects to consider | Examples of tools/frameworks for inputs |
|---|---|---|
| **Step 1: Identification** | **General:** Potential social and environmental impacts, risks and opportunities related to linear and circular business models | **General:** Preliminary context (peer assessment, due diligence, strategic priorities, etc.) and scoping identification (e.g., organizational boundaries), value chain assessment and material flow assessment outcomes, stakeholder input |
| **Step 2: Significance assessment** | **Impact materiality:** Environmental/social impact of resource use and circular activities<br><br>**Financial materiality:** Financial impact of resource use and circular activities on organization performance and financial results; as part of the assessment, you can analyze scenarios that cover climate change, resource use and circularity regulation | **General:** Stakeholder input (direct or indirect via proxies), value chain assessment and material flow assessment quantitative outcomes<br><br>**Impact materiality:** Impact measurement and valuation (Value Balancing Alliance – VBA; International Foundation for Valuing Impacts – IFVI), social return on investment (SROI)<br><br>**Financial materiality:** ISO 31000, TCFD scenario analysis, risk/opportunity matrices, ISSB/IFRS S2, return on sustainable investment (ROSI). |
| **Step 3: Prioritization** | **General:** Thresholds and cut-offs specific to resource use and circularity-related data | **General:** Management decisions on what is material or not material based on inputs provided by previous steps, circularity-specific thresholds<br><br>**Financial materiality:** ISO 31000, Committee of Sponsoring Organizations (COSO) enterprise risk management (ERM) for risk prioritization |

Having performed the identification step of the IRO assessment, your organization should have accumulated a series of impacts, risks and opportunities, specific to the business. Table 4, 5 and 6 provide examples of impacts, risks and opportunities related to resource use and circularity that your organization might have identified. This list is not exhaustive but is guidance for organizations performing an IRO assessment.

### *Impacts*

The impacts[27] link closely to the circular performance measurement category of **value and impact assessment** and the associated GCP indicators (see Stage 3. Measure – Circular value and impact assessment). Circularity impacts can be both positive and negative. The GCP focuses on direct and indirect impacts, meaning a business activity with a direct causal link to an organization or impacts resulting from an its business relationships, particularly in its upstream and downstream value chains.[28] Additionally, the GCP encourages organizations to consider the induced and cumulative or "ripple" effects of impacts, even though it does not explicitly mention them here.

## Table 4: Key impacts categories related to circular economy and resource use

| Impact topics | Examples of positive and negative impacts[29] | Reference to other frameworks[30] |
|---|---|---|
| **Resource use** | Negative: depletion of finite resources, ecosystem damage, reduced intergenerational resource equity<br>Positive: reduced resource consumption (e.g., through resource efficiency or use of renewable and secondary resources), product design for longevity | ESRS E5, TNFD (physical risk, planetary boundaries) |
| **Pollution** | Negative: landfill/incineration, littering/illegal dumping & microplastics cause environmental harm, GHG emissions, soil & water contamination, loss of material value<br>Positive: pollution reduction and management, cleaner production processes, innovation in pollution control | ESRS E2, E5, SASB (hazardous waste), TNFD (pollution, ecosystem impact) |
| **Biodiversity & ecosystems** | Negative: land use, unsustainable extraction/cultivation, pollution and waste cause ecosystem degradation and species loss, overextraction of renewable resources.<br>Positive: Reduced ecosystem destruction, biodiversity and species conservation, restauration of land. | ESRS E4, SASB (ecological impacts), TNFD (core metrics: impact on nature) |
| **Climate change** | Negative: GHG emissions from resource extraction and waste management exacerbate global warming, extreme weather risks<br>Positive: reductions in GHG emissions (e.g., through use of secondary and renewable resources, carbon sequestration. | ESRS E1, SASB (GHG emissions), TNFD (interlinked with ecosystem resilience) |
| **Water & marine ecosystem services** | Negative: over-extraction, pollution, watershed imbalance and water scarcity degrade local ecosystems and harm communities<br>Positive: reduced water consumption through efficient water management, protection and restoration of marine habitats, minimized water pollution | ESRS E3, SASB (Water), TNFD (nature-related impact: water flow and quality) |
| **Social** | Negative: labor exploitation and poor working conditions, community displacement, job losses (in linear economy)<br>Positive: protection of human rights, job creation and skills development (for circular economy), consumer benefits (such as product access and affordability) | ESRS S1/S2/S3/S4 (social standards), TNFD (social-ecological systems), UNGPs, OECD Guidelines |

### *Risks*

Circularity-related risks fall into three main categories: physical, transition and systemic. This classification, widely recognized in leading scientific and sustainability frameworks such as TCFD and TNFD, provides a structured way to identify and understand the different sources and pathways through which risks can impact an organization. This approach helps your organization ensure a complete and balanced assessment of the risk landscape and guides the prioritization of key circularity-related risk topics.

## Table 5: Key risk categories related to circular economy and resource use

| Risk type | Definition | Examples | References to other frameworks[31] |
|---|---|---|---|
| **Physical risk** | Risks from direct, tangible resource constraints or environmental changes | Material/resource scarcity (including critical materials), input price volatility, depletion | **TCFD, IFRS S2, IPCC** |
| **Transition risk** | Risks from the shift to a circular economy or changing market, regulatory and stakeholder expectations | Regulatory changes (Ecodesign for Sustainable Products Regulation – ESPR, Packaging and Packaging Waste Regulation – PPWR), compliance costs, market demand shifts, obsolete business models, reputational risks | **TCFD**, **IFRS S2**, **TNFD**, **IPCC** |
| **Systemic risk** | Broad, interconnected risks that can disrupt entire markets, supply chains or sectors | Global supply chain shocks, cascading failures, operational disruption from climate events, trade restrictions | **TNFD**, **IPCC** |

The risks link closely with the **Close the Loop** and **Narrow and Slow the Loop** module indictors and the associated GCP indicators (see Stage 3. Measure).

### *Opportunities*

While early circular economy efforts often focus on mitigating risks and enhancing resilience – such as diversifying supply chains through secondary raw materials and reducing reliance on volatile commodity markets – the real value extends further. The opportunities link closely to the **Value the Loop**, **Narrow and Slow the Loop** and **Close the Loop** module indicators and the associated GCP indicators (see Stage 3. Measure). They all go with the general aspect of being an early adopter of a circular economy, which might result in differentiation and competitive advantage and a disruption in the industry.

## Table 6: Key opportunity categories related to a circular economy and resource use

| Business opportunity topics | Examples of circular strategies | How circularity delivers this | References to other frameworks[32] |
|---|---|---|---|
| **Resource efficiency & cost reduction** | Circular sourcing, circular recovery systems, absolute and relative material reduction | Lowers input costs; reduces waste disposal/landfill fees; improves material and energy efficiency, lowers reliance on volatile virgin commodity prices through the use of recycled/secondary materials | SASB (cost structure), ESRS E5, TNFD |
| **Supply chain resilience** | Circular sourcing (local or secondary), material recovery | Diversifies sourcing; builds in redundancy and buffers against global or regional supply shocks | SASB (supply chain), ESRS E5, TNFD |
| **Innovation & new business models** | Critical material substitution, circular business models, design for circularity and recovery, lifetime extension | Drives product/process innovation, supports sustainable product/service development, provides access to new customer segments, premium pricing, implementation of new business models (product-as-a-service, etc.) | SASB (product design, business model innovation), ESRS E5/S4, TNFD |
| **Brand & reputational enhancement** | Transparency, circularity reporting, eco-design | Meets stakeholder, investor and consumer expectations for sustainability and circularity; enhances employer brand. | SASB (product life cycle), ESRS S4, TNFD |

### *Considerations when performing a robust circularity-related IRO assessment*

A robust IRO assessment is crucial for proactive risk management, enabling organizations to identify and mitigate potential impacts while capitalizing on emerging opportunities, ultimately enhancing strategic decision-making and improving overall business performance.

A robust material IRO assessment should consist of the following elements:

**Double materiality approach:** Assess both impact and financial materiality across the value chain – including suppliers, operations and customers. You may focus on either aspect based on objectives or stakeholder requirements:[33]

- **Impact materiality** (ESRS, GRI): Evaluates significant positive or negative effects of organization activities, including resource use and circularity, on people and the environment across linear and circular models.
- **Financial materiality** (ESRS, IFRS S1/S2): Assesses whether sustainability issues, such as circularity, could materially affect financial outcomes or resilience (e.g., resource scarcity, regulatory changes, stranded assets, reputation, new revenue streams, cost savings).

**Integrated perspective:** Recognize interdependencies between impacts, risks and opportunities to ensure a holistic assessment. For example, adopting recovered materials can reduce price volatility and boost brand value (financial) while lowering environmental impacts. Conversely, persisting with linear practices risks higher compliance costs and market share loss (financial), alongside continued negative environmental and social impacts.

**Stakeholder engagement:** Involve relevant stakeholders – internal (e.g., finance, risk teams) and external (e.g., customers, suppliers) – depending on the materiality focus, using surveys, interviews or workshops to inform the assessment.

**Consistent and repeatable process:** Follow a three-step approach – identification, significance assessment and prioritization of IROs – to ensure comparability and reliability.

**Context-specific adaptation:** Tailor the approach to your organization's objectives, resources, context and insights from prior assessments

> ***Note***
>
> The identification of circular hotspots can bring further robustness to the subsequent IRO assessment. Each hotspot represents an area in your value chain with significant potential for resource recovery, reuse, regeneration or waste and emissions reductions.

## 2.4 Set operational boundaries for material flows

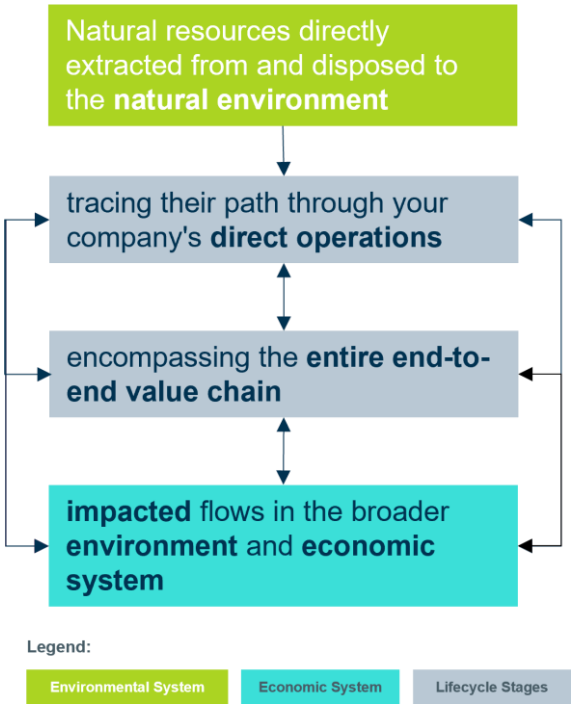
This section defines the operational boundaries to enable communication on circular performance.

### *Standardized scopes for material flows*

For improved understanding of the impact associated with and attributed to your material flows, the GCP recommends an operational boundary framework. Across the various stages of the material life cycle (Figure 6), interactions occur across multiple systems (e.g., environmental, social, the economic system and the system in focus – your organization's value chain). Note that the systems that typically interface and are attributed to material flows correspond with the scopes included in the boundary framework.

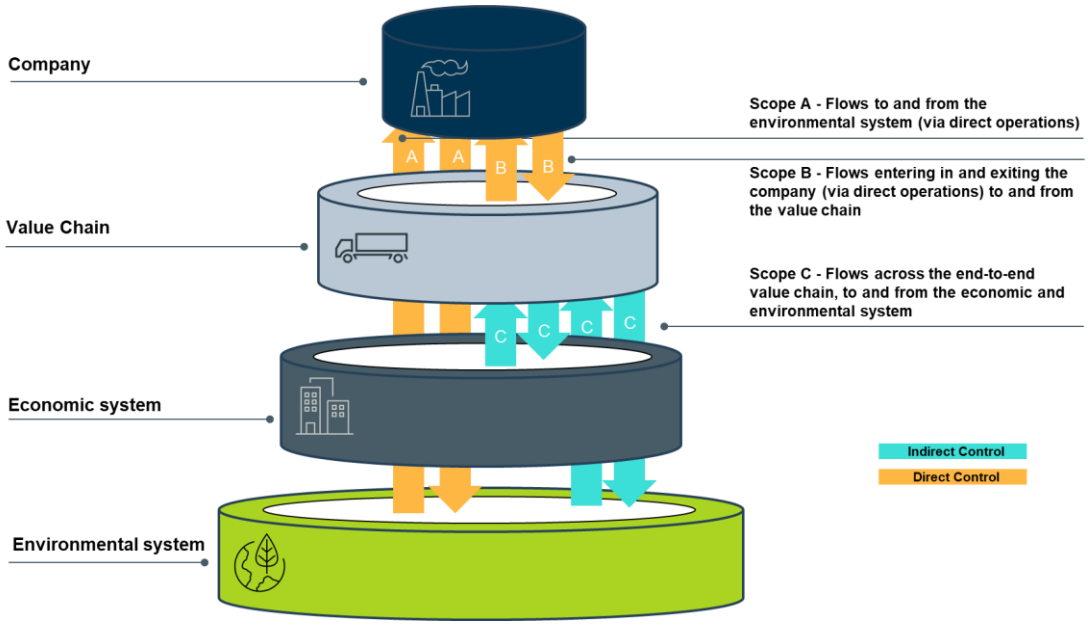
For your organization's value chain, it is important to define clear boundaries to help delineate these interactions from its system and other interfacing systems.

**Figure 6: Material flow interaction with interfacing and attributable systems**




The GCP introduces a scope framework (ABCD) for the *operational boundaries* that categorizes the material flows to the level of the organization's control, e.g., direct, indirect and contribution (Figure 7). The association of the material flow to the interfacing and attributable systems characterizes each scope. Note, the scopes encompass the social system throughout.

### Figure 7: Illustrative overview of the Operational Scope framework




- **Direct control over material flows (scope A and B)**

  *Direct control over material flows* refers to an organization's ownership and control of materials as defined by the *organizational boundaries*. This direct control over material flows can apply to any stage of a material life cycle (raw material extraction, manufacturing and processing, transportation, use, and retail and waste disposal).

  To clearly capture the impact of organizations on the *environmental system*, organizations need to differentiate between two categories of flows:

  – **Scope A – Flows to and from the environmental system (via direct operations):** the inflows and outflows directly exchanged between your organization and the environmental system. This includes the extraction of resources by your organization's operations (e.g., resource mining) and disposal of materials, waste and by-products directly to the environment (e.g., own landfill activities, leakage of fertilizers into the soil, fine particles emitted to the air).

> ***Note***
> Not all organizations have direct interactions with the environmental system.
> Example of sectors where scope A would be particularly relevant include mining, oil and gas, agriculture, forestry, waste management, water treatment.

  – **Scope B – Flows entering and exiting the organization:** Material flows that enter and exit your organization's operations (except scope A-related material flows), e.g., material flows procured from direct suppliers, used by customers or managed by service providers (e.g., waste management). This scope enables organizations to account for material flows directly controlled by their own procurement initiatives, product design, circular economy-driven business models and waste management practices used by customers or managed by service providers.

    ***Point of attention**: To avoid double counting, organizations that have interactions with the environmental system need to subtract the material flows counted under scope A when accounting for materials under scope B.*

- **Indirect control over material flows (scope C)**

  In scope C, the *indirect control over material flows* refers to material flows in the value chain before they enter and after they exit the organization's direct control.

  – **Scope C – Flows across the end-to-end value chain**
  Indirect material flows are a result of the operations of the organization and occur in the organization's value chain in the operations owned or controlled by another organization or user/consumer. This scope captures the movement of material flows that the organization can indirectly control and influence.

  This scope enables organizations to get comprehensive insights into the *circularity aspects* of their materials through their entire life cycle – from extraction to end-of-life – especially when the material flows represent a high environmental impact, e.g., the resource extracted from the environmental system to manufacture products; the actual recovery of products.

  Organizations should leverage the outcomes from Stage 2. Prepare – 2.2 Define your value chain to identify the stakeholders and value chain actors associated with the material flows. This then should determine collaboration, data management, development initiatives and relevant performance management processes required for the visibility and assurance for scope C reporting.

  ***Point of attention:*** *To avoid double counting, the flows accounted for under scopes A and B are not included in scope C.*

- **Contribution to the circular economy through system impact** *(*scope D in development – see Box 1*)*

  Scope D refers to an organization's contribution to the circular economy in other parts of the *economic system,* i.e., outside the organization's value chain.

  – **Scope D – Flows into and within other parts of the economic system**
  The organization has contributed to material flow circularity beyond its own value chains – the contribution to material flow circularity does not occur among the resource inflows or outflows of the organization (scope A and B) or the attributable value chains (scope C), but occurs in other value chains that the organization's activities influence or impact (i.e., at the level of the material flows between the organization's customer/end-user/waste manager and the customer/end-user/waste manager's own value chain).

> ***Example***
>
> Sectors where scope D would be particularly relevant: providers of sustainable substitutes (e.g., bio-based material providers), businesses facilitating circularity (e.g., refurbishment and remanufacturing services), sharing platforms, information brokers (e.g., digital product passport), investors, etc.).

***Points of attention***: To avoid double counting, flows already included in scopes B–C are excluded from the definition of the economic system in a scope D solution. This includes any other actor across the value chain that is not covered by scopes A–C.

**Box 1: Cautionary note on the use of scope D (scope in development)**

Scope D should demonstrate that your organization's material outflow (products and services) **enable** circular outcomes and solutions for other actors in the economic ecosystem, therefore indicating your organization's contributions to a circular economy.

Clear principles and robust criteria must govern scope D to ensure the credibility and integrity of reported impacts. This is why GCP v2.0 will include detailed guidance to support the implementation. Therefore, your organization should not use scope D until that guidance is published.

### *Selection of the scopes*

The ABCD scope framework is all-encompassing, with all material flows considered relevant for a circular performance assessment (this includes, but is not limited to, procured materials, production assets, consumables, wastes, by-products and extracted materials).

The objective of your circular performance assessment and the outcomes of the impacts, risks and opportunities (IRO) assessment should inform your organization's decision on which standardized scopes to apply to which material flow for the subject under assessment. Step 2.5 Identify and prioritize your materials flows provides guidance on the selection of relevant material flows.

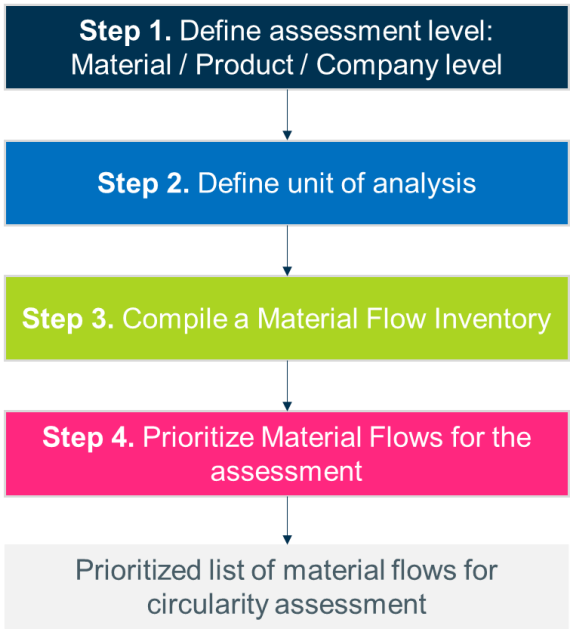
- Organizations should strive to account, at a minimum, for material flows under their direct control (scope A and B).
- Where relevant (based on the IRO assessment), organizations should account for material flows under their indirect control (scope C).
- In certain sectors and geographies, accessing data can be particularly challenging. For some organizations, the use of certification systems or product passports – such as sustainable cotton certifications – significantly facilitates data collection. While the GCP recognizes that collecting and validating data for the boundary scopes is a complex undertaking, organizations should collaborate as much as possible with the stakeholders and value chains actors, identified in Stage 2. Prepare – 2.2 Define your value chain and identify circularity hotspots, to unlock access to the data to be able to account for material flows under their direct and indirect control.
- While the GCP is still under development for the criteria of scope D and is currently not in use, your organization can begin to engage with value chain actors to assess existing, but uncovered, contributions to the circular economy.

| Box 2: Scopes for operational boundaries with sub-categories by flow | | | | |
|---|---|---|---|---|
| **Scopes for operational boundaries** | **Material flows under direct control** | | **Material flows under indirect control** | **Contribution to the circular economy through system impact** (scope in development for GCP v2.0) |
| **Denotation** | A | B | C | D |
| **Description** | Flows to & from the **environmental system** | Flows **entering in & exiting the organization** | Flows across the **end-to-end value chain** | Flows in **other parts of the economic system** |
| **Inflow sub-category examples** | 1. Ores mined (own operations)<br>2. Biomass extracted (own operations)<br>3. Fossil resources extracted (own operations) | 1. Purchased goods & services<br>2. Capital goods | 1. Ores mined<br>2. Biomass extracted<br>3. Fossil resources extracted | 1. Reduced resource consumption by customers & end-users (excluding products sold by reporting entity) |
| **Outflow sub-category examples** | 4. Releases (emissions to air) & discharges (to water & land)<br>5. Losses (unmanaged outflows of materials not recovered) | 3. Waste generated in own operations<br>4. By-products from own operations<br>5. Sold goods & services | 4. Releases (emissions to air & discharges to water & land) & losses<br>5. By-products<br>6. Waste generated in operations<br>7. Waste generated at end-of-life | 2. Reduced waste in operations at customers & end-users (excluding waste resulting from products sold by reporting entity)<br>3. Reduced waste generation at the end of the life of customer products & services |

## 2.5 Identify and prioritize your materials flows

This section explains how to define the unit of analysis, identify material flows across operational boundaries, and prioritize them for circular performance and impact assessment.

### 2.5.1 Identify your material flows




Setting the unit of analysis enhances comparability among different materials, products and organizations. The subject and the assessment level outlined in Stage 1. Frame – 1.3 Define the assessment level influences it. The steps described below largely follow practices from the ISO standard for life cycle assessment (LCA).[34] Recognizing the challenges of gathering complete information on material flows, the guidance provided here focuses on identifying the most relevant flows, aiming to deliver a comprehensive picture of material flows linked to the subject.

#### Step 1 – Determine the unit of analysis

This step determines the subject under analysis and defines the time frame of analysis at the selected assessment level. This improves comparability among materials, products or organizations.

You can determine the unit of analysis per product, per functional unit or per mass after establishing the appropriate assessment level. For the assessment level of product and material, the GCP strongly recommends you use a **functional unit** as the unit of analysis, similar to its use in LCA[35] and the Guidance on Organizational Life Cycle Assessment.[36] In cases where defining a functional unit is not relevant or possible – such as when an organization produces intermediate products (e.g., steel sheets) that various end-sectors can use without a clearly defined function – simply define the unit of analysis per product. Similarly, for organization or business unit level assessments that cover multiple products, services or activities, it is appropriate to choose the unit of analysis as per mass of the organization's outflow. Also, for material level assessments that include several products, the unit of analysis can be per mass.

The selected timeframe is also relevant when determining the unit of analysis. For the material and product level, this is typically reflected in the choice between focusing on a single use phase or multiple use phases. Note that choosing either single- or multiple use phases combined with a scope C analysis would cover the entire life cycle.

The analysis for a single use phase is directed at products that have a single use phase and do not perform any functionality within the organizational boundaries of the organization after their technical lifetime to the best knowledge of your organization. When your organization uses a product for the same or another function after the end of its first service life, both within or outside

organizational boundaries, it is appropriate to choose a multiple use phase time frame to assess the contributions of the relevant circularity strategies applied.
For the business unit or organization level (reporting), another time frame approach is more appropriate: a single point in time (snapshot). In a snapshot time frame, the analysis is done for a point in time (such as reporting period 2025) and the result can be compared to a reference year. While you can also apply this to the assessment levels of materials and products, it is most common for business units and organizations that intend to disclose information and reporting for a specific year, reflecting the current state.

The following provides guidance on determining the unit of analysis, accompanied by examples. Sections in parenthesis add the functional unit to a product.

***Examples***

- Assessment level: **Material**
  Unit of analysis and time frame: Per product (or functional unit), single use phase
  Neodymium used in the manufacturing of a single laptop over a use phase of 5 years *(which supports an average of 5,000 hours of computing)*.

- Assessment level: **Product**
  Unit of analysis: Per product (or functional unit), multiple use phase
  A laptop with 5 years of first use phase (which provides 5,000 hours of computing service) and 3 years of second use phase after refurbishment for lightweight computing (providing an additional 3,000 hours of computing service).
  An EV battery with 8 years of first use phase (which fulfils x km range) and 8 more years in its second use phase, where it is repurposed as electricity storage (providing X GWh capacity).

- Assessment level: **Organization**
  Unit of analysis: Per mass, snapshot
  A technology organization conducts a circular performance assessment for the material flows of the consumer electronics business unit, for reporting year 2025, with the purpose of comparing the results to a 2022 baseline. Unit of analysis is per mass, meaning if 2 Mt of critical raw minerals leave the operational boundaries in a given year, the organization can report corresponding inflows relative to those 2 Mt of critical raw minerals.

### Step 2 – Compile a material flow inventory

This step identifies key material flows entering and leaving the defined operational boundaries (the GCP recommends the minimum reporting scope associated to direct control (scope B), see Stage 2. Prepare – 2.4 Setting your operational boundaries for further guidance). This step can build upon the materiality assessment as described in Stage 2. Prepare – 2.3 Define your organization's material impacts, risks and opportunities related to resource use and circularity, as reviewing IROs can highlight flows you should include in the material flow inventory.

While a completely exhaustive list and quantitative data collection are not necessary at this stage, your organization should ensure the list covers material flows that are fundamental to the business, its sustainability goals and circular performance assessment.

### Step 2.1 – Identify the types of material flows entering (inflows) or leaving (outflows) the operational boundaries

This step identifies the types of material flows that cross the operational boundaries, for example, products, feedstocks and wastes. The output should be a long list of material flows. The non-exhaustive list should cover all flows that are fundamental to your organization's continuity and include the majority. For the purposes of this assessment, the GCP defines a *majority* as flows that together account for at least two-thirds (~67%) of the total mass crossing the system boundaries, consistent with the Science Based Targets Network (SBTN) framework.[37] This threshold balances practicality and completeness, ensuring that the material flow inventory remains manageable while still capturing a meaningful share of overall flows.

**Common exceptions**

- Energy carriers like fuels are often already accounted for in energy assessments.
- Emissions to air, water and land and materials extracted from atmosphere are typically addressed through separate environmental reporting frameworks (e.g., greenhouse gas inventories).
- Bulk minerals, such as waste rocks, often have a low economic or environmental impact per unit.

There may be cases in which the examples above do not hold, e.g., a chemical company that uses captured $CO_2$ should consider the materials extracted from the atmosphere in the assessment; or a mining company should consider waste rocks in its outflows. For reasons of transparency, the GCP recommends disclosing if the organization decides not to exclude any of the materials above and the reasoning behind this choice.

The two groups of flows below serve as a guide to identify the relevant materials:

1. Minimum product flows to include (among others):
    - Raw materials
    - Feedstock and components
    - Products
    - By-products[38]
    - Manufacturing wastes (if hazardous state as hazardous material)
2. Minimum operational flows to include (among others):
    - Machinery and equipment
    - Other supplies
    - Transportation fleet
    - Other wastes (if hazardous state as Hazardous material)

### Step 2.2 – Identify the materials and components present in each material flow

This step identifies the major materials present in each of the flows identified in Step 2.1, for example, steel, plastic and wood.

The GCP defines a list of material categories, as shown in Annex 3, to enhance the comparability of the assessment. The list consists of two levels of granularity: the *material group level (*e.g., metals, plastics, critical raw materials (CRMs), etc.) and within each material group, the *material level* (e.g., within metals, iron and steel, lead, etc.). Follow the same categorization when documenting the materials in each flow.

***Note***

**Critical raw materials**

The EU's Critical Raw Materials Act defines these materials as economically and strategically important, yet at high risk of supply chain disruptions that will distort market competition and induce market fragmentation.[39] Other countries sometimes referred to them as "critical minerals" or "strategic materials". Organizations can refer to either internal critical materials lists or existing public lists such as those compiled by the European Commission, the United States Geological Survey or the Republic of South Africa[40] to identify materials in question.

However, obtaining this information may be challenging for industries with high product complexity (e.g., in the electronics sector). Additionally, critical materials might exist in very low quantities in components that travel through the value chain. The organization can decide whether to assess the exposed risk associated with a dependency on any of these materials. Efforts to gain supply chain transparency at this level could be significant.

You can choose the level of granularity of the material flow inventory. Instead of identifying every material present, you can group several small material flows into one and record the flow at the *material group level* in the material flow inventory. For example, organizations can choose to identify the presence of CRMs as a group instead of each individual CRM within the flow. For complex material flows, such as printed circuit boards, you can use an estimated material composition of the component and record the major material flows, which account for at least two-thirds (~67%) of the combined mass of the flow, consistent with the SBTN framework.[41] This choice of granularity will depend on the goal of the analysis. As a rule of thumb, the smaller the assessment level, the higher the granularity of the materials:

- For an organization-level assessment, categorize material flows at the material group level or opt for a more granular level based on your needs;
- For a product-level or material-level assessment, categorize material flows at the material level or a more granular level, e.g., specific types of steel, which you define.

Organizations should target the same granularity level for the inflows and outflows. If this is not possible you should disclose it.

During this step and the one before (Step 2.1), you can decide to exclude other materials if there are specific reasons for it. Valid reasons for exclusion include:

i. When a material is convincingly demonstrated to have no relevance to the organization's identified IROs, disclosing the quantitative/qualitative criteria applied to determine this.

ii. When data for a material flow is unobtainable and collecting it would be disproportionately costly or unfeasible, provided its influence is known to be minor. You must explicitly acknowledge, clearly list, justify and discuss the implications of those excluded. You should carefully document and fully disclose the underlying reasons to ensure transparency in reporting and to provide a reliable reference for future assessments.

## Table 7: Example of output following step 2

| # | Name of material flow | Major materials and components present | Direction of flow |
|---|---|---|---|
| 1 | Printed circuit boards | 1.1 Epoxy resin<br>1.2 Copper<br>1.3 Other metals | Inflow from supplier X |
| 2 | Construction waste | 2.1 Concrete<br>2.2 Wood<br>2.3 Glass | Outflow to waste management |
| 3 | Wheat harvest | 3.1 Wheat | Inflow from the environment |
| 4 | Electric vehicle battery | 4.1 Lithium<br>4.2 Graphite<br>4.3 Other critical raw materials | Inflow from supplier Y |

***Example***

**Case study: An electronics manufacturer is assessing its circularity performance in the previous year for external reporting and disclosure**

This is a continuation of the case study in Define Assessment Level, in which the assessment level was determined to be the organization level.

*Step 1. Determine the unit of analysis.*

Since the objective of the assessment is to disclose circularity performance at the organization level, there is no need to specifically determine a unit of analysis.

The time frame of analysis is a snapshot of the organization's performance during the reporting period of the previous year.

*Step 2. Compile a material flow inventory*

*Step 2.1 Identify the type of material flows entering (inflows) or leaving (outflows) the operational boundaries*

The organization identifies the product (e.g., raw materials, manufacturing and operational flows and proceeds to compile a list of all major materials flows.

Table 8 lists the output of material flows identified:

**Table 8: Sample output listing identification of material flows entering and leaving the operational boundaries**

| # | Name of material flow | Direction of flow |
|---|---|---|
| 1 | Printed circuit boards | Inflow from suppliers |
| 2 | Battery | Inflow from suppliers |
| 3 | Plastic casing | Inflow from suppliers |
| 4 | Machinery | Inflow from suppliers |
| 5 | Components and equipment used in the repair and maintenance of machinery | Inflow from suppliers |
| 6 | Office supplies | Inflow from suppliers |
| 7 | Product | Outflow to retailer |
| 8 | Manufacturing wastes | Outflow to waste management |
| 9 | Other wastes, e.g., decommissioned machinery (components) and office wastes | Outflow to waste management |

*Step 2.2. Identify the materials and components present in each material flow*

The organization then proceeds to identify the major types of material present in each material flow.

**Table 9: Sample output of material flows mapped to other materials present in the material flow**

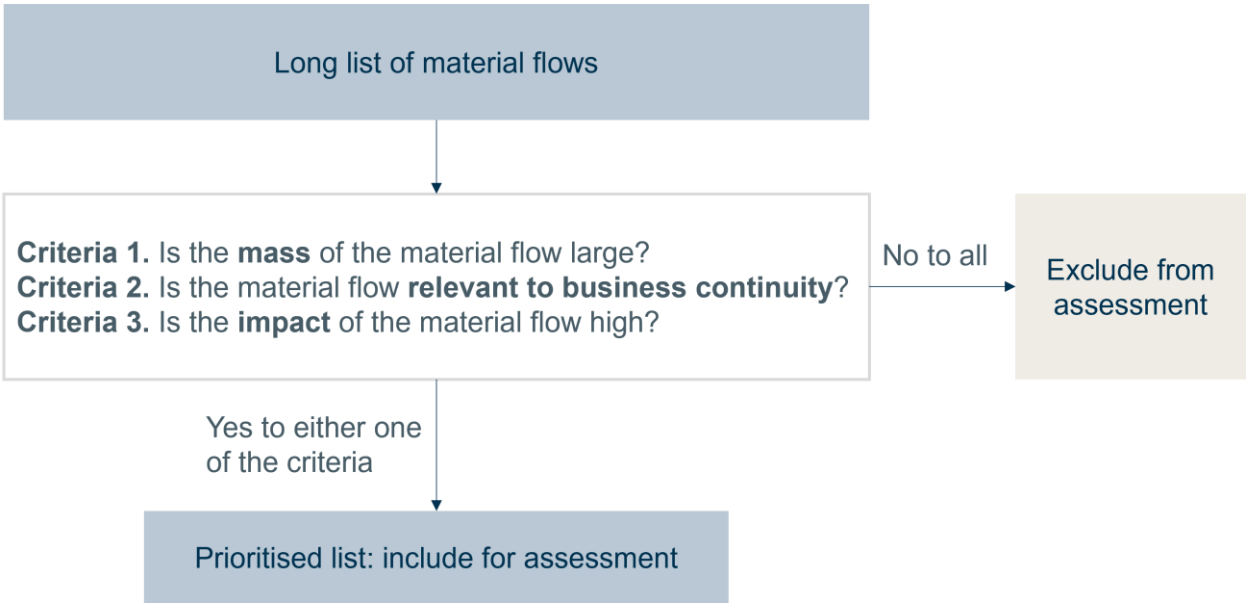
| # | Name of material flow | Major materials or components present | Direction of flow |
|---|---|---|---|
| 1 | Printed circuit boards | 1.1 Epoxy resin<br>1.2 Copper<br>1.3 Other metals | Inflow from suppliers |
| 2 | Battery | 2.1 Lithium<br>2.2 Graphite | Inflow from suppliers |
| 3 | Plastic casings | 3.1 Plastic – PC | Inflow from suppliers |
| 4 | Machinery | 4.1 Steel | Inflow from suppliers |
| 5 | Components and equipment used in the repair and maintenance of machinery | 5.1 Steel<br>5.2 Cleaning chemicals | Inflow from suppliers |
| 6 | Office supplies | 6. IT equipment | Inflow from suppliers |
| 7 | Product | 7.1 Epoxy resin<br>7.2 Copper<br>7.3 Lithium<br>7.4 Graphite<br>7.5 Plastic – PC | Outflow to retailer |
| 8 | Manufacturing wastes | 8.1 Electronics<br>8.2 Plastics | Outflow to waste management |
| 9 | Other wastes, e.g., decommissioned machinery (components) and office wastes | 9.1 Steel<br>9.2 IT equipment | Outflow to waste management |

### 2.5.2 Prioritize your material flows

The GCP provides a selection methodology to prioritize the material flows to monitor and communicate. The decisions made in earlier sections and steps – such as identifying risks and opportunities, selecting the assessment level, defining the unit of analysis and setting the time frame – produce a long list of material flows (identified in steps 2.1 and 2.2) that can be monitored. However, monitoring the entire list would create a significant burden in terms of data collection and reporting without further prioritization. Figure 8 illustrates the decision tree, which provides an overview for determining whether a material flow is a priority for the circular performance assessment. The sequence of the steps ensures that material flows with low mass but high impact (or high relevance to business continuity) will still be included in the GCP circular performance assessment that follows.

The design of the decision tree and criteria aims to help your organization determine which material flows to prioritize. They are most relevant to the product and organization level and less to the material level (as you will have already defined the material flow in scope).

**Figure 8: Decision tree for determining prioritized material flow for circular performance assessment**




Organizations are required to prioritize material flows identified previously that meet any one of the three criteria.

**Criteria 1. Prioritize material flows with a large expected mass**

For each of the material flows identified above, prioritize the flow if it contributes to 20% or more of the total mass of the material flow inventory identified in step 2.1 by your estimation or measurement. This 20% prioritization threshold applies to the flows *within* your material flow inventory. It should not be confused with the 67% inventory threshold, which requires your inventory to capture at least two-thirds of all materials crossing your operational boundaries. This prioritization threshold balances practicality and completeness, ensuring that the material flow inventory remains manageable while still capturing a meaningful share of overall flows. For example, manufacturing organizations should prioritize product flows over operational flows (e.g., office supplies) as the latter may be negligible when compared with the product flows.

**Criteria 2. Prioritize material flows that are relevant to the business continuity and identified risks and opportunities**

For each of the material flows identified previously, determine if the material flow is relevant to your organization's continuity. prioritize material flows that meet one or more of the considerations below:

(i) the material flow is irreplaceable: It cannot be substituted without major changes to products, processes or quality.
(ii) High-risk or scarce material: The flow is prone to supply chain disruption, geopolitical risks or long lead times.
(iii) Revenue-critical contributions: The flow is essential for products that generate a significant portion of organization revenue.
(iv) Connection to identified risks and opportunities: The flow is linked to organization-identified risks or opportunities, such as dependency on single suppliers, regulatory restrictions or creation of circular offerings.

**Criteria 3. Prioritize material flows that have a high impact**

For each of the material flows identified in Stage 2 – Prepare – 2.5 Identify and prioritize your materials, prioritize those that have a high impact on the environment.

To determine if the material flow has a high impact, refer to the approach of significance assessment described in Stage 2. Prepare – 2.3 Define your organization's material impacts, risks and opportunities related to resource use and circularity for your assessment; and when assessing materiality, consider both the scale and severity of the impacts.

In addition to the flows prioritized following the Impacts, Risks and Opportunities approach, prioritize material flows included in the SBTN High Impact Commodity List (HICL).[42] The HICL gathers a list of high-impact commodities identified in frameworks that pose significant environmental pressure. HICL also contains high-impact materials identified by the United Nations International Resource Panel (IRP).[43] When there are valid reasons, for example, the size of the flow is negligible, your organization may deprioritize material flows containing material listed in the HICL, provided you document and disclose the reasons.

The outcome is a list of prioritized material flows in scope of the GCP circular performance assessment.

***Example***

**Case study: An electronics manufacturer is assessing its circularity performance in the previous year for external reporting and disclosure**

Continuing the same case study in the Define assessment level and Identify material flows sections, in which the assessment level was determined to be the organization level and a long list of material flows crossing the operational boundaries has been created.

*Prioritize material flows for the analysis*

The organization assesses the material flows based on the three criteria.

First, the organization prioritizes the large material flows that account for 20% or more of the total mass of the material flow inventory. The organization decides to consider all product flows as a whole and it estimates that its product flows are much larger than the operational flows, passing

the 20% threshold. The organization then decides to prioritize the assessment of material flows 1, 2, 3, 7 and 8.

Next, the organization prioritizes material flows that are relevant to business continuity. The organization determines that machinery is core to revenue generation of the manufacturing business, so it also prioritizes material flows 4, 5 and 9.1.

As the final step, the organization prioritizes material flows that have a high impact. The organization examines if the materials present in the remaining flows (6 and 9.2) are part of the HICL. While the IT equipment contains materials listed on the HICL, the organization decides to exclude them from the assessment as the size of the flow is negligible compared to the other prioritized flows. The organization proceeds to document this decision, which it will disclose in the external report. Table 10 shows the list of prioritized material flows and the final output of this case.

**Table 10: Example case study: The list of prioritized material flows and final output**

| # | Name of material flow | Major materials or components present | Direction of flow |
|---|---|---|---|
| 1 | Printed circuit boards | 1.1 Epoxy resin<br>1.2 Copper<br>1.3 Other metals | Inflow from suppliers |
| 2 | Battery | 2.1 Lithium<br>2.2 Graphite | Inflow from suppliers |
| 3 | Plastic casing | 3.1 Plastic – PC | Inflow from suppliers |
| 4 | Machinery | 4.1 Steel | Inflow from suppliers |
| 5 | Components and equipment used in the repair and maintenance of machinery | 5.1 Steel<br>5.2 Cleaning chemicals | Inflow from suppliers |
| 7 | Product | 7.1 Epoxy resin<br>7.2 Copper<br>7.3 Lithium<br>7.4 Graphite<br>7.5 Plastic – PC | Outflow to retailer |
| 8 | Manufacturing waste | 8.1 Electronics<br>8.2 Plastics | Outflow to waste management |
| 9 | Other wastes, e.g., decommissioned machinery (components) | 9.1 Steel | Outflow to waste management |

A case study illustrating the identify and prioritize material flows steps is available in Annex 4 Stage 2. Prepare – Identify and prioritize material flows. The example is of a construction organization assessing the circular performance of several models of glass windows to determine which model to use in a construction project.

# Stage 3. Measure

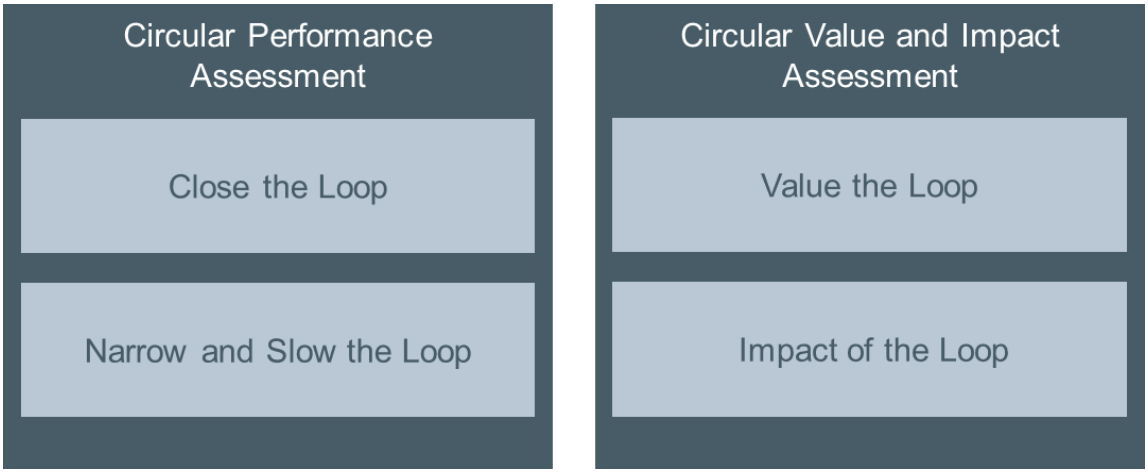
The Measure stage supports organizations in determining circular performance in a comprehensive and decision-useful way by providing organizations with key indicators to assess the circular inflow and outflow of materials, evaluate their dematerialization efforts, understand the impacts of circular strategies and business models on climate, nature and social equity and link their contribution to economic value.

The section is split into two categories:

- **Circular performance assessment**, based on the degree of circularity of material flows;
- **Circular value and impact assessment**, based on the value and impact of circular economy initiatives.

Each category introduces two indicator modules to support your organization in finding the right indicators for the objectives of the circular performance and impact assessment. The circular performance assessment contains the Close the Loop and Narrow and Slow the Loop modules. The circular value and impact assessment contains the Value the Loop and Impact of the Loop modules.

**Figure 9: The structure of Stage 3. Measure is based on two categories and four modules of indicators**




The indicators proposed in the different modules are based on WBCSD's Circular Transition Indicators v4.0, which have been updated for integration into the GCP in consultation with GCP stakeholders. While core definitions and formulas remain consistent, a new module has been introduced to capture strategies to Narrow and Slow the Loop, reflecting a more comprehensive view of circular performance. The Impact of the Loop module now features a new methodology to measure the social impact of circular economy initiatives.

In GCP v1.0, the Close the Loop module indicators focus exclusively on indicators for the calculation of *% material circularity*. Indicators for water circularity and renewable energy remain available in the CTI Sector Guides and CTI v4.0. ISO 59020 also includes them among the non-core indicators.

Existing indicators provide a strong foundation, but methodologies must continue to evolve. GCP v2.0 will prioritize these improvements, while also recognizing that internal performance review and external disclosure serve different purposes and may require distinct indicators.

***Note***

If you are using the **CTI Sector Guides (Fashion and Textile, Built Environment, Electronics and Chemical sector)**, you can leverage existing sector-specific guidance to ensure alignment with relevant definitions, data sources and recommended practices tailored to their industry. These guides present aligned theories but a different structure – the seven step CTI process. Businesses from these sectors preparing to disclose results of CTI assessments to regulators or stakeholders will follow the guidance on reporting and disclosure included in Stage 5. Communicate. The section provides clear instructions on how to communicate about circular performance and impact assessments in a consistent and transparent way for regulators and external audiences, position circular performance metrics within broader sustainability disclosures, ensure compliance with evolving regulatory expectations and enhance the credibility and comparability of reported data.

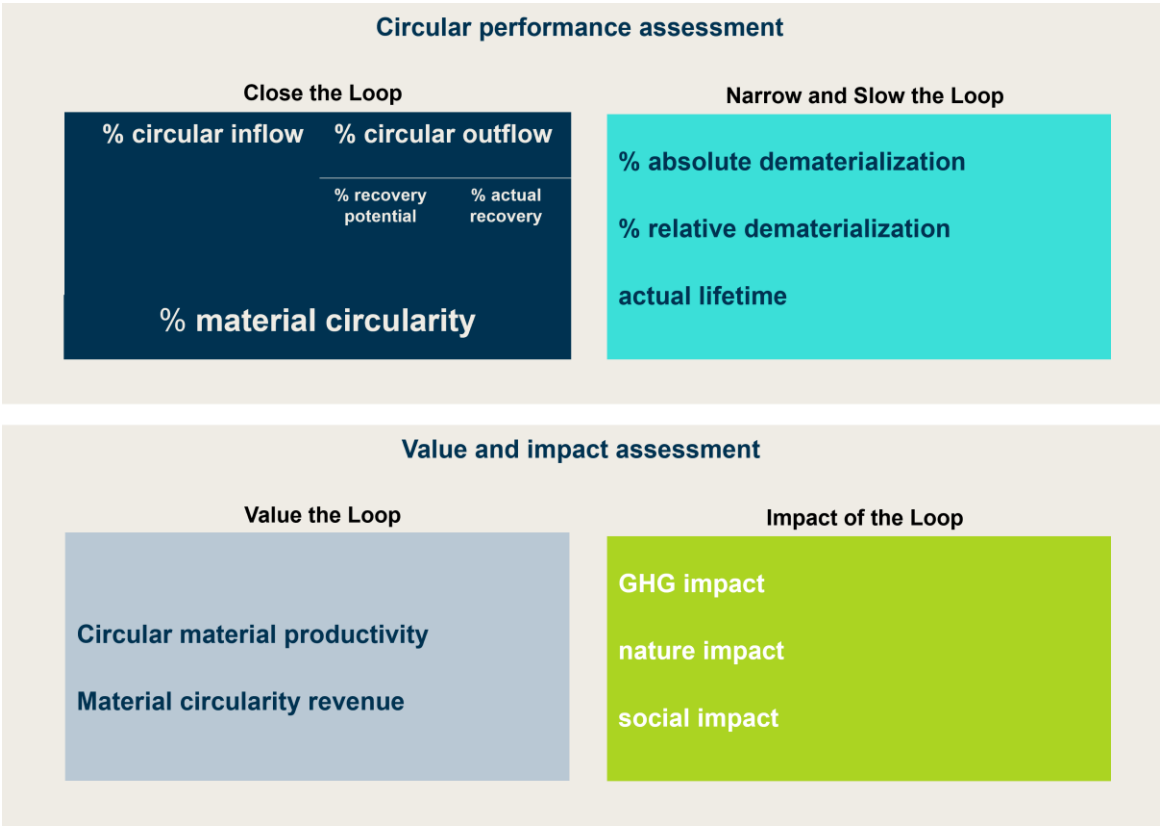
## 3.1 Select indicators

### *3.1.1 Overview of the circular performance and impact assessment methodology*

The GCP's circular performance and impact assessment methodology takes a holistic, material flow-based approach, mapping and quantifying how resources enter, move through and exit an organization's operational boundaries to assess circular performance, reduce reliance on virgin or non-renewable resources and minimize waste. This perspective moves beyond isolated sustainability initiatives, enabling businesses to pinpoint high-impact intervention points that can drive substantial environmental, social and financial gains. The various indicators and the impact that they have on both the business and sustainability objectives included in the methodology each provide distinct views on circular performance and are presented as part of different categories and modules.

