Embedding
PROJECT

WASTE AND CIRCULARITY

Product and Materials Stewardship

A GETTING STARTED GUIDE

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A Getting Started Guide

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ABOUT THIS SERIES

This guide is part of our series of Getting Started Guides that supports your company to develop an embedded strategy. Each guide tackles a specific sustainability sub-issue and explores what your company needs to do to support the resilience of the environmental and social systems around you.

In each guide, we address relevant trends, system thresholds, key concepts, key actors, and key resources. We also offer guidance on how to address the impacts of your operational and value chain activities and develop credible goals as well as outlining key corporate actions and internal targets that can help to provide clarity on the work ahead.

We recommend you read the first guide in the series, *Getting Started Guides: An Introduction*, which explains our overall approach and clarifies the value of setting a clear strategy anchored in your company's most material issues. It also explains how you can leverage process-based interim targets to clearly outline the specific actions that your company needs to take to achieve its high-level goals.

A complete list of sustainability issues and sub-issues can be found in our guide *Scan: A Comprehensive List of Sustainability Issues for Companies*.

This guidebook addresses the sub-issue of **product and materials stewardship** as part of the broader issue topic of waste and circularity.

Zero waste can encompass a wide range of distinct activities, including operational waste, product stewardship, materials stewardship, and packaging waste. Often, the components of this work may sit within different functional teams in your organisation, but feature overlapping priorities.

This guide is focused primarily on taking action on **product and materials stewardship** to separate out different levels of work that will be required to reach this ambition. Efforts towards product and materials stewardship are intrinsically linked and complimentary to the work outlined in the *Zero Waste: A Getting Started Guide* and *Packaging Waste: A Getting Started Guide.*

1 SETTING THE STAGE – THE NEED FOR STEWARDSHIP

There are rising global demands for producers to engage in product and materials stewardship by taking responsibility to minimise their products' environmental and social impacts throughout all stages of the product life cycle.

Over the last fifty years, global resource use has tripled, and by 2060 it is projected to rise by 60% from 2020 levels. Municipal solid waste is projected to nearly double by 2050 without urgent action on waste prevention and management. At the same time, the share of secondary materials in the global economy has declined, falling from nearly 9% to 7% over the last 5 years. This paints a bleak picture - we are consuming more than ever before, generating more waste than ever before, and failing to recover materials for re-use.

As countries grapple with the increasing complexity of the waste crisis, Extended Producer Responsibility (EPR) has become a key policy approach to drive product and materials stewardship. EPR has been successfully implemented in over 30 countries and nearly 400 EPR schemes exist across the world. The United Nations Environment Program (UNEP) describes EPR as "a concept where producers (including manufacturers, importers, distributors and retailers etc.) of products bear a significant degree of responsibility for the environmental impacts of their products throughout the product life-cycle, including upstream impacts inherent in the selection of materials for the products, impacts from manufacturers' production process itself, and downstream impacts from the use and disposal of the products."

To reduce resource use and minimise waste, we need to fundamentally transform our current processes of production and consumption. Businesses need to take responsibility for the environmental and social impacts of their products and design products to minimise the impacts a product has throughout its entire lifecycle. To do this, companies are pursuing circularity and incorporating circular design principles to improve product longevity, increasing end-of-life potential by planning for repair and disassembly, and integrating reuse systems to harness value from surplus products and existing waste streams. Companies also need to support reliable recovery and collections systems in under resourced regions to recapture value from products at the end of their lifecycle where possible.

Note: *In these guides, a system threshold is defined as the point at which the resilience of an environmental, social, or economic system becomes compromised. This occurs when the total impacts imposed on the system exceed its capacity to assimilate those impacts.*

SYSTEM THRESHOLD

The take-make-waste model of production is increasing resource scarcity. If this continues, we will exceed the global economy's capacity to viably supply necessary goods and services. Crossing this threshold will cause price shocks and limit access to necessities with significant cascading consequences for human wellbeing. In addition, the take-make-waste model leads to the accumulation of waste and pollution in the natural environment. Different types of waste place stress on biological and social systems that can lead to the transgression of localised thresholds that compromise ecosystem function (e.g. ocean plastics, nutrient runoff) and human health (e.g. microplastics, PFAS). Companies cannot continue to rely on Earth's or society's capacity replenish the materials they use and to assimilate the waste that they produce. This means that they need to transition to more circular models that reduce total material usage and minimise negative impacts of materials and products throughout their entire lifecycles.

