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TEXTILE TOOLKIT: DRIVING CIRCULAR ECONOMY AND RESOURCE EFFICIENCY

adelphi

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This toolkit was prepared by the adelphi consult GmbH under the European Union (EU) Resource Efficiency Initiative (EU-REI) which was the predecessor project (January 2017 – December 2023) of EU–I RECEI.

As of
February 2025

On behalf of the:
European Union (EU) and the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV).

Foreword

The textile and apparel sector contributes between 2-3% of GDP to the global economy and employs up to 60 million people worldwide, with India contributing 3.9% to the global trade. The sector is expected to see continued growth in the coming years. However, it also poses considerable environmental challenge of resource depletion, waste management, and pollution. The transition to a resource-efficient and circular economy is crucial to addressing these challenges and ensuring sustainable economic growth will require partnership and collaborative approach. The European Union (EU) and India are also important partners in the textile and apparel sector with EU being an important destination for Indian exports. In 2022-23, exports to the EU countries represented around 20.9% of total textile and apparel exports of India.

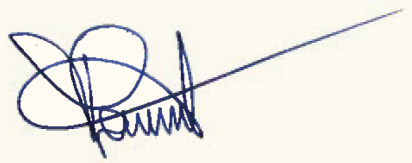
The 'India-EU Resource Efficiency and Circular Economy Partnership,' launched during the 15th EU-India Summit in July 2020, exemplifies the commitment of the European Union and India to work together towards a sustainable future. This partnership engages governments, businesses, academia, and research institutions from both regions to promote resource efficiency and circular economy practices including in the textile sector.

The EU–India Resource Efficiency and Circular Economy Initiative (EU-I RECEI) is an important vehicle for taking forward this partnership. It is implemented in partnership with Ministry of Environment, Forest and Climate Change. This toolkit is a significant outcome of our joint efforts with the Ministry of Textiles, Government of India, and was developed under the previous project on the EU-India Resource Efficiency Initiative (EU-REI) implemented from 2017 until December 2023. It was led by a consortium including Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, The Energy and Resources Institute (TERI), the Confederation of Indian Industry (CII), and adelphi.

The toolkit is designed to provide stakeholders in the textile sector with the tools and knowledge to embrace circular economy practices. It highlights pathways, strategies, and best practices that can be adapted to the specific context of India's textile industry. We hope that it will serve to inspire stakeholders to develop tailored solutions for a sustainable and resource-efficient textile value chain in India.

We extend our gratitude to the Ministry of Textiles and the Ministry of Environment, Forest and Climate Change, Government of India, for their cooperation and guidance, and efforts of all the consortium partners, and stakeholders for their invaluable contributions. We believe that the implementation of the strategies outlined in this toolkit will lead to a more sustainable textile sector and further our collective efforts towards a circular economy.

We wish all the stakeholders success in this important endeavour and look forward to the positive impacts of our continued collaboration.



Mr Franck Viault
Minister Counsellor, Head of Cooperation
Delegation of the European Union to India

What is this toolkit about?

What to expect – and what not to expect

Participants can expect to be given a basic background information about circular economy and resource efficiency in the textile sector. Replicable elements and success factors both on a regulatory level, but also a practical level in regards to the different value chain steps will be explored in this toolkit and also existing tools and best practice examples will be showed to the readers/participants as reference.

However, **do not expect** this toolkit to delve into highly technical or granular details of textile production processes or offer ready-made solutions for the Indian country context to simply copy and paste. Instead, it focuses on providing a holistic understanding of circularity concepts, tools, and strategies within the textile industry. Additionally, while it highlights best practices and breakthrough examples in India, it may not cover every niche innovation or emerging trend in the sector.

It aims to support you with some guidance you are about to adapt the most suitable solutions for a more circular and resource efficient textile value chain in India.

About the CE & RE Textile Toolkit

EU-I RECEI aims to promote scalable and inclusive circular economy and resource efficiency practices in India. It is also an important vehicle for the EU-India Resource Efficiency and Circular Economy (RECE) Partnership under the 2020 EU-India Joint Declaration on RECE.

The objective of this toolkit is to support public sector stakeholders by giving them background information about the status of circularity in the textile sector, the needs and potentials in the Indian context, to showcase and explain different strategies and approaches along the value chain, to equip them with a technique for policy protoprinting for Circular Economy in Textiles and to give an overview about already existing toolkits and best practice examples in the textile sector.

The **objective of this assignment** is to support public sector stakeholders by giving them background information about the status of circularity in the textile sector, the needs and potentials in the Indian context, to showcase and explain different strategies and approaches along the value chain, to equip them with a technique for policy protoprinting for Circular Economy in Textiles and to give an overview about already existing toolkits and best practice examples in the textile sector.

The 7 CE & RE textile toolkit modules

1. Introduction to Circular Economy (CE)
2. CE in the Context of Textiles
3. CE Policies and Enablers for Textiles
4. Needs and Potentials in the Indian Context
5. Policy Prototyping for CE in Textiles
6. Best Practice Examples Booklet
7. Repository of Toolkits

About the CE/RE Textile Toolkit's Modules

1
Introduction to Circular Economy (CE)

Navigating the Circular Economy

Landscape: Strategies, Models, and Sustainability Connections

2
CE in the Context of Textiles

Weaving Sustainability: Circular Economy in the Textiles Industry

3
CE policies and enablers for textiles

Global Strategies and Success Stories: Circular Economy Policies in the Textiles Industry

4
Needs and Potentials in the Indian context

Textile Industry in India: Policies, Strategies, Needs and Potentials

5
Policy Prototyping for CE in textiles

Empowering Stakeholders for a Circular Textile Future: Policy Training and Acceleration Methods

6
Best Practice Examples Booklet

Inspiring Circular Textile Innovations: Showcasing India's Breakthroughs and Best Practices

7
Repository of Toolkits

Empowering Sustainability: Tools for a Circular Textile Sector

How to use the textile toolkit

This Toolkit includes two different components

1. **Readings and Background Info** provide insights into the topic of Circular Economy in the textile sectors
2. **Practical Tools** provide step-by-step guidance to steer into the direction of more circular/ resource-efficient textiles in India

1. READINGS/BACKGROUND INFO

The readings and background information in this policy toolkit will contain basic information about Circular Economy (CE), the respective legislations on a national level and it´s connection to the textile industry. Other than that it will be looked into the Indian country context and the regulatory framework, Indian strategies and action plans regarding circular textiles will be delineated. At the end of the toolkit there will be a repository with different best practice examples in the textile industry as well as already existing toolkits which can be referred to in the future.

2. TOOLS

The readings and background information in this policy toolkit will contain basic information about Circular Economy (CE), the respective legislations on a national level and it´s connection to the textile industry. Other than that it will be looked into the Indian country context and the regulatory framework, Indian strategies and action plans regarding circular textiles will be delineated. At the end of the toolkit there will be a repository with different best practice examples in the textile industry as well as already existing toolkits which can be referred to in the future.

Module 01: Introduction to Circular Economy

1 Introduction to Circular Economy (CE)

2 CE in the Context of Textiles

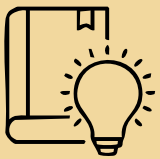
3 CE policies and enablers for textiles

4 Needs and Potentials in the Indian context

5 Policy Prototyping for CE in textiles

6 Best Practice Examples Booklet

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.

Module 01: 1.1 What is Circular Economy (CE)?

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.

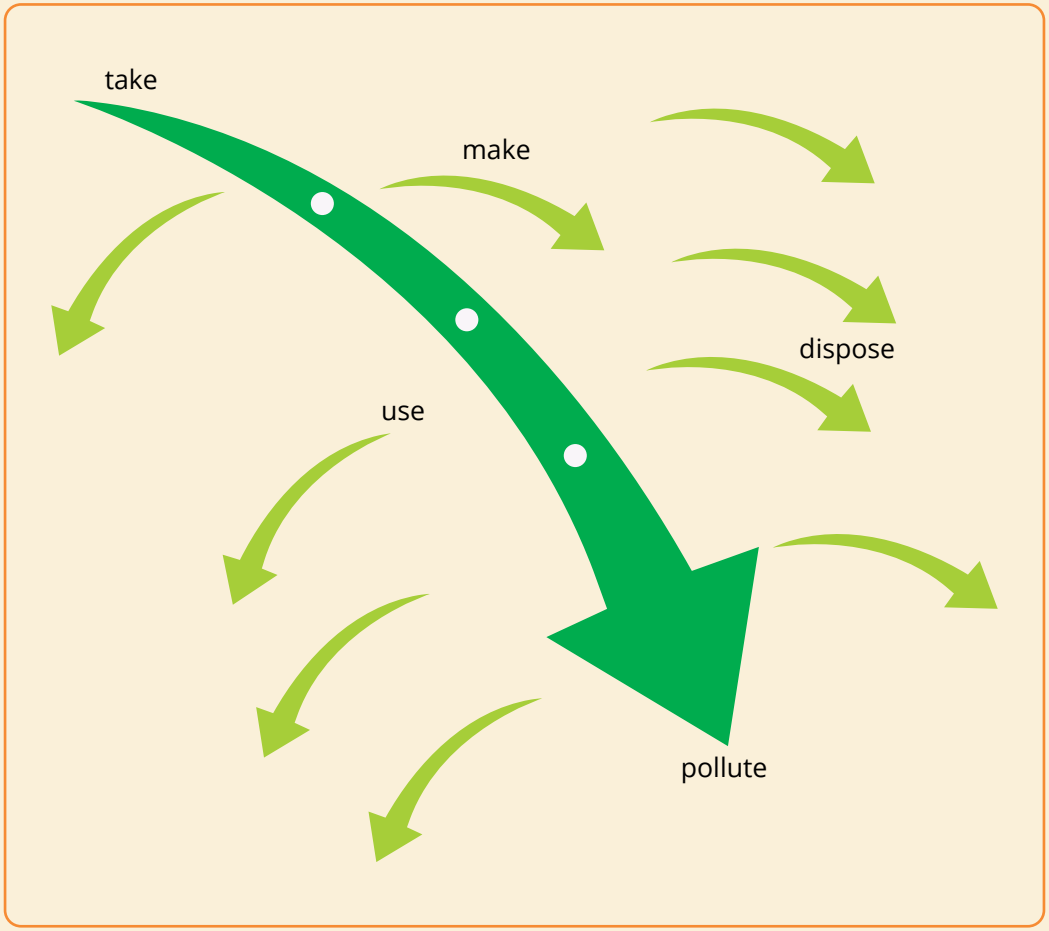
– ChatGPT, AI

Module 01: 1.1 What is Circular Economy (CE)?

Linear vs. Circular Economy

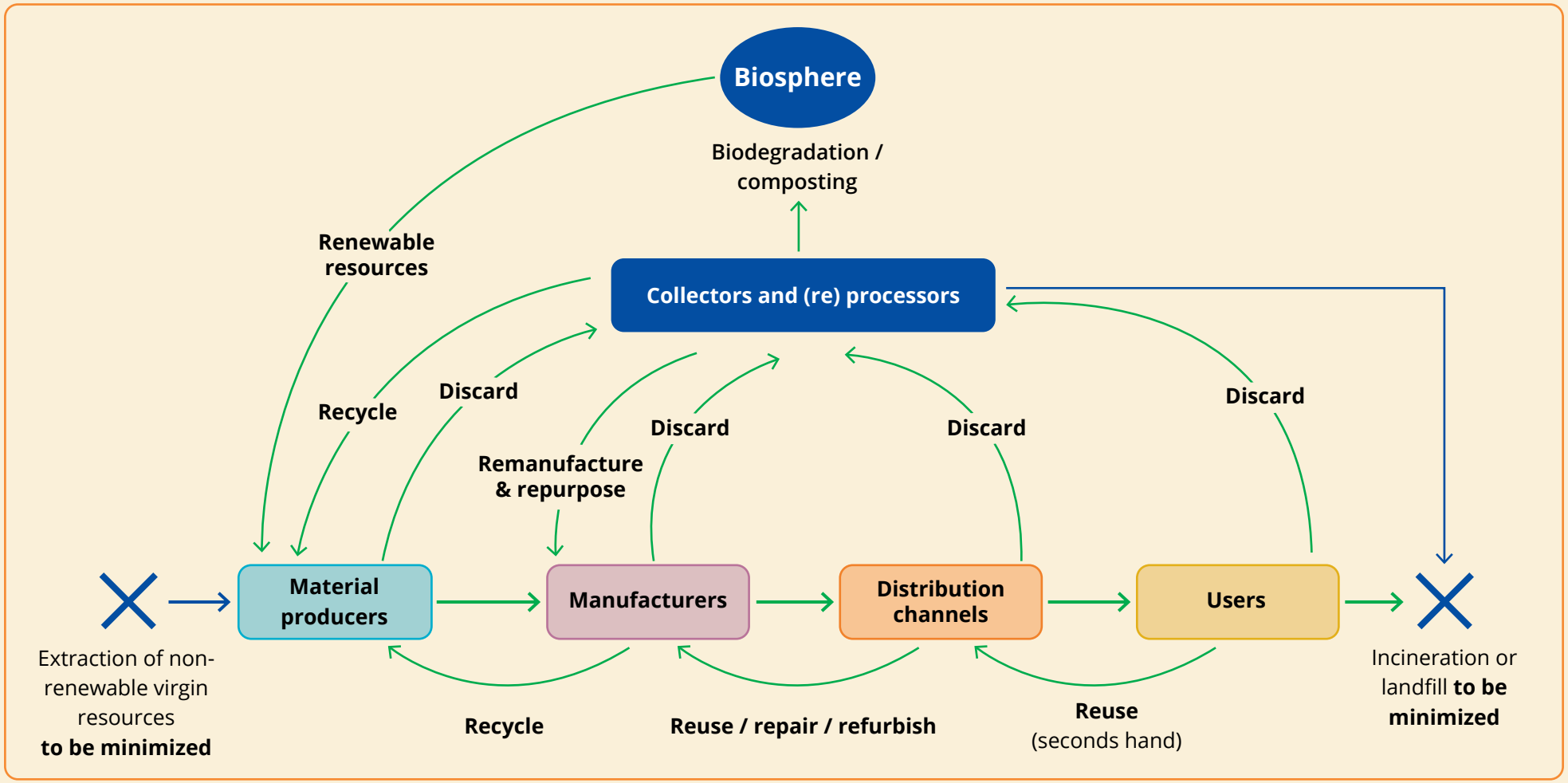
- For a long time, our economy has been «linear».
- TAKE → PRODUCE → USE → WASTE
- Production and delivery of products (creation of a value): resource consumption, environmental and social impacts
- When the product/resource becomes a waste: value destructed, all the resources used lost, only the environmental 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.



Module 01: 1.1 What is Circular Economy (CE)?

Circular Economy and Value Chains

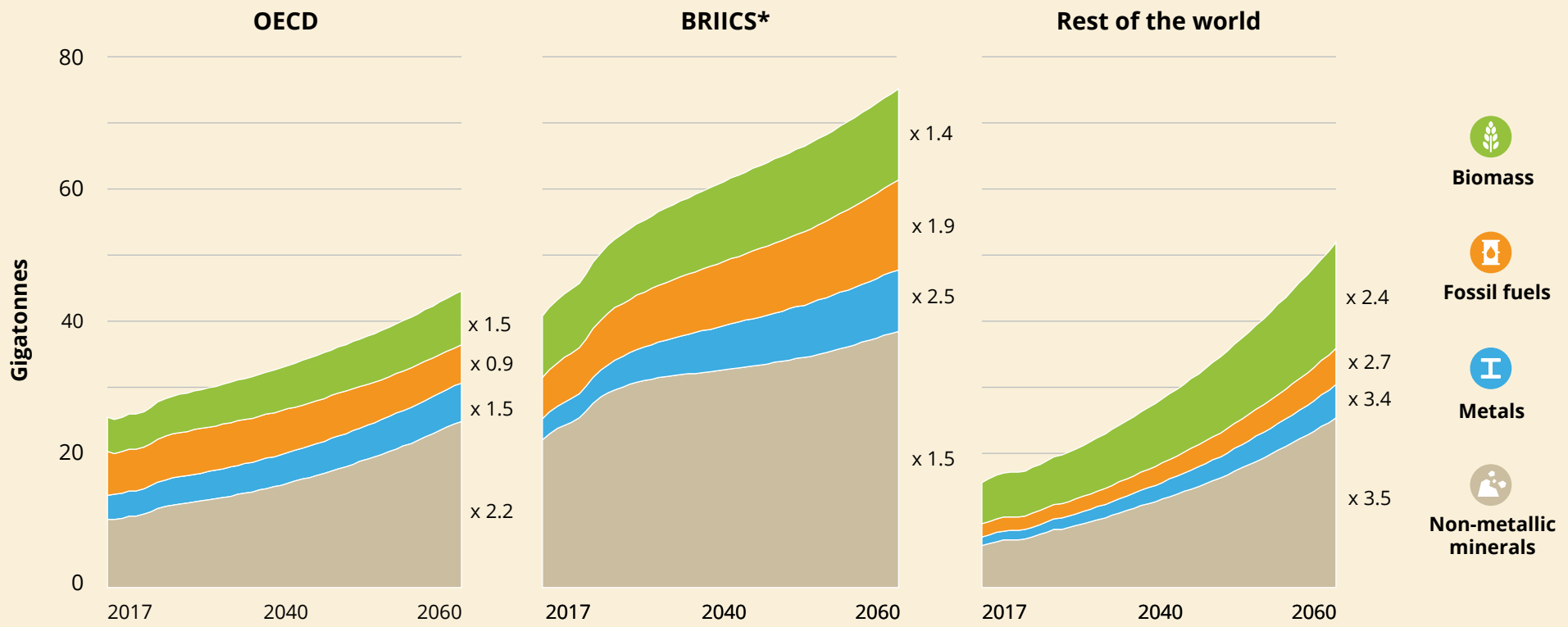


Source: CTI (2023): https://www.wbcsd.org/contentwbc/download/16345/233646/1

Module 01: 1.1 What is Circular Economy (CE)?

Why do we need a new update of our economy?

Materials use increase – Projections to 2060



*BRIICS: Brazil, Russia, India, Indonesia, China, South Africa

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

Module 01: 1.1 What is Circular Economy (CE)?

Why do we need a new update of our economy?

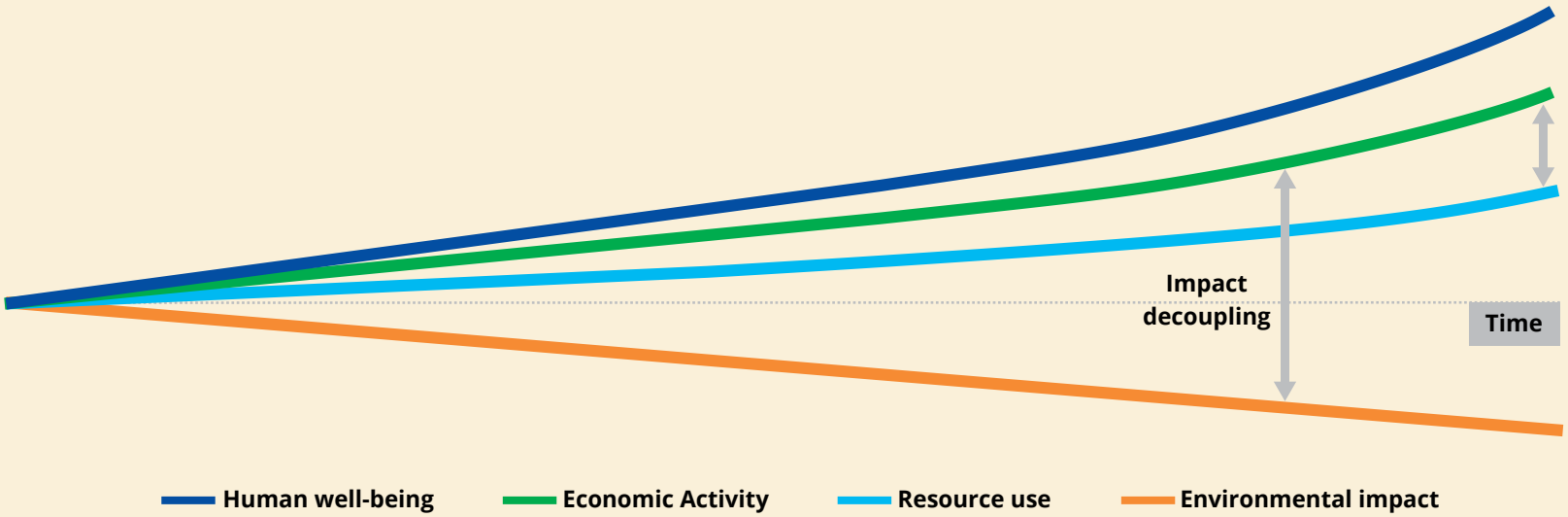
Doing more with less resources

Impact Decoupling

Reduction of resources used to create a unit of GDP

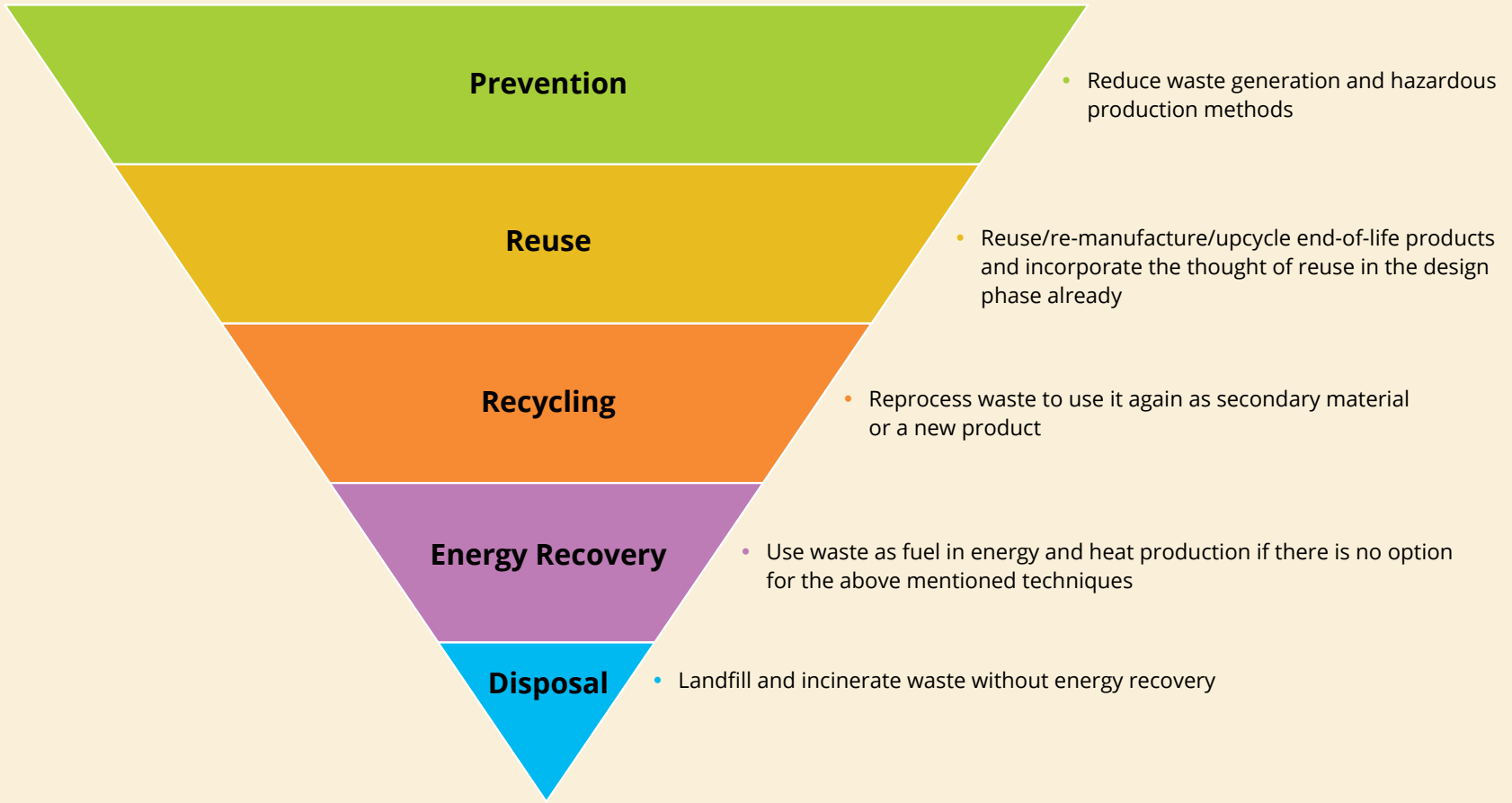
Resource Decoupling

Reduction of resources used to create a unit of GDP resources used



Module 01: 1.1 What is Circular Economy (CE)?

The Waste Hierarchy



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

Module 01: 1.1 What is Circular Economy (CE)?

Often Confused Terminologies

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:

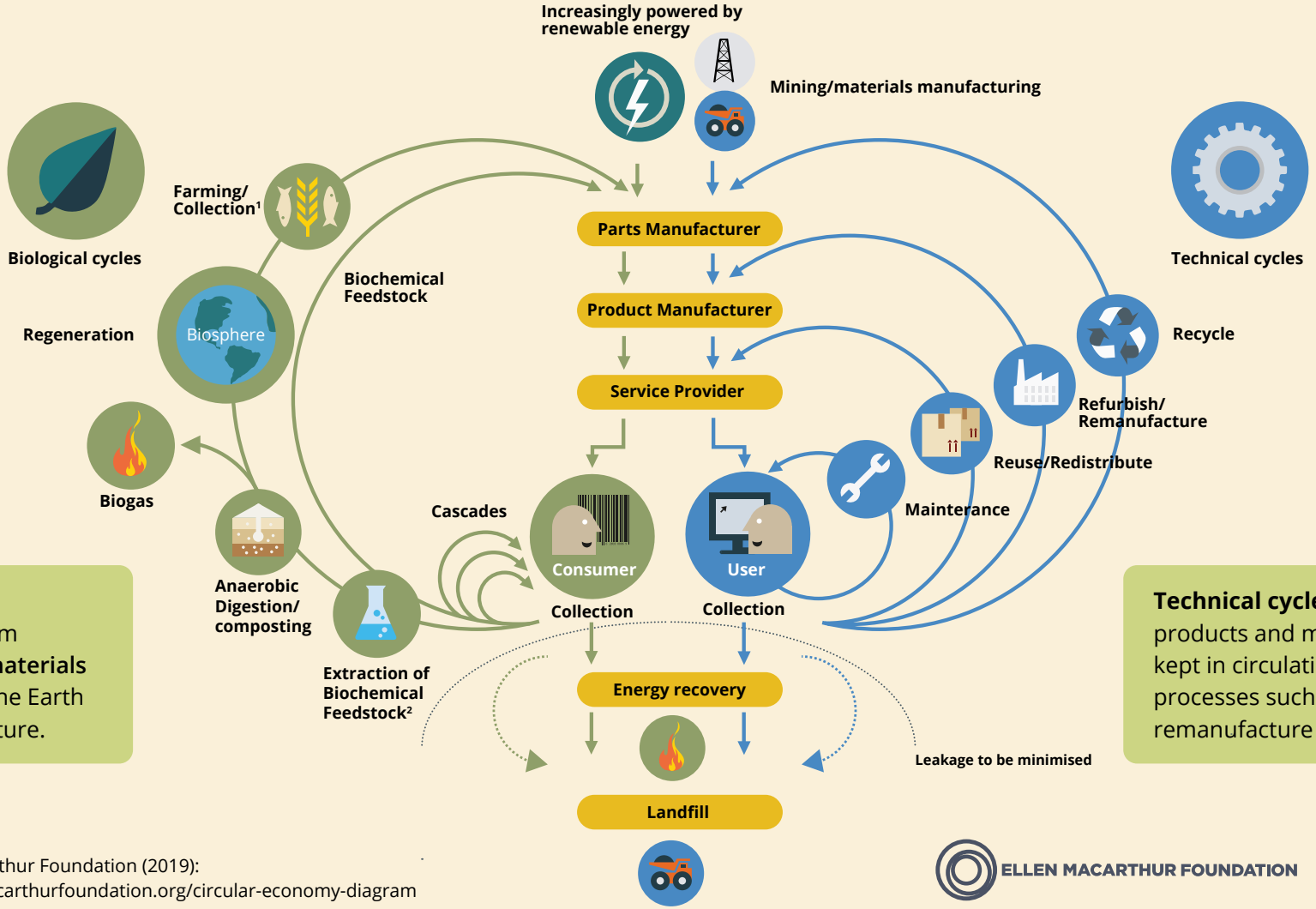
Upcycling is a creative process of transforming discarded or low-value materials into higher-value items. It enhances the quality or functionality of the original material, giving it a new purpose, often with an artistic or innovative twist.

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.

Module 01: 1.1 What is Circular Economy (CE)?

Technical and Biological Cycles



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.

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

ELLEN MACARTHUR FOUNDATION

Module 01: 1.1 What is Circular Economy (CE)?