The two categories - circular performance assessment, and circular value and impact assessment - contain a robust set of objectives, quantitative and flexible indicators structured across four thematic modules: Close the Loop, Narrow and Slow the Loop, Value of the Loop, Impact of the Loop (Figure 9). A module is a structured collection of indicators that helps organizations assess specific aspects of circular performance. Each module contains a set of indicators organizations can use based on their strategic priorities, operational context and readiness level (Figure 10).

**Figure 10: Overview of Circular Performance Assessment and Value and Impact modules**



## Circular performance assessment

The Circular performance assessment category focuses on a quantitative assessment of materials that flow through the organizational boundaries based on the assessment level and operational boundaries chosen in Stage 2. Prepare and how effectively your organization retains those materials in productive use and how successful it is in dematerialization, where this is a relevant circular economy strategy for the sector. To carry out a meaningful circular performance assessment, organizations should use the results from Stage 2. Prepare to organize their evaluation around these key intervention points.

- **Close the Loop**
  - **Sourcing (circular inflow)**: Evaluates the share and types of circular materials entering the business, such as secondary materials, sustainably managed feedstocks and reused components. This helps reduce dependency on virgin and/or non-renewable resources and supports circular procurement strategies.
  - **Design for recovery (recovery potential)**: Assesses how well products and materials are designed for value retention during the use phase and at end-of-life (EoL). It focuses on product and material recyclability, biodegradability (compostability), durability, multiple use cycles, design for longevity and lifetime extension (e.g., repairability).
  - **Circular recovery systems (actual recovery)**: Measures the extent to which materials, components and products are recovered and reintegrated into an equivalent function at the end of their useful life through close or open loop systems (e.g., collection systems, remanufacturing, recycling or other recovery processes).
- **Narrow and Slow the Loop**
  - **Absolute and relative material reduction and lifetime extension (dematerialization and actual lifetime)**: Measures reductions in overall material consumption and the extension of the useful life of products. It covers both absolute and relative material reductions and tracks how long products remain in use compared to their expected life cycle.

## Circular value and impact assessment

The circular value and impact assessment category involves the bridging of circular strategies that increase material circularity with value creation and tangible, business-relevant and sustainability-oriented outcomes. It links circular strategy execution and value creation, enabling organizations to systematically assess and select circular economy initiatives that support broader environmental, economic and social equity goals. This assessment connects material circularity to key value drivers, including:

- **Value the Loop**
  - **Economic value creation:** Assesses how circular business models contribute to resource productivity and value generation while reducing dependency on virgin and non-renewable materials.
- **Impact of the Loop**
  - **GHG emissions reductions:** Quantifies emissions savings resulting from circular strategies and business models. For example, shifting from virgin to secondary materials or designing

products with fewer and lighter materials could lead to significant emissions reductions, which can support science-based targets, carbon neutrality goals and regulatory compliance.
- **Land use and land-use change impacts:** Highlights circular sourcing strategies that reduce demand for land-intensive resources and prioritize regenerative inputs that minimize biodiversity loss.
- **Social impact and equity:** Measures the social implications of circular practices through the lens of a just transition where inclusivity, decent work and equitable distribution of benefits are factored into circular business strategies.

### *3.1.2 A modular approach*

The approach is both practical and adaptable, making it intuitive for organizations to implement, regardless of size, sector or readiness in circularity practices.

The use of indicators across the four modules fosters a shared understanding, both internally and externally, of what addressing circularity means, expressed in a common, actionable language that supports strategic alignment and credible communication about circular performance and its impacts on economic environmental and social markers.

Depending on the context, you can use the selected indicators to inform at the product level with product and packaging design, evaluate and steer portfolio performance, report on product- or process-level circularity performance in an annual report, set circular procurement guidelines, monitor decoupling from material consumption or support business model, R&D or innovation decisions. At the corporate level, the indicators can help align circularity with corporate strategy, support internal target-setting and, in line with the Stage 5. Communicate, prepare for external reporting on circularity of resource use and its associated climate, nature and social impacts.

The IROs identified in Stage 2. Prepare should guide the selection of materials and impacts, ensuring alignment between strategic priorities and assessment scope. This applies across all indicators, such as *% circular inflow* and % *absolute dematerialization*, allowing organizations to tailor their scope based on relevance and readiness.

***Example***

Based on the use case selected, the results of the IRO and the overall objectives of the assessment, your organization may identify that the use of virgin gold contributes significantly to scope 3 GHG emissions. In this scenario, substituting virgin gold with recycled gold as a feedstock represents a high-leverage circular economy strategy to mitigate climate impact.

To capture and quantify the benefits of this shift, the organization would select the *% circular inflow* indicator from Stage 3. Measure – 1.1 Circular performance assessment to measure the proportion of recycled material inputs, alongside the *GHG impact* indicator from the Value impact assessment category to track the associated emissions reductions.

You should monitor these indicators in parallel and overtime, enabling the evaluation of the correlation between increased circularity and reduced climate impact, assess trade-offs or synergies, and support continuous improvement and reporting aligned with corporate sustainability targets

***Note***

Organizations do not have to select or use all indicators for an assessment in alignment with the GCP. The progressive user journey establishes which indicators are essential, recommended and optional for each of the three levels (Initiation, Expansion and Consolidation). More details can be found in Stage 1. Frame – 1.4 Consider your progressive user journey and Annex 2: The GCP progressive user journey.

The sub-sections that follow explore each module in depth, providing guidance on how to calculate, interpret and use the results from the selected indicators to inform strategy and action.

### *3.1.3 The modules and indicators*

#### 3.1.3.1 Close the Loop

**Purpose and strategic relevance**

The **Close the Loop** module is the cornerstone of the GCP performance measurement methodology. It provides a foundational assessment of how effectively an organization retains materials in productive use – through procurement, design and recovery. This module is essential because it directly reflects an organization's ability to reduce reliance on virgin resources, minimize waste and build resilience across its value chain. By closing material loops, businesses can mitigate supply risks, lower environmental impacts and unlock long-term value.

**What it measures**

This module assesses circularity based on three key intervention points:

- **Inflow**: How much of the material entering the organization is circular (recycled, reused or renewable)?
- **Outflow (recovery potential)**: How much of the products, components, materials leaving the organization are designed to be recovered? (e.g., reusability, repairability, recyclability).
- **Outflow (actual recovery)**: How much of the products, components, materials leaving the organization are actually recovered at the end of their life?

**Headline indicator – % material circularity**: A headline indicator that aggregates inflow and outflow performance into a single metric

### Indicators in this module

| Indicator | Description | Strategic use |
|---|---|---|
| **% circular inflow** | Measures the share of input materials that are non-virgin or renewable | Supports circular procurement and supply chain resilience |
| **% circular outflow** | Measures the share of output materials that are recoverable (recovery potential) and actually recovered | Informs product design and end-of-life strategies |
| **% material circularity** | Aggregates inflow and outflow into a single performance metric | Enables high-level reporting and benchmarking<br>Supports the identification of opportunities, for instance reducing costs or creating new revenue streams |
| **% critical materials (strategic lens – inflow)** | Assesses the proportion of input materials classified as critical | Helps identify material dependency and supply risk exposure |
| **% recovery type (strategic lens – outflow)** | Tracks the type of recovery (reuse, recycling, etc.) applied to outflow materials | Supports transparency and alignment with circular recovery strategies |

The *% critical materials* and *recovery type* indicators are not part the *% material circularity* formula and you can use them as optional strategic lenses to enhance decision-making.

- *% critical materials* helps assess exposure to supply chain vulnerabilities by identifying reliance on critical, scarce or geopolitically sensitive resources, supporting risk management and long-term sourcing strategies.
- *Recovery type* provides insight into the quality and type of recovery (e.g., reuse, refurbishment, recycling). It enables organizations to track how materials are reintroduced into the economy and align recovery practices with circularity goals and regulatory expectations.

The CTI sector guides provide the *% critical materials* and *recovery type* indicators in the Optimize the Loop module.

### How to use this module

You can use the indicators individually or in combination, depending on their strategic priorities and reporting needs. This flexibility allows your organization to tailor assessments to specific business units, product lines or value chain stages.

***Note***

While current closed loop indicators provide a useful foundation, they may not fully capture the distinct inflow and outflow dynamics of process-oriented sectors, such as raw material extraction, which differ from product-oriented industries. Future iterations of the framework will build on this foundation, offering additional guidance and tailored approaches to better reflect and support the specific characteristics of these sectors.

***Note***

**The technical and biological cycles**

The GCP recognizes two distinct but interconnected cycles through which materials and products are kept in use: the technical cycle and the biological cycle.[44] While these two cycles are conceptually distinct, they can overlap in real-world applications. An example is bio-based plastics, which start in the biological cycle and circulate into the technical cycle for recovery. The success of the circular economy depends on recognizing and respecting these cycles, optimizing the flow of materials within them and designing products for circularity from the outset. By leveraging the full potential of both cycles, businesses can reduce environmental pressure, enhance resource efficiency and move closer to a regenerative economic model decoupled from finite resource use and environmental degradation.

This methodology captures nature regeneration through recovery in the biological cycle *(% actual recovery*), where bio-based materials re-enter natural systems (e.g., composting, anaerobic digestion) to restore nutrients and support ecosystem regeneration, consistent with the Ellen MacArthur Foundation's butterfly diagram.[45]

## % circular inflow

The ***% circular inflow*** indicator measures the share of your organization's total material input that originates from secondary or renewable sources, determined on a material flow level. It reflects your organization's ability to reduce reliance on virgin materials by integrating secondary or renewable resources into its operations. This indicator supports the conservation of natural resources, enhances supply chain resilience and reduces the environmental impacts associated with extraction and processing. By quantifying the circularity of incoming material streams, the *% circular inflow* indicator provides a foundational perspective on how effectively your organization is contributing to a more circular value chain from the point of resource acquisition.

Depending on your organization's level of control, you can assess *% circular inflow*, along with the other indicators included in the circular performance measurement category, at different scopes, from materials directly purchased and used in internal processes to those from suppliers in different tiers of the value chain (see the Stage 2. Prepare – 2.2 Define the value chain and identify circularity hotspots section).

***Example***

**Soda bottle packaging**

A food and beverage organization partners with its direct (tier 1) packaging supplier to replace virgin plastic used in its soda bottles with recycled plastics containing at least 80% post-consumer recycled (PCR) content, verified through documentation and third-party certification.

**Use case:** Internal steering

**Objective/IRO**: Reducing biodiversity loss and pollution from plastic waste

**Intervention point**: Sourcing

**Strategy**: Close the Loop

**Circular performance indicator/s**: % circular inflow

**Scope**: B – all materials under direct control are part of scope B inflow

**Assessment level:** Materials (plastics)

**Value/impact indicators**: Nature impact

To calculate the *% circular inflow*, you should first determine the *% circular inflow* of material flows individually, by assessing the amount of secondary or renewable content of each flow flowing through the organization boundaries aligned with the organization boundaries set in Stage 2. Prepare – 2.4 Set your operational boundaries for material flows. In general:

% circular inflow (x) = % secondary (or renewable) content of material flow x

Where x is 100% linear, the % circular inflow would be equal to 0%.

Please refer to Box 3: Types of circular inflow to see the definitions of the different circular inflow categories.

After determining the individual *% circular inflow* for the material flows in scope, your organization can use the following formula to determine the total *% circular inflow*:

$$\frac{(\%\ circular\ \mathrm{inf}\,low X\ \times\ mass\ X)\ +\ (\%\ circular\ inflow\ Y\ \times\ mass\ Y)\ +\ (\%\ circular\ inflow\ Z\ \times\ mass\ Z)}{total\ mass\ of\ all\ inflow\ (X+Y+Z)}$$

Where:

X, Y, Z = different material flows within the organization

**Box 3: Types of circular inflow**

**Non-virgin (secondary)**

Inflow previously used, e.g., recycled materials, second-hand products or refurbished parts

Depending on the type of circular inflows under evaluation, you can monitor reused and recycled content separately and aggregate them into a final circular inflow score. These metrics align with ISO 59020 and allow for a structured, comparable assessment of circular material inputs:

- % reused content of an inflow (fraction of input reused components and products);
- % recycled content of an inflow (fraction of input that is recycled material).

**Renewable**

Sustainably managed resources are renewable natural resources that, after extraction, return to their previous stock levels through natural growth or replenishment processes at a rate that matches or exceeds their rate of use. This ensures long-term availability without depleting the resource base. Compliance with internationally recognized certification schemes (e.g., Forest Stewardship Council – FSC, Programme for the Endorsement of Forest Certification – PEFC,

Roundtable on Sustainable Palm Oil – RSPO) can provide credible evidence of such sustainable management practices.

- This definition equally aligns with ISO 59020 (fraction of input that is sustainably produced renewable material)

Refer to sector-specific guides for tailored definitions and lists of certifications for non-virgin and renewable resources.

**Note**

To avoid double counting, you should categorize each inflow as either renewable or non-virgin, even if it qualifies as both in some cases.

### % critical materials

To avoid risks regarding critical material inflow, the *% critical materials* indicator assesses the proportion of your organization's total material input that can be defined as critical raw materials. This indicator provides insight into the dependency and exposure of an organization to materials that are vital for its operations, but potentially vulnerable due to geopolitical, environmental or market constraints. Understanding the share of critical materials in the inflow helps identify potential risks, prioritize circular strategies and explore substitution or recovery opportunities to strengthen material security and support long-term business resilience. (*The CTI sector guides provide the % critical material indicator in the Optimize the Loop module.)*

Use the formula below to calculate the *% critical material*:

$$\%\ critical\ material = \frac{mass\ of\ \ inf\ low\ defined\ as\ critical}{total\ mass\ of\ linear\ \ inf\ low} \times\ 100\%$$

### % circular outflow

The ***% circular outflow*** indicator assesses the total circularity of outflowing products, by-products and waste streams and needs to be determined per outflow type. It is comprised of two interrelated sub-indicators: the *% recovery potential* and the *% actual recovery*.

The *% recovery potential* reflects the extent to which products and materials are designed for recovery, considering strategies such as modularity, disassembly and recyclability. The *% actual recovery* measures the share of materials effectively recovered in practice, based on factors such as existing take-back systems, collection infrastructure, geography and treatment processes. In summary, *% circular outflow* reflects the combined effectiveness of an organization to design or treat its outflow to be recoverable and demonstrate that the broader economy or biological cycle recovers products, by-products and waste streams that leave your organization.

Outflow should be based on all material flows leaving organization boundaries. This includes products, by-products or materials placed on the market, as well as any waste or residual streams

exiting organization operations during the reporting period. It should mirror all materials considered as inflows, such as materials, parts and resources entering your organization.

Like most other indicators, the *% circular outflow* indicator is applicable across the different standardized scopes defined with the GCP framework. This flexibility allows you to select the scope that is most relevant to the assessment, whether based on alignment with the assessment objective, material flows or the outcome of the IRO (refer to Stage 2. Prepare – 2.3 Define your organization's material impacts, risks and opportunities related to resource use and circularity).

***Example***

**Electronic devices**

An electronics manufacturer aims to report on their *% circular outflow* performance.

To do so, the manufacturer uses data from partners further down the value chain (tier 2 and beyond), e.g., from organizations that are inspecting devices and those in good condition that are refurbished, resold or harvested for spare parts and recycling partners. The electronics manufacturer does not have a contractual relationship with the partners further down the value chain but aims to use their actual recovery data to gain better insights into performance. The organization makes spare parts and repair guidance available to indirectly influence the repair of their devices in the value chain.

**Use case:** Internal steering

**Objective/IRO**: Gain better insights into performance on circular outflow

**Intervention point**: Circular recovery systems

**Strategy**: Close the Loop

**Circular performance indicator/s**: % circular outflow

**Scope**: C – all material under indirect control as part of scope C

**Assessment level**: Product (electronic devices)

**Value/impact indicators**: n/a

As with the *% circular inflow*, you should first determine the *% circular outflow* of relevant material flows individually:

$$\%\ circular\ outflow\ X = \%\ recovery\ potential\ X \times \%\ actual\ recovery\ X$$

Any difference in weight between inflow and outflow may be due to inventory changes (e.g., materials, products or by-products not yet sold or used between the beginning and end of the reporting period) or losses through evaporation during production. Other discrepancies should be investigated and addressed, as they are likely to be due to inconsistencies in scope between inflow and outflow (e.g., missing material flows in either category), which should be avoided.

For material streams with verified (see Annex 5 on data quality) closed-loop recovery or third party-managed take-back, calculate circular outflow as the actual recovery, meaning it should reflect the

measured quantity of materials effectively recovered and reintegrated into production processes (do not multiply by recovery potential). (See definitions for open and closed loop recovery systems in the Glossary)

***Example***

**Verified closed-loop systems**

Company X remains the product owner and contracts Company Y to collect and recover the products from its consumers. Company Y provides a report to Company X detailing the collection process and the weight of materials recovered. In this case, Company X can report actual recovery as its circular outflow, as it retains ownership and has verified data on the quantities of materials effectively recovered and reintroduced into the value chain.

***Note***

If the materials are neither treated in such a way that they have any technical recovery potential, nor able to be reintroduced into the value chain or guarantee the safe return of nutrients to the biosphere, the relevant outflow is linear. You should also classify any waste streams included in the scope of the assessment, regardless of their form or composition, as linear outflows if they do not contribute to circularity via reuse, material recovery or biological processing routes.

### % recovery potential

The ***% recovery potential*** reflects the ability of an organization to design or treat its outflow to ensure it is technically recoverable through either the technical cycle or the biological cycle. For example, the outflow should be repairable, manufacturable or recyclable for the technical cycle and biodegradable for the biological cycle. This indicator focuses solely on design-based recovery feasibility and is expressed as a percentage from 0% to 100%, according to the recoverability of each material flow.

If your organization is using sector guides, refer to sector-specific guidance on how to calculate *% recovery potential*. In the absence of sector-specific guidance and visibility of the fate of products and materials, your organization can calculate the indicator based on recyclability for the technical cycle and biodegradability and toxicity for the biological cycle.

*Technical cycle – recyclability*

When assessing recovery potential in terms of recyclability, organizations should evaluate the ability of the material used to be reprocessed into materials of equivalent quality and functionality.

- **Design criterion**: Use recyclability as the basis for assessing recovery potential.
- **Recyclable**: A material is considered circular if it can be recycled into a functionally equivalent material in a technically feasible and economically viable way. Materials that meet these requirements from closed loop or open loop recycling are considered circular. Upcycling, where materials are transformed into products of higher value or quality, is recognized as circular. See box 4 on the conditions for downcycling to be considered as circular.

Note, the GCP aligns with the circular economy principle of “keeping materials in use at their highest value” meaning at a functional equivalence. Although the GCP sets conditions to qualify downcycling as circular (see box 4), when assessing recovery potential in terms of recyclability, organizations should consider recyclability in terms of functional equivalence.

- **Guiding principle**: If a technical material can maintain its functional integrity in a second life, it is circular. This includes cases where the material is broken down and reprocessed, such as plastics, provided the resulting output serves a comparable function to the original. If it loses value or function (e.g., through downcycling or combustion), it is circular under certain conditions (see box 4).

To assess the recyclability of outflow in the technical cycle and as new technologies develop, drawing the line between circular and linear for the recovery potential becomes more difficult. As a temporary guiding principle: if a technical material on any level (potentially molecular) can remain a functional equivalent material in a second life in a technically feasible and economically viable manner, it is circular. If your organization downcycles inorganic or fossil material or turns it into a fuel or burns it in any shape or form, it may be considered circular under certain conditions (see box 4).

*Biological cycle – biodegradability and toxicity*

When assessing the recovery potential of materials from the biological cycle (e.g., natural fibers, bio degradable plastics), evaluate whether materials are designed for biodegradability and non-toxicity to guarantee the safe return of nutrients to the biosphere:

- **Design criterion:** Use biodegradability and the absence of harmful substances as the basis for assessing recovery potential.
- **Biodegradability:** The material must be capable of decomposing through natural biological processes. Organizations can refer to standards such as OECD, ISO 14085, ISO 17088 or NEN 13042 (on packaging) for verification.
- **Toxicity:** Materials must meet defined thresholds for safe return to the biosphere. Refer to the Cradle to Cradle Certified™ Restricted Substances List (RSL) for guidance.
- **Hybrid products** (e.g., cotton-synthetic blends) that combine technical and biological materials inseparably are considered non-recoverable in the biological cycle and assigned 0% recovery potential.

***Note***

To ensure the comparability of GCP circular performance and impact assessments, organizations will preferably access standardized material databases that provide agreed recyclability rates for common materials where available. In the absence of such references, organizations should clearly disclose the data sources and assumptions used when determining recyclability

## % actual recovery

The ***% actual recovery*** indicator measures the share of outflow effectively recovered at the end of its initial life cycle. This includes materials that are reused, refurbished or recycled into functionally equivalent applications in both the technical and biological cycles. The recovery methods included in this sub-section are examples and not a full list of accepted recovery methods. **Important note**: If no primary or secondary traceability data exists, you can assume 0% actual recovery.

*Technical cycle – reuse and recycling*

For technical materials (e.g., metals, plastics, electronics), actual recovery is based on the measured quantity of materials that are:

- Reused or refurbished (e.g., components recovered for direct use).
- Recycled into equivalent materials

**Important**: Only material recovery is included. Energy recovery without material recovery (e.g., incineration) is not considered circular.

To qualify as actual recovery:

- The material must retain its functional equivalence.
- The recovery must occur within a defined time frame (e.g., one year, one production cycle). This means data on collected materials and products in the defined time frame.
- Verified data or credible sectoral recovery rates must be used.

**Box 4: Functional equivalence, Downcycling, Energy recovery, Closed material cycles**

The GCP aligns with the circular economy principle of "keeping materials in use at their highest value" i.e., at a functional equivalence.

However, recognizing the challenges inherent to recycling [maintaining quality may be difficult due to material degradation, contamination risks, regulatory limits (e.g., food-contact rules), and the limited availability of technologies – such as chemical recycling – to restore materials to virgin quality], the GCP progressive user journey establishes the conditions for deviating from the functional equivalence criteria and considering downcycling as circular when calculating the % actual recovery.

**Functional equivalence**

The state or property of being equivalent (or equal) in function. In the context of GCP, this defines an outflow (a product, product part, waste stream, etc.) designed so that it is technically feasible and economically viable to bring it back to inflow (as a material, product part, etc.), preserving a similar function as in its previous cycle. For example, it is possible to recycle the plastics used in mobile phones for the exterior of kitchen machine appliances because properties like strength and aesthetics are equivalent.

The "functional equivalence" is what organizations should strive for.

**Downcycling**

Downcycling activities are recycling activities that obtain recovered resources with a lower value.

- For progressive user journey levels 1-2

  Downcycling is recognized as circular (incineration is excluded from downcycling because it does not return materials to productive use but remove them permanently from circulation). For transparency reasons and because the GCP aims for organizations to keep materials at their highest value, when using % actual recovery, organizations also have to use the % recovery type to indicate to what extent downcycling has been used.

- For progressive user journey level 3

  Consistent with life-cycle thinking, downcycling is not considered circular when higher-value recovery options are technically and economically available. However, where

evidence such as certifications or technical studies (e.g LCA and similar) demonstrates that no higher-value recovery is available and that the lowest downcycling option achieves preferable environmental outcomes compared to disposal, such recovery may be recognized as circular.

**Energy recovery**

Certain forms of energy recovery from materials (e.g. incineration) within the technical cycle are generally not regarded as circular recovery strategies because they do not return materials to productive use but remove them permanently from circulation. This position is consistent with ISO 59004,[46] which excludes energy generation from circular recovery, with life-cycle thinking principles that emphasize maintaining material loops (ISO 14040[47]) and with the EU Waste Framework Directive, which ranks reuse and recycling above energy recovery in the waste hierarchy (Directive 2008/98/EC of the European Parliament and of the Council[48]). Note, a detailed analysis of co-processing will be provided in GCP version 2.

**Closed material cycles**

Based on life-cycle thinking, the GCP acknowledges that material cycles are only closed when components or materials are reintegrated into production systems. Repair is a lifetime extension strategy (and to be prioritized whenever possible), as it prolongs product use; it is through reuse, remanufacturing or recycling that materials return into circulation.

*Biological cycle – Biodegradation and recirculation*

For biological materials (e.g., compostable packaging, natural fibers), actual recovery is based on the **safe return to the biosphere** through biodegradation or composting. To qualify as actual recovery:

- The material must biodegrade as intended during design;
- It must meet toxicity thresholds (e.g., Cradle to Cradle Certified RSL);
- It must be responsibly sourced and free from contamination (the material does not contain hazardous substances, impurities or incompatible materials at levels that compromise its safety, quality or suitability for reuse, recycling or further processing).

**Note**: If no traceability exists, assume 0% actual recovery.

Unlike technical materials, bio-based materials can re-enter the biological cycle through incineration due to natural processes, including uncontrolled events such as combustion (e.g., lightning-induced fire). For these pathways to be considered circular, they must meet specific criteria adapted from the Ellen MacArthur Foundation's Material Circularity Indicator:[49]

- All other recovery options, besides landfilling, must be technically and economically unfeasible;
- The material must be of biological origin and responsibly sourced;
- It must be free from contamination by non-biodegradable, toxic or technical materials (unless inert);
- Energy recovery must be optimized and the energy usefully employed to displace non-renewable alternatives;
- Any by-products from energy recovery must be environmentally beneficial and not detrimental to the ecosystems to which they are introduced.

*Downcycling, landfilling or mixed-waste* incin*eration*

Landfilling or mixed-waste incineration is classified as linear, even if biological content is present. Downcycling is considered circular under certain conditions (see box 4). **Important note**: If no data or downstream traceability exists, the *% actual recovery* should be assumed to be 0%.

Refer to Stage 3. Measure – 3.2 Collecting data and calculating for guidance on data collection.

After calculating the *% circular outflow* for the individual flows, use the following formula to determine the total *% circular outflow*:

Circular outflow % =

$$\frac{(\%\ circular\ outflow\ X\ \times\ mass\ X)\ +\ (\%\ circular\ outflow\ Y\ \times\ mass\ Y)\ +\ (\%\ circular\ outflow\ Z\ \times\ mass\ Z)}{total\ mass\ of\ all\ \ inf\ l\ ow\ (X+Y+Z)}$$

Where:

X, Y, Z = different material flows within the organization.

***Note***
To ensure the accuracy and comparability in circularity reporting, differentiate between the following metrics:

- Collection rate – proportion of materials collected at end-of-life;
- Recycling rate – proportion of collected materials entering the recycling process;
- Recovery rate – proportion of materials exiting the recycling process as usable secondary raw materials;
- Circularity rate – proportion of recovered materials re-entering the economy.

Losses occur at each stage due to inefficiencies, contamination and quality degradation. Base the calculations of circularity performance in the *% actual recovery* indicator on recovery rates, as this metric reflects the actual quantity of materials available for reintegration into the economy.

Avoid reporting based solely on collection or recycling input rates, as these overestimate circular outcomes and undermine data comparability across sectors.

## % recovery types

The circular economy operates on two main cycles. Technical materials can be recirculated through maintenance and repair, reuse and redistribution, refurbishment and remanufacturing and, finally, recycling. In contrast, bio-based materials follow a biological cycle, where their nutrients return to nature at the end of their life. It is critical that these materials come from sustainably managed sources, as their supply is finite.

The *% recovery types* indicator allows organizations to monitor and report on different types of actual recovery separately and aggregate them into a final score. Types of recovery align with ISO 59020 and allow for a structured, comparable assessment of the actual recovery of material flows:

***Reused and refurbished recovery types***

*% actual reused products and components* (fraction of outflow reused or refurbished)

***Recycled recovery type***

*% actual recycled materials* (fraction of outflow that becomes recycled material)

Implementing strategies like reuse, refurbishment and remanufacturing plays a central role in extending product life cycles and maximizing the economic value of materials, all while reducing resource consumption, waste and negative environmental impacts. While recycling is recognized as a form of recovery, it does not contribute to extending product lifetime. Therefore, prioritizing lifetime extension strategies over recycling, whenever possible, is essential.

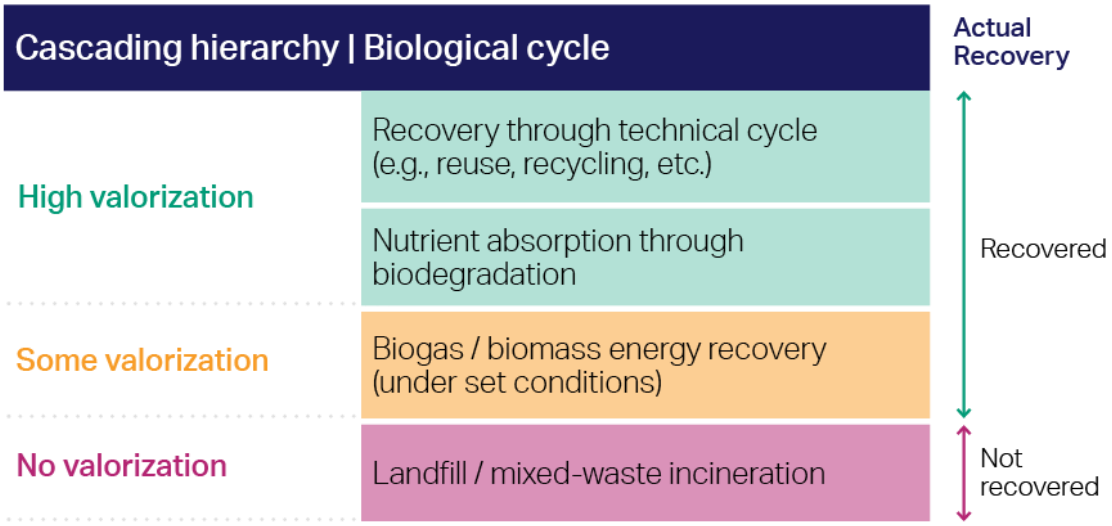
Note, organizations have to indicate in the *% actual recycled materials* the share (%) that is attributed to downcycling.

To support organizations in tracking their progress, the *% recovery by lifetime extension* sub-indicator helps measure performance across the different recovery strategies: reuse, refurbishment, remanufacturing and recycling. This is not a finite list, but an example. The indicator captures the proportion of outflows returned to use through these methods.

When calculating the *% recovery by lifetime extension* sub-indicator, consider outflows classified as waste during lifetime extension as either recycled or not recovered. Although recycling remains a valid circular strategy, it does not count toward lifetime extension in this sub-indicator, meaning all recycled mass flows in subsequent cycles are excluded.

When it comes to the biological cycle, Figure 11 summarizes the cascading hierarchy for biodegradable products, by-products or waste streams returning to the biological cycle, ranked by value retention.

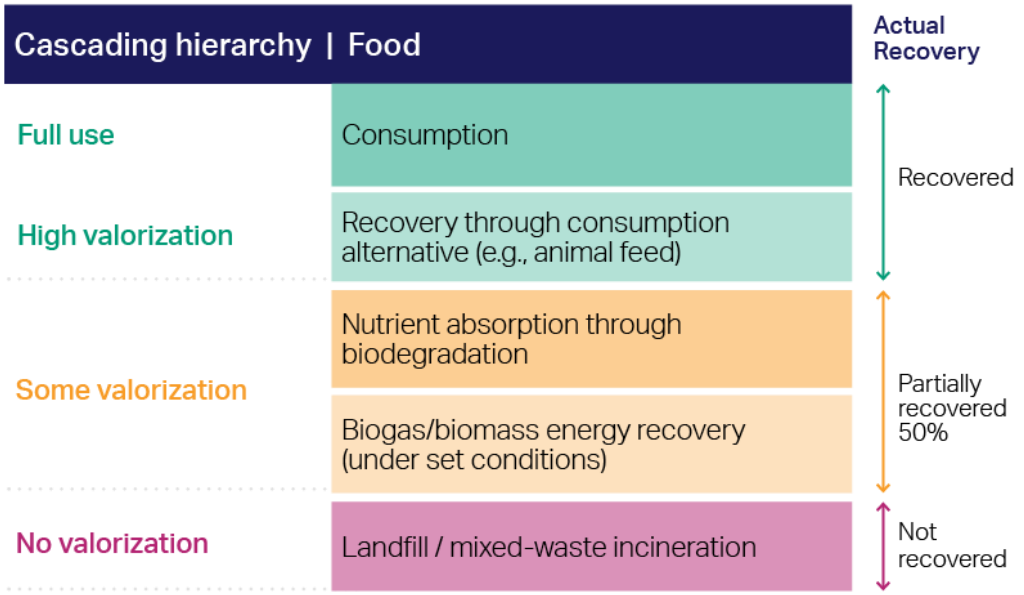
## Figure 11: Cascading hierarchy for the biological cycle




Source: Circular Transition Indicators v4.0

Special consideration is required for food streams in the biological cycle, as food is intended for consumption and recovery through biodegradation is not considered equally circular compared to direct consumption. For edible food, Figure 12 sets out a specific valorization hierarchy. Non-edible waste like eggshells, orange peels and coffee grounds are part of the general biological cascade.

## Figure 12: Cascading hierarch for food




Source: Circular Transition Indicators v4.0

***Note***

Certain forms of energy recovery from biological materials (e.g. incineration) are generally not considered a circular recovery strategy because it does not return materials to productive use. The Ellen MacArthur Foundation's *Circularity Indicators Methodology*[50] explicitly excludes energy recovery from circularity metrics, except under narrowly defined conditions for biological materials. The U.S. Department of Energy likewise states that incineration for energy recovery does not recirculate materials and therefore falls outside circular economy strategies. The European Union's *Waste Framework Directive* further distinguishes between recycling and energy recovery, explicitly classifying the latter as a recovery operation but not recycling of materials into the economy, thereby excluding it from circular economy metrics (Directive 2008/98/EC of the European Parliament and of the Council, consolidated 2018[51]).

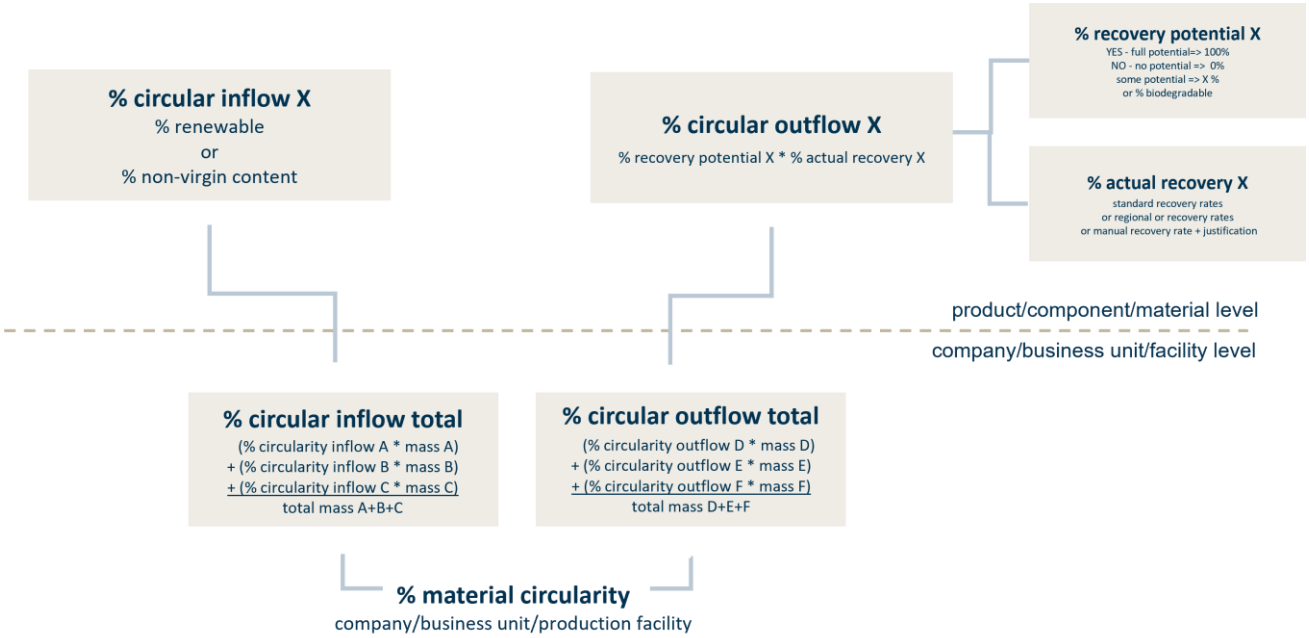
### % material circularity

The ***% material circularity*** expresses an organization's performance in closing the loop through the weighted-based ratio between *% circular inflow* and *% circular outflow*, as outlined in the formula structure below.

Use the following formula to calculate the *% material circularity* indicator:

$$\%\, material\ circularity = \frac{\%\, circular\ \mathrm{inf}\, low + \%\, circular\ ouflow}{2}$$

## Figure 13: % material circularity




To ensure comparability in calculating *% material circularity*, both inflow and outflow should refer to the same time period (e.g., one year or quarter) when determining the material flows through the organization boundaries (inflow) or material flows recovered (outflow).

Like most indicators, *% material circularity* is applicable across the different standardized scopes defined in the GCP framework. This flexibility allows you to select the scope that is most relevant to the assessment, whether based on alignment with the assessment objective, material flows or the outcome of the IRO (see Stage 2. Prepare – 2.3 Define your organization's material impacts, risks and opportunities related to resource use and circularity).

These range from material flows exchanged between the organization and the environment (scope A), materials exchanged between the organization and other organizations (scope B), materials that flow into or out of the organization's value chains (scope C) or even affected material flows within the wider economic system (scope D).

***Example***

**Office chairs**

An office furniture manufacturer partners with its direct suppliers to replace virgin plastics and textiles in office chair cushions with recycled material, aiming for at least 50% recycled content, verified through documentation and third-party certification. In the long term, the organization aims to return enough chairs to become less dependent on their suppliers for recycled material. This is why, at the same time, the organization operates a structured take-back program through partnerships with their B2B clients and logistics providers. Office chairs can be taken back and are refurbished or recycled (depending on their state). The organization aims to create a closed

loop system (with 100% non-virgin material and the reuse or recycling of old chairs) in the future in which *% material circularity performance* comes close to 100%.

**Use case:** Internal steering

**Objective/IRO**: Creating a closed loop system for office chairs

**Intervention point**: Sourcing, design circular recovery systems

**Strategy**: Close the Loop

**Circular performance indicator/s**: % material circularity

**Scope**: B – all materials under direct control as part of Scope B

**Assessment level:** Materials (plastics, textiles)

**Value/impact indicators**: n/a

### 3.1.3.2 Narrow and Slow the Loop

#### Purpose and strategic relevance

The **Narrow and Slow the Loop** module focuses on reducing the total volume of materials used and extending the useful life of products to prevent the use of virgin materials. This module is critical for organizations aiming to gain insights into performance on reducing total material consumption, decoupling growth from resource consumption and saving materials over time.

#### What it measures

This module evaluates two key strategies:

- **Narrowing**: Improving material efficiency and saving materials through dematerialization during extraction and production;
- **Slowing**: Extending product life cycles through design and business model innovation to reduce material consumption.

#### Indicators in this module

| Indicator | Description | Strategic use |
|---|---|---|
| **% absolute dematerialization** | Measures the total reduction in material | Tracks progress on absolute resource reduction goals |
| **% relative dematerialization** | Measures material use per unit of output (e.g., per product or revenue) | Supports efficiency benchmarking and performance improvement |
| **Actual lifetime** | Measures the average duration of product use before disposal or recovery | Informs design, durability and business model innovation strategies |

#### How to use this module

Use the indicators to gain two different insights into dematerialization performance: overall and over time depending on your organization's strategic priorities.

### Dematerialization: A critical strategy to lower material consumption

The GCP adopts a comprehensive global lens for material consumption, acknowledging the systemic dependency on materials across economies and the differences between the Global North and Global South. While the GCP emphasizes the overarching imperative of reducing total material consumption worldwide as a foundational step toward achieving a circular economy, it also recognizes that, in practice, organizations may demonstrate progress through both overall reductions and improved resource efficiency, depending on their context and business model.

Dematerialization describes decreasing the material requirements of whole economies. It is frequently regarded as a necessary condition for the sustainable development of economies and is a synonymous with absolute resource decoupling.[52]

Approaches for dematerialization play a critical role in advancing a circular economy and directly support the decoupling of economic activities from resource consumption.[53] Dematerialization occurs "whenever a unit good or a unit service can be produced or consumed with less material than before."[54] The focus of dematerialization is on the reduction and avoidance of physical materials throughout the production process and in the final product compared to a previous or baseline situation.

The dematerialization indicators address the total reduction and avoidance of material through the % *absolute dematerialization* indicator and the total reduction of material use per unit or function delivered through a % *relative dematerialization indicator*. Regardless of whether those materials are part of linear or circular flows. By focusing on total material consumption, the indicator provides a clearer lens to assess resource efficiency measures, material saving efforts and decoupling, providing flexible application across various sectors and businesses.

To capture the diversity of sector- and organization-specific pathways, the GCP provides a range of strategies[55] with potential contributions to dematerialization to enable meaningful performance measurement.

#### Table 11: Dematerialization strategies overview

| Dematerialization strategy | Description | Example | Dematerialization effect |
|---|---|---|---|
| **Refuse** | Eliminating the need for certain products, components or materials altogether by rethinking consumption or design | A hotel removes complimentary single-use toiletries entirely and encourages guests to bring their own, eliminating the need for packaging and the production and transport of single-unit products. | Reduction in material input by avoiding production and consumption of unnecessary products |
| **Reduce (lightweighting)** | Using fewer materials by optimizing product design, reducing thickness or selecting lighter alternatives without compromising function | A consumer electronics company redesigns a laptop casing to use 20% less aluminum while maintaining durability. | Reduction in the weight of materials used per unit product through design improvements |
| **Digitalization/ virtualization** | Replacing physical products or processes with digital alternatives | A university shifts from giving hard copy certificates to digital ones that are also traced online. | Reduction in material use by fully replacing physical goods with digital services |
| **Performance model (servitization/ platform as a service – PaaS)** | Shifting from product ownership to service delivery, enabling longer product life cycles, shared use and more efficient resource use; a key way these models contribute to | An organization offers washing machines as a service, maintaining ownership and optimizing their life cycle across multiple users. | Reduction in material use per unit of service delivered due to extended product life and increased use; also enables better collection and recovery at end-of-life |

| | | | |
|---|---|---|---|
| | circularity is by supporting improved collection and recycling | | |
| **Access model (sharing economy)** | Enabling multiple users to access the same product, reducing the need for individual ownership and total number of products needed | A citywide bike-sharing system allows many users to share a single fleet of bicycles. | Reduction in material use per user or per use cycle due to shared use |
| **Design for durability and longevity** | Creating products that last longer through robust design, delaying replacement needs | A clothing brand designs outdoor jackets using abrasion-resistant fabrics and reinforced seams to extend wearability over many years. | Reduction in material use per year of service or per use cycle |
| **Reuse**<br>**Repair**<br>**Refurbish**<br>**Remanufacture** | Extending product life or restoring functionality through maintenance and component reuse | A smartphone organization refurbishes and resells used devices with upgraded components. | Material reduction by decreasing the need for new material input per product life cycle |
| **On-demand production** | Manufacturing products only when needed, minimizing overproduction, waste and excess inventory | A fashion brand uses digital tools to produce garments only after a customer places an order. | Material reduction by avoiding surplus material use from overproduction |

As dematerialization can occur at multiple points across the value chain, from raw material extraction and production to product use and end-of-life, the indicators accommodate this variability by allowing the organization to define the scope of measurement based on where material reductions take place. This makes them broadly applicable across the standardized scopes defined in GCP Stage 2. Prepare and ensures flexibility to account for diverse business contexts.

Built on a *weight-based methodology*, the two indicators capture both absolute and relative dematerialization. By quantifying material input in terms of weight, either in total or relative to functional units such as time, use cycles or service output, the indicator provides a consistent and tangible way to assess performance across a wide range of strategies.

**Absolute dematerialization**
Measures the total reduction in material input, independent of time or output, while delivering the same product or service

*Use when the goal is to assess total material savings compared to a previous version*

**Relative dematerialization**
Measures the change in material input per unit of value delivered, such as per use, per year, or per functional unit

*Use when the product or service has changed in usage, lifespan, or utilization, and efficiency per unit is the focus*

A clearly defined set of eligibility requirements establishes the “rules of the game”, ensuring organizations perform measurements and make claims are made inside consistent boundaries while using the same principles for measurement. These eligibility criteria could differ depending on the industry, type of product or type of insight required.

Weight-based measurement is used as a practical starting point, acknowledging its limitations in capturing the full environmental or sector-specific impact of materials. Future versions of the GCP will include the development of additional impact metrics – including methodologies for avoided materials, climate, nature, social equity and financial indicators for dematerialization.

## % absolute dematerialization

The **% *absolute dematerialization*** indicator measures the **total weight-based reduction in material** input required to deliver the same function, regardless of time or output volume. It

assesses the overall material efficiency or savings by comparing current material use to a defined baseline, such as a previous product version, production cycle or reporting year.

This indicator is particularly useful when the goal is to understand and demonstrate the total reduction of material use in a specific scope, such as materials, products or the full organization scope. It relies on the accurate measurement of the total weight of materials used, making it a practical tool for tracking progress in material reductions over time, identifying areas for performance improvement and validating dematerialization claims.

Like most other indicators, *% absolute dematerialization* is applicable across the different standardized scopes defined in the GCP framework. This flexibility allows your organization to select the scope that is the most relevant to the assessment, whether based on alignment with the assessment objective, material flows or the outcome of the IRO (refer to Stage 2. Prepare – 2.3 Define your organization's material impacts, risks and opportunities related to resource use and circularity).

***Example***

**Electric warehouse crane**

An industrial equipment manufacturer redesigns an electric warehouse crane in-house, replacing a thick aluminum part with a lighter, structurally optimized version, reducing primary aluminum use by 30% per unit while maintaining performance.

The organization can choose to quantify the direct material reduction (e.g., kilograms of aluminum saved per unit) as part of scope B or extend the assessment to all materials flowing in the value chain, for example the rock-to-metal ratio (R2M) and estimate the volume of bauxite ore extraction avoided, as a scope C assessment.

**Use case:** Internal steering

**Objective/IRO**: Reducing dependency on virgin aluminum due to value chain disruptions identified as a high risk

**Intervention point**: Sourcing, design

**Strategy**: Narrow and Slow the Loop

**Circular performance indicators**: % absolute dematerialization

**Scope**: B or C – all material under (in)direct control as part of scope B or scope C

**Assessment level**: Materials (aluminum)

**Value/impact indicators**: n/a

Calculate the % *absolute dematerialization* indicator using the following formula:

$$\%\ absolute\ dematerialization = \frac{baseline\ material\ use - Optimized\ material\ use}{baseline\ material\ use} \times 100$$

This formula expresses the percentage reduction in material use achieved after applying circular strategies, compared to a defined baseline. It quantifies how much less material (by weight) is required to deliver the same function, offering a straightforward measure of material savings.

- **Baseline material use** refers to the sum of total material input (in weight, e.g., kilograms) *before* the implementation of any dematerialization strategies. This could reflect a previous product version, production cycle or fiscal year.
- **Optimized material use** represents the sum of total material input (in weight, e.g., kilograms) *after* circular strategies, such as lightweighting, design changes or material substitution, have been applied.

To ensure robust, credible and comparable measurement, your organization must meet specific *eligibility requirements* when applying the formula to establish a consistent basis for calculating and claiming dematerialization. Your organization is responsible for determining the exact specifics of the requirements, which are designed with flexibility to reflect varying business contexts. Then you must document the choice and assumptions made on the requirements to serve as proof of meeting the eligibility requirements. The focus lies on maintaining clear transparency about your choices, while providing a common framework to guide credible and comparable dematerialization claims. It is important to differentiate the level of evidence required based on the use case: for internal assessments, it may be sufficient to document that eligibility criteria have been considered; for external reporting or assurance purposes, more thorough documentation or supporting proof may be necessary (refer to Stage 5. Communicate for further guidance).