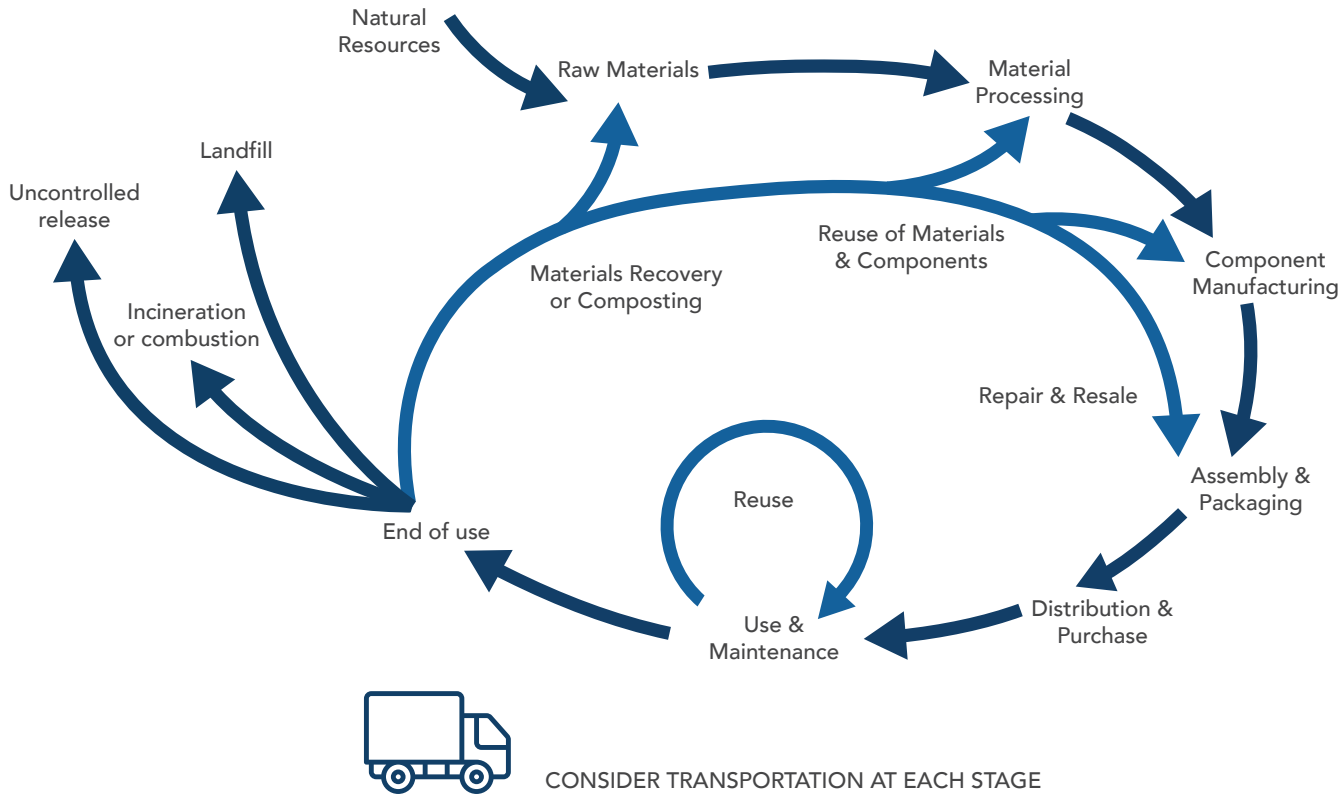
KEY TOPICS IN PACKAGING WASTE:

- Managing product lifecycle
- Improving product longevity
- Preventing spoilage
- Reducing overage and unsold goods
- Reducing defective products
- Design for repair and disassembly
- Circularity
- Beneficial reuse for surplus
- Maintaining goods to extend working life
- Recovery and collections systems
- Resource efficiency in your processes and your value chain
- Limiting the use of virgin and non-renewable resources
- Achieving maximum use from resources

2 KEY CONCEPTS IN PRODUCT AND MATERIALS STEWARDSHIP

Materials stewardship is defined by ICMM as the "range of activities required for optimal and appropriate use of …[materials] in society." This requires an "understanding [of the] social, environmental, and economic impacts of materials as they move through the life cycle from from [raw materials] to use and through to the end of their life."