Technical Cycle

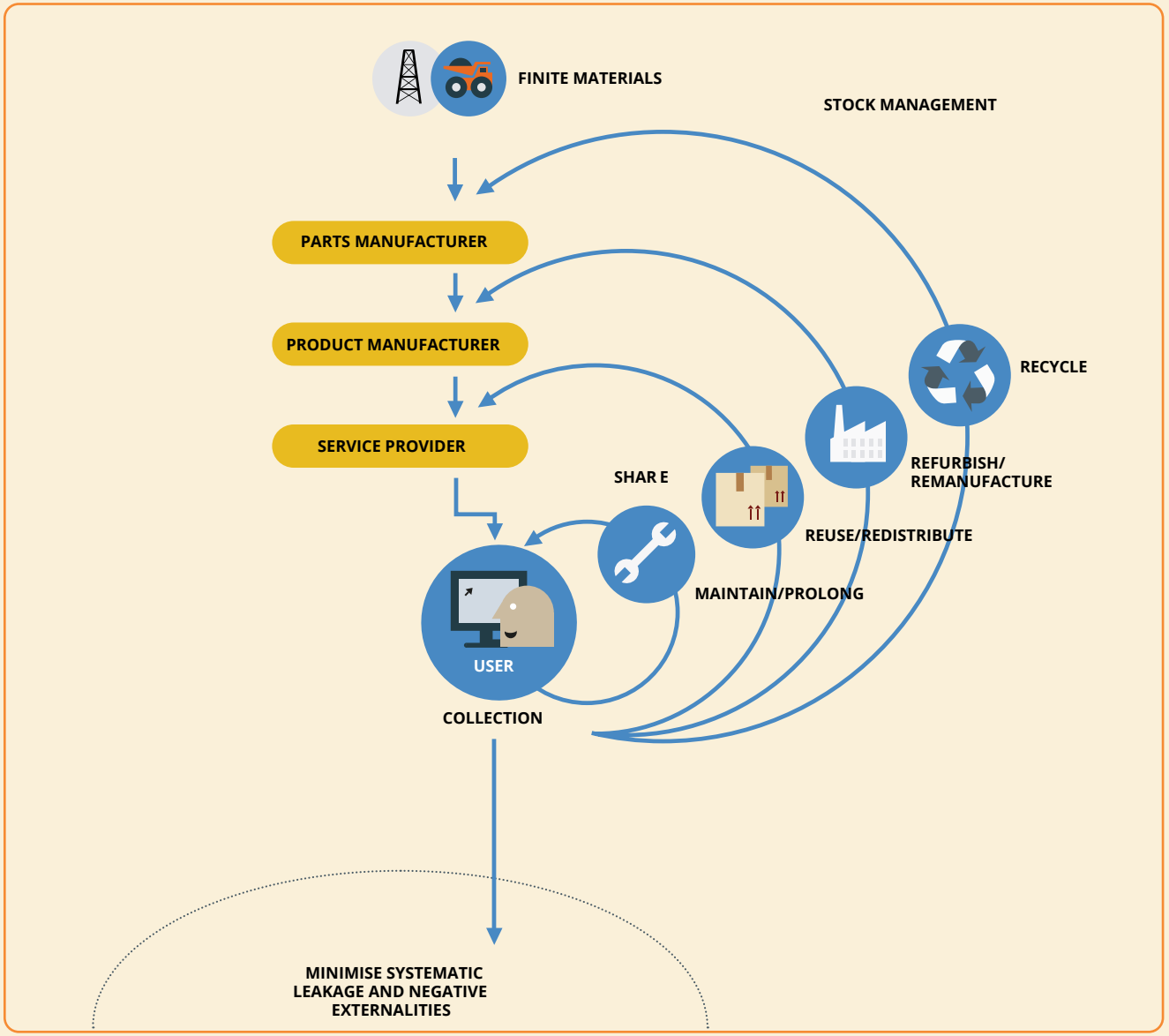
Related to inorganic materials (metals, fuels, synthetic textiles, chemicals, plastics, organic materials mixed/ contaminated with inorganic materials)

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.



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

Biological Cycle

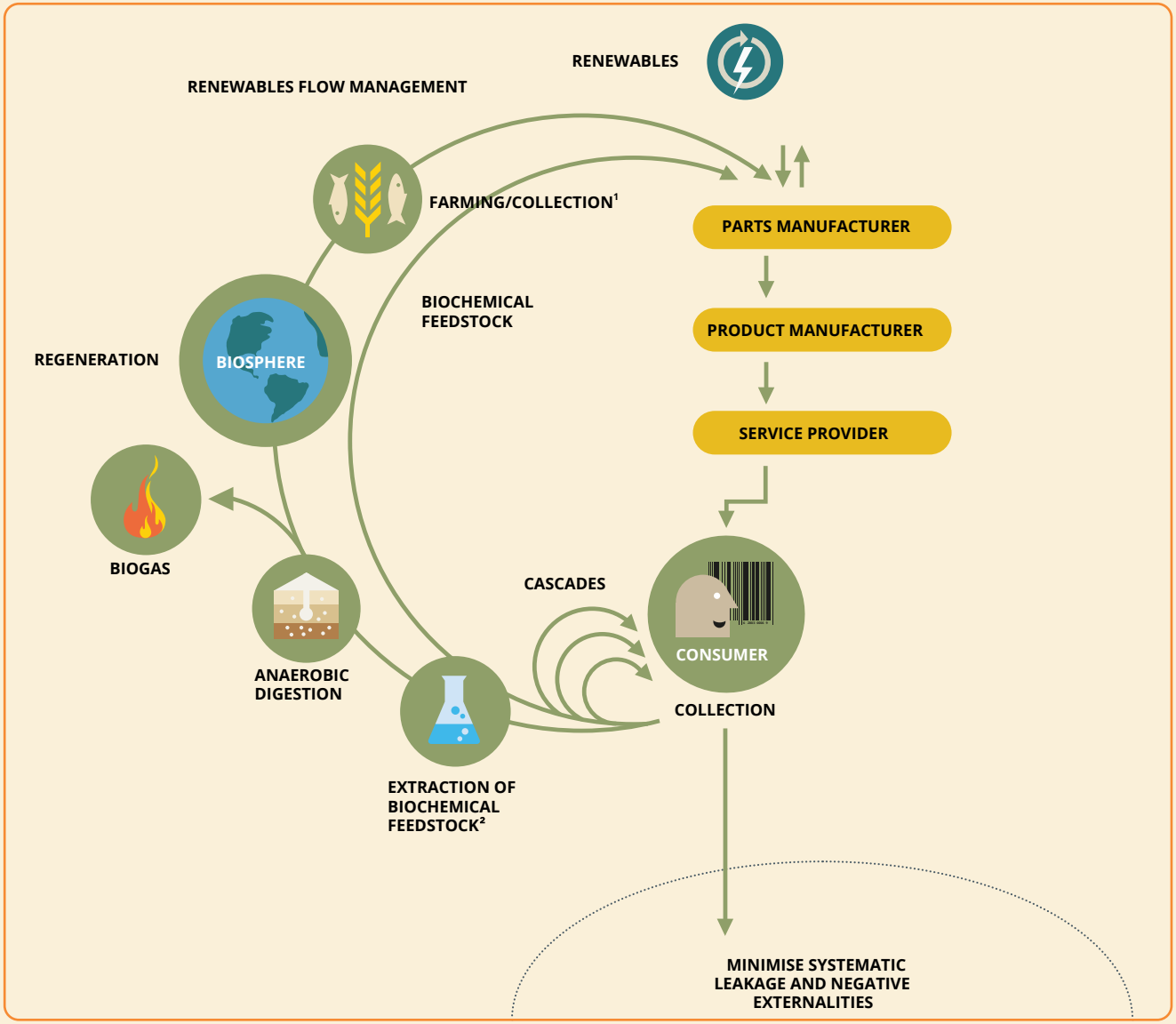
Related to organic and biodegradable materials suc as food, organic cotton, etc.

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 biodegradable materials, thus, ensuring the continuation of the cycle.

However some other biodegradable materials, suc as cotton or wood, may eventually make their way from the technical cycle into the biological cycle or 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.

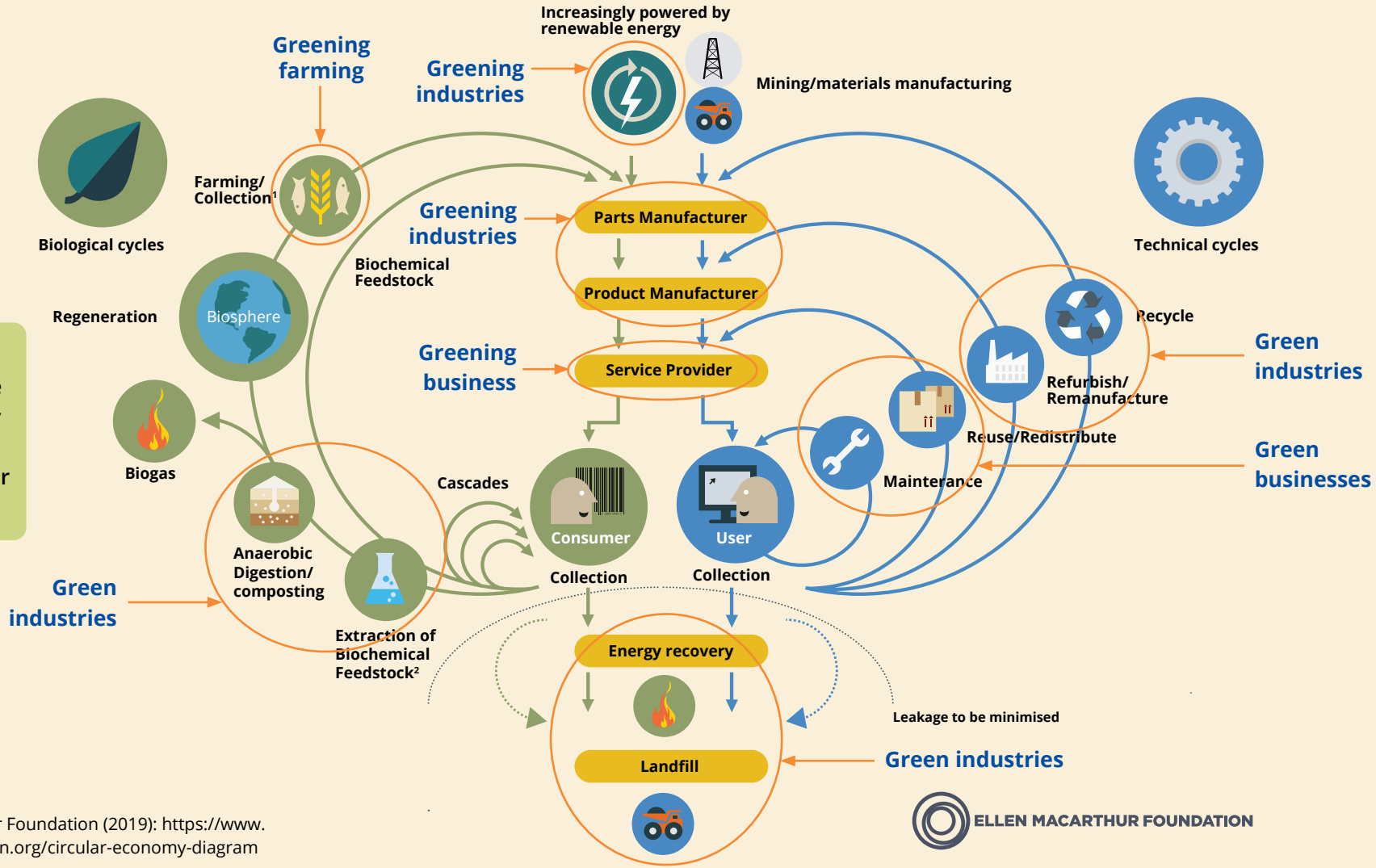


Sources: Ellen MacArthur Foundation (2019): https://www.ellenmacarthurfoundation.org/circular-economy-diagram

Module 01: 1.2 Introduction to CE strategies and business models

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.



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

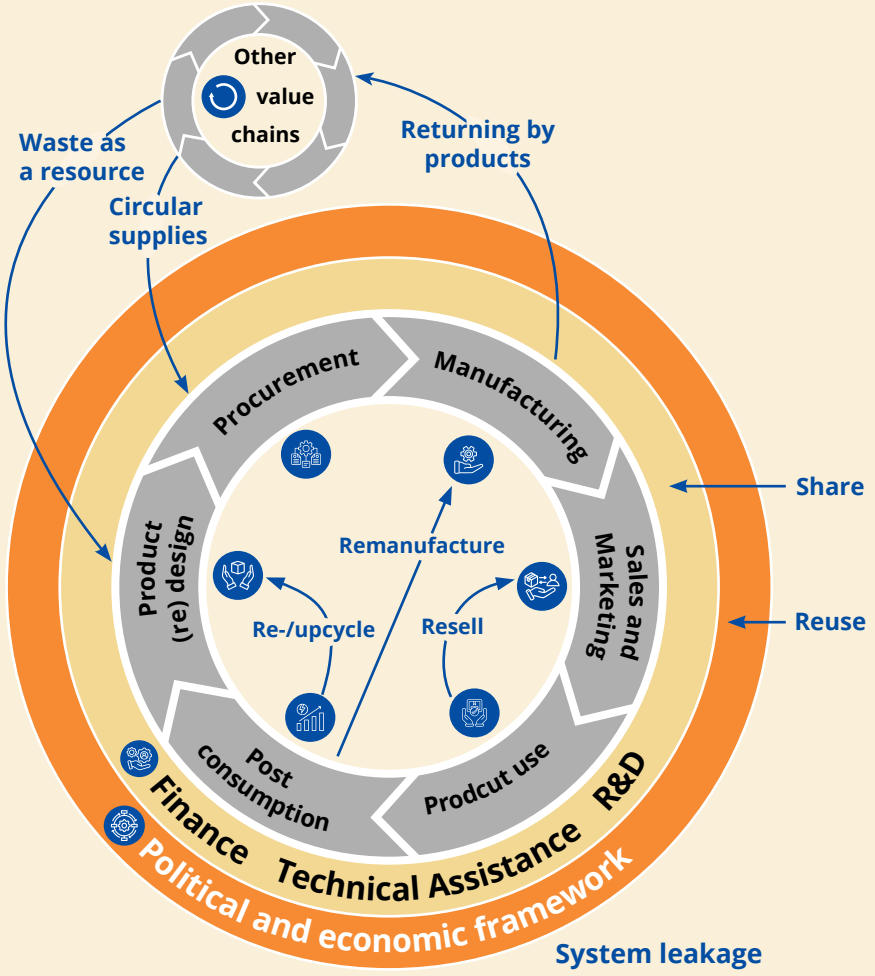
Module 01: 1.2 Introduction to CE strategies and business models

Circular economy – Strategies and business models

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

Facilitate demands 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



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

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

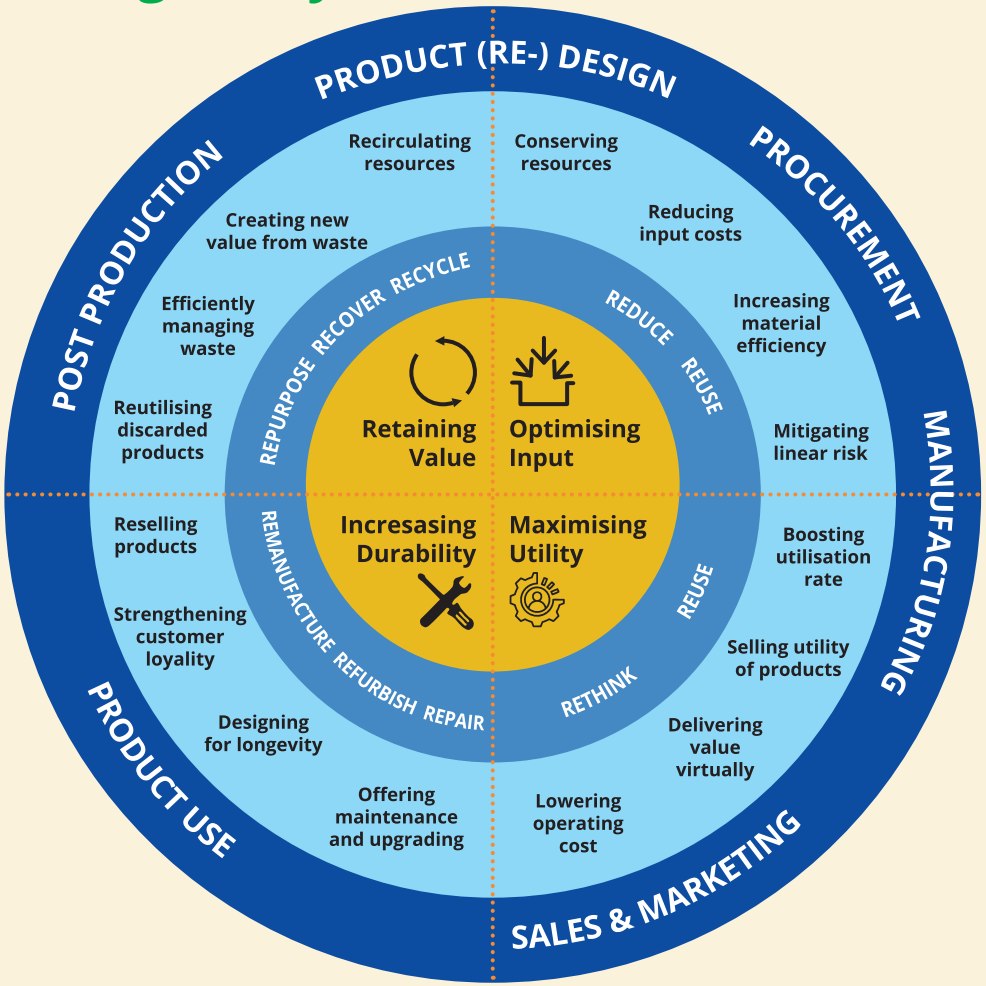
Shift to service-based models
- Develop new models of ownership for higher material value retention
- Adapt subscription model (rental, leasing, servitization)

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

Sources: adelphi (2022)

Module 01: 1.2 Introduction to CE strategies and business models

Biological Cycle



Business Value Chain	Circular Business Case
Circular Business Channel	Added Circular Business value

Sources: 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/

Module 01: 1.2 Introduction to CE strategies and business models

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

Sources: 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:

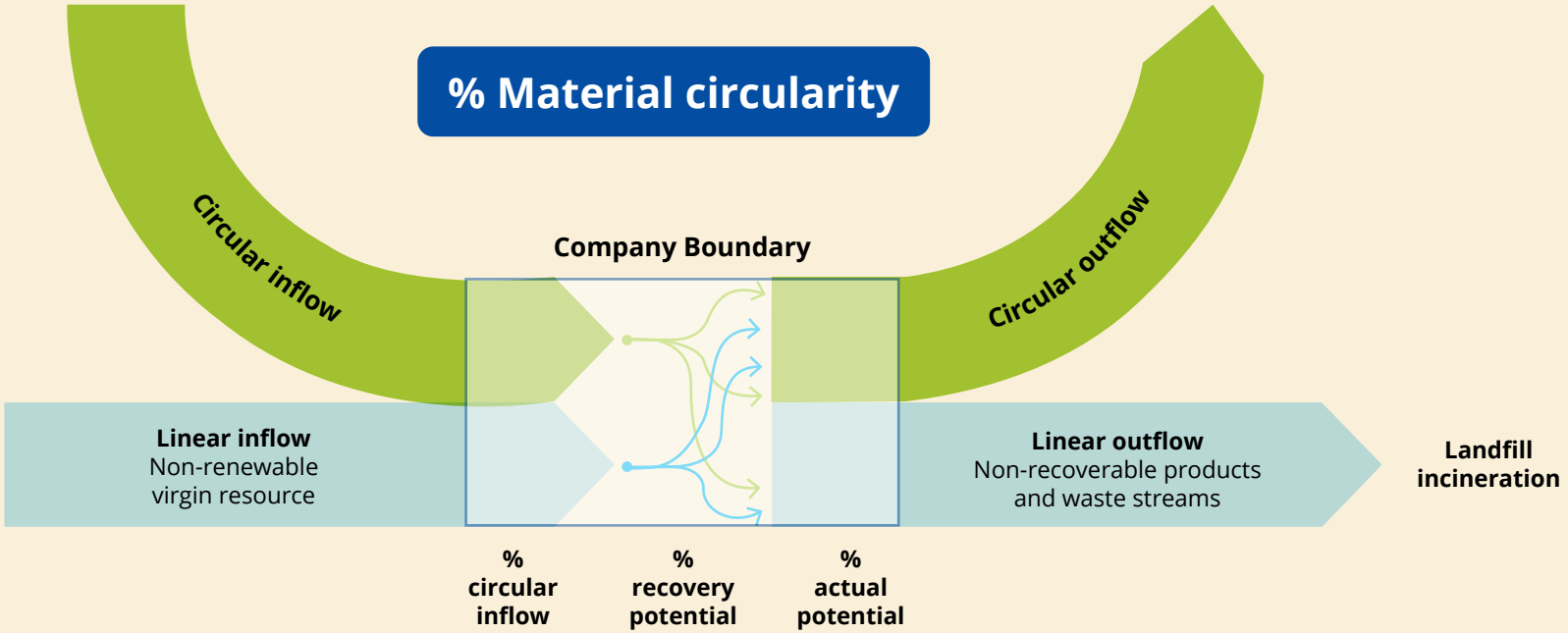
- **Circulytics - Ellen MacArthur Foundation (EMF)**
- **Circular Indicators Transition (CTI) - WBCSD ve Circular IQ**
- GRI 301: Materials 2016; GRI 306: Waste 2020
- Cradle to Cradle Certified®
- Circle Assessment – Circle Economy
- CirCelligence - Boston Consulting Group

Module 01: 1.3 Circularity metrics/ indicators

CTI TOOL

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



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

Module 01: 1.3 Circularity metrics/ indicators

CTI TOOL

Circular Transition Indicators (CTI)

Close the Loop
% material circularity
% water circularity
% renewable energy

Optimize the Loop
% critical material
% recovery type
actual lifetime
Onsite water circulation

Value the Loop
circular material productivity
CTI revenue

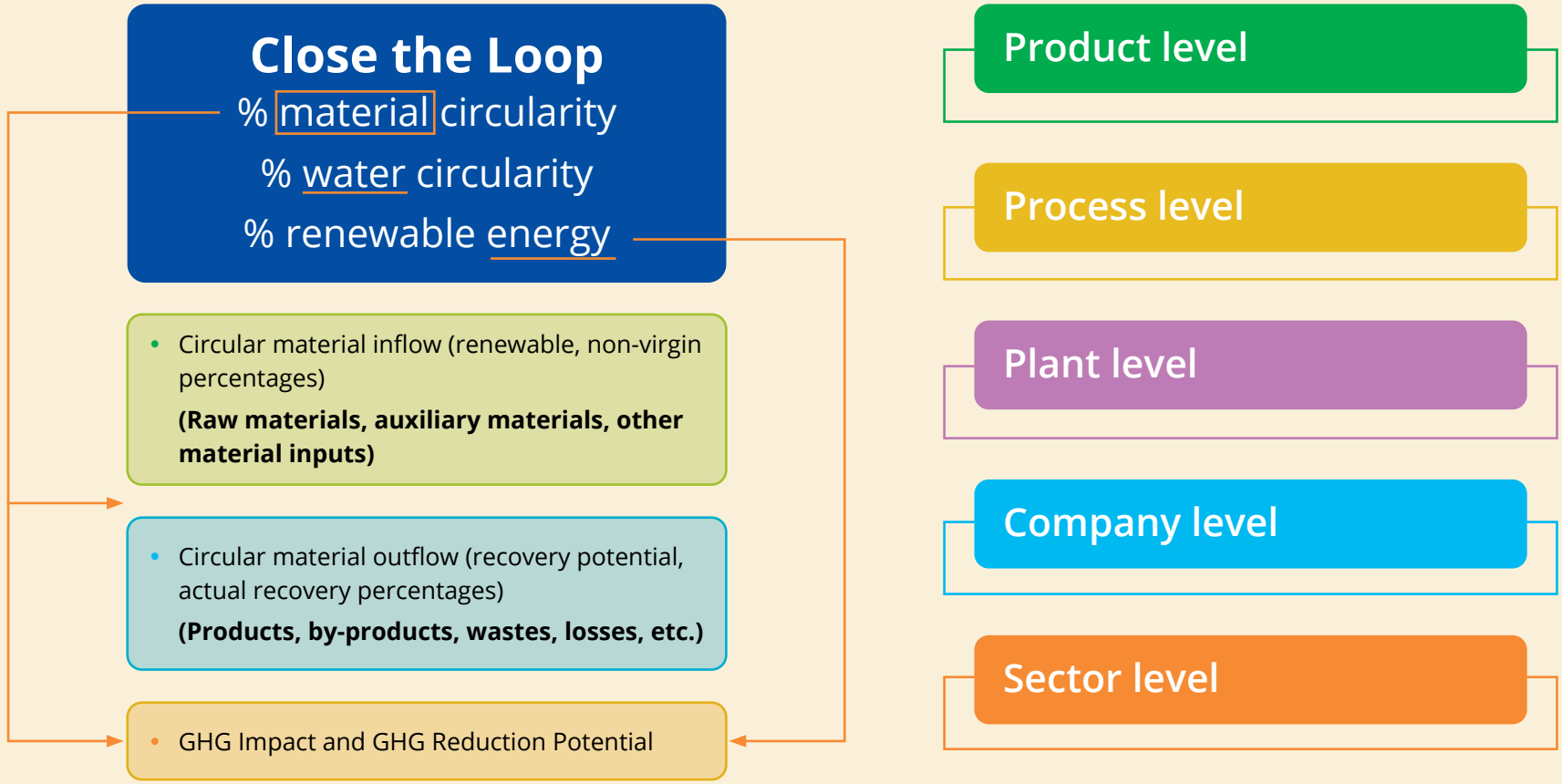
Impact of the Loop
GHG impact

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

Module 01: 1.3 Circularity metrics/ indicators

CTI TOOL

Circular Transition Indicators (CTI)

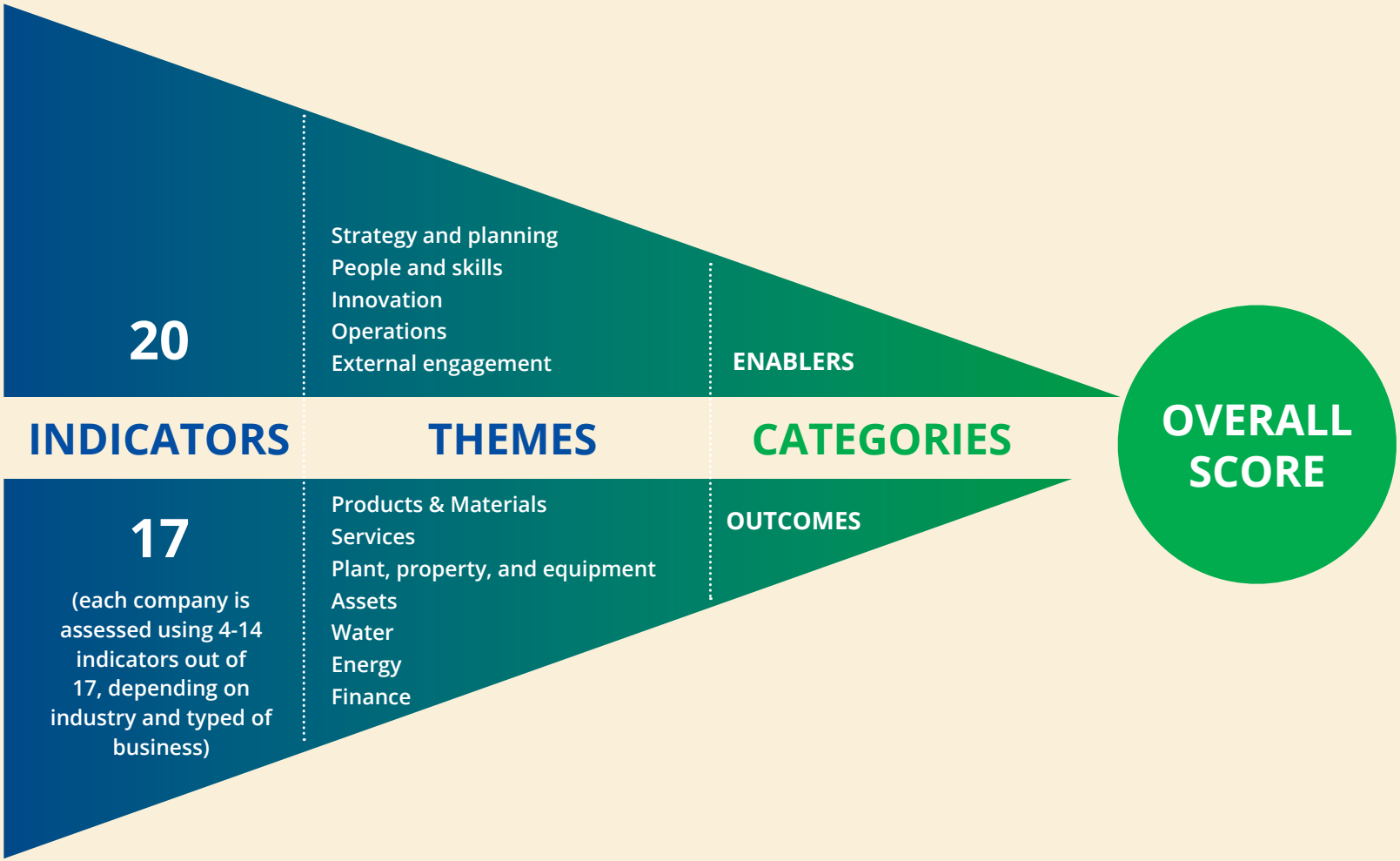


Sources: CTI (2023): https://www.wbcsd.org/contentwbc/download/16345/233646/1

Module 01: 1.3 Circularity metrics/ indicators

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**



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

Module 01: 1.3 Circularity metrics/ indicators

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?

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

Module 01: 1.3 Circularity metrics/ indicators

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

Sources: 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.

