Module 01 – Introduction to Circular Economy

1 Introduction to Circular Economy (CE)

2 CE in the context of textiles

3 CE policies and enablers for textiles

4 Need and Potentials in India

5 Developing Policy Instruments

6 Best Practice Examples

7 Repository of Toolkits



Objective: This chapter has the objective of providing a comprehensive overview of Circular Economy as overarching concepts. It seeks to delineate different CE strategies and business models and connect CE to other sustainability related concepts, like resource efficiency, cleaner production, carbon reduction, life cycle analysis, and ESG-criteria. Last but not least it will provide a broad overview about the policy landscape for CE at international level.

Circular economy: One concept, many definitions

So far, large parts of the environmental movement have mainly been concerned with restricting our actions, reducing, abandoning and describing a negative ecological footprint. **But why be less bad when we can be good?** [...] We should go fundamentally new ways: **Products and services are thought from beginning to (new) beginning, from cradle to cradle.**

- Cradle to Cradle NGO

A sustainable policy of conserving natural resources requires the creation of closed material cycles. **Modern waste policy is an important part of it.** It makes sure that waste is reused or recycled as efficiently as possible.

- Federal Environmental Protection Agency, Germany

Looking beyond the current take-make-waste extractive industrial model, **a circular economy aims to redefine growth**, focusing on positive society-wide benefits. It entails **gradually decoupling economic activity from the consumption of finite resources, and designing waste out of the system**. Underpinned by a transition to renewable energy sources, the circular model builds economic, natural, and social capital.

- Ellen MacArthur Foundation

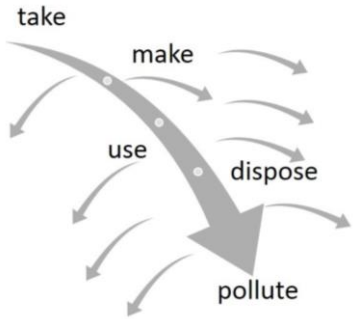
An **economic system** that uses a **systemic approach** to maintain a circular flow of resources, by recovering, **retaining or adding to their value**, while contributing to sustainable development.

- ISO

Circular Economy is a model of economic development where waste and resource depletion are minimized, and the value of resources is preserved and regenerated for as long as possible. It prioritizes sustainable practices and aims to create closed-loop systems that conserve resources and minimize waste, ultimately leading to a more resilient and sustainable future.

- ChatGPT, AI

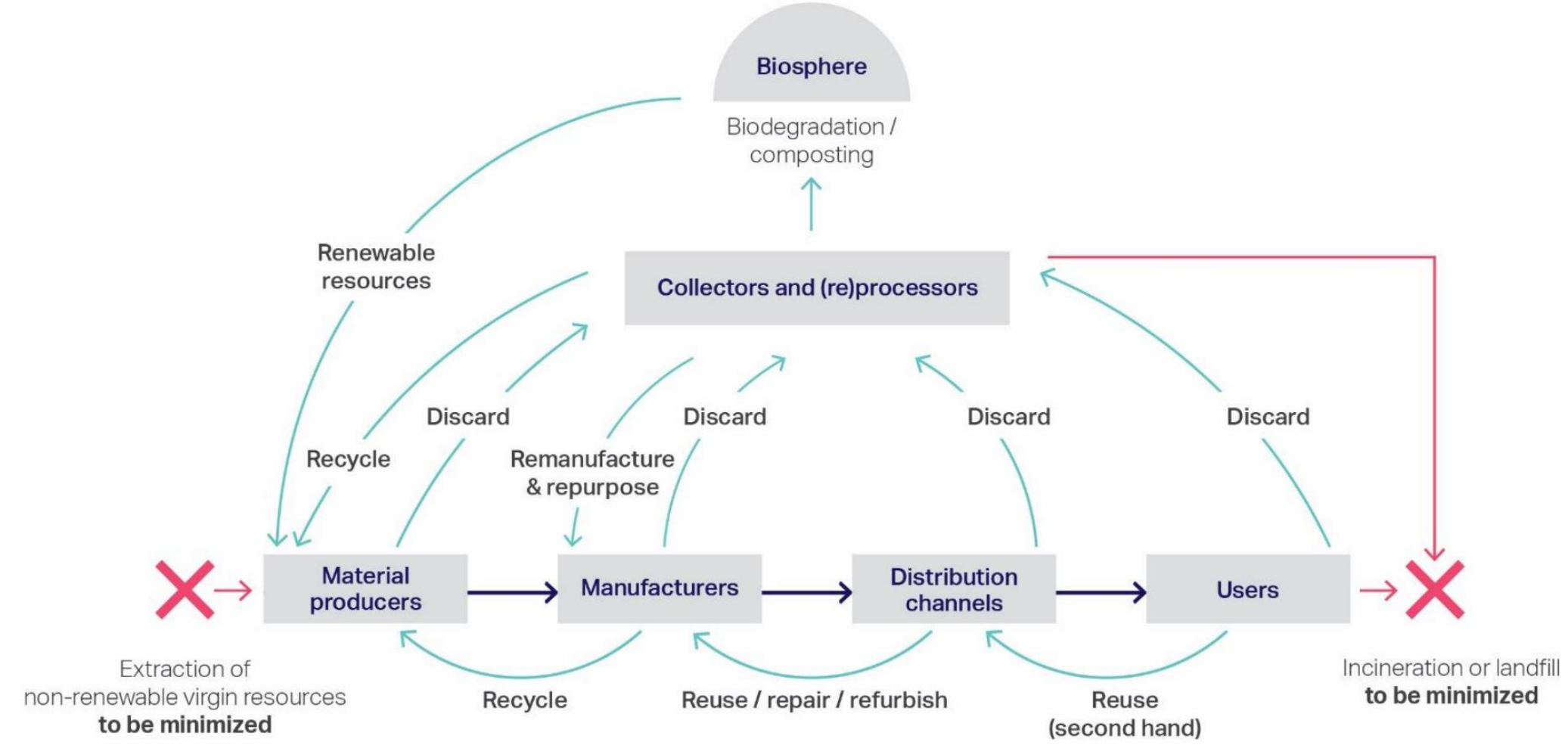
Linear vs. circular economy



- For a long time, our economy has been «linear».
- TAKE → PRODUCE → USE → WASTE
- Production and delivery of products (creation of a value): resource consumption, environmental and social impacts
- When the product/resource becomes a waste: value destructed, all the resources used lost, only the environmental and social impacts left behind
- Wastage of products/resources without being used efficiently: even a greater loss!

The aim of a **circular economy** is to minimize value destruction and encourage value retention or creation across the value chain. Retention of resource value means conserving resources in as close as possible to their original state.

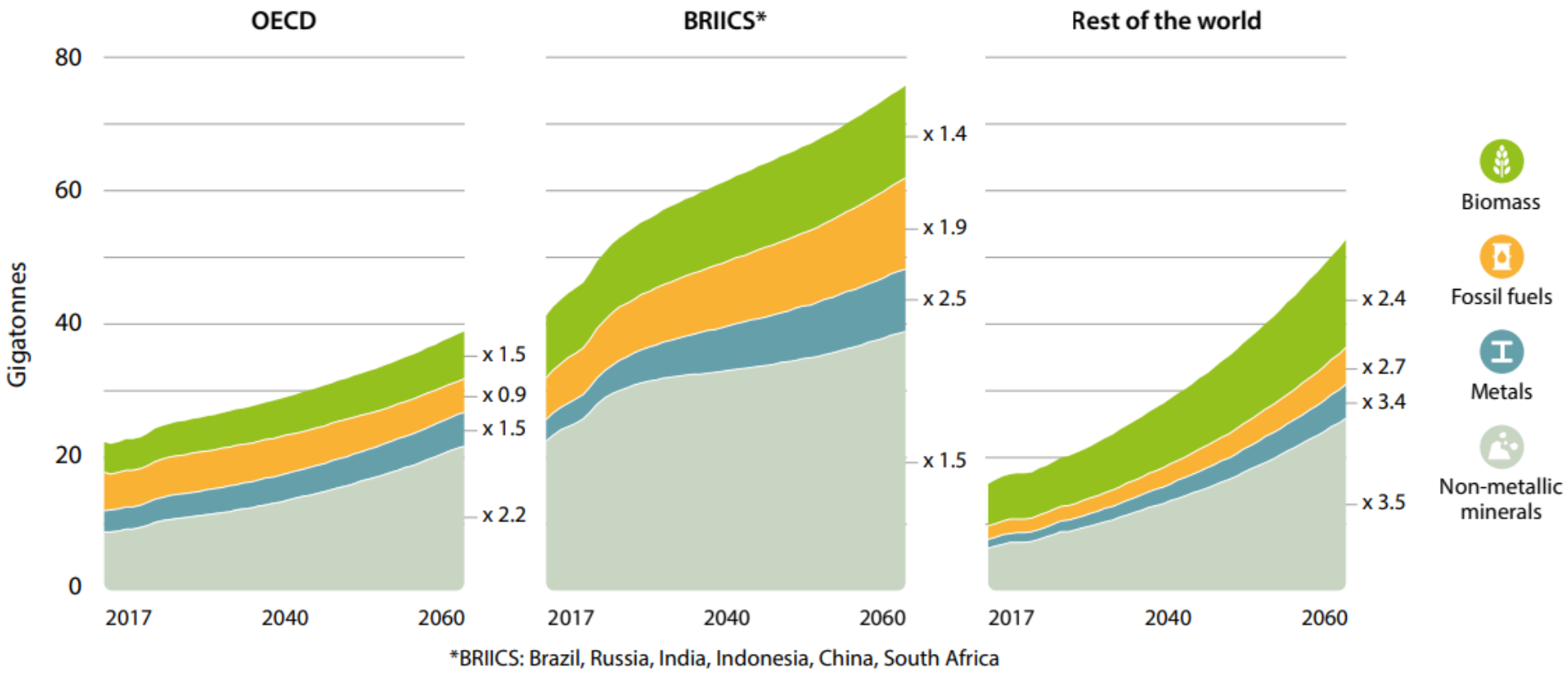
Circular economy and value chains



Source: CTI (2023): https://www.wbcsd.org/contentwbc/download/16345/233646/1

Why do we need a new update of our economy?

Materials use increase – projections to 2060



Source: OECD (2020), « Improving resource efficiency and the circularity of economies for a greener world », *OECD Environment Policy Papers No. 20*, OECD Publishing, Paris, https://doi.org/10.1787/23097841.

Source: OECD (2020): https://www.oecd.org/environment/improving-resource-efficiency-and-the-circularity-of-economies-for-a-greener-world-1b38a38f-en.htm

Why do we need a new update of our economy?

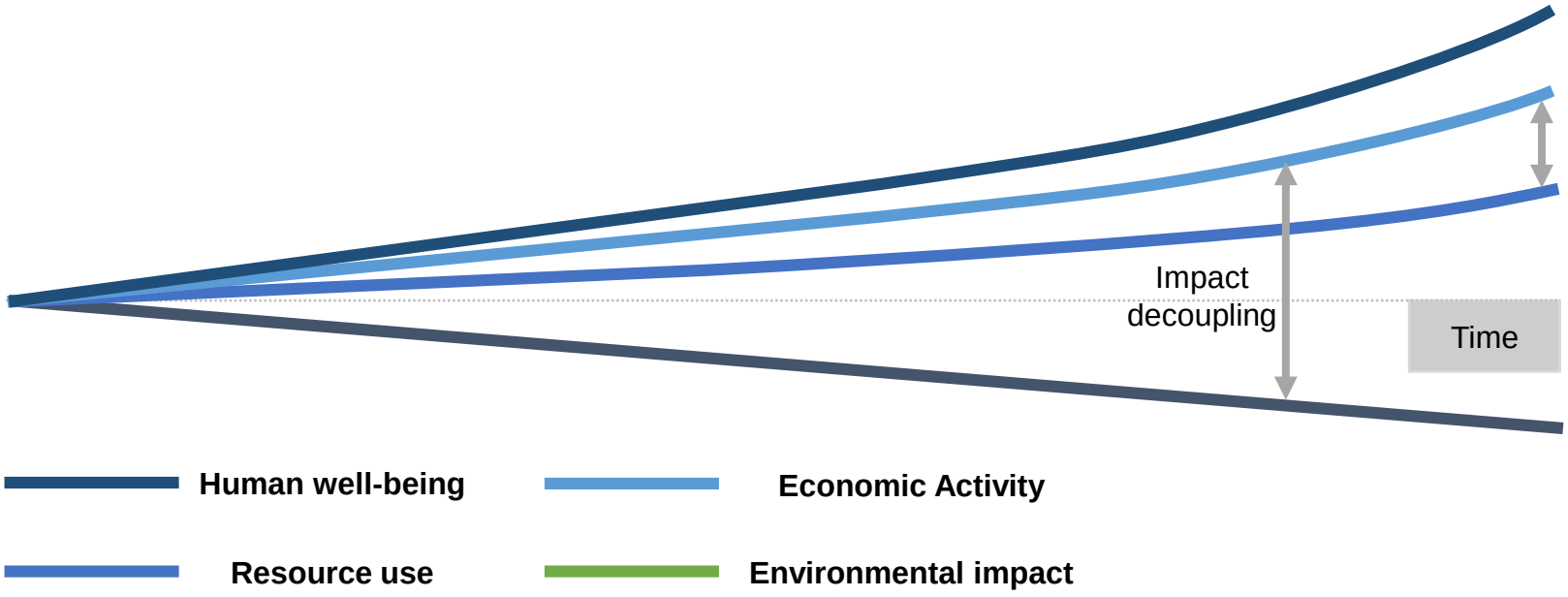
Doing more with less resources

Impact decoupling

Reduction of resources used to create a unit of GDP

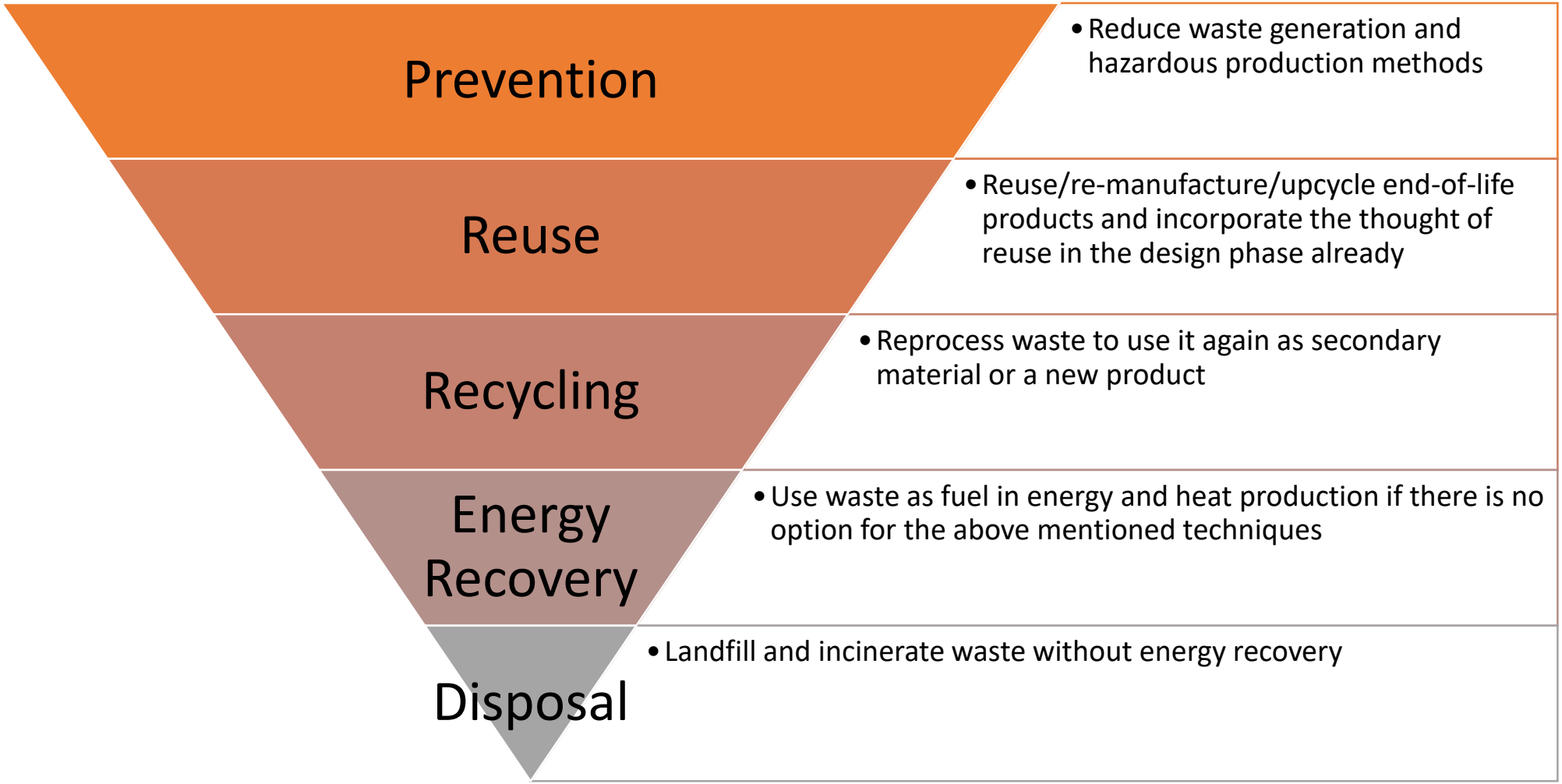
Resource decoupling

Reduction of to create a unit of GDP resources used



The waste hierarchy

1



Sources: OECD (2019): https://www.oecd.org/environment/environment-at-a-glance/env-2019-2343-en.pdf;
European Commission (2023): https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en

Often confused terminologies

1



Recycling:
Recycling involves collecting and processing used materials to create new products of similar or lower quality. It aims to reduce waste and energy consumption by reusing materials, such as paper, glass or textiles, in a closed loop.