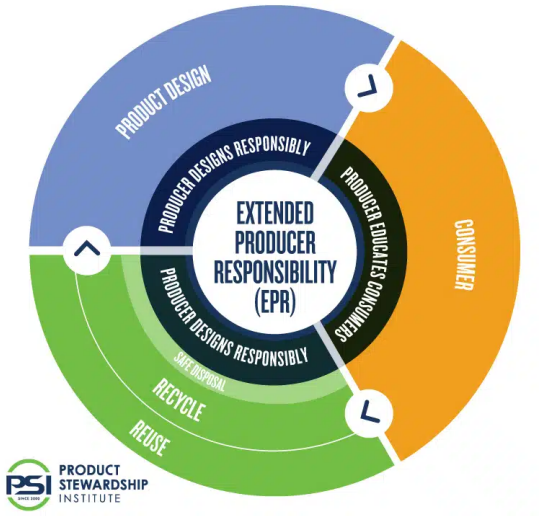
Life cycle thinking is a way of conceptually understanding (and in the case of life cycle assessment – quantifying) the environmental and social impacts of your products, processes, and services across their full life from the point of creation through to the end of their useful life. Life cycle thinking is anchored in systems thinking and whole systems approaches, which bring an awareness that our choices are not isolated, but instead, influence a larger system.



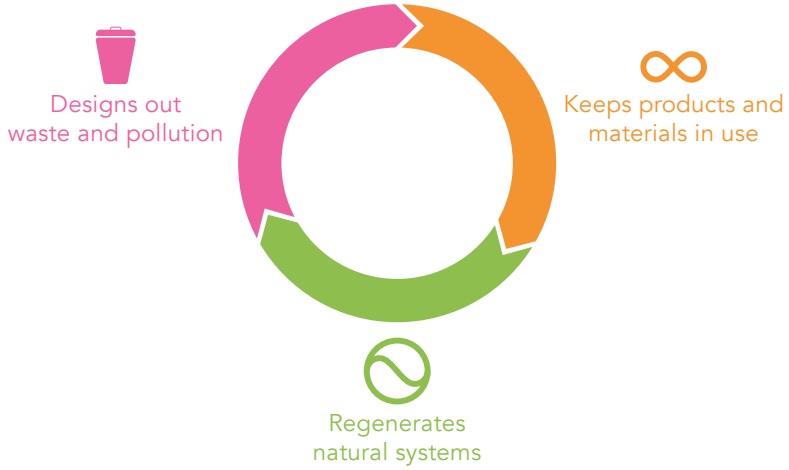
Note: *This graphic only includes the key stages of the life cycle. Consider the social and environmental impacts of products at each stage of its lifecycle, including transportation. For more insight onto environmental and social issues at each stage, see Life Cycle Thinking: A Guide*

Extended Producer Responsibility (EPR), as described by the Product Stewardship Institute, is "a mandatory type of product stewardship required by law. It includes, at a minimum, the requirement that the manufacturer's responsibility for its product extends to post-consumer management of that product and its packaging." Successfully implemented EPR schemes can be a powerful tool to drive the transition to a circular economy.

A **circular economy,** as described by the Ellen MacArthur Foundation, is a "system where materials never become waste and nature is regenerated. In a circular economy, products and materials are kept in circulation through processes like maintenance, reuse, refurbishment, remanufacture, recycling, and composting."