- **Clearly defined baseline**: The baseline must reflect the original way in which the same function was delivered prior to applying the dematerialization strategy. This could be the material composition of a previous product version, the previous product itself or an earlier process or workflow. The key is that the baseline represents the organization's own prior solution for delivering the same core function, serving as a consistent point of comparison for measuring material reductions.
- **Functional unit consistency**: The optimized product or service must, at a minimum, deliver the same core functionality as the baseline version. This includes maintaining equivalent levels of performance, quality, durability and safety, ensuring that reductions in material use do not compromise the intended use. In cases where the optimized version delivers additional functions beyond the baseline, such as added features or enhanced usability, these improvements are permitted as long as the original functionality is fully preserved and not compromised by material reduction measures.
- **Key material flows included in the assessment**: You must include all material inputs, as defined by the IRO assessment and objectives of the assessment (for further guidance, refer to Stage 2. Prepare), including those identified through Identify and prioritize your materials flows. This ensures the considering of all relevant flows required to establish or maintain the optimized product or service. This accounts for any additional inputs, such as those used for maintenance, transportation, return packaging, spare parts or upgrades.
- **Environmental impact neutrality**: Dematerialization must not lead to a higher overall environmental footprint, e.g., substituting a material with a lighter material causes significantly greater environmental harm is not eligible. While a full LCA is not necessarily required, your organization should consider available environmental data (e.g., carbon footprint, toxicity profiles, environmental product declarations (EPDs)) to ensure that material reductions do not result in disproportionate trade-offs.

- **Strategy-specific requirements**: Additional criteria may apply depending on the circular strategy implemented (e.g., design optimization, material substitution, service models). You must meet these requirements alongside the general criteria above; the GCP elaborates on them in the full guidance and indicator framework.

The result of assessing performance with the absolute dematerialization indicator is expressed as a percentage or as an absolute figure representing the reduction in total material use compared to the baseline. A positive percentage indicates successful dematerialization, meaning fewer materials are now used to deliver the same (or improved) function. For example:

- A result of 25% in the absolute dematerialization indicator signifies a 25% reduction in material input relative to the original version;
- A value of 0% indicates no change;
- A negative result suggests an increase in material use.

These insights help evaluate the effectiveness of dematerialization strategies and identify where to make further improvements. High-performing areas may serve as best practices for scaling across other product lines, while low or negative results can highlight inefficiencies, data gaps or unintended trade-offs. Your organization can use these findings to prioritize design improvements, adjust procurement strategies or inform broader sustainability and resource efficiency targets.

***Example***

**Laptop**

A global electronics manufacturer has recently *redesigned one of its bestselling laptops to reduce overall weight*. The focus was on cutting down the use of three high-impact metals: *aluminum*, used for the laptop chassis; *copper*, used in internal wiring and heat sinks; and *lithium*, found in the battery. It achieved these reductions through advanced material engineering, without compromising performance, battery life or durability. In addition to internal material savings, the company seeks to *quantify the reduced upstream impacts related to material use*, i.e., how much raw material extraction (ore) was prevented as a result of these material reductions.

**Use case:** Internal steering

**Objective**: Quantify material use (metals and minerals) reductions through lightweighting

**Scope**: Material content of the product in scope of the assessment (scope B) and upstream extraction impacts (i.e., rock or brine saved from mining) for a selection of materials (aluminum, copper, lithium) (scope C with indirect influence). (For further guidance, refer to Stage 2. Prepare)

**Identify the functional unit**: One laptop with equivalent or better performance characteristics, including same screen size and resolution, equivalent central processing unit/graphics processing unit capacity, same battery runtime, unchanged durability (drop and flex resistance)

**Select dematerialization indicator**: The company selects the *absolute dematerialization indicator* to measure the total weight of metal saved. Since the redesigned laptop retains its full functionality and durability, the savings represent a true, direct material efficiency improvement.

**Check eligibility criteria**

- **Clearly defined baseline:** The original version of the laptop before lightweighting

  *Sources: Engineering bill of materials (BOM, revision-controlled), manufacturing build record, official product data sheet or datasheet archive*
- **Functional unit consistency:** The new version maintains equivalent specifications: battery life, computing power, thermal regulation and mechanical resilience

  *Sources: Internal quality-assurance test reports, third-party certification results where applicable, field-failure-rate database or reliability-growth reports*
- **Key material flows included in the assessment**: No additional materials (e.g., denser alloys or added packaging) introduced that offset the metal savings

  *Sources: Comparative BOM (original vs redesigned), supplier material declarations, packaging specification sheets and mass records*
- **Environmental impact neutrality**: A comparative carbon hotspot analysis or high-level insight in to life-cycle emissions shows no increases in carbon footprint or other impact categories due to the redesign.

  *Sources: Comparative LCA study in accordance with ISO 14040[56]/14044[57] (or ISO 14067[58] for carbon footprint), primary process data from manufacturing sites (energy, yield, scrap), secondary datasets from recognized databases (e.g., ecoinvent[59] v3.x, GaBi,[60] ELCD[61])*

**Collect the data for calculation**

| *Direct material use (own operations)* | | | *Indirect material use (upstream extraction inputs)* | | |
|---|---|---|---|---|---|
| **Material** | **Baseline material use (g)** | **Optimized material use (g)** | **Material[62]** | **Baseline material use (g)** | **Optimized material use (g)** |
| **Aluminum** | 150 | 120 | Bauxite | 600.0 | 480.0 |
| **Copper** | 70 | 50 | Ore | 7,000.0 | 5,000.0 |
| **Lithium** | 40 | 35 | Brine | 10,000.0 | 8,750.0 |
| **Total** | **260** | **205** | **Total** | **17,600** | **14,230** |

### Calculate indicator

Based on the data gathered, apply the absolute dematerialization formula as follows:

$$\%\ absolute\ dematerialization = \frac{\left((0.260\ +\ 17.6)\ -\ (0.205\ +\ 14.23)\right)}{(0.260\ +\ 17.6)} \times 100 = 19.17\%$$

### Analyze results

The company achieves *19.17% total dematerialization per laptop unit* by reducing both direct metal use and the amount of rock, ore and brine that would have been extracted upstream.

This result can be extended in two practical ways to capture the broader environmental and financial impact:

- Translate material savings into potential emission savings: Apply published cradle-to-gate emissions factors for each material, for example: aluminum ≈ 11 kg $CO_2$e /kg, copper ≈ 4 kg $CO_2$e /kg, lithium ≈ 15 kg $CO_2$e /kg and multiply each metric ton (or kilogram) of savings by its factor to estimate the $CO_2$-equivalent emissions averted.
- Translate the same savings into cost-avoidance: Use current market prices (EUR €/kg) for each material and multiply by the mass reduction to quantify direct material-cost savings, which can then be compared with the redesign's additional engineering or tooling costs.

### % relative dematerialization

The *% relative dematerialization* indicator measures the *change in material input per unit of function delivered*, rather than total material use alone. It is used for internal steering purposes and reflects improvements in material efficiency over time, per usage cycle or per unit of service provided, allowing for meaningful comparisons when products or services are used differently, have longer life cycles or serve more users: This indicator is most useful when:

- An organization has optimized a product or service to last longer or be used more intensively;
- An organization wants to capture improvements in material efficiency (weight of materials used to perform a function) rather than just reductions in total material use;
- An organization needs to compare different product generations where usage patterns or life cycles have changed.

Examples include measuring material use per year of service, per kilometer travelled, per customer served or per unit of production output.

***Example***

**Washing machine**

A washing machine manufacturer is extending the durability of its products by changing the material composition of a component that breaks down most often to a lighter more durable material without having a negative impact on the environment or a heavier material that significantly improves the functional unit, since it lasts longer. The material is more expensive. The functional unit the organization chooses is the number of washing cycles. The material savings could be measured relative to the improved functional unit.

**Use case**: Internal steering

**Objective/IRO**: Reducing the relative material consumption for the manufacturing of the product

**Intervention point**: Design

**Strategy**: Slow the Loop

**Circular performance indicators**: % relative dematerialization

**Scope**: B or all material under direct control as part of scope B

**Assessment level:** Component/material level (plastics and aluminum)

**Functional unit**: Number of washing cycles

**Value/impact indicators**: n/a

While the *% relative dematerialization* indicator primarily supports internal steering, it can also be applied in ESG reporting by attributing improvements to the reporting year in which the organization introduces the optimized product or service. For example, if an organization enhances a washing machine's design to deliver more usage cycles over its lifetime without increasing material input, it can calculate the relative material efficiency gain based on expected lifetime use (e.g., grams per wash cycle). It then reports this improvement is for all units sold in the reporting year, using clearly stated assumptions on functional performance. This approach enables alignment with annual reporting cycles while capturing long-term material efficiency improvements.

As most other indicators, the *% relative dematerialization* indicator is applicable across the different standardized scopes within the GCP, allowing you to choose a scope of the assessment that is most relevant for your organization (e.g., most related to the objective or IRO of the assessment) (Refer to Stage 2. Prepare for further guidance)

The *% relative dematerialization* is calculated using the following formula:

$$\%\ relative\ dematerialization = \frac{\frac{baseline\ material\ use}{baseline\ relative\ unit} - \frac{optimized\ material\ use}{optimized\ relative\ unit}}{\frac{baseline\ material\ use}{baseline\ relative\ unit}} \times 100$$

This formula calculates the percentage change in material intensity per relative functional unit, comparing the baseline to the optimized scenario.

- **Baseline material use:** The total material input (in weight, e.g., kilograms) *before* the implementation of any dematerialization strategies. This could reflect a previous product version, production cycle or fiscal year.
- **Optimized material use:** The total material input (in weight, e.g., kilograms) *after* the application of circular strategies, such as lightweighting, design changes or material substitution.
- **Relative unit**: The denominator used to normalize material use. This must reflect a consistent unit of function and it must be measurable and clearly defined in both baseline and optimized cases. The three possible relative units are:
  - Time-based (e.g., years of product life cycle);
  - Function-based (e.g., km travelled, units produced, wash cycles);
  - User-based (e.g., number of people served).

To ensure robust, credible and comparable measurement, you must meet specific *eligibility requirements* when applying the formula to establish a consistent basis for calculating and claiming dematerialization. It is important to differentiate the level of evidence required based on the use case: for internal assessments, it may be sufficient to document that you have considered eligibility criteria; for external reporting or assurance purposes, more thorough documentation or supporting proof may be necessary.

- **Clearly defined baseline**: The baseline must reflect the original way in which the same function was delivered prior to applying the dematerialization strategy. This could be the material composition of a previous product version or an earlier process or workflow. The key is that the baseline represents the organization's own prior solution to delivering the same core function, serving as a consistent point of comparison for measuring material reduction.
- **Functional unit consistency**: The optimized product or service must, at a minimum, deliver the same core functionality as the baseline version. This includes maintaining equivalent levels of performance, quality, durability and safety, ensuring that reductions in material use do not compromise the intended use. Improvements where the optimized version delivers additional functions beyond the baseline, such as added features or enhanced usability, are permitted if the original functionality is fully preserved and not compromised by material reduction measures.
- **Key material flows included in the assessment**: You must include all material inputs, as defined by the IRO assessment and objectives of the assessment (see Stage 2. Prepare for further guidance), required to establish or maintain the optimized product or service. This accounts for any additional inputs such as those used, for example, maintenance, transportation, return packaging, spare parts or upgrades.
- **Environmental impact neutrality**: Dematerialization must not lead to a higher overall environmental footprint. Substituting a lighter material with one that causes significantly greater environmental harm is not eligible.
- **Relative unit consistency:** Material use must be normalized by a clearly defined and measurable unit that reflects the product's function or value. You must use the same type of unit for both the baseline and optimized case.

- **Strategy-specific requirements**: Additional criteria may apply depending on the circular strategy implemented (e.g., design optimization, material substitution, service models). These requirements must be met alongside the general criteria above; the GCP will elaborate on this in the full guidance and indicator framework.

The result of the *% relative dematerialization* indicator shows the change in material efficiency per relative functional unit. A positive result indicates improved material performance – using fewer materials per year of service or per use cycle – while a zero or negative result may indicate unchanged or worsened efficiency. This insight allows you to evaluate whether your organization's improvements come from smarter design, extended life cycles or increased use intensity. It can inform product development, business model innovation (e.g., leasing, shared use) and sustainability reporting. Organizations may use this indicator to identify which design or service interventions deliver the greatest efficiency gains and to support claims of resource-efficient value delivery.

***Example***

***Technical outdoor jacket***

A clothing company *redesigns one of its core outerwear garments*, a technical outdoor jacket, *using more durable materials* and construction techniques (e.g., abrasion-resistant fabrics, reinforced seams). While the new jacket *requires slightly more material per unit*, it lasts longer and *can be worn significantly more times* before being replaced. The company wants to quantify how much material is needed per use and show how this improved wear efficiency contributes to resource savings.

**Use case**: Internal steering

**Objective**: Quantify the relative reduction in material use per wear achieved by redesigning a garment to increase its durability and use-life

**Scope**: Material flows into the company that are used to produce the jacket (scope B) (for further guidance see Stage 2. Prepare)

**Identify the functional unit:** A jacket that provides equivalent comfort, weather protection and usability during everyday outdoor wear

**Identify the relative unit**: The number of times the jacket is worn (use-based approach)

**Select the dematerialization indicator**: The company selects the relative dematerialization indicator to measure material use per number of times the jacket is worn since the redesigned jacket lasts longer and is worn more frequently before being discarded.

**Check eligibility criteria**

- **Clearly defined baseline:** The baseline is the standard jacket with known average wear-life before disposal

  *Sources: Historical durability/wear-life data from returns, customer surveys and wear testing*
- **Functional unit consistency:** Both jackets serve the same purpose (e.g., windproof, comfortable, functional fit)

  *Sources: User trials or wear panels comparing mobility, perceived comfort and fit, third-party certifications or compliance reports (e.g., bluesign®, OEKO-TEX®) confirming the same functional claims*

- **Key material flows included in the assessment**: Includes all production materials for both baseline and optimized scenario (fabric, zippers, linings, thread)

  *Sources: Full BoM and production data*
- **Environmental impact neutrality**: A screening LCA confirms that no new environmental burden was introduced (e.g., energy-intensive fabric coatings)

  *Sources: Comparative LCA study in accordance with ISO 14040/14044 (or ISO 14067 for carbon footprint), primary energy, water and chemical-use data from dyeing/finishing facilities*
- **Functional unit consistency**: Number of times the jacket can be worn

  *Sources: Customer usage surveys, RFID-tag or smart-label tracking of garment wear frequency*

**Collect the data for calculation**

| *Direct material use (own operations)* | | |
|---|---|---|
| **Material and wears** | **Baseline scenario** | **Optimized scenario** |
| **Weight per jacket (g)** | 800 | 950 |
| **Average wears per jacket (#)** | 50 | 100 |

**Calculate the indicator:**

Based on the data gathered, the relative dematerialization formula can be applied as follows :

$$\%\ relative\ dematerialization = \frac{\left(\frac{800}{50} - \frac{950}{100}\right)}{\frac{800}{50}} \times 100 = 40.6\%$$

**Analyze results**

By increasing the jacket's durability, the company achieves *40.6% relative dematerialization*, meaning each wear requires over 40% less material input than before.

## Actual lifetime

Longer design lives and the lifetime extension of products contribute to slowing down the overall flow of materials, reducing environmental impacts and the production of waste while preserving the economic value embedded in products and materials.[63] This methodology recognizes design for longevity and lifetime extension of products as a circular practice. Designing durable products and materials and implementing strategies to extend their lifetime once they become obsolete leads to higher circularity and value retention through the life cycle of materials and products.

UNEP defines a product's lifetime as the duration of the period that starts at the moment of a product's release for use after manufacturing or recovery and ends at the moment a product becomes obsolete.[64] Its durability, meaning the ability to "function as required, under specified conditions of use, maintenance and repair, until a limiting event prevents its functioning", drives longer product lifetime.[65] A product's technical lifetime and functional lifetime enable its durability. The technical lifetime is the time span or number of use cycles for which a product is considered to

function as required, under defined conditions of use, until a first failure occurs. Functional lifetime is the time a product is used until the requirements of the user are no longer met, due to the economics of operation, maintenance and repair or obsolescence. While the technical lifetime is part of the intrinsic properties of the product, the conditions created around the product determine its functional lifetime.[66]

These conditions facilitate the repairability, upgradability and reusability of products extending their useful life. The actual lifetime indicator drives organizations to develop an understanding of a product's average life duration. This means the duration of life the product lasts, on average, rather than design life or warranty period. The actual lifetime indicator rewards organizations with a higher score for products that stay in use for longer than the industry average and is calculated as follows:

$$Actual\ lifetime = \frac{product\ actual\ lifetime}{average\ product\ actual\ lifetime}$$

Organizations can measure lifetime in number of years OR number of use cycles.

***Note***

**Do no significant harm**[67]

In designing products for longevity and exercising product lifetime extension strategies, organizations should ensure that these do not do significant harm to efforts to mitigate and adapt to climate change, the sustainable use and protection of water and marine resources, pollution and prevention control, and the protection and restoration of biodiversity and ecosystems. For more background, organizations may refer to the European Commission's Do no significant harm (DNSH) principles or other similar regional, national, sector or industry directives.

***Example***

**Computer mouse**

A computer mouse is designed to last 6 years but the average lifetime of a computer mouse is 4.5 years.[68] The actual lifetime indicator in the GCP will provide a positive score for companies whose computer mouse stays in use demonstrably longer than the industry average.

In calculating this indicator, organizations may determine a reference lifetime value, for example lifetime (in time span or number of use cycles) of the prior product version or, if appropriate, an average of at least a few prior products. Another option is to reference the lifetime (in time span OR number of use cycles) of an "industry average" product, which is either:

- Calculated using a methodology consistent with both LCA or ISO best practices

**OR**

- Obtained from reference literature, taking care to use the most up-to-date data and, at a minimum, not using data that is too outdated to reflect the current state of the industry

The strength of the indicator relies on the methodology that organizations adopt to calculate the actual lifetime of assessed products. For example, reference products would target the same overall customer base, in similar geographies and time frames. Widespread adoption and comparability will depend on the harmonization and standardization of an appropriate methodology to measure lifetime by relevant industries and sectors.

Tracking a product's lifetime extension is a circular practice. In calculating the actual lifetime indicator, organizations should aim to capture the actual average life duration of the product under scope. In developing an understanding of the average life duration of their products, organizations may consider tracking maintenance, repair and upgrade operations that the product underwent and the number of its successive users.[69] The actual lifetime indicator measures the performance for finished products and components; materials are currently not within the scope of this comparison. Organizations may use this indicator for durable products that require no or minimal water, electricity or detergent consumption during use and whose greatest environmental impact issues from the production or disposal phases (e.g., furniture, clothing or technical equipment) of life cycle (e.g., fast-moving consumer goods).[70]

This indicator is not quantified based on material inflow or outflow metrics. Consequently, the standardized scope definitions prescribed under GCP are not applicable to its assessment or reporting boundaries.

***Note***

While actual lifetime is a universal, sector-agnostic indicator to monitor higher product lifetime performance, sector guidance documents should address how different lifetime extension strategies contribute to its improvement, since the effectiveness and impacts of such strategies can vary significantly by sector, material and product.

### 3.1.3.3 Value the Loop

**Purpose and strategic relevance**

The Value the Loop module connects circular performance to financial performance. It helps organizations quantify the economic value generated through circular strategies – such as using secondary materials, extending product lifetime or shifting to service-based models. This module strengthens the business case for circularity by demonstrating how circular actions contribute to revenue generation and resource productivity.

**What it measures**

This module focuses on the financial outcomes of circular strategies:

- How efficiently an organization generates revenue from circular material flows. For example, a PaaS model may enable prolonged revenue generation from the same set of materials, highlighting the financial efficiency of circular approaches.
- How much of its revenue is derived from circular products or services.

The indicators can support internal decision-making, investor communication and sustainability reporting.

### Indicators in this module

| Indicator | Description | Strategic use |
|---|---|---|
| **Circular material productivity** | Measures revenue generated per unit of linear material input | Demonstrates decoupling of growth from virgin resource use |
| **Material circularity revenue** | Measures the share of revenue generated from circular products or services | Supports portfolio steering and investor engagement |

While the current indicator in this module uses **revenue** as the denominator, organizations may choose to use **cost** or **profit** instead to complement their strategic focus.

- **Revenue**: Is useful for tracking growth and market share of circular products.
- **Cost**: Helps assess efficiency and resource productivity.
- **Profit**: Supports business case development and return on investment analysis.

Organizations should document their chosen metric and apply it consistently. A comparison of these financial measures can help tailor insights to different audiences (e.g., executives, investors, operations teams).

#### How to use this module

The Value the Loop module provides a structured approach to quantifying the business value generated through circular material flows, highlighting the economic dimension of circular strategies. By aligning circular performance with financial outcomes, the module strengthens the business case for circular economy strategies and supports a more financially informed decision-making across product design, operations and investments.

> ***Note***
>
> In addition to the core circularity metrics presented here, organizations may wish to consider broader economic and business value dimensions of circular performance. The set of additional indicators included in ISO 59020 Annex B address these, providing supplementary guidance for organizations seeking to capture the wider economic benefits of circular economy strategies.

## Circular material productivity

The first indicator in the Value the Loop module illustrates how efficiently an organization reduces dependence on virgin materials while maintaining or increasing growth. Organizations can calculate circular material productivity by dividing revenues generated by the mass of linear inflow as considered in the Close the Loop module, using the formula below:

$$circular\ material\ productivity = \frac{revenue}{total\ mass\ of\ linear\ \ inf\ l\ ow}$$

The greater the circular material productivity, the more efficient an organization is at decoupling financial performance from linear resource consumption. To get the most benefits out of this indicator, organizations should analyze the indicator over time, comparing it with data from previous years to understand the evolution of material productivity and monitor progress.

***Example***

**Scope B: Elevator**

A building system manufacturer produces and sells elevators using a mix of materials, including virgin steel, copper and electronic components, as well as recycled metals and refurbished parts. The company wants to understand how effectively it generates revenue from the virgin materials it directly purchases and uses in its own operations.

Circular material productivity is assessed over multiple years to track progress. The company calculates it by dividing its revenue by the mass of virgin materials under its direct control.[71]

Year 1

- **Revenue from elevator sales**: EUR €150 million
- **Virgin materials purchased**: 3,000 metric tons

Circular material productivity=$\frac{€150,000,000}{3,000} = €50,000/ton$

Year 2

- **Revenue from elevator sales:** €155 million
- **Virgin materials purchased:** 2,800 metric tons

Circular material productivity =$\frac{€155,000,000}{2,800} = €55,357/ton$

% change in circular material productivity:

$$\frac{€55,357 - €50,000}{€50,000} = 10.7\%$$

This result shows how efficiently the company converts its directly sourced virgin materials into revenue, indicating that over the course of one year, the company now uses its virgin materials 10.71% more effectively, generating more revenue per metric ton. This measurable improvement in *circular material productivity* highlights progress in material efficiency and supports efforts to reduce dependency on virgin inputs or shift to recycled alternatives. It is particularly useful for internal steering and investor communication.

**Use case**: Internal steering

**Objective/IRO**: Understand how efficiently the company generates revenue from virgin materials it directly purchases for elevator production

**Intervention point**: Procurement and material sourcing

**Strategy**: Close the Loop

**Circular performance indicator**: Circular material productivity

**Scope**: B – All materials under direct control

**Assessment level**: Product (elevator)

**Scope C: Elevator**

The same manufacturer now wants to assess how efficiently it generates revenue from virgin materials used across its entire value chain, including upstream mining, component manufacturing and electronics assembly, which it does not directly control. The total material flow includes both virgin and non-virgin inputs, but this indicator focuses on the virgin portion to identify opportunities for improvement.

Circular material productivity is assessed over multiple years to track progress. The company calculates it by dividing its revenue by the estimated mass of virgin materials used across the full value chain.

The company estimates the total virgin materials used across the value chain and calculates circular material productivity using the same revenue figure.

Year 1

- **Revenue from elevator sales**: €150 million[72]
- **Estimated virgin materials across the value chain**: 6,500 metric tons

Circular material productivity=$\frac{€150,000,000}{6,500} = €23,077/ton$

Year 2

- **Revenue from elevator sales:** EUR €155 million
- **Estimated virgin materials across the value chain:** 6,000 metric tons

Circular material productivity=$\frac{€150,000,000}{6,000} = €25,000/ton$

Change in circular material productivity:

Circular material productivity=$\frac{€25,000-€23,077}{€23,077} = 8.3\%$

This result shows how efficiently the company converts virgin materials used across its full value chain into revenue, indicating that over the course of one year, the company now uses the virgin materials in the value chain 8.3% more effectively, generating more revenue per metric ton. This broader view reveals that the company's value chain is less efficient in converting materials into revenue. It could support in highlighting hotspots (e.g., inefficient metal processing) and supports strategic decisions like supplier engagement, sourcing or investment in circular infrastructure.

**Use Case**: Internal steering

**Objective/IRO:** Understand how efficiently the company generates revenue from all virgin materials used across the value chain

**Intervention point:** Value chain collaboration and supplier engagement

**Strategy:** Close the Loop

**Circular performance indicator:** Circular material productivity

**Scope:** C – All materials under indirect control

**Assessment level:** Product (elevator)

### Material circularity revenue

The second indicator of the Value the Loop module explores the share of value created through circular actions. As financial institutions increasingly recognize the value that the circular economy presents in terms of risk mitigation, financial opportunity and positive environmental and social

impacts, a solid grasp of the value created through circular investments would allow investors to proactively recognize and reward organizations that make progress on circularity.

To measure this, organizations can calculate the Material circularity revenue of a specific product by multiplying the average of % circular inflow and % circular outflow of the product (determined in the Close the Loop module) with the revenue generated by this product:

$$material\ circularity\ revenue = \left[\frac{\%\ circular\ \inf l\ ow + \%\ circular\ outflow}{2}\right] \times revenue$$

To scale the measurement up to organization level, sum up all product *Material circularity revenue* in the portfolio in scope as follows:

$$material\ circularity\ revenue\ (company) = material\ circularity\ revenue\ X + material\ circularity\ revenue\ Y + material\ circularity\ revenue\ Z\ \ldots$$

Where:

X, Y and Z are products in scope within an organization's portfolio

The greater the *Material circularity revenue* , the better an organization can generate revenues from its circular products/business. This metric also reflects decoupling as revenues increase from circular flows.

***Example***

**Scope B: Notebooks**

A stationery company produces and sells notebooks made from paper, cardboard covers and metal wire binding. It wants to assess how much revenue it generates from circular notebooks based on the materials and design features it directly purchases and controls.

The company assesses its circularity based on the percentage of circular inflow and circular outflow. This is the starting point for calculating the *Material circularity revenue* indicator.

This includes the recycled content of the paper it buys, the recyclability of the cardboard covers and the design choices it makes to ensure the notebooks are easily recycled.

The company calculates the indicator by multiplying the average of the % circular inflow and % circular outflow for its notebook line by the revenue generated from that product line.

- Revenue from notebook sales: EUR €10 million
- % circular inflow: 50% (recycled paper, renewable cardboard)
- % circular outflow: 60% (primarily driven by design for recovery)

Material circularity revenue $\frac{50\%+60\%}{2} \times €10{,}000{,}000 = €5{,}500{,}000 \frac{50\%+60\%}{2} \times €10{,}000{,}000 = €5{,}500{,}000$

This means that the company generates EUR €5.5 million of its revenue from circular notebooks, based on the materials and design choices under its direct control. This insight helps the company steer its product portfolio and communicate progress to investors and customers.

**Use case**: Internal steering

**Objective/IRO**: Understand how much of the company's revenue is generated from circular notebooks under its direct control

**Intervention point**: Product design, procurement and recyclability

**Strategy**: Close the Loop

**Circular performance indicator:** Material circularity revenue

**Scope**: B – All materials under direct control as part of scope B

**Assessment level**: Product (notebooks)

***Example***

**Scope C: Notebooks**

The same company now wants to assess *Material circularity revenue* from a broader value chain perspective. This includes upstream processes such as pulp production, paper bleaching and printing, which the company does not directly control, but which are necessary to produce the notebooks it sells.

In scope C, the company considers indirect material flows, such as chemicals used in bleaching and waste generated during paper trimming, that are not part of the final product but are essential to its creation.

In collaboration with its suppliers and partners, the company estimates the circular inflow and outflow performance of the full value chain for its notebooks and applies the same formula.

- Revenue from notebook sales: EUR €10 million
- Estimated % circular inflow (value chain): 35%
- Estimated % circular outflow (value chain): 45%

Material circularity revenue$\frac{35\%+45\%}{2} \times €10{,}000{,}000 = €4{,}000{,}000 \frac{35\%+45\%}{2} \times €10{,}000{,}000 = €4{,}000{,}000$

This broader scope C view shows that circular performance across the full value chain supports only EUR €4 million of the company's revenue. It highlights gaps in upstream sourcing (e.g., virgin pulp, chlorine bleaching) or downstream recovery (e.g., mixed-material covers) and can guide supplier engagement or investment in circular infrastructure.

**Use case**: Internal steering

**Objective/IRO**: Understand how much of the circular performance across the full notebook value chain supports the company's revenue

**Intervention point**: Value chain collaboration, supplier engagement and recovery partnerships

**Strategy**: Close the Loop

**Circular performance indicator**: Material circularity revenue

**Scope**: C – All materials under indirect control as part of Scope C

**Assessment level**: Product (notebooks)

### 3.1.3.4 Impact of the Loop

#### Purpose and strategic relevance

The Impact of the Loop module helps organizations understand how circular strategies affect broader sustainability outcomes, specifically climate, nature and social equity. It enables businesses to assess the systemic consequences of their circular actions, uncover synergies and manage trade-offs. This module is essential for aligning circularity with ESG goals, regulatory compliance and stakeholder expectations.

#### What it measures

This module evaluates the environmental and social impacts of circular strategies across three dimensions:

- **GHG impact**: GHG emissions reductions from circular inflow and outflow;
- **Nature impact**: Land use and biodiversity impacts from material sourcing;
- **Social impact**: Outcomes for workers and affected communities.

All indicators can be applied individually or in combination to support impact measurement and disclosure.

#### Indicators in this module

| Indicator | Description | Strategic use |
|---|---|---|
| **GHG impact** | Measures emissions savings from circular sourcing and recovery | Supports climate strategy and scope 3 emissions reductions |
| **Nature impact** | Assesses land use and biodiversity impacts of material inflow | Aligns with nature-positive goals and risk mitigation |
| **Social impact** | Evaluates social risks and opportunities in circular transitions | Supports a just transition, human rights and inclusive value creation |

#### How to use this module

These indicators aim to help organizations understand the impact of circular strategies on achieving sustainability objectives related to climate, nature and equity. By combining these three impact lenses – climate, nature and people – it enables businesses to understand and manage the systemic consequences of circular actions. This enhanced approach helps uncover synergies (e.g., reuse that lowers emissions and creates jobs) and trade-offs (e.g., material substitutions that improve recyclability but increase land use pressure). The following sections provide guidance on how to calculate the GHG, nature and social impacts.

### GHG impact

The *GHG impact* indicators provide organizations with a high-level indication of the GHG emissions savings from applying circular strategies. Circular strategies include the use of secondary or renewable materials as inflow and enabling recovery via “higher value retention” strategies, such as reusing, refurbishing and remanufacturing or recycling of the outflow (products and materials).

Organizations can use this information to better understand GHG emissions savings, evaluate trade-offs and help prioritize circular improvements.

To determine the GHG impact of circular flows, the GCP adopts the “Allocation, Cut-off by classification” system model. This approach allows non-virgin material users and producers to benefit from inputs that carry no production-related emissions burden, while also incentivizing primary material producers to support product and material recovery to reduce emissions from landfill and incineration. Table 12 provides an overview of what the methodology represents.

### Table 12: GHG impact methodology

| What it is | What it is not |
|---|---|
| High level information on the impact of the company’s transition from linear to circular | A full-blown impact assessment, life-cycle analysis or detailed carbon footprint |
| Additional insight to support decision making | Stand-alone decision information |
| Difference in impact between current inflow versus use of secondary material inflow (reuse of entire product, component or recycled content) | Detailed carbon footprint of current choice of inflow materials |
| Difference in impact on producer’s material carbon footprint for reused or recycled outflows versus linear disposal methods (incineration and landfill) | Detailed carbon footprint of current recovery or disposal of outflows |

Source: *Circular Transition Indicators v4*[73]

***Note***

**GHG impact indicator vs GHG Protocol**

The GHGP[74] is the global standard for GHG accounting and must be used for ESG reporting. The GHG Impact indicator from the GCP is not a substitute, but a complementary tool to support decision-making when evaluating circular interventions.

Its main value lies in being simpler to apply than the GHGP, making it useful when resources are limited, as a first step towards full GHGP compliance or for rapid internal portfolio screening and risk assessment.

For scope D flows, GHG Impact can also support avoided emissions estimates, helping fill a methodological gap in the GHGP. However, for external disclosure, GHGP remains the required reference.

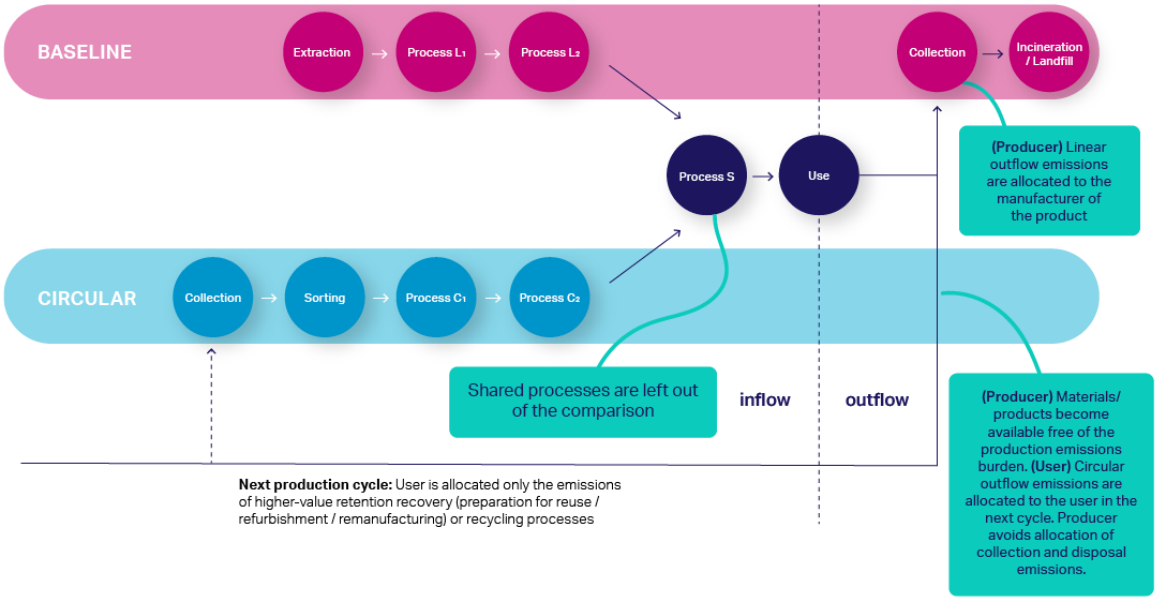
***Note***

Several major initiatives (including the SBTi, GHG Protocol and WBCSD's Avoided Emissions Guidelines) are currently under review to better account for the GHG impacts of circular actions. Further versions of the GCP will align with these revised standards as they mature and are released.

Applying the "cut-off by classification" model has the following criteria:

- The producer of a material or product is fully accountable for the GHG emissions of the production of that material or product, even in the case of it being recovered for the next cycle;
- The non-virgin material part or product becomes available free of GHG emissions burden for the user of this non-virgin material or product in the next production cycle;
- The user of this non-virgin material or product is only allocated the GHG emissions of preparation for reuse or recycling processes needed;
- According to the GHG Protocol Accounting standards, for linear end-of-life disposal (incineration and landfill), all emissions associated with linear disposal processes are allocated to the producer as these are not assigned to other users.

## Figure 14: Allocation of GHG burden




Source: Circular Transition Indicators v4.0

The "Allocation, cut-off by classification" system uses the following calculations to assess the potential GHG emissions savings of circular strategies.

### Inflow

The GHG impact related to secondary inflow is accounted for as non-virgin materials, based on the "Allocation, Cut-off by classification" system. For closed loop recycling systems, the GCP proposes the following emissions formula to calculate the absolute emissions savings on the inflow side:

Savings on inflow

$$savings = (M_t \times GHG_c) - (M_c \times GHG_c) - (M_l \times GHG_l)$$

% savings on inflow

$$\% \text{ savings} = \frac{(M_t \times GHG_c) - [(M_c \times GHG_c) + (M_l \times GHG_l)]}{(M_c \times GHG_c) + (M_l \times GHG_l)} \times 100$$

$M_t$ = total mass material

$GHG_c$ = emissions factor of sourcing the secondary material ($kgCO_2/kg$)

$M_c$ = circular inflow mass (e.g., reused or recycled)

$GHG_l$ = emissions factor of sourcing the linear material ($kgCO_2/kg$)

$M_l$ = linear inflow mass

The outcome is the percentage GHG emissions savings on inflow realized, for example, if the material is made out of 100% virgin content minus the emissions associated with the recovery method. The indicator gives insights into the amount of GHG emissions saved (by the user of the recovered materials) if the materials go from the current % circular content to 100% circular content.

***Example***

**PET Bottle (inflow)**

As an example, consider a 700-gram PET bottle that consists of 5% recycled content. The GHG emissions factor for the sourced recycled content is 1.7 kg $CO_2$-eq/kg material.[75] This includes processes like collection of used bottles, sorting and mechanical reprocessing into new resin. The GHG emissions factor for the sourcing of the virgin content is 3.1 kg $CO_2$-eq/kg material, including processes like extraction and refining of crude oil, cracking and polymerization and the transportation of raw materials. Based on the calculation below, the company will see a 44% reduction in GHG emissions when it increases the recycled content of the bottle from 5% to 100%.

$$\% \text{ savings} = \frac{(0.7 \times 1.7) - [(0.035 \times 1.7) + (0.065 \times 3.1)]}{(0.035 \times 1.7) + (0.065 \times 3.1)} \times 100 = 44\%$$

**Use case**: Internal steering

**Objective/IRO**: Assessing the reduction in GHG emissions from increasing recycled content in a bottle

**Intervention point**: Sourcing, design circular recovery systems

**Strategy**: Close the Loop

**Circular performance indicator**: GHG Impact

**Scope**: C – all materials under indirect control as part of Scope C

**Assessment level:** Materials

If an organization evaluates a scenario in which a product contains inflow sourced from multiple recovery strategies (e.g., a laptop that includes aluminum parts made from recycled scrap, a reused battery module from a previous generation device and remanufactured internal components such as fans or circuit boards) the formula for absolute GHG emissions savings is:

$$savings = \sum M_r \times GHG_r - (M_c \times GHG_c) - (M_l \times GHG_l)$$

And the percentage becomes:

$$\% \text{ savings} = \frac{\sum(M_r \times GHG_r) - [(M_c \times GHG_c) + (M_l \times GHG_l)]}{(M_c \times GHG_c) + (M_l \times GHG_l)} \times 100$$

Where:

$M_r$: specific recovery strategy circular inflow mass

$GHG_r$: specific recovery strategy emissions factor

**Outflow**

When it comes to calculating GHG emissions savings on the outflow side, using the "Allocation, Cut-off by classification" system, an organization can observe savings once a product or material is recovered with a circular recovery strategy:

- Circular recovery methods – preparation for reuse or recycling will not lead to any emissions burden for the producer and therefore represent savings compared to the linear disposal method;
- Linear disposal methods – incineration or landfill will lead to an emissions burden for the producer of the unrecoverable products and materials.

Formula for the absolute savings:

$$GHG_l(M_c - M_t)$$

Formula for the percentage savings:

$$\% \, savings = \frac{(M_c \times GHG_l) - (M_t \times GHG_l)}{(M_t \times GHG_l)} \times 100$$

$M_t$ = total mass material

$GHG_l$ = emissions factor of the linear recovery method: incineration, landfill

$M_c$ = circular outflow mass

The outcome of the formula is the percentage GHG emissions savings compared to a scenario in which 100% of the material is disposed of in a linear way, via incineration or landfill. It gives insights

into the amount of GHG emissions a producer can save, if the products or materials under scope are recovered through higher value retention recovery or recycling versus incineration or landfill. Based on the "Allocation, Cut-off by classification" system, savings are equal to the emissions of the percentage of material that avoids incineration or landfilling, because the producer makes them available for recovery and usage by another organization in a following cycle.

***Example***

**PET bottle (outflow)**

Building on the example used for inflow, consider that the 700-gram PET bottle is 30% recycled and 70% incinerated. The GHG emissions factor for the incineration of PET is 0.0904 $CO_2$ -eq/kg.[76] According to the "Allocation, Cut-off by classification" system, the producer of the PET bottle accounts for the emissions associated with linear disposal methods. In this case, the producer of the PET is allocated the GHG emissions associated with 70% incineration. In the example, potential emissions savings from transitioning to a 100% circular scenario would be 70%. With the current 30% recycling, the producer saves 30% of emissions that otherwise would be allocated for the linear disposal of the bottle. If the producer works with value chain partners to increase the recycling rate of the bottle to 100%, this would provide an additional 70% savings on the emissions allocated for the linear disposal through incineration or landfill.

$$\% \text{ savings} = \frac{(0.21\times0.0904)-(0.7\times0.0904)}{(0.7\times0.0904)} \times 100 = 70\%$$

Since the producer is not allocated emissions for the incineration and landfilling of the product or material, the emissions savings are 70%. This is because the emissions savings are based on the transition from 70% incineration to 0% linear disposal. In this approach, users of non-virgin materials benefit from materials that are free from the burden of production emissions while producers of primary materials benefit from incentivizing the recovery of products and materials to avoid high landfill or incineration emissions.

**Use case**: Internal steering

**Objective/IRO**: Assessing the savings in GHG emissions from increasing recovery of PET bottles

**Intervention point**: Design circular recovery systems

**Strategy**: Close the Loop

**Circular performance indicator**: GHG Impact

**Scope**: C – all materials under indirect control as part of Scope C

**Assessment level:** Materials (plastics)

***Note***

The GHG impact methodology identifies potential emissions savings associated with circular strategies, but it is not intended to support claims of avoided emissions. To make avoided emissions claims, organizations should refer to WBCSD's Avoided Emissions Guidance, which provides the specific framework for such accounting. Within GCP, when a circular loop falls

outside the scope 3 boundary as defined by the GHG Protocol, results should be framed as potential GHG savings rather than avoided emissions to ensure consistency with established standards and avoid overstatement.

## Nature impact

The third principle of the circular economy is to regenerate nature.[77] This can be achieved by applying regenerative production practices, extending product lifetimes, reducing waste and resource extraction.[78,79] Through this principle, the circular economy can reverse and halt nature loss, leaving more room for nature to thrive. Circular interventions have the potential to recover the world's biodiversity to year 2000 levels by 2035.[80]

This indicator focuses specifically on impact from land-use change. Land-use change is the most impactful driver of nature loss and includes land occupation, land-use change, land degradation and deforestation impacts.[81] This indicator provides an initial screening of land-use impacts from the material extraction and cultivation related to an organization's material inflow. It helps organizations understand how their circular performance impacts nature by measuring the land-use impacts of their current inflow and potential improvement by shifting to circular sourcing. The indicator is especially relevant for organizations that are highly dependent on materials that have a significant contribution to negative impacts on nature. Measuring land-use impacts is in line with the vision of a nature-positive world by 2030 and complements the Roadmaps to Nature Positive work, developed by WBCSD and member organizations, which provide a tailored sectoral framework for business accountability and ambition and support the implementation of the Global Biodiversity Framework. There are three dimensions to consider when estimating the impact of land-use change on nature: the extent of land use, the condition of the land used and the significance of the land.

***Note***

**What is it (not)**

This indicator measures land-use impacts associated with an organization's material inflow, focused on measuring extent of land used, the intactness of the biodiversity on the land and the significance of land for biodiversity. You can use this indicator for technical materials and biological materials. The *Nature impact* indicator does not enable an organization to track how its responses or circular economy activities contribute to improving the state of nature. For simplicity and usability, the scope of this indicator is limited to the extraction and cultivation stage of sourced materials only, as this stage is the most impactful on land use. It excludes the land use of other stages along the value chain, such as processing, manufacturing, distribution or recovery. It also excludes toxicity or other air, soil or water emissions that negatively impact nature.

## Figure 15: Calculation of nature impact


Source: Circular Transition Indicators v4.0

*The nature impact score measures the land use impacts of material extraction and cultivation. It represents the loss of quality-adjusted km$^2$ that an organization is responsible for, weighted according to the global extinction threat associated with sourcing locations. Land-use impacts associated with manufacturing processes are not included (but can also be estimated using LCA-based methods), while any additional primary sourced parts introduced into circular processes (e.g., new elements added in repaired products) are considered within the standard framework.*

Impact on nature is calculated using the following formula for each raw material separately:

$$Nature\ impact = (M_x \times extent) \times (LI_x \times condition\ change) \times (SL_x \times significance)$$

Where:

- Mx: total mass of the raw material X
- LIx: land-use type and land use intensity of raw material X
- SLx: sourcing location of raw material X
- Extent (in km$^2$) of land occupied: the allocated physical area of habitat occupied due to production of raw materials for inflow; based on estimated yield per area of raw material; the smaller the extent, the better the performance on this metric
- Condition change (from 0-1) of biodiversity on the land: the ”quantity” or ”amount” of biodiversity lost on the occupied land, relative to an undisturbed reference state, based on the type and intensity of land use; condition change is based on biodiversity loss coefficient calculated from Mean Species Abundance (MSA), ranging from 1 (intact habitat) to 0 (loss of all biodiversity); the smaller the condition change from an undisturbed reference state to current land use, the better the performance of an organization is on this metric; an organization could use another metric instead of MSA to measure condition change
- Significance (on a scale of 1 to 5) of biodiversity impacted: the ”value” of the biodiversity, represented by the types of biodiversity present in the area and how significant their loss

would be for biodiversity protection and recovery globally; GCP recommends using the STAR metric[82] as it is the best metric currently available data for setting organization targets to reduce species extinction risk; the lower the significance of a particular area, the smaller the global biodiversity impact of the sourcing activities; an organization could use another metric instead of STAR-t scores to measure significance

For more information on the Condition and Significance concepts, refer to Annex II in CTI v4.0.[83]

The resulting unit represents "threat-weighted quality square kilometers", where threat refers to the extinction risk of terrestrial vertebrate species (mammals, birds, amphibians). The smaller the number, the smaller the associated biodiversity land-use impacts.

**Box 5: STAR metric**

**STAR metric**

GCP adopts the Species Threat Abatement and Restoration (STAR) metric to assess Significance. STAR is accessed through the Integrated Biodiversity Assessment Tool (IBAT), which requires an IBAT license. Country-level STAR data will be freely available through the WWF biodiversity filter. At present, few suitable Significance metrics are available globally and free of charge for commercial use. Another option is the Global extinction probability (GEP) metric created by Verones et al. (2022).[84]

The assessment can be simplified using a score card. The score card provides broad value categories, with quantitative lower and upper bounds, for extent, condition and significance. Select categories based on the best available information, applying plausible assumptions. This approach requires only estimates for the scale, impacts and location of sourced materials, rather than exact quantification. You can apply a more comprehensive, fully quantitative approach in a data-rich scenario where organizations wish to fully quantify their land-based biodiversity footprint.