Sources: 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

Module 01: 1.4 Standardization in the Circular Economy

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 Circular Economy – Guidance on business models and value networks	**ISO 59 020 Circular Economy –** Measuring and assessing circularity	**ISO 59 040 Circular Economy –** Product Circularity Data Sheet	**ISO 59 014 Circular Economy –** 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

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

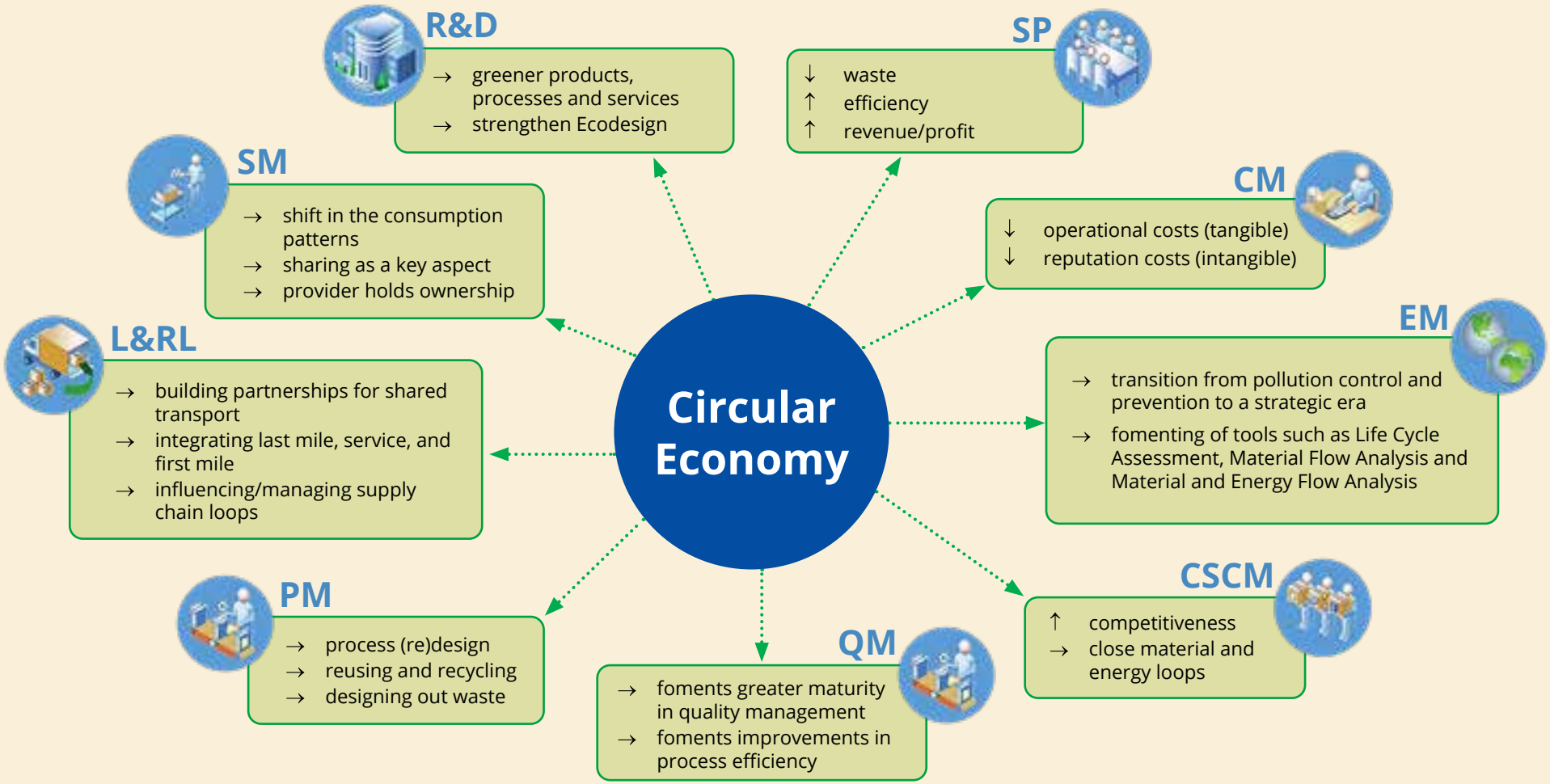
Module 01: 1.5 Connection of CE to other sustainability related concepts

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)

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

Other sustainability concepts related to CE



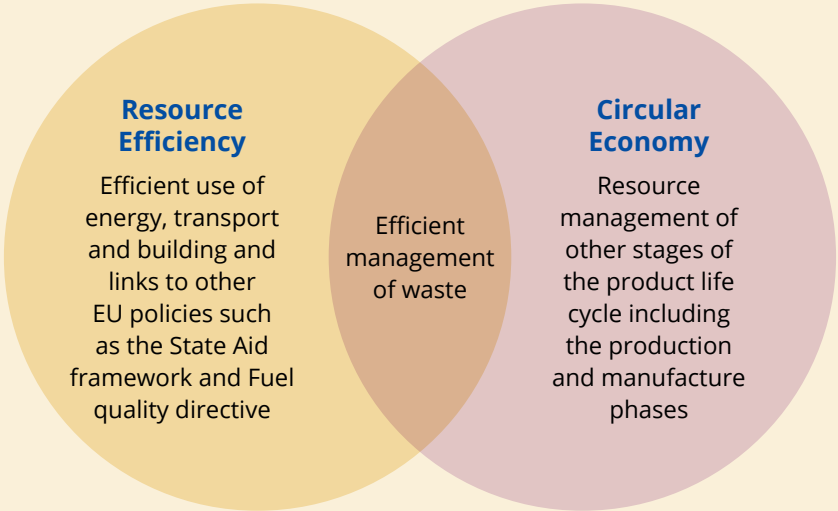
Sources: Barros et al. (2021): https://www.sciencedirect.com/science/article/pii/S2666789420300064

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

Resource Efficiency (Water, energy, materials)

Cleaner Production

Waste Management



- 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.

Sources: 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

Increase resource efficiency

- Cleaner Production and pollution prevention
- Design for Zero Waste Production

Extend the life-time of products

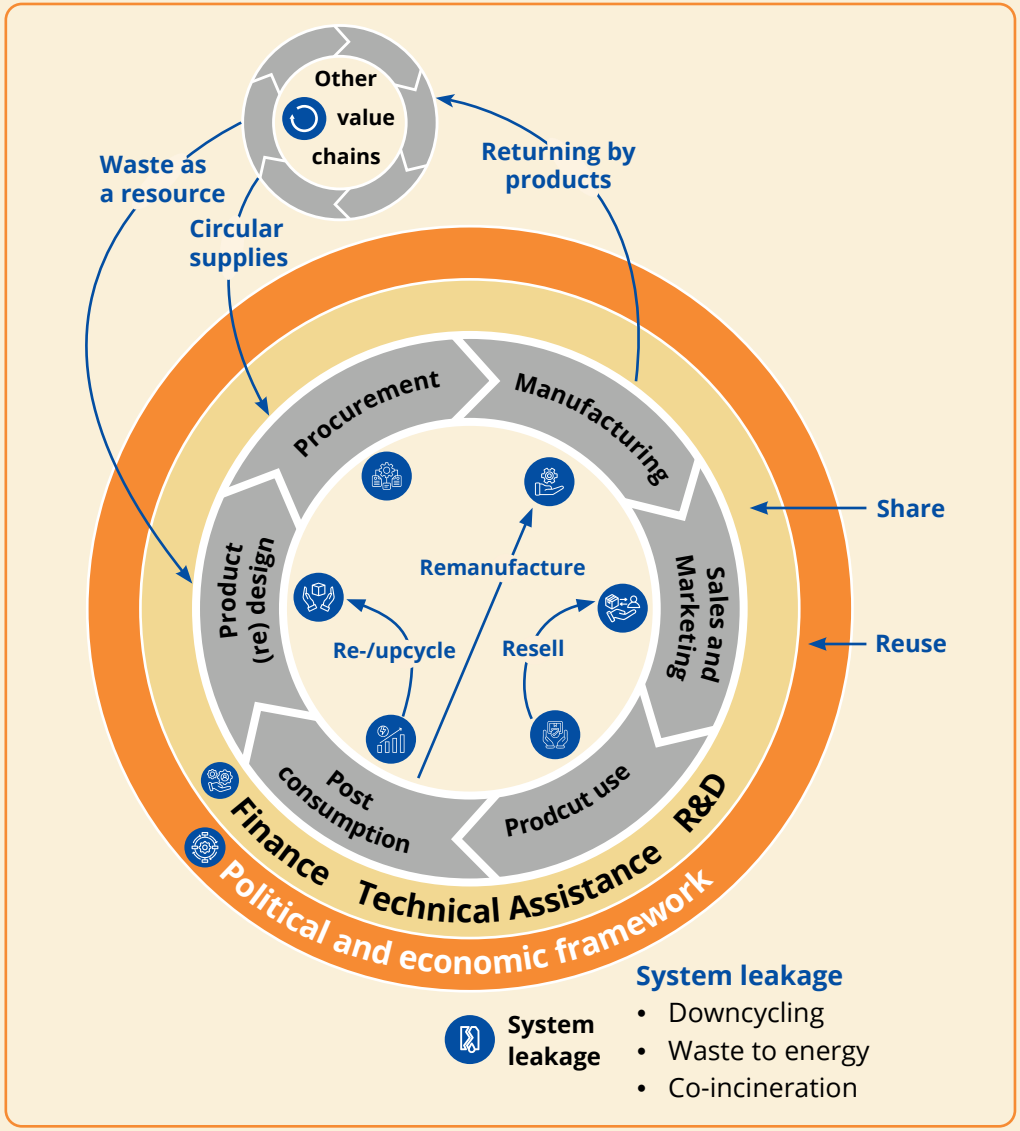
- Design for durability and modularity
- Repairing and upgrading
- Reuse/repurpose

Sources: 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

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.

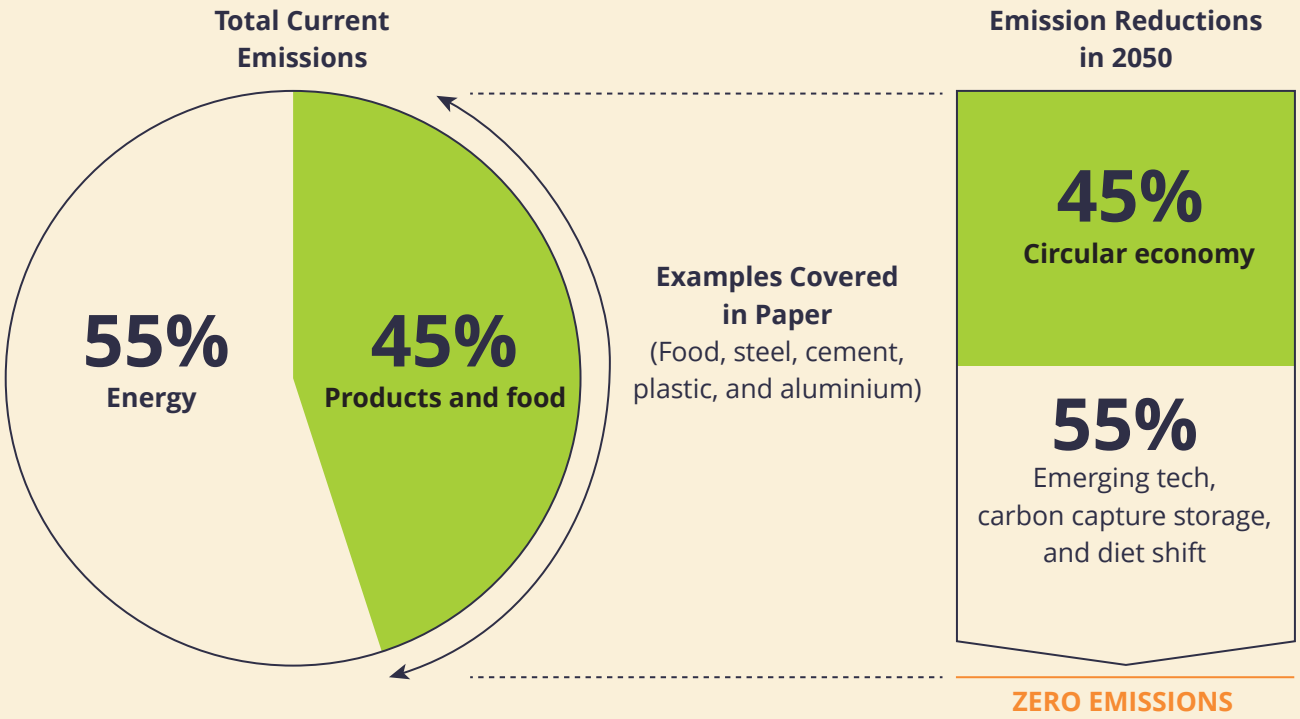


Module 01: 1.5 Connection of CE to other sustainability related concepts

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.



Sources: 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

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

Climate Change and Carbon Reduction

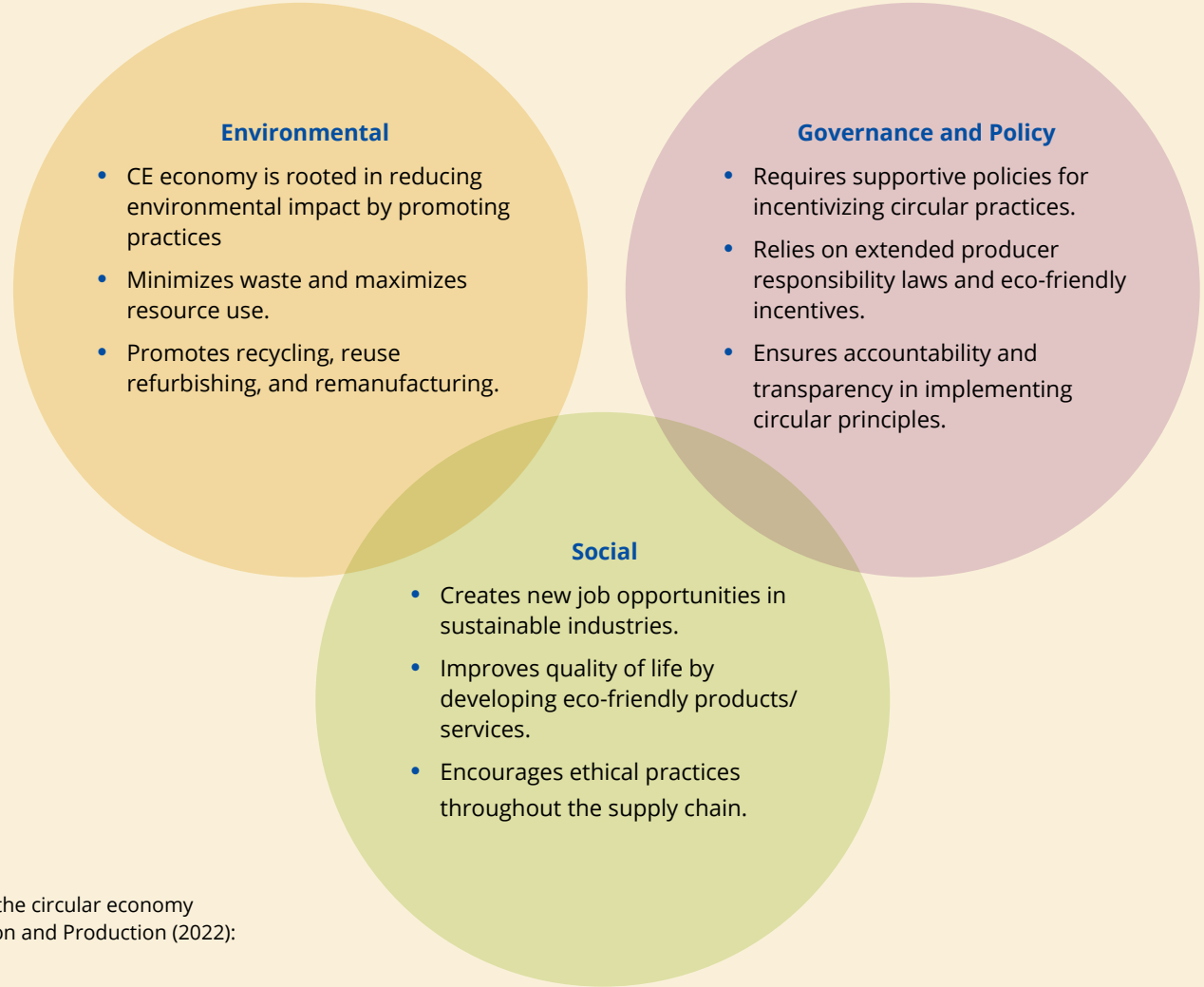
- There is an increasing awareness of scope 3 emissions amongst the participating companies, both when it comes to calculating and setting reduction targets for these emissions – especially from the largest companies.
- More and more companies see the potential in reducing scope 3 emissions by using 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.



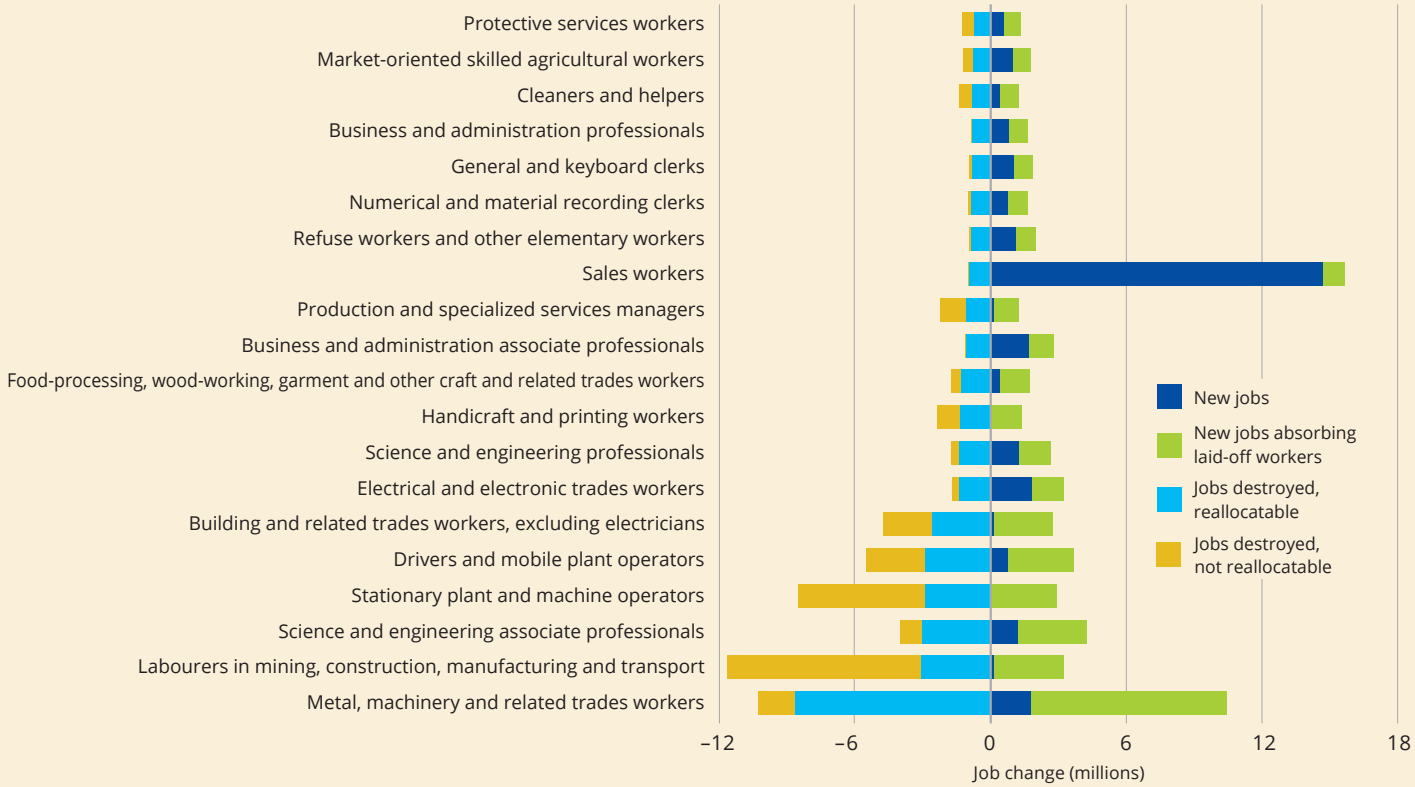
Source: Mies & Gold (2021): (PDF) Mapping the social dimension of the circular economy (researchgate.net); Collaboration Centre on Sustainable Consumption and Production (2022): CIAP_social impact_cover (europa.eu)

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

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.

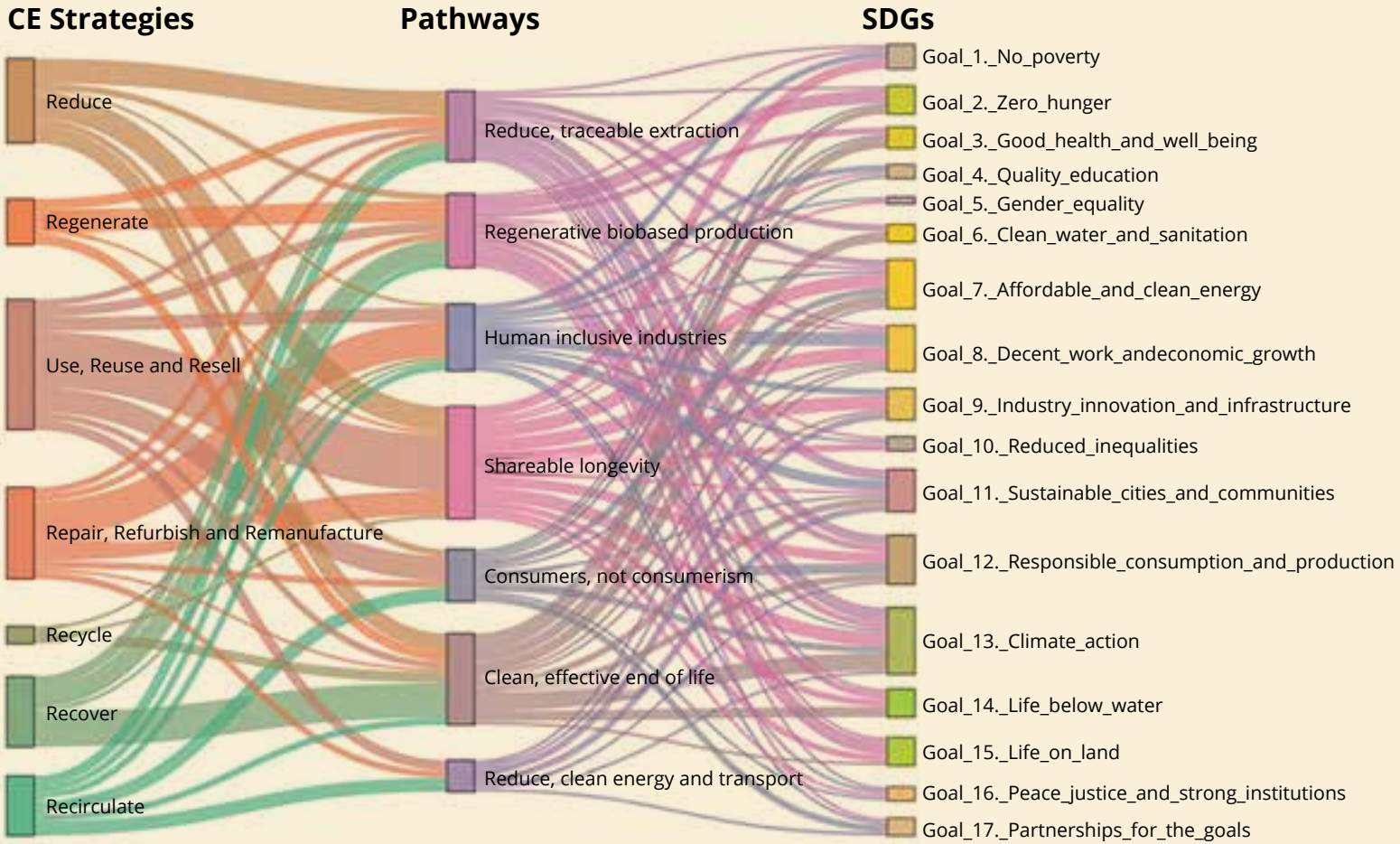
Figure ES 4. Occupations most susceptible to job destruction and reallocation across industries in a global circular economy scenario, 2030



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

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

Sustainable Development Goals (SDGs)

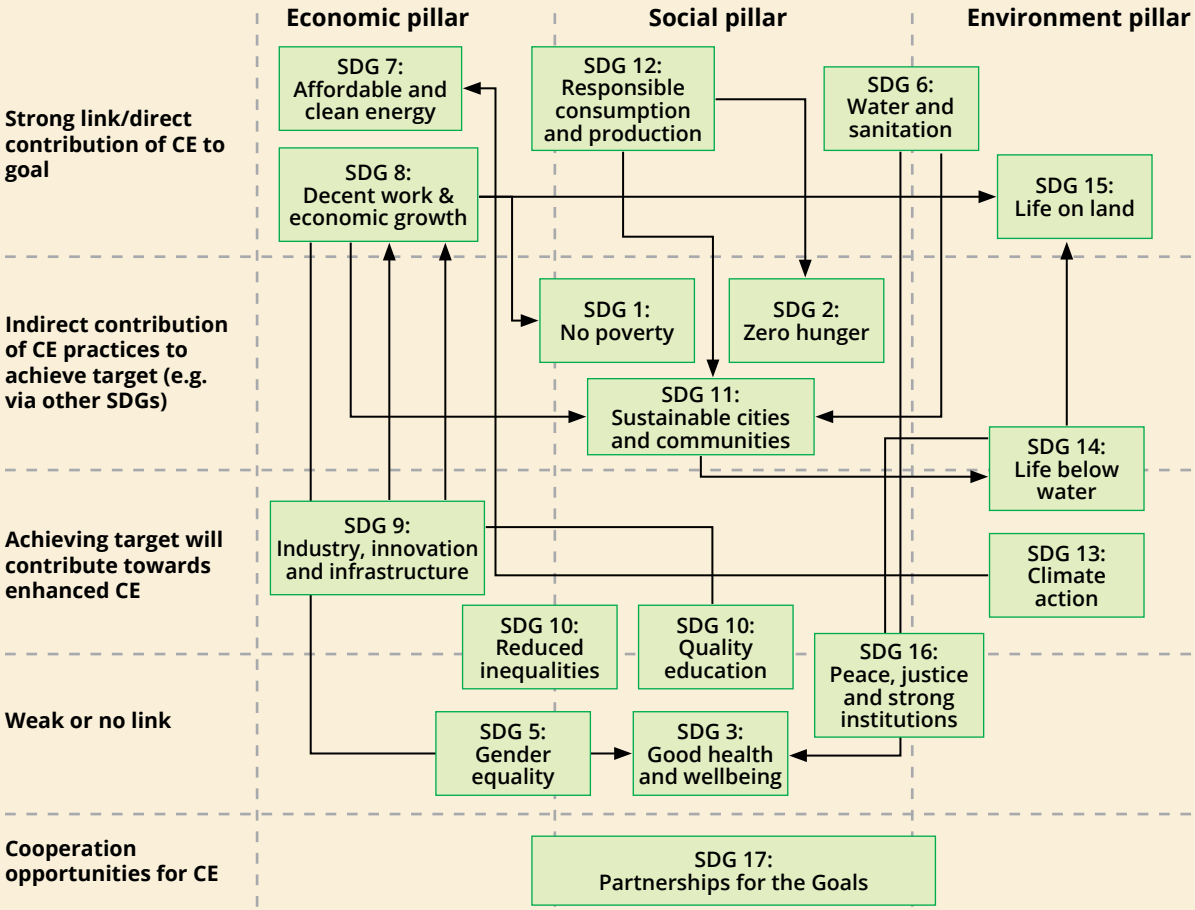


- Identified 7 distinct pathways with 25 core elements linking CE strategies and SDGs and lying a foundation for evaluating action plans to align with SDGs
- Pathways include reduced extraction, regenerative production, inclusive industries, among others.
- Pathways 4, 6, and 2 are most impactful, accounting 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

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

Sustainable Development Goals (SDGs)



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

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.

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.