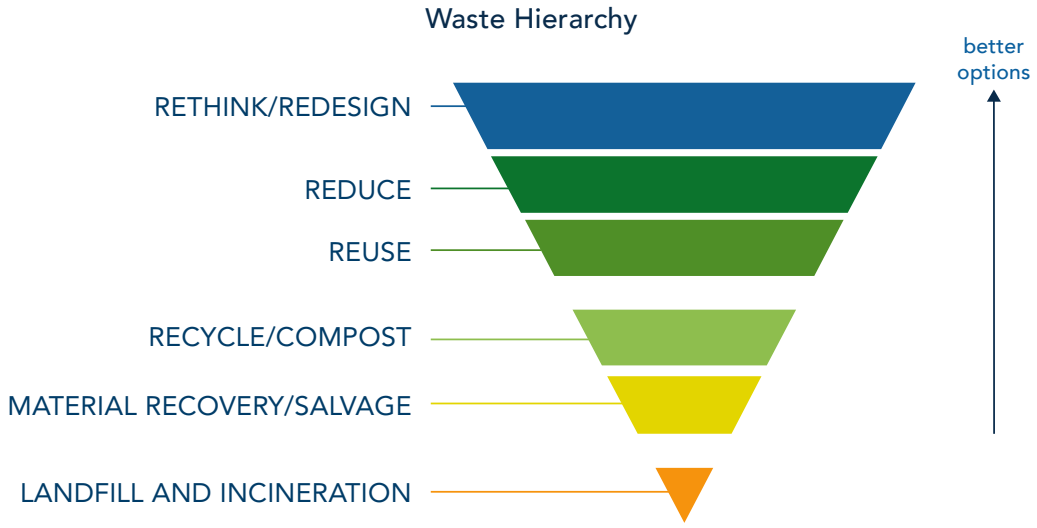


Extended Producer Responsibility
Source: Product Stewardship Institute



Circular Economy
Source: Embedding Project

Waste hierarchy: When tackling the issue of product and materials stewardship, the waste hierarchy is a helpful framework to identify and prioritise opportunities to reduce and eliminate waste.



Waste Hierarchy
Source: Adapted from Zwia

Additional terms and definitions:

Linear economy: "A system where resources are extracted to make products that eventually end up as waste and are thrown away. Products and materials are generally not used to their full potential in a linear economy and, as the name suggests, always move in one direction – from raw material to waste." Ellen MacArthur Foundation

Technical cycle: "One of two fundamental cycles for keeping products and materials in circulation. The technical cycle involves, the reuse, repair, remanufacture, and recycling of products." Ellen MacArthur Foundation

Biological cycle: "One of two fundamental cycles for keeping products and materials in circulation. The biological cycle applies to biodegradable materials. It involves returning products to earth through processes like composting and anaerobic digestion." Ellen MacArthur Foundation

Biodegradable: "Able to be broken down into carbon dioxide, water, and biomass by the natural action of microorganisms over an unspecified length of time and in undefined conditions." Ellen MacArthur Foundation

Compostable: "Able to be broken down into carbon dioxide, water, and biomass within a specific time-frame under specific conditions. This can mean either home-compostable (at ambient temperatures and with a natural microbial community) or industrially compostable (under increased temperatures, humidity, and specifically formulated microbial conditions). Compostable material can be made from either bio-based or petro-chemical inputs." Ellen MacArthur Foundation

Note: There are variations on the definitions of biodegradable and compostable – other definitions may include concepts such as toxicity and nutrient value or include other technical components of the process.

3 KEY PLAYERS IN PRODUCT AND MATERIALS STEWARDSHIP

LIFE CYCLE INTIATIVE

The Life Cycle Initiative, hosted by UNEP, promotes life cycle knowledge, which reveals the unintended trade-offs between the social, environmental, and economic impacts of circular approaches.

ELLEN MACARTHUR FOUNDATION

The Ellen MacArthur Foundation creates original research and resources to support the transition to a circular economy. They are well-known for their work on eliminating plastic pollution which has brought together more than 1,000 public and private organisations.

INTERNATIONAL RESOURCE PANEL

The International Resource Panel, hosted by UNEP, creates and shares knowledge about the world's most pressing resource issues and conducts research needed to improve the use of resources around the world.

BIOMIMICRY INSTITUTE

The Biomimicry Institute aims to embed learnings and solutions from nature to inspire and design effective, efficient, and sustainable approaches to products, polices, and other challenges.

4 COMMITTING TO TAKE ACTION – MID- AND LONG-TERM GOALS

Committing to take action on product and materials stewardship can include addressing many of the key topics listed above. The mid- and long-term commitments that your organisation elects to make will be based on your identified priorities, areas of greatest impact, and your capacity to undertake the work required. It is important to note that this section does not provide all possible mid- and long-term goals related to this issue. Below, we share our understanding of current corporate action and goals by offering a sample of the goals that were most frequently adopted by organisations in our research.

Common mid- and long-term goals and/or commitments related to **product and materials stewardship** include variations of the following:

Long-term goal: Take responsibility for the impacts of products throughout their entire lifecycle by 20[XX]

- Design products for longevity and eventual circulation through maintenance, reuse, refurbishment, remanufacture, recycling, and/or composting by 20[XX]
- Increase the use of recycled and renewable materials in products by [X]%
- Offer solutions for repair, refurbishment, and/or reselling to extend the life of products and/or develop take-back models to recover materials for reuse by 20[XX]

Long-term goal: Take responsibility for the impacts of materials throughout their entire lifecycle by 20[XX]

- Reduce resource use of virgin and non-renewable resources by [X]% by 20[XX]
- Increase resource efficiency in processes and throughout the value chain by [XX]% by 20[XX]
- Achieve maximum use from resources and circulate materials at their highest value

Are you setting new goals or interested in benchmarking your goals against leading practice? To help advance progress in credible corporate sustainability goals, we maintain a public goals database containing leading sustainability goals and commitments set by large companies globally.