## Figure 16: Nature impact scorecard

| Estimated extent (km²) | ~0 | 0- <0.1 | 0.1-<1 | 1-<10 | 10<100 | 100<1,000 | 1,000<10,000 | >10,000 |
|---|---|---|---|---|---|---|---|---|
| Category description | Negligible | Very small | Small | Small-medium | Medium-large | Large | Very large | Extremely large |
| Score for extent dimension (E) | 0.01 | 0.1 | 1 | 10 | 100 | 1000 | 10000 | Use actual area estimate |

| Estimated condition change (on 0-1 scale, based on MSA) | 0- <0.1 | 0.01-<0.1 | 1-<0.3 | 0.3-<0.5 | 0.5-<0.7 | >0.7-1 |
|---|---|---|---|---|---|---|
| Category description | Very small | Small | Small-medium | Medium-large | Large | Very large |
| Score for condition dimension (C) | 0.01 | 0.1 | 0.3 | 0.5 | 0.7 | 1 |

| Estimated significance (80th percentile STAR-t score) | 0- <10 | 10<100 | 100<1,000 | 1,000<10,000 | 10,000<100,000 |
|---|---|---|---|---|---|
| Category description | Low | Moderate | High | Very high | Highest |
| Score for significance dimension (C) | 1 | 2 | 3 | 4 | 5 |

Source: Circular Transition Indicators v4.0

***Example***

**Cotton or palm oil**

A company wants to assess the nature impact of the cotton or palm oil used in its value chain. While it does not directly grow or source these raw materials, it recognizes that upstream agricultural practices significantly affect biodiversity and land use. Therefore, it applies scope C to include indirect material flows such as land use, farming practices and sourcing location.

In a hypothetical scenario where the extent of land required to produce all of the cotton or palm oil a company uses in its value chain is estimated to be 1–10 $km^2$ the extent would fall into the "small-medium" category. Likewise, if the land is intensively farmed, the condition change is likely to be at least a loss of 0.7 MSA; therefore, the category will be "very large". In this framework, organic farming and materials grown using regenerative agricultural practices are considered renewable and therefore circular. In the nature indicator, this "renewable" criteria is expressed in the improvement in the condition change. Finally, if it is sourced from a less biodiverse country (e.g., in northern Europe) the significance may be "moderate" or "low". The final score for the nature impact in this case will be:

$$Nature\ impact = 10\ x\ 1\ x\ 2 = 20$$

This result reflects the biodiversity impact of the company's upstream sourcing practices. It helps identify opportunities to reduce nature-related risks by shifting to regenerative agriculture or sourcing from lower-impact regions.

**Use case**: Internal steering

**Objective/IRO**: Understand the biodiversity and land use impact of upstream cotton or palm oil sourcing

**Intervention point**: Raw material sourcing and supplier engagement

**Circular performance indicator**: Nature impact

**Scope**: C – All materials under indirect control as part of scope C

**Assessment level**: Material (cotton or palm oil)

## Social impact

Transitioning to a circular economy has the potential to accelerate the shaping of a more equitable, net-zero and nature-positive future.[85] When intentionally inclusive and designed to mitigate social risks, the circular transition can improve livelihoods by enhancing working conditions, fostering inclusion in new business models and increasing transparency.[86] The GCP social impact approach provides organizations with a methodology that helps them design circular strategies and business models geared towards inclusivity and social justice. The objective of the approach is to highlight those circular strategies that deliver better outcomes for workers and affected communities, from both the formal and informal economy.

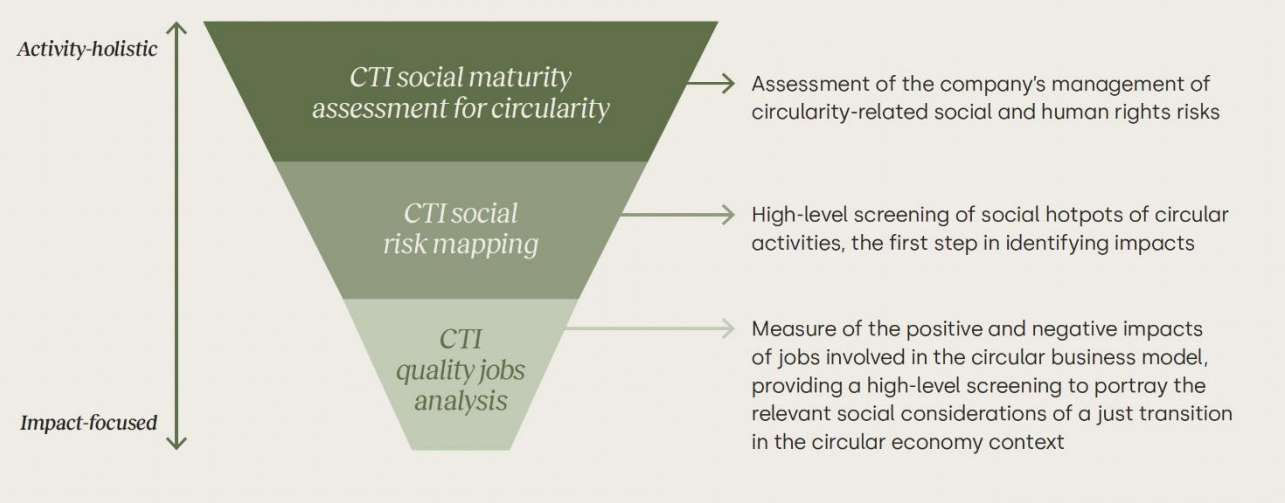
The methodology proposes a three-pronged approach to assess the social outcomes of circular interventions:

- The GCP social maturity assessment for circularity evaluates an organization's readiness and practices in managing social and human rights risks related to the shift from linear to circular business models;

- The GCP social risk mapping approach provides tools to assess circularity related social and human rights risks based on severity and likelihood and includes guidance on key risk factors;
- The GCP quality jobs analysis evaluates the impact of circular business models on value chain workers and their families, with a focus on the most vulnerable workers.

With this approach, organizations are equipped with a practical roadmap to align circular innovation with social responsibility, ensuring that circular transitions contribute meaningfully to long-term, inclusive value creation.

## Figure 17: GCP social impact approach




Source: Circular Transition Indicators (CTI) Social Impact Guide

### GCP social maturity assessment

The objective of the GCP social maturity assessment is to provide an efficient analysis to assess an organization's risk management practices at a high level, including current policies, processes and practices, to manage the social risks related to shifting from linear to circular business models.

Its aim is to facilitate and enhance stakeholder engagement by prompting organizations to understand how they interact with affected stakeholders and identify opportunities to build trust and improve the relationship with them. Undertaking the GCP social maturity assessment can be part of ensuring compliance with international standards, such as the UN Guiding Principles on Business and Human Rights or local regulations.[87] It can align with existing processes that aim to identify, assess and mitigate social and human rights risks (such as human rights due diligence) and promote effective decision-making and accountability. The assessment checks readiness on the topics listed in Table 13.

## Table 13: GCP Social maturity assessment areas

| *Potentially affected stakeholders* | *Social risks of the circular economy transition* |
|---|---|
| **A. Value chain workers** | A.1 Jobs created/lost<br>A.2 Equality and inclusion<br>A.3 Informal sector<br>A.4 Responsible value chains |
| **B. Affected communities** | B.1 Local communities |
| **C. Consumers and end-users** | C.1 Consumer behavior<br>C.2 Accessibility of circular and sustainable goods and services |

***Note***

Mapping in reference to GCP scopes to be added in the visual above:

**A. Value chain workers**
Scope A – workers in the own organization
Scope B – workers in the own organization
Scope C – workers in the value chain
Scope D – workers in other affected value chains

**B. affected communities**
Scope A – communities affected by extraction of materials
Scope B – communities affected by other operations (e.g., production and own logistics)
Scope C – communities affected by other value chain actors
Scope D – communities affected by other affected value chains

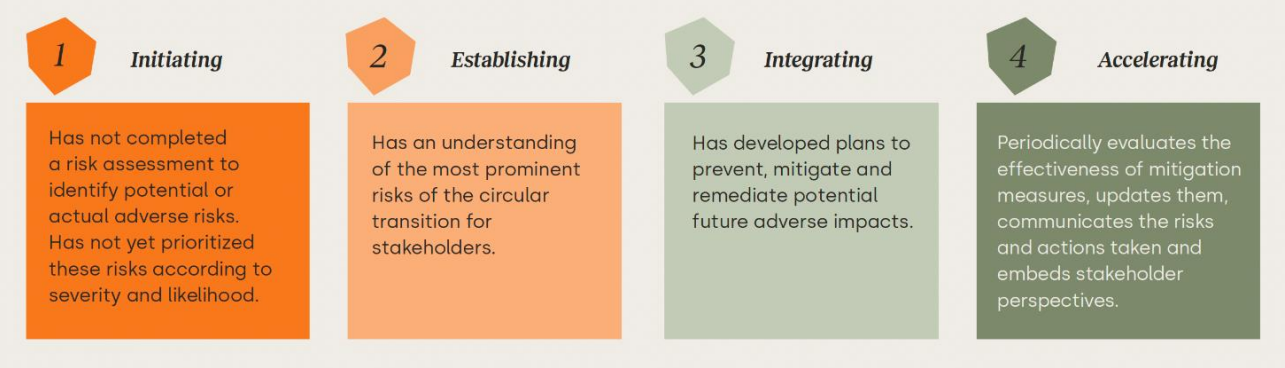
**C. consumers and end-users**
Scope B – your own customers
Scope C – end-users
Scope D – consumers affected outside your own value chain

While your organization can perform an entire GCP social impact approach at the desired business level, you should conduct a GCP social maturity assessment at either the corporate or facility level. Aiming for one of these levels will provide holistic insights into what management practices are in place to identify, assess, address and monitor social and human rights risks and impacts.

To carry out the GCP Social Maturity Assessment, engage relevant corporate-level business functions and gather internal documentation. This involves two key steps:

1. Identify relevant business units – Engage departments such as HR, supply chain, procurement, risk, design and sustainability, as they typically hold the necessary data and expertise.
2. Collect data – Conduct brief interviews with key content owners to gather input for the assessment.

## Figure 18: GCP Social maturity assessment scorecard




Source: Circular Transition Indicators (CTI) Social Impact Guide

As mentioned above, the approach identifies three key stakeholder groups typically affected by transition risks – value chain workers, communities, consumers and end-users – and requires organizations to assess its maturity in understanding and addressing the needs of these key stakeholders across different maturity levels through a set of scorecards. The core steps and key elements of human rights due diligence inspire each scorecard,[88] which consists of four levels of maturity. The statement identified as reflecting the organization's status at the moment of the assessment links directly to a maturity level. Each scorecard has four statements that describe corporate practices, with each statement indicating a distinct level of maturity of the risk management approach. These levels range from 1, "initiating" to 4, "accelerating". They provide a snapshot of how an organization manages the transition risks in each thematic area.

Organizations can average the results from filling out assessments for all stakeholder groups to obtain three unique values that reflect its maturity score in relation to value chain workers, affected communities and consumers and end-users.

### GCP social risk mapping

The GCP social risk mapping, as an important second step, helps organizations identify the stakeholder groups affected by the transition and the risks to workers and communities connected to the shift from linear to circular models. The mapping offers a targeted approach that can support circularity practitioners in conducting a quick risk assessment focused on a product, business unit or organization level.

Table 14 shows the selection of several key social hotspots relevant to the transition to a circular economy. This shortlist aligns with international human rights standards, such as the UNGPs and the OECD Guidelines for Multinational Enterprises;[89] its design prioritizes and highlights topics that are at higher risk of impact in the new circularity context.

## Table 14: Social hotspots for a circular economy transition

| *Social hotspots relevant in a circular economy* |
|---|
| ***Workers in the value chain*** |
| Occupational health and safety |
| Child labor |
| Forced labor |
| Discrimination |
| Freedom of association and collective bargaining |
| Decent working conditions |
| ***Consumers and end-users*** |
| Health and safety |
| Affordability |
| Accessibility |
| ***Local communities*** |
| Health and safety |
| Access to material and immaterial resources |
| Community engagement |
| Skills development |
| Contribution to economic development |

Source: Circular Transition Indicators (CTI) Social Impact Guide

During this phase, your organization should collect – at a minimum – quantitative information about potential risks linked to the new circular strategy or business models. You can rely on publicly available sources (see the CTI Social Impact[90] guide) or internally available databases (such as Amfori[91] and Datamaran[92]). It can expand and strengthen the information collected via desktop research, using internal interviews in this phase or at a later stage, should it require deep information.

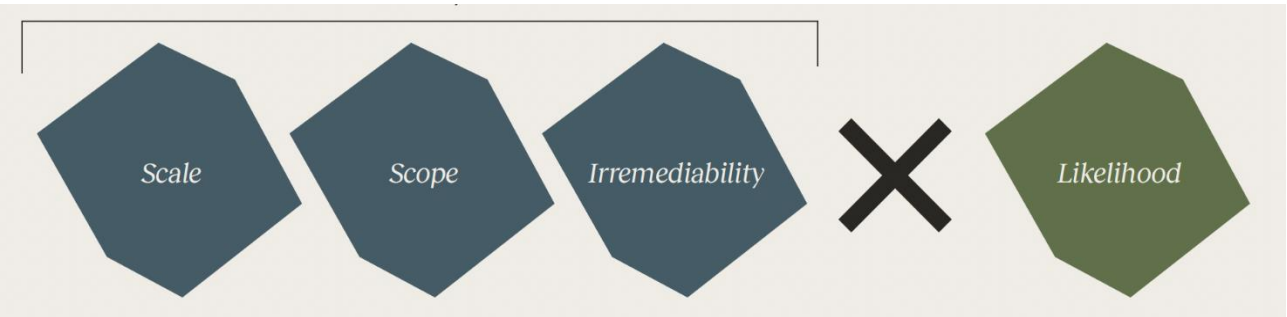
After data collection, the next step is to determine the severity and the likelihood of the potential impacts. In full alignment with leading practices,[93] the severity of a potential impact comprises an evaluation of the scale, scope and irremediability of the potential impact:

- The scale expresses how grave or serious the impact would be on people and their human rights;
- The scope expresses how many people the potential impact may affect;
- The irremediability expresses the level of ease those impacted could return to their prior enjoyment of the rights;
- The likelihood expresses the chances risks will materialize; each component receives a low, medium or high rating.

The severity score is the result of multiplying the sum of the scale, scope and irremediability scores with the likelihood. Each dimension of severity and likelihood receives a score from 1 to 3. By applying the calculation shown in Figure 19, the lowest threshold of the risk analysis would be 3, while the highest threshold would be 27. The formulation of intermediate risk categories are:

- Green: risk score between 3 and 7
- Yellow: risk score between 8 and 14
- Orange: risk score between 15 and 20
- Red: risk score between 21 and 27

## Figure 19: Calculation of the risk level




Source: Circular Transition Indicators (CTI) Social Impact guide https://www.wbcsd.org/resources/circular-transition-indicators-cti-social-impact/

### GCP quality-jobs analysis

The GCP quality jobs analysis is a set of high-level screening indicators aimed at quantifying the social impacts of jobs involved in the circular business model.[94] It has 3 dimensions, 10 critical social impact categories and 14 composite, multi-attribute, qualitative indicators. It gives organizations information on:

- The critical social (quality of job) hotspots of selected jobs;
- Which social impacts are critical and which concrete indicators require the most attention;
- Which workers involved in the circular value chain are most vulnerable and what is the extent of their vulnerability;
- Which specific aspects the organization needs to prioritize when evaluating circular strategies.

## Table 15: Dimensions, categories and indicators in CTI quality-jobs analysis

| *Dimension* | *Social impact categories* | *Head indicators* | *Computation* |
|---|---|---|---|
| *Quality of job impact on workers* | 1. Earning quality | 1. Earning quality | 1. Wage in the pocket (1 indicator) |
| | 2. Job security | 2. Job security | 2. Job security (average of 2 indicators) |
| | 3. Work environment | 3.1 Health & security | 3.1 Health & security (average of 3 indicators) |
| | | 3.2 Personal development | 3.2 Training & internal promotion (average of 4 indicators) |
| | | 3.3 Work environment (physical) | 3.3 Work environment – physical demands (average of 3 indicators) |
| | | 3.4 Work environment (emotional) | 3.4 Work environment – emotional demands (average of 3 indicators) |
| *Equality and discrimination impacts* | 4. Equal opportunity & equal treatment | 4. Equal opportunity & equal treatment | 4. Equal opportunity (average of 3 indicators) |
| | 5. Forced labor | 5. Forced labor | 5. Forced labor (average of 4 indicators) |
| | 6. Discrimination & vulnerable employment structures | 6. Vulnerable employment structures | 6. Discrimination & vulnerable employment structures (average of 5 indicators) |
| | 7. Child labor | 7. Child labor | 7. Child labor (average of 3 indicators) |
| | 8. Voice & collective bargaining | 8. Voice & collective bargaining | 8. Voice & collective bargaining (average of 3 indicators) |
| *Indirect job impact on worker and family well-being* | 9. Social security for workers & family | 9. Social security for workers & family | 9. Social security for workers & family (average of 5 indicators) |
| | 10. Well-being of workers & their families | 10.1 Work-life balance | 10.1 Work-life balance (average of 4 indicators) |
| | | 10.2 Well-being of workers' families | 10.2.1 Social integration (average of 3 indicators) |
| | | | 10.2.2 Access to & quality of natural resources (average of 3 indicators) |

Source: Circular Transition Indicators (CTI) Social Impact Guide

The analysis is based on a worker survey with 46 questions (43 direct and 3 related to demographics, requiring qualitative and semi-quantitative information).[95] The survey has three sections and analyzes:

- The quality of the direct and indirect jobs for workers involved in the circular value chain;
- The employment segregation and occupational structure to contextualize worker vulnerability;[96]
- Workers' families and community well-being.

Each dimension uses a 4-point Likert scale to score the indicators. First, group workers per identifier of multiple vulnerabilities and then send the survey to each identified group and analyze it separately (see **pages 35-36** of the CTI Social Impact Guide for more information on how to group workers).

## Table 16: Likert and heatmap score scale

| *4-Point Likert scale* | *1* | *2* | *3* | *4* |
|---|---|---|---|---|
| Ranking scale for earning quality (based on a social impact assessment framework for circularity (SIAF-CE)) | Poverty line | Minimum wage | Living wage | Average median salary sector |
| Social impact indicators | Most critical challenge | Significant challenge | Challenge but no priority | Good practice |

Source: Circular Transition Indicators (CTI) Social Impact guide

The calculation of the head indicators is the simple average of the responses of the group of indicators associated with each head indicator using the formula:

$$\frac{Sum\ of\ the\ indicators\ scores\ in\ the\ category}{Number\ of\ indicators\ in\ the\ category}$$

***Example***

**Large textile company**

An Indian company implementing circular strategies of repair, remanufacturing and recycling used the GCP quality jobs analysis. The analysis included all employees in the direct manufacturing unit, including tailors, sorters and logistics technicians. Additionally, it included third-party contractual workers who did some of the repair jobs. The company sent the survey to direct employees and suppliers and translated it into local languages. To gather the required data, the company held its collection over two days. The heatmap showcases that the risk populations are migrants, women and informal workers. The company split the results of the analysis based on these three vulnerable groups.

**Table 17: GCP quality jobs analysis example**

| *Dimensions* | *Disagregation level* / *Social impact indicators* | *Circular strategies employed* | | | | | |
|---|---|---|---|---|---|---|---|
| | | *Repair Migrant* | | *Remanufacture migrant* | | *Recycle informal worker* | |
| | | *Women* | *Men* | *Women* | *Men* | *Women* | *Men* |
| *Direct quality of job impacts* | 1. Income | 1 | 2 | 1 | 2 | 1 | 2 |
| | 2. Job security | 3 | 3 | 3 | 2 | 3 | 3 |
| | 3. Work environment (composite version) | 3 | 3 | 3 | 3 | 3 | 4 |
| *Determinants of job precariousness and vulnerabilities* | 4. Equal opportunity & treatment | 3 | 3 | 2 | 3 | 4 | 4 |
| | 5. Forced labor | 2 | 2 | 2 | 2 | 2 | 1 |
| | 6. Job-precariousness-discrimination | 4 | 3 | 3 | 4 | 4 | 4 |
| | 7. Child labor | 3 | 3 | 3 | 3 | 2 | 2 |
| | 8. Voice and collective bargain | 2 | 2 | 3 | 3 | 2 | 1 |
| *Well-being of workers and their families* | 9. Social protection for worker & family | 3 | 3 | 3 | 3 | 3 | 3 |
| | 10. Worklife balance and well-being | 2 | 2 | 3 | 3 | 3 | 3 |

Source: Circular Transition Indicators (CTI) Social Impact Guide

Note

The social indicators presented here will be tested and further refined through practical application. Furthermore, GCP plans to develop other nature circularity metrics in future iterations to provide additional targeted guidance on nature impacts.

## 3.2 Collect data and calculate

Effective circular performance and impact assessment begins with accurate and relevant data. Collecting data for circularity can be complex, as it often involves multiple systems, suppliers and life-cycle stages. Common challenges include data fragmentation, inconsistent reporting formats, lack of visibility beyond direct operations and difficulty quantifying end-of-use scenarios. Overcoming these obstacles requires cross-functional collaboration, clear definitions and iterative engagement with stakeholders. Despite these challenges, establishing a reliable data foundation is essential to generating meaningful circular insights and driving strategic action.

### *Relevant data points and sources*

#### 3.2.1 Close the Loop

*% circular inflow (per material flow):*

- *% of renewable content* or *% non-virgin content* per inflow type
- Mass of each inflow type

***Example***

**Built environment**

To calculate *% circular inflow*, organizations in the sector can obtain the information from the following sources:

- Supplier documentation: product data sheets, material safety data sheets, environmental product declarations (LCAs, other sustainability reporting documents), certifications and compliance reports (LEED, BREEAM);
- Building information modelling tools;
- Bill of quantities (BOQ), including costs;
- Material takeoff (MTO);
- Bill of materials (BoM), in cases of offsite and modular construction of components and materials for assembly;
- Material passports.

*% critical materials*

- An organization's internal critical materials list;
- Existing public national or regional lists (e.g., European Commission 30 critical raw materials list[97] or United States list of 50 critical minerals[98]).

*% circular outflow (per material flow)*

- % of the recovery potential per outflow type
- % actual recovery – material recovery rates per outflow type:
  - Regional recovery rates;
  - Sector-specific recovery rates for product group in scope or comparable product groups;
  - Material recovery rates from own buy-back/take-back contract, partnership system, collection and recovery programs, etc. (if applicable).
- % actual recovery: mass of outflow per outflow type.

To determine the *% actual recovery*, organizations should ideally rely on primary data, such as results from internal take-back programs or verified recovery operations, providing insights into the number and weight of products or materials recovered over the number and weight of products or materials flowing through the organization boundaries.

If primary data is not available, organizations may use standard recovery rates published by national or regional authorities or sector-specific benchmarks (e.g., for electronics, textiles or food). If no data exists for the product category in scope, organizations may use recovery rates of comparable product streams, only when including a statement on the use of this data for the recovery of their products (refer to Stage 2. Prepare – 2.4 Set operational boundaries for material flows). In cases where no standard data exists, organizations may apply primary data for recovery rates, provided they include clear justification and documentation of the assumptions used.

Recovery is based on actual recovery figures during the reporting period. For non-fast-moving consumer goods, this may mean that the recovery data reflects previous versions of products.

For example, in an open-loop scenario for an assessment conducted in 2024 for a household appliance company selling in the EU, the company could calculate the actual recovery rate using 2024 Eurostat figures from the countries where it sells the products. It would then multiply this rate would by the recovery potential of the respective product models. The same theory holds for actual recovery rates in different geographies for different materials, e.g., the recovery of aluminum cans in Brazil from Abralatas and the Brazilian Aluminum Association (Abal) and the Brazilian Association of Highly Recyclable Cans Manufacturers (Abralatas) in 2024, with recovery potential of cans produced in other years.

In this case, the recovery potential is based on 2024 data, likely referring to the 2024 model of the product, while the actual recovery data (e.g., Eurostat figures) also corresponds to 2024, although it may reflect older product models due to the longer life cycle of household appliances.

***Example***

**Fashion and textiles[99]**

A company in the sector can leverage secondary data if primary data is not available. The GCP includes a recommendation for such data below to support organizations in this process:

Due to the complex, opaque global value chain for post-consumer textiles, where garments are often exported multiple times and rarely reach verified recycling streams, it is difficult to reliably track actual recovery outcomes. Despite claims of “recycling”, most exports are destined for second-hand markets, not recyclers, and there is limited data on whether items are reused, downcycled or disposed of. GCP recommends using a global average recycling rate (e.g., 8.45%) or Textile Exchange estimates per material as a conservative basis for calculating actual recovery when lacking traceable evidence for national or retailer-specific recovery scenarios.

| Material[101] | Recycling rate materials |
|---|---|
| Polyester | ~1% recycled worldwide |
| Wool | ~6% recycled worldwide |
| Elastane | ~3% recycled worldwide |
| Polyamide | ~2% recycled worldwide |
| Cotton | ~1% recycled worldwide |
| Down | ~1% recycled worldwide |
| MMCF (synthetic cellulose fibers) | ~0.5% recycled worldwide |

| Country | Recycling rate |
|---|---|
| Global | 7.7% |

Source: CTI sector guidance – Fashion and Textile v2.0

*% recovery types*

- Recovery type per recovered outflow. For example:
  - Reused, repaired, refurbished, remanufactured, recycled for products moving in the technical cycle;
  - Consumption by an organism, extraction of biochemical feedstock, biodegradation, biogas or biomass energy recovery under set conditions for products moving in the biological cycle.

### 3.2.2 Narrow and Slow the Loop

*Absolute and relative dematerialization*

Data points and potential sources for calculating the % absolute dematerialization and % relative dematerialization indicators:

- **Baseline material use**: Source data to determine the baseline material use (weight in kg/metric ton) from internal data logs (relevant for scope A/B assessments in particular) such as product design specifications, bills of materials, procurement records or production data archives. If no internal data are available, use supplier-provided specifications, industry benchmarks or average weight data from comparable products or public environmental declarations (e.g., EPDs) (relevant for scope C/D in particular).
- **Optimized material use**: This data can be found in updated BoMs, engineering change documents, life-cycle service plans or supplier disclosures related to the revised product version (relevant for scope A/B assessments in particular). In the absence of internal data, draw estimates from third-party repair service providers, LCA tools or typical material profiles of components used in the optimized design (relevant for scope C/D in particular).
- **Relative unit (only for % relative dematerialization)**: Source data from product use data, product testing data, maintenance logs, customer use studies or service contracts. If internal tracking is unavailable, rely on external research studies, customer surveys or

standardized assumptions from industry guidelines (e.g., average use cycles, service life or use rates).

- Data points and potential sources for validating the eligibility criteria:
  - **Clearly defined baseline**: Typically found in historical product specifications, BoMs or archived production and procurement records.
  - **Functional consistency**: Product performance test reports, technical specifications, quality assurance documentation or certifications.
  - **Total material accounting**: Often found in product life-cycle documentation, aftersales service records, logistics data or supplier-provided component and material breakdowns; if no internal data is available, consult third-party logistics partners or spare parts suppliers, or use modelled estimates based on typical maintenance schedules, packaging practices, etc.
  - **Environmental impact neutrality**: Environmental assessments, including internal (mini) LCAs, third-party EPDs or verified carbon accounting tools; if such assessments are not yet available internally, use screening LCAs, sectoral benchmarks or emission factors from public databases (e.g., ecoinvent, ADEME, DEFRA) to estimate comparative impacts.
  - **Use of relative unit (only for % relative dematerialization):** Data sources include product usage data, technical specifications, operational or customer usage records.
  - **Strategy-specific requirements**: Data depends on the strategy used and may include design change logs, supplier disclosures, service contracts or pilot implementation documentation.

*Actual lifetime*

- A reference lifetime value, for example:
  - Lifetime (in time span OR number of use cycles) of prior product version or, if appropriate, an average of at least a few prior products;
  - Lifetime (in time span OR number of use cycles) of an “industry average” product.

### 3.2.3 Value the Loop

*Circular material productivity*

- Revenue of assessed part of the business, value chain or economic system

*Material circularity revenue*

- Revenue per product (group)
- Level of circularity per product or product group (based on the Close the Loop module indicators)

***Note***

**Documentation**

When collecting data, your organization should document sources and provide justification. Record keeping will help retrieve data in upcoming cycles and will enhance the robustness of the results and institutional memory.

### 3.2.4 Impact of the Loop

*GHG impact*

Inflow

- All data points for the *% circular inflow* indicator
- $CO_2$-eq/kg sourced virgin materials
- $CO_2$-eq/kg secondary sourced materials

The collection of information on the $CO_2$ equivalent for comparison between sourcing virgin and non-virgin versions should come from a credible secondary emissions factor database. If your organization has already collected supplier-specific information on the GHG footprint of both the virgin and non-virgin material sourcing options, you could use this information instead of collecting generic factors from secondary emissions factor databases.

When collecting information on GHG emissions factors, keep in mind that an exact specification of the material might not be available in existing databases. In that case, you may use the GHG emissions factors of a reference material instead.

Consider bio-based materials circular if they are renewable. A criterion of renewability is that the materials be sustainably grown. Research into the "sustainably managed" criterion did not provide supportive evidence of a lower GHG emissions burden compared to bio-based material that is not sustainably managed. As a result, the material carbon footprint for renewable bio-based material is not, by default, considered to be lower than the material carbon footprint of conventionally sourced bio-based material.[100] Determine the GHG footprint of the renewable bio-based materials used through primary data on emissions factors or supplier-specific information to determine.

***Outflow***

- All data points for the *% circular outflow* indicator
- $CO_2$-eq/kg preparation for reuse[101]
- $CO_2$-eq/kg recycling process[102]
- $CO_2$-eq/kg incineration (with/without energy recovery)
- $CO_2$-eq/kg landfill

To structure the data required for the different recovery strategies and support organizations in data collection, the GCP adopted the structure of the waste hierarchy (presented in the Waste Framework Directive – see Box 6). The waste hierarchy presents the following categories: preparation for reuse, recycling, energy recovery and landfill. Preparation for reuse activities clusters the reuse, remanufacturing and refurbishing emissions.

The GCP recommends that the information on the $CO_2$ equivalent for comparison between linear scenarios (incineration, landfill) and circular scenarios (emissions from recovery strategies) originate from a credible secondary emissions factor database. If you have already collected organization-specific or third party-specific information on the GHG emissions impact of the presented circular recovery strategies and linear disposal strategies, you can use this information instead of collecting generic factors from secondary emissions factor databases.

**Box 6: Waste Framework Directive**

The **Waste Framework Directive** (Directive 2008/98/ EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives)[103] presents the basic waste management principles for use in the EU. The directive distinguishes between "waste" and "secondary materials" and provides a hierarchy to prioritize the preferred recovery options. The aim of the directive is to structure the recovery of emissions factors of different recovery strategies. It adopts no further definitions of "waste" or the "waste status". The hierarchy only provides a clear structure for different emissions factors associated with recovery strategies. The GCP adopts the EU Waste Framework Directive as it is grounded in life-cycle thinking, it provides harmonized targets and definitions and its waste hierarchy incentivizes by prioritizing higher value recovery strategies, such as preparation for reuse and recycling when available, while still allowing case-by-case deviations where evidence shows environmentally preferable outcomes.

*Nature impact*

The *Nature impact* indicator requires an overview of incoming materials and products, a necessary step to calculate *% circular inflow* measured in the Close the Loop module. It also requires additional data on land-use type, land-use intensity and sourcing location. This allows for the estimation of the extent, condition and significance associated with an organization's inflow. Sum up scores across materials for a constituent product or entire value chain. In general, each dimension requires the following primary data:

- Extent: All data points for the *% circular inflow* indicator
- Condition:
  - Type (qualitative) based on the raw material type (e.g., natural forest, plantation forest, cropland, mine or industrial site);
  - Intensity (qualitative) based on the specific land-use practices in place (e.g., conventional, organic, certified).[104]
- Sourcing location (e.g., country, sub-national region or precise location)

As organizations can differ in the availability of primary data, data availability scenarios may vary from full primary data availability to limited data. Contextual datasets must complement all primary and secondary data. The GCP recommends the following datasets per dimension:

- Extent:

  Yield per unit area estimates;

  - Global and regional crop yields are freely available from Food and Agriculture Organization (FAO) of the United Nations;[105]
  - Crop yields per country are freely available from Our World in Data;[106]
  - Land use per unit of agricultural production per country is freely available from Our World in Data;[107]

- Global rock-to-metal ratios for inorganic materials estimated by Nassar et al. (2022);[108] the land required for the mine can then be estimated using simple mass to volume conversions and mine site geometry assumptions depending on the mine type; see Annex I of CTI v4.0[109] guide for more details.

- Condition:
  - Biodiversity loss coefficients, based on MSA. Using the GLOBIO model,[110] MSA allows for the quantification of biodiversity loss relative to a pristine condition according to distinct categories of land-use types and intensities. Organizations can adopt the biodiversity loss coefficients from the supplementary materials of the Natural Capital Impact Group's Biodiversity Impact Metric,[111] which is freely available.

- Significance:
  - Extinction risk, based on the Species Threat Abatement and Restoration (STAR) metric STAR-t score.[112] STAR-t scores provide spatially explicit quantitative estimates of the species extinction risk associated with a given area of interest. These data are not publicly available and can be accessed via the Integrated Biodiversity Assessment Tool Alliance (IBAT) platform or in the forthcoming country profiles in the WWF biodiversity risk filter.

***Data compilation process***

1. List all raw material inflows for the selected scope used for calculation of *% circular inflow* and *% material circularity*.

An additional step may be to convert the inflow from processed materials, parts, components or products into raw, unprocessed minerals or biomass for renewable materials. Conduct this step internally. However, where precise conversion is challenging, use approximate figures in line with the scoring card (refer to Stage 3. Measure).

2. Identify what material inflows are most impactful for nature.

Check the list against the high-priority commodity list provided in the SBTN High Risk Commodities List[113] for initial prioritization screening. Note that you can use the nature indicator for both technical materials and biological materials. However, the GCP proposes this step to identify the materials that are likely to be most impactful for nature and thus simplify the process for organizations with many different commodities and sourcing locations in their value chain.

3. Identify data availability by asking the following questions:
   - Is the exact location of production (extraction, mining, cultivation, etc.) known?
   - Are the types of practices used for production known (e.g., organic vs industrial agriculture, strip vs open pit mining, any sustainability certifications)?
   - For inflow where detailed sourcing information is missing, is it possible to provide at least the country of production?

*Social impact*

Social maturity assessment

For the GCP Social maturity assessment, your organization can collect data by conducting short interviews with the content owners identified. The questions below can guide the conversation:

- Does an organization-level social risk assessment procedure exist? What are the salient risks and how does the organization monitor and address them?
- Have you identified how the transition to a circular economy may impact workers and affected communities? How have you done so and what risks did you identify?
- What action plans or strategies are in place to address risks directly or indirectly involved in business and supply chain practices? How did you develop them and how do you measure their effectiveness?
- How did you include the perspectives of the potentially affected groups in such activities?

Content owners may provide additional information to document practices and social risks across the value chain.

Social risk mapping

During this GCP Social risk mapping stage, your organization should collect – at a minimum – quantitative information about potential risks linked to the new circular strategy or business models. You can rely on publicly available sources or internally available databases (such as Amfori, Datamaran). You can expand and strengthen the information collected via desktop research, using internal interviews in this phase or at a later stage, should it require deeper information.

Quality-jobs analysis

For the final element of the GCP Social impact methodology, organizations should collect data using primary sources from their direct employees and indirect workers and subcontractors involved in the activities being addressed. You should adapt the survey to accommodate the needs of the population analyzed; the GCP recommends complementing it with personal in-depth interviews with at least one worker from each vulnerable group identified. The survey and guidance on adapting the survey are available in the GCP quality jobs analysis supporting documents.

Finally, you should gather country context information regarding the critical social hotspots that are present, using the data from the risk assessment database section for this purpose. Your organization also needs to collect information related to wages, such as poverty line, minimum wage, local living wage and median wage in the sector in the official local currency.

***Note***

**Considerations for social data collection**

Social data collection requires refined and detailed methods to ensure robustness and reliability. Research has shown that, due to a lack of access to relevant workers, it is challenging to establish the appropriate format of the survey to ensure sampling and data reliability and local contextualization.[114] This is particularly relevant as labor-intensive jobs tend to gravitate towards vulnerable populations characterized by a high risk of informality.[115] To tackle these challenges, the GCP strongly suggests organizations:

- Establish partnerships with local community organizations, local worker organizations and NGOs to facilitate social data collection;
- Get a qualified team to collect data from vulnerable populations to ensure data integrity, confidentiality and anonymity;
- Use survey software that allows for visual and audio support for questioning and answering, as some workers might be illiterate.

While the 46-question survey is optimal, if this is the first time that your organization performs the assessment, there is a chance that the use of all the required questions is not possible. In such cases, you should use a minimum of two questions per head indicator.

*Streamlining data collection*

Collecting data for a GCP circular performance and impact assessment can be resource-intensive, especially when multiple systems, suppliers and departments are involved. This section outlines practical strategies to simplify and accelerate the data gathering process while maintaining accuracy and completeness. By identifying key data sources, leveraging existing tools and fostering internal collaboration, organizations can reduce inefficiencies and improve the consistency of circularity metrics.

1. **Identify the data source**

For each data set, define the sources of the data needed for the assessment and who is responsible for providing and maintaining it. The following question can help in the process:

- Who owns this data? Differentiate between internal sources (e.g., another department) and external sources (such as suppliers). You should also ask suppliers where they source their data.
- How did your organization collect the data? For this it is important to differentiate between primary and secondary data.

2. **Assess the data quality**

For each data set, assess the quality of the data by understanding the data collection process.

- How accurate and how representative is the data provided?
- What level of confidence do you have in the data provided?
- What assumptions did your organization make during the data gathering process? How do these affect the usability and applicability of the data?

3. **Structure of the data**

For each data set, you should clarify the structure needed and how to aggregate the different data, with the aim of making data management as efficient as possible, which will also make any necessary data corrections and further updates easier. Therefore, structure the data using the relevant categories for inputs and outputs and the correct units for easy inclusion in the calculations.

## 4. Guidance on data quality and availability

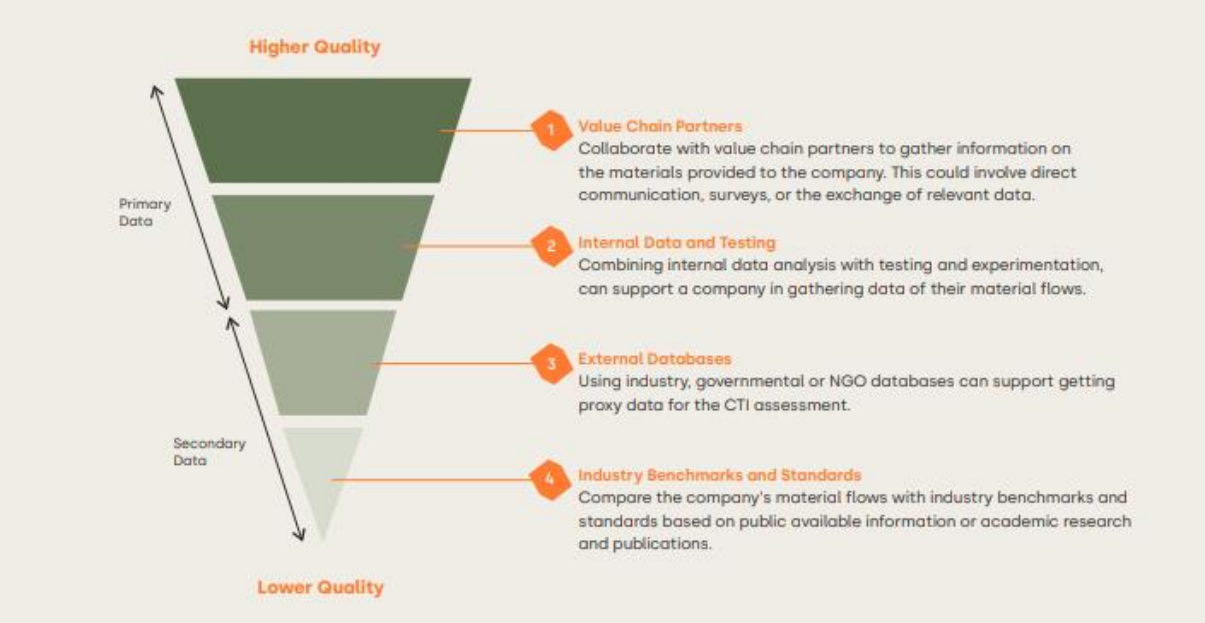
*External value chain data*

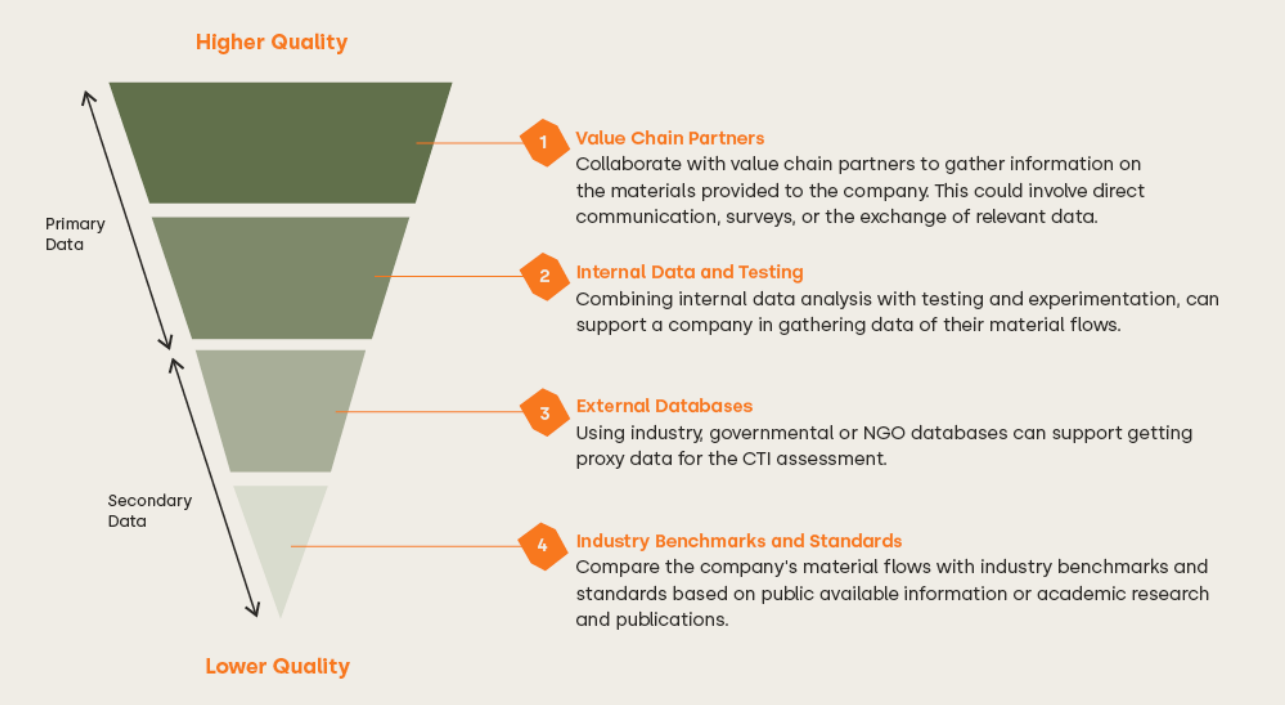
You can find data with external partners and within your own organization. To conduct the assessment, your organization usually rely strongly on external data from both up- and downstream value chain partners.

The most reliable and precise approach is to obtain primary data from value chain partners, as they provide first-hand information about the specific material, component or product being assessed. The GCP encourages third-party verification of supplier data, for example obtaining certification on the use of recycled materials in production from an independent organization as it is considered a best practice. For calculations on scope C and D in particular, where primary data may be unavailable, you may resort to using proxy or benchmark data, also referred to as secondary data. You can obtain these from publicly available or paid sources such as databases, research or publications. While secondary data can be useful, it is generally less specific to a certain product or region and considered of lower quality and accuracy compared to primary data.

Prioritize obtaining primary data and only resort to using indirect data if primary data is unavailable. It is also possible to combine primary and secondary data for the assessment. Figure 20 shows the level of quality per data source spread across the possible primary data sources and secondary data sources. For more guidance on how to approach incomplete or inaccurate data, see Annex 5 on data quality.

**Figure 20: Level of quality per data source**






Source: Circular Transition Indicators (CTI): Sector guidance – Electronic devices

*Internal value chain data*

In the data collection phase, you may look for internal data sources within your organization. The availability of internal data can vary significantly depending on the nature of your organization's operations. For instance, a manufacturing organization may have data on the materials contained in their products, which is crucial for determining the circular inflow or on product design relevant in determining the recovery potential. On the other hand, a retailer who is not involved in the manufacturing process is less likely to have this type of data available internally and will need to rely more heavily on value chain partners for this information.

It is important to note that even if an organization has internal data available, it may not be sufficient for conducting a comprehensive assessment. In such cases, it may be necessary to consult external data sources from value chain partners, industry databases and other relevant sources to supplement the internal data. Figure 21 offers guidance on where to look for internal data. It is important to note that this is not an exhaustive list and that departments and their responsibilities can vary from one organization to another.

## Figure 21: Potential internal data sources

| % circular inflow | % recovery potential | % circular outflow |
|---|---|---|
| → Procurement | → Research & Development | → Sales |
| → Supply chain management | → Design and engineering | → After-sales services |
| → Research & Development | → Innovation and technology | → Logistics and distribution |
| → Design and engineering | → Manufacturing and production | → Waste management |
| → Innovation and technology | → Quality Assurance and Testing | → EoL Partner management |
| → Manufacturing and production | | → Internal repair department |

Source: Circular Transition Indicators (CTI): Sector guidance – Electronic devices

For further guidance on data governance, refer to Annex 5 on data quality.

# Stage 4. Manage

To lead a meaningful circular transition, organizations must take strategic, data-informed approaches that drive operational decision-making towards concrete goals. This means identifying which circular strategies drive the most value, whether due to the materials and volumes used, their environmental or social impact, supply risk or business relevance and using that insight to guide focused, high-impact interventions.

Prioritizing interventions based on the highest impact is the focus of Stage 2. Prepare – 2.5 Identify and prioritize your materials. It enables organizations to determine which material flows your organization should address first, based on quantitative performance and strategic value. Prioritization also lays the groundwork for credible reporting under frameworks like CSRD, by linking physical resource performance with double materiality considerations gathered in Stage 2. Prepare – 2.3 Define your organization's material impacts, risks and opportunities related to resource use and circularity

Once your organization has identified priority areas, the next step is to develop structured, forward-looking roadmaps. The prioritize action phase translates strategic intent into organizational practice. It provides a foundation for setting measurable goals, tracking progress and making continuous improvements over time.

***Note***

The right corporate governance must support the successful integration of circular strategies. This means embedding circularity targets into strategic planning cycles, aligning incentives across procurement, operations and innovation teams and ensuring cross-functional accountability for delivery. When governance structures integrate circularity, it can shape capital investment, supplier engagement, product development and compliance efforts across the organization.

This section provides critical guidance on how to operationalize these elements. By prioritizing material flows, building actionable roadmaps and embedding circularity into core decision-making processes, organizations can ensure alignment between strategic intent and execution.

## 4.1 Analyze results

After the indicator calculations, the next step is to analyze the results. This step transforms raw data into actionable business intelligence and helps organizations begin contextualizing their circular performance, identifying patterns, uncovering inefficiencies and revealing the material and value chain dynamics that drive their results. Rather than viewing circularity indicators as end points, this section treats them as the foundation for strategic insight and continuous improvement. By comparing results across value chain stages, business units and product lines, organizations can identify both strengths and opportunities for intervention.

Moreover, this section provides the essential link between circular performance and broader sustainability goals such as carbon reduction, resource optimization and risk mitigation. In essence, it bridges the gap between measurement and decision-making, enabling organizations to prioritize initiatives that offer the greatest value for both business and planet. Organizations should involve the relevant decision-makers in this part of the process.

### *Current performance*

The performance measurement methodology aims to provide wide applicability across various organizations, industries and value chains. As performance is likely to vary substantially depending on the organization's characteristics, the model does not subjectively judge what "bad" or "good" performance is. This way, the GCP empowers organizations to study their own potential for improvement by examining the percentage of their business still considered linear. Analyzing the underlying indicators is relevant to understanding what is necessary to increase the level of circularity.

### *Performance over time*

The most valuable insights might come from tracking performance over time. An organization can compare progress to any time-bound goals, objectives or targets that it has formulated. If performance does not meet the expectations, the organization may further analyze the underlying indicators and parameters that influence their outcomes.

The analysis should provide clear insights on where the biggest opportunities for improvement are for the used indicators. For detailed guidance on the analysis of the results per indicator, refer to Annex 6 Stage 4. Manage – Analyze.