The EU will:

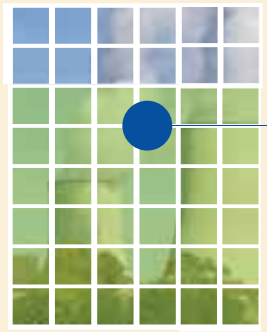
- Become climate-neutral by 2050
- Protect human life, animals and plants, by cutting pollution
- Help companies become world leaders in clean products and technologies
- Help ensure a just and inclusive transition

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

Module 01: 1.6 Policy landscape / EU Green Deal

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**

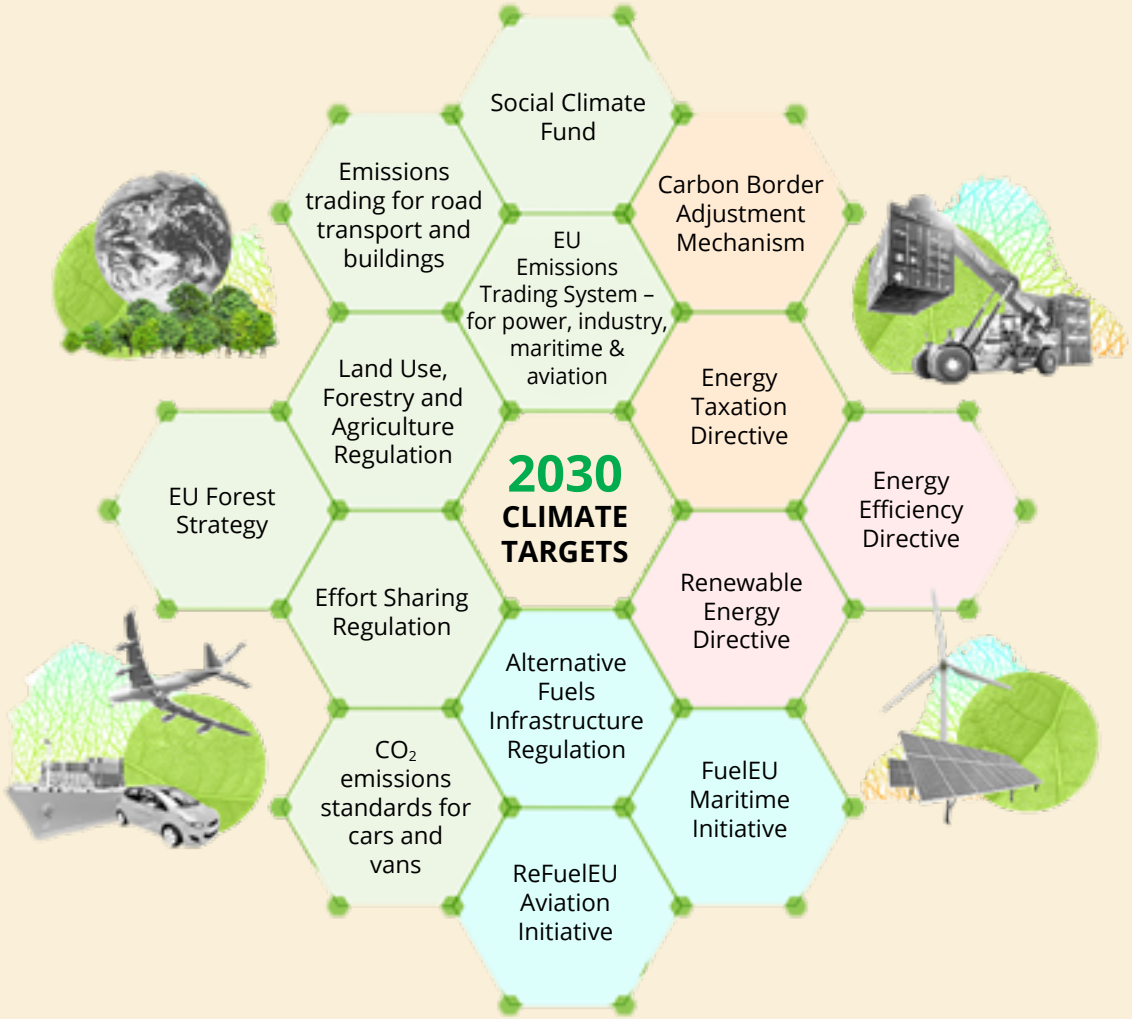
93% of Europeans have **taken** at least one **action** to tackle climate change

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

Module 01: 1.6 Policy landscape / EU Green Deal

The EU Green Deal proposals to achieve 2030 targets



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

Module 01: 1.6 Policy landscape / EU Green Deal

The EU Green Deal – 12 building blocks

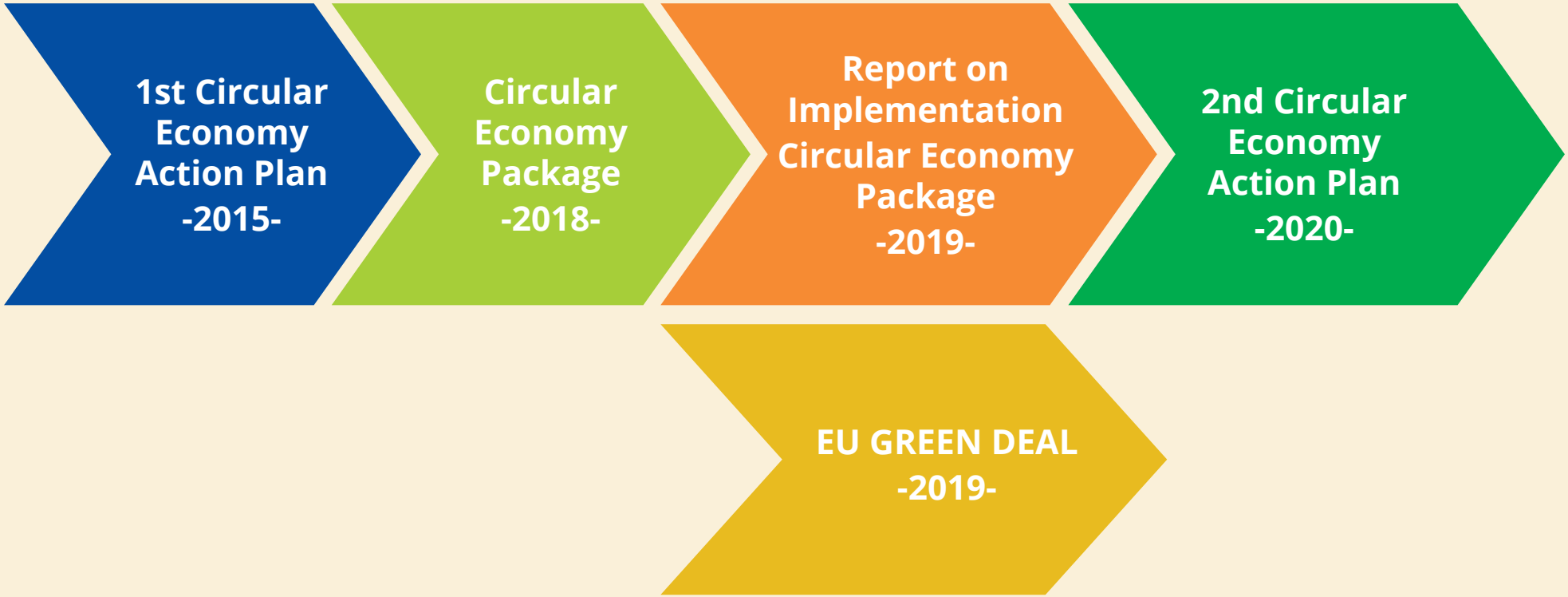
→ Focus on energy, chemicals, forestry, circular economy, adaptation to climate change etc.

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

Module 01: 1.6 Policy landscape for Circular Economy

Circular Economy Strategy Development in the EU



Module 01: 1.6 Policy landscape for Circular Economy

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

Module 01: 1.6 Policy landscape for Circular Economy

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

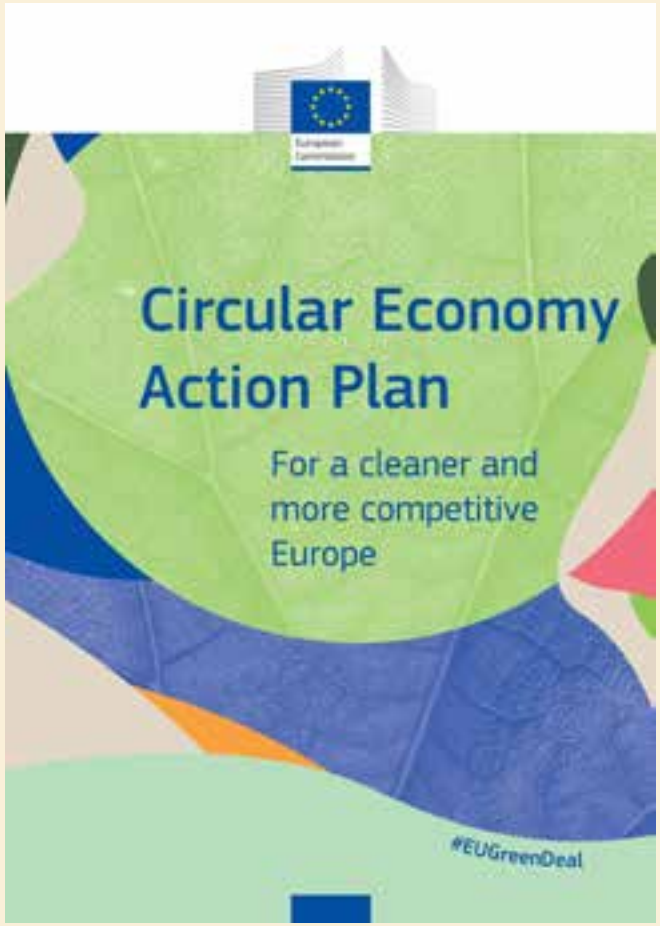
- The Action Plan announces initiatives along the entire life cycle of products.
- The Commission will implement all 35 actions listed in this Action Plan
- It includes legislative and non- legislative measures.

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
- CROSS-CUTTING 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

Module 01: 1.6 Policy landscape for Circular Economy

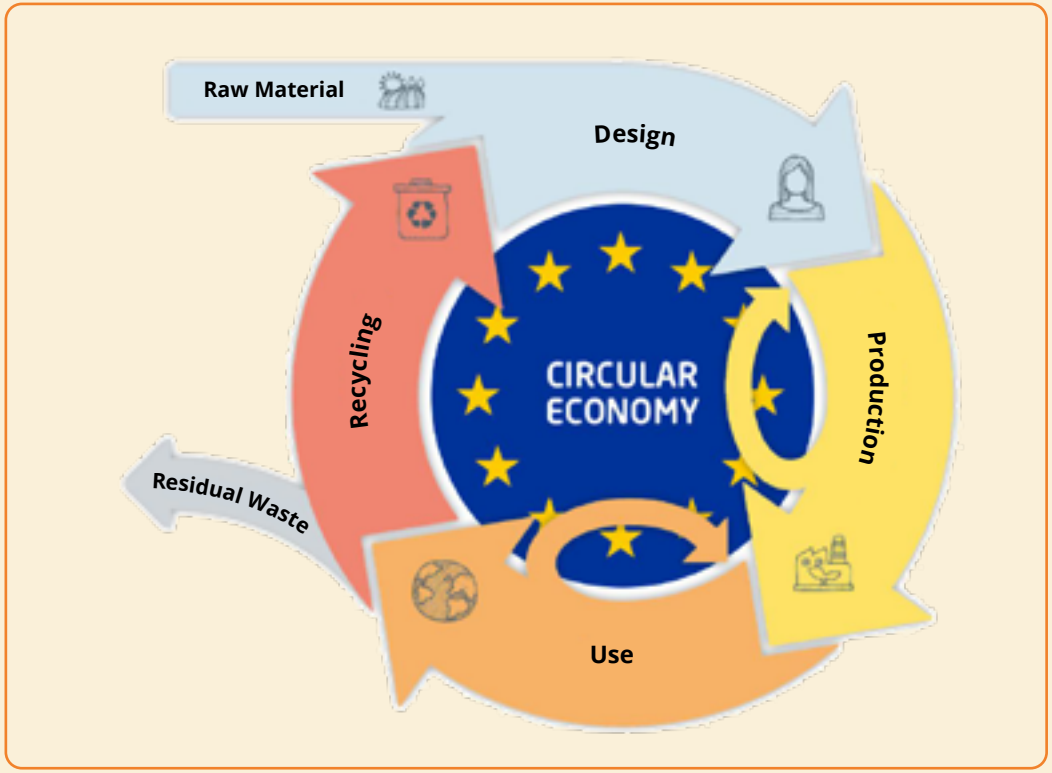
The Circular Economy Action Plan (EU CEAP)

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

Module 01: 1.6 Policy landscape for Circular Economy

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.

Making sustainable products the norm in a more resilient Single Market

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

Brand HP
Model: 15-eh0007na

Components **Reports**

Recycling **Repair**

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

Module 01: 1.6 Policy landscape for Circular Economy

A SUSTAINABLE PRODUCT POLICY FRAMEWORK

The Circular Economy Action Plan (EU CEAP)

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

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**

Each citizen produces nearly **half a tonne of municipal waste per year**

Measures will be introduced for **waste prevention and reduction,** increasing recycled content, minimising waste exports outside EU. An EU model for separate collection and labelling of products will be launched.

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

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)

A SUSTAINABLE PRODUCT POLICY FRAMEWORK

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)

A SUSTAINABLE PRODUCT POLICY FRAMEWORK

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

Module 01: 1.6 Policy landscape for Circular Economy

EU Sustainable Finance Strategy

Action plan on financing sustainable growth (2018)

Paris Agreement Targets
UN 2030 Agenda for Sustainable Development

Connect finance with sustainability

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

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

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 activities

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

Module 01: 1.6 Policy landscape for Circular Economy

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

Module 01: 1.6 Policy landscape for Circular Economy

EU Taxonomy

Objectives

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 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

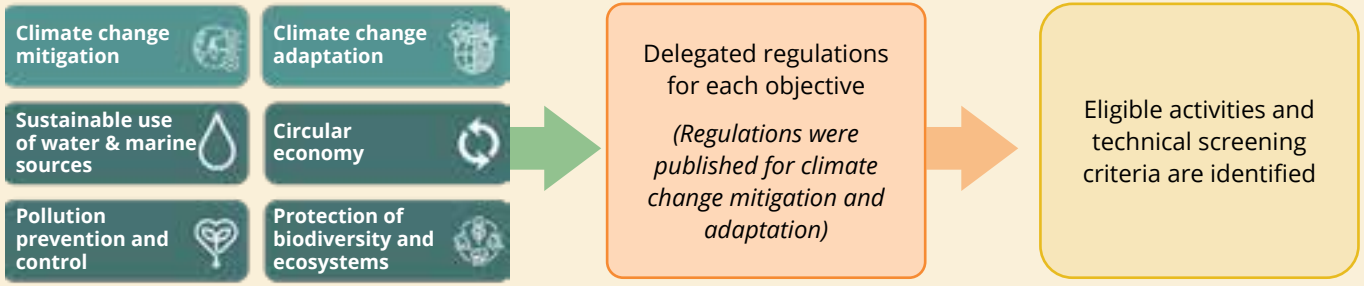
First companies to report on taxonomy eligibility

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



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 subsequently to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harms to any of the other environmental objective

(Test with EEA relevance)

1. Forestry
1.1 Afforestation
1.2 Rehabilitation and restoration of forests, including reforestation and natural forest regernation after an extreme event
1.3 Forest management
1.4 Conservation forestry
2. Environmental protection and restoration activities
21. 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 are 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 operation over the whole forest cycle;

(e) difinition 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 good conditon of forest ecosystems;

(h) consideration of societal issues (including preservation of landscape, consulatation 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**
   - Manufacture of plastic packaging goods
   - 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**
   - Repair, refurbishment and remanufacturing
   - Sale of spare parts
   - Preparation for re-use of end-of-life products and product components
   - Sale of second-hand goods
   - Product-as-a-service and other circular use-and result-oriented service models
   - 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

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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)

Module 01: 1.6 Policy landscape for Circular Economy

Corporate sustainability reporting directive (CSRD)

Objectives

- 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

SExtended 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)

Module 02: CE in the Context of Textiles

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 putting CE economy into the **context of textiles**. It will showcase the textiles value chain and environmental hotspots as well as current facts and figures about the textiles industry´s impact. Furthermore CE strategies and business models along the different value chain steps will be explained and an overview of best practice examples along the value chain steps will be given. In this chapter there will only be given an overview of the best practice cases, while in chapter 6 one selected case study for each value chain step will be explained more in detail.

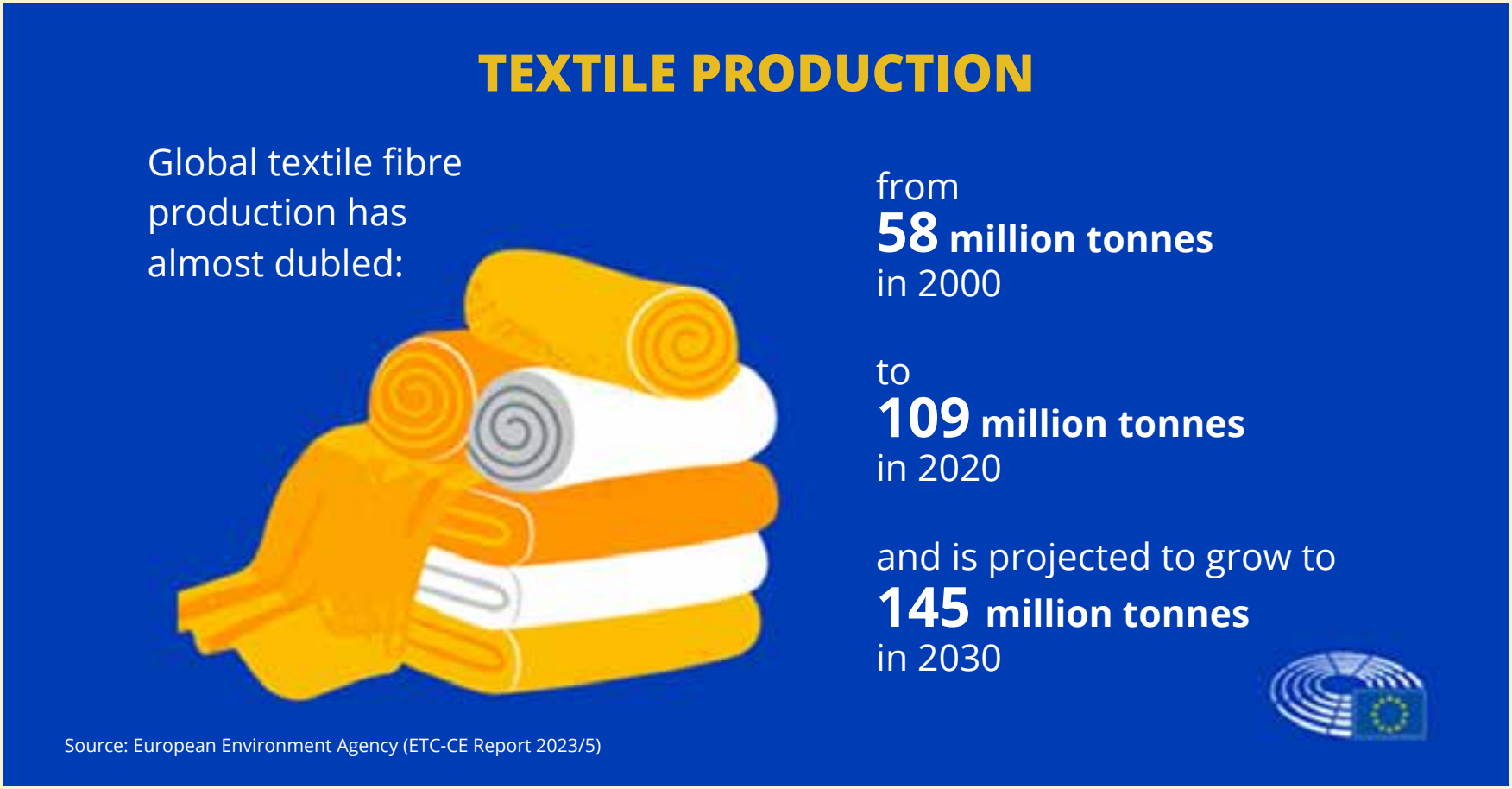
Module 02: 2.1 Textile industry and its impacts

Production and consumption patterns

- The **fast fashion** phenomenon shapes production and consumption patterns across the world.
- This business model is based on offering consumers quicker turnaround of new styles and a **high number of collections** each season, often at **lower prices**.
- As a result, brands are now producing almost twice the number of clothing collections as they were pre-2000, when this phenomenon started, and the overall increase in **clothing production demand** is estimated at an annual 2%.
- Fast fashion a source of **ecological stress** for the region, generating environmental hotspots like water scarcity, water and air pollution, and material waste.
- Strikingly **low rates of clothing utilization** that lead to an increased environmental footprint. It is estimated that more than half of fast fashion items are **disposed of** in under a year.

Source: Niniimäki et al. (2020): (PDF) The environmental price of fast fashion (researchgate.net);
SPC/RAC (2020): SCP/RAC report: "Circular business opportunities in the south Mediterranean report: how can businesses lead the way to sustainable fashion?" is now available | | SCP/RAC - Regional Activity Centre for Sustainable Consumption and Production (cprac.org);
Ellen MacArthur Foundation (2017): https://www.ellenmacarthurfoundation.org/a-new-textiles-economy

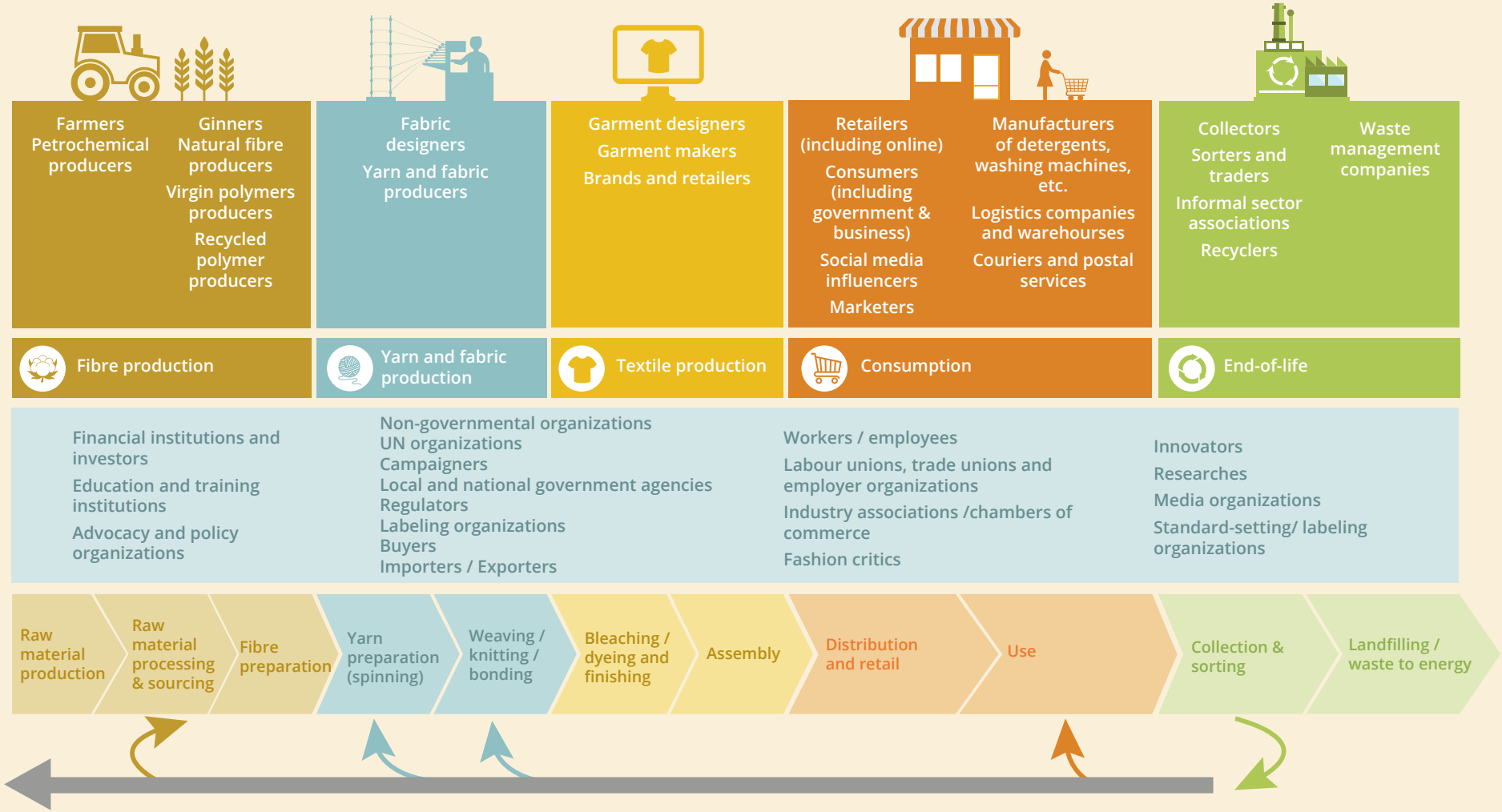
Production and consumption patterns



Source: European Parliament (2020): The impact of textile production and waste on the environment (infographics) | News | European Parliament (europa.eu)

Module 02: 2.1 Textile industry and its impacts

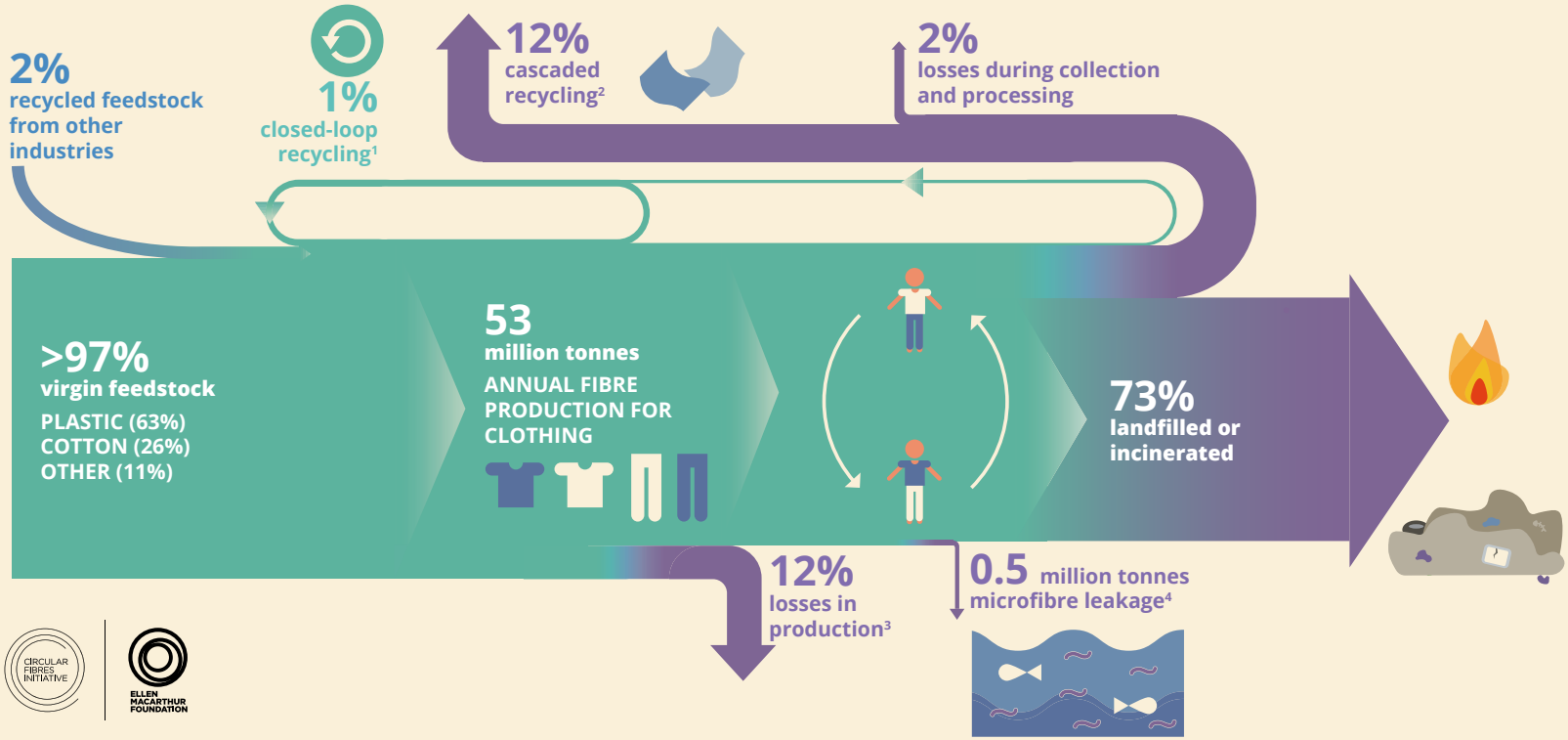
Linear value chains



Source: UNEP (2020): https://www.oneplanetnetwork.org/sites/default/files/from-crm/unep_sustainability_and_circularity_in_the_textile_value_chain.pdf

Module 02: 2.1 Textile industry and its impacts

Why do we need a new update of our economy?



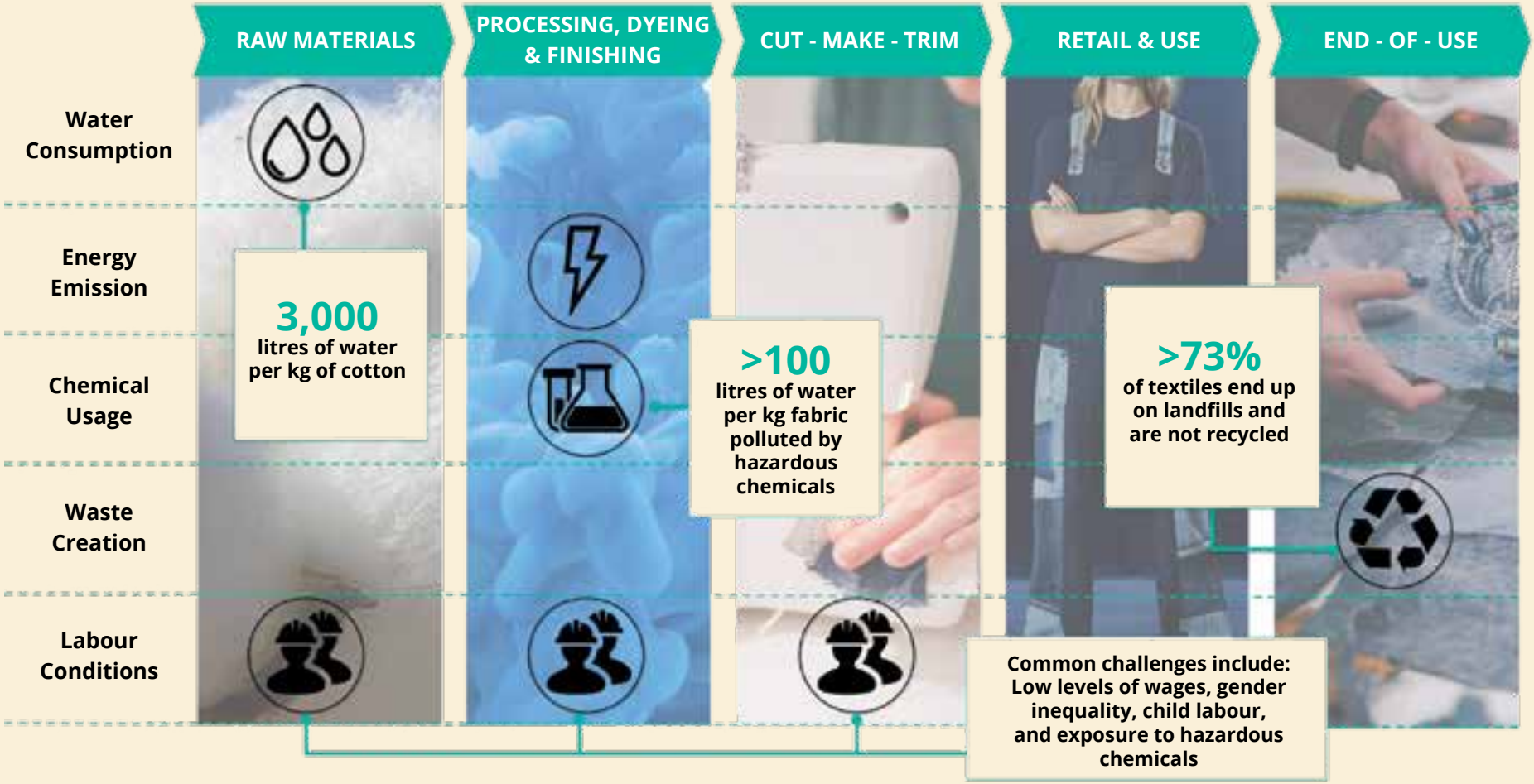
1 Recycling of clothing into the same or similar quality applications
2 Recycling of clothing into other, lower-value applications such as insulation material, wiping cloths, or mattress stuffing
3 Includes factory offcuts and overstock liquidation
4 Plastic microfibres shed through the washing of all textiles released into the ocean

In the current predominantly linear textile value chain, very few textiles *(<1%) are recycled back into clothing*, with another 12% going into cascaded recycling, where they are used in products such as cleaning cloths, insulation material and mattress stuffing.