Explore our Sustainability Goals Database for more mid- and long-term goals on **product and materials stewardship**.

5 HOW TO GET THERE – PROCESS-BASED INTERIM TARGETS

Note: *The following proposed timelines are only for guidance and are based on the pace outlined by other companies. The timeframe for actions and work for each step needs to be embedded in your organisational context, which may require different time allocations.*

YEAR 1: UNDERSTAND EXTENDED PRODUCER RESPONSIBILITY (EPR)

Begin by building an understanding of EPR and how it applies to your organisation. Identify whether there are mandatory and voluntary EPR systems in place in the regions where you operate, if these systems tie producer responsibility to performance targets, and what that means for your company's practices. Also, look to familiarise your organisation with the key objectives and principles of EPR. The graphic below from the WWF displays the roles and responsibilities of different stakeholders in the EPR system:

STAKEHOLDER	ROLES & RESPONSIBILITY IN THE EPR SYSTEM
RAW MATERIALS SUPPLIERS, MANUFACTURERS AND COVERTERS OF PACKAGING MATERIAL	• Provide packaging material for producers and importers - either virgin material or secondary resources • Their packaging design/material is a crucial determinant for the reusability and recyclability of the packaging waste
PRODUCERS, AND IMPORTERS OF PACKAGED GOODS, SERVICE PACKAGING AND SPECIFIC NON-PACKAGING ITEMS (OBLIGED COMPANIES)	• Put the system-relevant goods on the market by selling imported products or locally produced goods in packaging (comprises of both SMEs and MNCs) • Responsible for their packaging waste to be properly collected, sorted, and recycled • Register relevant packaging and products with the Producer Responsibility Organisation and pay EPR fees
DISTRIBUTERS, FOOD OUTLETS & RETAILERS OF PACKAGED GOODS	• An interface between the private sector and end consumers of packaged products • Contribute to informing consumers about environmentally sound packaging waste handling • Could implement take-back responsibility by providing collection bins/sites for consumers
CONSUMERS	• Correctly dispose of packaging and products through waste separation at source to ensure high-quality recycling • Strive for waste reduction, opt for unpackaged goods and products and reuse packaging as often as possible
WASTE MANAGEMENT OPERATORS	• Receive funds from *the* Producer Responsibility Organisation for their services in collecting, sorting, and processing the packaging waste • Crucial prerequisite registration with the competent authority • Recycle packaging according to the highest standards possible to ensure high quality recycling; include the informal sector
LOCAL AUTHORITIES/MUNICIPALITIES	• Act as linkages between consumers and waste management operators • Responsible for implementation of EPR on the local level through organising the collection (Producer Responsibility Organisation contracts out/pays for waste collection through the local authorities)
GOVERNMENT AND OTHER PUBLIC AUTHORITIES	• Legislation, governance, and enforcement of the EPR system • Manage register for the waste management operators

Adapted from: World Wildlife Fund (WWF)

YEAR 1: ENGAGE IN LIFE CYCLE THINKING TO UNDERSTAND YOUR IMPACTS

Map out your product portfolio to understand and prioritise offerings where you can have the greatest impact (for instance, based on sales volume and significant impacts). It may be helpful to build out a matrix with the priority offerings (based on volume) and the key sustainability impacts at each life cycle stage.

This can be done by engaging in conceptual life cycle mapping and where appropriate, conducting life cycle assessments on key products to rethink products, processes, and services that you use or produce, where they come from, and determine whether they contribute to, or erode, the resilience of social and environmental systems. This work can start with a high-level conceptual life cycle mapping and proceed to a more detailed investigation, based on the availability of resources for this work. Even conceptual life cycle mapping can help you to understand key impacts and inform further assessments and focus areas. In either case, consider a broad range of environmental, social, and governance issues. Since environmental data can often be more easily quantified, measured, and prioritised, companies can end up focusing primarily on environmental impacts. When engaging in life cycle thinking, the social and governance dimensions are also crucial aspects that must be included and weighted appropriately within this process. Consider a comprehensive set of sustainability issues to help you better prioritise where you need to take action.