## 4.2 Prioritize actions

Following the analysis of circular performance, this section enables organizations to move from acquiring insights to action. At this stage, organizations begin translating data into direction, identifying where to act first to accelerate circularity in a way that aligns with business goals, stakeholder expectations, identified IROs in Stage 2. Prepare and systemic impact.

Circular opportunities often span a wide range of interventions, from process or product design changes and supply chain improvements to end-of-use strategies. However, not all options are equally viable or valuable in a given context. This section applies a structured evaluation framework to rank potential interventions, integrating an organization's exposure to circularity-related risks and opportunities (as defined by the IROs) with quantitative results derived from the indicators in the circular performance and impact methodology.

### *Risk assessment review*

The first step is to review the risks and opportunities associated with an organization's linear practices and potential circular strategies going forward from the IRO assessment in Stage 2. Prepare. By building on the results of the IRO assessment, this ensures the grounding of the prioritization in the real-world context of the organization's business, identifying where inaction may lead to exposure to market, regulatory, reputational or operational risks.

Your organization should ensure feedback loops are in place so that new insights on IROs from the GCP circular performance and impact assessment are addressed. You should also ensure that the IROs identified by business units, facilities and product groups, at local or regional levels, are systematically used to update the corporate IRO, following best-practice approaches in other areas of risk management.

### *Define potential action roadmaps*

After understanding exposure to circularity-related risks and opportunities, your organization should define and assess potential action roadmaps. The purpose of this step is to leverage the insights from the IRO to outline how its business may evolve in the future.

Your organization can start with evaluating a business-as-usual (BAU) scenario that describes how its business will develop without taking any additional actions to improve circular performance. Then you can use the BAU situation as a baseline and outline potential action roadmap scenarios to:

- Mitigate the identified linear risks;
- Unlock potential benefits from circular opportunities.

For each objective or IRO identified, present both BAU and one or more alternative scenarios. Best practice visualizations include marginal abatement cost (MAC) curves and bar charts. Subsequently, to determine whether further action is required (e.g., via threshold analysis or linkage to STBN), use a simple prioritization process based on factors such as importance and urgency.

To illustrate how each action roadmap may influence your organization's future, you can use either a text-based narrative format, similar to storytelling, or a graphical representation, such as a timeline highlighting projected developments and milestones.

**Linking circular solutions to action roadmaps**

After defining the roadmaps, you should engage with stakeholders from different business processes (e.g., product development, supply chain, production, business models or end-of-life

operations) to analyze how proposed solutions will affect corresponding material flows and calculations results.

Some recognized circular solutions to improve performance:

*Inflow*

- Replace current linear inflow with non-virgin alternatives
- Replace current linear inflow with renewable alternatives
- Replace non-renewable bio-based materials with renewable alternatives (for example through certification for sustainably or regeneratively managed bio-based materials)
- Reduce resource use through light-weighting of products
- Reduce resource use through use optimization, digitalization, replacing physical products with services (called “servitization” in some sectors), durability, etc.
- Reduce resource use by optimizing nutrient consumption (i.e., avoiding food waste and replacing nutrients/protein with less material intensive alternatives)

*Recovery potential*

- Redesign to incorporate, among others, modular design, design for disassembly, high recyclability by using mono-materials (technical cycle) or biodegradability and non-toxicity (biological cycle)

*Actual recovery*

- Increase actual recovery by selling a product as a service or instituting pay per use (technical cycle)
- Increase actual recovery through buy-back/take-back schemes (technical cycle)
- Increase actual recovery through value chain collaboration and partnerships for collection and recovery programs
- Increase biodegradable outflow that is actually consumed (i.e., by avoiding food waste or high valorization) (biological cycle)

*Dematerialization*

- Optimize product and packaging design to reduce material input (e.g., lightweighting, material substitution)
- Eliminate unnecessary components or product features through functional redesign
- Digitalize physical products or processes where feasible (e.g., virtual manuals, e-documents)
- Extend the use of internal assets (e.g., IT equipment, tools) through maintenance, repair or reuse
- Implement material-efficient business models (e.g., shared use, modular upgrades, on-demand production)
- Integrate material reduction targets into R&D and product development pipelines

- Use material footprint data to prioritize high-impact product lines or components for intervention

This list provides a starting point for you to explore actionable strategies that improve material efficiency and enable credible dematerialization claims. The choice of strategy depends heavily on your organization's specific business model, product type and value chain position – not every approach will be suitable or impactful in every context.

*Actual lifetime*

- Design products for durability, reusability, upgradability and repairability
- Implement business models that incentivize longer useful lives (e.g., product as a service)
- Provide accessible technical service and supply/spare parts for products beyond warranty
- Limit software obsolescence to improve the durability of electronics
- Improve product portfolio circularity by implementing solutions highlighted under "for inflow", "for recovery potential" and "for actual recovery"
- Drive increased sales in more circular products (compared to less circular products)

This list is not exhaustive and could grow over time, but it is a good starting point to look at possible solutions to consider.

*Material circularity revenue*

- Improve product portfolio circularity by implementing the solutions highlighted under "for inflow", "for recovery potential" and "for actual recovery"
- Drive increased sales in more circular products (compared to less circular products).

The examples on this and the following page illustrate what some of these solutions could look like. By making assumptions on the changes in material flows, you can calculate the effects on respective indicator performance in each course of action. In this way, it is possible to identify improvement potential in relation to the BAU scenario. Additionally, you can use the results to define ambition levels as part of their strategic target-setting.

### *Evaluate the business case*

Lastly, evaluating the business case enables organizations to either choose options or verify their expected business outcomes. The WBCSD 8 Business cases for the circular economy[116] report emphasizes that circular business practices can accelerate growth, enhance competitiveness and mitigate risk and, to seize those growth opportunities, organizations should demonstrate the business case. In principle, the circular business case is like any other business case; but there is potential to overlook some circular business case characteristics when operating under BAU. Therefore, some relevant considerations when evaluating the business case for circularity are below.

### 1. Evaluate as any other business case

The first step is to assess it like any other business case. If there is already a clear case, there may be no need to demonstrate the circular added value.

### 2. Consider potential cost savings in a circular business case

- Savings can be related to the inflow by replacing linear (virgin, non-renewable) with circular inflow (either renewable or non-virgin).

$$cost\ savings = costs\ from\ 100\%\ linear\ inflow - costs\ from\ current\ inflow$$

$$potential\ cost\ savings = costs\ from\ current\ inflow - costs\ from\ 100\%\ circular\ inflow$$

- Cost savings may result from improved client retention and acquisition, driven by a strengthened green brand image or long-term engagement models such as product-as-a-service and buy-back/take-back schemes, which can, in turn, reduce marketing and customer acquisition costs.
- Savings can be related to better retention and attraction of talented employees (driven by the “purpose” of circular business).
- Savings can be related to the avoidance of losses (for example nutrient loss related to food waste for the biological cycle or reusing waste streams for the technical cycle).
- Savings can be related to reduced waste management costs as materials are recovered and reused.

$$potential\ cost\ savings = current\ inflow\ costs - 100\%\ circular\ inflow\ costs$$

$$cost\ savings = costs\ from\ 100\%\ linear\ inflow - current\ inflow\ costs$$

### 3. Identify increases in revenues

- Circularity, convenience and sustainability may attract new customers.
- New segments may attract new clients because of lower initial investment for a service than a product (pay-per-use model).
- Your organization may see new revenues related to high valorization of waste streams and (by-) products.

### 4. Anticipate and respond to growing investor interest

As investors increasingly become aware of circular economy opportunities, your organization should proactively communicate with them about their commitments to the circular economy and be prepared to demonstrate performance when approached by investors.

### 5. Account for the longer term perspective

Product-as-a-service or trade-in offers are based on longer term service contracts or buy-back/take-back offers. Adopting these business models may stabilize profits over time and improve future cash flow predictability. By maintaining ownership of the products or regaining access, your organization secures future supply and hedges against future resource inflow price volatility. The societal shift to a circular economy may create future changes in costs savings, profitability and legal requirements.

***Note***

To avoid adverse impacts from other externalities when at scale, it is important to ensure that your organization avoids tunnel vision in pursuing circular ambitions and instead accounts for the broader sustainable impacts. You should complete the picture by complementing circular performance assessments with environmental and social LCAs and other tools. These and other product-related indicators are key to assessing or comparing circularity between different products.

Always implement these considering the local context to account for all intermediary steps and to identify the most appropriate solutions. This will ensure that your organization recognizes any potential trade-offs that may present themselves in analyzing circular strategies across different environmental and social impacts and dependencies.

## 4.3 Develop your action roadmap

Finally, organizations need to turn measurement into action. After assessing circular performance and identifying key opportunities, the focus is on translating insights into strategic decisions, operational improvements and innovative actions. Developing an action roadmap encourages organizations to actively integrate circularity into core business processes, such as product development, procurement and value chain collaboration, while aligning initiatives with broader environmental and social objectives. By formulating SMART targets and tangible actions to achieve these targets, organizations can prioritize high-impact strategies, monitor progress over time and embed circular thinking as a driver of long-term resilience and value creation.

### *Step 1: Set SMART targets*

Based on the analysis, the potential opportunity for improvement has become apparent. In addition, the prioritize phase in developing your action roadmap has identified the risk and opportunities to address. When combined, this information provides relevant evidence to formulate SMART target criteria.

Setting this criteria ensures clarity and accountability, turning broad ambitions into actionable steps. For example, instead of aiming to “increase recycled content,” a SMART target would be: “Increase the share of recycled materials or regeneratively sourced materials in product packaging to 60% by 2027”. This approach helps align internal teams, track performance objectively and communicate commitments transparently to stakeholders. In the context of circularity, SMART targets are a bridge between strategic intent and tangible impact, enabling you to focus efforts where they matter most and monitor progress along the circular transition journey.

### *Step 2: Design and plan actions*

It is necessary to create actions to achieve the targets. Although it is up to your organization to further define the specific actions per target, you can consider the following steps as a checklist for what to contemplate when setting tangible actions for target achievement.

1. **Clarify the action**

The target gives direction on what needs to happen. Stage 4.1 Analyze results describes potential high-level examples of possible directions to take. It is up to your organization to further formulate specific actions based on the nature of your organization and the outcomes of the analysis.

2. **Set timelines (back casting)**

You should set up an action plan through back casting. With the time-bound target in mind, your organization can roll out intermediate targets and actions based on a roadmap. It is important to define the timelines in the roadmap to ensure the alignment of assessment cycles with the intermediate targets.

3. **Assign ownership**

To ensure action, identify an owner to drive action. Table 18 provides examples of the possible actions listed in Stage 4.1 Analyze results, with the relevant departments internally, external parties to include and considerations to take into account when executing the action.

4. **Evaluate progress and adjust**

Lastly, recognize that applying is not the final step in measuring and managing circular transition. As mentioned Stage 3. Measure, the methodology is a navigation tool that supports an ongoing journey, rather than a one-time exercise.

## Table 18: Illustrative examples of targets and actions

| Departments to involve | External partners | Further considerations | Example targets | Example actions |
|---|---|---|---|---|
| **Reduce linear inflow by replacing it with renewable inflow** | | | | |
| **Sustainability, procurement, product design, product management and R&D** | Suppliers and certification bodies | Suppliers | Launch a new fashion line using natural materials by 2030 | Explore how certificates consider sustainability and land use and the functionality of certified materials for purpose |
| **Reduce linear inflow by replacing it with secondary inflow** | | | | |
| **Sustainability, procurement, product design, product management and R&D** | Suppliers | Sustainability, technical feasibility, acceptance by customer and functionality | Product category X should contain 40% recycled content by 2027 | • Discuss technical feasibility and availability with supplier<br>• Switch supplier if needed |
| **Increase recovery potential by circular product design (for modularity, disassembly, mono-material biodegradability** | | | | |
| **Sustainability, product design, service and maintenance, product management and R&D** | Clients and suppliers | Technical feasibility and economic viability | 60% of bottles produced consist of mono-materials by 2027 | • Change supplier<br>• Set up research with supplier |
| **Increase actual recovery by maintaining ownership or buy-back/take-back schemes** | | | | |
| **Sustainability, product design, sales account management, customer relations, service and maintenance and legal product management** | Clients and financiers | Financial implications (e.g., on balance sheet and cash flow) and legal implications | 30% of revenues from high-value assets should come from pay-per-use models by 2030 | • Pilot with a supplier for return logistics<br>• Market research to understand client needs and barriers for the new model |
| **Increase actual recovery by setting up take-back/buy-back or recovery schemes with third parties in the value chain** | | | | |
| **Sustainability, product design, sales account management, customer relations, product management and R&D** | Clients and suppliers | Collaboration forms with other parties | Set up a take-back or buy-back scheme for all newly sold phones by 2027 | Set up an agreement with a refurbishment organization |
| **Increase actual recovery by investing in and advocacy for public schemes** | | | | |
| **Sustainability and public relations** | Customers and public authorities | Achievable influence and impact | Support public scheme advocacy in 95% of offset markets by 2030 | Join forces with peers on advocacy |

### *Step 3: Monitor, evaluate and iterate*

Circularity does not end with setting targets and initiating actions; it requires continuous monitoring, re-evaluation and iteration. By regularly tracking progress and refining strategies, organizations can remain responsive to new insights, evolving conditions and emerging opportunities for greater impact.

## 4.4 Establish strategic governance for circular value

The transition to a circular economy is a systemic transformation that requires organizations to fundamentally rethink how they manage material flows, structure roles and responsibilities, govern data and align with broader sustainability priorities. Circularity is not confined to a single department, unit or function, it spans the entire organization, influencing everything from product design and procurement to data infrastructure and stakeholder engagement. To deliver meaningful impact, this transformation demands integrated governance frameworks that foster coherence across functions, ensure accountability and align circular efforts with strategic business objectives.

The GCP recognizes that circular governance can be complex, but its design supports organizations in taking steps at any stage. Early, incremental engagement will help organizations adapt more smoothly and avoid greater challenges in the future. This section offers practical guidance for organizations seeking to embed, or deepen, the integration of circular economy principles in their governance frameworks.

### *Organizational integration, collaboration and communication*

Circular economy strategies often span multiple departments, from processing, product design and procurement, to logistics, marketing, finance and customer experience. To implement these strategies effectively, organizations should break down silos and foster internal collaboration and communication across functions. This means, for instance:

- Establishing shared definitions and terminology, along with a clear internal process, is key to streamlining internal communication and ensuring everyone is aligned.
- Optimizing resource processing systems to minimize waste and boost circular value. This includes using smarter sorting and separation methods to recover more valuable material, reprocessing left-over waste from operations and reusing water in closed loops. New technologies can help reduce the amount of waste from mining, for example, by turning it into useful products for other industries (e.g., construction).[117]
- Incentivizing design teams to design for circularity by ensuring that materials can be easily separated and products can be disassembled for recycling and repair. They collaborate closely with the marketing team, procurement and customers or consumers (depending on value chain position) to align design choices with practical needs and sustainability goals.
- Applying advanced data analysis techniques to large datasets, such as material passports, repair records and environmental impact reports, to identify design optimizations, substitute materials or improve circularity scores. For instance, R&D teams can leverage pattern recognition tools that may highlight components that consistently underperform in reuse cycles and prompt targeted redesigns.
- Coordinating operations with logistics to enable reverse flows and product recovery requires ongoing communication to ensure smooth processes.
- Aligning investment decisions and performance metrics with finance and sustainability.
- Ensuring collaboration between the marketing and product teams to create and communicate circular value propositions to end-consumers and internal stakeholders. Internally, marketing can translate and educate on the benefits and opportunities and, by doing so, support wider efforts to scale circularity by contributing to increased understanding and engagement across functions.[118]

- Establishing cross-functional circular economy working groups or steering committees. Along with an organization's leadership, these groups are accountable for achieving circularity targets, with performance incentives strengthened by linking these targets to remuneration. These groups should include representatives from departments such as sustainability, operations, finance, procurement, business units and product teams, and be empowered to coordinate initiatives, resolve trade-offs and track progress. To operate effectively, these groups need clear accountability structures that define who is doing what, not just in theory, but in day-to-day execution.

One practical tool to support this is the Responsible, accountable, consulted and informed (RACI) model (see example below), which outlines who is responsible, accountable, consulted and informed for specific tasks or decisions. This can be especially useful when circular initiatives cut across traditional departmental lines and business units.

***Example***

**Responsible, accountable, consulted and informed (RACI) model**

During the development of a take-back program for returned products, the sustainability team might be responsible for program design, operations accountable for logistics, procurement consulted on reverse flows and marketing informed to communicate with customers. By mapping roles explicitly, the RACI model supports smoother coordination and helps prevent ownership gaps as the organization implements circular strategies. The organization can reinforce this kind of role clarity through specific assignments. For instance:

- The sustainability team may be responsible for setting targets and tracking performance.
- The procurement team may be accountable for sourcing circular materials, components and products.
- Product teams may be central to driving circular change by making design decisions that enable durability, repair, reuse and material recovery across the product life cycle.
- Risk management teams may assess circularity-related risks and opportunities, such as resource volatility, liability exposure or transition risk. Their involvement helps ensure the embedding of circular considerations in broader enterprise risk frameworks.
- Regulatory compliance teams may be responsible for ensuring adherence to evolving circular economy regulations, such as EPR schemes, product labeling requirements and waste management laws. Their involvement is critical in tracking legislative developments across jurisdictions, advising on legal obligations related to product take-back, recycling and reuse, and preventing non-compliance risks that could delay or derail circular initiatives.
- Finance and executive leadership should support circular investment decisions and business case development. A dedicated circular economy lead or program office may help coordinate efforts across functions.

This structure facilitates the inclusion of circularity into day-to-day operations, business management and strategic planning. It ensures that responsibilities and decision making are clearly stated and at the core of corporate objectives.

To successfully implement circular strategies and business models, embedding strong internal accountability mechanisms is key, not only to coordinate efforts, but to sustain long-term alignment. This requires more than assigning responsibility; it also calls for a clear business value proposition for circularity, sponsored by your organization's leadership. Without demonstrating how circular

strategies support profitability, competitiveness or resilience, it will be difficult to secure meaningful buy-in across departments. Framing circularity as a business-wide opportunity, for example, through cost savings from efficiency, access to new markets or more resilient revenue streams, supports the shift from a sustainability obligation to a commercial priority.

At the same time, it is important to recognize that circular solutions can at times involve trade-offs, such as higher costs for recycled materials or slower payback periods. Keeping these realities in view can support more grounded decision-making and increase the likelihood of sustained internal engagement.

***Example***

**Aligning sales incentives with circular objectives**

Commercial teams, like sales departments, can be a pressure point in this transition. Sales teams are traditionally evaluated using volume-based KPIs, like units sold, quarterly targets or acquisition numbers, which may conflict with circular goals such as promoting product durability, enabling reuse, supporting product-as-a-service models or recovering value at end-of-life.

The shift to circular sales models, like bundling services, offering take-back or upgrade programs, or driving recurring income through subscriptions, creates new value but requires rethinking how performance is measured and rewarded and which teams are responsible. Sales professionals may feel uneasy if the new model undermines familiar ways of proving success or threatens their earning potential.

To address this, organizations should be transparent about the value circularity brings, invest in upskilling and communication, and shift recognition and rewards to emphasize long-term outcomes, like customer retention, life-cycle support or service performance, over one-time transactions.

To support this shift, organizations can, for example:

- Integrate circularity into departmental KPIs and performance reviews;
- Set ambition levels with SMART targets and integrate them into annual business planning cycles;
- Conduct regular internal assessments of circularity initiatives;
- Ensure transparency in decision-making, resource allocation and the long-term financial incentives and business growth from circularity incentives;
- Embed circular considerations into portfolio management and strategic investment decisions;
- Have group management (e.g., the chairperson) communicate circularity to sales and how traditional KPIs will be replaced.

Equally important is fostering a sense of ownership across departments. Circularity should not be confined to sustainability teams or isolated pilots, it should be embedded across business functions as a core driver of value creation. Achieving this requires a more distributed and cross-functional approach to circular strategy and target-setting, where all departments, from procurement and product design to sales, marketing and finance, are actively involved and accountable. The following elements can support this shift:

- Tailored training programs that help different functions translate circularity into their day-to-day roles;
- Incentives for cross-functional collaboration and innovation, particularly where shared targets are in place;
- Internal communications that celebrate circular achievements across teams, not just individuals

To be most effective, circular performance metrics should not remain isolated in reporting or sustainability teams but actively embedded into core processes, such as strategic planning, innovation roadmaps and value chain decision-making. This integration facilitates metrics guiding real transformation rather than serving as retrospective indicators.

To successfully embed circularity into corporate governance, organizations should:

- Include a clear, concise statement on the strategic business benefits of circularity, articulating the "why" for your organization, to convey the contributions of financial value creation and ensure alignment and shared purpose across cross-functional teams and topics (e.g., climate, nature and equity).
- Secure and communicate leadership buy-in from the top to ensure circularity is regarded as a strategic objective. Your organization should clearly articulate this top-down commitment alongside the strategic business benefits of circularity to foster alignment and shared purpose across cross-functional teams.
- Integrate circular economy objectives into departmental KPIs and performance reviews by setting SMART targets and embedding them in annual business planning cycles.
- Build cross-functional teams that coordinate to align actions and decisions across all value chain stages, from sourcing raw materials to product design, manufacturing, distribution, use and end-of-life.
- Initiate internal capacity building programs to equip staff with foundational knowledge of circular economy principles. This foundation enables organizations to move from isolated initiatives to integrated, organization-wide circular strategies.

### *Circular performance metrics for different organization types*

Key organization types can be identified based on their dominant role in the value chain.[119] For each, relevant circular performance indicators and modules are identified, along with key considerations for implementation. Refer to Stage 3. Measure for further details on the respective indicators and modules. It presents the relevant indicators and modules as a starting point for reflection and planning.

In practice, the relevance and feasibility of specific circular performance indicators will vary depending on an organization's size, sector, geographic context and position in the value chain. Some organizations may span multiple roles or evolve over time, requiring a dynamic approach to indicator selection. This table does not prescribe a fixed set of indicators and modules but offers initial guidance to support organizations in identifying meaningful entry points for circular performance measurement and governance.

### Table 19: Relevant circular performance indicators for different organization types

| Organization type | Explanation | Relevant indicators & modules | Key considerations |
|---|---|---|---|
| Raw material suppliers (extraction and harvesting of materials) | Provide primary or secondary materials to downstream actors | - % circular outflow<br>- % circular inflow (for biological cycle)<br>- Impact of the Loop | In terms of inflow, extraction operations for materials in the technical cycle are typically linear, relying on finite virgin materials. In contrast, the biological cycle depends on renewable inflows, requiring organizations to |

| | | | |
|---|---|---|---|
| | | - Value the Loop | ensure that natural systems can regenerate inputs sustainably. Outflows, however, can be circular in both cycles if materials are reused, recycled or safely returned to the environment at EoL. Across all stages, organizations bear significant responsibility for managing environmental and social impacts – particularly during extraction and when sourcing involves informal or unregulated channels. |
| Equipment and machine suppliers | Provide machinery and components used in production or consumption | -% material circularity<br>- % dematerialization<br>- Actual lifetime<br>- Value the Loop | Have a high influence on the circular design of the machinery and components they provide, including durability and recovery potential. Should be aware of and aim to manage environmental and social impacts across the supply chain. |
| Producers/ manufacturers (including intermediate producers, original equipment manufacturers, original design manufacturers, brands, private-label producers, product assemblers) | Manufacture proprietary intermediate and finished goods (materials, components, products and packaging) either directly or through equivalent entities across sectors | - % material circularity<br>- % dematerialization<br>- Impact of the Loop<br>- Value the Loop | Have a high influence on the circular design of the finished goods and packaging they provide, including the durability and recovery potential. Should be aware of and aim to manage environmental and social impacts across the supply chain. |
| Retailers (and wholesale) | Sell products to end-users and may facilitate take-back or resale | - % material circularity<br>- % dematerialization<br>- Value the Loop | Can influence upstream procurement, offer repair services, buy-back, leasing and spare-part provision and enable reverse logistics. Key role in consumer engagement and accessibility of circular products. |
| Repair providers | Extend product life through repair services | - % actual recovery<br>- Value the Loop | Focus on lifetime extension through service. |
| Logistics providers | Manage transport and distribution, including reverse logistics | - Value the Loop<br>- *Circular performance indicators may apply to own operations (e.g., fleet reuse, packaging) and, in some cases, to services supporting reverse flows, sorting or traceability.* | While not directly involved in product development, logistics providers are essential enablers of circular flows. Their role is especially important in managing reverse logistics, minimizing material degradation in transit and supporting traceability or sorting processes. In some cases, they can also contribute valuable data for circular performance tracking. |
| Recovery managers | Operate at EoL stages (e.g., collecting, sorting, dismantling, recycling) | - % actual recovery<br>- Value the Loop | Should evaluate and prioritize higher value R-strategies (e.g., reuse over recycling). |
| Intermediaries (platforms) | Facilitate sharing, resale or reuse through digital or physical platforms | - % dematerialization<br>- Value the Loop | By enabling access over ownership and higher product use, they have the potential to contribute to dematerialization. Additionally, intermediaries can support circular economy activities such as maintenance schemes, predictive maintenance and repair services, further extending product life cycles and reducing material throughput. |
| Emerging actors (e.g., financiers, data providers) | Provide enabling services such as capital, data or certification, including new categories of actors not yet identified | - Social impact<br>- Value the Loop (Portfolio Level) | Support the ecosystem through capital allocation and data transparency. May apply *% material circularity* at the portfolio level. |

*This list is non-exhaustive and solely intended to support organizations' IROs-based discussions and internal prioritization.*

### *Recommendations for implementers*

To implement this data governance vision, the GCP proposes, where possible, the following measures at the corporate level:

- **Appoint senior circular economy governance leads responsible for data management:** Designate high-level leaders to oversee circular data governance, ensuring accountability, data quality and alignment with broader corporate sustainability objectives.
- **Implement a robust system for collecting circularity data:** Ideally integrate this with existing ESG tracking systems to ensure consistency, streamline reporting and support holistic sustainability decision-making.
- **Embed circularity data into incentive structures, KPIs and board reporting:** Integrate circular economy goals into performance incentives and key performance indicators, while regularly communicating progress to the board to drive organizational commitment and transparency.
- **Use federated data governance models to onboard diverse partners:** Adopt a federated approach that balances centralized oversight with local autonomy, enabling inclusive collaboration across internal teams and external stakeholders in the circular economy ecosystem.
- **Align procurement and capital allocation with circular performance metrics, starting with measurable areas and progressively expanding:** Use circularity data as a guiding signal to prioritize procurement decisions and investment flows, beginning with clearly quantifiable metrics and gradually incorporating more complex aspects as capabilities mature.

*To learn more about areas of data governance, federated governance models, inclusion, modularity and global equity in data governance, see Annex 7: Stage 4. Manage.*

### *Embedding circularity for long-term impact*

Embedding circularity into corporate governance is critical to building resilient, sustainable and competitive organizations. This requires more than isolated pilots; it demands integrated, organization-wide frameworks that align strategic priorities, roles, targets and accountability mechanisms across departments, value chains and regions. When circularity is embedded beyond sustainability teams, into core functions like risk management and operations, it becomes a driver of innovation, resilience and long-term value creation.

To succeed, your organization must tailor circular strategies to the specific context, its size, sector and value chain position, while also considering the inclusion of smaller actors, especially in the Global South. Data governance plays a key enabling role, providing the transparency and trust needed to support decision-making, ensure compliance and build stakeholder confidence. When integrated effectively, circular governance enhances both financial and non-financial performance by optimizing resource use, improving supply chain resilience and aligning with evolving climate, nature and social goals. When faced with growing risks, from resource scarcity to regulatory pressure, governance becomes the backbone of scalable circular transformation, enabling organizations to shift from symbolic action to systemic change.

# Stage 5. Communicate with external stakeholders

This stage guides organizations in preparing the outcomes of the stages 2. Prepare, 3. Measure and 4. Manage for a coherent and transparent external disclosure, suitable for any format of external reporting.

***Note***

The guidance on metrics provided here supports the development of robust narratives when applying GCP indicators for external disclosure purposes. Note, however, that the original design of the GCP indicators was for internal decision-making and thus they may not always be fully suited for external communication. When preparing external disclosures, organizations should ensure the quality, verification and assurance of data to a standard that exceeds what may be sufficient for internal assessments. Future versions of the GCP may incorporate additional or alternative indicators to address identified gaps and further enhance alignment with external disclosure requirements beyond the current GCP metrics.

## 5.1 Prepare your disclosure

External communication can unlock many benefits for your organization. For example, it can improve your access to (responsible) capital and funding or serve supply chain data requests. By extension, it can also prepare your organization for mandatory organization-level reporting, either for existing sustainability reporting regulations or in anticipation of new regulations.

Also, external communication depends on the type and level of information to communicate. As discussed in Stage 1. Frame – Define the assessment level, organizations should select one of the following levels of assessment: material/resource, product or business unit/organization level. Communicating on an assessment done at the level of materials or products can serve objectives such as attracting capital (e.g., by disclosing new circularity initiatives or measurements) or specific product transparency regulation such as ESPR, while communication at the organization level is, in many causes, preceded by an IRO assessment, which is mandatory due to regulations such as the CSRD in the EU, and require a comprehensive disclosure set of information.

### *5.1.1 Core considerations*

The following core considerations guide the communication narrative and the selection of the disclosure elements (5.2) to enable effective communication:

- Consider your target audience;
- Consider decision-usefulness;
- Apply reporting principles.

*Consider your target audience*

To communicate the assessment results from Stage 3. Measure effectively and ensure disclosures enable stakeholders to make informed choices, the GCP recommends organizations tailor their communication to the needs of key stakeholder groups.

When considering your target audience for circularity reporting, it may be helpful to reflect on which stakeholders – such as investors, regulators, suppliers, value chain partners and customers – are

likely to benefit from decision-useful information about your organization's circularity performance, risks and opportunities. The audiences most relevant to your reporting objectives or those with a significant influence on, or who are significantly affected by your circularity initiatives may be particularly important. Disclosures tailored to these key groups can help ensure your report is meaningful, actionable and supports stakeholder trust, in line with the GCP approach.

In this stage, the GCP provides considerations for decision-useful disclosures for the following four key stakeholder groups, along with examples of decision-useful information tailored to each audience, supporting relevant, targeted reporting.

- **Financial institutions, investors and multilateral development banks:** Interested in how circular practices affect financial risk, investment return and long-term business sustainability.
- **Policymakers and regulators:** Focused on compliance with regulations, alignment with national circular economy strategies and targets, and reporting requirements.
- **Suppliers and value chain partners:** Concerned with the influence of circular practices on supply chain processes, collaboration and shared value creation.
- **Customers (B2B):** Seeking information on how circularity initiatives impact product quality, value and sustainability credentials, influencing purchasing decisions and brand loyalty; and **Consumers (B2C):** Driving awareness, informing consumer choice and shifting consumer behavior towards sustainable alternatives.[120]

Refer to the audience-specific tables at the end of each disclosure pillar for further guidance on decision-useful information. See 5.2.3 Core disclosure pillars.

These examples are not exhaustive or prescriptive; they help organizations focus on those disclosures most meaningful for each group. Not all examples will apply in every context and not every disclosure will be relevant to all stakeholder groups. **Select and adapt examples that best support your organization's decision-making and stakeholder trust.** While the GCP highlights four key stakeholder groups, you may also consider additional audiences relevant to your organization's specific context.

*Consider decision-usefulness*

Decision-usefulness refers to information that enables stakeholders, those using the communicated information, to make informed decisions. In relation to the circular economy, such insights help assess factors such as competitiveness, financial value, risk management, and the environmental and social impacts of an organization's resource use and circularity efforts across different time horizons. Decision-usefulness is a cornerstone of the GCP.

In the context of circularity, decision-useful information allows stakeholders to:

- Assess sustainability: Understand how the organization mitigates negative environmental and social impacts from resource use and contributes to positive outcomes.
- Evaluate resilience: Gauge how the organization manages risks related to resource scarcity, price volatility and waste and builds robust operations and supply chains.
- Identify growth opportunities: Recognize new business models, cost efficiencies and customer segments that create value and attract impact-focused capital.

Based on your analysis on decision-usefulness, the GCP recommends you select and focus only on these disclosure elements from 5.2 to effectively tell a focused story. For example, a bank with a large real estate portfolio should focus its disclosure on the material flows and the circularity of its

own offices, as well as on its real estate portfolio which represents a large and, therefore, significant part of their indirect business operations.

*Apply reporting principles*

The foundational reporting principles (relevance, fair representation, consistency, comparability, transparency, verifiability, comprehensibility and timeliness) guide how your organization collects, measures and presents information, supporting alignment with best practices and regulatory expectations. In addition, two application principles tailored to the circular economy context are included: circularity specificity, and systems thinking and value chain perspective, recognizing the interconnected, value chain-wide nature of circularity. Annex 8: Stage 5. Communicate – Description of reporting principles provides a more detailed view of the principles.

Together, these principles define the quality and integrity of circularity reporting and form the basis for the operational guidance that follows in 5.2 Select your disclosure elements, with operational guidance on areas such as timing, data quality, changes in methodologies and verification.

### *5.1.2 How to navigate this section's guidance*

The GCP has structured and formatted the guidance items in this stage as follows:

- Disclosures: Presented in **bold blue** font, they represent the information on circular economy the GCP recommends to disclose.
- Guidance: Includes suggestions, background information, explanations and examples to help better understand the disclosure recommendations.
- Interoperability: For each guidance item in this chapter, the left-hand **Interoperability** column lists the relevant standards and frameworks in alphabetical order, showing where elements from these frameworks correspond to the GCP recommendations.

*Application of interoperability*

While many reporting standards and frameworks offer comparable reporting disclosure requirements, they may differ in terminology or emphasis. The GCP brings together the main disclosure items for each disclosure pillar from these diverse sources, helping ensure that disclosures are consistent with existing requirements and simplifying the reporting process. The GCP highlights where reporting elements correspond to external frameworks and directs your organization to original sources for the precise requirements and detailed wording. This approach enables organizations to achieve better-aligned reporting, helping them understand how individual requirements are reflected across multiple frameworks and facilitating the integration of disclosures.

By consolidating core circularity disclosures, the Protocol helps organizations navigate overlapping requirements, reduce duplication of effort and support efficient, consistent reporting. However, as not all requirements will be relevant for every organization, you should carefully consider materiality and fair representation. The GCP encourages organizations to focus on the most pertinent data points to their operations, business model and materiality, rather than aiming to report comprehensively on every item across all frameworks relevant to them.

Although the GCP offers circularity-specific guidance tailored to stakeholder needs, it does not guarantee compliance with all external requirements. With the exception of metrics, the Protocol does not indicate the extent of alignment with the different frameworks.

## 5.2 Select your disclosure elements

As discussed in 5.1, the selection and disclosure of information strongly depends on communication objectives, assessment level, type of audience and possibly other context-specific factors. This section provides an overview of the full list of potentially relevant disclosure elements.

For sustainability reporting on an organization level (e.g., in anticipation of a new sustainability regulation framework), a large portion of these elements are likely to be relevant or mandatory to disclose. But this does not mean that you should cover all disclosure elements in all external communication. On the contrary, after defining the target audience and decision-useful information, you should select and disclose only the relevant disclosure elements based on the reporting principles.

**Example 1**: An organization presenting its new circularity action plan on an investor day is likely to select and disclose more disclosure elements on strategy or governance than on IRO management or metrics.

**Example 2:** An organization serving data requests from a large customer, which is reporting under CSRD, may focus its disclosure on resource flows and key GCP indicators. Disclosure on strategy or governance may be less relevant in this example.

### Table 20: Overview of the disclosures

| | | |
|---|---|---|
| **5.2.1 Accounting, Data and Assurance** | Timing of reporting | • Reporting period |
| | Data collection and quality management | • Data source used and/or data collection process and level of confidence<br>• Data enrichment or processing, assumptions |
| | Changes in reporting | • Change in methodology and scope<br>• Changes in context<br>• Correction of material errors |
| | Verification and assurance | • Internal and external assurance provided and verification statements |
| **5.2.2. Scope of the assessment** | - | • Outcomes of the Prepare assessments (objective of the assessment, scope (level of assessment, organizational boundaries, value chain and circularity hotspots, material IROs, operational boundaries, material flows) |
| **5.2.3 Core disclosure pillars** | Strategy | • Circular vision, mission, goals, targets<br>• Circular strategy development process, IRO and materiality integration<br>• Strategy to value link |
| | Governance | • Overview of governance structure and policies<br>• Integration into IRO, strategic oversight and stakeholder governance<br>• Incentives schemes<br>• Data governance, due diligence processes across the value chain<br>• Risk management processes and internal controls<br>• Stakeholder engagement |
| | Impact, Risk and Opportunity management | • Circular policies in place<br>• Circular actions and action plan development<br>• Process to identify IRO and link to strategy, metrics and targets |
| | Metrics and targets | *Metrics*<br>Based on the disclosure objectives i.e., sustainability, resilience, growth:<br>• Disclosure of relevant indicators and performance (methodology, validation/verification, definition, unit of measure, reason for indicator/metric selection; current performance and interpretation)<br>*Targets*<br>• Targets used by the organization (description, time frame, baseline year, ecological threshold, methodology, regulatory requirements, progress, comparison to benchmarks |

### *5.2.1 Disclosures on accounting, data and assurance*

This sub-section provides practical operational recommendations to support high-quality, reliable circularity reporting. Building on the reporting principles (see Annex 8: Stage 5. Communicate – Description of reporting principles) and data quality and governance recommendations (see Annex 5: Stage 3. Measure – Data quality), it outlines best practices and requirements for:

- Setting and aligning reporting periods;
- Ensuring data quality and transparency;
- Managing changes in reporting approaches;
- Applying robust verification and assurance processes.

## Timing of reporting

The objective is to establish a clear and consistent temporal framework for circularity data, enabling comparability over time, ensuring reliability and consistency and providing essential context for performance against baselines and targets. This transparency allows stakeholders to effectively track progress and make informed decisions.

| Interoperability | Disclosures and guidance |
|---|---|
| **GCP MEASURE**<br>**ESRS, GHGP**<br>**GRI, ISSB IFRS S1** | **Disclose the organization's reporting period**<br><br>Disclose, where applicable:<br>• **Established and consistently applied time frame/reporting period** (e.g., calendar/fiscal year, quarterly updates) for the GCP circular performance assessment and associated reporting.<br>• **How the reporting period aligns with financial reporting.**<br>**Note:** GCP recommends the chosen circularity reporting period align, where feasible, with your organization's financial reporting cycle. This alignment facilitates data integration, streamlines data collection processes and enhances coherence between financial and circularity performance disclosures. However, the assessment time frame might follow a production cycle or another more meaningful time frame (such as one that is relevant to the construction sector or for capital equipment), which you should disclose.<br>• If the reporting period changes, **indicate that it has changed, along with reasons and impacts on comparability**.<br>• **Confirmation of consistent application of this reporting period and the defined cut-off dates.**<br>**Note:** Precisely define and rigorously apply clear and consistent cut-off dates for data inclusion across all reporting periods. This ensures that you capture all relevant circularity activities and material flows occurring in the designated period. |

## Data collection and quality management

This sub-section provides an overview of disclosures outlining the essential processes and methodologies for gathering accurate and relevant data to support effective reporting on circularity. It suggests practices for ensuring data integrity, consistency and reliability throughout the collection process. Moreover, it emphasizes the importance of ongoing quality management to maintain high standards of data accuracy, thereby enhancing the credibility of disclosures. Additionally, your organization should assess and disclose the quality of the data used and explain the implications this has for the analysis presented. Where data quality may impact confidence in the results or conclusions, you should clearly communicate this to stakeholders.

The aim of reporting and disclosing data collection and quality management practices is to ensure the transparent communication of the methodology used, allowing stakeholders to contextualize the information provided. Additionally, it assesses trust and credibility in the shared data and can enable some form of comparability between organizations (in the same industry) by clarifying differences in data collection approaches.

| Interoperability | Disclosures and guidance |
|---|---|
| **GCP MEASURE**<br>**ESRS**<br>**GRI** | **Identify for each disclosure requirement the data source used and the data collection process and assess the level of confidence** |
| | Disclose, where applicable:<br>• **The inputs and source used for circularity disclosure.** GCP recommends your organization clarify for the various disclosure requirements the source of the data used, the data collection process, the type of data, the period of data collection and the justification for use.<br>• **Data quality**. This includes aspects covering data completeness, representativeness and precision:<br>  ○ **Completeness:** Your organization has selected all relevant indicators that meet the objective of the assessment and included all material inflows and outflows.<br>  ○ **Representativeness:** The data reflects the same time period and geography as determined in the scope.<br>  ○ **Precision:** The data is as precise as required to serve decisions linked to it and uncertainties require review and documentation.<br>• **The verifiability of the data collected**. GCP recommends that your organization explain the verifiability based on the data source and if any certification took place, and share the estimates and assumptions used when collecting the data. Rate the verifiability for each indicator separately.<br>  • *For key data not obtained directly from your organization's operations:* Disclose the methodology and information sources used, with a description of how your organization selected the data and any limitations or risks identified.<br>• **Any improvements made to data quality.** Explain any improvements since the previous disclosure period and plans or strategies to enhance data quality over time. |
| **ESRS**<br>**GRI** | **Document for each requirement the type of data enrichment or processing that took place and the associated assumptions** |
| | Disclose, where applicable:<br>• **The processing and calculations used for circularity disclosure.** The GCP recommends that you clarify for the various disclosure requirements the processing and calculations added to the data (e.g., emissions factors, recycling rate aggregations).<br>• **The level of confidence for the data processing**. The GCP recommends that your organization explain the level of confidence based on the data processing and if any certification took place, and share the assumptions used when processing the data. |

## Changes in reporting

The goal of disclosing changes in reporting is to facilitate the identification of alterations in reporting practices compared to the previous reporting period. Your organization should provide insights into how these changes impact the relevance and transparency of (past) disclosures, ensuring that stakeholders have access to comparable and consistent information. All of the disclosures are only to report on if the specific change has occurred.

| Interoperability | Disclosures and guidance |
|---|---|
| **ESRS,**<br>**GRI** | **Disclose changes in reporting methodology and scope**<br><br>Only if these changes were made, disclose:<br>• **The changes in reporting methodology**<br>○ **Methodology for performance metrics and data collection:** Detail any changes made to the methodologies used to prepare circularity performance metrics and the processes for collecting related data. This includes:<br>• The **rationale** for the changes (e.g., improvements in accuracy, alignment with evolving industry standards, enhanced stakeholder relevance, adoption of new circularity measurement techniques).<br>• The **impact** of these changes on previously reported circularity metrics, including how they affect historical comparability. For example, the qualitative explanation may describe how the methodological adjustments alter measurement approaches or definitions, while the quantitative explanation may demonstrate the extent of changes through restated figures or percentage differences in prior reports.<br>○ **Methodology for reporting format and presentation:** Explain any changes made to the format, medium or integration of circularity-related information in broader sustainability or financial reports. Outline the reasons for these changes and how they affect the presentation and interpretation of circularity performance and initiatives.<br>• **The changes in reporting scope and boundaries**<br>○ **Organizational boundaries** that affect circularity reporting. This includes detailing how mergers, acquisitions or the removal of entities or parts of entities impact the scope of reported circularity metrics. Such changes often lead to shifts in supply chain operations, sourcing practices and product management. You should clearly explain these shifts, **as they may require adjustments to the approach for reporting on operational boundaries. If such changes are significant, your organization should disclose a clear disclaimer about the extent of these changes.**<br>○ **Operational boundaries** in relation to circularity reporting. This includes clarifying any changes to the reporting scopes. Your organization should explain how these adjustments reflect the approach to managing circularity-related impacts, risks and opportunities across the value chain. Refer to Stage 2. Prepare for an approach to define the scope of the assessment. |
| **ESRS** | **Disclose changes in context**<br><br>Only if these changes have occurred, disclose:<br>• **The impact of external environmental changes and significant events:** Explain how shifts in the external environment (e.g., new regulations, evolving market dynamics, economic factors, supply chain disruptions) or significant events (e.g., natural disasters, geopolitical events) during the reporting period have impacted the circularity performance and reporting. This includes effects on resource availability, operational capacity and the feasibility of circular initiatives.<br>• **The instances where it may be impracticable to adjust comparative information for one or more prior periods**. This could occur if there have been substantial changes in reporting methodologies, organizational structure or material flows due to acquisitions, divestitures or the implementation of new circular initiatives. You should articulate the reasons for the impracticality of making such adjustments, clarifying how these changes might affect the comparability of historical data and the insights derived from it. |
| **ESRS,**<br>**ISSB IFRS S1,**<br>**GRI** | **Disclose any corrections of material errors in prior periods**<br><br>If your organization made any corrections or restatements, disclose:<br>• **The corrections made to material errors in any prior reporting periods**. Restate the nature of the material error and description of changes made for the affected prior periods, unless it is impracticable to do so. This ensures that stakeholders have access to consistent and reliable data for evaluating your organization's circularity progress over time.<br>○ **Nature of a material error:** Provide a clear description of the material error identified (e.g., inaccuracies in reported recycling rates, waste diversion metrics, resource consumption figures or misreported supplier data).<br>○ **Specific corrections made:** Detail the specific adjustments made for each impacted prior period, including any changes to circularity metrics (e.g., "Corrected 20XX recycling rate from X% to Y% due to updated processing data").<br>○ **Circumstances of impracticality:** If corrections are impracticable, explain the circumstances that led to this situation (e.g., challenges in data retrieval, changes in operational procedures or discrepancies in historical data). Also describe how your organization has addressed the error moving forward, including any new processes or technologies implemented, to ensure accuracy in future reporting. |

| | |
|---|---|
| | • **Restatements from previous reporting periods.** If your organization has restated any previous circularity performance information from prior reporting periods for reasons other than error correction (e.g., due to improved data accuracy from new systems or a shift to more precise measurement techniques), provide clear explanations for their necessity related to circularity performance. Additionally, describe the impact of these restatements on reported circularity metrics, including implications for sustainability commitments and compliance with regulatory requirements. |

## Verification and assurance

The goal of this sub-section is to outline whether you provided validation of the accuracy and reliability of the information disclosed by describing suggested verification methods. Additionally, it presents guidance on the disclosure of verification details, such as the verification provider and the verification process. This can enhance stakeholder confidence in the integrity of the reported data.

| Interoperability | Disclosures and guidance |
|---|---|
| **Carbon Disclosure Project (CDP), ESRS,**<br><br>**GRI, GHG Protocol** | **Disclose any internal and external assurance provided and any verification statements, if applicable, of the reported circularity-related data**<br><br>Disclose, where applicable:<br>• **If you verified or assured the disclosed circularity-related data**. If you did not verify the data, you should also clearly state this.<br>• **The verification/assuring body**: Describe the body or person who has verified the circularity data and whether it is an internal or external party.<br>  ○ **Internal verification**: Describe the processes for internal audits or reviews conducted by internal teams to assess the accuracy and reliability of circularity data (e.g., waste diversion rates, recycling statistics). This includes consistency checks, reviews of data collection and compliance assessments.<br>  ○ **External verification**: Detail the engagement of independent third-party verification bodies to assess the circularity-related information. This covers details onsite visits, staff interviews and data sampling used to ensure accuracy and credibility of reported metrics (e.g., recycled content percentage, resource recovery efficiency).<br>• A clear **definition of the scope**, indicating whether it covers selected circularity information (such as specific indicators) or includes the full circularity or other reports. For example, verification or assurance might focus on specific streams of secondary materials, confirming their origins, processing and outcomes to substantiate circularity claims, such as those in line with the EU Green Claims Directive.<br>• A specification of the **level of verification or assurance** (e.g., limited or reasonable assurance). |

### *5.2.2 Reporting on the scope of the assessment*

Reporting the scope of assessment clarifies what was assessed and why, the boundaries applied, and how the scope aligns with wider organizational reporting and your role in the value chain. This guidance outlines the required disclosures across objectives, assessment level, organizational/operational boundaries, material IROs and material flows to ensure consistent, decision-useful reporting.

| Interoperability | Disclosures and guidance |
|---|---|
| **ESRS,**<br>**GRI** | **Disclose the outcomes of the Stage 1. Frame and Stage 2. Prepare assessments.**<br>• **Overall objectives of the assessment:**<br>  ○ What drives your assessment, what stakeholder audience did you take into account?<br>  ○ Description of the **assessment level**, i.e., material/resource, product or business unit/organization level<br>• **Scope of the assessment and the interconnectedness of all elements, including:**<br>  ○ Description of **organizational boundaries** of the assessment:<br>  ▪ Statement of alignment of the scope of the assessment with organizational boundaries used in your organization's wider sustainable and financial reporting.<br>  ▪ *Where there is not full alignment between the scope of the assessment and the defined boundaries:*<br>  • *Clarify exceptions, specifically providing an explanation and justification of any additional inclusions or exclusions, including if any are specific to the IRO assessment that deviate from the defined boundaries.*<br>  ○ Description of your **value chain (activities)** and your role within this value chain.<br>  ○ Description of **material IROs**. For further guidance on IROs and their interconnectedness with the other elements, see Impact, risk and opportunity management.<br>  ○ Description of **operational boundaries** of the assessment:<br>  ▪ The GCP recommends reporting scope A and scope B, covering all operations under the direct control of the reporting entity. It also encourages entities to go beyond this minimum, where feasible, to provide a more comprehensive view of their circularity performance and impact.<br>  ▪ Statement of alignment of the scope of the assessment with operational boundaries<br>  ○ Description of the scope of the **material flow identification analysis** including the material flows prioritized and the material flows excluded. |

### *5.2.3 Core disclosure pillars*

The disclosure pillars outlined help organizations report effectively to their stakeholders, in line with relevant disclosure frameworks and standards (e.g., ESRS, GRI, ISSB IFRS S1, TNFD). The GCP structures the disclosures into the following pillars:

- Strategy
- Governance
- Impact, risk and opportunity management
- Metrics and targets

The material impacts, risks and opportunities (IROs) identified in Stage 2. Prepare of the GCP circular performance assessment are the basis of the key matters related to resource use and circular economy that require management. Failing to prioritize these areas risks overlooking critical challenges and misallocating resources. The GCP circular performance assessment informs all four pillars and they link to the material IROs identified. The pillars listed above describe how the organization governs the IROs, how the IROs inform and are informed by the strategy, how the organization identifies and manages the IROs and how it tracks the performance and progress of this IRO management.