Upcycling:
Upcycling is a creative process of transforming discarded or low-value materials into higher-value items. It enhances the quality or functionality of the original material, giving it a new purpose, often with an artistic or innovative twist.

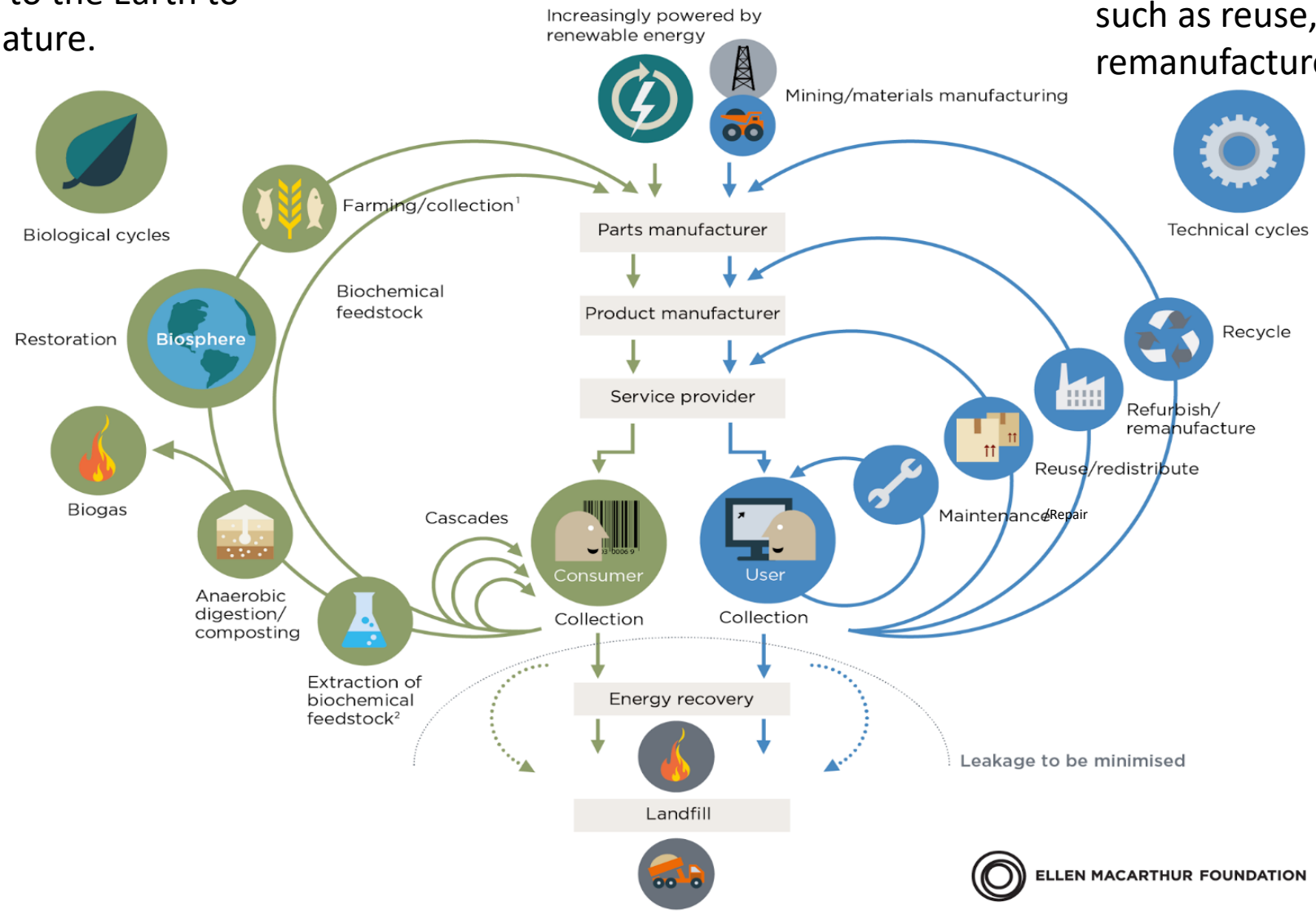


Downcycling:
Downcycling refers to the reprocessing of materials into products of lower quality or value. It typically involves breaking down complex materials into simpler ones, resulting in a loss of quality and potential for reuse.

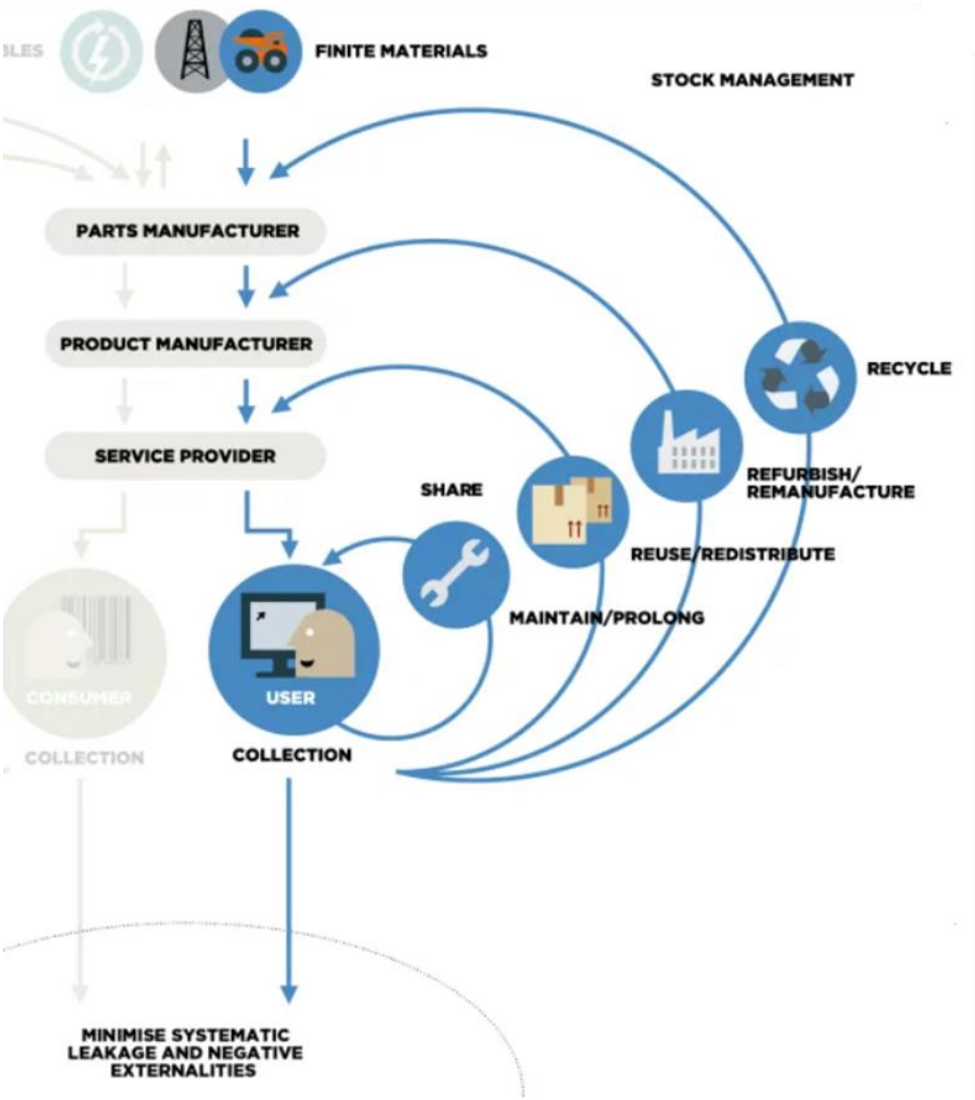
Biological cycle: The nutrients from biodegradable materials are returned to the Earth to regenerate nature.

Technical cycle: products and materials are kept in circulation through processes such as reuse, repair, remanufacture and recycling.

Technical and biological cycles



Source: Ellen MacArthur Foundation (2019): https://www.ellenmacarthurfoundation.org/circular-economy-diagram



Technical cycle

Related to inorganic materials (metals, fuels, synthetic textiles, chemicals, plastics, organic materials mixed/ contaminated with inorganic materials)

Some biodegradable materials, such as cotton or wood, pass through the technical cycle steps until the point where they can no longer be used to make new products.

The inner loops represent the highest value that can be retained from a product.

By keeping a product in its whole composition rather than decomposing or reprocessing it after its use, it retains greater embedded value.

Products' whole value includes the value of its components as well as the value of the time and energy used to produce it.

Source: Ellen MacArthur Foundation (2019): https://www.ellenmacarthurfoundation.org/circular-economy-diagram

Biological cycle

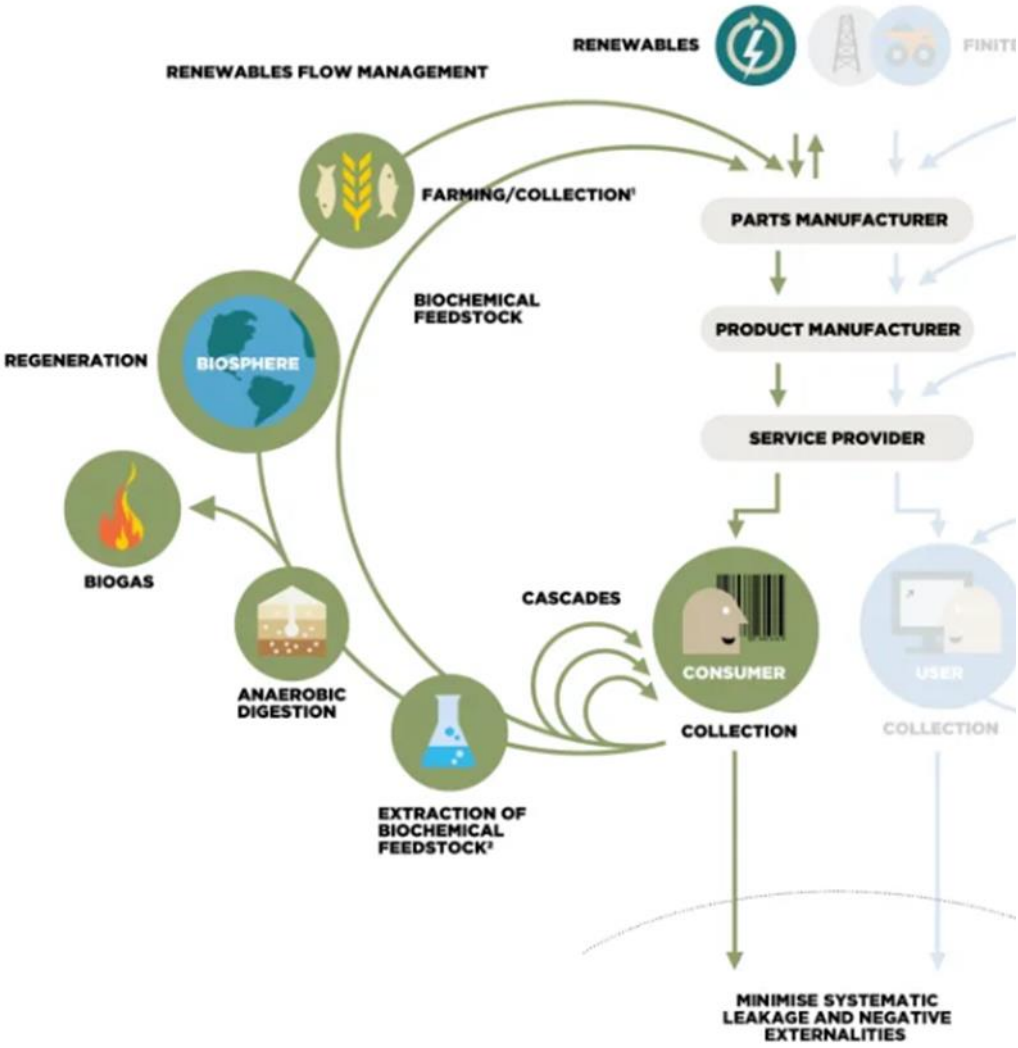
Related to organic and biodegradable materials suc as food, organic cotton, etc.

Biodegradable materials are returned to the Earth and decomposed through processes such as composting and anaerobic digestion.

This allows the land to regenerate the nutrients, which can then be used to create new biodegradab materials, thus, ensuring the continuation of the cycle.

However some other biodegradable materials, such as cotton or wood, may eventually make their way from the technical cycle into the biological cycle on they have degraded to a point where they can no longer be used to make new products.