Life cycle assessments can be done at a product category or a SKU level. At a category level, it can help you assess strategies for the whole grouping of products, whereas at a product level, it can help target individual products that may be having the greatest impact throughout their lifecycle. Explore the life cycle mapping process in more detail here.

YEAR 1: UNDERSTAND CIRCULARITY PRINCIPLES AND PRODUCT AND MATERIALS STEWARDSHIP BEST PRACTICE

Aim to understand the core components of circular design and circularity principles that can inform work within this focus area. Broadly, the three principles include:

- Eliminate waste and pollution
- Circulate products and materials
- Regenerate nature

Look to identify guiding principles or standards set forth by international and/or local bodies to guide a deeper understanding of best practice in your industry for product and materials stewardship. Understand new approaches to sustainable design, such as biomimicry, and if they can be a good fit for expanding or complementing your organisation's efforts.

Examples of process-based targets for Year 1:

- By 20[XX], we will identify EPR laws in the regions where we operate
- By 20[XX], we will conduct high-level life cycle mapping to understand the impacts of our products [and/or services] to inform further assessments and focus areas
- By 20[XX], we will conduct a life cycle assessment for [X] of our key product offerings to understand the greatest opportunities to reduce material use and waste across the product lifecycle
- By 20[XX], we will understand circularity principles
- By 20[XX}, we will identify what best practice for circularity and product and materials stewardship looks like in our industry

YEAR 2: IDENTIFY KEY AREAS OF IMPROVEMENT REGARDING MATERIALS

Undertake detailed mapping of your current mixed waste streams to understand every material consumed at the factory level. Consider if there are methods or technologies available to improve resource efficiency or achieve maximum use from resources to circulate materials at their highest value. It may be helpful to explore what other companies in your industry are doing to adopt material stewardship into their processes. For materials that can safely biodegrade, explore the different aspects of the biological cycle and consider how you can support regeneration through materials stewardship.

It is also important to consider the full lifecycle impacts of materials, from their production to end of life. If you are a company that engages in activities related to the production of key materials, it can be important to map out who you sell to, what they may be using the materials for, and the social, environmental, and economic impacts of the material past your direct control.

YEAR 2: DEFINE CIRCULARITY ATTRIBUTES RELEVANT TO YOUR PRODUCTS

Define the most important circularity attributes for your materials and products, such as those related to durability, repairability, recyclability, and compostability. This should be based on the impacts you have identified through your life cycle thinking work, which may apply to both environmental and social sustainability issues.

YEAR 2: EMBED LIFE CYCLE THINKING AND STEWARDSHIP INTO YOUR PRODUCT INNOVATION CYCLE

Look to embed lifecycle thinking and stewardship into your product innovation cycle. This can include integrating the use of circular product design practices into early processes or evolving current practices to include life cycle assessment and relevant data to keep sustainability considerations at the forefront of product design. Establish guidelines on circular design and product and materials stewardship. Align this with calls for producer responsibility identified within applicable EPR laws and identify end-of-life solutions for your relevant product lines.

CASE STUDY: PepsiCo's Sustainable from the Start (SftS) program

PepsiCo's Sustainable from the Start (SftS) program is an internal product design program that "provides life cycle analysis tools to estimate products' total environmental impact during their early design and development phase. …It also establishes guidelines on reducing impacts with changes to alternative ingredients, improved packaging and more sustainable technology and distribution. Results from SftS are then incorporated into the new product development business process for visibility and decision-making. When the SftS process identifies an opportunity between a product and design standards or long-term sustainability goals – such as non-recyclable packaging – the product team is required to develop a future solution or mitigation plan."

CASE STUDY: Nokia's circular services

Nokia recognised that upgrading existing telecom networks can be a challenge that generates large amounts of waste, and that many operators are not positioned to address the complexity of enabling circularity in the telecom equipment market. The company decided to develop its own circular services for telecom network modernisation. The company aims to support the transition by taking on the collection, refurbishment, reuse, and recycling of telecom equipment for operators, including asset recovery such as handling surplus products and testing dismantled equipment for reuse.