Source: Ellen MacArthur Foundation (2017): https://www.ellenmacarthurfoundation.org/a-new-textiles-economy

Module 02: 2.1 Textile industry and its impacts

Environmental, social and economic impacts



Sources: FashionForGood (2020): https://reports.fashionforgood.com/wp-content/uploads/2020/07/20201019_State-of-Circular-Innovations-in-the-Indian-Fashion-and-Textile-Industries-Final.pdf

Module 02: 2.1 Textile industry and its impacts

Environmental, social and economic impacts

- It is estimated that the fashion industry is accountable for 10% of worldwide carbon emissions, surpassing the combined emissions of international flights and maritime shipping.

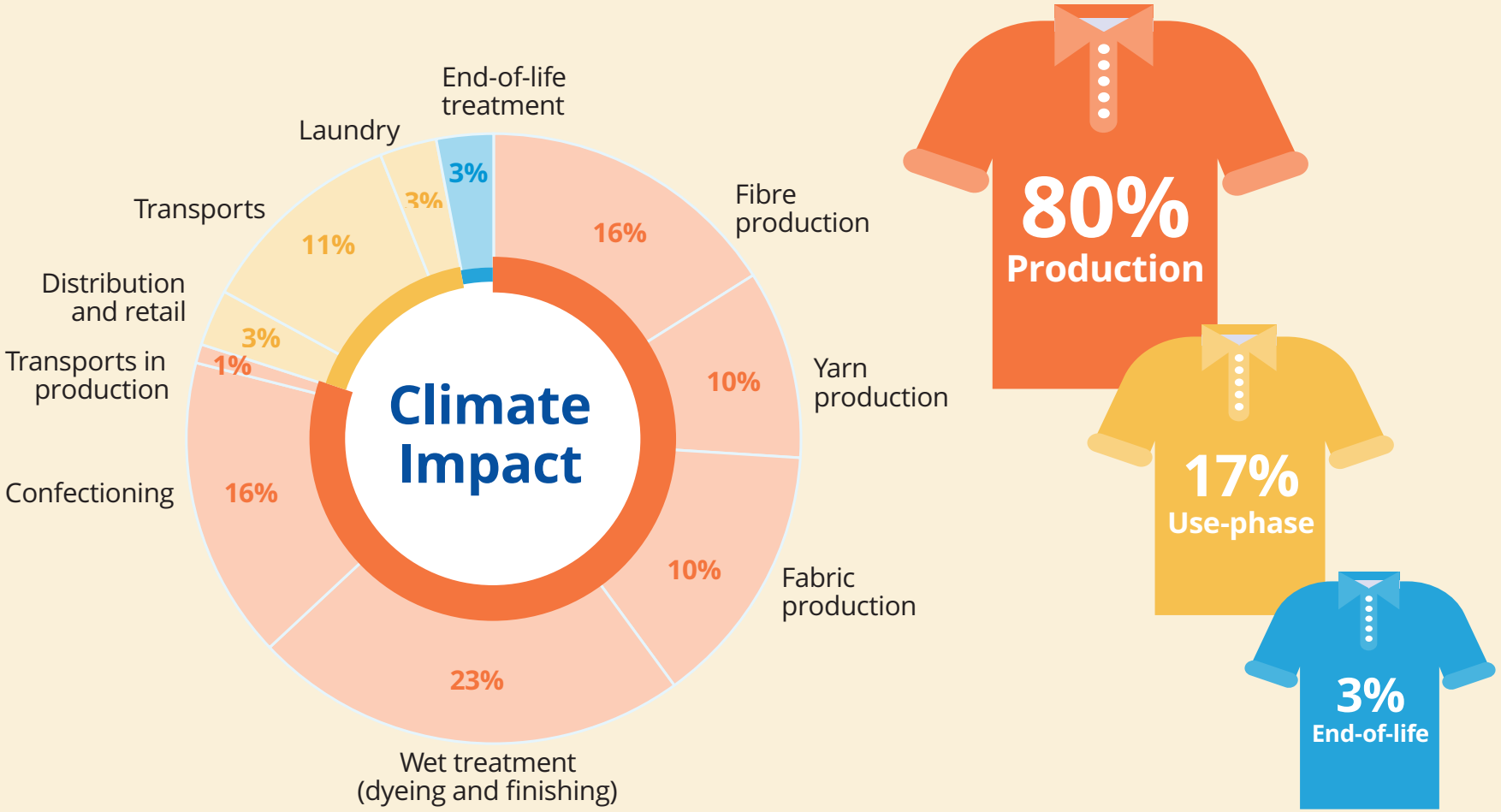
- It is approximated that in 2015, the worldwide textile and clothing sector consumed 79 billion cubic meters of water, whereas the entire economy of the EU required 266 billion cubic meters in 2017.
- Textile manufacturing is believed to contribute to roroughly 20% of the world's freshwater pollution due to dyeing and finishing processes. The washing of synthetic garments is responsible for releasing 35% of primary microplastics into the environment.

- The disposal of unwanted clothing has also evolved, shifting from donation to disposal. Less than 50% of used clothes are collected for potential reuse or recycling, and merely 1% of used clothing is recycled into new garments, as the necessary technologies for converting old clothes into virgin fibers are just beginning to emerge.

- Textile production processes use a large amount and wide variety of chemicals.
- The production of 1 kg of cotton t-shirts, for example, requires about 3 kg of chemicals.

Sources: European Parliament (2020): The impact of textile production and waste on the environment (infographics) | News | European Parliament (europa.eu); Swedish Chemical Agendy (2014): https://www.kemi.se/download/18.6df1d3df171c243fb23a98f3/1591454110491/rapport-6-14-chemicals-in-textiles.pdf

Division of environmental impact along the value chain

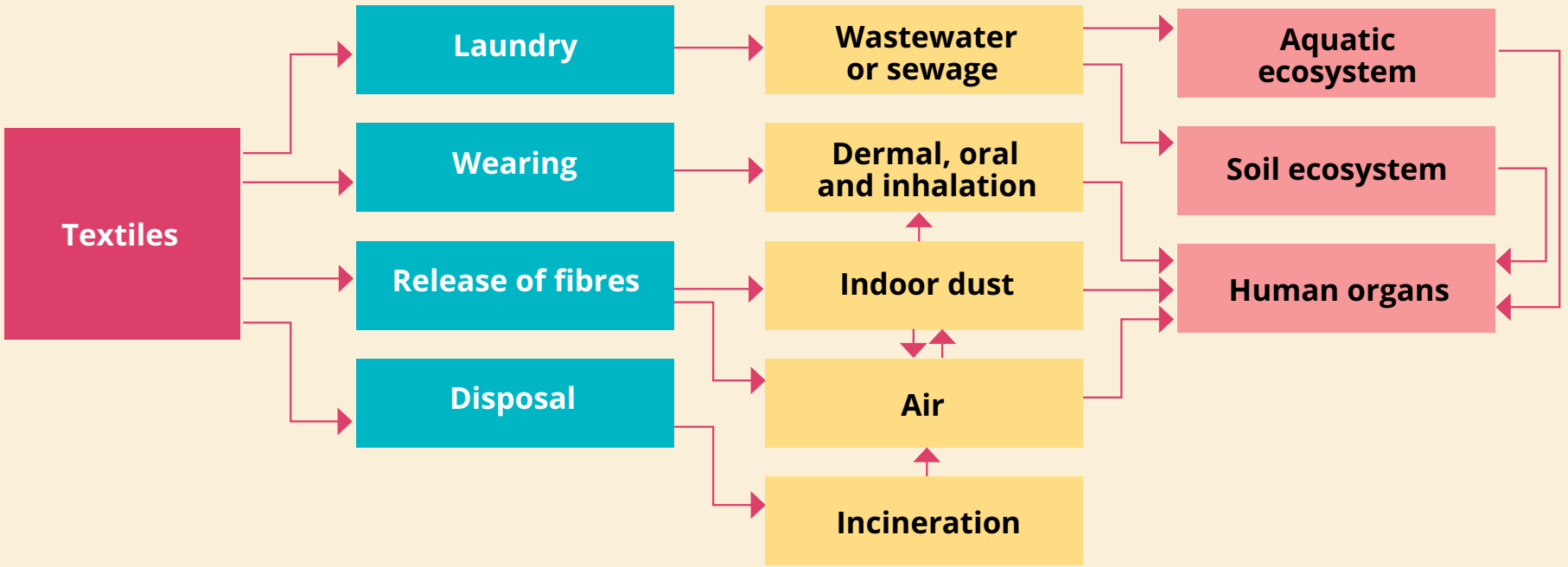


Sources: ecos (2021): https://circulareconomy.europa.eu/platform/sites/default/files/ecos-report-how-ecodesign-can-make-our-textiles-circular.pdf

Environmental, social and economic impacts

Chemical use and hazardous substances along the value chain

- Excessive use of chemical fertilizers and pesticides particularly in **cotton production**.
- **Manufacturing** involves a wide variety of chemical use. Up to 3500 chemical substances are used to turn raw materials into textiles. Approximately 10% of these chemicals are hazardous to **human health or the environment**.
- Some of the chemicals may persist in the environment, build up in the body, and affect immune and reproductive systems.



Sources: Gaonkar (2021): https://www.researchgate.net/publication/358804949_AN_OVERVIEW_OF_TOXIC_CHEMICALS_IN_TEXTILES

Environmental, social and economic impacts

Chemical use and hazardous substances along the value chain

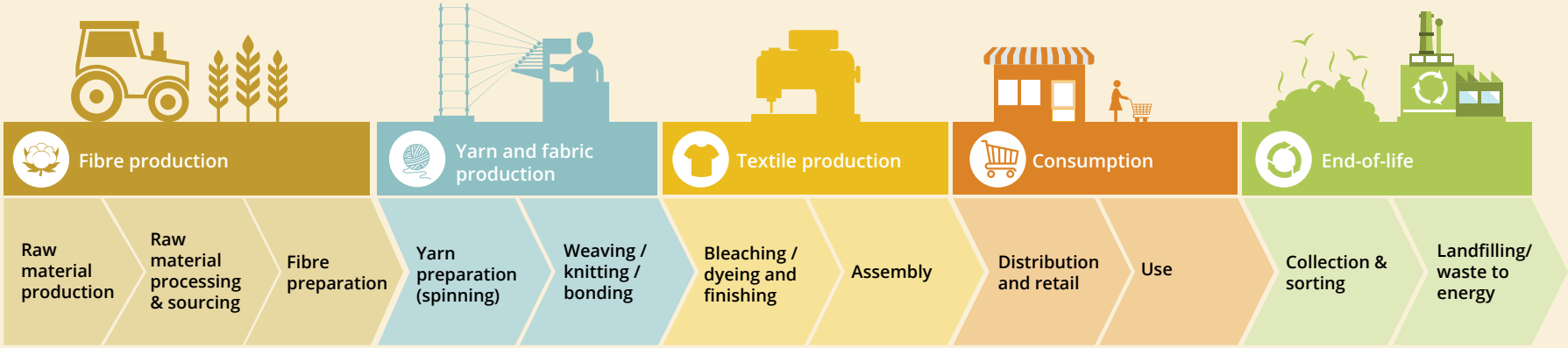
- Chemical use increase the pollution load during production; raise the wastewater, waste and air emissions management costs.
- They have adverse impact on the circularity of the products and the overall value chain.
- Chemicals involved in products/materials hinder them to be cycled in the biological cycle.

Process step	Chemicals or chemical groups used	Function/product specifics
Fibre production	Pesticides, detergents	Remove wool impurities
	Heavy metals	Viscose, Polyester
Knitting	Mineral oils, including polyaromatic hydrocarbons	Lubricating/emulsifying
Washing	Organic solvents, nonylphenols/nonylphenol ethoxylates (NPEOs)	Detergents in washing
Desizeing	Pentachlorophenol	Remove starch sizes
Dyeing or printing	Azo dyes	Used for dyeing
	Heavy metals	Attach dyes to fibre
	Organochlorines (chlorinated solvents, chlorinated benzenes)	Carriers
	Solvents, formaldehydes, NPEOs	Auxiliary substances
Stabilizing	Formaldehyde, triazones, carbamates	Stabilizing of cellulose fibre
Fire-proofing	Heavy metals, halogens, salts, formaldehyde, brominated flame retardants (BFRs), short-chain chlorinated paraffins (SCCPs), and asbestos	
Biocide treatment	Metals, SCCPs, triclosan, organotins	Anti-mould or anti-microbial
Anti-pilling, water proofing	Phthalates, heavy metals, organotins, perfluorinated compounds (including PFOS, PFOA)	Cotton, polyester
Protective printing inks	Phthalates, heavy metals, organotins	Depend on fabric and use
Water, oil, stain, and wrinkle-resistant coatings	Formaldehyde, perfluorinated compounds (including PFOS, PFOA)	
Dry cleaning	Tetrachloroethylene, trichloroethane, chlorofluorocarbons	
Transport and storage	Chlorinated phenols	Added as biocides

Sources: Gaonkar (2021): https://www.researchgate.net/publication/358804949_AN_OVERVIEW_OF_TOXIC_CHEMICALS_IN_TEXTILES

Module 02: 2.1 Textile industry and its impacts

Environmental impacts – Hotspots



Impacts	Hotspots									
Climate	Fossil fuels used in production of synthetic textiles				Coal-based energy used in textile production			Electricity used in washing and drying		
Water scarcity	Water used in cotton cultivation							Water used in washing		
Land use	Land used in cultivating cotton leads to habitat loss and impacts on biodiversity									
Ecosystem quality	Fertilisers, herbicides and pesticides used in cotton cultivation				Chemicals and water pollution in textile production			Electricity and detergent used in washing and drying; microfibres releases		

Sources: UNEP (2020): https://www.oneplanetnetwork.org/sites/default/files/from-crm/unep_sustainability_and_circularity_in_the_textile_value_chain.pdf

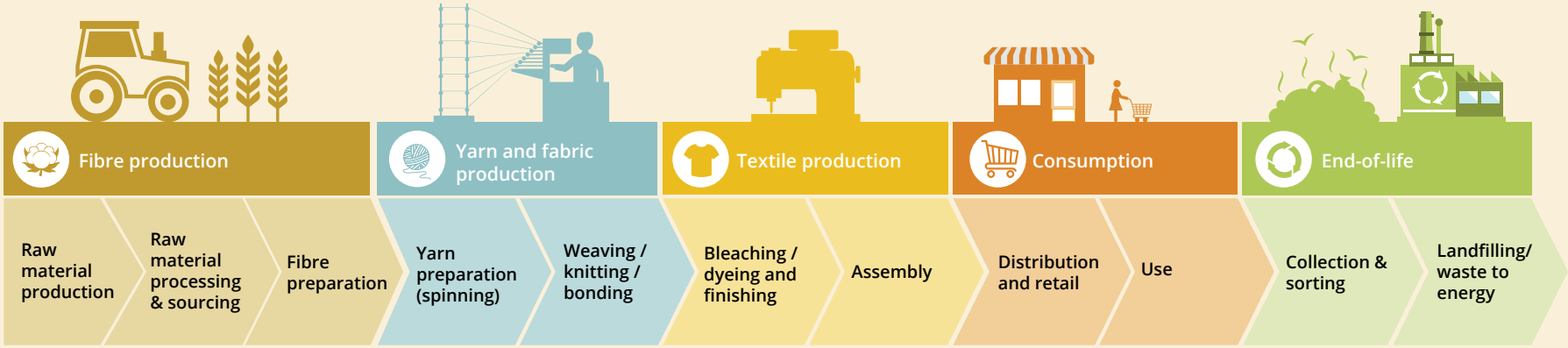
Environmental impacts – Hotspots

		Productions of fibres and raw materials	Textile manufacturing	Retailing and transport	Consumer use	End-of-life
Input	Land use	Primary				
	Water use	Primary	Primary		Primary	
	Energy use	Secondary	Secondary	Secondary	Secondary	
	Chemicals use	Secondary	Primary		Tertiary	
Output	Emissions to air	Tertiary	Tertiary	Tertiary	Secondary	Primary
	Emissions to water	Tertiary	Primary		Primary	
	Material waste		Secondary	Primary	Primary	Primary
	Biodiversity loss					
	Toxic subtances	Secondary	Secondary			

Sources: SPC/RAC (2020): SCP/RAC report: "Circular business opportunities in the south Mediterranean report: how can businesses lead the way to sustainable fashion?" is now available | | SCP/RAC - Regional Activity Centre for Sustainable Consumption and Production (cprac.org);

Module 02: 2.1 Textile industry and its impacts

Social impacts – Hotspots

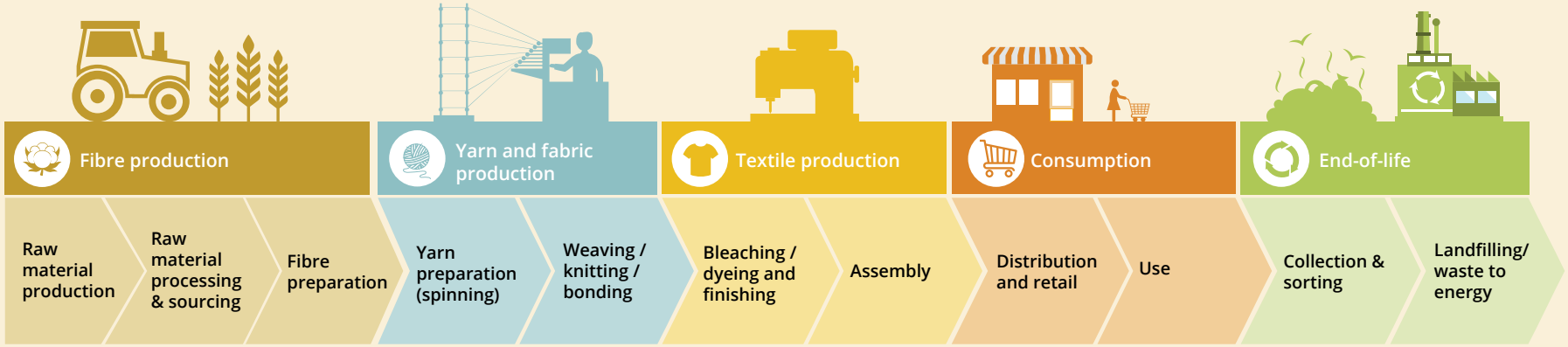


Human health	Agrochemicals used in cotton cultivation; risk of injury and exposure to toxins and hazards		Risk of injury and exposure to hazards	High use of chemicals (risk of exposure to toxins and hazards); high use of coalbased energy	Risk of unsafe working conditions					
Social risk	Risk of child labour, forced labour, excessive working time, below minimum wage pay, gender inequality and conflict		Risk of child labour, forced labour, excessive working time, below minimum wage pay, gender inequality and conflict		Risk of child labour, forced labour, excessive working time, below minimum wage pay, gender inequality and conflict					
Governance risks	Risk of corruption and fragility in the legal system		Risk of corruption and fragility in the legal system		Risk of corruption and fragility in the legal system					

Sources: UNEP (2020): https://www.oneplanetnetwork.org/sites/default/files/from-crm/unep_sustainability_and_circularity_in_the_textile_value_chain.pdf

Module 02: 2.1 Textile industry and its impacts

Economic impacts/value loss – Hotspots



Value loss										Materials and resources lost in landfill and incineration
							Economic value add highly skewed to top end of value chain			Textile "dumping" disrupting local industries

Sources: UNEP (2020): https://www.oneplanetnetwork.org/sites/default/files/from-crm/unep_sustainability_and_circularity_in_the_textile_value_chain.pdf

Module 02: 2.1 Textile industry and its impacts

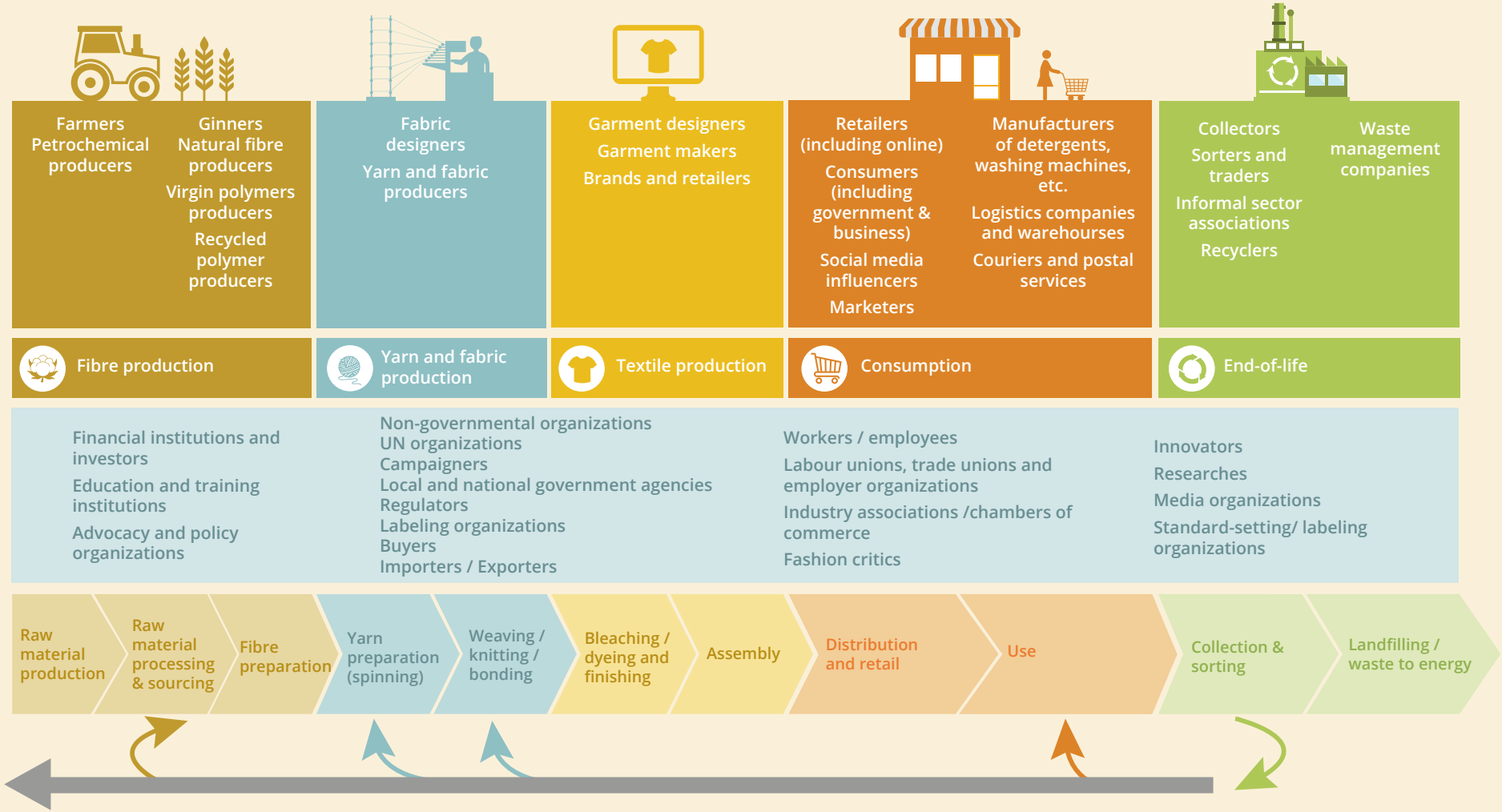
Hotspots summarized

Fibre Production	• High use of **fossil fuels** to produce **synthetic fibres** (which involves climate, human health and ecosystem quality impacts) • High use of **agrichemicals, land** and water to produce **natural fibres**, especially cotton (leading to biodiversity and ecosystem quality impacts) • **Unsafe working conditions** and **fragility of the legal system** (leading to human health impacts and social risks)
Yarn and Fabric Production	• **No hotspots identified** (although there are climate, human health and ecosystem quality impacts, along with social risks, the available life cycle data shows yarn and fabric production is not among the top contributors to impacts when the whole value chain is considered)
Textile Production	• High use of **fossil fuels** for heat and electricity generation in energy intensive textile processes (which involves climate, human health and ecosystem quality impacts) • Use of **hazardous chemicals** (leading to high human health and ecosystem quality impacts, particularly via water pollution) • **Release of microfibres** (leading to ecosystem quality impacts and potential human health impacts) • **Unsafe working conditions** and **fragility of the legal system** (leading to human health impacts and social risks)[18]
Use Phase	• High use of **electricity** in the care of textiles over their lifetime (fossil fuels used for energy production, leading to climate, human health and ecosystem quality impacts) • High use of **water** and releases of **microfibres** in washing textiles over their lifetime (leading respectively to water scarcity, ecosystem quality and potential human health impacts)
End-of-Life	• **Low rates of recovery** of textiles at end-of-life leading to high material value loss and non-renewable resource depletion

Sources: UNEP (2020): https://www.oneplanetnetwork.org/sites/default/files/from-crm/unep_sustainability_and_circularity_in_the_textile_value_chain.pdf

Module 02: 2.2 Value chain actors

Actors along the value chain



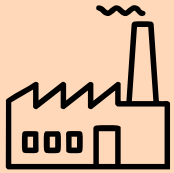
Sources: UNEP (2020): https://www.oneplanetnetwork.org/sites/default/files/from-crm/unep_sustainability_and_circularity_in_the_textile_value_chain.pdf

Module 02: 2.2 Value chain actors

Actors along the value chain

Policymakers: Can have an influence on each step of the value chain by elevating goals, adopt innovative sustainable policies, align funding with intentions, take a comprehensive approach to policy impact, engage in extensive consultation for policy design, and collaborate with key stakeholders.

Financial institutions: Can especially influence the sourcing process by overcoming systemic funding obstacles, enhance internal capabilities, strategize for the transition, foster genuine innovation in solutions and processes, introduce innovative financial products, and expand funding options for sustainable and circular initiatives.



Raw material producers and manufacturers: Optimize production sites through the adoption of top-tier technical practices for environmental impact reduction, while simultaneously safeguarding and empowering workers.

Brands and retailers: Generate revenue through innovative business models, prioritize problem prevention in the design stage via low-impact and circular design, and implement evidence- based business enhancements to reduce environmental and social impact

Sources: UNEP (2020): https://www.oneplanetnetwork.org/sites/default/files/from-crm/unep_sustainability_and_circularity_in_the_textile_value_chain.pdf

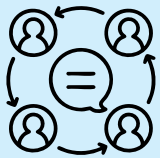
Module 02: 2.2 Value chain actors

Actors along the value chain

Consumers: buying fewer, higher-quality clothing items, supporting eco-friendly brands, recycling and upcycling clothing, and raising awareness about the environmental and ethical impacts of the fashion industry

Innovators and recyclers: introduce innovative circular solutions and technologies, make these solutions accessible and adaptable across various user contexts.