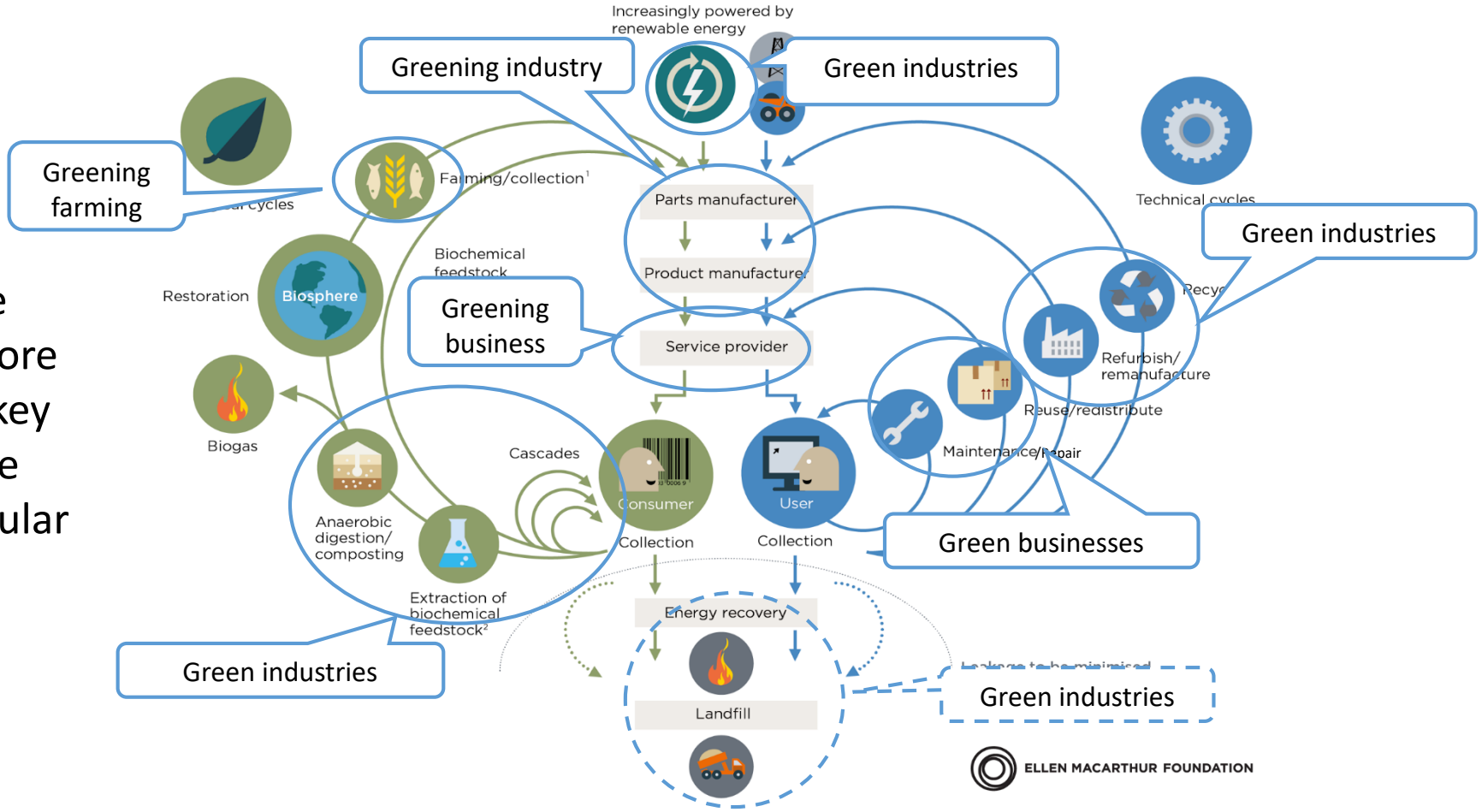
It is also important for such materials not to be contaminated.



Source: Ellen MacArthur Foundation (2019): https://www.ellenmacarthurfoundation.org/circular-economy-diagram

The role of businesses in the CE

Industry, and the private sector more generally, has a key role to play in the transition to circular economies.



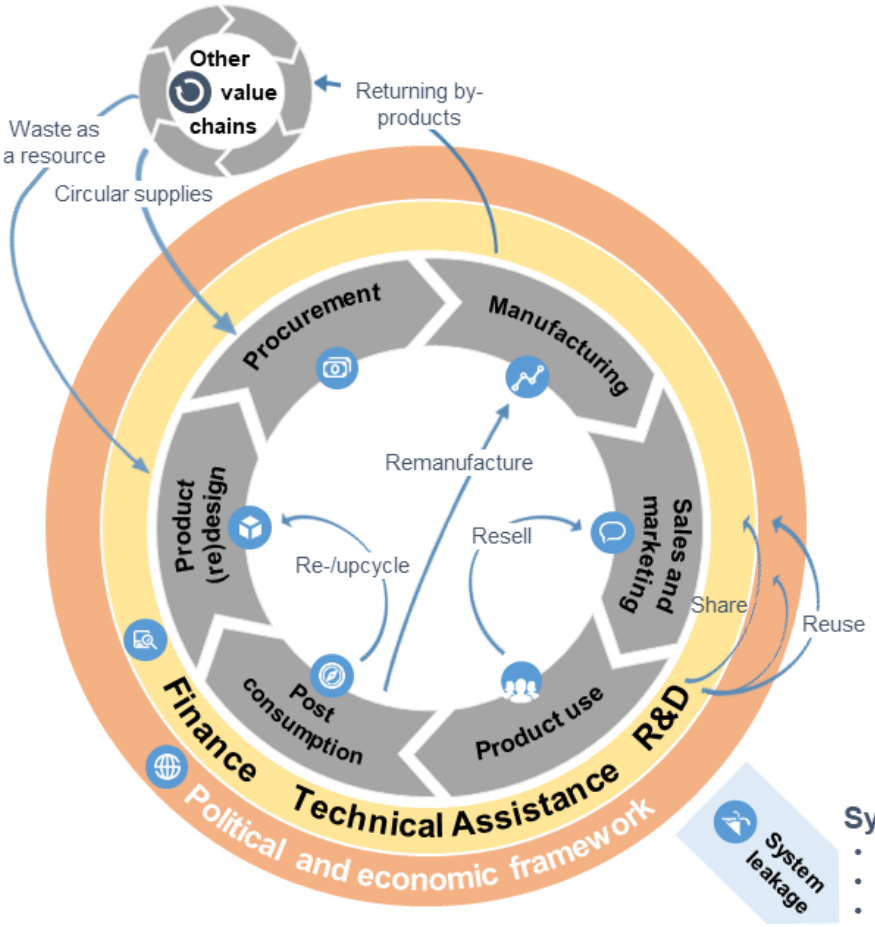
Source: Ellen MacArthur Foundation (2019): https://www.ellenmacarthurfoundation.org/circular-economy-diagram

Circularity economy – Strategies and business models

Shift to circular supplies
- Reconstruct value chains with alternative, low-impact, regenerative and recycled materials
- Create slow food, fashion, cities products

Facilitate demand for circular products and services
- Raise awareness among consumers
- Reduce resource consumption during use

Recover after disposal
Either post-industrial or post-consumption
- Separation, collection, recycling and upcycling
- Design for disassembly, reassembly or recycling
- Industrial symbiosis



Increase resource efficiency
- Cleaner Production and pollution prevention
- Design for Zero Waste Production

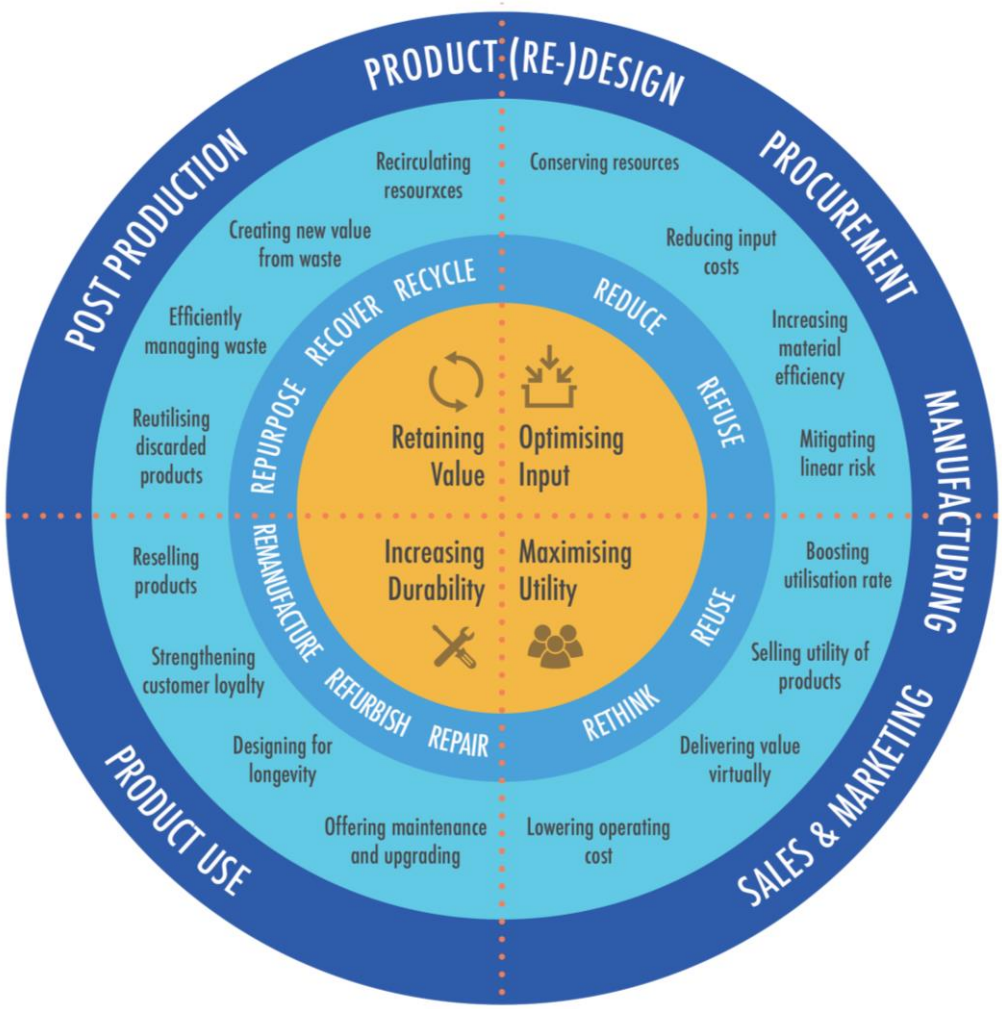
Shift to service-based models
- Develop new models of ownership for higher material value retention
- Adapt subscription model (rental, leasing, servitization)

Extend the life-time of products
- Design for durability and modularity
- Repairing and upgrading
- Reuse/repurpose

System Leakage
- Downcycling
- Waste to energy
- Co-incineration

Source: adelphi (2022)

Business opportunities



Source: adelphi (2020)

What are circular business opportunities?

There are a myriad of ways in which a business can create positive economic benefits by going circular. Take a look at the **Circular Economy Taxonomy** on the left: what you see is a collection of pathways that enterprises can take to achieve their goal of circularity.

- Starting from the inside, the four orange quarters represent the **circular business values** that are inherent in each circular measure you may take. If you, for example, decide to open a used smartphone shop, you effectively increase the durability of the phones by refurbishing broken ones that would otherwise have reached the end of their product life.
- One step outward, the taxonomy shows you which **channels** you may take to turn a circular business value into action. In the phone shop example, you would repair or refurbish old smartphones.
- One step further outward you find the **circular business cases**. These represent the actual revenue-generating activities you engage in with the channels you chose. Your smartphone shop would only generate income by reselling their refurbished products.
- The outermost layer of the taxonomy regards the **business value chain** in which your circularity activity most likely takes place. The used phone shop does not increase the circularity of a marketing process, but rather affects how (long) a product is used.

The Circular Economy Taxonomy is a core concept of this toolkit and referenced multiple times in the TOOLs ahead.

This CE business opportunity graphic and content is developed under **Circular Economy Catalyst** project funded by **IKEA Foundation** and implemented by **adelphi**. https://www.thecircularcatalyst.com/

Ellen MacArthurs´ 4 intervention points to create value

1) **The power of the inner circle**
   - keep products alive and operating for as long as possible
   - design products in a way that they are easy to maintain and repair, and create business models to support that

2) **The power of circling longer**
   - keeping products in as many consecutive cycles as possible and prolonging the time of each cycle
   - offer high product quality, easy repairs & upgrades or service schemes
   - use parts as spare parts or building blocks for other products
   - set up of return systems for consumable products, such as bottles or cans

3) **The power of cascade use**
   - Diversify the reuse of products and materials within and between industries

4) **The power of pure circles**
   - Uncontaminated material streams since this is key in to maintaining the quality of the materials for many consecutive cycles

→ Application of the 4 principles does not inhibit the application of other principles as well

Source: EllenMacArthur Foundation (2013): https://archive.ellenmacarthurfoundation.org/assets/downloads/publications/TCE_Report-2013.pdf

Module 01 – 1.3 Circularity measurement/ assessment

Circularity measurement/ assessment is a process implemented to identify how well a system, a product or an organization performs in the context of a circular economy.

The process is based on certain circularity metrics/ indicators:

(1) Indicators aimed at providing a value expressing how circular a system is. (e.g. recirculated materials in a product)

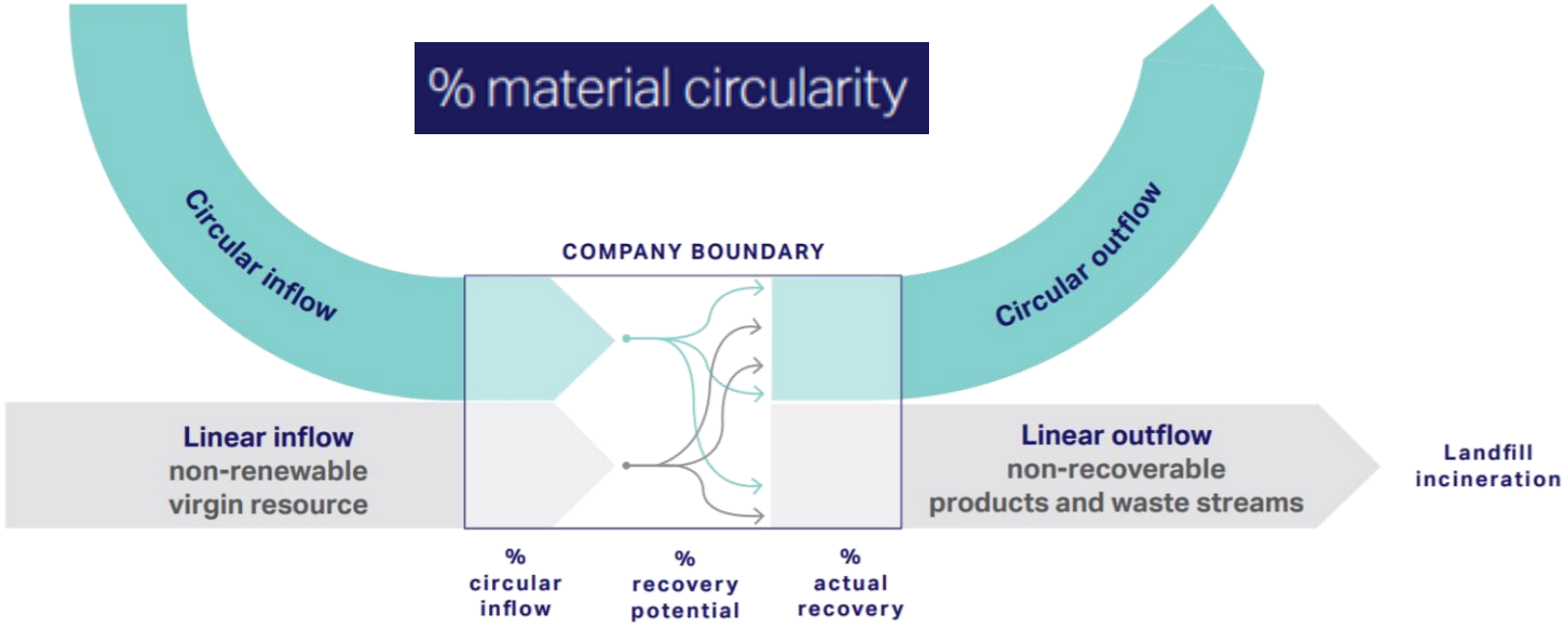
(2) Indicators aimed at analyzing the contribution to circular strategies and principles (e.g. existence of targets, action plans)

Examples of measurement and assessment tools available:

- Circulytics - Ellen MacArthur Foundation (EMF)
- Circular Indicators Transition (CTI) - WBCSD ve Circular IQ
- GRI 301: Materials 2016; GRI 306: Waste 2020
- Cradle to Cradle Certified ®
- Circle Assessment – Circle Economy
- CirCelligence - Boston Consulting Group

Circular Transition Indicators (CTI)