Examples of process-based targets for Year 2:

- By 20[XX], we will undertake detailed mapping of mixed waste streams and consider every material consumed at each factory
- By 20[XX], we will define key circularity attributes for our products (e.g. energy use, longevity, repairability, ease of disassembly, substances of concern, recyclability, recycled content, biodegradability, compostability, life cycle footprint)
- By 20[XX], we will develop a plan to embed life cycle thinking and circular design principles into product innovation
- By 20[XX], we will embed life cycle thinking in our product ideation and stage-gate approval processes, with the goal of making new products more sustainable than the previous generation
- By 20[XX], we will identify end-of-life solutions for [X] product lines

YEAR 3: DEVELOP A STRATEGY TO INNOVATE OR SHIFT TOWARDS GREATER PRODUCT AND MATERIALS STEWARDSHIP

Use your learnings to identify opportunities to reduce environmental and social impacts across the entire lifecycle of your products and materials. This can include rethinking current production processes, designing products with circular design principles to improve product longevity, increasing end-of-life potential by planning for repair and disassembly, and integrating reuse systems to harness value from surplus products and existing waste streams to meet EPR requirements. You can also consider phasing out certain products from your portfolio and innovating current and/or new products with materials and processes that reduce their impacts across the lifecycle. For materials stewardship, look to reduce resource use of virgin and non-renewable resources, increase resource efficiency in processes, and achieve maximum use from resources. Collaborate with others to build reliable end-of-life collection programs for products and materials to circulate resources at their highest value.

CASE STUDY: Tesco aligns with EPR regulations

Aligning their waste reduction efforts with recently announced EPR laws in the U.K., Tesco invested in implementing a national deposit return scheme. This included installing reverse vending machines for consumers to return empty containers to claim back a small refundable deposit they were charged upon purchase. This was paired with other efforts, including improving the materials and designs of their products and packaging, and continued research on improving the recyclability of packaging for consumers at home.

CASE STUDY: Niaga develops product passports to enable recycling

The circular solutions provider Niaga discovered that a lack of data on material compositions inhibited recycling. To address this, the company developed a scannable tag that shows exactly what a product is made of and how it can be returned, helping keep valuable materials in the loop.

Examples of process-based targets for Year 3:

- By 20[XX], we will develop a strategy to increase the circularity of [X] products in our portfolio
- By 20[XX], we will set up customer return logistics to enable re-processing, repairs, and to ensure that returned materials are appropriately processed
- By 20[XX], we will study how to best increase our products' remanufacturing and recycling rates (e.g. material composition transparency)
- By 20[XX], we will implement plans to manage and make use of unsold and returned products

YEAR 4: IDENTIFY VALUE CHAIN PARTNERS TO WORK TOWARDS BROADER SYSTEMIC CHANGE

Extend your efforts into your value chain and engage with your suppliers to understand priority issues areas to support circularity and stewardship. Share insights from your own journey and identify key partners within your value chain with whom you can collaborate to further align your products with circular design principles. Ensure that efforts to transition value chains towards product and materials stewardship account for possible social impacts on communities and informal waste sectors.

Partnerships and collective efforts are key to supporting systemic change on product and materials stewardship. Identify industry collaborations or local and/or international organisations working on circularity and stewardship with whom you can partner to further enhance your strategy and push for broader systemic change. This may include setting up infrastructure for reliable recovery and collections systems in currently under-equipped regions to recapture value from products at the end of their lifecycle and/or engaging in advocacy for greater product and materials stewardship in your industry. Consider other companies that may be strategically placed to be important partners in building the systems needed for your efforts in your operations and value chains to be effective.

Examples of process-based targets for Year 4:

- By 20[XX], we will identify suppliers with whom we can collaborate to foster responsible product and materials stewardship in our value chain
- By 20[XX], we will identify industry and/or local and international partners with whom we can collaborate to support systemic change on product and materials stewardship

RESOURCES

GUIDANCE

UNDERSTANDING LIFE CYCLE THINKING

Life Cycle Thinking: A Guide explains how life cycle thinking and mapping help you identify and better understand the potential impacts of your products and services on people and the environment. By exploring environmental and social impacts from your raw materials, through manufacturing and distribution, to customer use, and end of life, you can identify hot spots and leverage points to take action on.

UNDERSTANDING MATERIALS USE

The Global Material Resources Outlook to 2060 from the OECD presents global projections of materials use and their environmental consequences, providing a quantitative outlook to 2060 at the global, sectoral, and regional level. It explains the economic drivers determining the decoupling of economic growth and materials use; provides projections of economic baseline scenarios, economic drivers of materials use, primary materials use, and of recycling and secondary materials; and features case studies on demand and supply risks for specific materials.