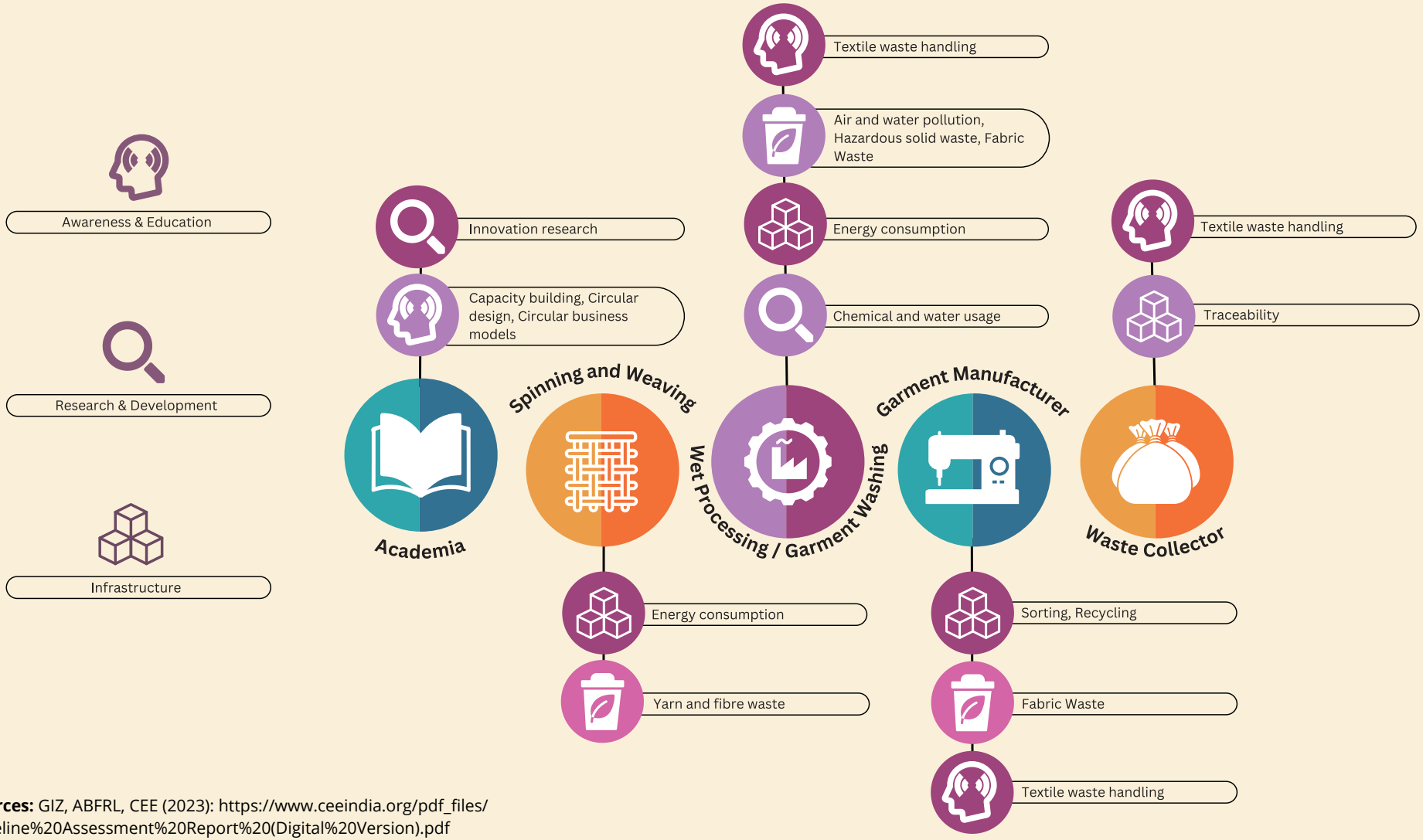
Non-governmental, representative, and technical organizations: promote and bolster swift action from both the industry and policymakers, instigate heightened ambition and advancements, offer trustworthy mechanisms, recommendations, and data to guide prioritization and accountability.



Communication and consumer engagement actors: Transform consumer behavior by making sustainable choices aspirational, acknowledging consumer diversity, and shifting mindsets away from the norm of excessive consumption

Sources: UNEP (2020): https://www.oneplanetnetwork.org/sites/default/files/from-crm/unep_sustainability_and_circularity_in_the_textile_value_chain.pdf

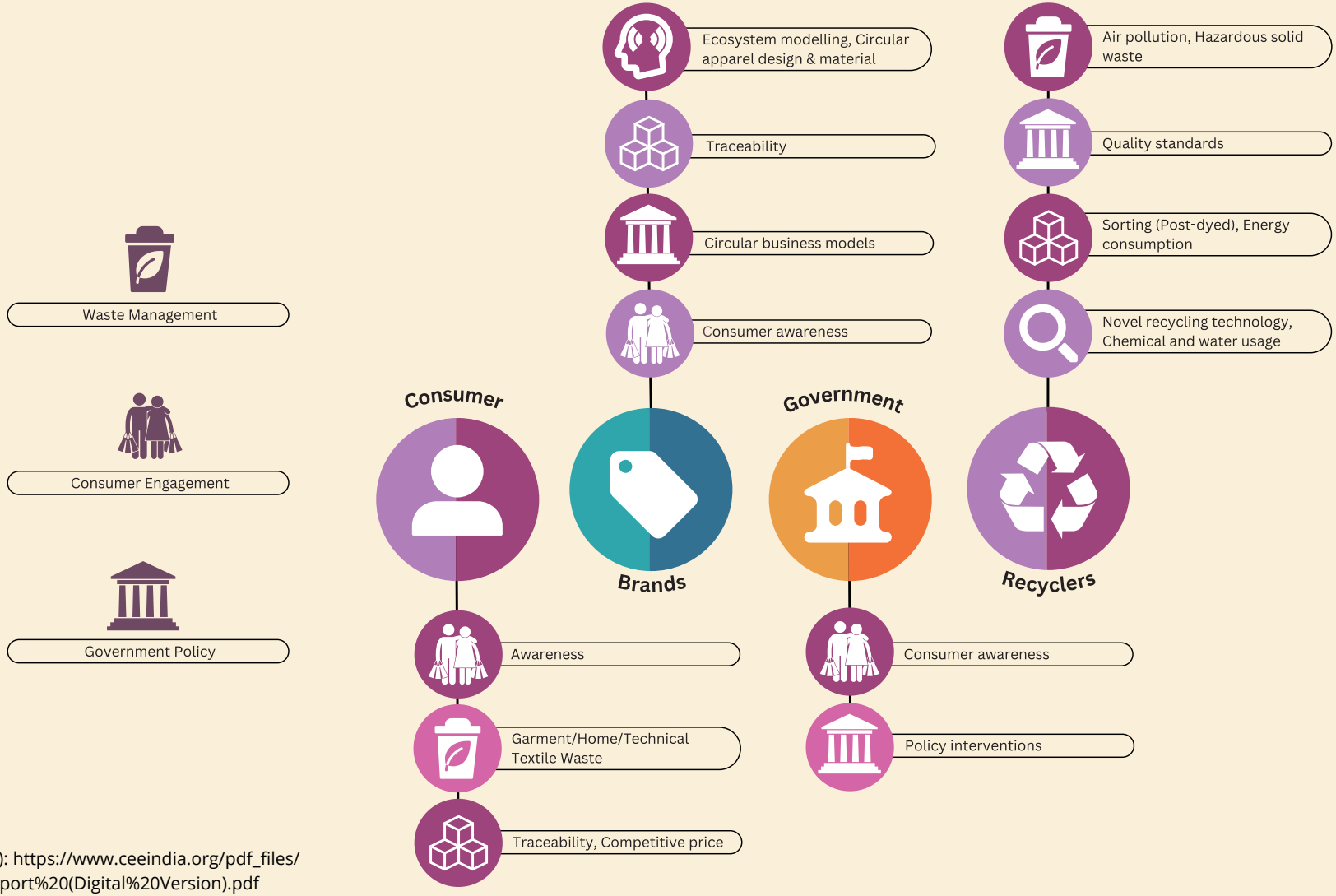
Actors along the value chain



Sources: GIZ, ABFRL, CEE (2023): https://www.ceeindia.org/pdf_files/Baseline%20Assessment%20Report%20(Digital%20Version).pdf

Module 02: 2.2 Value chain actors

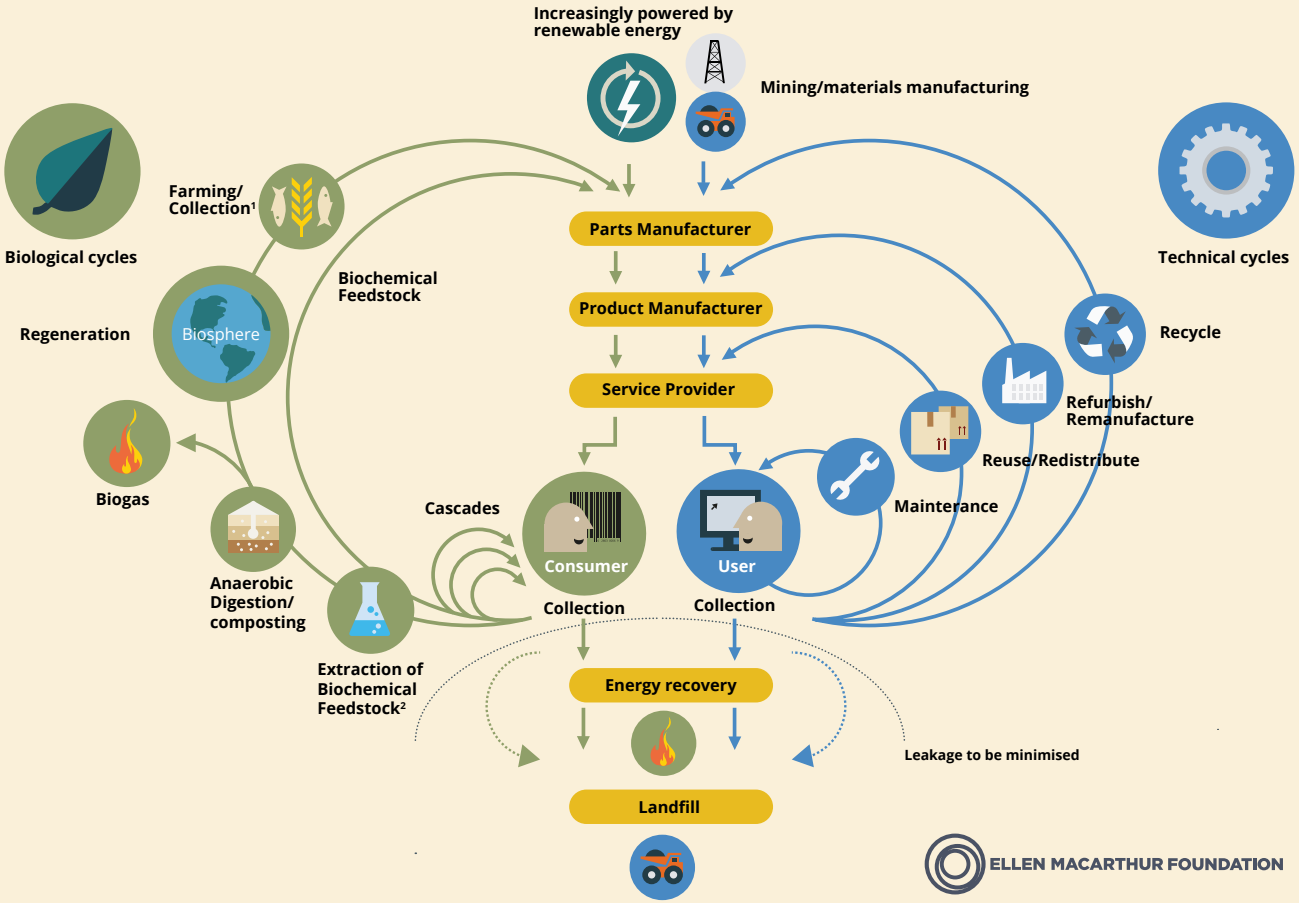
Actors along the value chain



Sources: GIZ, ABFRL, CEE (2023): https://www.ceeindia.org/pdf_files/Baseline%20Assessment%20Report%20(Digital%20Version).pdf

Module 02: 2.3 CE Strategies and Business Models for Textiles

CE strategies and business models for textiles



*"A circular textiles economy describes an industrial system which produces **neither waste nor** pollution by redesigning fibers to circulate at a high quality within the production and consumption system for as long as possible and/or feeding them back into the **bio- or technosphere** to restore natural capital or providing secondary resources at the end of use." (GIZ, 2019)*

Full "cyclability" in biological cycles can only be ensured if the raw materials (e.g. pesticide-free organic cotton) and all involved dyestuffs and other chemicals applied throughout the production processes are fully biodegradable and do only contain substances that are beneficial to human health and the environment.

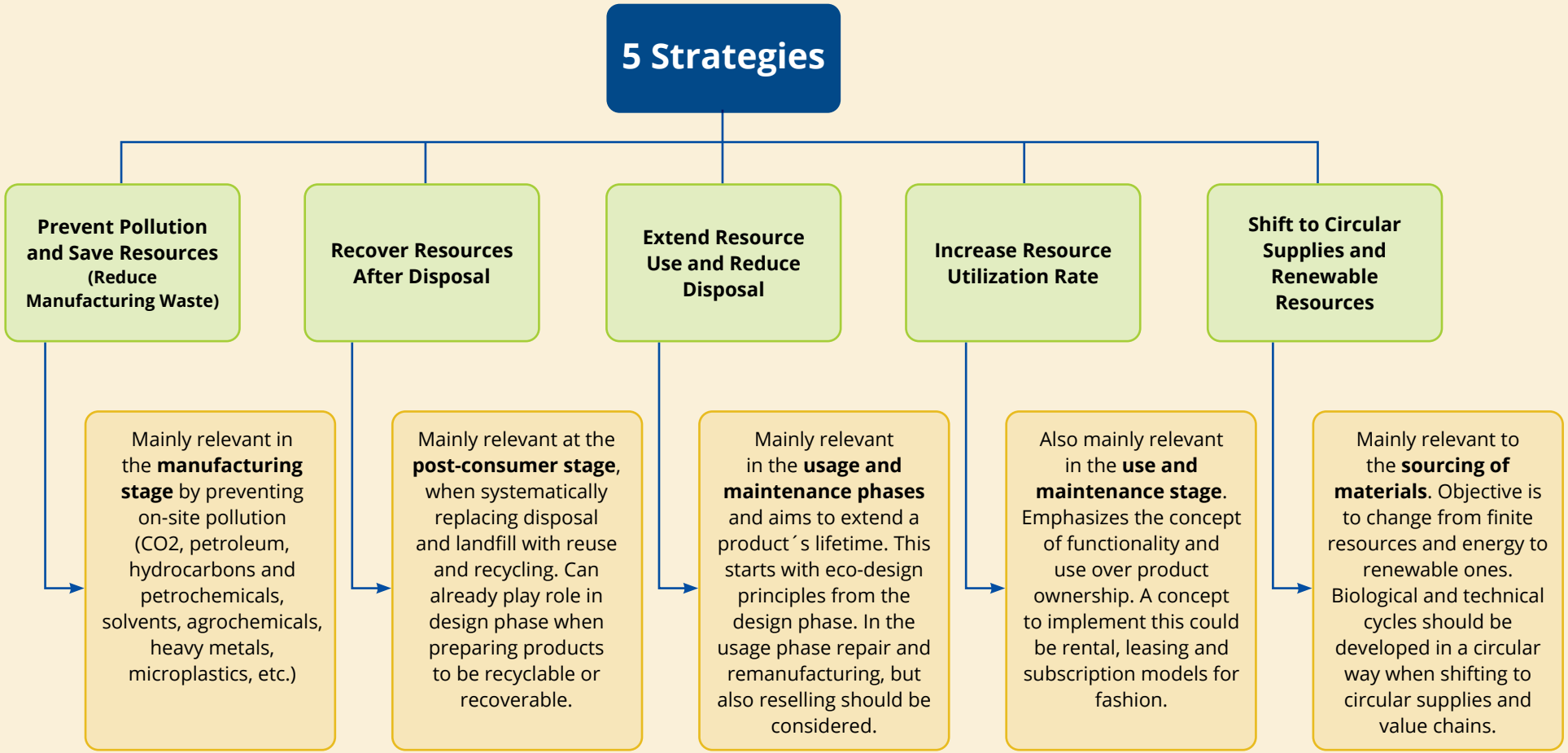
Otherwise, the products needs to be part of the **technical cycle** by ensuring recyclability, reusability, repairability, etc. through circular product design and circular business models.

The transformation towards a circular textile industry calls for fundamental changes throughout the entire lifecycle of textile apparel products.

Sources: Hemkhaus et al. (2019): https://circulareconomy.europa.eu/platform/sites/default/files/giz_report_circular_economy_textile_sector_2019_final.pdf

Module 02: 2.3 CE Strategies and Business Models for Textiles

CE strategies and business models for textiles



Sources: SCP/RAC; BCSD (2020): SCP/RAC report: "Circular business opportunities in the south Mediterranean report: how can businesses lead the way to sustainable fashion?" is now available | | SCP/RAC - Regional Activity Centre for Sustainable Consumption and Production (cprac.org)

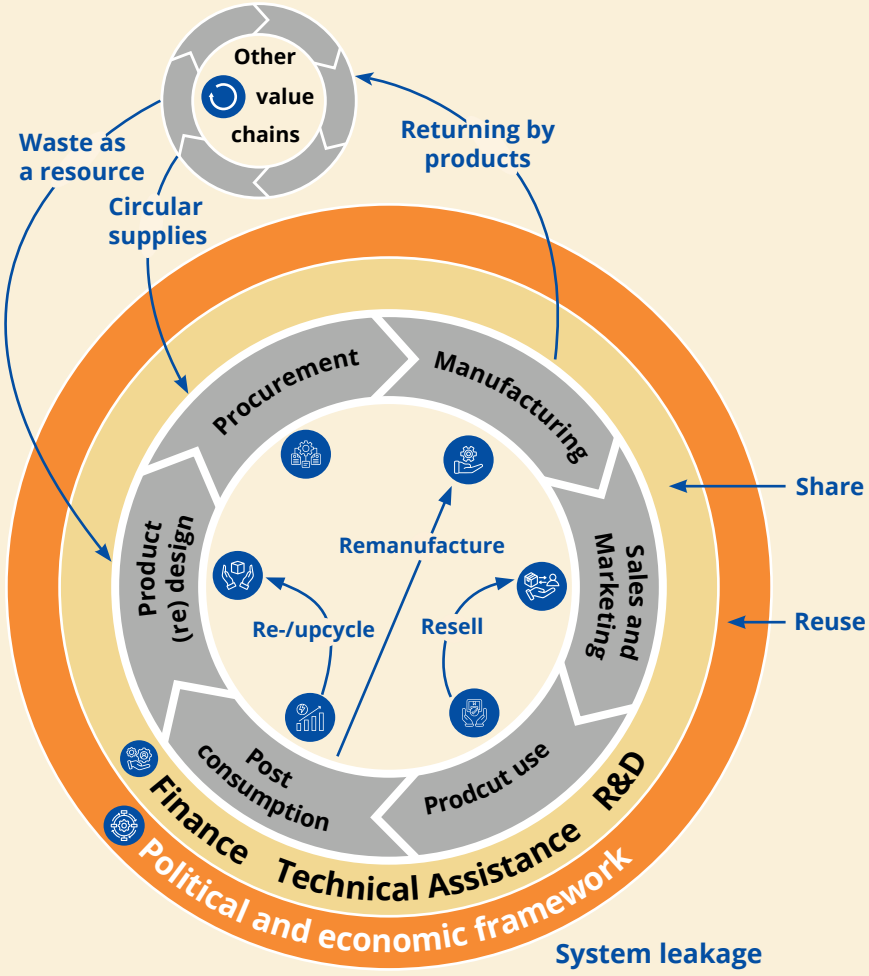
Module 02: 2.3 CE Strategies and Business Models for Textiles

CE strategies and business models for textiles

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

Facilitate demands 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



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

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

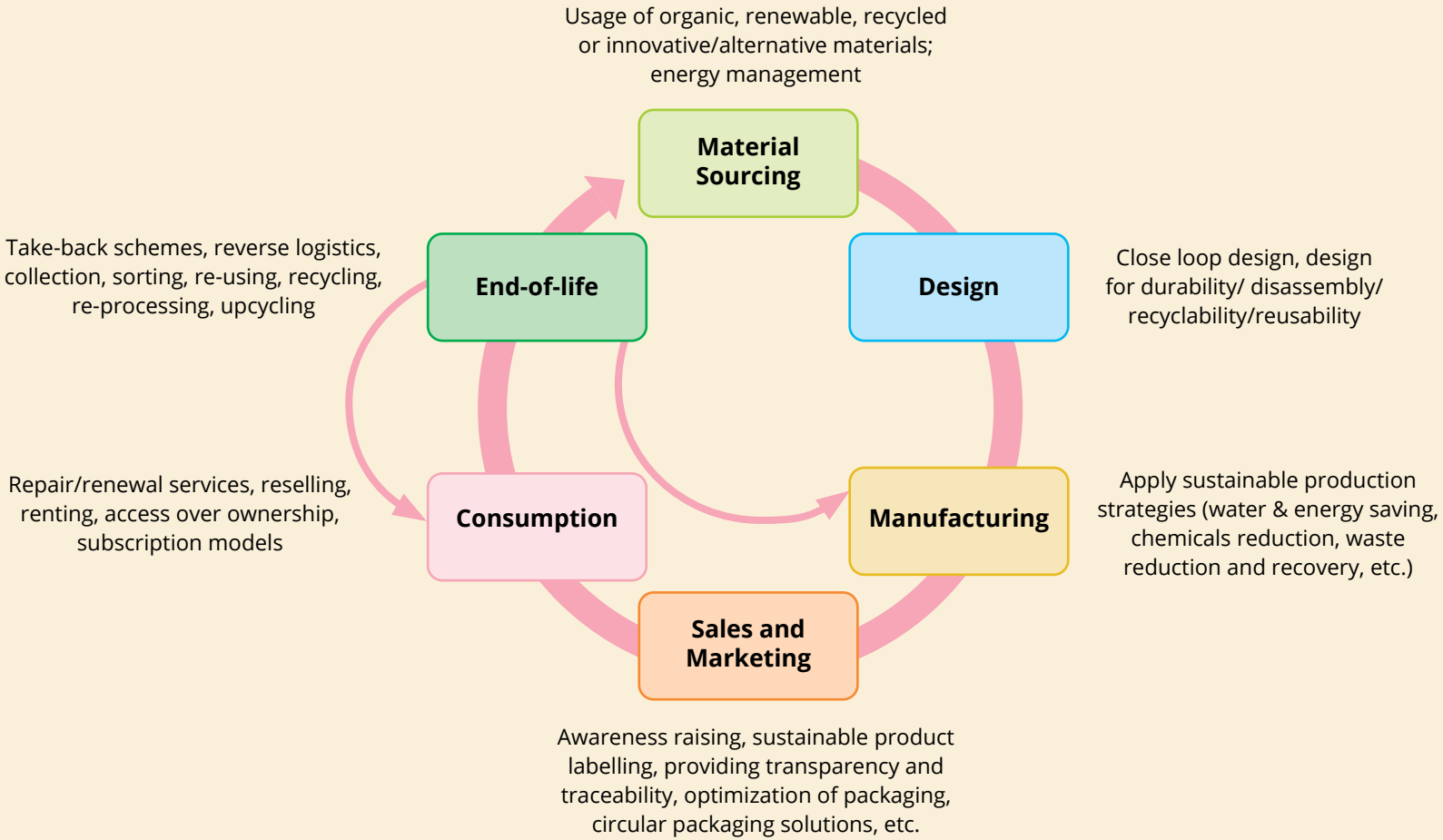
Shift to service-based models
- Develop new models of ownership for higher material value retention
- Adapt subscription model (rental, leasing, servitization)

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

Sources: adelphi (2022)

2.3 CE Strategies and Business Models for Textiles

Examples of business models and practices applicable at different stages of the value chain



2.3 CE Strategies and Business Models for Textiles

Examples of “supportive” business models and practices

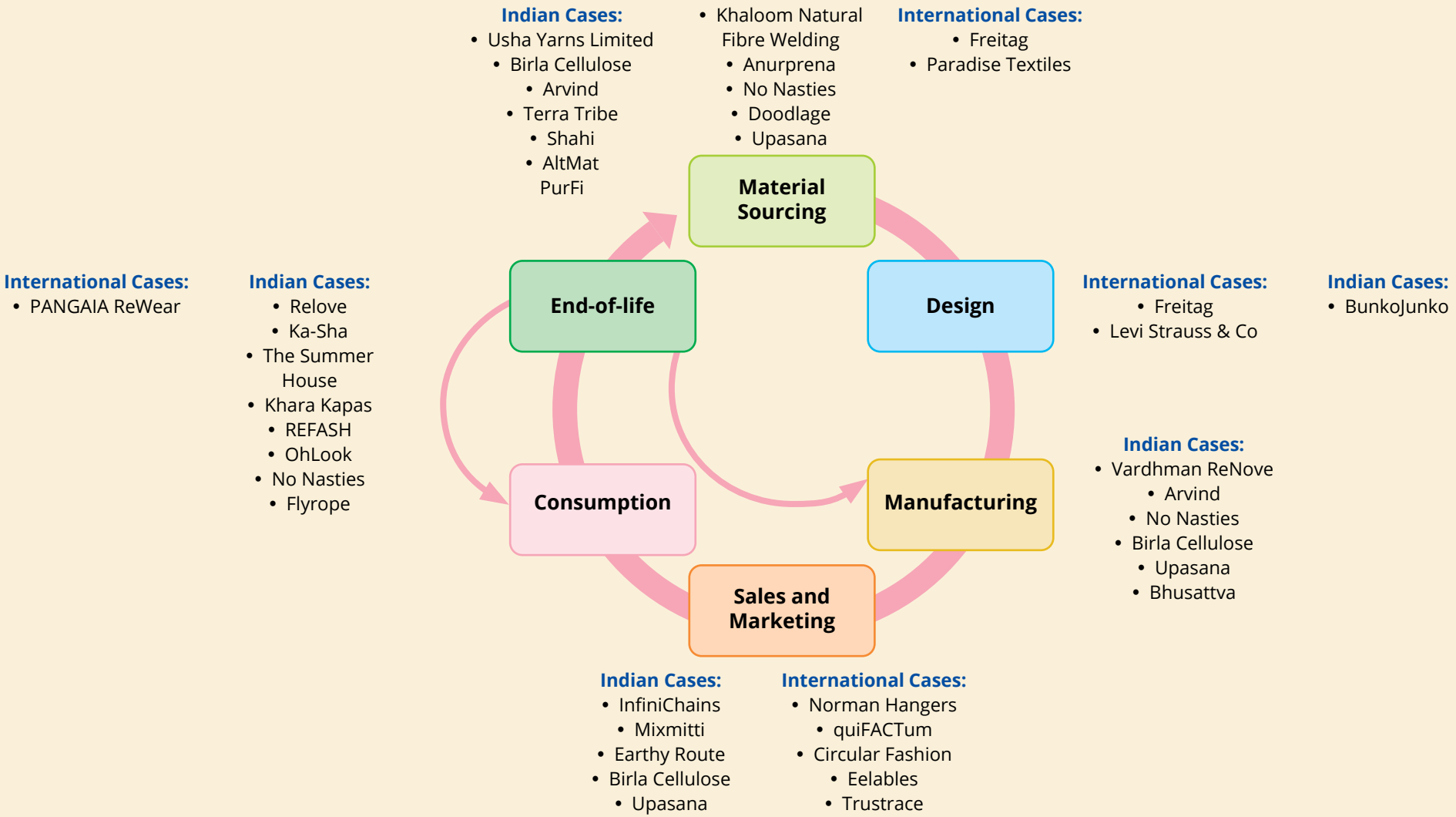
(Development/deployment of tools, applications, and services enabling circular economy strategies)

- Digital tools and applications to facilitate reverse logistics (tracking, take-back of products for reuse, repair or recycling), improve resource efficiency and avoidance of waste production
- Virtual marketplaces for secondary raw materials or second hand/repaired products
- Digital material passports and related data repositories to facilitate the tracing, marketing and trade of secondary raw materials in end-of-life products
- Methodological frameworks and tools for measuring and monitoring of progress in the transition to a circular economy
- Digital tools and applications for consumer awareness raising/education on the application and benefits of different circular economy strategies
- Advisory services to companies and public authorities for strategizing, preparing and implementing circular economy transition
- Secondary material certification services, etc.

Sources: European Union (2020): https://circulareconomy.europa.eu/platform/sites/default/files/categorisation_system_for_the_ce.pdf

Module 02: 2.4 Best Practice Examples (business examples)

The highlighted cases will be explained in more detail in Module 6!



Module 02: 2.5 Technologies Enabling Circularity in Textiles Industry

Technological trends in the textile sector

Design	Material sourcing	Manufacturing	Trading	Consumer reach
AI and **AR/VR** enhanced design **3D** design	**Advanced Material/ Industrial Biotech eg.** natural-fibre-reinforced composites, anti-microbial flame-retardant **AI neural network** for cotton/yarn grading, fabric colour-fastness	**3D printing** of clothing and apparel Digital inkjet technology, digital printing **AI applications** for defect identification, pattern inspection, colour matching	**Big Data** for supply chain analytics, unsold inventory **Blockchain** as a chip or a tag added to support traceability	**AI** algorithms and **IoT** for consumer behaviour tracking **AR/VR** for virtual shopping

Internet of Thing (IoT), Advanced Materials, Nanotechnology, Photonics to support a fully new segment of wearable electronics

Source: Technopolis Group, 2020, based on the review of used cases in the sample

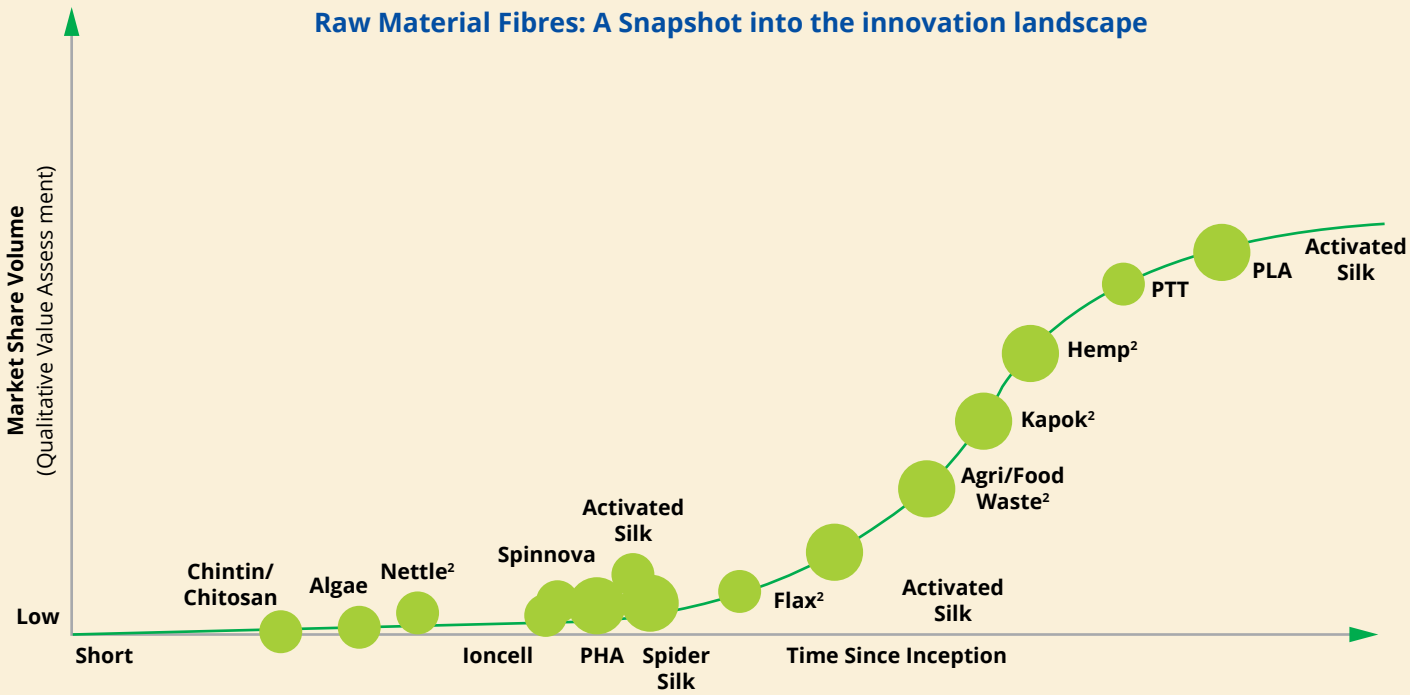
Textile companies are adopting technology in multiple ways:

- Using advanced Materials, such as anti-bacterial or antiviral functioning textiles
- Focusing on Nanotechnology to enhanced textile attributes in fibres, yarns and fabrics
- Integrating the Internet of Things to automate processes or produce higher output

Sources: European Union (2021): https://ati.ec.europa.eu/sites/default/files/2021-07/Leaflet%20Technological%20trends%20in%20the%20textiles%20industry.pdf

Module 02: 2.5 Technologies Enabling Circularity in Textiles Industry

Technologies Used for Material Sourcing



[2] Bast fibres like flax, nettle and hemp, as well as fibres such as kapok and banana have been around for centuries are well established. What is shown here are innovations in quality and efficiency.