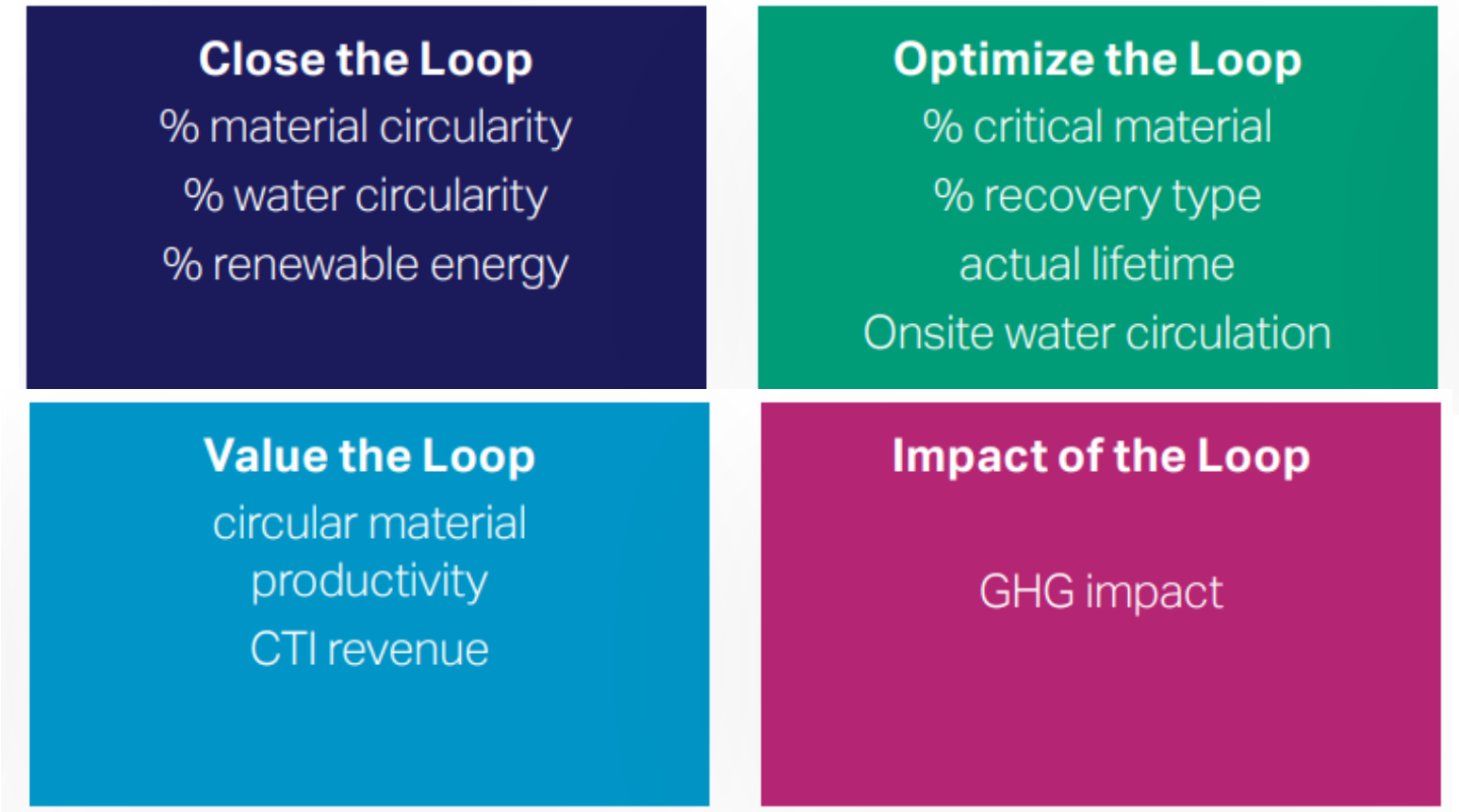
- Is a circularity assessment/measurement methodology and tool, based on different groups of indicators
- Has been developed for companies by World Business Council for Sustainable Development (WBCSD) in collaboration with KPMG and Circular IQ *(by business for business)*
- The methodology is mainly based on material flows through the system



Source: CTI (2023): https://www.wbcsd.org/contentwbc/download/16345/233646/1

CTI TOOL

Circular Transition Indicators (CTI)



Source: CTI (2023): https://www.wbcsd.org/contentwbc/download/16345/233646/1

CTI TOOL

Circular Transition Indicators (CTI)

Close the Loop

% material circularity

% water circularity

% renewable energy

- Circular material inflow (renewable, non-virgin percentages)

  (Raw materials, auxiliary materials, other material inputs)

- Circular material outflow (recovery potential, actual recovery percentages)

  (Products, by-products, wastes, losses, etc.)

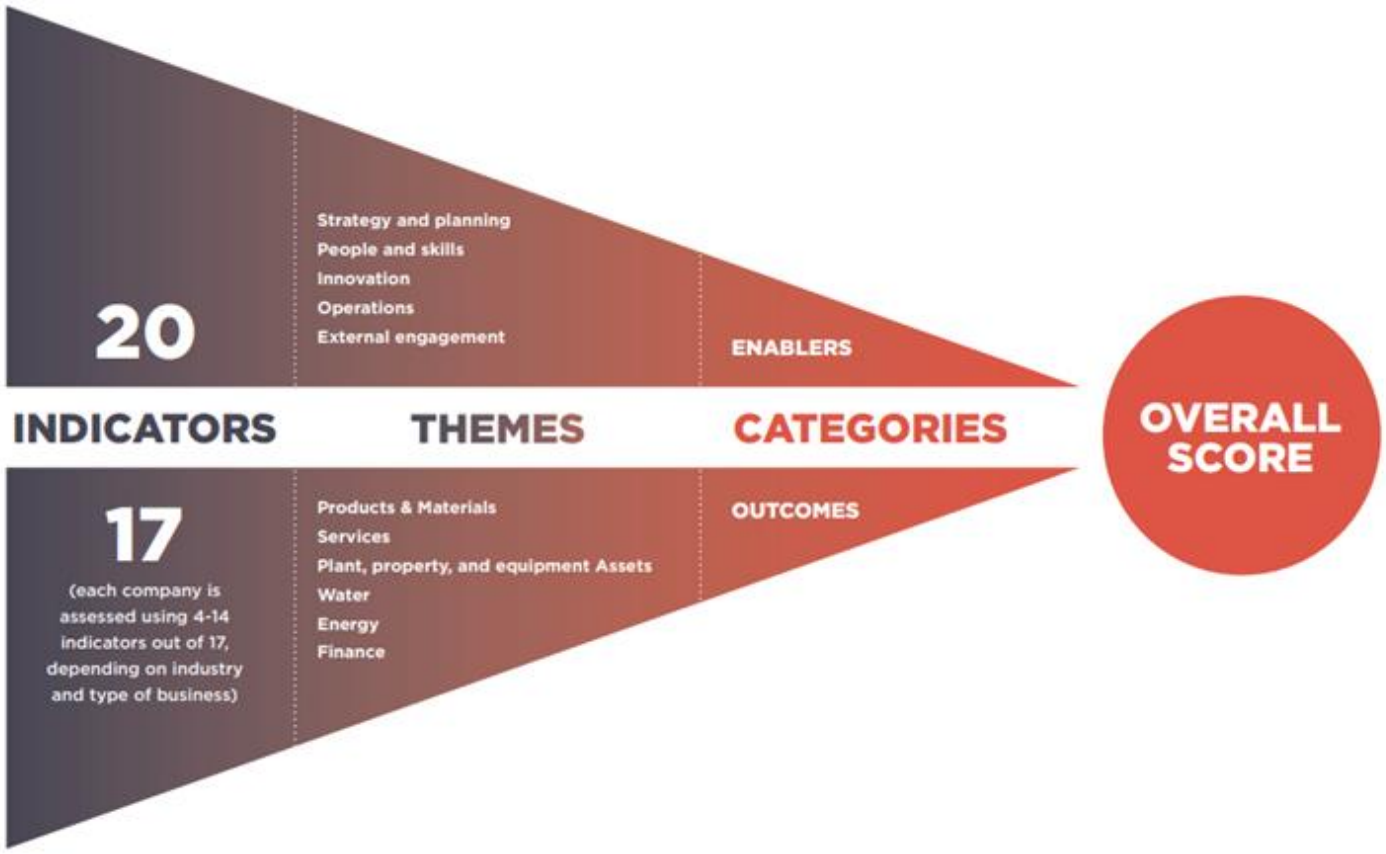
- GHG Impact and GHG Reduction Potential

- Product level
- Process level
- Plant level
- Company level
- Sector level…

Source: CTI (2023): https://www.wbcsd.org/contentwbc/download/16345/233646/1

Circulytics

- Circulytics measures the circular economy performance of a company's entire operations, using a comprehensive set of indicators.
- It measures this in two categories: **Enablers and Outcomes**



Source: Ellen MacArthur Foundation (2023): https://www.ellenmacarthurfoundation.org/resources/circulytics/resources

Circulytics

Category 1: Enablers
The critical aspects to enable company-wide transformation. All themes in the Enablers category are relevant to all companies.

- **Theme 1 –** Strategy and planning:
  Have you placed the circular economy at the heart of your strategy?
- **Theme 2 -** Innovation:
  Are the conditions in place to support the development of innovative circular products and services? Are you innovating towards new circular economy products, systems, or services?
- **Theme 3 -** People and skills:
  Are you supporting your employees? Have you employed people to develop the skills required to transition to a circular business model?
- **Theme 4 -** Operations:
  Have you invested sufficiently in your digital systems and plant, property, and equipment assets to support the change?
- **Theme 5 –** External engagement:
  Are you promoting your circular economy initiatives and influencing those in your business sphere, such as clients or your supply chain?

Source: Ellen MacArthur Foundation (2023): https://www.ellenmacarthurfoundation.org/resources/circulytics/resources

Circulytics

Category 2: Outcomes

Metrics that capture how circular a company is today. A subset of the themes in the Outcomes category is relevant to any given company, as outlined in the Indicator list.

- **Theme 6 -** Products and materials: Are the materials you procure and the products you design supporting a circular economy?
- **Theme 7** – Services: Are the services you provide supporting a circular economy?
- **Theme 8** - Plant, property, and equipment assets: Are you procuring and decommissioning your plant, property, and equipment assets in ways that support a circular economy?
- **Theme 9** – Water: If you operate in a water-intensive industry, are you using water in a circular way?
- **Theme 10** – Energy: Are you procuring renewable energy and (if you are an energy provider) producing renewable energy to support a circular economy?
- **Theme 11** – Finance: If you are a financial institution, are you intentionally financing companies and projects that support a circular economy?

In line with CTI

Source: Ellen MacArthur Foundation (2023): https://www.ellenmacarthurfoundation.org/resources/circulytics/resources

Tools for measuring social impact of CE

Social Life Cycle Assessment (S-LCA)

Life Cycle Initiative

- Evaluates social and sociological aspects across a product's life cycle.
- Makes use of generic and site-specific data, can be quantitative, semi-quantitative or qualitative, and complements the environmental LCA and LCC
- Follows ISO 14040 framework with some specific differences.
- UNEP Guidelines propose a methodology for life cycle inventories.
- Inventories relate indicators (e.g., job creation) to impact categories (e.g., local employment) for five stakeholder groups.
- Groups include workers, consumers, local communities, society, and value chain actor

The Methodological Sheets for Subcategories in S-LCA: Supplement the UNEP/SETAC Guidelines for S-LCA of Products (2009), serving as a public resource and hands-on tool, furnishing detailed information on subcategories organized by stakeholder categories for comprehensive study conduction.

Source: UNEP (2009): https://www.lifecycleinitiative.org/wp-content/uploads/2012/12/2009%20-%20Guidelines%20for%20sLCA%20-%20EN.pdf;
Collaboration Centre on Sustainable Consumption and Production (2022): https://circulareconomy.europa.eu/platform/sites/default/files/ciap_social-impact_report.pdf

ISO 59000 Series

A Package to facilitate CE Implementation – ISO 59000 Series (In progress) to develop frameworks, guidance, supporting tools and requirements for the implementation of activities of all involved organizations, to maximize the contribution to Sustainable Development.

ISO 59 004 – Circular Economy – Terminology, Principles and Guidance for implementation

ISO 59 010	ISO 59 020	ISO 59 040	ISO 59 014
Circular Economy – Guidance on business models and value networks	**Circular Economy –** Measuring and assessing circularity	**Circular Economy –** Product Circularity Data Sheet	**Secondary materials –** Principles, sustainability and traceability requirements
Early 2024	**Early 2024**	**Early 2024**	**Early 2024**

ISO TR 59 031 – Circular Economy – Performance based approaches
ISO TR 59 032 – Circular Economy – Review of business model implementation

2023

Sources:
ISO TC 323 (2023): https://www.wcoomd.org/-/media/wco/public/global/pdf/events/2022/greener-hs/session-3/iso-tc-323-iso_international-standardization-activities-in-the-circular-economy.pdf?la=en;
ISO TC 323 (2023) https://www.iso.org/committee/7203984.html

ISO 59000 Series

A Package to facilitate CE Implementation – ISO 59000 Series (In progress)

ISO 59004 - Terminology, principles and guidance for implementation

Circular Economy Principles: Systems thinking, value creation, value sharing, resource availability focus, resource traceability, ecosystem resilience

Actions to implement circular economy: Actions that create added value, actions that contribute to value retention, actions that regenerate lost values

ISO 59020 - Measuring and assessing circularity

A framework for organizations to measure and assess circularity

Applicable to multiple levels of an economic system from regional to product level including organizations level

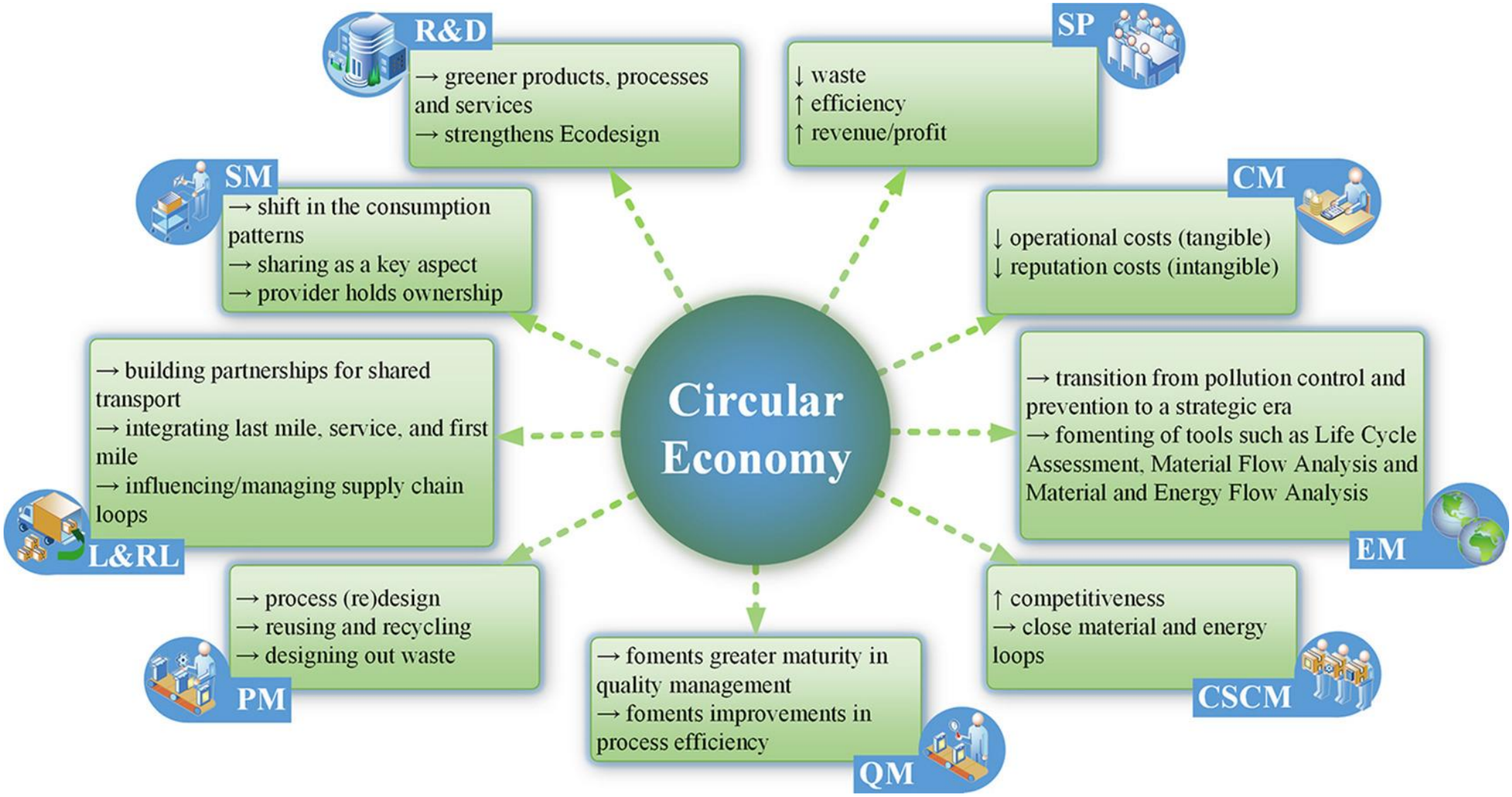
- To monitor circular actions => Reuse, Reduce, Repair, Recycle, Remanufacture, etc.
- To measure flows => Retain, regenerate, create, etc.
- To assess sustainability impacts => Social, environmental and economic impacts