UNDERSTANDING EXTENDED PRODUCER RESPONSIBILITY

The Extended Producer Responsibility (EPR) Fact Sheet by the WWF will help you understand the basics of extended producer responsibility (EPR). It highlights the benefits of EPR, and provides a high-level overview of the roles and responsibilities of stakeholders in the EPR system.

How to Implement Extended Producer Responsibility (EPR): A Briefing for Governments and Businesses, by the WWF and the Institute for European Environmental Policy, explains the concept of EPR, the role of governments in EPR schemes, and the importance of EPR for businesses, as well as potential next steps for implementation.

UNDERSTANDING CIRCULARITY

What is the Circular Economy? by the Ellen MacArthur Foundation provides a range of videos, audio files, case studies, and slides that can help you to understand the limitations of our linear economy, the aspects and benefits of a circular approach to industry, and the principles that can enable businesses and communities to achieve a more sustainable economy.

Circular business practices need to be embedded into business strategy in order to be sustainable. Circularity: From Theory to Practice from the SustainAbility Institute can help you with the early stages of developing a circular economy strategy that aligns with your business strategy. It identifies four steps that can help you to kickstart your company's pursuit eliminating waste and maximising the reuse of resources: identify drivers and goals, determine focal points, develop an action plan, and execute.

UNDERSTANDING THE BIOLOGICAL CYCLE

The Biological Cycle by the Ellen MacArthur Foundation provides a quick overview of the "butterfly diagram" that is helpful in visualising the circular economy. It focuses in on the biological cycle, which is for materials that can safely biodegrade, and explains some of the key concepts associated within it.

What is Biomimicry? by the Biomimicry Institute provides a quick overview of the definition of biomimicry and the three key elements that support the translation of nature's strategies into design.

PRODUCT INNOVATION

This article, titled What is Sustainable Innovation?, provides a high-level explanation of what sustainable innovation looks like when designing products and services and how it differs from traditional innovation. This resource is a good introduction on how businesses can make innovation sustainable, and will help you to understand why this matters.

This comprehensive Handbook for Product Social Impact Assessment outlines a method for analysing the social impacts of a product across its entire life cycle. It presents a number of indicators you can use to make impacts more visible and potentially identify hotspots, risks, and opportunities for improvement. It was developed by The Roundtable for Product Social Metrics, a business-led working group that works in collaboration with academia, NGOs, government, and industry organisations.

Vision 2050 Products and Materials Pathway by the World Business Council for Sustainable Development is one of the nine transformational pathways to create a sustainable world by 2050. The short article identifies 10 priority actions for companies to take to accelerate sustainable products and materials throughout their operations and value chains.

THE CIRCULAR ECONOMY IN SUPPLY CHAINS

The Circular Procurement in 8 Steps eBook by Copper8 offers practical guidance on integrating circular principles into your procurement cycle by outlining eight steps you can take to minimise waste and maximise value retention of the resources and materials you procure.

The Circular Supply Chain Network is a global community of supply chain practitioners working to accelerate the transition to circular business operations through education and connection.

Building a Circular Supply Chain white paper from the Ellen MacArthur Foundation and Circular Supply Chain Network explaining what circular supply chains are, the benefits and challenges in implementing them, and how supply chain leaders can transition their organisation's supply chain from linear to circular.

TOOLS

This database by Solar Impulse Foundation showcases thousands of solutions for improving the sustainability of operations, products, and services. The curated database allows you to filter for solutions by sector, client profile, application, geography, and more, and the solution profiles highlight the potential environmental and financial benefits. This is a good one-stop shop for technology experts, engineers, operations managers, change agents, and leaders to explore the growing range of innovations that can support their sustainability-related projects and objectives.

The Okala EcoDesign Wheel App is a great prompt for early thinking on improving the sustainability of a product or service. Taken from the Okala Practitioner Guide, it organises different strategies for minimising ecological impact around the stages of the product lifecycle.

CTI Tool was developed to help businesses accelerate their transition towards a circular economy. Using a simple, objective, quantitative framework, the CTI Tool structures data, calculates outcomes, and generates reports, enabling you to improve your understanding of circularity and set more ambitious targets.

The Biomimicry Toolbox by the Biomimicry Institute can help you to understand how to solve problems in line with nature by using insights from nature. Dedicated to sharing the lessons of nature to create a healthier planet, the Institute's platform features several resources, including its flagship resource the Biomimicry Toolbox. This toolbox introduces the foundational concepts of biomimicry and outlines a six-step biomimicry design process.

Explore more resources on product and materials stewardship here.

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