The GCP emphasizes that disclosures should not only report on activities under each pillar, but also demonstrate how the pillars interconnect and support one another.

*For example,* the governance structure (**Governance**) is responsible for overseeing the implementation of the sustainability strategy (**Strategy**). The design of that strategy is to manage specific risks and opportunities (**IRO management**), which key metrics and targets then measure and monitor (**Metrics and targets**). This integrated approach ensures the holistic addressing of IROs, with progress and accountability tracked across the organization.

#### Strategy

Disclosure on strategy is relevant for stakeholders to understand the resource-related actual and potential impact on and risks and opportunities for your organization's businesses, strategy and financial planning. This sub-section provides an overview of strategy disclosure related to circularity. This includes outlining strategic frameworks, goals and practices that guide your organization's circularity efforts, ensuring alignment with sustainability objectives.

The disclosure section links to the guidance in Stage 3. Measure, which describes indicators for determining circular performance and impact, and in Stage 4. Manage, which explains actions, roadmaps and governance for circularity. All of these are connected to the circularity strategy of your organization.

| Interoperability | Disclosures and relevance |
|---|---|
| **SRS, ISO**<br>**ISSB IFRS S1,**<br>**TFND** | **Present your circular vision, mission, goals and targets**<br><br>Stage 4. Manage – 4.3 Develop your action roadmap stresses translating insights into SMART roadmaps; disclosing your loop-aligned vision, time-bound goals and targets demonstrates how you convert circular performance measurement into clear strategic direction. See also disclosure pillar Metrics and targets. |
| **GCP MEASURE**<br>**ESRS,**<br>**ISSB IFRS S1,**<br>**TFND** | **Disclose your circular strategy development process, IRO and materiality integration**<br>Stage 4. Manage – 4.2 Prioritize actions emphasizes grounding intervention choices in material impacts, risks and opportunities and scenario analysis; disclosing how you wove IROs, materiality and stakeholder insights into your strategy shows that your circular roadmap is both resilient and risk-aware. |
| | **Demonstrate strategy-to-value link (financial, environmental, social)**<br>Stage 4. Manage – 4.1 Analyze results describes how a positive business case is elemental to prioritizing (circular) actions to understand trade-offs, allowing for internal decision-making. To attract capital or explain your circular actions, it is equally important to demonstrate the positive strategy-to-value (financial, environmental and social) link. |

## Table 21: Guidance for organizations to enhance decision-usefulness for strategy reporting for specific target audiences

| Guidance/ disclosure theme | Financial sector | Policymakers and regulators | Value chain partners | Customers |
|---|---|---|---|---|
| **1. Circular vision, mission, goals and targets** | - Disclose circular vision and goals aligned with global standards (ESRS, SDGs)<br>- Communicate measurable, time-bound targets and their monitoring frameworks<br>- Connect vision/goals to financial risk/opportunity, long-term value and transition plans | - Show alignment of circular vision/goals with national/regional circular economy policies and regulatory objectives<br>- Disclose localized goals for different markets<br>- Report on monitoring/ accountability for policy targets | - Share circular vision and targets with partners<br>- Explain joint goals or milestones and expectations for partner alignment<br>- Highlight involvement in setting or advancing circularity goals in the value chain | - Communicate organization's circular vision and goals for product/service benefits<br>- Explain how these will improve value, durability or sustainability for customers |
| **2. Circular strategy development process, IROs and materiality integration** | - Explain how identified IROs influence business model, value chain and financial planning<br>- Describe scenario analysis and strategic resilience | - Disclose inclusion of regulatory risks, opportunities and materiality in strategy<br>- Highlight approach to transparency and accountability to policy makers | - Explain how organization consults value chain partners and stakeholders in strategy development<br>- Disclose how organization integrates supplier/partner feedback and IROs into strategy and planning | - Share how organization considers customer/user feedback and societal trends in strategy<br>- Describe how the strategy addresses customer needs through circular innovation |
| **3. Strategy-to-value link (financial, environmental, social)** | - Quantify expected financial value/costs from circular strategy (ROI, NPV, investment needs)<br>- Disclose expected climate, nature and social value creation<br>- Explain scenario-based value evolution over time | - Report expected contribution to policy objectives in financial/ environmental/social terms<br>- Quantify progress on regulatory or SDG targets (waste reduction, circularity, inclusion), resource security and economic resilience | - Share how circular strategy creates shared value across the value chain (e.g., supply chain savings, shared innovation, social outcomes)<br>- Present joint value creation case studies | - Communicate positive impacts for customers (cost savings, sustainable product access, social/environmental benefits)<br>- Share broader societal benefits of circular initiatives |

## Governance

Stage 4. Manage – 4.4 Strategic governance for circular value articulates how robust governance frameworks foster long-term implementation, facilitate informed and senior-level decision-making and ensure robust a data governance across the value chain. This sub-section offers guidance on how an organization can effectively communicate robust governance to stakeholders.

| Interoperability | Disclosures and relevance |
|---|---|
| **CDP, COSO, ESRS, <IR>, PRB, TNFD** | **Provide a comprehensive overview of the governance structure and policies**<br>Organizational integration and cross-functional collaboration ensure coherence and accountability; disclosing your full governance structure shows how leadership, cross-functional committees and clear accountabilities align to deliver your circular strategy. |
| **CDP, ESRS <IR>, PRB, TNFD** | **Demonstrate integration into IROs, strategic oversight and stakeholder governance**<br>Accountability and ownership and integration with other sustainability topics ensure robust strategic oversight of IROs; disclosing how IROs inform your planning, budgeting and periodic reviews demonstrates that your organization systematically embeds circular considerations in business decision-making (e.g., in case of trade-offs with other sustainability topics). |
| **CDP, ESRS <IR>, PRB, TNFD** | **Provide any incentive schemes for management, employees and clients**<br>Performance incentives are a key accountability mechanism for circular transformation; disclosing the link between circular-economy KPIs and remuneration shows how individual and client behaviors align with your circular objectives. |
| **CDP, ESRS <IR> , PRB, TNFD** | **Disclose data governance and due diligence processes across the value chain**<br>Disclosing your federated data architecture and formal due diligence procedures evidences the integrity and transparency of the information driving your circular decisions, whereas disclosing your due diligence process displays to what extent your organization is in control or exposed to various resource-extraction related risks (e.g., human rights, pollution). |
| **CDP, COSO, ESRS, <IR>, ISSB IFRS S1, TNFD** | **Disclose risk management processes and internal controls**<br>Disclosing your risk framework and internal control measures shows stakeholders how you identify, assess and mitigate linear risks in a robust governance environment and to what extent this is engrained in the business functions. |
| **CDP, <IR>, PRB, TNFD** | **Demonstrate stakeholder engagement on circular economy practices and reporting**<br>Inclusive, cross-functional stakeholder participation is elemental in driving systemic change; disclosing how you engage and incorporate feedback from investors, customers, suppliers and policymakers demonstrates your commitment to transparency, continuous improvement and equitable governance. |

## Table 22: Guidance to enhance decision-usefulness on governance reporting for specific target audience groups

| Guidance | Financial sector | Policymakers and regulators | Value chain partners | Customers |
|---|---|---|---|---|
| **1. Comprehensive overview of governance structure** | - Describe the reflecting of circularity in the business model and integrating it into strategies, risk management and capital allocation.<br>- Disclose specific policies integrating circularity into lending/investment decisions; explain how this influences capital allocation and funding.<br>- Summarize governance mechanisms relevant to lenders/investors.<br>- Connect governance disclosures to SDGs, public benefit objectives or circular economy impact criteria | - Describe how governance aligns with circular economy regulations and policy objectives.<br>- Name roles responsible for compliance and oversight. | - Outline joint governance boards, cross-organization committees or working groups for circularity.<br>- Explain the setting of governance expectations and cascading them to suppliers/partners.<br>- Highlight channels for partners to raise governance concerns. | - Explain governance practices that enhance transparency, including independent advisory panels, stakeholder representation and procedures for verifying the accuracy of product or service claims. |
| **2. Integration into IROs, strategic oversight and stakeholder engagement** | - Show the system for regularly briefing investors/lenders on circularity-related performance, risks and transition plans, such as through investor briefings or sustainability reports<br>- Describe regular investor engagement on circularity strategy.<br>- Summarize investor/stakeholder feedback mechanisms and how feedback shapes governance. | - Disclose the frequency/mechanisms for management review of compliance and regulatory risks.<br>- Outline engagement with regulators, e.g., participation in consultations, policy co-creation and how regulatory input shapes strategy.<br>- Report on public communication of regulatory progress and compliance. | - Show the engagement of suppliers/partners in circularity strategy (e.g., supplier forums or feedback loops).<br>- Explain two-way communication and regular updates on circularity expectations and performance.<br>- Provide examples of collaborative strategy-setting with partners. | *- Less relevant* |
| **3. Incentive schemes for management, employees and clients** | - Show any links to incentive-based financial products/services (e.g., green loans, sustainability-linked bonds).<br>- Report on board/executive remuneration linked to circularity KPIs. | - Describe any incentive schemes for compliance with regulation or for alignment with policy objectives.<br>- Explain how incentive structures support regulatory and sustainability goals. | - Detail supplier incentive programs for circularity (rewards, recognition for achieving targets).<br>- Disclose contractual requirements or bonus schemes for partners supporting circularity.<br>- Outline support/capacity-building for suppliers to meet new standards. | *- Less relevant* |
| **4. Data governance and due diligence across the value chain** | - Explain the inclusion of circularity due diligence in investment/lending decisions (e.g., pre-loan or investment screening, supply chain risk assessments).<br>- Disclose material risks in the supply chain relevant to financing.<br>- Summarize engagement with clients/investees on due diligence. | - Report on outcomes of due diligence for regulatory or policy alignment.<br>- Reference participation in regulatory due diligence pilots or frameworks. | - Describe supplier due diligence and regular performance assessment processes for circularity.<br>- Communicate support/capacity building for suppliers to meet due diligence and circularity requirements.<br>- Provide examples of supplier audits and action plans. | - Disclose product/supply chain transparency claims and the handling of customer-facing due diligence, if applicable. |

| | | | | |
|---|---|---|---|---|
| **5. Risk management processes and internal controls** | - Explain the communication process for circularity risks and controls to investors/lenders.<br>- Report on assurance of risk disclosures.<br>- Link risk processes to transition plans to move from a linear to a circular business model. | - Outline internal controls ensuring reliability and compliance in circularity reporting.<br>- Disclose processes for monitoring regulatory risks and internal audits related to compliance.<br>- Reference public reporting on control effectiveness. | - Show collaboration on risk identification/mitigation with partners.<br>- Describe controls for cascading risk management expectations to suppliers. | *- Less relevant* |
| **6. Engaging stakeholders** | - Summarize investor/stakeholder engagement sessions on circularity governance and performance.<br>- Highlight use of investor feedback in updating governance and strategy.<br>- Report on regular investor briefings and outcomes. | - Describe participation in policy consultations, regulatory working groups or direct engagement with authorities.<br>- Report on public consultations, transparency initiatives and how external input is integrated.<br>- Disclose regulatory engagement outcomes. | - Detail engagement channels (e.g., partner workshops, supplier forums, joint projects), feedback mechanisms and collaborative improvement initiatives.<br>- Outline supplier recognition programs for engagement. | - Summarize customer/client feedback channels and how feedback informs circularity strategy, product/service design or reporting.<br>- Explain public disclosure of how engagement shapes governance or decision-making. |

## Impact, risk and opportunity (IRO) management

Disclosing the management of impacts, risks and opportunities (IROs) through focused policies and action plans demonstrates to stakeholders how and the implementation of circular economy initiatives aimed at mitigating impacts and risks and capitalizing on opportunities. This framework assists organizations in articulating how these initiatives align with their overall circularity strategy and contribute to value creation.

### Disclosure of IRO management

| Interoperability | Disclosures and Guidance |
|---|---|
| **ESRS** | **Disclose circular policies in place**<br>Stage 4. Manage – 4.2 Prioritize actions and Stage 4. Manage – 4.3 Develop action roadmap emphasize the importance of concrete policies in place, implemented by and in your organization. Many of those policies will encompass sustainability strategies wider than only circularity (e.g., broader ESG, decarbonization or biodiversity policies). Demonstrating effective policies in place and showing to what extent your organization are putting circular strategies into action.. |
| **ESRS,**<br>**ISO** | **Disclose circular actions and action plan development, including circular products and services**<br>Stage 4. Manage – 4.2 Prioritize actions highlights the need for detailed action sequencing and continuous iteration; disclosing your portfolio of circular offerings, phase-out plans and structured action roadmap highlights how you operationalize strategic intent into tangible products, services and business-model shifts. |
| **ESRS,**<br>**TNFD** | **Disclose the identification of materials IROs and the link to strategy, metrics and targets**<br>Stage 2. Prepare – 2.3 Determine your material IROs offers guidance to identify material IROs following the double materiality approach. Disclosing this process and showing alignment with corporate strategy and other ESG-pillars demonstrate to what extent your organization has fully engrained this process into business-as-usual |

## Table 23: Guidance to enhance decision-usefulness on IRO management reporting for specific target audience groups

| Guidance/disclosure theme | Financial sector | Policymakers and regulators | Value chain partners | Customers |
|---|---|---|---|---|
| **1. IRO management policies** | - Disclose formal circularity policies (e.g., design, procurement, zero waste) and their integration into governance and risk frameworks.<br>- Identify senior responsible roles and links to risk committees or sustainability teams.<br>- Explain oversight of policy implementation. | - Show alignment of IRO management policies with regulatory requirements and public policy objectives.<br>- Name responsible persons for compliance.<br>- Describe how policies support national or sectoral circularity goals. | - Share policies that cascade expectations to suppliers/partners (e.g., sourcing, recycling, take-back).<br>- Highlight joint policy development or endorsement.<br>- Describe partner responsibilities and support mechanisms. | - Communicate policies that ensure product safety, longevity, recycling or responsible end-of-life.<br>- Explain the consideration of customer needs/feedback in policy development. |
| **2. Circular actions and action plan development, including circular products and services** | - Disclose specific action plans (e.g., R&D, infrastructure, supply chain engagement) to mitigate risks/capitalize on opportunities.<br>- Outline resource allocation (financial, human, technological) for each action.<br>- Explain use of risk management tools (scenario analysis, risk registers) to identify and manage circularity risks.<br>- Show how action plans tie to financial value creation, cost savings or risk reduction. | - Report action plans and initiatives that deliver on regulatory targets or address public risks (e.g., compliance, waste, pollution).<br>- Disclose public investments/partnerships and regulatory compliance projects.<br>- Explain monitoring mechanisms and responsible positions. | - Explain collaborative action plans (e.g., joint R&D, material flow pilots, supplier training) to manage shared IROs.<br>- Disclose shared KPIs and resource commitments.<br>- Detail risk sharing and joint risk management tools. | - Highlight action plans that deliver direct customer benefits (e.g., improved durability, recyclability, service options).<br>- Communicate education campaigns or guarantees related to circularity. |
| **3. Identification of materials IROs and the link to strategy, metrics and targets** | - Show how policies/action plans align with overall circularity strategy and reference key metrics/targets tracked.<br>- Disclose performance measurement systems, KPIs, audit/assurance processes.<br>- Explain how results inform financial planning, investment and risk disclosures.<br>- Link IRO outcomes to SDGs or impact frameworks used by financiers. | - Reference strategic circularity goals and regulatory targets, with progress reporting.<br>- Disclose relevant metrics used for regulatory compliance or public benefit measurement.<br>- Show how feedback from public reporting informs policy/plan adjustments. | - Show link between IRO management, supplier/partner targets and overall value chain strategy.<br>- Share progress against joint goals and improvement metrics.<br>- Present case studies of shared value creation or risk mitigation. | - Communicate how management of circular impacts/risks/opportunities translates into improved product/service outcomes and customer experience.<br>- Reference metrics and targets relevant to customer expectations (e.g., recyclability rates, product, life cycles). |

## Metrics and targets

This disclosure pillar provides guidance on communicating your organization's circular performance and progress. It covers both the disclosure of **1. Metrics** (quantitative indicators of performance) and **2. Targets** (measurable objectives set for future performance), supporting transparency and accountability in circular resource management.

### *1. Guidance for the disclosure of metrics*

This sub-section provides guidance on disclosing the indicators selected and calculated in Stage 3. Measure for 4 different stakeholder groups. You may choose any metrics relevant to the context and objectives; GCP circularity performance metrics are available as an option, but you are not required to use them.

The following three-step approach guides users in structuring disclosures and developing tailored narratives – based on reporting objectives, material IROs, target audience and selected indicators – in line with the reporting principle (Annex 8: Stage 5. Communicate – Description of reporting principles) and to maximize decision-usefulness:

#### Step 1: Identify the circular strategies and indicators to communicate your progress on sustainability, resilience or opportunities

This step helps you determine which circular strategies and indicators are most relevant to disclose for your material impacts, risks and opportunities (IROs). Table 24 provides an overview of those GCP metrics used most commonly, but you are free to select any other indicators that best reflect your organization's and industry's context and material IROs.

## Table 24: Identification of likely circular strategies and indicators

| Disclosure objectives | Demonstrate sustainability through material impacts | | | | | Demonstrate resilience through material risks | | | | | | | | | | Demonstrate growth through material opportunities | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Strategies** | Impact the Loop** | | | | | Close the Loop | | | | | | | Narrow the Loop | | Slow the Loop | Value the Loop | |
| **Indicator types** | Climate | Nature | Social | | | Inflow | | | Outflow | | | Waste | Dematerialization | | Actual lifetime | Economic value | |
| **Indicators*** | GHG emissions savings | Impact from land-use change | Maturity assess-ment | Risk mapping | Quality jobs | Total weight of inflow | % recycled and % renewable content | % critical materials | Total weight of outflow | Recovery potential | % actual recovery | Linear outflow waste generated | % absolute demater-ialization | % relative demater-ialization | Actual lifetime | Material circularity revenue | Circular material produc-tivity |

Note that each industry will have its own priority indicators; therefore, it is important to assess the feasibility and reliability of data before selecting metrics for disclosure. For further guidance on data quality and governance, see Annex 5: Stage 3. Measure – Data quality.

As a single indicator may relate to multiple objectives or scopes, you do not need to disclose it more than once. But your organization's narrative should address all applicable objectives and scopes

### Step 2: Determine audience-specific, decision-useful information on material impacts, risks and opportunities

This step provides, through tables, guidance on which indicators can demonstrate the results of the circular strategies connected to your material impacts, risks or opportunities for each of the three disclosure objectives: **Sustainability** through material impact management; **Resilience** through material risk management; and **(Business) Growth** through material opportunity management.

Disclosures by impacts, risks (and dependencies) and opportunities align with frameworks such as TNFD (disclosure recommendations A and B), ISO 59020 and ESRS E5-4, E5-5 and E5-6, which categorize indicators by resource inflows, outflows and economic/financial effects.[121]

The audience-specific guidance supports the tailoring and disclosure of decision-useful information for the stakeholder groups most relevant to your organization.

*Note: Future versions of the GCP will further develop the Impact of the Loop and Value the Loop modules. Currently, these metrics might not reflect all relevant topics of impact or value creation/loss, making them less suitable for external reporting*

- **Sustainability: Communicate audience-specific, decision-useful information on material impacts**

  Table 25 supports the preparation and structuring of relevant financial and non-financial information to disclose how an organization's transition to a circular economy helps prevent or mitigate actual or potential negative impacts on people and the environment and (potentially) impacts them positively. Circular initiatives, for instance, can benefit your organization's net-zero goals. By tracking and reporting on environmental impact indicators – such as reduced resource footprint, lower emissions, waste minimization and responsible sourcing – organizations can clearly evidence their contributions to decarbonization and environmental stewardship.

## Table 25: Indicative selection of indicators for communication on environmental impact and sustainability

| Material impact | Relevance | GCP indicators | Financial sector | Policymakers and regulators | Value chain partners | Customers |
|---|---|---|---|---|---|---|
| **Resource use** | • Addresses increasing scrutiny from investors and financiers on resource topics for relevant sectors<br>• Enables value chain partners and clients to evaluate product/process environmental impact, informing their sustainability commitments and supplier selection | Impact from land-use change | ✓ | | ✓ | ✓ |
| **Pollution and waste** | • Enables organizations, particularly the manufacturing industry, to answer value chain partner requests; disclosure is likely to be included in requests for proposals by public organizations, governmental bodies and others due to the wide adoption of waste metrics | Impact from land-use change<br>Social maturity assessment | ✓ | ✓ | ✓ | |
| **Biodiversity and ecosystem** | • Informs investors, partners and clients about land use for material extraction and potential unsustainable extraction/cultivation<br>• Enables investors to evaluate biodiversity impacts of pollution and waste, causing ecosystem degradation and species loss and negatively impacting communities | Impact from land-use change<br>Social risk mapping | ✓ | ✓ | ✓ | ✓ |
| **Climate change** | • Informs about the contribution to net zero scope 3 and 4 (avoided emissions) of organizations through the embodied carbon profile of materials/products<br>• Enables partners and clients to evaluate the environmental impact of products and processes throughout the value chain, informing their own sustainability commitments and supplier selection | GHG emissions savings | ✓ | ✓ | ✓ | ✓ |
| **Water and marine ecosystem services** | • Addresses over-extraction of water, water pollution, watershed imbalance and water scarcity and how it degrades local ecosystems and harms communities | Impact from land-use change<br>Social risk mapping | ✓ | ✓ | | ✓ |

- **Resilience: Communicate audience-specific, decision-useful information on material risks**

  Table 26 helps audiences understand how your organization adapts business models and value chain relationships to identify, manage and mitigate key risks linked to the transition to a circular economy. By organizing and presenting financial and non-financial indicators – such as material circularity, circular inflow, reliance on critical materials, actual and potential recovery and dematerialization – organizations can demonstrate how their circular strategies enhance competitiveness and resilience over the short, medium and long term.

  Communicating clearly on both the protection and creation of business and financial value enables organizations to attract investment and secure capital under favorable terms. These circularity indicators provide actionable insights to address risks related to resource dependencies, supply chain disruptions, regulatory compliance and reputational exposure. Moreover, they support strategic decisions to safeguard value and foster a competitive advantage, while also showing how value creation can be decoupled from resource consumption.

## Table 26: Indicative selection of indicators for communication on risks and resilience

| Material risk driver* | Relevance | GCP indicators | Financial sector | Policymakers and regulators | Value chain partners | Customers |
|---|---|---|---|---|---|---|
| Resource scarcity and dependency | • Enables investors and regulators to assess business continuity and operational resilience when faced with critical material shortages<br>• Supports supply chain partners in evaluating immediate risk exposure and mitigation actions | • Total weight of inflow<br>• % recycled and renewable content<br>• % critical materials<br>• Absolute and relative dematerialization | ✓ | ✓ | ✓ | ✓ |
| Regulatory and legal risk | • Indicates how well products are designed for recovery, supporting risk mitigation against future regulations and reducing the risk of stranded linear assets | All Close the Loop, Narrow and Slow the Loop module indicators | ✓ | | | |
| Changing stakeholder demand and business model risks | • Signals the financial exposure (monetized) of linear business models | • Total weight of inflow<br>• % recycled and renewable content<br>• % critical materials<br>Absolute and relative dematerialization | ✓ | | ✓ | |
| External supply chain disruption | • Communicates about the organization's efforts to reduce total material use, supporting sustainable procurement, investment and supply chain collaboration decisions for resource efficiency and cost savings | • Total weight of inflow<br>• % recycled and renewable content<br>• % critical materials<br>• Absolute and relative dematerialization | ✓ | | ✓ | |
| Operational shocks | • Provides information on the organization's capability to recover materials in its own processes, compliance with EPR and landfill regulations, operational efficiency and operational robustness | All Close the Loop and Narrow and Slow the Loop module indicators | ✓ | ✓ | ✓ | |

- **Growth: Communicate audience-specific, decision-useful information on material opportunities**

  Table 27 assists organizations in preparing and presenting relevant financial and non-financial information to demonstrate its successful transition to a circular business model. It facilitates clear communication of the business value that circularity can deliver to various stakeholder groups, including actors from the financial sector, policymakers and regulators, value chain partners and customers (see columns on the right). By leveraging circularity indicators – such as material circularity, circular inflow, recovery rates, critical material substitution, product lifetime extension and dematerialization – organizations can highlight opportunities to reduce costs, unlock new revenue streams and enhance products and services.

  Furthermore, these disclosures help identify how innovative business models (such as take-back schemes, product-as-a-service and repair or resale offerings) can open additional growth avenues, strengthen brand reputation and improve market access. Ultimately, these indicators aim to demonstrate how pursuing circularity drives both financial performance and broader value creation.

## Table 27: Indicative selection of indicators for communication on opportunities and resilience

| Material business opportunity | Relevance | GCP indicators | Financial sector | Policymakers and regulators | Value chain partners | Customers |
|---|---|---|---|---|---|---|
| **Resource efficiency and cost reductions** | • Allows customers and investors to assess improvements in resource efficiency per unit of product or service, supporting procurement decisions, efficiency benchmarking and investment in scalable business models<br>• Enables product/service teams to track resource use as business grows<br>• Decreases sourcing costs, which will lead to higher earnings before interest, taxes, depreciation, and amortization (EBITDA), net profits and shareholder value | • Circular material productivity | ✓ | | ✓ | ✓ |
| **Supply chain resilience** | • Informs about diversified sourcing, through built-in redundancy and buffers against global or regional supply shocks | • Material circularity revenue | ✓ | | ✓ | ✓ |
| **Innovation and new business models** | • Will inform financiers (including M&A) of the benefits of more predictable “as-a-service” revenue streams, particularly when customer lock-ins are possible | • Material circularity revenue | ✓ | | ✓ | |
| **Brand and reputational enhancement** | • Provides information on the organization’s capacity to recover materials in its own processes, compliance with EPR and landfill regulations, operational efficiency and operational robustness | • Material circularity revenue | ✓ | ✓ | ✓ | ✓ |

### Step 3: Communicate on the assessment results while considering alignment with other frameworks

To provide an understanding of the disclosed metrics, the GCP recommends organizations disclose a set of datapoints and contextual information.[122]

| Interoperability | Disclosures and guidance |
|---|---|
| **ESRS,**<br>**TNFD** | **Disclose the relevant indicators and performance of your organization to understand the environmental and social impacts, the risks and the growth opportunities related to resource use and circular economy.**<br><br>For guidance on identifying the relevant indicators for your organization, follow the process described in Step 1 and Step 2 of 1. Guidance for the disclosure of metrics, clustered by reporting objectives, user pathways and sustainability benefits. You can choose those which apply best to your organization's situation.<br><br>To provide an understanding of the disclosed metrics, the GCP recommends organizations disclose the following contextual information:<br><br>• **Methodology**. Include the reference to the GCP methodology in your disclosure. If you have deviated from the GCP methodology when conducting your assessment, describe the methodology used. Additionally, describe assumptions made to calculate circularity-related metrics. You can include the methodology elements already disclosed as part of Data collection and quality management by referencing this sub-section. For further guidance, see Annex 5: Stage 3. Measure – Data quality.<br>• **Validation/verification.** Outline any quality controls, data sources and frequency of data updates, as well as acknowledge any limitations or uncertainties affecting the data. If an external party provided validation, disclose the assurance provider. For further information, refer to Verification and assurance.<br>• **Definition.** Provide a clear description of the metric. For descriptions and definitions of the GCP Circular performance metrics, you can refer to Stage 3. Measure.<br>• **Unit of measure.** State clearly the unit of measure of a metric. For currencies, apply the same unit as used in the financial statements.<br>• **Reason for indicator/metric selection.** Describe why you selected an indicator for measurement and disclosure.<br>• **Current performance and interpretation.** Disclose the current performance metrics by providing up-to-date, accurate data that reflects progress against established baselines and targets. This disclosure includes the period covered and the scope of measurement. Additionally, interpret the results, explaining what they mean for business performance, impacts, risks and opportunities. Also, highlight significant trends, improvements or areas of concern to give stakeholders a clear understanding of their current status and the effectiveness of their initiatives. |

### *2. Guidance for the disclosure of targets*

Communicating about circular performance targets set for internal purposes (see guidance on SMART target-setting in Stage 4. Manage), can create a strong message and narrative when done in a comprehensive manner. For your stakeholders to get a full picture of your organization's targets, the GCP recommends the disclosure of a set of datapoints and contextual information.[123]

You should understand this guidance on the disclosure of targets to be an extension to the three-step approach to metrics, for those organizations with the intention of adding concrete targets to their communicated metrics, which should be in line with strategic goals (as defined through Stage 4. Manage and communicated on through the disclosure pillar Strategy).

| Interoperability | Disclosures and guidance |
|---|---|
| | **5.3.6.2 Describe the targets the organization uses to manage circularity-related impacts, risks and opportunities and performance against targets.** |
| | Describe your circularity-related targets, such as those related to potential opportunities, specific circular economy strategies, circular inflows and circular outflows, impacts related to resource flows, etc., in line with the circularity-related metrics above and with anticipated regulatory requirements, market constraints or strategic goals. Strategic goals may cover increasing secondary material inflow, resource efficiency or product durability, reducing waste or financial goals, such as increasing revenue from circular products. Based on the controllability, focus on targets that largely depend on internal factors and formulate them clearly and specifically to ensure they are achievable.<br>When disclosing targets, organizations should consider including the following: |
| **ESRS,**<br>**GHG Protocol,**<br>**ISSB IFRS S1,**<br>**TNFD** | • **Description.** Include the target's objective concerning the management of material impacts, risks and opportunities, accompanied by a reference to the relevant metrics used for measurement. Additionally, specify the disclosure level (e.g., resource, product, organization) as well as the disclosure scope (scopes A, B, C, D) to clarify the boundaries of the target and how it relates to overall sustainability reporting. The target should also indicate its alignment with a circular economy strategy, such as those detailed in the R-strategies framework. For an overview of the R-strategies, see the Glossary. |
| **GCP MEASURE**<br>**ESRS,**<br>**GHGP,**<br>**ISSB IFRS S1,**<br>**TNFD** | • **Time frame.** To make targets time-bound, define deadlines to meet the targets and plan the assessment cycle accordingly. Organizations should also disclose associated interim targets when releasing medium-term or long-term targets. All targets should be in line with your organization's strategic time frames and reflect the potential time investment in research and development for circular inventions. |
| **ESRS,**<br>**GHGP,**<br>**GRI,**<br>**ISSB IFRS S1,**<br>**TNFD** | • **Baseline year.** In line with the guidance under Timing of reporting, disclose the base period from which your organization measures progress against circularity targets and the rationale for choosing it. This could reflect any metric relevant to your organization's operations, providing a clear context for understanding the management of material circularity-related impacts, risks or opportunities. Additionally, define short-, medium- and long-term time frames for all circularity targets. Lastly. document any revisions to the target, including changes to the base period and a rationale for any adjustments made to the target itself.<br>**Note:** The GCP recommends that your organization clearly defines what constitutes short-term, medium-term, and long-term in the context of your circularity strategy, aligning with your overall business planning cycles and reflecting your material IROs. |
| **ESRS,**<br>**TNFD** | • **Ecological threshold.** Disclose the (entity-specific) ecological threshold identified, the methodology used to identify it and the allocation of internal responsibility for the threshold. Thresholds should consider the location of your organization's own operations and its value chain activities and can, where applicable, refer to different disclosure levels (e.g., resource, waste stream).<br>*The GCP will provide further guidance on science-based target-setting for circularity in future versions.* |
| **ESRS,**<br>**TNFD** | • **Methodology.** Describe the methodologies used to calculate circularity-related targets. The methodology elements already been disclosed as part of Data collection and quality management by referencing this sub-section. |
| **ESRS** | • **Regulatory requirements.** Disclose the regulatory requirements that have influenced the setting of a circularity target, detailing the relevant laws, directives or standards, such as the EU's Circular Economy Action Plan or national legislation on extended producer responsibility (EPR), |

| | |
|---|---|
| | along with the obligations they impose on organizations. Additionally, clarify whether a target is mandatory or voluntary. Your organization might also outline any anticipated changes in regulations that could influence current or future circularity targets. |
| **GCP MEASURE**<br>**ESRS,**<br>**GHGP,**<br>**ISSB IFRS S1,**<br>**TNFD** | • **Progress against each target.** Based on the progress, conduct an analysis of trends or changes in the entity's circularity performance over time. Comparison of performance can be made to any time-bound goals, objectives or targets formulated or global performance levels (such as the *Circularity Gap Report*). If performance does not meet the expectations, your organization may further analyze the underlying indicators and parameters that influence its outcomes. |
| **GHGP,**<br>**ISSB IFRS S1** | • **Comparison to benchmarks.** Compare the measured performance against internal and external circularity benchmarks to contextualize the progress. |

# Future versions

Developed with extensive stakeholder input to balance scientific rigor with practical usability, the Global Circularity Protocol for Business is the first global and interoperable framework to measure, manage and communicate an organization's circular performance and its impacts.

While this initial version provides a credible foundation for organizations, the GCP is a starting point in a multi-year journey. It will evolve with new knowledge, best practices, technological advances and user feedback. Future iterations will broaden the scope, close gaps and deepen integration with policy and finance, targeting additional audiences. The list below highlights priority areas for development, while inviting input from organizations, policymakers, researchers and other stakeholders.

**Planned areas for development include (not in order of importance)**

- A comprehensive circularity policy framework
- A science-based target-setting methodology for circularity across sectors
- Methodologies for avoided resource use and its impacts on climate, nature and social equity
- Finance and investment integration, including new finance indicators related to dematerialization and circular risk/value in corporate finance
- A Clean the Loop module focused on pollution and toxicity
- Sector-specific guidance
- Implementation support, capacity building and practical tools for data sourcing, management and exchange
- Benchmarking datasets by sector and geography
- Guidance for product- and material-level impact, risk and opportunity assessments
- Guidance on product-design standards and implications
- Expanded impact topics to include economic effects (direct, indirect and induced)
- Stronger links between micro-level indicators (material, product, organization) and macro-level indicators (regional or national) to align organization performance with system-wide progress
- Integrating marketing, advertising, consumer information and behavioral change aspects

Just as the Greenhouse Gas Protocol matured over successive editions to become the global reference for climate accounting, the Global Circularity Protocol will expand in scope and sophistication. The ambition is to both refine organization-level assessments and provide the connective tissue between business action, financing, policy development and system-level transformation.

We invite all stakeholders to contribute ideas, pilot methodologies and share lessons learned, ensuring future editions remain globally relevant, practical and effective in accelerating the transition to a circular economy. As a public good, the GCP thrives on collaboration.

# Annexes

## Annex 1: The GCP use cases and user journey in detail (Stage 1.4 Frame)

This annex provides further details on Figure 1: Overview of the GCP user journey, outlining the broad range of objectives the GCP can help you achieve.

1) **Stakeholder communication and external reporting**: The GCP enables the transparent and credible communication of circular performance, building trust across key stakeholder groups through a standardized methodology that allows for comparability on circular performance. For example, it can enable you to:
   a) **Communicate with customers (B2B)**: Demonstrate the circularity of your organization and products and how that helps business customers reduce their virgin, non-renewable material use and build a resilient supply chain, supporting them in meeting their own circularity and decarbonization goals.
      - *Product performance/product design for circularity*: Inform retailers, customers and end-users about product/component recovery possibilities, promoting closed loops, waste reduction and reductions in demand for virgin materials through circular design.
      - *Supply chain resilience*: Provide investors, corporate customers and supply chain partners transparency into your organization's efforts to reduce total material use, supporting decisions on sustainable procurement, investment and supply chain collaboration for resource efficiency and cost savings.
      - *Circularity to reduce environmental impact*: Enable partners and clients to evaluate the environmental impact of products and processes throughout the value chain, informing their own sustainability commitments and supplier selection.
      - *Manufacturing waste*: Respond to customer requests, particularly requests for proposals from public organizations and government bodies, by providing credible circularity disclosures, especially on waste metrics, which are widely adopted in the EU and increasingly relevant for the manufacturing sector.
      - *Production efficiency*: Allow customers and investors to assess improvements in resource efficiency per unit of product or service, supporting procurement decisions, efficiency benchmarking and investment in scalable business models.

   b) **Communicate with investors**: Showcase how your organization's transition to a circular economy reduces risks and delivers measurable business value and positive impacts.
      - *Reporting and disclosure of circular performance and its impacts:* Transparently report and disclose circular performance using a standardized, comparable methodology – providing a common language for organizations of all sizes and regions to demonstrate measurable sustainability impacts, business value and alignment with regulatory and stakeholder expectations.
      - *Communicating de-risking*: Share how circular strategies reduce resource-related risks, strengthening investor confidence in your organization's long-term resilience and positioning in the circular economy.
      - *Critical material dependency:* Enable investors to assess business continuity and operational resilience when faced with critical material shortages.
      - *Business model transition risks*: Signal the financial risk of linear business models and highlight the financial opportunities of circular business models, which investors can use for portfolio decisions and modelling.

- *Regulatory risks*: Indicate how well your organization has designed products for recovery, supporting risk mitigation against future regulations and reducing the risk of stranded linear assets.
- *Resource extraction:* Support resource use transparency and accountability, helping meet growing expectations from investors and financiers, particularly in sectors where resource efficiency is increasingly material.
- *Strategic positioning:* Disclose additional decision-useful information that demonstrates circular economy leadership, supporting the positioning of your organization as a frontrunner in the transition and gain a competitive edge through transparency and credibility.
- *Circular business models/decoupling value creation from resource use:* Inform financiers of the benefits of more predictable as-a-service revenue streams, particularly when customer lock-ins are possible.

c) **Communicate with suppliers and value chain partners**: Collaborate with your suppliers to help them align with your organization's circular procurement standards, enabling you to meet your own circularity targets. This also includes working with suppliers to gather the necessary data for your GCP circular performance assessment.
   - *Supply chain dialogue*: Facilitate the dialogue between supply chain actors, ease supplier circularity onboarding, support the wide-spread implementation of standardized circularity performance language, and align on performance measurement and data sharing practices.
   - *Supply chain information disclosure*: Support value chain actors and the wider business ecosystem in obtaining circularity performance measurement data for reporting and beyond, in a standardized and streamlined manner.

d) **Communicate with regulators**: Present accurate, interoperable and decision-useful data that supports broader environmental accountability and regulatory alignment, while highlighting data gaps and informing policy development.
   - *Regulatory compliance and readiness*: Meet and get ahead of evolving regulatory requirements by leveraging the reliable and comprehensive framework for disclosing circular performance and its impacts, aligning with key global frameworks such as the ESRS E5 (European Sustainability Reporting Standards (ESRS)), International Sustainability Standards Board International Financial Reporting Standards S1 (ISSB IFRS), Global Reporting Initiative (GRI), Sustainable Accounting Standards Board (SASB) and Taskforce on Nature-related Financial Disclosures (TNFD).
   - *Downstream compliance and liability risks*: Provide investors, clients and regulators with evidence of your organization's capability to recover materials within its own processes, comply with extended producer responsibility (EPR), landfill regulations and operational efficiency.

2) **Internal steering:** The GCP supports internal decision-making by providing a robust, data-driven foundation for aligning strategy, operations and product design with circular economy, climate, nature and social equity goals, for example:
   a) **Portfolio steering**: Measure and compare circular performance across products, services and activities or business units and prioritize investments and strategic efforts based on identified circularity risks and opportunities. This includes directing resources to circular product design, sustainable sourcing, enhanced recovery systems and innovation in business

models, ensuring that capital and operational efforts align with long-term circular economy goals, regulatory expectations and value creation.
- *Product design*: Inform about product design improvements by assessing both the potential resource recovery (i.e., *% recovery potential*) and actual resource recovery (i.e., *% actual recovery*). These insights guide material selection for inflows and highlight dematerialization efforts, ultimately enhancing resource efficiency and supporting the decoupling of economic growth from resource consumption.

b) **Performance and opportunity analysis**: Identify areas for the improvement of circular performance, determine which circular strategies are most effective in meeting climate and nature objectives, guarantee a just transition to circular business models and quantify the revenue generated from circular strategies.
c) **Strategic planning and prioritization**: Understand the current circular performance baseline to set ambitious yet realistic targets and milestones and prioritize interventions that offer the highest sustainability and financial impact.
d) **Organizational alignment and capability building**: Drive the internal alignment of key performance indicators (KPIs) and objectives across teams, support scenario building and build internal capacity to steer your organization toward circularity with confidence and clarity.
e) **Innovation and business model development**: Support product and business model innovation by revealing circularity-driven opportunities, encouraging dematerialization and resource efficiency and highlighting strategies that extend product life cycles and minimize virgin and non-renewable material use.
f) **Customer retention and strategic positioning**: Design and validate circular business models (such as take-back and rental schemes) that foster long-term customer relationships, while further informing and clearly communicating the added value and sustainability impact of circular offerings.

3) **Resource risk analysis:** The GCP helps organizations identify and manage resource-related risks, while uncovering opportunities to improve resilience and create value through the implementation and measurement of circular strategies.
   a) **Risk assessment**: Identify risks related to linear business models, reliance on virgin non-renewable materials, and identify circular opportunities.
   b) **Risk mitigation efforts**: Measure the amount of circular inflow and the impact of circular strategies such as reuse, recycling, dematerialization and take-back mechanisms, to demonstrate how these efforts help reduce reliance on virgin materials and mitigate exposure to resource scarcity and price volatility.
   c) **Supply chain risks**: Support the evaluation of circular alternatives that reduce exposure to socially or environmentally high-risk supply chains and prepare for compliance with circular resource use, critical raw material and responsible sourcing regulations.
   d) **Scenario building and internal alignment**: Support product and sustainability teams in developing scenarios that demonstrate the risk mitigation and financial value of circular strategies and supply chain resilience, effectively translating these insights for internal stakeholders such as finance and corporate strategy teams.

### *GCP user experience and use case application*

A use case is a practical example demonstrating how an organization can use the GCP to achieve a specific goal.

Stage 1. Frame – 1.1 Define your use case introduces three examples of use case clusters (1. Resource risk mitigation, 2. Internal steering and 3. Stakeholder communication and external reporting).

By unpacking these use cases, this section helps businesses understand how to use the GCP in a practical, goal-oriented way.

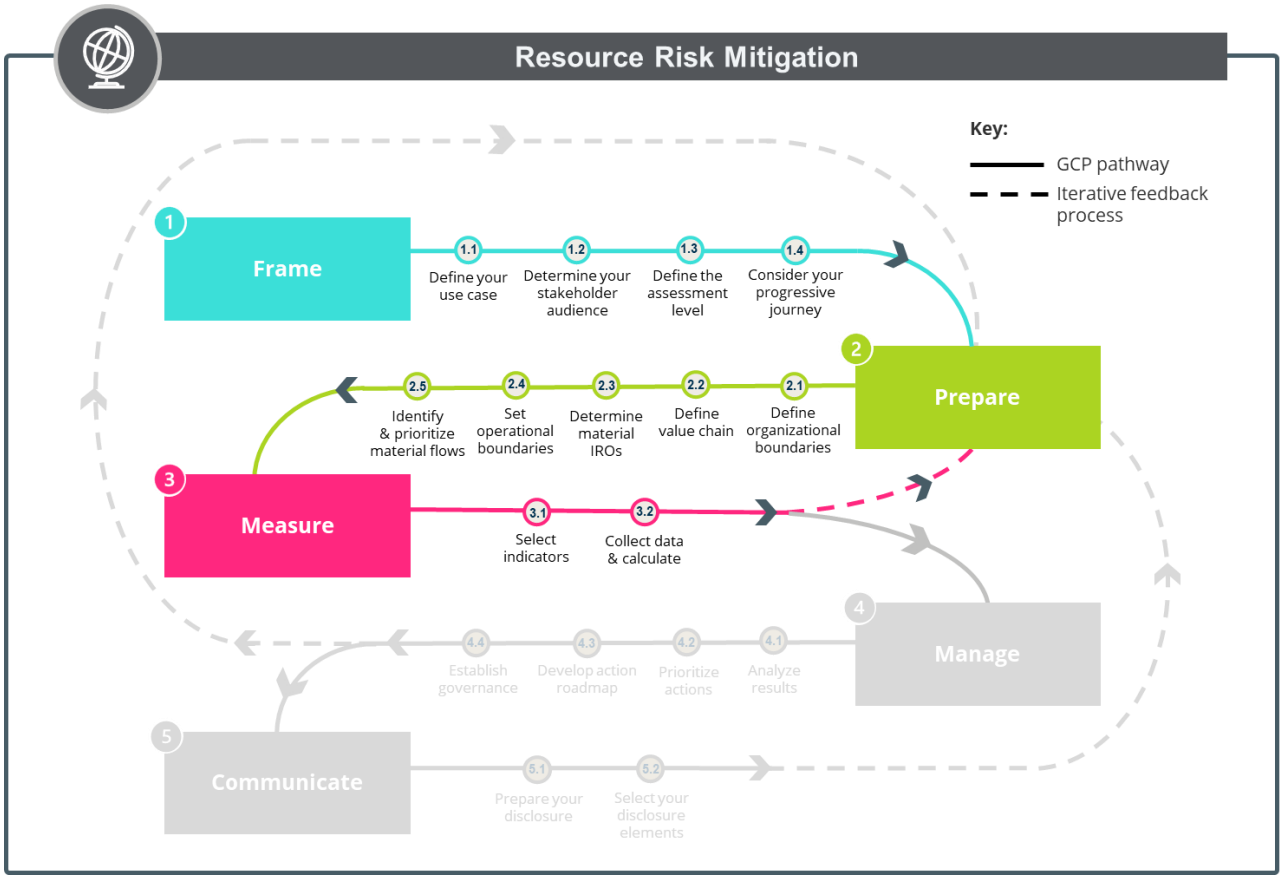
### 1. Resource risk mitigation – Risk assessment for a single material

At the simplest level, applying the GCP enables your organization to identify material-related risks. Once this is done, it will enable to develop mitigation strategies to reduce those risks, improve material sourcing, use and end-of-life management practices, and enhance resilience to supply chain disruptions, while reducing financial and reputational risks.

The GCP supports you in identifying the specific risks associated with a material flow (e.g., virgin material reliance, poor recycling infrastructure) and design mitigation strategies (e.g., using secondary material, determining materials with the highest chance for recovery, improving waste management). This reduces reliance on material sourcing in volatile markets, enables alignment with regulatory standards (e.g., ISSB), while mitigating environmental, social and financial risks.

The following GCP use case example outlines how your organization can apply the Protocol to **identify risks** associated with a particular material.

**Figure 22: GCP user journey – Risk assessment for a single material**



***Example***

A technology organization uses the GCP to assess the risks associated with sourcing cobalt for its lithium-ion batteries.