Sources:
ISO TC 323 (2023): https://www.wcoomd.org/-/media/wco/public/global/pdf/events/2022/greener-hs/session-3/iso-tc-323-iso_international-standardization-activities-in-the-circular-economy.pdf?la=en;
ISO TC 323 (2023) https://www.iso.org/committee/7203984.html

Other sustainability concepts related to CE

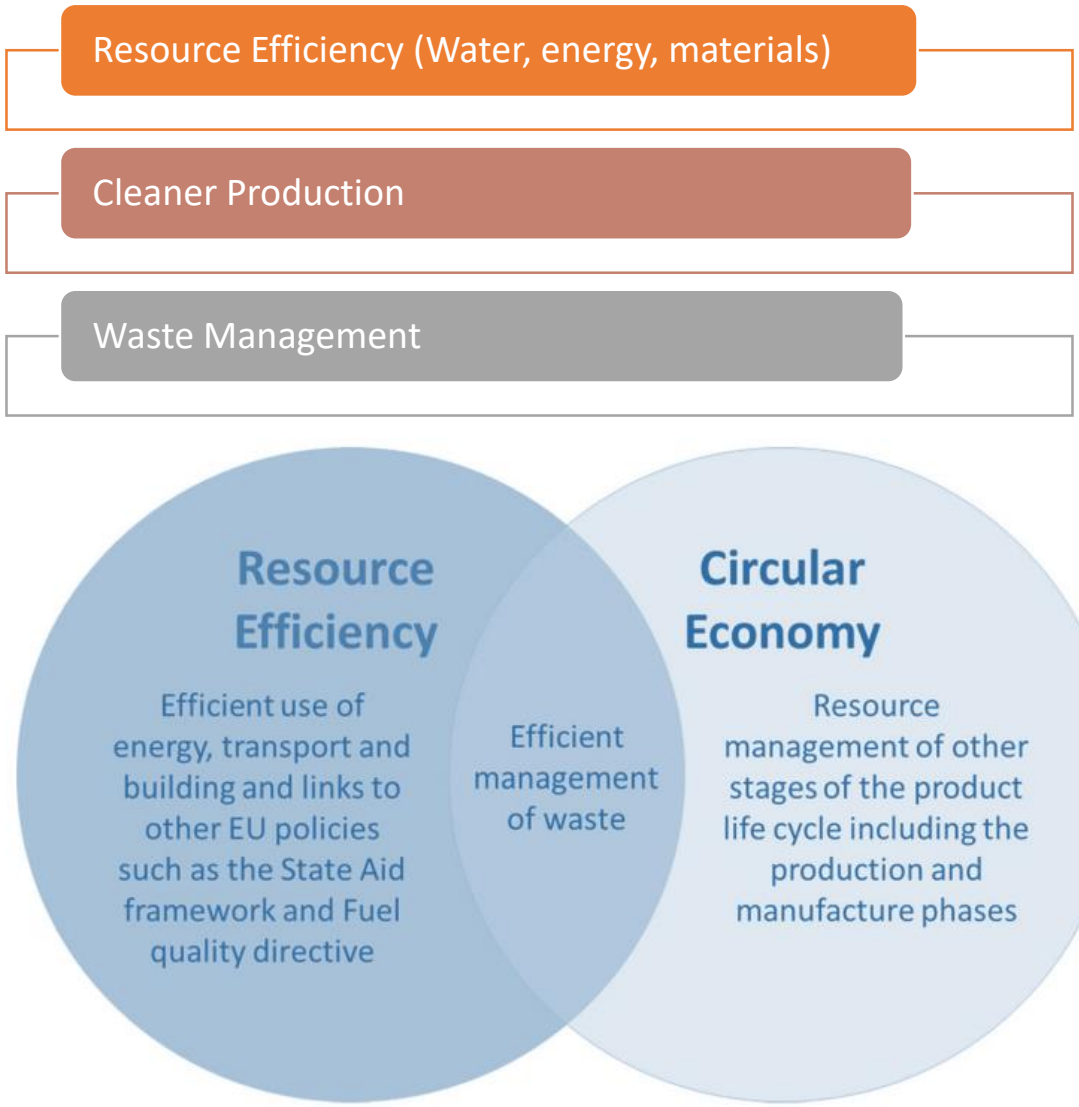
- Resource Efficiency (Water, energy, materials)
- Cleaner Production
- Waste Management
- Life Cycle Assessment (LCA)
- Climate Change and Carbon Reduction
- Environmental, Social and Governance (ESG)
- Sustainable Development Goals (SDGs)

Other sustainability concepts related to CE



Source: Barros et al. (2021): https://www.sciencedirect.com/science/article/pii/S2666789420300064

Module 01 – 1.5 Connection of CE to other sustainability related concepts



- CE aims to "reduce, reuse, recycle, substitute, safeguard, and value" resources across all stages of a product life cycle.
- Resource Efficiency is a broader term which encompasses improved use of energy, transport and buildings as well as resources.
- From material consumption point of view, the resource efficiency includes the savings from improved waste management including waste prevention strategies.
- The CE considers dematerialization strategies across all stages of the life cycle, including those relating to production, manufacturing and end of life.

Source: Pratt, Lenaghan & Mitchard (2016):
https://www.researchgate.net/publication/307950172_Material_flows_accounting_for_Scotland_shows_the_merits_of_a_circular_economy_and_the_folly_of_territorial_carbon_reporting

Module 01 – 1.5 Connection of CE to other sustainability related concepts

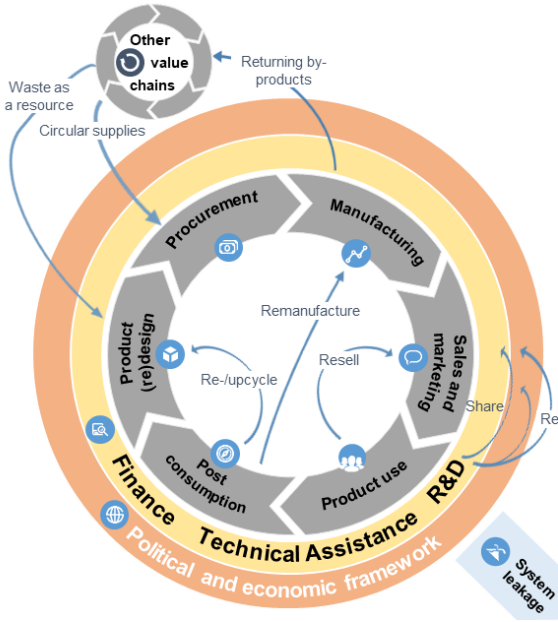
- Resource Efficiency (Water, energy, materials)
- Cleaner Production
- Waste Management

- Resource efficient material strategy: a car manufacturer redesigns their production process so that each car it produced was made of less material.
- In a circular economy, the car manufacturing process may be redesigned so that not only are cars made with less material, they are designed to allow easy remanufacture and repair as well



Source: Pratt, Lenaghan & Mitchard (2016):
https://www.researchgate.net/publication/307950172_Material_flows_accounting_for_Scotland_shows_the_merits_of_a_circular_economy_and_the_folly_of_territorial_carbon_reporting

Life Cycle Assessment (LCA)

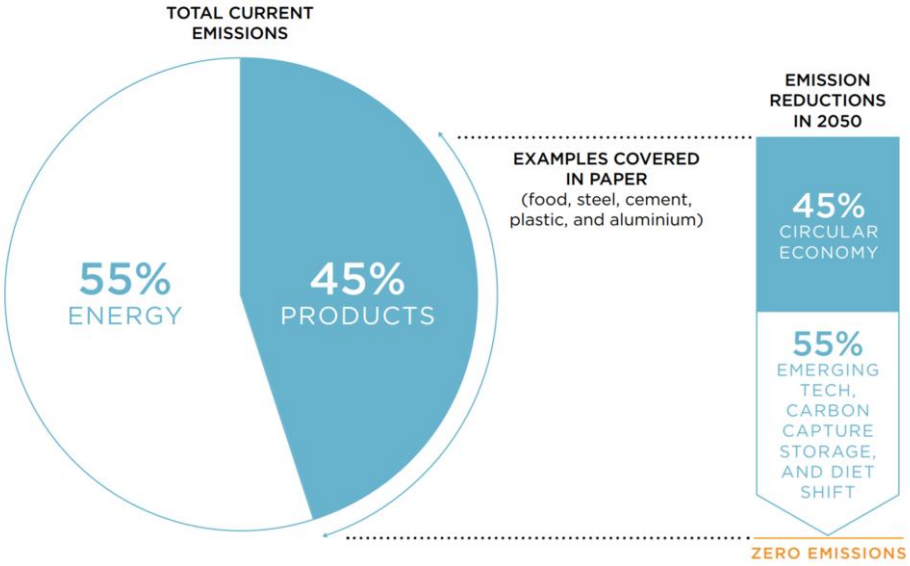


- Life cycle approach is a comprehensive approach to understand the entire life cycle and value chain of a product. This includes all stages from the extraction of raw materials and processing, through to product manufacture, delivery, use, and finally to waste management and recycling.
- It is similar to the circular economy in that it is based on a 'systems thinking' perspective, which involves looking at a product as part of a system that also includes the service associated with it.
- **Life Cycle Assessment (LCA) and Circular Economy have existed alongside each other as separate fields**. Yet, the underlying philosophy of both approaches is complementary and linking the two concepts can be a crucial step towards measuring and achieving circularity in business.
- LCA is a science-based, internationally standardized methodology to establish the environmental footprint of a product across the entire product life cycle provides the metrics to evaluate the merits and demerits of different circular solutions.

Climate Change and Carbon Reduction

Circular Economy is a systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution

- Material extraction and processing accounts for approximately 50% of the total GHG emissions.
- 40% of GHG emissions can be reduced by material efficiency measures.
- Only 55% of the GHG emissions is associated with energy systems. 45% of it is caused by products' manufacturing processes.



Source: United Nations Environment Programme, & International Resource Panel (2019): https://wedocs.unep.org/20.500.11822/27517

Source: Ellen MacArthur Foundation (2021): https://emf.thirdlight.com/file/24/XoGiOySXvopGQ9Xo4d6XnKIvUh/Completing%20the%20picture%20-%20%20Executive%20summary.pdf

Climate Change and Carbon Reduction

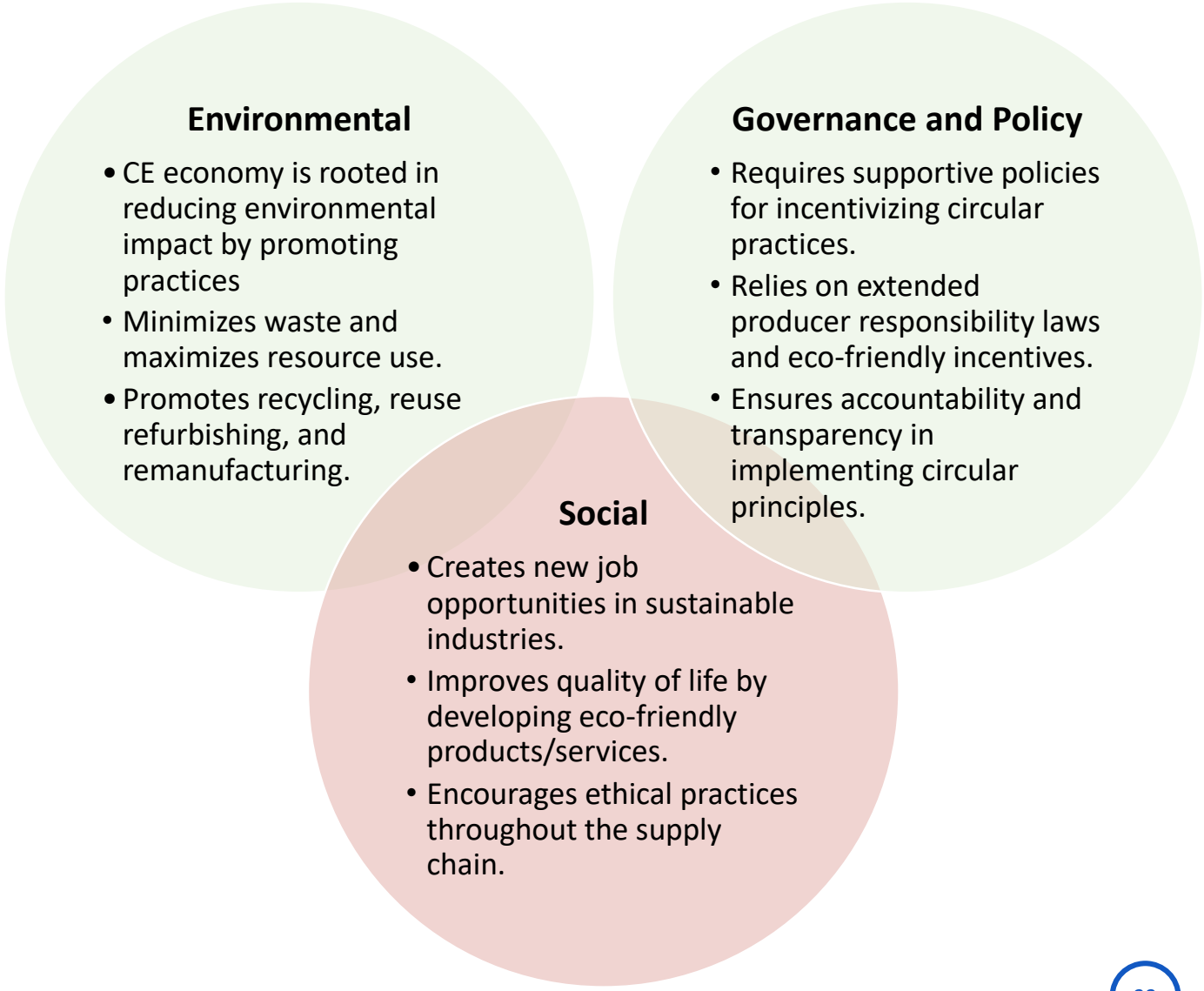
- There is an increasing awareness of scope 3 emissions amongst the participating companies, both when it comes to calculating and setting reduction targets for these emissions – especially from the largest companies.
- More and more companies see the potential in reducing scope 3 emissions by using circular initiatives both upstream and downstream in the value chain.
- Companies mainly tend to apply circular initiatives to activities that are upstream in the value chain, and where they to an extend have control and influence.
- Thus, the location of the emissions in the value chain is pivotal to the potential for applying reducing initiatives.
- However, there is an increasing complexity of applied circular initiatives suggest an equally increasing maturity level amongst companies when applying circular initiatives
- Obtaining good quality data is the main challenge for companies when both calculating scope 3 emissions and applying circular initiatives.

Source: Transition & Danish Business Authority (2023): https://erhvervsstyrelsen.dk/sites/default/files/2023-05/Reducing-scope-3-emissions-through-circular-economy-initiatives_WA.pdf

Module 01 – 1.5 Connection of CE to other sustainability related concepts

Environmental, Social and Governance (ESG)

- While sustainability involves ecological, economic, and social dimensions, discussions **often prioritize the economic and environmental aspects, leaving the social impacts less explored.**
- Circularity offers sustainable production and consumption methods that benefit society.
- A holistic shift towards a sustainable economic system necessitates a more equitable integration of social sustainability dimensions.