Sources: FashionForGood (2020): https://reports.fashionforgood.com/report/state-of-the-circular-innovations-in-the-indian-fashion-and-textile-industry/chapterdetail?reportid=181&chapter=4

Module 02: 2.5 Technologies Enabling Circularity in Textiles Industry

Technologies Used for Material Sourcing

Plant-based natural fibers:

- **Bast fiber**, also known as phloem or skin fiber, is derived from the phloem—the inner bark or bast—encircling the stem of specific dicotyledonous plants. It bolsters the conductive cells of the phloem and fortifies the stem, with flax and hemp being prime examples.
- **Leaf fibers**, termed hard fibers, are utilized primarily for cordage or vegan leathers. These fibers, found in fleshy leaf plants like pineapple and agave, boast heightened lignin content, rendering them the toughest among plant fibers and are used for materials like sisal.
- **Fibers from seeds and fruit** are often attached to hairs or enclosed within a fibrous husk, as seen in cotton, coir, and kapok.
- **Wood fibers** are sourced from trees, grasses, and bamboo. They tend to be stiffer and typically require an additional process to soften.
- **Hemp** offers incredibly versatile and beneficial fibers known for their antibacterial properties, durability, resilience, and natural cooling abilities. It's a fast-growing plant that requires minimal water, doesn't need herbicides, pesticides, synthetic fertilizers, or GMO seeds.
- **Coffee fibers** which consist of post-patented processed coffee ground and polymers offer excellent natural anti-odour qualities, in addition to UV ray protection and a quick drying time.

Sources: FashionUnited (2017): https://fashionunited.com/news/business/6-sustainable-textile-innovations-that-will-change-the-fashion-industry/2017100917734
West (2021): https://www.textileworld.com/textile-world/features/2021/04/fiber-world-sustainable-alternative-plant-fibers-for-textiles/

Module 02: 2.5 Technologies Enabling Circularity in Textiles Industry

Technologies Used for Material Sourcing

- **Regenerative protein fibers:** man-made fibres produced from either animal or vegetable non-fibrous proteins which have been reconfigured to take up a fibrous form to emulate the natural protein fibres of wool or silk (cupro fibres, casein fibres, groundnut protein fibres, zein fibres, soya bean fibres, silicate fibres and alginate fibres)

- **Man-made cellulosic fibers** are crafted from natural origins through the extraction of cellulose, converting it into pulp, and subsequently spinning it into yarn. Cellulosic materials like wood, food waste, or agricultural remnants undergo either chemical or mechanical treatments to produce a fresh fiber. Numerous innovative processing technologies are revolutionizing the cellulosic industry, such as Lyocell and the more recent Eastman's Naia™ fiber.

Sources: FashionForGood (2020): https://reports.fashionforgood.com/report/state-of-the-circular-innovations-in-the-indian-fashion-and-textile-industry/chapterdetail?reportid=181&chapter=4
TradeKey (n.d.): https://www.tradekey.com/product-free/Cupro-Fiber-And-Non-Woven-Waste-2908595.html

Module 02: 2.5 Technologies Enabling Circularity in Textiles Industry

Technologies Used for Design and Manufacturing

- **Digital textile library for design:** A digital textile library is an online resource facilitating designers and brands in sourcing a wide array of textiles, grappling with the challenge of adapting to rapid industry changes and showcasing material textures virtually, especially in the context of increased digital exhibitions since the pandemic.

- **Digital printing**, an almost waterless process, relies on factors like color variations, print layers, and fabric type for color durability. Its most promising innovation involves pigment use, potentially suitable for all materials, albeit requiring ready-for- dye fabric and heat press post-treatment. This technology marks a sustainable shift from traditional dyeing, saving water, chemicals, and energy, while enabling near-shoring, on-demand production, and customization.

Sources: Apparel Resouces (2022): https://apparelresources.com/fashion-news/innovation/five-latest-technologies-plant-based-sustainable-innovations-textile-fabric- domain/#:~:text=Five%20latest%20technologies%20and%20plant-based%20sustainable%20innovations%20in,Armor%20...%208%20Insect%20Proof%20...%20Weitere%20Elemente TexIntel (n.d.): https://www.texintel.com/press-room/digital-textile-printing-expected-to-drive-the-global-textile-printing-machine-market-to-139-bn-by-2025

Module 02: 2.5 Technologies Enabling Circularity in Textiles Industry

Sorting Technologies

Near-Infrared (NIR) and Visual Spectroscopy (VIS) Sorting: This technology utilizes near-infrared and visual spectroscopy to sort textile waste by fiber type and color.

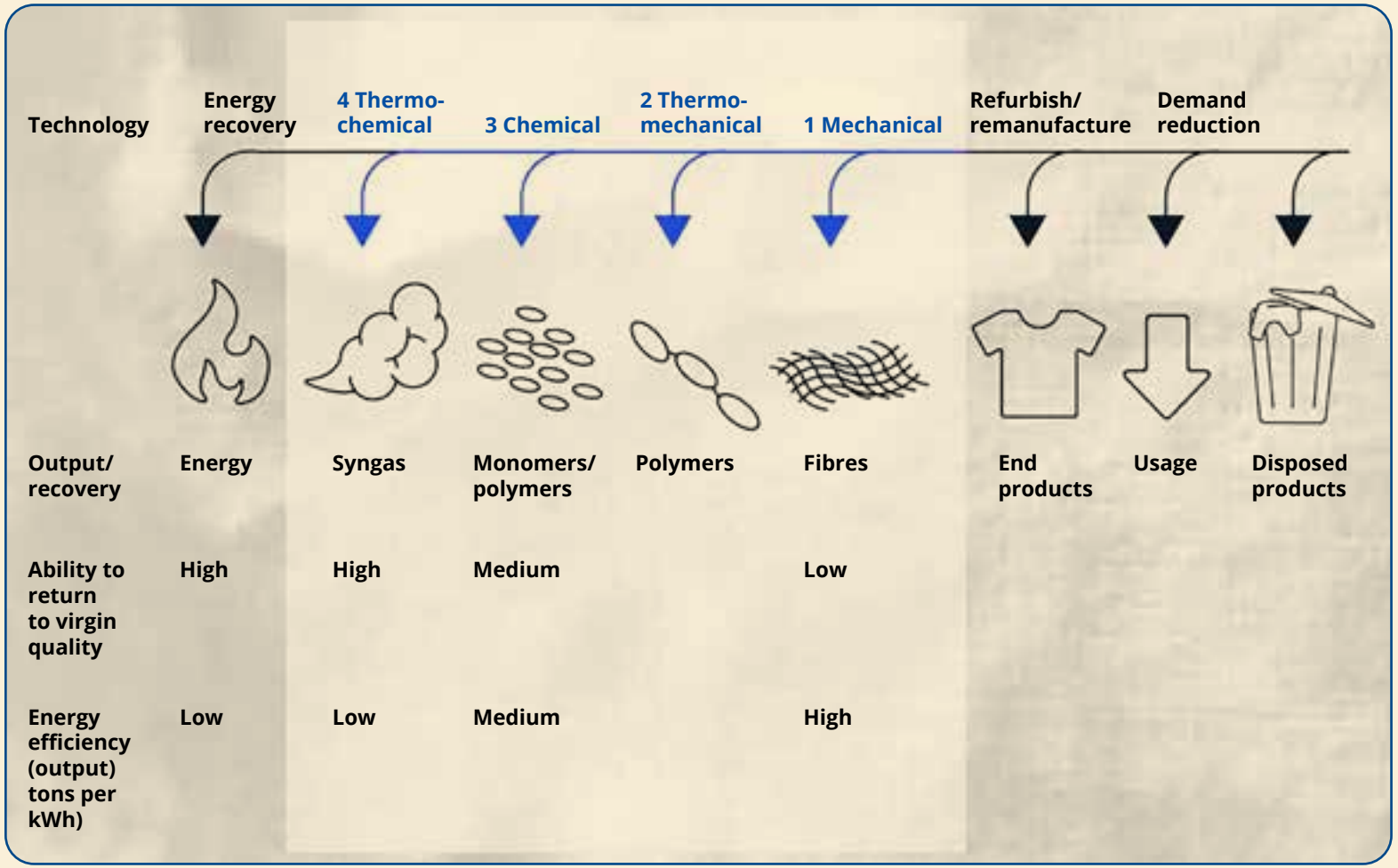
Automated Sorting Systems: Automated sorting systems use advanced technology to separate whole and shredded textiles by color and type while removing impurities like buttons and zippers, contributing to efficient textile waste sorting.

Hyperspectral Vision Technology: This technology is based on hyperspectral vision, allowing for automated separation of materials, including textiles, leading to a greater recovery of value through precise and accurate material classification for recycling.

Sources: TOMRA (n.d.): https://www.tomra.com/en/waste-metal-recycling/applications/waste-recycling/textiles
Innovation in Textiles (2021): https://www.innovationintextiles.com/first-fully-automated-sorting-plant-in-sweden/
Recycling Inside (2022): https://recyclinginside.com/recycling-technology/separation-and-sorting-technology/hyperspectral-vision-and-the-classification-of-textiles-for-recycling/ Glover (2020): https://www.ecotextile.com/2020111727004/materials-production-news/first-industrial-textile-sorting-system-launched.html

Module 02: 2.5 Technologies Enabling Circularity in Textiles Industry

Recycling Technologies



Sources: McKinsey (2022): https://www.mckinsey.com/industries/retail/our-insights/scaling-textile-recycling-in-europe-turning-waste-into-value#/

Module 02: 2.5 Technologies Enabling Circularity in Textiles Industry

Recycling Technologies

Technology	Definition of recycling process
Mechanical recycling	Process based on physical forces, which may be used in isolation for fabric or fibre recycling or as pre-processing for thermo mechanical or chemical and biochemical recycling processes. • **Closed-loop recycling:** Recycling the material to create a product that is nearly identical to the original. • **Open-loop recycling:** Recycling the material to produce a different category of product.
Thermo- mechanical process	Process based on heating with the aim to recover either polymers or low molecular weight building blocks.
Chemical recycling	Process using chemical dissolution or chemical reactions which is employed in polymer or monomer recycling.
Thermo-chemical recycling	Process using partial oxidation reaction of polymers to produce low molar mass components or heat to degrade polymers to monomers that can be used as feedstock for the chemical industry, with the exclusion of fuels used for energy production or other combustion or energy recovery processes.

Sources: (adapted from): Gustav Sandin, Greg M. Peters (2018): https://doi.org/10.1016/j.jclepro.2018.02.266

Module 02: 2.5 Technologies Enabling Circularity in Textiles Industry

Best Practice Examples – Raw Material

Spinnova:

Clean manufacturing through advanced technology:

Spinnova, produces a cellulose-based fibre that emulates the properties of traditional cotton, but without toxic chemicals. It takes 99 per cent less water to produce than cotton and can be recycled repeatedly without loss of quality to the fibres.

AltMat (India):

They have developed a proprietary process to extract usable bast fibre from agricultural produce, sourcing hemp and banana agri-waste directly from organisations and farmers. The fibre is natural, environmentally sustainable and socially inclusive by enhancing farmer's livelihoods. Although, still need to be blended with other materials, like cotton, viscose and polyester.

AltMat

Spintex:

Clean manufacturing through advanced technology:

Creates next generation fibres and materials from a liquid silk solution. The artificially spun silk filaments are produced sustainably and efficiently. Fibres are spun from a waterbased silk solution, purely by applying a small pulling force, which forms the solid fibres through self-assembly.

Module 02: 2.5 Technologies Enabling Circularity in Textiles Industry

Best Practice Examples - Wet and Dry Processing

Sasmira's Institute of Man-made Textiles (SMMT) (India):

They developed a patented technology for waterless dyeing and has built two systems that use supercritical CO2 technology with a capacity of 3 and 20 litres

Nano-Dye:

Salt free cationic treatment that changes the charge of the cotton molecule to the opposite charge of the dye to enhance the absorption of the dye into the fibre. Resulting in a significant reduction of waste dye, other auxiliaries and water (75%) and energy (90%) usage.

NTX – Cooltrans:

They provide a digitally enabled gravure printing method for both artworks and solids. They distinguish themselves from other printing technologies through their superior fastness, precision and proprietary inks that are manufactured in-house. The technology is applicable to natural, man-made and synthetic fibres.

Module 02: 2.5 Technologies Enabling Circularity in Textiles Industry

Best Practice Examples - Cut-Make-Trim

Unspun:

On-demand fashion technology company has developed 3D fit algorithms and a 3D weaving machine for intentional and localised manufacturing. With a three second body scan, unspun creates fully customised garments, perfectly matching supply and demand; by using only the fabric that is needed, no waste is produced.

Microspin (India):

Chennai-based yarn spinning enterprise that holds patents for revolutionary spinning machines that make small lots of yarn on IoT-enabled machinery. Operated via proprietary, energy-efficient algorithms, makes them five times more energy efficient than conventional methods. The resultant crafted yarn that is natural and holds dyes better than conventionally spun yarn and therefore requires half the water in their process.

E-Shakti (India):

eShakti's custom capabilities allow women to tailor any item to their specific tastes such as changing neckline, sleeve or hem, or tweaking the measurements to ensure a flattering fit. Their patented methodology helps them overcome barriers of sizing and fit concerns as clothes are virtually designed and draped.

Module 02: 2.5 Technologies Enabling Circularity in Textiles Industry

Best Practice Examples - Retail and Use & End-of-life

Flyrobe (India):

India's only VC-funded clothing rental platform, which was acquired by Myntra, a popular shopping platform. With a focus on occasion wear, the platform rented out clothing worth over $10 million in retail value in 2017. It offers pick-up and drop-off logistics and also has brick-and-mortar stores in seven cities around the country.

Blocktexx: has developed a patent pending process that combines chemical recovery technology and advanced manufacturing to separate and recycle polyester and cotton blends. The company raised seed funding of over $500k in mid-2019, which enabled the optimization of their technology in a pilot plant alongside trial projects with supply and demand partners.

TrusTrace: provides brands such as Filippa K, Decathlon and the Fenix Group, with a blockchain-based software platform for tracing their supply chain from fibre to garment. The information is used by brands to communicate this information to their customers, perform internal risk analysis and manage their supply chain better.

Re4Circular's: Their business model centers on an AI-driven technology and B2B platform streamlining textile waste sorting, digitization, and redirecting used clothing towards circular fashion destinations, in line with upcoming EU mandates on waste collection.

Business Case Development Examples

Promotion of Multi-Stakeholder Projects for Sustainable Textile Supply Chains in Jordan

The Challenge

- Production of ready-made garments (RMG) in industrial zones such as the Al-Hassan Industrial Estate (HIE) results in considerable amounts of solid textile waste in Jordan
- Textile waste is disposed of in municipal landfills
- Ministry of Local Administration announced that Al-Ekeider Landfill will no longer accept textile waste from HIE
  - Decision was overruled and landfill continues to receive RMG waste from the HIE

The Opportunity

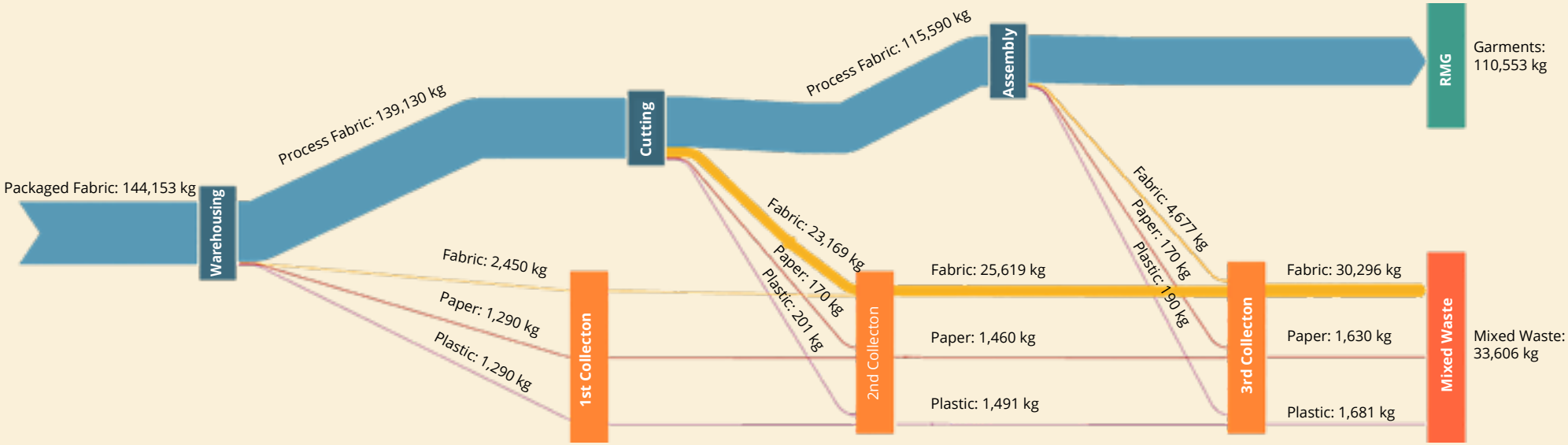
- Assessment of data on RMG waste from the HIE
  - Collection of quantitative and qualitative data from 9 RMG manufacturers and 3 other HIE management stakeholders
  - Conduction of a Material Flow Analysis
- Development of business cases for the prevention and revalorisation of waste
- Identification of pilots for implementation

Source: Project Info: https://adelphi.de/en/projects/promotion-of-multi-stakeholder-projects-for-sustainable-textile-supply-chains-in-jordan

Business Case Development Examples

Promotion of Multi-Stakeholder Projects for Sustainable Textile Supply Chains in Jordan

Material flow analysis and waste characterization



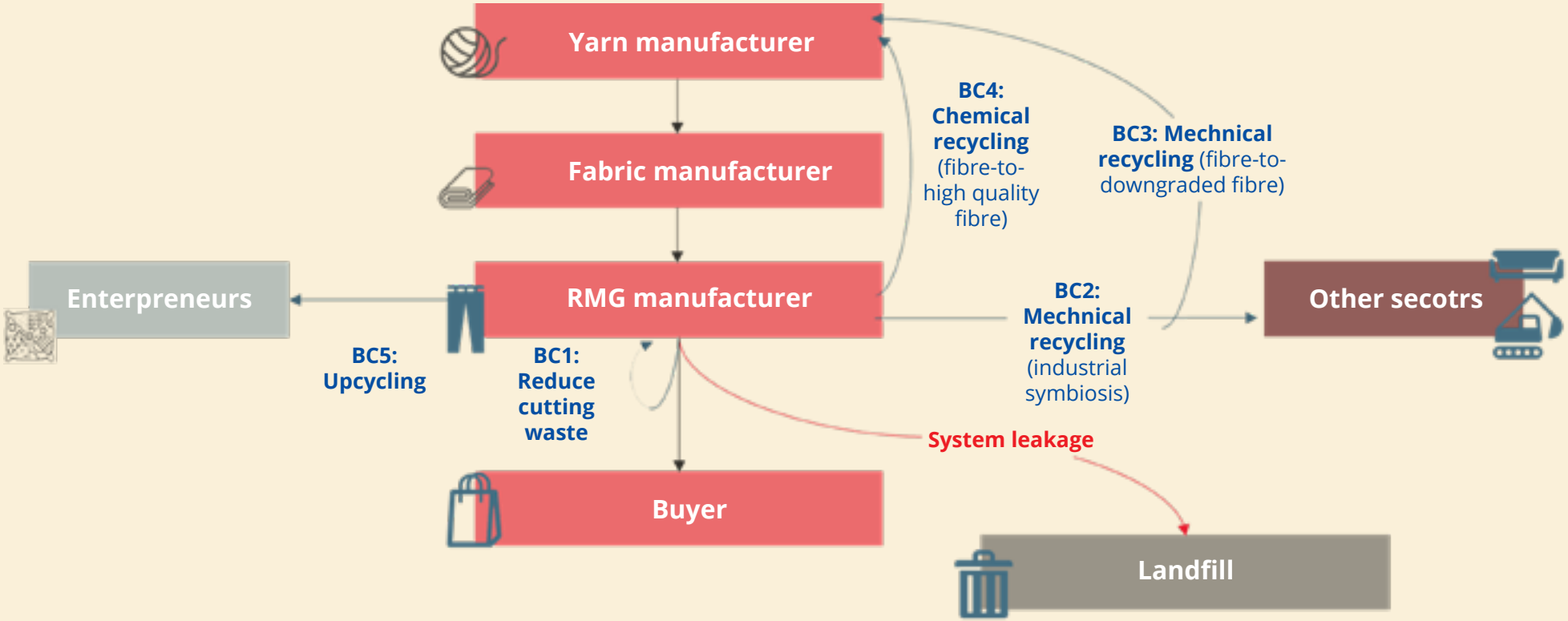
1. *The figures are daily amounts, and refer to the year 2021.*
2. *The collection point in reality are mixed waste containers. The distinction between waste flows has been done only for illustrative purposes.*
3. *No distinctions between RMG products has been conducted.*
4. *Other types of waste (e.g. food from canteens, packaging wood, etc.) are neglected in this assessment.*
5. *It considered that all imported goods in 2021 have been used in the same year, and not material from years before have been processed in 2021.*

Source: Project Info: https://adelphi.de/en/projects/promotion-of-multi-stakeholder-projects-for-sustainable-textile-supply-chains-in-jordan

Business Case Development Examples

Promotion of Multi-Stakeholder Projects for Sustainable Textile Supply Chains in Jordan

Circularity opportunities were studied and business cases were developed



Source: Project Info: https://adelphi.de/en/projects/promotion-of-multi-stakeholder-projects-for-sustainable-textile-supply-chains-in-jordan

Business Case Development Examples

Promotion of Multi-Stakeholder Projects for Sustainable Textile Supply Chains in Jordan

Circularity opportunities were studied and business cases were developed

Source: adelphi, GIZ (2023): https://www.giz.de/en/worldwide/102349.html

Module 03: CE Textile policies and enablers

1 Introduction to Circular Economy (CE)

2 CE in the context of textiles

3 CE Textile policies and enablers

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 giving an **overview of different circular economy policies** and enablers for textiles on an international level, categorize those along the value chain and give some **best practice examples** for successfully implemented policies

Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP)

Source: adelphi (2022)

Module 03: 3.1 International Policies related to Circular Textiles

KEY PRODUCT VALUE CHAINS

The Circular Economy Action Plan (EU CEAP)

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

Module 03: 3.1 International Policies related to Circular Textiles

EU Policies

26 January 2023	**European Commission launches ReSet The Tred campaign**
30 March 2022	**European Commission adopted the EU strategy for sustainable and circular textiles**
11 March 2020	**European Commission adopted new circular economy acation plan**

Source: European Commission (2023): https://environment.ec.europa.eu/news/reset-trend-2023-01- 26_en#:~:text=ReSet%20the%20Trend%3A%20EU%20calls%20on%20young%20people,the%20EU%20Strategy%20for%20Sustainable%20and%20Circular%20Textiles.; European Commission (2023): https://op.europa.eu/en/publication-detail/-/publication/615d8686-21f4-11ee-94cb-01aa75ed71a1/language-en/format-PDF/source-289573476 European Union (2020): https://op.europa.eu/en/publication-detail/-/publication/45cc30f6-cd57-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-170854112

Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP)

- A SUSTAINABLE PRODUCT POLICY FRAMEWORK
- KEY PRODUCT VALUE CHAINS
- LESS WASTE, MORE VALUE
- MAKING THE CIRCULAR ECONOMY WORK FOR PEOPLE, REGIONS AND CITIES
- CROSS-CUTTING 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

Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP) - Textiles

A SUSTAINABLE PRODUCT POLICY FRAMEWORK

KEY PRODUCT VALUE CHAINS

- Priority groups of the CEAP will electronics, ICT, **textile** and furniture but also high impact intermediary products (steel, cement, chemicals, etc.)
- Application of a **new sustainable product framework for textiles** includes developing eco- design measures to make textile products fit for circularity, ensure the update of secondary raw materials, tackling the presence of hazardous chemicals and empowering business and private consumers to choose sustainable textiles and have easy access to reuse and repair services.
- **Improving the business and regulatory environment** for sustainable and circular textiles in the EU by providing incentives and support to product-as-a-service models, circular materials and production processes as well as increased transparency through cooperation
- Guidance to **achieve high levels of separate collection of textile waste by 2025**
- Reach higher levels of reuse and recycling of textiles by innovative, encouraging **industrial applications and regulatory measures like extended producer responsibility (EPR)**

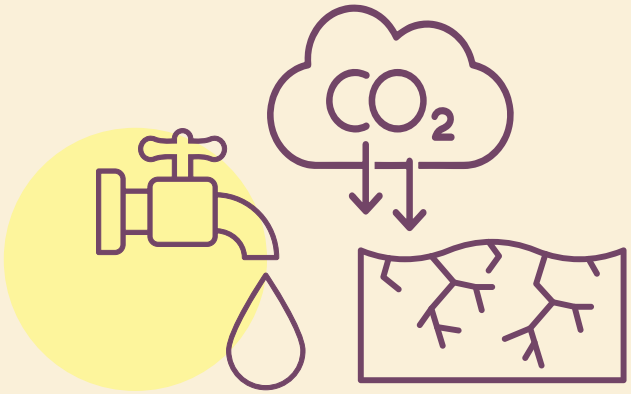
Source: European Commission (2022): https://eur-lex.europa.eu/resource.html?uri=cellar:9d2e47d1-b0f3-11ec-83e1-01aa75ed71a1.0001.02/DOC_1&format=PDF

Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP) – Textiles

Why a strategy on textiles?

European consumption of textiles has the **fourth highest impact** on the environment and climate change, after food, housing and mobility.



It is one of the **top three pressures on water and land use**, and the **top five in terms of raw material use and greenhouse gas emissions in the EU.**

Source: European Week for Waste Reduction: https://ewwr.eu/thematic_focus/circular-and-sustainable-textiles/

Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP) – Textiles

Why a strategy on textiles?

Challenges:

- **Raw Materials**
  - The global **production of fibre doubled** from 58 million tonnes in 2000 to 111 million tonnes in 2019
- **Processing and garment production**
  - Spinning raw materials into yarns, weaving into fabrics and fabric dyeing are **energy-intensive** processes requiring **large amounts of water and chemicals**
- **Transport and distribution**
  - **Most textile raw materials and final products are imported into the EU**, implying long delivery routes.
- **Consumer use**
  - **Environmental impacts of the use phase** in the lifecycle of clothes arise from the water, energy and chemicals used in washing, tumble-drying and ironing, and the microplastics shed into water.
- **End-of-life**
  - Globally, **less than one per cent of all materials that are used in clothing is recycled back into clothing**

Source: European Parliament (2022): https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/729405/EPRS_BRI(2022)729405_EN.pdf

Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP) – Textiles

EU strategy for sustainable and circular textiles (2022)

- The textile strategy implements the commitments of the European Green Deal, the new circular economy action plan and the industrial strategy
- **Vision for 2030:**

"By 2030

- ***Textile products placed on the EU market*** *are long-lived and recyclable, to a great extent* ***made of recycled fibres, free of hazardous substances*** *and produced in respect of* ***social rights and the environment****.*
- ***Fast fashion is out of fashion*** *and consumers benefit longer from* ***high quality affordable textiles****,*
- *Profitable* ***re-use and repair services*** *are widely available.*
- *In a competitive, resilient and innovative textiles sector,* ***producers take responsibility*** *for their products along the value chain, including when they become waste.*
- *The circular textiles ecosystem is thriving, driven by sufficient capacities for innovative f****ibre-to-fibre recycling****, while the* ***incineration and landfilling of textiles is reduced to the minimum"***

Source: European Commission (2022): https://environment.ec.europa.eu/strategy/textiles-strategy_en

Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP) – Textiles

EU strategy for sustainable and circular textiles (2022)

Action Points:

- Set **design** requirements for textiles to make them last longer, easier to repair and recycle
- Introduce clearer **information** on textiles and a **digital product passport**
- Empower consumers and tackle greenwashing by **ensuring the accuracy of companies' green claims**
- Stop **overproduction and overconsumption**, and discourage the **destruction of unsold or returned textiles**
- Harmonize **EU Extender Producer Responsibility rules for textiles** and economic incentives to make products more sustainable
- Address the unintentional **release of microplastics** from synthetic textiles
- Address the challenges from the **export of textile waste**
- Publish a **transition pathway** for actors in the textiles ecosystem to successfully achieve the green and digital transitions and increase its resilience

Source: European Commission (2022): https://eur-lex.europa.eu/resource.html?uri=cellar:9d2e47d1-b0f3-11ec-83e1-01aa75ed71a1.0001.02/DOC_1&format=PDF

Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP) – Textiles

EU strategy for sustainable and circular textiles (2022)

Key actions – Introducing mandatory Eco-design requirements

- Introducing mandatory **Eco-design requirements**
  - The Commission will develop binding product-specific eco-design requirements to increase textiles' performance in terms of
    - Durability
    - Reusability
    - Reparability
    - fibre-to-fibre recyclability
  - and **increase mandatory recycled fibre content**, to minimise and track the presence of **substances of concern** and to reduce the adverse impacts on climate and the environment.
  - The Commission also encourages businesses to **prioritise** their efforts on **fibre-to-fibre recycling** over **PET** bottle recycling.
  - By developing criteria for safe and sustainable by design chemicals and materials, the Commission will **support industry** to substitute as much as possible and otherwise minimise the substances of concern in textile products placed on the EU market.