**Stage 1. Frame** – It defines the scope to include the entire cobalt supply chain, from mining to battery recycling. The goal is to inform internal stakeholders on the key risks.

**Stage 2. Prepare** – It maps the cobalt value chain, encompassing mining, processing, battery manufacturing, end-of-life battery collection and recycling, identifying all stakeholders and activities involved and distinguishing between activities under direct control and those influenced externally. It identifies key risks, such as supply chain disruptions, ethical sourcing concerns and price volatility. The organization prioritizes cobalt as a material flow for the GCP circular performance assessment due to its high mass, relevance to business continuity (essential for lithium-ion batteries) and high environmental impact (including ethical sourcing concerns and resource scarcity).

**Stage 3. Measure** – The GCP guides the organization in selecting the relevant indicators, including cobalt sourcing transparency, the percentage of recycled cobalt used and the potential for cobalt recovery at end-of-life. It collects data from various sources, including supplier audits, industry reports and scientific literature. The analysis reveals high dependency on cobalt from conflict-affected regions and a low rate of cobalt recovery from end-of-life batteries.

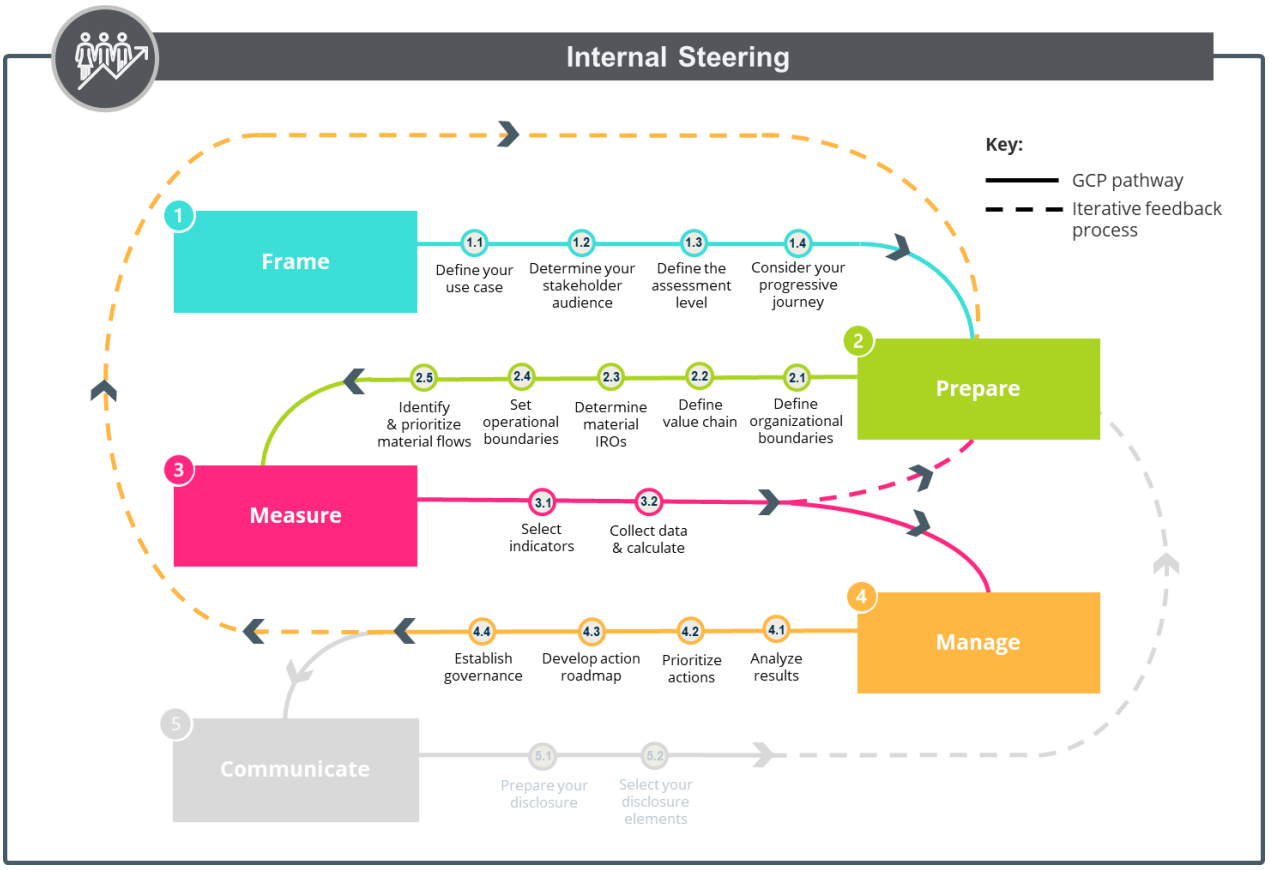
### 2. Internal steering – Portfolio steering on a product, service, activity category level

The GCP supports your organization in improving the design of products, services and activities to align with circular economy principles.

The Protocol provides the information necessary to align with circular economy principles, such as switching to non-virgin or renewable material inputs to reduce linear inflow, redesigning products for easier disassembly and higher recovery potential, and investing in a take-back program or collaborating with partners to improve actual recovery of products and materials. In addition to the strategies outlined, achieving resource efficiency requires a focus on product durability, repairability, reusability and exploring sharing models to minimize resource consumption and waste.

This use case shows how your organization can apply the Protocol to make **internal strategic decisions** specifically focusing on **a product, service or activity category level.** This example uses the product category level use case to demonstrate the GCP's application and its ability to support strategic decision-making in a business.

## Figure 23: GCP user journey – Portfolio steering (on a product level)




***Example***

**Stage 1. Frame** – A furniture manufacturer uses the GCP to steer its product portfolio towards greater circularity. It focuses on a specific product category: office chairs.

**Stage 2. Prepare** – It defines the organizational boundaries to encompass all their manufacturing facilities and directly owned subsidiaries involved in the production and distribution of office chairs, aligning with the GHG Protocol's control approach. The organization then sets the operational boundaries, defining the direct and indirect material flows (categorizing them as circular or linear) associated with these operations. Using the GCP, it identifies key material flows and conducts a material impact, risk and opportunity (IRO) assessment at a corporate level. This reveals that the current chair design uses a significant amount of non-recyclable plastic and that the supply chain for certain components is vulnerable to disruptions.

**Stage 3. Measure** – The GCP's indicator selection guides the organization to focus on metrics such as material circularity, including product durability and repairability. Data collection involves internal production data, supplier information and life-cycle assessments, as well as an assessment of design features. The analysis reveals that a modular chair design, using easily replaceable components and recyclable materials, offers significant circularity improvements against the traditional design of a comparable office chair.

**Stage 4. Manage** – This insight informs the organization's mid-term product development strategy, leading to the launch of a new modular chair line. The GCP's governance framework ensures that the new product design aligns with the broader sustainability goals and that the organization

allocates the necessary resources for its successful implementation. The organization monitors the performance of the new chair line using the GCP indicators, tracking progress on their circularity targets and making data-driven adjustments to the strategy as needed.

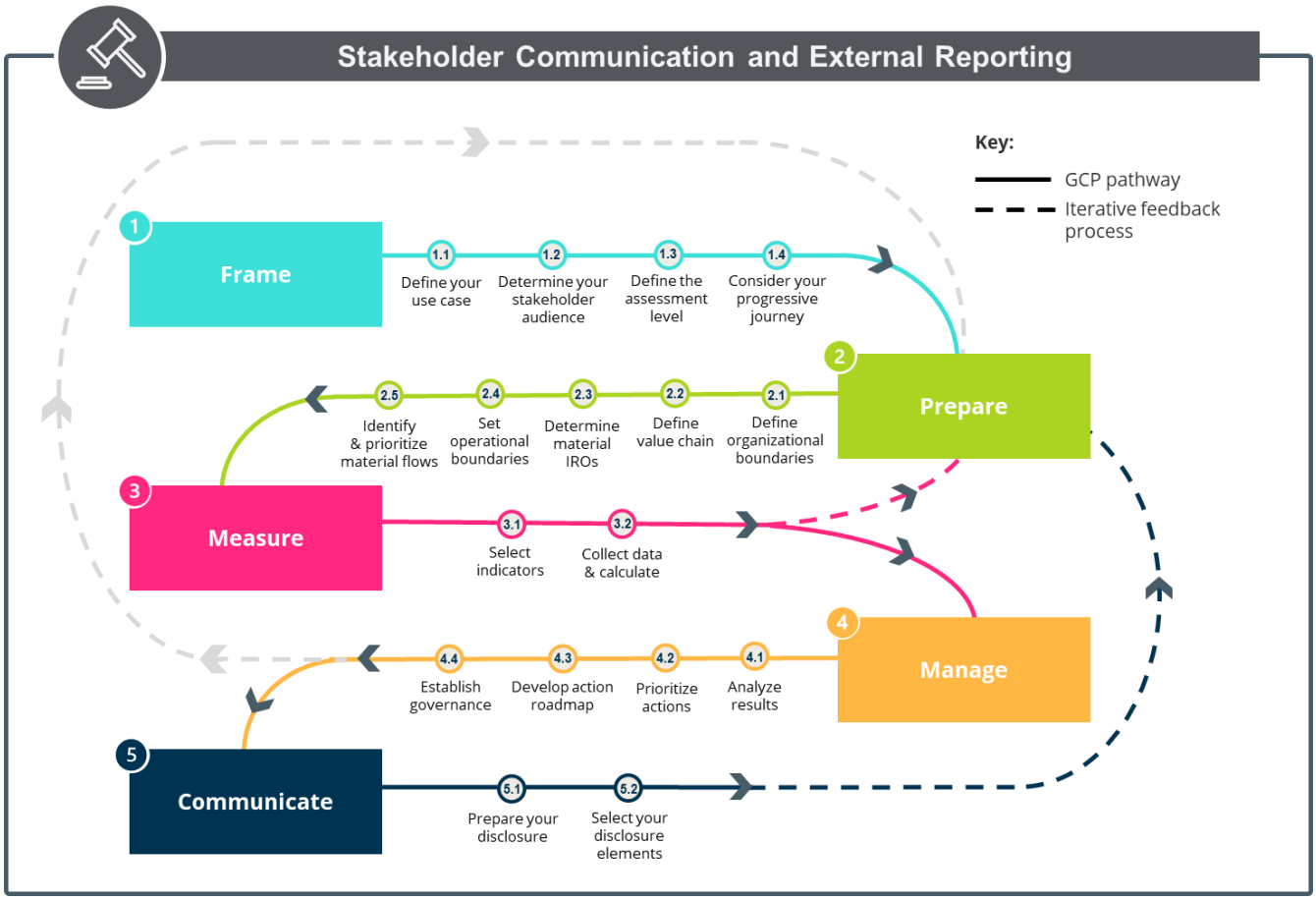
## 3. Stakeholder communication and external reporting

The GCP provides practical, technical guidance to help organizations report and disclose circular performance and its impacts in a consistent and comparable way. It simplifies and strengthens reporting – whether for voluntary disclosure or regulatory compliance – by establishing a common language and methodology across sectors and geographies, allowing organizations to focus on the resource flows, risks and opportunities that matter most.

A core principle of the GCP is communicating decision-useful information: ensuring it enables stakeholders to make informed choices rather than reporting for reporting's sake. In the context of circularity, this means showing how an organization mitigates environmental and social impacts, strengthens resilience against resource and market risks, and identifies growth opportunities through innovative business models, cost efficiencies and value creation.

The following GCP use case outlines your organization can apply the Protocol to **externally report and disclose your organization's circular performance** by following the staged structure.

**Figure 24: GCP user journey – External reporting and disclosure of circular performance**



***Example***

**Stage 1. Frame** – A solar panel manufacturer uses the GCP to comprehensively assess its circular performance for external reporting.

**Stage 2. Prepare** – It defines the organizational boundaries to include all manufacturing facilities and its primary supply chain for key materials, like silicon and aluminum. Using the GCP framework, it maps its value chain, from raw material extraction to end-of-life panel management, identifying key material flows and associated environmental and social impacts. The organization sets operational boundaries using a combination of direct interactions with the environment, material flows entering and exiting the manufacturing facilities, and material flows across the broader value chain, including the end-of-life management of panels.

**Stage 3. Measure** – It selects relevant indicators, such as the percentage of recycled materials used *(% circular inflow*), the rate of panel recycling and reuse *(% actual recovery*) and the amount of waste sent to landfill *(linear outflow*). It collects data from internal production records, supplier information and industry benchmarks. The analysis reveals that, while a high (75%) proportion of the panel is recyclable, the organization's use of recycled silicon remains low (10%). The other materials included in solar panels already have high recycled content use.

**Stage 4. Manage** – This insight informs its action plan, focusing on partnerships with silicon recyclers and the development of new panel designs that facilitate easier disassembly and material recovery.

**Stage 5. Communicate** – The organization then publishes a detailed sustainability report, transparently disclosing its circularity performance, including baseline data, targets and progress on achieving a more circular business model. It uses this report to engage investors, attract environmentally conscious customers and demonstrate compliance with evolving sustainability regulations. The use of the GCP ensures the organization's reporting is consistent, comparable and credible, building trust with stakeholders and enhancing its brand reputation as a leader in sustainable manufacturing.

# Annex 2: The GCP progressive user journey (Stage 1.4 Frame)

The GCP progressive user journey provides a pathway for organizations to start, prioritize foundational elements, and grow their positive impact, according to their current expertise, experience, or data availability.

| Stage | | The 3 levels | | |
|---|---|---|---|---|
| | | Initiation (level 1) | Expansion (level 2) | Consolidation (level 3) |
| Frame | Level of assessment | Organizations select 1 material/product/organization | Same level of assessment as at initiation | Same level of assessment as at initiation |
| Prepare | Operational boundaries | Organizations focus in their assessment on material flows that are under their direct control (scope A, B) | | Organizations include both material flows under their direct control -scope A, B- and under indirect control – scope C – (where relevant) in their assessments |
| | Impacts, Risks, Opportunities | Organizations decide themselves which impacts, risks and opportunities to investigate in their assessment | For assessments at organization level: organizations identify which impacts, risks and opportunities to investigate in their assessments through stakeholder consultation | |
| | Value chain | Organizations should map 67% (of spend or volume reflected in your procurement activities) of direct suppliers (in line with SBTN) and direct customers as part of their assessment. | In addition to the criteria for level 1, organizations should map 100% (of spend or volume reflected in your procurement activities) of upstream and downstream activities that are related to the identified circular hotspots and IROs. | In addition to the criteria for level 1 and 2, organizations should map 67% (of spend or volume reflected in your procurement activities) of all upstream and downstream activities (from extraction to end-of-life). |
| Measure | Essential indicators<br>(see Table 19: relevant indicators for different organization types) | Organizations select at least 1 metric that measures the circularity of material flows or the intensity of material use to include in the assessment.<br>Close the loop*<br>• Circular inflow and/or<br>• Recovery potential and/or<br>• Actual recovery<br>OR<br>Narrow & Slow the loop<br>• Absolute dematerialization and/or<br>• Relative dematerialization | Organizations include all metrics that measure the circularity of material flows and the intensity of material use in the assessment.<br>Close the loop*<br>• % material circularity for materials under direct control (scope B)<br>AND<br>Narrow & Slow the loop<br>• Absolute dematerialization and/or<br>• Relative dematerialization | Organizations include all metrics that measure circular performance in their assessment, as well as relevant impact metrics.<br>Close the loop*<br>• % material circularity for materials under direct and indirect control (scope ABC)<br>AND<br>Narrow & Slow the loop<br>• Absolute dematerialization and/or<br>• Relative dematerialization<br>AND<br>Impact of the loop<br>• GHG impact, Nature impact, and/or Social impact |

| | | | | |
|---|---|---|---|---|
| | | * Downcycling is recognized as circular (incineration is excluded). For transparency reasons and because the GCP aims for organizations to keep materials at their highest value, when using % actual recovery, organizations also have to use the % recovery type indicator to indicate to what extent downcycling has been used. | | * Consistent with life-cycle thinking, downcycling is not considered circular when higher-value recovery options are technically and economically available. However, where evidence such as certifications or technical studies (e.g. LCA and similar) demonstrate that no higher-value recovery is available and that the lowest downcycling option achieves preferable environmental outcomes compared to disposal, such recovery may be recognized as circular. |
| | Recommended indicators | Value the loop<br>• Circular material productivity and/or<br>• Material circularity revenue | Close the loop<br>• % critical material<br>Narrow & Slow the loop<br>• Actual lifetime<br>Value the loop<br>• Circular material productivity and/or<br>• Material circularity revenue<br>Impact of the loop<br>• GHG impact, Nature impact, and/or Social impact | Close the loop<br>• % critical material<br>Narrow & Slow the loop<br>• Actual lifetime<br>Value the loop<br>• Circular material productivity and/or<br>• Material circularity revenue |
| | Optional indicators | Close the loop<br>• % critical material<br>Narrow & Slow the loop<br>• Actual lifetime<br>Impact of the loop<br>• GHG impact, Nature impact, and/or Social impact | Close the loop<br>• % critical material<br>Narrow & Slow the loop<br>• Actual lifetime | |
| Manage | | Application of the GCP sections but no effect on moving from one level to the other (for GCP v1.0) | | |
| Communicate | | Reporting and disclosure depending on the use case but no effect on moving from one level to the other | | |
| Applicability for SMEs | | High | Low | Low |

# Annex 3: Classification of materials[124] (Stage 2.5 Prepare - Prioritize your material flows)

- MF1 Biomass
  - MF 1.1 Crops (cereals, roots, tubers, sugar crops, pulses, nuts, oil-bearing crops, vegetables, fruits, fibers, other crops)
  - MF 1.2 Crop residues (straw, fodder crops, grazed biomass)
  - MF 1.3 Wood (timber-industrial roundwood, wood fuel and other extraction)
  - MF 1.4 Wild fish
  - MF 1.5 Live animals and animal products (meat and meat preparations, dairy products, birds, eggs and honey excluding wild fish, aquatic plants and animals, hunted and gathered animals)
  - MF 1.6 Other (animal fibers, skins, furs, leather etc.)
  - MF 1.7 Product mainly from biomass (biofuels)
- MF2 Metals (excluding CRMs)
  - MF 2.1 Iron and steel
  - MF 2.2 Lead
  - MF 2.3 Gold, silver, other precious metals
  - MF 2.4 Uranium and thorium
  - MF 2.5 Other metals
- MF3 Non-metallic minerals
  - MF3.1 Marble, granite, sandstone, porphyry, basalt, other ornamental or building stone (excluding slate)
  - MF3.2 Chalk and dolomite
  - MF3.3 Slate
  - MF3.4 Chemical and fertilizer minerals
  - MF3.5 Salt
  - MF3.6 Limestone and gypsum
  - MF3.7 Clays and kaolin
  - MF3.8 Sand and gravel
  - MF3.9 Other non-metallic minerals
  - MF3.10 Excavated earthen materials (including soil)
- MF4 Fossil resources (used as feedstock, not energy carrier)
  - MF 4.1 Coal and other solid feedstock (lignite-brown coal, hard coal, oil shale and tar sands, peat)
  - MF 4.2 Liquid and gaseous feedstock (crude oil, condensate and natural gas liquids, natural gas)
  - MF 4.3 Other products
- MF5 Plastics
  - MF5.1 PET – polyethylene terephthalate
  - MF5.2 HDPE – high-density polyethylene
  - MF5.3 PVC – polyvinyl chloride
  - MF5.4 LDPE – low-density polyethylene
  - MF5.5 PP – polypropylene
  - MF5.6 PS – polystyrene
  - MF5.7 All other plastics
- MF6 Critical raw minerals (CRMs)[125]
  - MF 6.1 Copper
  - MF 6.2 Nickel
  - MF 6.3 Zinc

  - MF 6.4 Tin
  - MF 6.5 Platinum group metals
  - MF 6.6 Bauxite and aluminum
  - MF 6.7 Cobalt
  - MF 6.8 Rare earth elements
  - MF 6.9 Manganese
  - MF 6.10 Lithium
  - MF 6.11 Phosphate rock
  - MF 6.12 Niobium
  - MF 6.13 Phosphorus
  - MF 6.14 Magnesium
  - MF 6.15 Natural graphite
  - MF 6.16 Others (antimony, arsenic, baryte, beryllium, bismuth, boron, coking coal, cesium, chromium, feldspar, fluorspar, gallium, germanium, hafnium, helium, indium, iridium, rubidium, scandium, silicon metal, strontium, tantalum, titanium metal, tungsten, tellurium, vanadium, zirconium)
- MF7 Hazardous materials[126]

# Annex 4: Case study (Stage 2.5 Prepare - Identify and prioritize material flows

**Case study: A construction organization is assessing the circularity performance of several models of glass windows to determine which model to use for a construction project.**

Since the objective of the assessment is to compare products for decision-making, the organization conducts the assessment at the product level.

**Identify material flows**

*Step 1. Determine the unit of analysis.*

To effectively compare products, the organization first defines the functional unit to be ‘‘a double-glazed window with a surface area of 1 $m^2$ and a thermal resistance performance (U-value) of 2 $W/m^2K$”.

The time frame of analysis is a single use phase of the window, which is estimated to be 25 years.

*Step 2. Compile a material flow inventory*

Step 2.1 Identify the type of material flows entering (inflows) or leaving (outflows) the operational boundaries

The organization has defined the operational boundaries as scope B. The material flows crossing the boundaries include the components of the window. Table 28 lists the output of material flows identified.

## Table 28: Example case study: Sample output listing identification of material flows entering and leaving the operational boundaries

| # | Name of material flow | Direction of flow |
|---|---|---|
| 1 | Flat glass | Inflow from suppliers |
| 2 | Window frame | Inflow from suppliers |
| 3 | Hinges, handles and locks | Inflow from suppliers |
| 4 | Gasket | Inflow from suppliers |
| 5 | Sealant | Inflow from suppliers |
| 6 | Installed window | Outflow to client |
| 7 | Replacement gasket and sealant for maintenance | Outflow to client |

Step 2.2. Identify the materials and components present in each material flow

The organization then proceeds to identify the major types of material present in each material flow.

## Table 29: Example case study: Sample output of material flows mapped to other associated materials present in the material flow

| # | Name of material flow | Major materials or components present | Direction of flow |
|---|---|---|---|
| **1** | Flat glass | 1.1 Glass | Inflow from suppliers |
| **2** | Window frame | 2.1 Aluminum | Inflow from suppliers |
| **3** | Hinges, handles and locks | 3.1 Stainless steel<br>3.2 Aluminum | Inflow from suppliers |
| **4** | Gasket | 4.1 Synthetic rubber | Inflow from suppliers |
| **5** | Sealant | 5.1 Silicone | Inflow from suppliers |
| **6** | Installed window | 6.1 Glass<br>6.2 Aluminum<br>6.3 Stainless steel<br>6.4 Synthetic rubber | Outflow to client |
| **7** | Replacement gasket and sealant for maintenance | 7.1 Synthetic rubber<br>7.2 Silicone | Outflow to client |

### *Prioritize material flows for the analysis*

The organization assesses the material flows based on the three criteria.

First, it prioritizes the large material flows that account for 20% or more of the total mass of the material flow inventory. The organization estimates that the glass typically accounts for 80% of the total mass of a double-glazed window, followed by aluminum (15%). The organization then decides to prioritize the assessment of glass (flows 1.1 and 6.1).

Next, it prioritizes material flows that are relevant to business continuity. The organization determines that the aluminum frame is irreplaceable for the window without compromising properties such as light-weight and resistance to corrosion. Therefore, it prioritizes flows 2.1 and 6.2.

As the final step, the organization prioritizes material flows that have a high impact. It examines if the materials present in the remaining flows are part of the Science Based Targets Network (SBTN) High-Impact Commodity List (HICL). The organization determines that none of the remaining flows are on the list. It is noteworthy that stainless steel, while not directly mentioned in the list, is made of other materials that are on the list, including iron and chromium. However, considering that stainless steel is only used in a small component of a window, the organization decides to exclude it from the assessment.

Table 30 shows the list of prioritized material flows, which is the final output of 2.5 Identify and prioritize material flows.

## Table 30: Example case study: Sample list of prioritized material flows and final output

| # | Name of material flow | Major materials or components present | Direction of flow |
|---|---|---|---|
| **1** | Flat glass | 1.1 Glass | Inflow from suppliers |
| **2** | Window frame | 2.1 Aluminum | Inflow from suppliers |
| **6** | Installed window | 6.1 Glass<br>6.2 Aluminum | Outflow to client |

# Annex 5: Data quality (Stage 3.2 Measure - Collect data and calculate)

Reliable data is essential to producing meaningful and credible GCP circular performance and impact assessments. However, along the journey towards implementing the GCP, organizations may encounter limitations in accessing complete or high-quality data. In such cases, the GCP offers the following guidance, informed by the Greenhouse Gas Protocol (GHGP) and the European Sustainability Reporting Standards (ESRS), to help maintain transparency, relevance and comparability in data collection.

### *1. Make best efforts to collect primary data*

Prioritize the use of primary data wherever feasible, especially for material flows or circularity indicators considered significant to the assessment. Make reasonable efforts to engage internal teams and value chain actors to obtain relevant, recent and reliable data.

### *2. Use proxy or secondary data where necessary*

Where your organization is unable to obtain high-quality primary data, do not omit the information. Instead, substitute it with:

- **Proxy data** from comparable operations, materials or use cases;
- **Industry averages** or third-party databases;
- **Benchmark or literature values** that are geographically and technologically relevant;
- **Internal extrapolations** from partial datasets.

Select such sources based on their quality, representativeness and relevance to your organization's chosen boundaries and assessment level.

### *3. Clearly document limitations, methods and sources*

Transparently document all data gaps, approximations and assumptions. This includes:

- The nature of the missing or unreliable data;
- The source and justification for any proxy or secondary data used;
- Any estimations or extrapolations applied;
- Indicating the uncertainty or potential variability in the data;
- The rationale behind any exclusions made.

This approach supports transparency and allows for the interpretability of results while preserving the integrity of the GCP circular performance and impact assessment.

### *4. Avoid omissions and apply consistent methodologies*

In the context of external reporting, some frameworks do not allow data omissions solely due to incomplete or uncertain data. (e.g., ESRS). While there are exceptions, it is essential to report estimates.

Where proxy data or estimation methods are used, apply them consistently across similar products, units or material categories. Consistency supports comparability within and across reporting cycles.

### *5. Strive for continuous improvement*

The GCP encourages organizations to view data quality as an iterative process:

- Begin with available data, even if imperfect;
- Prioritize improving data for the most material flows;
- Regularly reassess and replace low-quality data.

Invest in improving internal tracking systems, strengthening supplier engagement for data collection and refining methodologies for data validation and verification over time. In particular, prioritize data quality improvements for activities that have the following:

- Relatively low data quality;
- Relatively high areas of improvement (circularity hotspots).

By following this guidance, organizations can maintain the integrity of their GCP circular performance and impact assessments while building a pathway toward more robust, transparent and comparable reporting.

# Annex 6: Analysis of the results per indicator (Stage 4.1 Manage – Analyze results)

## *Close the Loop – Analysis of underlying indicators of circular inflow and outflow*

### The mass of flows

A mass-based indicator means heavier material flows have a greater contribution to the percentage. A relevant assessment is to list the linear flows from largest to smallest mass. Closing the loop on the larger mass streams will provide a larger contribution to the level of circularity. However, this may result in the overlooking of other parameters, such as critical or priority materials.

### The circularity of flows

*Guidance for the technical cycle*

The circularity of the inflow in the technical sphere depends on the characteristics of the material flows to be non-virgin. The opportunity for improvement is in assessing the characteristics of linear flows and exploring renewable (moving towards the biological cycle) or non-virgin alternatives.

The circularity of the outflow contains two components: recovery potential and actual recovery. To improve recovery potential, the analysis focuses on opportunities to optimize the design (e.g., modular design, design for disassembly, repairability, high recyclability by using mono-materials, etc.). Improving actual recovery requires different actions. For example, adopting new business models, such as product-as-a-service or buy-back/take-back schemes, will likely significantly improve actual recovery rates. Another option is to collaborate with value chain partners that drive circularity, bringing more clarity into mass flows down the value chain and a greater ability to develop a shared value proposition.

*Guidance for the biological cycle*

Your organization should consider bio-based inflow as circular and label it as renewable, if it is sustainably grown and harvested at a rate that natural growth and replenishment can occur after extraction. The circularity of flows in the biological cycle therefore depend on the stream management characteristics. You should explore if streams are not minimally sustainably managed and, in that case, label them as non-renewable. Therefore, the opportunity for improvement to have more circular inflow for bio-based streams is to increase the share of sustainably grown materials, for example by using certified sources.

The circularity of the outflow contains the same two components in the biological cycle as for the technological cycle – recovery potential and actual recovery. In the biological cycle, biodegradability and toxicity determine the recovery potential (see the Organization for Economic Co-operation and Development (OECD) biodegradability testing standard[127]). Therefore, the improvement potential includes ensuring the bio-based product is biodegradable and does not contain restricted substances beyond threshold levels. In the case of hybrids (products containing both bio-based and technical flows), it is possible to improve the recovery potential through the design (e.g., your organization should make separating the bio-based and technical components possible by design).

Improving actual recovery for products, by-products and waste streams moving in the biological cycle will depend on the type of valorization. For non-edible bio-based flows, consider valorization through technical cycle strategies and explore the related new business models. As these strategies are unlikely to be endless for bio-based materials (e.g., paper fiber loses length and strength with each recycling loop, leading to maximum recycling of around seven times) your organization needs to prepare the flow for recovery in the biosphere as well (i.e., through biodegradation or nutrient recovery).

Edible flows are considered recovered when there is an actual living organism to consume them. Therefore, organizations should consider avoiding food waste and losses in the value chain to increase circular outflow. Although not fully circular, the biodegradation of edible flows will provide a 50% recovery score (whereas for non-edible biodegradable streams, biodegradation is 100% recovery) and therefore could provide a slightly better alternative over landfill.

***Note***

**Important considerations on biodegradability[128]**

Not all biodegradable products are bio-based or made from renewable resources. Some fossil-based polymers are fully biodegradable (e.g., polybutylene adipate-coterephthalate (PBAT) or polycaprolactam (PCL)).

Not all bio-based products are biodegradable. While biodegradability is a property inherent to some bio-based products, many of them are durable and do not biodegrade. Biodegradation is a chemical process while disintegration is a physical process: For a product to decompose completely, both must occur.

Biodegradation is highly dependent on factors such as temperature, time and the presence of bacteria and fungi: higher temperatures and controlled conditions make industrial composting the ideal environment for plastics to decompose.

## Table 31: Examples of actions based on analyzing Close the Loop indicators

| Indicator | Examples for the technical cycle | Examples for the biological cycle |
|---|---|---|
| **Secondary inflow** | A construction business could increase circularity levels by replacing virgin steel beams with reused beams or recycled steel. | A paper business could increase the recycled content of paper and card boxes. |
| **Renewable inflow** | A cosmetics business could increase circularity levels by replacing virgin synthetic ingredients with renewable content. | A furniture manufacturer could only use Forest Stewardship Council (FSC)-certified wood to ensure renewability and alignment with a cycle of growth and replenishment. |
| **Recovery potential** | An information and communications technology (ICT) business could change the design of a product to enable disassembly, allowing for repair, reuse and refurbishment. | A cosmetics business could change the design of a product to ensure the separation of biological and technical streams of hybrid products, allowing for biodegradability of the bio-based streams. |
| **Actual recovery – business model** | An ICT business could change to a pay-per-use-business model, enabling higher collection and reuse rates. | A fragrance business could change to a higher valorization type, enabling full recovery of its residual streams by using them as input for the food industry. |
| **Actual recovery – collaboration** | An electronic equipment manufacturer could collaborate with a retailer to collect used equipment by stimulating the consumer with a take-back scheme, ensuring the recovery of parts and materials. | A supermarket could provide almost expired products to food banks to avoid food waste and increase recovery. |

### Critical inflow

The results of this indicator demonstrate to what extent your organization depends on materials identified as critical. Even if the percentage of critical materials is small, it may be relevant to further analyze it to understand:

- The diversity in critical materials;
- The substitutability of critical materials;
- The absolute use of critical materials;
- Revenue dependent on critical materials (revenue at risk).

*The characteristics of the critical materials*

Your organization may have multiple critical materials in its inflow. It is important to understand the nature of these materials. Not all materials defined as critical have the same score on criticality, which is a combination of supply risk and regional economic importance. It can be relevant to evaluate the critical material flows based on size, revenue dependent on the flow and the relative criticality of the material.

*Substitutability of the critical materials*

If it is possible to substitute the critical materials with alternative, non-critical materials with the same or similar functionality, your organization may partly mitigate its risk. Therefore, it is relevant to assess whether any substitutes are available.

*The absolute use of critical materials*

Even if the relative use of critical materials (in percentage) is low, the absolute amount or costs of critical materials could reach a point where absolute scarcity, price increase and price volatility affect business continuity. Therefore, it can be relevant to also monitor the absolute use of critical materials.

**Nature of a critical material**

What material is it?
What is the respective criticality of the material?
Is the material virgin or secondary?

**% recovery types**

*Guidance for the technical cycle*

In the technical cycle, the assumption is that all recovery strategies should take place at some time at some place in the value chain. The opportunities for an individual organization to shift between recovery types will largely depend on the type of organization and its position in the value chain. Nonetheless, your organization may evaluate the opportunities to ensure the outflow retains the highest value possible by moving towards higher value maintaining strategies (i.e., reuse over recycling). You should explore the effects of innovative models such as product-as-a-service or sell-and-buy-back, as well as less-radical changes, such as new value chain collaborations on enabling the shift towards higher value-retaining recovery strategies.

*Guidance for the biological cycle*

In contrast to the technical cycle, the assumption that all recovery strategies take place at some time and at some place in the value chain does not hold for the biological cycle. Therefore, the driver of every individual organization should be to climb up the hierarchy to enable high valorization strategies. Your organization may collaborate with other partners in the value chain to look for alternative recovery types or set up adjusted logistics to achieve higher valorization of outflow.

## *Narrow and Slow the Loop*

### Dematerialization

Your organization should analyze the results of the dematerialization indicator in the context of its product or service function, material profile and business objectives. A positive result indicates improved material efficiency, either through reduced total material use (absolute) or the more efficient use of materials relative to value delivered (relative). A flat or negative result may point to unchanged material intensity, data gaps or unintended trade-offs, such as replacing materials with lighter but more impactful alternatives.

To improve performance, you should examine the main drivers of material use within the assessed scope. This may involve revisiting product design for lightweighting, exploring more durable or modular solutions, reducing over-specification or enhancing repairability and reuse. In relative terms, increasing product use or life cycle (e.g., through shared use, maintenance or servitization models) can yield stronger dematerialization outcomes. If results are flat or negative, it is important to reassess the baseline and optimized scenarios: check for inconsistencies in scope, functionality or data coverage and evaluate whether the strategy applied truly reduced material input or simply shifted it elsewhere (e.g., from core product to packaging or spare parts). Reviewing supplier practices, material choices and internal asset management systems can also uncover hidden inefficiencies and new opportunities for material reduction.

### Actual lifetime

A product can achieve a longer than average actual lifetime when it's designed for maximum performance across both technical and functional lifetimes. While the technical lifetime is part of the intrinsic properties of the product, the conditions created around the product determine the functional lifetime.[129]

Your organization may improve the actual lifetime indicator score by designing products and product ecosystems that enable maximum technical and functional lifetimes. Your organization can achieve this by improving product design for durability and reliability, modularity and part standardization, ease of maintenance and repair, upgradability, disassembly and reassembly, and component recovery via refurbishment or remanufacturing. Along with designing for durability, your organization will achieve longer lifetimes for their products by preventing premature obsolescence. This will entail a product ecosystem that keeps products performing, relevant, easy to use, upgradable, repairable and desirable.

## *Value the Loop*

### Circular material productivity

This indicator expresses monetary value per unit of mass. This absolute value will vary greatly across organizations and it is best to use it to compare performance over time. An increase in circular material productivity demonstrates a decoupling of financial growth from material consumption.

In addition, it is relevant to compare a decrease or increase in circular material productivity externally. For example, if enough anonymized and aggregated data is available, one possible insight is that your organization had a 2% increase in circular material productivity over one year while the sector had a 5% increase. This could indicate that your organization has additional opportunities to seize. You should consider how different factors like exchange rates, inventory and material circularity revenue will affect circular material productivity over time and measure the calculation's sensitivity to such factors.

Even though the calculation for circular material productivity is not the same as that for domestic material consumption (DMC)/gross domestic product (GDP), both metrics demonstrate decoupling. Therefore, it might be interesting to compare changes in circular material productivity with the increase in DMC/GDP on a national or sector level.

### Material circularity revenue

This indicator can provide a few insights:

1. Understanding the percentage of your organization's total revenues derived from circularity;
2. How your organization's revenues from more circular products compare to less circular ones;
3. How your organization's product portfolio breaks down across Close the Loop performance tiers, highlighting where you may want to focus improvement efforts on product circularity or sales.

On this last point, charting the organization's or business unit's product portfolio across the board will help bring each of these insights to light. In the analysis phase, use opportunities for portfolio steering by:

1. Innovating new circular product (groups);
2. Increasing the circularity of existing products;
3. Driving sales of more circular alternatives over less circular alternatives.

In doing this exercise, you may find that the overall circularity score (based on mass of *% circular inflow* and *% circular outflow*) may be different from the percentage of total revenue quantified as circular as per the *Material circularity revenue* indicator. If an organization finds that the *Material circularity revenue* indicator as a percentage of total revenue is greater than the (mass-based) circularity *% material circularity*, this may imply that the organization makes disproportionally more revenue off more circular products or services. If *% material circularity* revenue/total revenue is less than the *% material circularity*, the organization likely depends on more linear products in its portfolio to generate most of its revenue.

To analyze this further, Table 32 shows how your organization can see how its revenues fall across circular deciles (e.g., 0%, 1–10%, etc.). This indicates how linear the revenues are (and vice versa). You can then use this table to adopt targets for improving the product portfolio to become more circular. You can implement this analysis at the product group level (if there is sufficient variation within the group) or higher, including business unit or the whole organization portfolio. Taking this table further, your organization may wish to add additional columns on stock keeping units (SKUs) or % of total product portfolio to capture more relevant insights side-by-side. This will allow you to see both where revenues fall across % circularity performance tiers and where most products reside. Organizations should illustrate the findings of this table in graphical form, including histograms, bar and a combination of bar and line.

### Table 32: Material circularity revenue

| % circularity (Close the Loop indicator) | Revenue (USD $) | Weighted average revenue" (% circularity x revenue) |
|---|---|---|
| 0% | USD $400 million | USD $0 million |
| 1-10% | USD $150 million | USD $7.5 million |
| 11-20% | USD $200 million | USD $30 million |
| 21-30% | USD $150 million | USD $37.5 million |
| 31-40% | USD $50 million | USD $17.5 million |
| 41-50% | USD $30 million | USD $13.5 million |
| 51-60% | USD $20 million | USD $11 million |
| 61-70% | - | - |
| 71-80% | - | - |
| 81-90% | - | - |
| 91-100% | - | - |
| Total revenues | USD $1 billion | |
| CTI revenue | | USD $117 million (11.7%) |

## *Impact of the Loop*

### GHG impact

*Inflow – Higher value retention and closed loop recycling*

Your organization should analyze the information derived from the Impact the Loop module in light of the *% material circularity*. The combination of increase in material circularity and potential for emissions savings can support the ranking of different solutions and focusing on the largest gains from both a material flow and GHG perspective.

The result of the calculations is the amount of GHG emissions that can be saved if the materials go from the current % recycled content to 100% recycled content. This information for internal purposes to analyze improvement opportunities. Note that the output is not a carbon footprint or life-cycle assessment (LCA). The GCP strongly recommends the use of granular approaches, such as LCA, for final decision-making and external communication.

**Example**

*Refurbished laptops*

Consider an organization whose inflow consists out of 200 new laptops for their employees. Currently its inflow is 100% linear as the laptops are newly produced, emitting 331 kg $CO_2$eq per laptop (206.875 kg $CO_2$eq/kg).[130] The organization is considering increasing their percentage circular inflow by purchasing refurbished laptops. The emissions of refurbishing a laptop are 0.9 kg

$CO_2$eq per laptop (0.375 kg $CO_2$eq/kg).[131] The following formula shows the calculations for the GHG Impact:

$$\frac{(320 \times 0.375) - (0 \times 0.375) - (320 \times 206.875)}{(0 \times 0.375) - (320 \times 206.875)} \times 100$$

The laptop weighs 1.6 kg. In total, the organization can save some 66,200 kg $CO_2$ (99.8% reduction) by transitioning from 0% circular laptops to 100% circular laptops.

*Outflow*

For the outflow, the result of the calculation phase is the amount of GHG emissions saved if the materials go from the current % of recovery to 100% recovery via circular strategies such as recycling, remanufacturing or reuse.

**Example**

*PET laptop cover*

Based on the example provided for the outflow, there is a 70% reduction in GHG emissions of a PET laptop cover that went from 30% recycling to 100% recycling. In addition to the 700-gram cover, the product contains a 1,500-gram aluminum frame that is 90% recycled and 10% landfilled. The emissions factor of recycling the aluminum frame is 0 $CO_2$-eq/kg (on the outflow end) and 0.0393 $CO_2$- eq/kg for the landfilling.[132] The following formula shows the calculations for the GHG impact indictor on outflow:

$$\frac{(1.5 \times 0.0393) - (0 \times 1.5 \times 0.9) - (0.1 \times 1.5 \times 0.0393)}{(1.5 \times 0.0393)} \times 100$$

The GHG impact measurement shows a 10% reduction in GHG emissions when the reuse of the aluminum frame is increased from 90% to 100%. In this case, the GHG emissions savings are based on the related avoidance due to the 10% recovery via reuse. From the material circularity perspective on the outflow side, there is a clear preference to start improving the recovery of the PET cover, since there is a marginal improvement for the aluminum frame, which is already 90% recycled.

### Nature impact

As mentioned before, the *Nature impact* indicator helps organizations understand how their circular performance impacts nature. The indicator allows for comparison between different sourcing strategies, including circular sourcing, to see which one is most effective in reducing land-use impacts and pressure on nature.

**Example**

*Bio-based materials*

Consider a car manufacturer whose material inflow consists of 6,250 metric tons of cotton each year for the production of upholstery. Currently, 80% of the inflow is virgin inflow sourced from a farm in India that uses conventional agricultural practices (Source A). This inflow is linear as the suppliers use conventional agricultural practices that do not promote renewability. The organization is considering whether it should aim to convert the remainder of virgin inflow to more non-virgin content or go for the renewable option of organically certified cotton. Both are circular options:

- Source B: A farm in China with certified organic agricultural practices;
- Source C: A cotton recycling center in the UK.

Table 33 shows the extent, condition change and significance of the current state and the two circular scenarios using the scoring card.

**Table 33: Nature impact scorecard - car business**

| Source | Extent | Condition change | Significance | Score |
|---|---|---|---|---|
| **Source A** | Small – medium | Very large | High | 10 x 1 x 3 = 30 |
| **Source B** | Small – medium | Large | Moderate | 10 x 0.7 x 2 = 14 |
| **Source C** | Negligible | Very large | Low | 0.01 x 1 x 1 = 0.01 |

The results show that **Source C** (recycled cotton) is likely to be the circular alternative with the lowest nature impact related to land use. Therefore, the manufacturer may achieve synergies between circularity and nature impacts by moving to 100% recycled cotton sourcing. Source B (organic cotton from China), is better than conventional farming in India as the on-land practices of organic farming are better for nature. Another beneficial aspect is that the significance of biodiversity in China is moderate whereas it is high in India, meaning that producing cotton in China has less of a land-use impact than it does in India. Note that organic agriculture can be less productive than conventional agriculture in the short term,[133] which may lead to a higher score on the extent indicators. Again, the impacts of conventional cotton farming via pollution, water use and GHG emissions are likely to be larger than those from organic farming, but the GCP does not take them into account here. Consequently, purely from a land-use perspective, it is preferable to introduce recycled cotton instead of changing the primary sourcing.

The scores can also allow for the visual comparison of different circular strategies, e.g., relative to each other or relative to lowest (0.0001) and highest possible scores (>5,000) or with other organizations for benchmarking, if scores are disclosed.

**Example**

*Mineral-based materials*

Consider a company whose inflow consists of 100% virgin aluminum for the production of laptops. The company analyzes the land-use impacts for its inflow in 2022 sourcing 15 million kg of aluminum. The company currently sources virgin aluminum from the Carajas open pit mine in Brazil (Source A) and is considering two potential alternative sourcing strategies:

- Source B: An underground mine in Kiruna, Sweden;
- Source C: An aluminum recycling center in the UK.

Based on published rock-to-metal ratios, 15 million kg of aluminum requires the extraction of approximately 105 million kg of rock. Applying simple rock density and mine site geometry calculations produces and estimated attributable extent of 42.75 $m^2$. Since this entire area is converted either into a mine pit or associated infrastructure, the condition impacts are very high. The extent and condition of an underground mine are also likely to be very small and very high, respectively, while the extent of land use from recycling is negligible. The condition change of the recycled aluminum is very large, as the recycling center holds no biodiversity. The significance of biodiversity in Carajas, Brazil, is high, while it is low for Sweden and the UK. Using the scorecard represented in the following table, the *Nature impact* indicator shows that **Source C**, the recycled aluminum from the UK, is the sourcing strategy with the lowest impact on nature. This indicates that improving circular performance goes hand in hand with reducing pressure on nature.

**Table 34: Nature impact scorecard – aluminum producer**

| Source | Extent | Condition change | Significance | Score |
|---|---|---|---|---|
| **Source A** | Very small | Very large | High | 0.1 x 1 x 3 = 0.3 |
| **Source B** | Very small | Very large | Low | 0.1 x 1 x 1 = 0.1 |
| **Source C** | Negligible | Very large | Low | 0.01 x 1 x 1 = 0.01 |

## Social impact

*Social maturity assessment*

The GCP social maturity assessment offers a view of your organization's maturity at different levels of granularity, as it considers the approach to risk management in relation to specific stakeholder groups and deep dives into selected thematic areas.

Interpretations of the four maturity levels:

1. **Initiating**: Very limited or no integration of just transition lenses into the transition-related activities; limited or no processes in place to identify and address transition risks.
2. **Establishing**: Some processes in place to identify transition risks and the stakeholder groups the risks might affect; it is still necessary to develop a structural approach to measuring risk mitigation, stakeholder engagement and effectiveness.
3. **Integrating**: Have developed plans to prevent, mitigate and remedy potential adverse impacts connected to the transition to a circular economy; the greater integration of best practices offers space for further improvement.
4. **Accelerating**: Integrate leading practices into the approach to transition risk management; have a structured approach to monitoring progress and integrating stakeholder views in the development and evaluation of the action plan; engage with relevant initiatives and communicate externally on their risks, plans and progress.

**Example**

*Sports retailer*

A brand sells sports gear designed for repairability to ensure a longer functional lifetime. The brand takes steps to facilitate product reparation, recycling and access to secondary markets. However, no process is in place to identify and address how the shift to the new materials may affect stakeholders along the value chain.

**Table 35: Social maturity assessment example**

| *Affected stakeholder group* | *Prioritized circular economy topics* | *Scoring framework* |
|---|---|---|
| *Value chain workers & own workforce* | Jobs created/lost | **Initiating** |
| | Informal sector | |
| | Equality | |
| *Affected communities* | Communities | **Initiating** |
| *Consumers and end-users* | Accessibility | **Accelerating** |
| | Responsible behavior | |

In this example, the company is a leader in product accessibility and responsible consumer behavior. However, it has limited processes in place to identify and address risks to workers and affected communities. This overview suggests that the company should expand its efforts in that direction. The GCP social risk mapping efforts can help prioritize the input.

*Social risk mapping*

Your organization can analyze and aggregate the results of the GCP social risk mapping in multiple ways to support internal dialogue and the development of a tailored strategy. However, two key overviews are essential:

- A value chain, life-cycle view: This is a display of the most pressing risks in each step of the life cycle. This overview can help identify which stakeholder groups are most at risk throughout the value chain and whether the product presents higher risks at the sourcing, manufacturing or use level.
- A hotspot analysis: This allows your organization to drill down to where a specific social topic is most at risk across the value chain. This view can help identify whether existing organization strategies to tackle human rights topics need further integration or adjustment in the context of a given product.