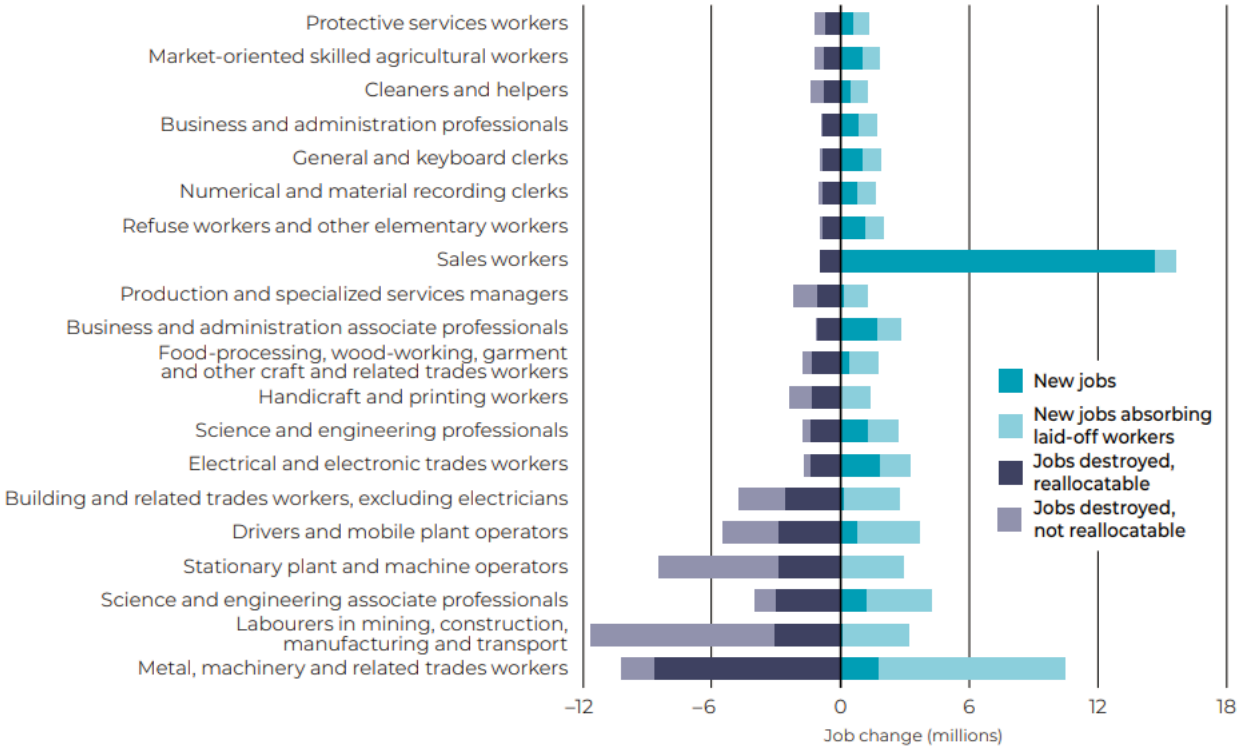


Sources: Mies & Gold (2021): (PDF) Mapping the social dimension of the circular economy (researchgate.net); Collaboration Centre on Sustainable Consumption and Production (2022): CIAP_social impact_cover (europa.eu)

Environmental, **Social** and Governance (ESG)

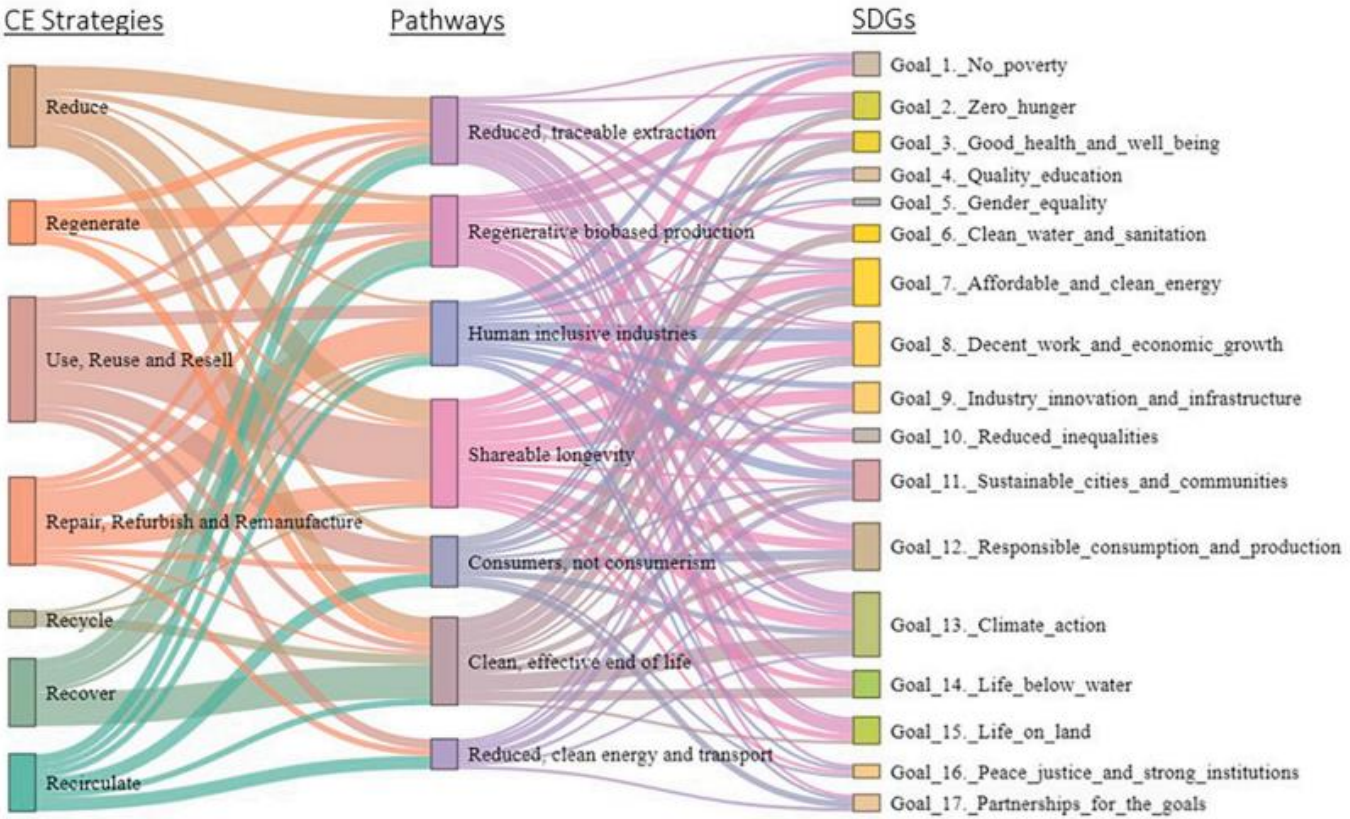
- ILO estimates 7-8 million new jobs by 2030 in a shift toward a circular economy.
- Projection: Circular economy scenario predicts creation of 78 million jobs and destruction of around 71 million.
- Approximately 49 million workers from lost jobs might find vacancies in other industries within their country.
- Nearly 29 million new jobs will be created without job reallocation.
- About 22 million jobs might be lost without corresponding vacancies in similar occupations.
- Figure ES 4 highlights the 20 most impacted occupations by job destruction and reallocation in the circular economy scenario.

Figure ES 4. Occupations most susceptible to job destruction and reallocation across industries in a global circular economy scenario, 2030



Source: ILO (2019): https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_709121.pdf

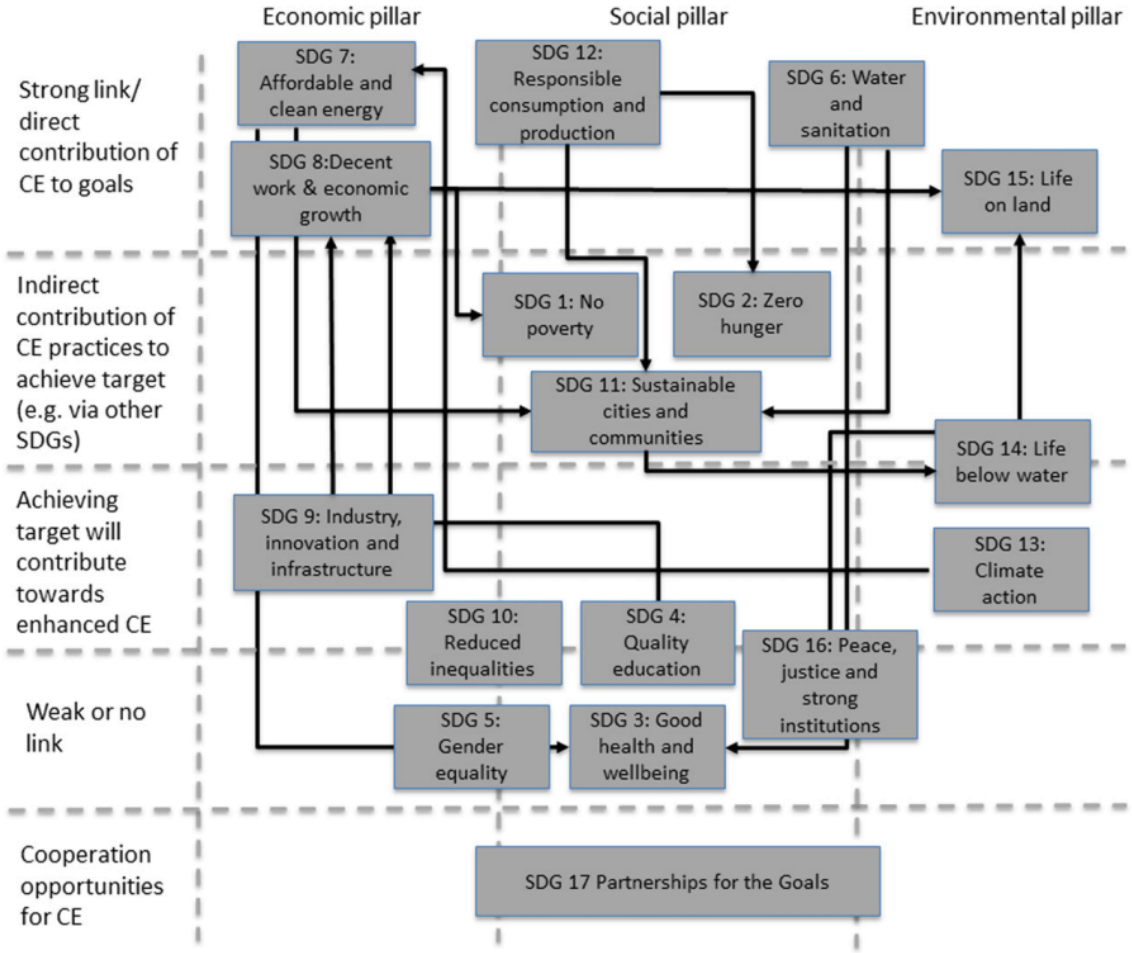
Sustainable Development Goals (SDGs)



- Identified 7 distinct pathways with 25 core elements linking CE strategies and SDGs and lying a foundation for evaluating action plans to align with SDGs
- Pathways include reduced extraction, regenerative production, inclusive industries, among others.
- Pathways 4, 6, and 2 are most impactful, accounting for 66% of matches between CE and SDGs.
- Pathways can be used by stakeholders to design strategies and policies

Source: Ortiz de Montellano, Samani, van der Meer (2023):
https://www.researchgate.net/publication/372116036_How_can_the_circular_economy_support_the_advancement_of_the_Sustainable_Development_Goals_SDGs_A_comprehensive_analysis

Sustainable Development Goals (SDGs)



Findings:

- While CE can help achieve SDG targets, progress on non-CE-related SDG targets can benefit the uptake of CE practices.
- Advanced CE practices require efforts in skills training, capacity building, technology development, and multistakeholder partnerships (SDG 17).
- Highlights how SDGs unrelated to CE practices can still aid in promoting the adoption of CE practices, notably SDGs 16, 4, and 9.

Way forward:

- Advocate for integrating CE-related goals and indicators into SDGs.
- SDGs need intentional design with CE principles for a true shift toward sustainability.
- Research serves as guiding principles for evaluating new CE strategies for SDG advancement.

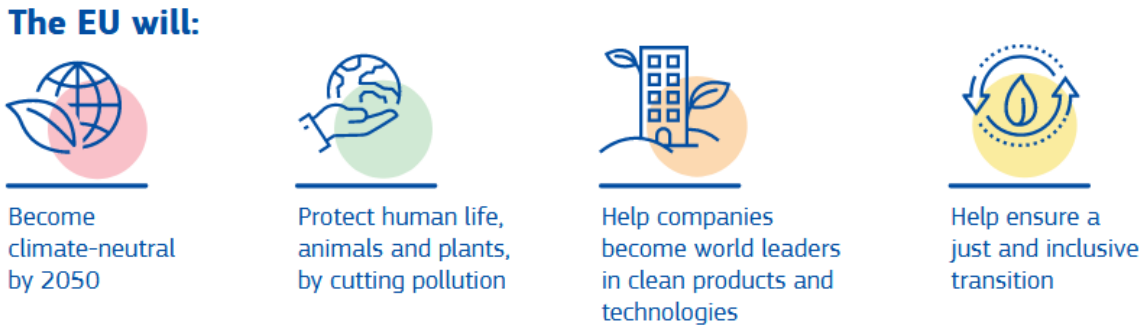
"Adoption of CE practices will be necessary to achieve many targets outlined under the SDGs, not only for SDG 12"

Source: Schröder, Anggraeni, Weber (2018): https://www.researchgate.net/publication/344220320_The_Relevance_of_Circular_Economy_Practices_to_the_Sustainable_Development_Goals

The EU Green Deal

- Set of policy initiatives by the European Commission approved in 2020
- Objectives:
  - making the European Union (EU) climate neutral in 2050;
  - reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 level;
  - reviewing each existing EU law on its climate merits;
  - introducing new legislation on the circular economy, building renovation, biodiversity, farming and innovation;
- On 14 July 2021, the Commission presented proposals to deliver these targets and make the European Green Deal a reality.





Source: European Commission (2019): https://ec.europa.eu/commission/presscorner/detail/en/fs_19_6714

The EU Green Deal (Baseline – 2019)

ENERGY

Decarbonise the energy sector



The production and use of energy account for more than **75%** of the EU's greenhouse gas emissions

BUILDINGS

Renovate buildings, to help people cut their energy bills and energy use



40% of our energy consumption is by buildings

INDUSTRY

Support industry to innovate and to become global leaders in the green economy



European industry only uses **12%** recycled materials

MOBILITY

Roll out cleaner, cheaper and healthier forms of private and public transport



Transport represents **25%** of our emissions

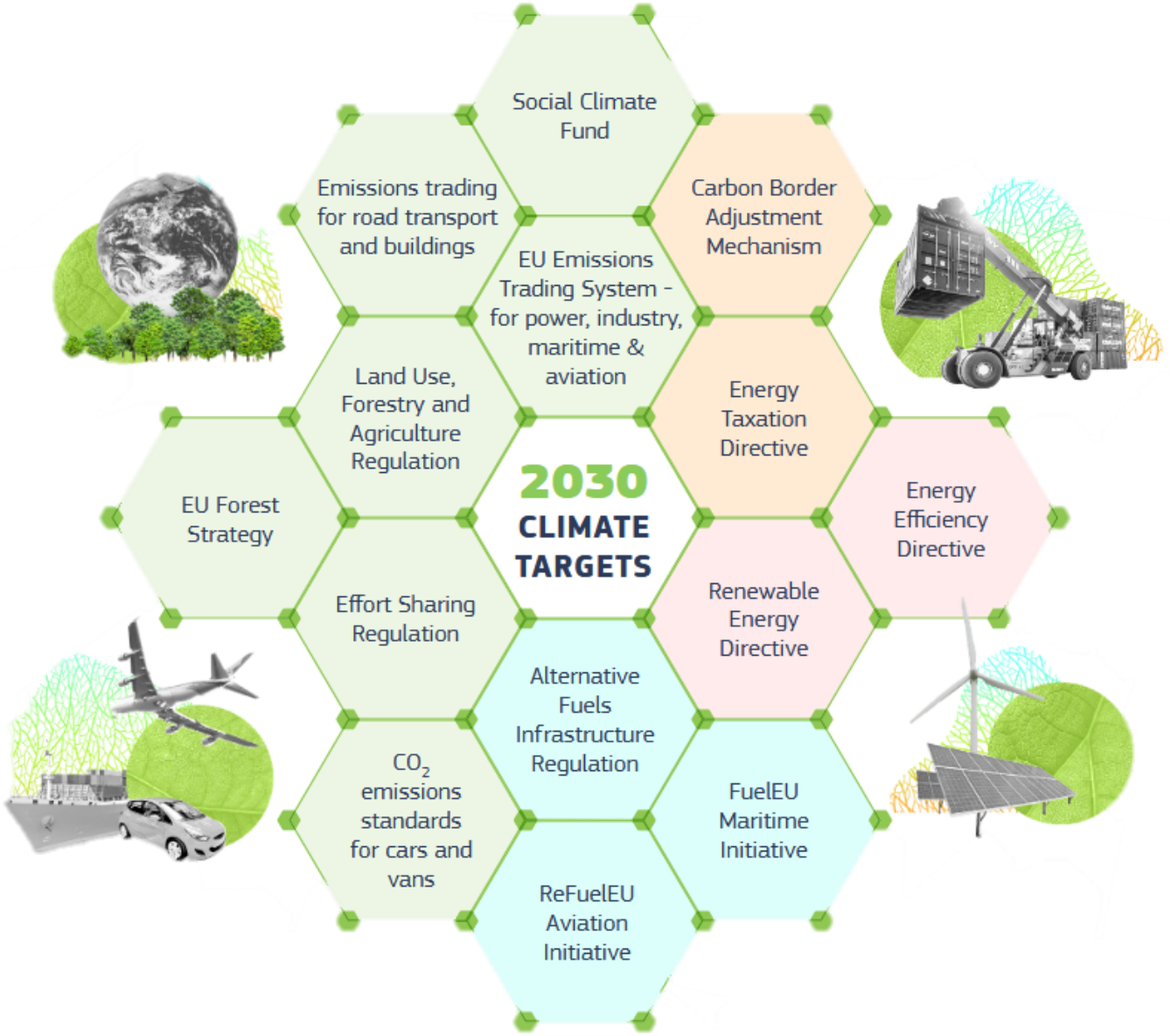
93% of Europeans see **climate change** as a **serious problem**

93% of Europeans have **taken** at least one **action** to tackle climate change

79% agree that taking action on climate change will **lead to innovation**

Source: European Commission (2019): https://ec.europa.eu/commission/presscorner/detail/en/fs_19_6714

The EU Green Deal proposals to achieve 2030 targets



Source: European Commission (2019): https://ec.europa.eu/commission/presscorner/detail/en/fs_19_6714

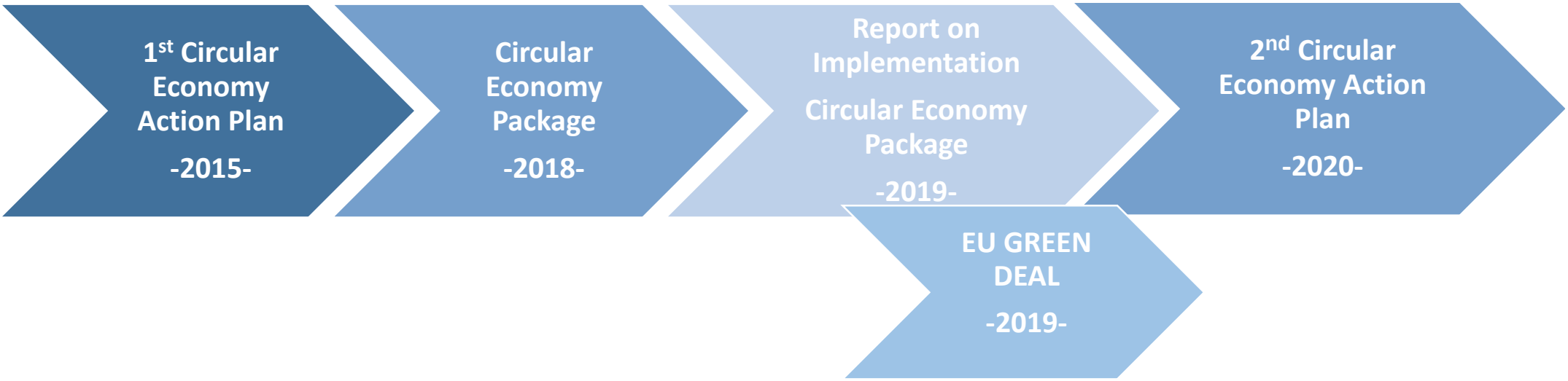
The EU Green Deal – 12 building blocks

→ Focus on energy, chemicals, forestry, circular economy, adaptation to climate change etc.

Fit for 55	European climate law	EU strategy on adaptation to climate change	EU biodiversity strategy for 2030
'Farm to fork' strategy	European industrial strategy	**Circular Economy Action Plan**	Batteries and waste batteries
Just transition	Clean, affordable and secure energy	EU chemicals strategy for sustainability	Forest strategy and deforestation-free imports

Source: European Commision (2019): https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1596443911913&uri=CELEX%3A52019DC0640#document2

Circular Economy Strategy Development in the EU



Circular Economy Strategy Development in the EU



First circular economy action plan - 2015

54 actions for guiding the EU's transition to a circular economy:

Production	Consumption	Waste management	Waste to resource (Secondary raw materials)	Priority Areas/ Sectors	Innovation, investment, other horizontal measures	Monitoring
•Product design Eco-design (reparability, durability, upgradability, recyclability) •Production processes Best available techniques, innovative industrial processes (industrial symbiosis)	•More trustworthy green claims (Eco-label, env. footprints) •Incentives/economic instruments •Guarantees •Repairability •Reduction of household wastes •Green Public Procurement	•Waste hiearchy •Increased recycling targets for packaging materials •Waste collection and sorting improvements •Improvement in waste management legislation towards circular economy	•Quality standards for secondary raw materials •End-of-waste rules •Cross-border circulation of secondary raw materials •Facilitating water reuse	•Plastics •Food waste •Critical raw materials •Construction and demolition •Biomass and bio-based products	•The Horizon 2020 work programme: Industry 2020 in the circular economy •Complemented by the Eco-innovation Action Plan •Financing to scale up improved technologies and processes	•Reliable indicators based on data already collected by Eurostat •Resource Efficiency Scoreboard •Raw Materials Scoreboard

Waste targets for 2030:
65% of municipality waste to be recycled.
75% of packaging waste should be recycled.
Landfilling to be reduced to 10%.

Circular Economy Strategy Development in the EU

Circular economy packages and implementation (2015 – 2019)

- **Eco-design** Working Plan
- **Eco-design** implementing regulations
- Strategy on **plastics** in the circular economy
- Directive on **single-use plastics** enters into force
- Staff Working Document on **Sustainable Products** in a Circular Economy
- Revised **legislative framework on waste**
- Report on **critical raw materials** and the circular economy
- Analysis and policy options to address the **interface between chemicals, products and waste legislation**
- Revised **fertilisers regulation**
- Development of a **monitoring framework** for the circular economy

Source: European Commision: https://environment.ec.europa.eu/topics/circular-economy/first-circular-economy-action-plan_en#policy-areas

Most prominent international policies for Circular Economy

Second Circular Economy Action Plan (EU CEAP) - 2020

Objectives

Measures aim to:

- make sustainable products the norm in the EU
- empower consumers and public buyers
- focus on the sectors that use most resources and where the potential for circularity is high
- ensure less waste
- make circularity work for people, regions and cities
- lead global efforts on circular economy

Overview

The Action Plan announces initiatives along the entire life cycle of products.

The Commission will implement all **35 actions** listed in this Action Plan

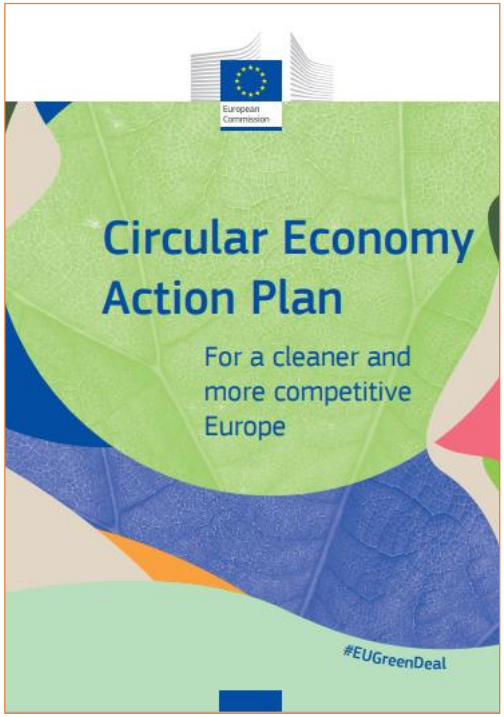
It includes legislative and non-legislative measures.

Timeframe

March 2020: new circular economy action plan adopted
December 2020: new regulation on sustainable batteries
October 2021: rules on persistent organic pollutants in waste
November 2021: news rules on waste shipments
March 2022: new measures incl. eco-design & circular textiles
April 2022: revised measures incl. pollution from large industrial installations
November 2022: new measures adopted incl. on packaging waste

Source: European Union (2020): https://op.europa.eu/en/publication-detail/-/publication/45cc30f6-cd57-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-170854112

The Circular Economy Action Plan (EU CEAP)



- *7 Main Policy Areas*

A SUSTAINABLE PRODUCT POLICY FRAMEWORK

KEY PRODUCT VALUE CHAINS

LESS WASTE, MORE VALUE

MAKING THE CIRCULAR ECONOMY WORK FOR PEOPLE, REGIONS AND CITIES

CROSSCUTTING ACTIONS

LEADING EFFORTS AT GLOBAL LEVEL

MONITORING THE PROGRESS

Source: European Union (2020): https://op.europa.eu/en/publication-detail/-/publication/45cc30f6-cd57-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-170854112

The Circular Economy Action Plan (EU CEAP)

A SUSTAINABLE PRODUCT POLICY FRAMEWORK

Sustainable Product Policy Framework



- Legislative proposal for a **sustainable product policy initiative**
- Legislative proposal **empowering consumers** in the green transition
  - Legislative and non-legislative measures establishing a new **"right to repair"**
  - Legislative proposal on **substantiating green claims**
  - **Mandatory Green Public Procurement (GPP)** criteria and targets in sectoral legislation and phasing-in mandatory reporting on GPP
  - Launch of an industry-led **industrial symbiosis** reporting and certification system

Source: European Union (2020): https://op.europa.eu/en/publication-detail/-/publication/45cc30f6-cd57-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-170854112

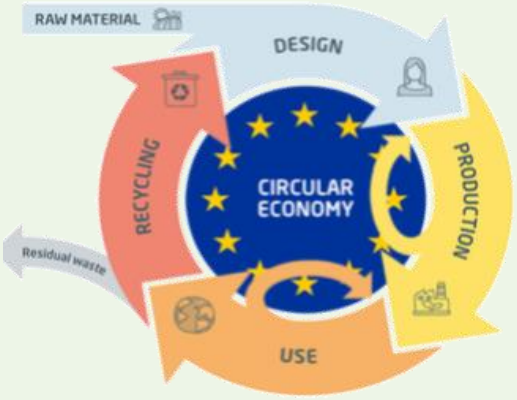
The Circular Economy Action Plan (EU CEAP)

A SUSTAINABLE PRODUCT POLICY FRAMEWORK

Sustainable Product Policy Initiative

- A revision of the **Eco-design Directive** widening its scope beyond energy-related products (A proposal published in March 2022)
- Address the presence of **harmful chemicals** in products, such as electronics & ICT equipment, textiles, furniture, steel, cement and chemicals
- Setting **minimum criteria** not only for energy efficiency but also for **circularity**:
  - Product durability, reusability, upgradability and reparability
  - Presence of substances that inhibit circularity
  - Energy and resource efficiency
  - Recycled content
  - Remanufacturing and recycling
  - Carbon and environmental footprints
  - Information requirements, including a Digital Product Passport

Up to **80%** of products' environmental impacts are determined at the design phase



Source: European Union (2020): https://op.europa.eu/en/publication-detail/-/publication/45cc30f6-cd57-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-170854112

The Circular Economy Action Plan (EU CEAP)

A SUSTAINABLE PRODUCT POLICY FRAMEWORK

Sustainable Product Policy Initiative

Eco-design for Sustainable Products Regulation (ESPR) (Proposal)

- General framework imposing eco-design requirements on **products intended for sale on EU markets**.
- **Scope of products will be expanded** to include "the broadest possible range" (food, feed and medicinal products will be exempt),
- The initial list of identified products for the first working plan includes **textiles, furniture, mattresses, tyres, detergents, paints, lubricants**.
- Digital Product Passport (DPP) will be introduced
- Destruction of unsold goods will be prohibited.



Source: European Union (2020): https://op.europa.eu/en/publication-detail/-/publication/45cc30f6-cd57-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-170854112

The Circular Economy Action Plan (EU CEAP)

A SUSTAINABLE PRODUCT POLICY FRAMEWORK

Empowering consumers

- Proposing a revision of **EU consumer law** to ensure that consumers receive trustworthy and relevant information on products (proposal adopted in March 2022)
- Working on establishing a new '**right to repair**' and considering new rights for consumers (availability of spare parts, access to repair, etc.)
- Including more systematically durability, recyclability and recycled content in the **EU Eco-label criteria** and exploring the possibility to integrate the Product and Organisation **Environmental Footprint** methods in the EU Ecolabel.
- Improving information for consumers on the durability and reparability of products, including through possible **voluntary labelling**;
- Introducing a **digital product passport**



Source: European Union (2020): https://op.europa.eu/en/publication-detail/-/publication/45cc30f6-cd57-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-170854112

The Circular Economy Action Plan (EU CEAP)

A SUSTAINABLE PRODUCT POLICY FRAMEWORK

Digital Product Passport

- Digital product passports will be the norm for all products regulated under the ESPR, enabling products to be **tagged, identified and linked to data relevant to their circularity and sustainability**.
- Provide **information on the environmental sustainability of products**. Depending on the product concerned, this can include information on energy use, recycled content, presence of substances of concern, durability, reparability, including a reparability score, spare part availability and recyclability.
- Help **track the presence of substances of concern** throughout the life cycle of materials and products.
- Help consumers and businesses make **informed choices** when purchasing products, facilitate repairs and recycling and **improve transparency** about products' lifecycle impacts on the environment.
- Help public authorities to better perform checks and controls.