Example

*Clothing brand*

A clothing brand designed a sustainable line and is looking to assess the social impact of its t-shirts. The (hypothetical) product life cycle of a t-shirt is illustrated below. In alignment with the brand's strategy to focus on areas where it has the most significant influence, its GCP social risk mapping exercise will target social hotspots in its supply chain and operations. Given this prioritization and considering the market and price of the product, the social hotspots concerning consumers and end-users are out of scope.

Figure 25: GCP social risk mapping: social hotspots

| *Social hotspots relevant in a circular economy* | |
|---|---|
| *Workers in the value chain* | *In scope?* |
| Occupational health and safety | ✓ |
| Child labor | ✓ |
| Forced labor | ✓ |
| Discrimination | ✓ |
| Freedom of association and collective bargaining | ✓ |
| Decent working conditions | ✓ |
| *Consumers and end-users* | |
| Health and safety | ✗ |
| Affordability | ✗ |
| Accessibility | ✗ |
| *Local communities* | |
| Health and safety | ✓ |
| Access to material and immaterial resources | ✓ |
| Community engagement | ✓ |
| Skills development | ✓ |
| Contribution to economic development | ✓ |

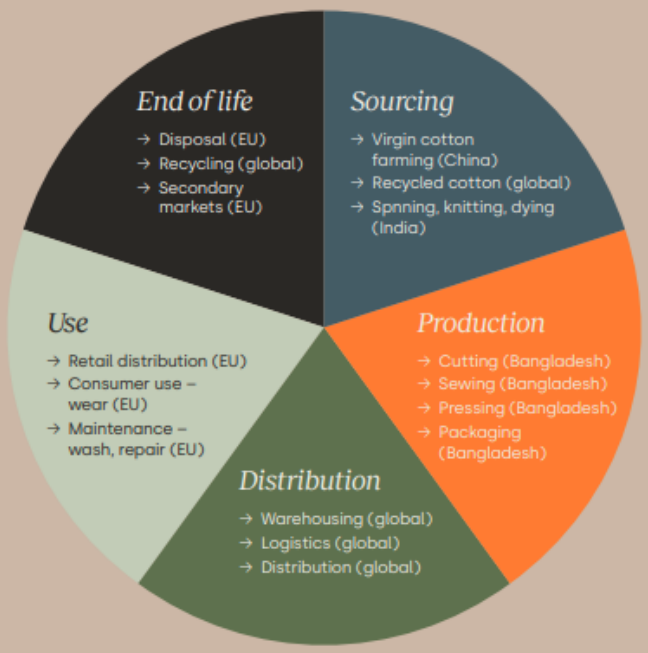
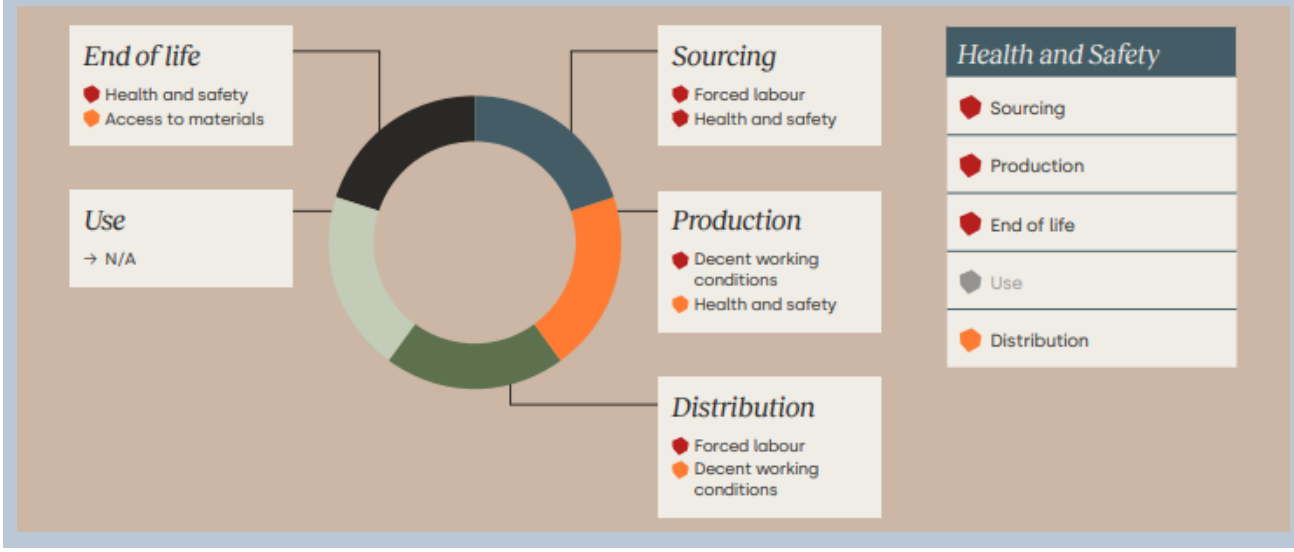



Figure 26 shows the results of the calculations for the life cycle of the t-shirt after the identification of risks and the data collection.

**Figure 26: Life-cycle hotspot identification results**



### CTI quality-jobs analysis

There are two possible levels of analysis depending on the level of aggregation. If your organization used the condensed option, the score will show an aggregated value associated with a certain color on the heatmap scale. If you used the full option (see Table 36), aggregate these indicators on their own and analyze them separately for more granular information. Interpret the results of composite indicators within the organization's own dimension.

## Table 36: GCP quality jobs analysis full option

| *Dimension* | *Social impact categories* | *Head indicators* | *Computation* |
|---|---|---|---|
| *Quality of job impact on workers* | 1. Earning quality | 1. Earning quality | 1. Wage in the pocket (1 indicator) |
| | 2. Job security | 2. Job security | 2. Job security (average of 2 indicators) |
| | 3. Work environment | 3.1 Health & security | 3.1 Health & security (average of 3 indicators) |
| | | 3.2 Personal development | 3.2 Training & internal promotion (average of 4 indicators) |
| | | 3.3 Work environment (physical) | 3.3 Work environment – physical demands (average of 3 indicators) |
| | | 3.4 Work environment (emotional) | 3.4 Work environment – emotional demands (average of 3 indicators) |
| *Equality and discrimination impacts* | 4. Equal opportunity & equal treatment | 4. Equal opportunity & equal treatment | 4. Equal opportunity (average of 3 indicators) |
| | 5. Forced labor | 5. Forced labor | 5. Forced labor (average of 4 indicators) |
| | 6. Discrimination & vulnerable employment structures | 6. Vulnerable employment structures | 6. Discrimination & vulnerable employment structures (average of 5 indicators) |
| | 7. Child labor | 7. Child labor | 7. Child labor (average of 3 indicators) |
| | 8. Voice & collective bargaining | 8. Voice & collective bargaining | 8. Voice & collective bargaining (average of 3 indicators) |
| *Indirect job impact on worker and family well-being* | 9. Social security for workers & family | 9. Social security for workers & family | 9. Social security for workers & family (average of 5 indicators) |
| | 10. Well-being of workers & their families | 10.1 Work-life balance | 10.1 Work-life balance (average of 4 indicators) |
| | | 10.2 Well-being of workers' families | 10.2.1 Social integration (average of 3 indicators) |
| | | | 10.2.2 Access to & quality of natural resources (average of 3 indicators) |

Your organization should use the heatmap score scale depicted in Table 37 as a reference for the analysis. Adopting this scale system allows you to identify critical hotspots, defined as places where remediation strategies should focus and highlight good practices. This will allow for subsequent monitoring to follow the progress of the indicators where hotspots are. Red and orange indicate the most critical and significant challenges, which your organization must prioritize, whereas green shades show good practice.

## Table 37: Heatmap score scale

| *Indicator/scale* | *1* *Critical challenge* | *2* *Significant challenges* | *3* *Not a significant challenge, not a priority* | *4* *Towards good practice* |
|---|---|---|---|---|
| 1. Income | Below minimum wage | Minimum wage | Living wage | Above living wage |
| 2. Job security | Critical risk of loosing job | Significant risk of loosing job | Not a big risk of loosing job | Job is secure |
| | Critical risk of not being able to apply for unemployment insurance | Significant risk of not being able to apply for unemployment insurance | Not at significant risk of not being able to apply for unemployment insurance | Can apply for unemployment insurance |
| 3.1 Health and security (support for protective equipment) | No access to it, although needed | Workers paid from own pocket | Workers get reimbursed for equipment needed | Company provide what's needed and pays for it |
| 3.2 Health and security (occurrence of sickness associated with circular job) | Presence of illness related to job | Frequent occurrence of sickness during past year | Rare occurrence of sickness | No occurrence of sickness |
| 3.3 Health and security (exposure to harmful chemicals on circular job) | Constant exposure to harmful chemicals | Frequent exposure to harmful chemicals | Seldomly exposed to harmful chemicals | No exposure to harmful chemicals |

The final step of the GCP quality jobs analysis consists of selecting which hotspots to prioritize and what mechanisms to put in place to ensure a return to the situation before the damage took place and to improve positive benefits for workers and affected communities.

**Example**

*Large textile company*

Following the latest example with the large textile company, the analysis results indicate that the repair, remanufacture and recycle department of this company should work on:

- Increasing wages and removing the gender income gap, as the score shows that in the same position, women earn less than men. This is particularly relevant for the migrant and informal workers in the company's remanufacturing and recycling operations. The focus should be on improving the working conditions as it appears that some forced labor practices are affecting migrant and informal workers in their circular operations.
- Investigating the recycle segment as it appears that child labor is currently affecting some informal workers too.
- Improving the voice, collective bargaining and worker participation of their repairing and recycling businesses, as the score shows that migrant and informal workers are less involved.

## Table 38: GCP quality Jobs hotspot prioritization example

| Dimensions | Disaggregation level<br>Social impact indicators | Circular strategies employed | | | | | |
|---|---|---|---|---|---|---|---|
| | | Repair/ Migrant | | Remanufacture/ Migrant | | Recycle/ Informal worker | |
| | | Women | Men | Women | Men | Women | Men |
| Direct quality of job impacts | 1. Income | 1 | 2 | 1 | 2 | 1 | 2 |
| | 2. Job security | 3 | 3 | 3 | 2 | 3 | 3 |
| | 3. Work environment (composite version) | 3 | 3 | 3 | 3 | 3 | 4 |
| Determinants of job precariousness and vulnerabilities | 4. Equal opportunity & treatment | 3 | 3 | 2 | 3 | 4 | 4 |
| | 5. Forced labor | 2 | 2 | 2 | 2 | 2 | 1 |
| | 6. Job-precariousness-discrimination | 4 | 3 | 3 | 4 | 4 | 4 |
| | 7. Child labor | 3 | 3 | 3 | 3 | 2 | 2 |
| | 8. Voice and collective bargain | 2 | 2 | 3 | 3 | 2 | 1 |
| Well-being workers and their families | 9. Social protection for worker & family | 3 | 3 | 3 | 3 | 3 | 3 |
| | 10. Worklife balance and well-being | 2 | 2 | 3 | 3 | 3 | 3 |

# Annex 7: Further details on data governance (Stage 4.4 Manage - Strategic governance)

## *Integration with other sustainability topics*

The design of corporate governance for a circular economy should align with broader sustainability priorities. The following tables highlight a selection of examples of trade-offs and synergies between circular economy and other sustainability topics from research. It is important to note that the trade-offs and synergies presented here are not exhaustive. Your organization should remain attentive to additional sustainability interactions that may arise based on the specific context, value chain and material choices.

### Table 39: Trade-offs between circular economy and sustainability topics

| Sustainability topic | Trade-off description | Source |
|---|---|---|
| **Climate** | Electrification and decarbonization increase demand for scarce materials (e.g., rare Earth elements). | Haas et al. (2024)[134] |
| **Biodiversity** | Substituting non-renewable materials with nature-derived material solutions may increase forest harvesting pressures, impairing biodiversity if not coupled with biodiversity-enhancing forest management. | Ruokamo et al. (2023)[135] |
| **Social** | If not intentionally designed to foster meaningful work, inclusion and community engagement, a circular economy may promote informal work practices (e.g., in waste management) in an unjust and unsafe way. Economic motivations can also undermine social value creation in circular economy. | Haas et al. (2024)[136] Quintelier et al. (2023)[137] |

### Table 40: Synergies between circular economy and sustainability topics

| Sustainability topic | Synergy description | Source |
|---|---|---|
| **Climate** | A circular economy could reduce emissions via material efficiency, reuse and reduced virgin material extraction.<br><br>Circular economy practices could also reduce energy use and material waste by promoting the reuse, repair and recycling of products, minimizing the need for raw material extraction and energy-intensive manufacturing. By keeping materials in use for longer and designing out waste, it significantly lowers the environmental footprint of production and consumption. | Haas et al. (2024)[138];<br><br>Rüdele et al. (2024)[139]<br><br>Cantzler et al (2020)[140] |
| **Biodiversity** | Regenerative agriculture and the circular economy synergize by transforming agricultural by-products and waste into valuable inputs that enhance soil health and reduce reliance on synthetic fertilizers.<br><br>Additionally, circular economy actions such as cascading the use of nature-derived materials, extending building lifetimes and optimizing space can support in mitigating biodiversity loss. | International Finance Corporation (2025)[141]<br><br>Ruokamo et al. (2023)[142] |
| **Social** | A circular economy fosters meaningful work, inclusion and community engagement, and can support the formalization and integration of informal work practices (e.g., in waste management) as part of a just circular economy transition. | Quintelier et al. (2023)[143]<br><br>South Africa Department of Environment, Forestry and Fisheries and Department of Science and Innovation (2020)[144] |

To manage these dynamics, an effective corporate governance structure supporting a circular economy governance should consider:

- **Ensuring that circular business strategies are implemented to support climate, nature and equity goals:** Conduct comprehensive materiality assessments that consider resource use and the complex interplay between environmental, social and governance (ESG) factors over both short- and long-term horizons, assessing systemic impacts and opportunities to ensure that corporate decisions on circular interventions capture them at multiple levels. This includes the use of foresight and scenario planning to anticipate rebound effects and unintended consequences.
- **Recognizing that, in addition to supporting ESG goals, circularity plays a critical role in managing risk:** Use circularity to help de-risk operations across multiple dimensions, from reducing exposure to volatile resource markets and supply chain disruptions, to lowering regulatory and reputational risks. These benefits strengthen overall business resilience and should be considered alongside other ESG priorities. Over time, the development of tools such as "circularity-adjusted risk scores" may help organizations and financial actors systematically assess circularity-related risks and opportunities (e.g., credit risk, regulatory risk or supply chain exposure).
- **Supporting inclusive decision-making processes that incorporate diverse stakeholder perspectives, with a particular focus on the Global South**: Foster participatory governance by actively engaging a broad range of voices, especially from underrepresented communities and the Global South, to ensure that circular economy strategies are equitable, context-sensitive and socially just.
- **Aligning incentives to promote and reward long-term social and environmental progress.** Recognize that this shift from short-term operational efficiency can be complex and requires systemic change. Designing performance and reward systems that support sustainable innovation, resilience and equity involves navigating trade-offs and evolving organizational mindsets, but can unlock broader, lasting value**.**

## Data governance as strategic infrastructure

Circularity data management requires appropriate governance. Governance sets the "rules of the game" as to who collects what data, who can access it, how it is verified and how it is used. Effective governance ensures data is reliable, secure and useful.

There are four key areas of data governance:

- **Technical infrastructure**: This includes tools like digital product passports (DPPs) and application programming interfaces (APIs).
- **Legal rules**: These define who owns the data, who is responsible for protecting it and how to meet regulations (like the general data protection regulation (GDPR) or the European Union (EU) Data Act).
- **Institutional roles**: These refer to who makes the rules – such as public authorities, certification bodies or industry alliances – and how those rules are enforced.
- **Values and ethics** (normative): Governance should support inclusion, fairness and data sharing without exploitation. For example, informal recyclers or small organizations should not be left out because they cannot afford high-tech systems[145,146]

Data governance also underpins circular risk management by ensuring that organizations can reliably identify and monitor risk exposures such as dependency on critical raw materials, emissions leakage and vendor compliance.

The following terms are central to understanding how digital tools support circularity and how to ensure the data behind those tools is consistent, accessible and trustworthy:

- DPP (digital product passport): A structured digital file that travels with a product and provides information on materials, composition, repairability and circular value. Think of it as a digital identity card for a product that helps with reuse, repair, refurbishing, recycling and compliance.
- API (application programming interface): A digital tool that allows different software systems to exchange data efficiently. You can think of it like a translator or adapter that connects two applications so they can talk to each other.
- ERP (enterprise resource planning): A software system that helps organizations efficiently manage all the crucial processes (e.g., supply chain and sales) and operations by connecting them together in an integrated system.[147]
- PLM (product life-cycle management): A software that streamlines product development by integrating processes across a product's life cycle, enabling global collaboration and data sharing. It provides a unified platform for managing design, engineering, manufacturing and compliance; when enhanced with technologies like artificial intelligence (AI) and internet of things, it delivers real-time insights into product performance and market needs.[148]
- Shared data standards: A formalized vocabulary or data structure that ensures everyone describes products and materials the same way. For example, if two organizations refer to polypropylene in their systems, a shared data standard helps confirm they mean the same thing.

### Federated governance models – Scaling trust and participation

Most organizations collaborate with a wide range of partners, suppliers, customers and recyclers, requiring data exchange across different systems and organizations. Federated governance models can support this complexity. This model is a decision-making and oversight system in which authority and responsibilities are distributed across semi-autonomous units, such as departments, business units or partner organizations, while maintaining coordination and alignment through a shared overarching framework. In the context of data governance, federated models enable organizations to share and govern data based on agreed-upon principles, without requiring all parties to use the same software, platform or infrastructure. This allows for interoperability, local control and alignment with shared standards or regulatory frameworks. These systems include shared "rulebooks" (guidelines on how to share and use data) and "trust frameworks" (principles that help users know the data is reliable). These allow participation even by smaller organizations or those based in different countries.

Data sharing challenges remain as small and medium-sized enterprises (SMEs) lack the technical or financial resources to meet the onboarding requirements of such systems. Standards and governance structures are also continuously evolving, which prevents organizations from planning or committing to long-term integration. Addressing these barriers will be critical to scaling inclusive and functional federated models.

### Inclusion, modularity and global equity in data governance

Capabilities vary across organization sizes and contexts. SMEs, suppliers in the Global South or actors in the informal economy may lack access to digital systems. That is why data governance should be modular and inclusive. This means:

- Providing accessible, easy-to-use tools that lower the barrier to entry, such as Excel-based templates or user-friendly web interfaces, especially for organizations with limited digital capacity.

- Enabling a step-by-step participation model where stakeholders can start with basic engagement and gradually advance to deeper integration through technical resources like open API documentation.
- Ensuring digital platforms are inclusive by offering multilingual interfaces and functionality that work in low-connectivity environments, enhancing accessibility in underserved regions.
- Offering practical and standardized resources, such as checklists, process diagrams or visual roadmaps, to help stakeholders understand requirements and implement circular strategies effectively.
- Developing tiered governance frameworks that reflect varying levels of organizational readiness, aligning each stage with corresponding circularity performance metrics and digital readiness.

Actively involving stakeholders from the Global South in shaping governance models and participating in pilot programs ensures equity, relevance and global applicability.

# Annex 8: Description of reporting principles (Stage 5.1 Prepare your disclosure)

| Interoperability | Guidance |
|---|---|
| **ESRS,**<br>**GRI,**<br>**GHG Protocol,**<br>**IR,**<br>**ISSB IFRS S1** | **1. Relevance**<br>The principle of relevance, determined by the materiality of a matter, fundamentally guides effective circularity reporting. In line with leading frameworks, the GCP defines materiality as the significance of topics or information that reflect an organization's substantial actual and potential impacts on the environment and society and your organization's capacity to create, preserve or diminish value over time, ensuring an it focuses on issues most relevant to sustainable development and informed decision-making. The GCP suggests focusing on material impacts, risks and opportunities (IROs) related to circular economy activities.<br>Materiality can be assessed from two perspectives:<br>• **Financial materiality:** Effects of circularity and resource use on financial performance and enterprise value.<br>• **Impact materiality:** Significant positive or negative effects on the economy, environment and people.<br>An IRO is material – and therefore reportable – if it is significant from either or both perspectives. This dual lens ensures a comprehensive understanding of how circularity issues may affect both business value and broader societal outcomes.<br>All material IROs to be considered across short, medium and long-term horizons to capture both current and future implications |
| **ESRS,**<br>**GRI,**<br>**GHG Protocol,**<br>**ISSB IFRS S1** | **2. Fair representation**<br>Fair representation is the provision of a complete, neutral and accurate depiction of an organization's sustainability-related impacts, risks, opportunities and performance. This means that all material circularity-related information in the scope of the assessment, as defined in Stage 2. Prepare, is included without omission or selective reporting. Fair representation ensures that reported information faithfully reflects your organization's actual circumstances, enabling users to make well-informed decisions. While absolute precision may be challenging, you should reduce uncertainties as much as practicable and clearly justify and disclose any estimations or assumptions. |
| **GRI,**<br>**GHG Protocol,**<br>**ISSB IFRS S1** | **3. Consistency**<br>Apply methodologies, terminology, data collection procedures, operational scopes and reporting periods for GCP circular performance assessments uniformly over time. This consistency enables meaningful trend analysis, robust performance tracking against targets and enhanced comparability of information. For any changes made, see the disclosure guidance in Stage 5. Communicate – Changes in reporting. |
| **GRI,**<br>**GHG Protocol,**<br>**ISSB IFRS S1** | **4. Comparability**<br>Present circular information in a way that allows for meaningful comparison across different reporting periods for the same organization, and, where appropriate, with other organizations or industry benchmarks. This enhances external transparency and allows for peer assessment. |
| **ESRS,**<br>**GRI,**<br>**GHG Protocol,**<br>**ISSB IFRS S1** | **5. Transparency**<br>Clearly, factually and coherently disclose all methodologies, assumptions, calculation methods, data sources and any significant limitations related to the GCP circular performance assessment and reporting. This fosters trust and enables stakeholders to assess the credibility of the reported information. |
| **ESRS,**<br>**IR,**<br>**ISSB IFRS S1** | **6. Verifiability**<br>Ensure audit trails, robust documentation and appropriate internal controls substantiate the reported circularity information. This allows for independent review and assurance, bolstering the credibility and trustworthiness of the data. |
| **ISSB IFRS S1** | **7. Comprehensibility**<br>Present information clearly and concisely so that users can readily comprehend its meaning and significance. |
| **ESRS,**<br>**ISSB IFRS S1** | **8. Timeliness**<br>Provide circularity information in a timely manner to support decision-making and maintain its relevance. |

*Circularity application principles*

| N/A | 9. Circularity specificity |
|---|---|
| | The design of the principles and metrics applied reflect the unique nature of the circular economy, reframing resource use as a value driver by keeping materials in use for as long as possible, designing out waste and regenerating natural systems. It moves business beyond the take-make-waste model or the “disposable economy” toward a system that is more resilient, sufficient, efficient and future-fit. By providing circularity-specific insights, the Protocol drives genuine circular practices and supports more informed financing decisions – enabling capital providers and internal stakeholders to assess, value and allocate resources effectively for circular economy initiatives. |
| **ESRS,**<br>**GRI,**<br>**ISSB IFRS S1** | **10. Systems thinking and value chain perspective**<br>During GCP circular performance assessments, consider the broader system and value chain impacts, recognizing that circular solutions often require collaboration and data collection beyond your organization's direct operational control (e.g., upstream material sourcing, downstream product end-of-life). |

# Acronyms, abbreviations and initialisms

| | |
|---|---|
| B2B | business-to-business |
| B2C | business-to-consumer |
| BOM | bill of materials |
| CTI | Circular Transition Indicators |
| COSO | Committee of Sponsoring Organizations |
| CRM | critical raw material |
| DNSH | European Commission's Do no significant harm principles |
| EFRAG | European Financial Reporting Advisory Group |
| EoL | end-of-life |
| EPD | environmental product declarations |
| ERM | enterprise risk management |
| ESPR | Ecodesign for Sustainable Products Regulation |
| ESRS | European Sustainability Reporting Standards |
| EV | electric vehicle |
| FSC | Forest Stewardship Council |
| GCP | Global Circularity Protocol for Business |
| GHG | greenhouse gas |
| GHGP | Greenhouse Gas Protocol |
| GRI | Global Reporting Initiative |
| HICL | High Impact Commodity List |
| IFRS | International Financial Reporting Standards (IFRS) |
| IBAT | Integrated Biodiversity Assessment Tool |
| IPBES | Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services |
| IPCC | Intergovernmental Panel on Climate Change |
| <IR> | integrated reporting as per the International Integrated Reporting Council |
| IRO | impacts, risks and opportunities |
| IRP | United Nations International Resource Panel |
| ISO | International Organization for Standardization |
| ISSB | International Sustainability Standards Board |
| KPI | key performance indicator |
| LCA | life-cycle analysis |
| MSA | Mean Species Abundance |
| OECD | Organisation for Economic Co-operation and Development |
| OPN | One Planet Network |
| PEFC | Programme for the Endorsement of Forest Certification |
| PPWR | Packaging and Packaging Waste Regulation |
| RACI | Responsible, accountable, consulted and informed model |
| ROSI | return on sustainable investment |
| RSPO | Roundtable on Sustainable Palm Oil |
| SASB | Sustainable Accounting Standards Board |
| SBTi | Science Based Targets initiative |
| SBTN | Science Based Targets Network |
| SROI | social return on investment |
| SRS | UK Sustainability Reporting Standards |
| SME | small and medium-sized enterprise |
| STAR | Species Threat Abatement and Restoration |
| TCFD | Task Force on Climate-related Financial Disclosures |
| TNFD | Taskforce on Nature-related Financial Disclosures |
| UNEP | United Nations Environment Programme (UNEP) |
| UNGP | United Nations Guiding Principles |
| WBCSD | World Business Council for Sustainable Development |

# Glossary

**A**

**Assessment level:** The scale at which a circular performance assessment is conducted, such as at the material, product, business unit or organization level. The assessment level determines the scope, depth and granularity of the analysis, including the relevant unit of analysis, time frame and material flow boundaries.

**B**

**Baseline performance:** The initial state of an organization, product or material system's circularity performance, used as a reference point against which organizations measure future progress or improvements. It is typically linked to a specific point in time or reporting year.

**Biodegrade**: Microbial (bacteria and fungi) breakdown of organic matter in the presence of oxygen to produce soil with high organic (humus) content. (CTI v4.0, 2023)

**Boundaries**: In the context of the Global Circularity Protocol (GCP), boundaries are lines that help in defining the scope of the assessment and ensure that all relevant material flows are accounted for in the circular performance assessment.

- **Operational boundaries:** Define the specific activities, processes and interactions within an organization's direct operations and wider value-chain, attributed to the circularity potential of the material flows. They provide an understanding of the material inflow, outflow and the stages of the material or product life cycle, which are considered when evaluating environmental, social and economic impact.
- **Organizational boundaries:** Delineate the specific corporate entities included in the scope of an organization's circular performance assessment for the GCP. Organizational boundaries provide understanding of the organization's direct operations and the level of control and influence over specific entities

**By-products:** Unintended but inevitable additional material stream of material processing that is not the intended main product. (CTI v4.0, 2023)

**C**

**Cascading:** repeated use of a resource usually starting at a level of high value with decreasing quantity and quality at each subsequent stage or cycle, depending on the processes used (ISO 59004, 2024).

**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. (ISO 59004, 2024)

**Circular economy principles** (Ellen Macarthur Foundation, 2024):

- Design out waste and pollution
- Keep products and materials in use
- Regenerate natural systems

**Circular inflow:** Inflow that is:

- renewable inflow and used at a rate in line with natural cycles or renewable
  or
- non-virgin. (CTI v4.0, 2023)

**Circular models:** Business models designed for renewability, long life, optimal (re)use, refurbishment, remanufacturing, recycling and biodegradation. (Adapted from CTI v4.0, 2023)

**Circular performance:** The degree to which an organization's products, processes or operations align with the objectives and principles of the circular economy by preserving resource value, supporting sustainable development and decoupling resource use from economic growth.

**Circular recovery systems**: Measures the extent to which materials are recovered at the end of their useful life through close or open loop systems.

- **Closed loop recovery system:** Processes where materials are recovered and reintegrated into the same or equivalent function within the same production cycle.
- **Open loop recovery system:** Recovering materials and reintegrating them into different functions or production cycles.

**Circular risk:** The exposure to effects of circular business practices – requiring new ways of operating to preserve goods and materials, foster collaboration across supply chains and align incentives among all parties involved. (Adapted from Kopgroep Circulair Financieren, 2022)[cxlix]

**Circularity-specific thresholds:** Science-based quantitative or qualitative criteria that define the minimum levels of materiality at which circularity-related impacts, risks or opportunities become significant enough to warrant prioritization within an organization's assessment, management and disclosure processes. These thresholds establish clear cutoffs to identify which materials, processes or activities exceed defined environmental, social or economic significance aligned with global climate and sustainability frameworks such as the Science Based Targets initiative (SBTi) and the Science Based Targets Network (SBTN).[cl]

**Circularity**: Degree of alignment with the principles for a circular economy. (ISO 59004, 2024)

**Circularity assessment:** Evaluation and interpretation of results and impacts from a circularity measurement. (ISO 59004, 2024)

**Circularity data:** The standardized information on the circularity aspects that other stakeholders could use partially or entirely to enable circular evaluation of the product. For this reason, circularity data can be information collected and/or measured. (Adapted from ISO PCDS 59040, 2025)

**Circularity hotspots**: Areas in the value chain with significant potential for resource recovery, reuse, regeneration or waste and emissions reduction.

**Circularity measurement:** Process to help determine the circularity performance through collection, calculation or compilation of data or information. (ISO 59004, 2024)

**Control**: In the GCP (especially when setting boundaries, in Stage 2. Prepare) "control" is the ability of an organization to direct the policies of another operation. More specifically, it is defined as either operational control (the organization or one of its subsidiaries has the full authority to introduce and implement its operating policies at the operation) or financial control (the organization has the ability to direct the financial and operating policies of the operation with a view to gaining economic benefits from its activities). (Adapted from GHG Protocol, 2004)

**Corporate system**: Material flows in an organization's direct operations, where design, sourcing, production and logistics decisions influence circular outcomes.

**D**

**Decision-useful information:** Information that enables stakeholders to make well-informed decisions by providing relevant insights with predictive and confirmatory value. In the context of the GCP, it supports the assessment of sustainability impacts, resilience to risks and opportunities for value creation across different time horizons. (Adapted from European Financial Reporting Advisory Group – EFRAG, 2025)

**Decoupling:** Decoupling is when resource use or some environmental pressure either grows at a slower rate than the economic activity that is causing it (relative decoupling) or declines while the economic activity continues to grow (absolute decoupling). This indicates the ideal goal of resource efficiency, through the notion of decoupling – that economic output and human well-being will increase at the same time as rates of resource use and environmental degradation slow down and eventually decline to levels compatible with planetary boundaries (thereby enabling resource use and the delivery of ecosystem goods and services to be sustained for future generations). (International Resources Panel)

**Dematerialization**: Describes decreasing the material requirements of whole economies. It requires (a) reducing the material intensity of products and services, i.e., by increasing material efficiency and (b) especially reducing the use of primary material resources (such as ores, coal, minerals, metals, etc.) by improving recycling and reuse of secondary materials (i.e., shifting to a circular economy). It is frequently regarded as a necessary condition for the sustainable development of economies and is synonymous with absolute resource decoupling. (International Resources Panel)

**Double materiality assessment:** In the context of the GCP, a double materiality assessment is an approach that helps organizations identify, prioritize and disclose where circular strategies intersect with both environmental goals and financial exposure, ensuring that actions taken are meaningful to stakeholders and economically viable.

- **Impact materiality assessment:** Understanding how your organization's activities affect the environment and society and thus which material impact your organization is making.
- **Financial materiality assessment**: Evaluating how environmental and social factors linked to circularity affect your organization financially and thus which material risks and opportunities the environment is creating for your organization.

**Downcycling:** recycling activities that obtain recovered resources with a lower value (ISO 59 004, 2024). Downcycling indicates a loss of the material's or product's original characteristics that precludes use in a similar function to its previous cycle (functional equivalence). Downcycling is usually used to describe a product's material properties, their level of degradation or, in the case of metals, if they have become impure, which leads to a loss of economic value. (CTI v4.0, 2023). Incineration is excluded from downcycling because it does not return materials to productive use but remove them permanently from circulation. Note, the GCP will provide further guidance on downcycling in future versions in the absence of an ISO definition.

**Downstream:** The activities that occur in the later stages of the life cycle. This includes product assembly, distribution, use and end-of-life processing and management. (Adapted from ISO LCA 14040; ISO 14044, 2006). In the context of the GCP and to steer away from linear thinking, the Protocol adopts a Cradle-to-Cradle approach.

**Durability:** The ability of a product to function as required, under specified conditions of use, maintenance and repair, until a limiting event prevents its functioning. (CTI v4.0, 2023)

## E

**Economic system:** In relation to material flows, the economic system encompasses the collective of activities – from resource extraction, production, manufacturing, to consumption and waste management – that determine how materials are valued, used, managed within a society, geography or sector.

**Environmental system:** Represents the biosphere and the source and sink of resources (ISO 59020). In relation to material flows, the environmental ecosystem, in the context of the GCP, refers to the network of biological and naturally occurring resources which is attributed to the material extraction, processing, use and disposal.

## F

**Functional equivalence:** The state or property of being equivalent (or equal) in function. In the context of the GCP, this defines an outflow (a product, product part, waste stream, etc.) designed so that it is technically feasible and economically viable to bring it back to inflow (as a material, product part, etc.) preserving a similar function to its previous cycle. For example, it is possible to recycle the plastics used in mobile phones for kitchen appliances because properties like strength and aesthetics are equivalent.

## G

**GCP indicators**:

- **% circular inflow:** The share of input materials that are non-virgin or renewable (Close the Loop).
- **% circular outflow**: The share of output materials that are recoverable (recovery potential) and actually recovered (Close the Loop).
- **% material circularity**: The weighted average of the % circular inflow and % circular outflow for a given product (group or portfolio), business unit or organization (Close the Loop).
- **% critical materials:** The share of input materials classified as critical (Close the Loop); an organization may refer to internal critical materials list or existing public national or regional lists (such as European Commission 30 critical raw materials list or United States list of 35 critical minerals).
- **% recovery type**: The type of recovery (reuse, recycling, etc.) applied to outflow materials (Close the Loop).
    - **% recovery potential**: The extent to which products and materials are designed for recovery, considering strategies such as modularity, disassembly and recyclability.
    - **% actual recovery**: The share of materials that is effectively recovered in practice, based on factors such as existing take-back systems, collection infrastructure and treatment processes.
- **Absolute dematerialization:** Measures the total reduction in material use required to deliver the same function, regardless of time or output volume (Narrow and Slow the Loop).
- Relative dematerialization: Measures the change in material use per unit of function delivered, in relation to a baseline unit of function, rather than total material use (Narrow and Slow the Loop).
- **Actual lifetime**: Measures the average duration of product use before disposal or recovery (Narrow and Slow the Loop).
- **Circular material productivity:** Measures revenue generated per unit of linear material input (Value the Loop).
- **Material circularity revenue:** The revenue generated by a product (group or portfolio), business unit or organization multiplied by its % circularity (Value the Loop).

- **GHG impact:** Measures emissions savings from circular sourcing and recovery (Impact of the Loop).
- **Nature impact:** Assesses land use and biodiversity impacts of material inflow (Impact of the Loop).
- **Social impact:** Evaluates social risks and opportunities in circular transitions (Impact of the Loop).

**GCP modules**: The structuring of GCP indicators across two assessment areas:

- **Close the Loop module:** A circular performance assessment focused on circular inflow, recovery potential and actual recovery.
- **Narrow and Slow the Loop module**: A circular performance assessment focused on material efficiency, material reduction and product longevity.
- **Value the Loop module**: A value and impact assessment focused on business value creation from circular strategies.
- **Impact of the Loop module:** A value and impact assessment focused on environmental and social impact of circular strategies.

**Guidance**: structured recommendations, explanations or supporting materials provided to assist organizations in interpreting and applying the steps, principles or methodologies outlined in the GCP.

## I

**Inflow:** Resources that enter the organization, including materials, parts or products (depending on an organization's position within the supply chain); not included are water and energy, which are part of the specific water and energy indicators. (CTI v4.0, 2023)

- **Virgin inflow:** Inflow not previously used or consumed (primary). (CTI v4.0, 2023)
- **Non-virgin inflow**: Inflow previously used (secondary), e.g., recycled materials, second-hand products or refurbished parts. (CTI v4.0, 2023)

## L

**Land-use change: T**he conversion of natural areas into human-dominated landscapes, caused by activities such as urbanization, deforestation, agriculture and infrastructure development. This process is a key driver of biodiversity loss. Addressing land-use change is vital to preserving biodiversity and ensuring sustainable development. (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES))

**Life-cycle assessment (LCA):** A systematic method for evaluating the environmental impacts of a product, process or service throughout its entire life cycle: from raw material extraction to disposal. It helps identify opportunities to improve sustainability by analyzing energy use, emissions and resource consumption at each stage. (ISO 14040, 2022)

**Linear inflow:** Virgin, non-renewable resources. (CTI v4.0, 2023)

**Linear outflow:** Outflow that is not classifiable as circular. This means that the outflow: is not circular in design, consists of materials treated in a manner that they have no recovery potential OR neither demonstrably recovered nor flowing back into the economy. (CTI v4.0, 2023)

**Linear risk**: The exposure to the effects of linear business practices – use scarce and non-renewable resources, prioritize sales of new products, fail to collaborate and fail to innovate or adapt – which will negatively impact an organization's license to operate. (WBCSD, 2018)

**Losses:** unmanaged outflows of a resource from the system in focus that are not recovered. (ISO 59004, 2024)
*Note 1 to entry:* For the purpose of measuring circularity performance, losses can be estimated.
*Note 2 to entry*: Losses can happen at any stage of the life cycle, such as wear and tear in the use stage (e.g., tire abrasion, microplastic).

## M

**Material flow:** In the context of the GCP, material flows are the physical movement of nutrients, compounds, materials, parts, components or products into, through and out of a given system, defined by system boundaries. For readability, the GCP refers to all of these as material flows. (Adapted from CTI v4.0, 2023; International Resources Panel)

- **Direct material flows:** Material flows from operations the measuring or reporting organization owns or controls. (Adapted from the GHG Protocol)
- **Indirect material flows**: Material flows that occur in the organization's value chain at operations owned or controlled by another organization or user/consumer. (Adapted from the GHG Protocol).

**Material resources:** Referred to in the GCP as "materials", these are biomass (like crops for food, energy and bio- based materials, as well as wood for energy and industrial uses), fossil fuels (in particular coal, gas and oil for energy), metals (such as iron, aluminum and copper used in the built environment and electronics manufacturing) and non-metallic minerals (e.g., sand, gravel and limestone). (Adapted from International Resources Panel).

## N

**Natural resources:** A resource occurring in nature. Natural resources usually have not been subjected to any human-related processing or modification. Natural resources are acquired or extracted from the environment or nature (the geosphere or biosphere) into the technosphere and emissions to air, water or land are released from the technosphere into the environment. (ISO 59004, 2024)

## O

**Operation:** A generic term used to denote any kind of business, irrespective of its organizational, governance or legal structures. An operation can be a facility, subsidiary, affiliated organization or other form of joint venture. (GHG Protocol, 2004)

**Organization**: Person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives. (ISO 59004, 2024)

*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 (e.g., foundation, union, association, agency, municipality, region, country, intergovernmental agencies).

*Note 2 to entry:* A group of organizations can also be considered as an organization that has, alone or collectively, their own objectives.

**Outflow:** Material flows that leave the organization, including materials, parts, products, by-products and waste streams (depending on its position in the supply chain). (CTI v4.0, 2023)

## P

**Principle:** Fundamental basis for decision-making or behavior. (ISO 26000, 2010)

**Product:** Typically considered as the manufactured good assembled of resources and materials. Products are designed in aim to fulfil a specific use. (Adapted from ISO 9000, 2015)

**Protocol:** A standardized set of guidelines, rules or methodologies that define how specific market-related activities should be conducted. Protocols are essential in ensuring consistency, transparency and accountability. They also serve as frameworks that enable users to measure, report and verify, thereby facilitating compliance, communication and benchmarking.

## R

**R-strategies:** refuse, rethink, reduce, reuse, repair, refurbish, remanufacture, repurpose, recycle and recover. (Kirchherr et alii, 2017).

**Reasonable effort:** Actively pursuing data collection through established internal systems and outreach to value chain actors. (GHG Protocol, 2004; ESRS, 2022)

**Recovery**

- **Material recovery** is the method of recapturing and reutilizing recoverable resources specifically for reuse, refurbishing, remanufacturing, recycling or other methods that add or retain value of a resource. (ISO, 59004, 2024)
- **Energy recovery** is the generation of useful energy through the direct and controlled transformation of recovered resources. (ISO, 59004, 2024)

**Recovery types:** The different forms of material recovery, such as (in order of the recirculation loops in the Ellen MacArthur Foundation's Circular Economy System Diagram or butterfly diagram). (CTI v4.0, 2023):

- **Reuse:** To extend a product's lifetime, with or without a change of ownership, beyond its initially intended life cycle, without modification to the product or its functionality (Adapted from CTI v4.0, 2023).
- **Repair:** To extend a product's lifetime by restoring it after breakage or tearing, without changes made to the product or its functionality.
- **Refurbish**: To extend a product's lifetime by large repair, potentially with replacement of parts, without changes made to the product's functionality.
- **Remanufacture:** To disassemble a product to the component level and reassemble (replacing components where necessary) to as-new condition with possible changes made to the functionality of the product.
- **Recycle**: To reduce a product back to its material level, thereby allowing the use of those materials in new products.

**Regenerative**: To have the ability to restore material resources and improve ecosystem health to ensure productivity and other benefits (e.g., carbon capture, biodiversity and other ecosystem services). Note that regeneration goes beyond retaining the status quo of natural systems that may already have degraded from their initial state. (Ellen MacArthur Foundation, 2019 CTI v4.0, 2023)

**Releases:** Managed emissions to air and discharges to water or land from the system in focus. (ISO 59004, 2024)
*Note 1 to entry:* Releases can be solid, liquid or gaseous.
*Note 2 to entry*: For the purpose of measuring circularity performance, releases are quantifiable but are not recovered at the time of emission or discharge.
*Note 3 to entry:* Releases can happen at any stage of the life cycle (e.g., car emissions).

**Renewable inflow**: Sustainably managed resources, most often demonstrated by internationally recognized certification schemes like the Forest Stewardship Council (FSC), Programme for the

Endorsement of Forest Certification (PEFC), Roundtable on Sustainable Palm Oil (RSPO), etc. that, after extraction, return to their previous stock levels by natural growth or replenishment processes at a rate in line with use cycles. Therefore, they are replenished/regrown at a faster rate than harvested/extracted. (Organization for Economic Co-operation and Development (OECD), 2008; CTI v4.0, 2023)

**Reporting:** Presenting data to internal management and external users such as regulators, shareholders, the general public or specific stakeholder groups. (GHG Protocol, 2004)

**Resources:** Resources – including land, water, air and materials – are parts of the natural world that can be used in economic activities to produce goods and services. Material resources, referred to in the GCP as “materials”, are biomass (like crops for food, energy and bio- based materials, as well as wood for energy and industrial uses), fossil fuels (in particular coal, gas and oil for energy), metals (such as iron, aluminum and copper used in construction and electronics manufacturing) and non-metallic minerals (used for construction, notably sand, gravel and limestone). (Adapted from International Resources Panel)

**Rules**: In the context of the GCP, rules are ways that the user is expected to adhere to, at a minimum, for a particular activity, measurement and/or calculation.

## S

**Scope:** Defines the operational boundaries in relation to direct and indirect material flows. (Adapted from the GHG Protocol, 2004)

**Social system**: The people, cultures and communities that shape and are shaped by material flows. This includes labor conditions, public health, equity and cultural norms, as well as behaviors and attitudes toward consumption, reuse and sustainability.

**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. (ISO Guide 82, 2019)

**System**: Set of interrelated or interacting elements. (ISO 9000, 2015)

**System boundary:** The boundary representing the physical, process, temporal and geographical limits of what is included and what is not included in the circularity performance and impact assessment. These boundaries delineate the material interaction with the environmental system, economic system and social system.

**Systems thinking**: Organizations take a life-cycle perspective and apply a long-term approach when considering their impacts on environmental, social and economic systems. (ISO 59004, 2024)

## T

**Traceability**: Ability to trace the history, application and location of that which is under consideration. (ISO 59004, 2024)

## U

**Upstream**: The activities that occur in the earlier stages of the product’s or material’s life cycle. This typically includes raw material extraction, process and manufacturing of components. (Adapted from ISO 14040, 2006). In the context of the GCP and to steer away from linear thinking, the Protocol adopts a cradle-to-cradle approach.

**Traceability:** The ability to trace the history, application and location of that which is under consideration. (ISO 59004, 2024)

## V

**Value:** Gain(s) or benefit(s) from satisfying needs and expectations, in relation to the use and conservation of resources. (ISO 59004, 2024)

**Value chain:** The full set of interconnected activities (i.e., primary and secondary) across the life-cycle stages of the subject under assessment, through which value is created, delivered or conserved, involving stakeholders and actors contributing to the various life-cycle stages.

**Verification**: An independent assessment of the reliability (considering completeness and accuracy) of a material inventory or circular performance and impact assessment. (Adapted from GHG Protocol, 2004)

**Virgin resources:** Natural resources or energy that are used as resources for the first time as input in a process or for creating a solution. (ISO 59004, 2024)

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To ensure the highest integrity, technical and scientific standards, the GCP formed a Policy, a Business and an independent Scientific Advisory Committee. The authors wish to thank the following committee members for their continued active support and review of this publication:

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The publication has been developed through an iterative process that incorporated input and feedback from a broad range of stakeholders, including business leaders, scientific and academic institutions, think tanks, non-governmental organizations, civil society representatives, and policymakers. While every effort has been made to reflect the diverse perspectives shared throughout this process, the final content remains the sole responsibility of WBCSD and OPN. The views expressed by individual participants are personal and do not necessarily represent those of their respective organizations or employers.

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The report builds upon the findings of previous Global Circularity Protocol (GCP) publications and reflects work conducted between July 2023 and November 2025. This document constitutes the first edition of the Global Circularity Protocol for Business (GCP, Version 1.0). Future iterations of the GCP may update, refine, or replace the concepts and methodologies presented in this version in response to stakeholder feedback, evolving practices, or new technical developments.

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# Attribution



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The World Business Council for Sustainable Development is the leading community of over 250 global businesses making sustainability performance a key driver for competitiveness. Established in 1995, WBCSD is a non-profit member-led organization that connects business leaders through all sectors and major economies, and creates the tools and frameworks to scale collective impact, drive cross-sector innovation, and shape an ambitious, enabling policy agenda. We operate from seven offices worldwide — in Geneva, New York, Chicago, Amsterdam, London, Singapore and Wuhan — enabling collaboration across value chains and geographies. Together with our members, we are rewiring economic and financial systems to support the transition to a net-zero, nature-positive, and inclusive future that creates business value.

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The One Planet network is a global community of practitioners, policymakers and experts, including governments, businesses, civil society, academia and international organisations, that implements the 10-Year Framework of Programmes on Sustainable Consumption and Production and works towards achieving SDG 12: ensuring sustainable patterns of consumption and production. It is comprised of thousands of individual members; six thematic programmes and their partner organisations; numerous working groups; and over 140 national focal points for sustainable consumption and production within country governments. Serving as the secretariat of the 10YFP, the United Nations Environment Programme facilitates the One Planet network. Collectively, the One Planet network holds enormous experience and expertise on sustainable consumption and production, and houses a global repository of projects, policies, tools and resources.

The One Planet network inspires a global movement for sustainable consumption and production, facilitating collaboration, cooperation and coordination to increase our combined knowledge, effectiveness and impact.

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In LCA, a functional unit is a quantified description of the primary function of a product or system, serving as the reference point for all inputs and outputs in the analysis.

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[121] We will publish tables showing the GCP's alignment with these standards in future versions.

[122] For a detailed understanding of the alignment of the GCP with ESRS and Taskforce on Nature-related Financial Disclosures (TNFD), an alignment table guidance will be available in future versions.

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[cl] We will update the definition in the next version(s) of the GCP.


Global
Circularity
Protocol
for business
Powered by
World Business
Council
for Sustainable
Development
One planet
handle with care