Source: European Union (2020): https://op.europa.eu/en/publication-detail/-/publication/45cc30f6-cd57-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-170854112

The Circular Economy Action Plan (EU CEAP)

KEY PRODUCT VALUE CHAINS

- Electronics and ICT
- Batteries and vehicles
- Textiles
- Plastics
- Packaging
- Construction and buildings
- Food, water and nutrients

Source: European Union (2020): https://op.europa.eu/en/publication-detail/-/publication/45cc30f6-cd57-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-170854112

The Circular Economy Action Plan (EU CEAP)

LESS WASTE, MORE VALUE

Less Waste, More Value

- **Waste reduction targets** for specific streams and other measures on waste prevention
- EU-wide harmonized model for **separate collection** of waste and **labelling** to facilitate separate collection
- Methodologies to track and minimize the presence of **substances of concern in recycled materials** and articles made thereof
- Harmonised information systems for the presence of substances of concern
- Scoping the development of further EU-wide **end-of-waste and by-product criteria**
- Revision of the rules on **waste shipments**



Source: European Union (2020): https://op.europa.eu/en/publication-detail/-/publication/45cc30f6-cd57-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-170854112

The Circular Economy Action Plan (EU CEAP)

LESS WASTE, MORE VALUE

Less Waste, More Value

Waste reduction targets

- **Revision of EU legislation** on batteries, packaging, end-of-life vehicles, and hazardous substances in electronic equipment with a view to **preventing waste, increasing recycled content, promoting safer and cleaner waste streams, and ensuring high-quality recycling**.
  - To halve the amount of residual (non-recycled) **municipal waste** by 2030
  - To promote safer and cleaner waste streams, and ensure high-quality recycling.
  - To integrate the **reduction of food waste**, as it constitutes a significant share of municipal waste
- Enhancing **extended producer responsibility** (EPR) schemes

Source: European Union (2020): https://op.europa.eu/en/publication-detail/-/publication/45cc30f6-cd57-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-170854112

The Circular Economy Action Plan (EU CEAP)

LESS WASTE, MORE VALUE

Less Waste, More Value

Separate collection and labelling, substances of concern

- Addressing the most effective **combinations of separate collection models**, the density and accessibility of **separate collection points**, etc.
- Facilitating **consumer involvement** through different ways such as common bin colors, **harmonized symbols** for key waste types, product **labels**, information campaigns and economic instruments.
- Providing **guidance** for separate collection of municipal waste

Source: European Union (2020): https://op.europa.eu/en/publication-detail/-/publication/45cc30f6-cd57-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-170854112

The Circular Economy Action Plan (EU CEAP)

LESS WASTE, MORE VALUE

Less Waste, More Value

Waste shipments

- Ensuring that the EU **does not export its waste challenges** to third countries
- Taking actions on product design, quality and safety of **secondary materials** and enhancing **their markets**
- Enhancing **re-use and recycling** of waste in the EU by a thorough review of EU rules on waste shipments
- **Restricting exports** of waste that have **harmful** environmental and health impacts in third countries or can be **treated domestically within the EU** by focusing on countries of destination, problematic waste streams, types of waste operations that are source of concern, and enforcement to counteract illegal shipments.
- Strengthening **controls of shipments of waste**, and improving the sustainable management of waste in these countries.

Source: European Union (2020): https://op.europa.eu/en/publication-detail/-/publication/45cc30f6-cd57-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-170854112

The Circular Economy Action Plan (EU CEAP)

Other topics

- Supporting the circular economy transition through the **Skills Agenda** which is a five-year plan to help individuals and businesses develop more and better skills for Green Deal
- Improving measurement, modelling and policy tools to **capture synergies between the circular economy and climate change** mitigation and adaptation at EU and national level
- Regulatory framework for the **certification of carbon removals**
- Mainstreaming **circular economy** objectives in the context of the rules on **non-financial reporting**, and initiatives on **sustainable corporate governance** and on **environmental accounting**
- Mainstreaming circular economy objectives in **free trade agreements**, in other bilateral, regional and multilateral processes and agreements, and in **EU external policy funding instruments**
- Updating the **Circular Economy Monitoring Framework** to reflect new policy priorities and develop **further indicators** on resource use, including consumption and material footprints

Source: European Union (2020): https://op.europa.eu/en/publication-detail/-/publication/45cc30f6-cd57-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-170854112

EU Sustainable Finance Strategy

Action plan on financing sustainable growth (2018)

Connect finance with sustainability

Paris Agreement Targets
UN 2030 Agenda for Sustainable Development

European Green Deal targets

COVID-19 pandemic

Need for resilience against climate and environmental shocks

Investments and funds to be directed towards sustainable projects and activities

Renewed sustainable finance strategy and update on the action plan on financing sustainable growth (2020)

Source: European Commission (2021): https://finance.ec.europa.eu/system/files/2021-07/210706-sustainable-finance-strategy-factsheet_en.pdf

EU Action Plan on Financing Sustainable Growth – Key elements

Taxonomy regulation

EU Taxonomy

Establishment of a unified classification system of environmentally sustainable activites

Sustainable Finance Disclosure Regulation

Increase transparency and reporting of financial companies and investment products on integration of and performance with respect to ESG factors

Coroporate Sustainability Reporting Directive

Improve reporting on ESG matters and provide company information necessary for Taxonomy and SFDR reporting

Source: European Commission (2021): https://finance.ec.europa.eu/system/files/2021-07/210706-sustainable-finance-strategy-factsheet_en.pdf

EU Taxonomy

- The EU taxonomy is a **classification** system, establishing a **list** of environmentally sustainable economic activities.
- It is expected to provide companies, **investors** and policymakers with **appropriate definitions** for which economic activities can be considered environmentally sustainable.
- In this way, it should create security for investors, **protect private investors from greenwashing**, help companies to become more climate-friendly and **help shift investments** where they are most needed.
- Aims to help the EU **scale up sustainable investment** and implement the European green deal.
- The EU Taxonomy is a **living document** that will be added to over time and be updated as necessary.



Source: European Commission (n.d.): https://ec.europa.eu/sustainable-finance-taxonomy/home

EU Taxonomy

Target

Define a unified classification system of sustainable economic activities in order to direct private investments towards **six environmental goals**:

(i) climate change mitigation
(ii) climate change adaptation
(iii) pollution prevention
(iv) circular economy
(v) protection of marine resources and
(vi) biodiversity ecosystems

EU Commission has also started the process to develop a complementary **social taxonomy**

Overview

Defines activities that may substantially contribute to one of the six environmental goals (→ **Taxonomy eligibility**)

Defines criteria to be fulfilled for an activity to be actually contributing (→ **Technical screening criteria (TSC)**)

Defines full set of requirements for **Taxonomy alignment**

- Significantly contributes to one of the environmental objectives (TSCs)
- Without doing significant harm (DNSH) to any of the other environmental objectives (DNSH criteria for each goal)
- Meets minimum social safeguards

Timeframe

December 2021:
Publication of 1. DA, defining overall goals

April 2022:
Expert report on TSC for goals 3-6, but not timeline for adoption

June 2022:
Adoption of TSC and DNSH for goals 1&2

Jan 2022
First companies to report on taxonomy eligibility

Jan 2023
First companies to report on taxonomy alignment

Source: European Commission (n.d.): https://ec.europa.eu/sustainable-finance-taxonomy/home

EU Taxonomy Criteria

- Climate change mitigation
- Climate change adaptation
- Sustainable use of water & marine sources
- Circular economy
- Pollution prevention and control
- Protection of biodiversity and ecosystems

→ Delegated regulations for each objective

(Regulations were published for climate change mitigation and adaptation)

→ Eligible activities and technical screening criteria are identified



II

(Non-legislative acts)

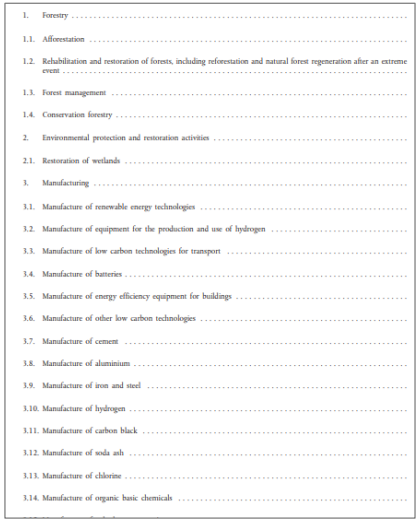
REGULATIONS

COMMISSION DELEGATED REGULATION (EU) 2021/2139

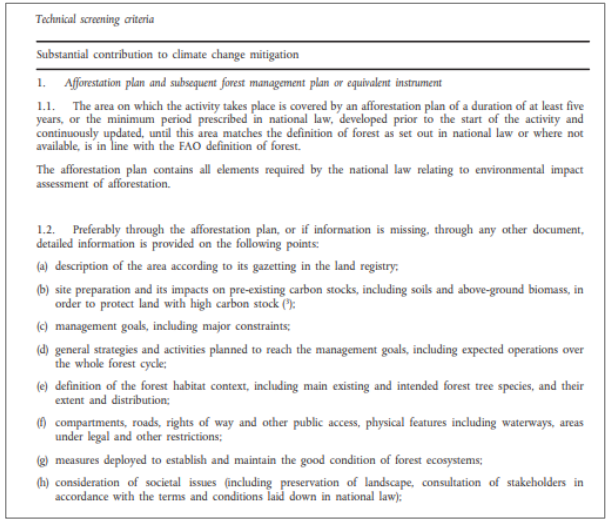
of 4 June 2021

supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives

(Text with EEA relevance)



1. Forestry
1.1. Afforestation
1.2. Rehabilitation and restoration of forests, including reforestation and natural forest regeneration after an extreme event
1.3. Forest management
1.4. Conservation forestry
2. Environmental protection and restoration activities
2.1. Restoration of wetlands
3. Manufacturing
3.1. Manufacture of renewable energy technologies
3.2. Manufacture of equipment for the production and use of hydrogen
3.3. Manufacture of low carbon technologies for transport
3.4. Manufacture of batteries
3.5. Manufacture of energy efficiency equipment for buildings
3.6. Manufacture of other low carbon technologies
3.7. Manufacture of cement
3.8. Manufacture of aluminium
3.9. Manufacture of iron and steel
3.10. Manufacture of hydrogen
3.11. Manufacture of carbon black
3.12. Manufacture of soda ash
3.13. Manufacture of chlorine
3.14. Manufacture of organic basic chemicals



Technical screening criteria

Substantial contribution to climate change mitigation

1. *Afforestation plan and subsequent forest management plan or equivalent instrument*

1.1. The area on which the activity takes place is covered by an afforestation plan of a duration of at least five years, or the minimum period prescribed in national law, developed prior to the start of the activity and continuously updated, until this area matches the definition of forest as set out in national law or where not available, is in line with the FAO definition of forest.

The afforestation plan contains all elements required by the national law relating to environmental impact assessment of afforestation.

1.2. Preferably through the afforestation plan, or if information is missing, through any other document, detailed information is provided on the following points:

(a) description of the area according to its gazetting in the land registry;

(b) site preparation and its impacts on pre-existing carbon stocks, including soils and above-ground biomass, in order to protect land with high carbon stock (3);

(c) management goals, including major constraints;

(d) general strategies and activities planned to reach the management goals, including expected operations over the whole forest cycle;

(e) definition of the forest habitat context, including main existing and intended forest tree species, and their extent and distribution;

(f) compartments, roads, rights of way and other public access, physical features including waterways, areas under legal and other restrictions;

(g) measures deployed to establish and maintain the good condition of forest ecosystems;

(h) consideration of societal issues (including preservation of landscape, consultation of stakeholders in accordance with the terms and conditions laid down in national law);

Source: European Commission (n.d.): https://ec.europa.eu/sustainable-finance-taxonomy/home

EU Taxonomy activities and criteria – Circular Economy

1. Manufacturing

1.1. Manufacture Of Plastic Packaging Goods

1.2. Manufacture Of Electrical And Electronic Equipment

2. Water Supply, Sewerage, Waste Management And Remediation Activities

3. Construction And Real Estate Activities

4. Information And Communication

5. Services

5.1. Repair, Refurbishment And Remanufacturing

5.2. Sale Of Spare Parts

5.3. Preparation For Re-use Of End-of-life Products And Product Components

5.4. Sale Of Second-hand Goods

5.5. Product-as-a-service And Other Circular Use- And Result-oriented Service Models

5.6. Marketplace For The Trade Of Second-hand Goods For Reuse

- Significantly contributes to one of the environmental objectives (TSCs)
- Without doing significant harm (DNSH) to any of the other environmental objectives (DNSH criteria for each goal)

Source: European Commission (n.d.): https://ec.europa.eu/sustainable-finance-taxonomy/home

EU Action Plan on Financing Sustainable Growth – Key elements

Taxonomy regulation

EU Taxonomy

Establishment of a unified classification system of environmentally sustainable activites

Sustainable Finance Disclosure Regulation

Increase transparency and reporting of financial companies and investment products on integration of and performance with respect to ESG factors

Coroporate Sustainability Reporting Directive

Improve reporting on ESG matters and provide company information necessary for Taxonomy and SFDR reporting

Source: European Commission (2021): https://finance.ec.europa.eu/system/files/2021-07/210706-sustainable-finance-strategy-factsheet_en.pdf

EU Taxonomy and Reporting

- To date, reporting has targeted the first two environmental objectives, pending finalisation of the Environmental Delegated Acts for the remaining four.
- The Taxonomy Regulation establishes reporting criteria that inform and provide a basis for other sustainable finance legislation:
  - **Sustainable Finance Disclosure Regulation (SFDR):** Financial market participants (FMPs) are required to disclose the extent to which their financial products are environmentally sustainable, address sustainability-related principal adverse impacts (PAIs), and to what extent products align with the environmental objectives laid out in the Taxonomy.
  - **Non-Financial Reporting Directive (NFRD)/ Corporate Sustainability Reporting Directive (CSRD):** Financial and non-financial companies in scope of the NFRD/CSRD are expected to report both Taxonomy eligibility and Taxonomy alignment annually.
    (On 5 January 2023 CSRD entered into force; NFRD remain in force until companies have to apply the new rules of the CSRD)

Corporate sustainability reporting directive (CSRD)

Target

- Replace currently existing EU non-financial reporting directive
- Expanding the range of companies required to report
- Broaden the information on which companies have to report on and requirement of adhering to mandatory EU sustainability reporting standards
- Provide information needed for financial market to ESG information required by Taxonomy and SFRD

Overview

Extended application scope

- EU companies fullfilling 2 out of 3 size criteria
  - >249 employees
  - Total assets > 20 Mio EUR
  - Revenue > 40 Mio EUR
- Listed SME
- Non-European companies with more than 150 mio revenue in the EU and at least one subsidiary or branch in the EU

Extended reporting scope, e.g.

- KPIs according to European Sustainability Reporting Standards (under development)
- Information on six environmental targets as defined by EU Taxonomy
- External assurance of reporting

Timeframe

June 2022:
Legislative act was adopted

Financial year 2024:
implementation for all companies >500 Emp

Financial year 2025:
implementation for all companies with revenue > 40 Mio EUR

Financial year 2026: Listed SME that are orientated towards the capital markets

Financial year 2028: Non-EU countries that are required to report

Policy Instruments for Circular Economy – Summary

CE strategies	Regulatory / planning instruments	Economic / fiscal instruments	Voluntary instruments	Informational instruments
Increase resource efficiency	• Waste management plans • Best Available Technology (BAT) regulation • Eco-design regulation	• Tax relief for reduced industrial waste • Resource Efficiency Credit Facilities • Landfill tax	• Voluntary basis/agreement on providing environmental performance data and information.	• Cleaner Production Centre's Capacity Building • Programmes on eco-design
Recover after disposal	• Implementation of national EPR schemes • Implementation of national norms for recycled materials • Formalisation of plastic packaging waste picker and collector communities	• Sustainable public procurement • Tax incentives for recyclers • Circular Credits for informal waste pickers	• Public private partnerships for recycling technologies • Voluntary EPR schemes • Voluntary deposit systems • Municipal waste separation and collection partnership with informal waste picker cooperatives	• Guidelines for municipal domestic waste separation • Information centres or help desk for collectors, pickers, separators, recyclers • Eco-labelling schemes for separation • Awareness raising campaigns
Extend the life-time of products	• Implementation of national EPR schemes	• Sustainable public procurement • Deposit systems	• Send products to repair	• Information about reapairability of products • Tutorials

Source: adelphi (2022)

Policy Instruments for Circular Economy – Summary

CE strategies	Regulatory / planning instruments	Economic / fiscal instruments	Voluntary instruments	Informational instruments
Shift to service-based models		• Open Innovation Challenges • Municipal grant schemes • Crowdfunding schemes	• Eco-entrepreneur business development programmes Partnership for alternative service solutions	• Guidelines for alternative products and services
Shift to circular supplies	• Public procurement procedures in favor of recycled products	• Sustainable public procurement • Economic incentives to promote the use of recyclates • Funding for research and development of new technologies		
Facilitate demand for circular products and services				• Certificates and labels for products made of recycled materials • Informational campaigns • Repair cafes

Source: adelphi (2022)