Source: OVAM (2021): https://circulareconomy.europa.eu/platform/sites/default/files/ecodesign_criteria_for_consumer_textiles.pdf
European Commission (2022): https://eur-lex.europa.eu/resource.html?uri=cellar:9d2e47d1-b0f3-11ec-83e1-01aa75ed71a1.0001.02/DOC_1&format=PDF

Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP) – Textiles

EU strategy for sustainable and circular textiles (2022)

Key actions – Stopping the destruction of unsold or returned textiles

- Proposal of a transparency obligation requiring large companies to **publicly disclose the number of products they discard**.
- Introduction of **bans on the destruction of unsold products**, including as appropriate, unsold or returned textiles.
- Assessment of **digital tools** with industry, how they could reduce the high percentage of returns of clothing bought online, **encourage on-demand custom manufacturing**, and improve the **efficiencies** of industrial processes

Source: European Commission (2022): https://eur-lex.europa.eu/resource.html?uri=cellar:9d2e47d1-b0f3-11ec-83e1-01aa75ed71a1.0001.02/DOC_1&format=PDF

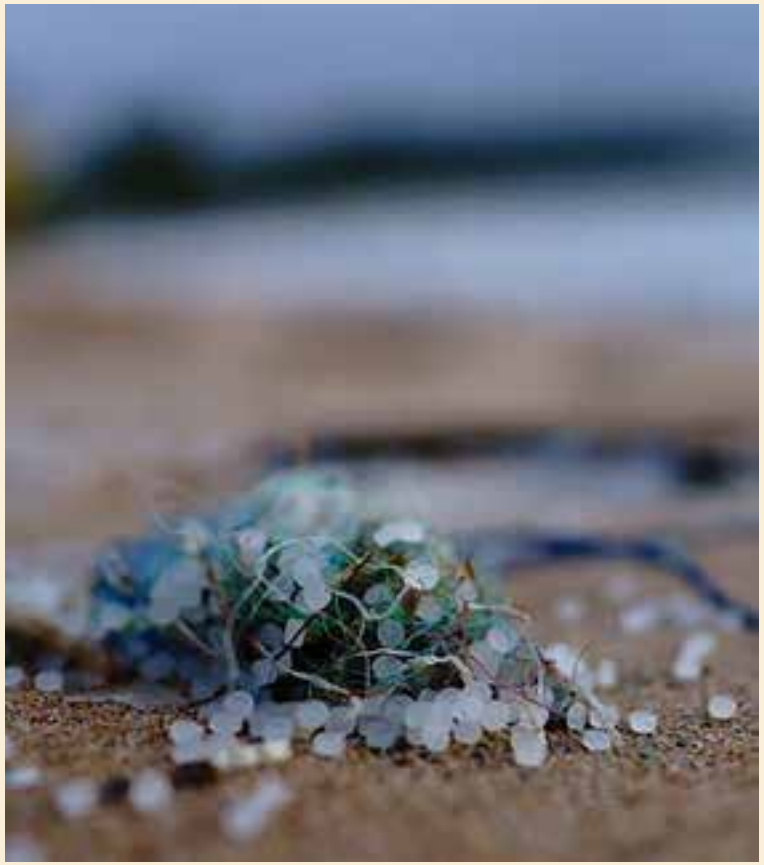
Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP) – Textiles

EU strategy for sustainable and circular textiles (2022)

Key actions - Tackling microplastics pollution

- Set of **prevention and reduction measures**, notably t**hrough binding design requirements to be introduced under the Eco-design for Sustainable Products Regulation**, as well as under the forthcoming Commission initiative to address the unintentional release of microplastics in the environment, to be presented
- ongoing **standardisation** work on the establishment of **test methods** to measure microplastics release **from washing of synthetic textiles**



Source: OVAM (2021): https://circulareconomy.europa.eu/platform/sites/default/files/ecodesign_criteria_for_consumer_textiles.pdf
European Commission (2022): https://eur-lex.europa.eu/resource.html?uri=cellar:9d2e47d1-b0f3-11ec-83e1-01aa75ed71a1.0001.02/DOC_1&format=PDF

Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP) – Textiles

EU strategy for sustainable and circular textiles (2022)

Key actions - Digital Product Passport

- Under the new Eco-design for Sustainable Products Regulation, the Commission will introduce a **Digital Product Passport for textiles** based on mandatory information requirements on circularity and other key environmental aspects
- **Review of Textile Labelling Regulation**, which requires textiles sold on the EU market to carry a label clearly **identifying the fibre composition**.

Source: European Commission (2022): https://eur-lex.europa.eu/resource.html?uri=cellar:9d2e47d1-b0f3-11ec-83e1-01aa75ed71a1.0001.02/DOC_1&format=PDF

Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP) – Textiles

EU strategy for sustainable and circular textiles (2022)

Key actions - Green claims

- The new EU rules will ensure that **consumers are provided with information** at the point of sale about a **guarantee of durability** as well as information relevant to repair, including a **reparability score**, whenever this is available.
- **General environmental claims**, such as "green", "eco-friendly", "good for the environment", will be allowed **only if underpinned by recognised excellence** in environmental performance, for example basing on the **EU Ecolabel**.
- **Voluntary sustainability labels** covering environmental or social aspects **must rely on a third party verification** or be established by public authorities.

Source: European Commission (2022): https://eur-lex.europa.eu/resource.html?uri=cellar:9d2e47d1-b0f3-11ec-83e1-01aa75ed71a1.0001.02/DOC_1&format=PDF

Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP) – Textiles

EU strategy for sustainable and circular textiles (2022)

Key actions - Extended producer responsibility

- For boosting **reuse and recycling** of textile waste the current Waste Framework Directive will be revised in 2023.
- **Harmonised EU extended producer responsibility rules for textiles** will be introduced – producers will the responsible for the end-of-life related impacts and cost; fees will be applied for contributing to such costs and promoting the implementation of eco-design criteria.
- Contributions made to EPR schemes will also be **dedicated to waste prevention measures** and preparing for reuse.
- **Separately collected textile waste** from households is regarded as the necessary first step.
- Study with a view to proposing mandatory **targets for preparing for re-use and recycling of textile waste**.

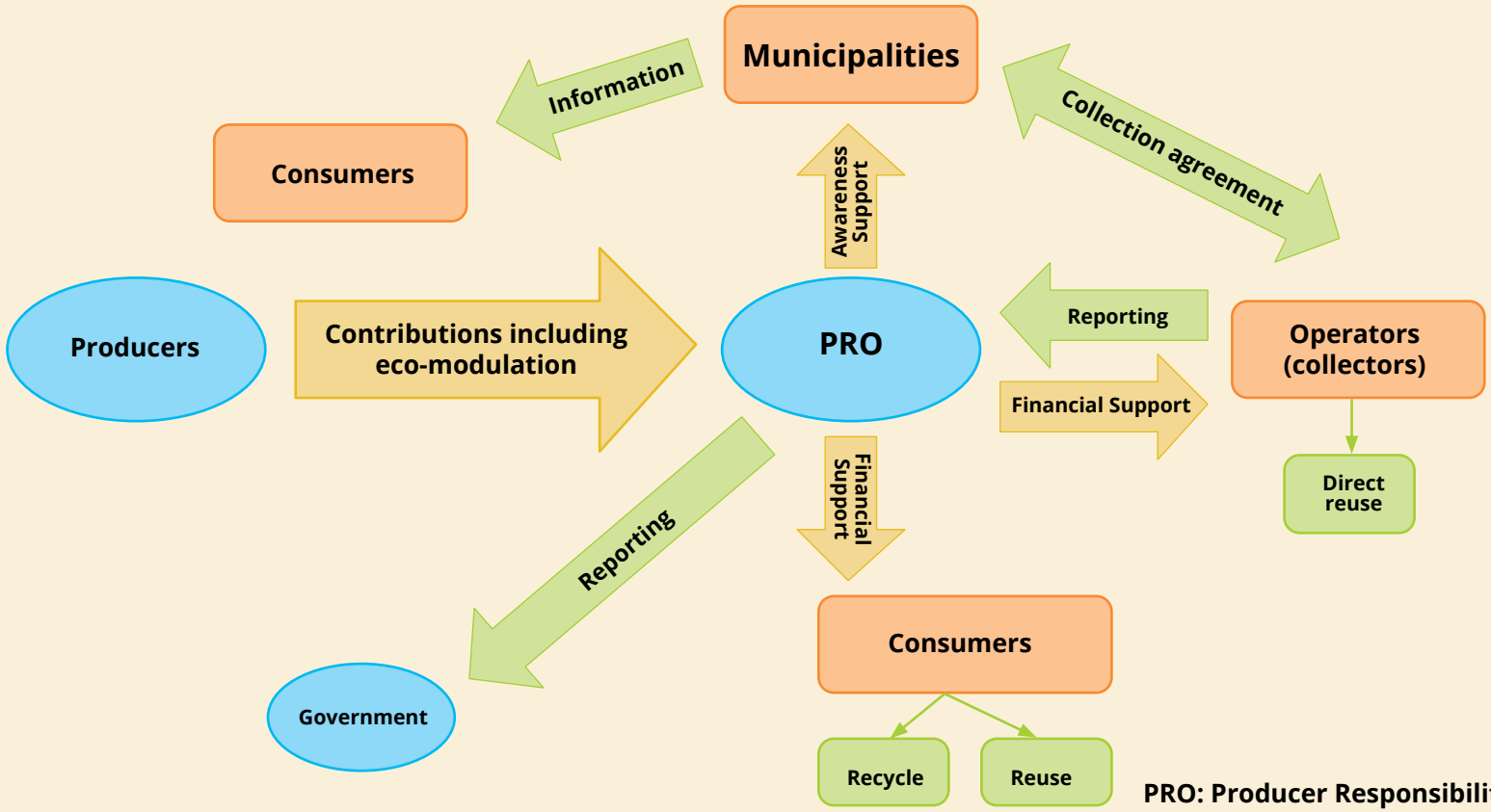
Source: European Commission (2022): https://eur-lex.europa.eu/resource.html?uri=cellar:9d2e47d1-b0f3-11ec-83e1-01aa75ed71a1.0001.02/DOC_1&format=PDF Redress (n.d.): https://www.redress.com.hk/takeback

Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP) – Textiles

EU strategy for sustainable and circular textiles (2022)

Key actions - Extended producer responsibility



PRO: Producer Responsibility Organization

Source: Lewe (2023): https://finix.aalto.fi/extended-producer-responsibility-in-the-textiles-industry/

Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP) – Textiles

EU strategy for sustainable and circular textiles (2022)

Key Actions - Fast Fashion

- Driving fast fashion out of fashion. A new paradigm of **attractive alternatives** to fast changing fashion trends. Companies should become **the champions** of this paradigm shift.
- **Re-shaping the purchasing habits** of consumers is difficult unless **companies provide for new circular business models** (product-as-service models, take-back services, second-hand collections and repair services). **Transition Pathway to engage with stakeholders** to facilitate the scaling up of resource-efficient manufacturing processes, reuse, repair.
- As fast fashion is linked to the growing use of fossil-fuel based synthetic fibres, shifting to more sustainable business models will reduce both the **dependency of clothing producers on fossil fuels** and **their impacts on climate change and microplastic pollution**.

Source: European Commission (2022): https://eur-lex.europa.eu/resource.html?uri=cellar:9d2e47d1-b0f3-11ec-83e1-01aa75ed71a1.0001.02/DOC_1&format=PDF

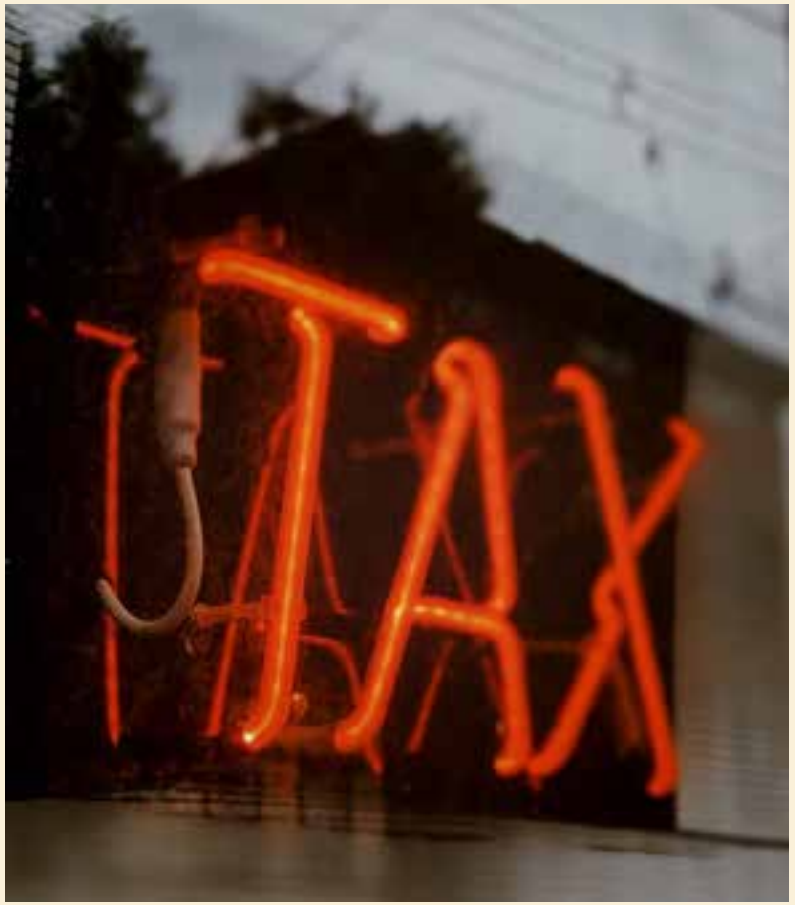
Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP) – Textiles

EU strategy for sustainable and circular textiles (2022)

Key actions - scale up of new business models

- Member States also have an important role to play. In addition to measures to support the reuse and repair sector, **taxation measures**, can be a particularly useful tool.
- The Commission will develop **guidance on promoting circular business models through investment, funding and other incentives**, which will feature the opportunities to create circular value and jobs in the textiles ecosystem.
- **Financial support for the sector's transition will be available** under Horizon Europe's European Partnerships, the LIFE programme, and the Digital Europe Programme for the **development of skilled experts** to support the textiles industry in its digitalisation.
- **Boosting social enterprises active in the reuse sector is particularly important**, as they have considerable potential to create local, green and inclusive businesses and jobs in the EU.



Source: European Commission (2022): https://eur-lex.europa.eu/resource.html?uri=cellar:9d2e47d1-b0f3-11ec-83e1-01aa75ed71a1.0001.02/DOC_1&format=PDF

Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP) – Textiles

EU strategy for sustainable and circular textiles (2022)

Key actions - export of textile waste

- The Commission **proposal for new EU rules on waste shipments** will allow the export of textile waste ton non-OECD countries only under certain conditions.
- Countries must notify the Commission that they **wish to import this waste** and **demonstrate their ability** to manage it sustainably.
- To avoid waste streams being **falsely labelled as second-hand goods** when exported from the EU, the strategy proposes the **development of specific EU- level criteria to distinguish waste properly**.
- The Commission will also work to **increase transparency and sustainability in global trade in textile waste and used textiles**.

"The amount of used textiles exported from the EU has tripled over the past two decades from slightly over 550,000 tons in 2000 to almost 1.7 million tons in 2019, according to a briefing published this week by the European Environment Agency (EEA)." (EEA, 2023)

Source: European Commission (2020): https://ec.europa.eu/commission/presscorner/detail/en/QANDA_22_2015 European Environment Agency (2023): https://www.eea.europa.eu/publications/eu-exports-of-used-textiles

Module 03: 3.1 International Policies related to Circular Textiles

The Circular Economy Action Plan (EU CEAP) – Textiles

EU strategy for sustainable and circular textiles (2022)

Key actions - Textiles Ecosystem Transition Pathway – Co-creation process

- TThe updated **EU Industrial Strategy** highlights the need to accelerate the **green and digital transitions** of EU industry and its ecosystems. To that end, it proposes **cooperation between industry, public authorities, social partners and other stakeholders**.
- Together with the EU strategy for sustainable and circular textiles, the EC invited stakeholders to join in the c**o-creation of a transition pathway for the textiles ecosystem**. Through this inclusive process, **they identified** what the digital and green transitions and increasing resilience mean for the textiles ecosystem, and what s**pecific actions and commitments** need to accompany the transition.


EUROPEAN
COMMISSION

Brussels, 30.3.2022
SWD(2022) 105 final

COMMISSION STAFF WORKING DOCUMENT

Scenarios towards co-creation of a transition pathway for a more resilient, sustainable and digital textiles ecosystem

Source: European Commission (2021): https://single-market-economy.ec.europa.eu/consultations/scenarios-towards-co-creation-transition-pathway-resilient-innovative-sustainable-and-digital_en

Module 03: 3.1 International Policies related to Circular Textiles

EC – ReSet the Trend campaign (2023)

The campaign aims to engage Europeans in the battle against **fast fashion** and raise **public awareness** about the EU textiles strategy.

"Changes in textiles and the fashion industry will involve everyone: designers, producers, retailers and consumers – and you."

"The good news is we can all make a difference right now. It's easy. Join our campaign and help raise awareness across Europe about sustainable fashion."

"It's time to spread the word about what we can do to green the textiles sector. It's time to ReSet the Trend! " "Make fast fashion out of fashion."

"Take action and become a role model"

Source: European Commission (2023): https://environment.ec.europa.eu/news/reset-trend-2023-01- 26_en#:~:text=ReSet%20the%20Trend%3A%20EU%20calls%20on%20young%20people,the%20EU%20Strategy%20for%20Sustainable%20and%20Circular%20Textiles.

3.1 International Policies related to Circular Textiles

EC – ReSet the Trend campaign (2023) - Inspiring stories of change

Introducing Refashion

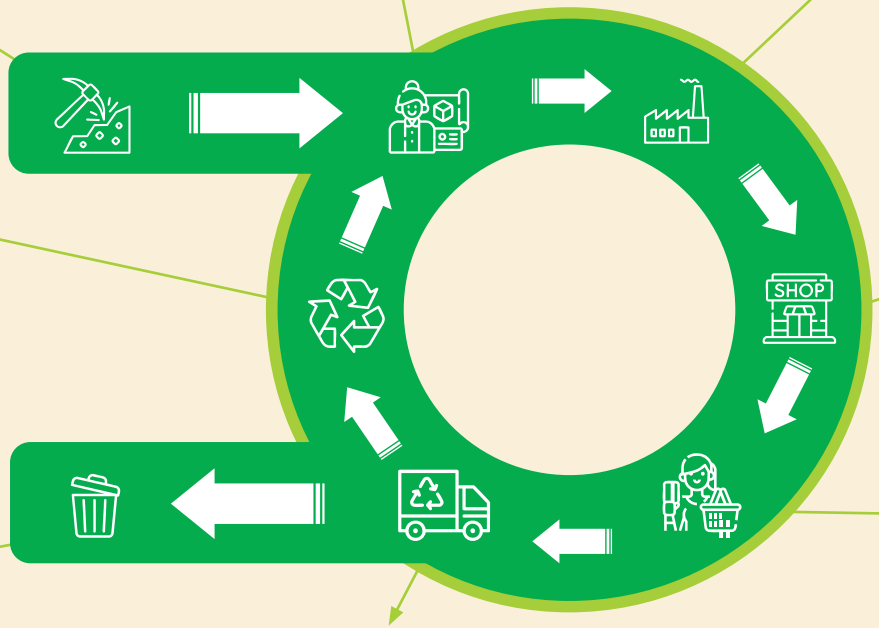
A circular zero-waste fashion system

- Refashion is a new approach to fashion that uses pre-designed multifunctional fabric blocks to create a wide range of styles.
- This circular fashion system is designed to be zero-waste and sustainable, utilizing the same fabric multiple times with the help of artificial intelligence (AI).
- After three years of collaboration, the team successfully created a proof-of-concept collection called Refashion.
- This collection features three pre-designed multifunctional fabric blocks, which can be transformed into 11 different refashionable styles, including a top, four dresses, two skirts, a bolero, two jumpsuits, and a reversible jacket.
- This showcases how versatile the fabric blocks can be. Each garment can be easily disassembled, redesigned, and remanufactured into another style.

Source: European Commission: https://environment.ec.europa.eu/topics/circular-economy/reset-trend/get-inspired-stories-change/introducing-refashion_en

Module 03: 3.2 Different Policy Instruments for Textiles

Different Policy models affecting stakeholders in the textile value chain



Extractive and Mining Companies
- Primary material tax
- Primary metal tax

Product Designers
- Recycled content standards
- Extended Producer
- Responsibility with modulated fees
- Support for R&D

Manufacturers and Producers (primary and secondary)
- Primary material tax
- Primary metal tax
- Reduction of labour taxes
- Product taxes on hard-to-recycle products
- Subsidies on input price of recycled material (secondary producers)
- Green Public Procurement with recycled content criteria (secondary producers)

Recycling Companies
- Investment in resource efficiency
- Create incentives to stimulate secondary markets
- Public loans and grants supporting improvements in resource efficiency and high quality recycling

Distributors or Retailers
- Extended Producer Responsibility with takeback requirements
- Selective tax reduction

Private and Industrial Consumers
- Pay-As-You-Throw schemes (households only)
- Landfill taxes
- Incineration taxes
- Product taxes on hard-to-recycle products
- Advance disposal fees
- Environmental Product Labelling

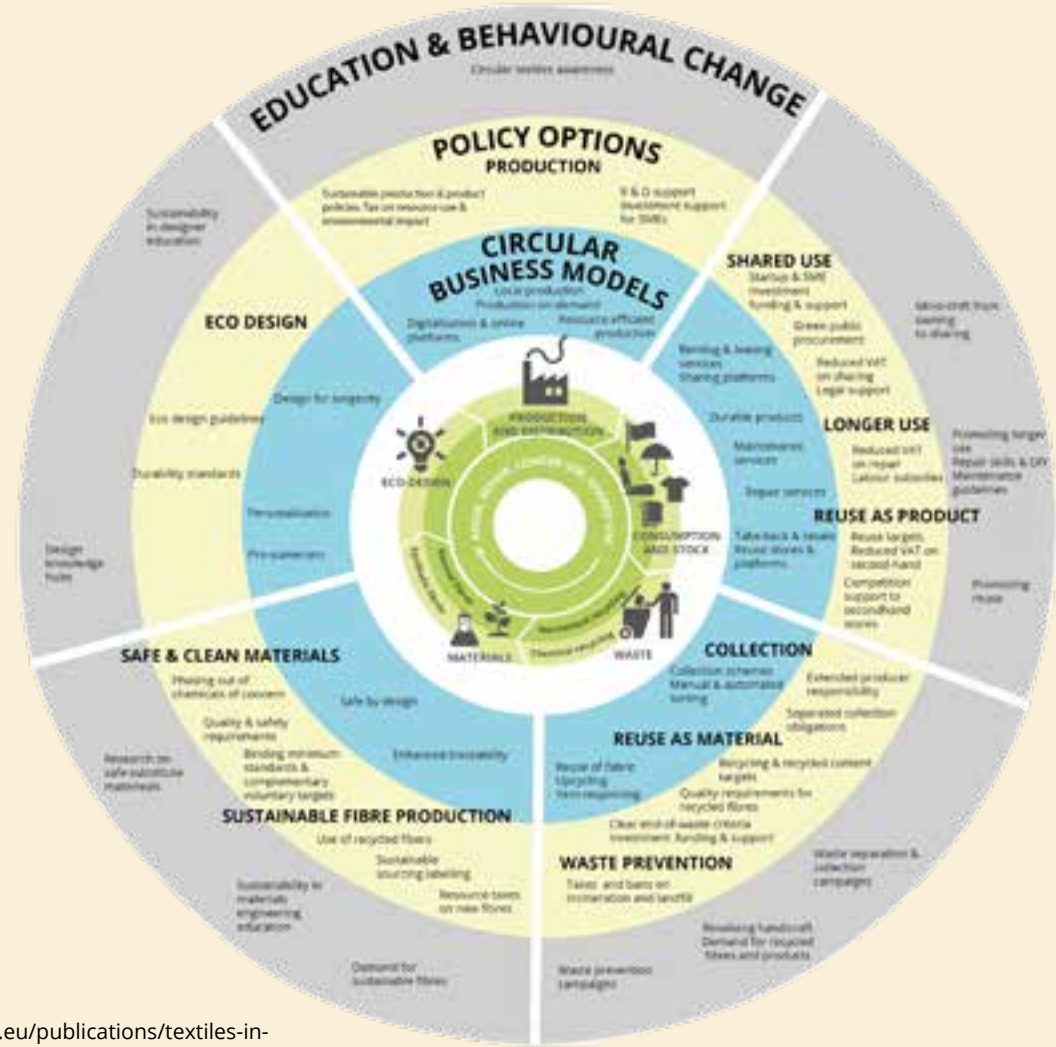
Landfill and Incineration Site Operators (disposal with or without energy recovery)
- Investment in resource efficiency

Collectors (often municipalities)
- Investment in collecting, sorting and recycling infrastructure

Source: OECD (2020): https://www.oecd.org/environment/synergies-and-trade-offs-in-the-transition-to-a-resource-efficient-and-circular-economy-e8bb5c6e-en.htm

Module 03: 3.2 Different Policy Instruments for Textiles

Different Policy models along the textile value chain



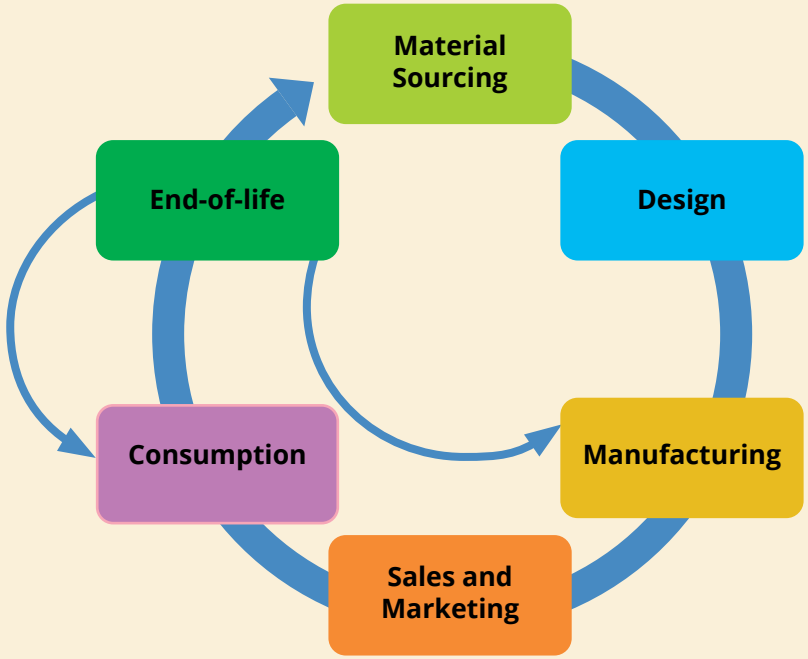
Source: EEA (2019): https://www.eea.europa.eu/publications/textiles-in-europes-circular-economy/textiles-in-europe-s-circular-economy

Module 03: 3.2 Different Policy Instruments for Textiles

Policy & Industry Solutions

Policy Level:
Primary Material Tax, Recycled Content Standard, Sustainable Material Standard, Due Diligence, CSRD, EPR with modulated fees, support for R&D

Industry Level:
Usage of organic, recycled or innovative material



Policy Level:
Legislation for ecodesign of sustainable products, Recycled Content Standard

Industry Level:
Design for Durability, Disassembly

Policy Level:
Sustainable Textile Strategy EU, Product Taxes on hard-to-recycle products, Green Public Procurement with recycled content criteria (secondary producers)

Industry Level:
Apply sustainable strategies (water & energy saving, etc. in the production phase)

Policy Level:
Digital Product Passport, Consumer Education, Rights and Protection

Industry Level:
Transparency, Awareness Raising on Website, Traceability

Policy Level:
Legislation against planned obsolesce, minimum durability criteria, product repairability

Industry Level:
Repair Services, Subscription Models, Access over Ownership, Resell, Refresh, Upcycling

Policy Level:
Extended Producer Responsibility

Industry Level:
Take-Back Schemes, Sorting, Recycling, Processing

Module 03: 3.2 Different Policy Instruments for Textiles

Material and product standards

Support for policy making

- Offer guidance and best practices, setting benchmarks that align with broader policy objectives
- Drive market transformation by incentivizing companies to adhere; as more businesses adopt these to remain competitive, it indirectly supports policy goals.
- Often have global reach, providing a common language and set of criteria transcending national borders.

Difference to traditional policies

- Unlike legally binding policies they are voluntary. Companies choose to comply as a means of differentiations, meetings customer demands, etc.
- Often developed in collaboration with industry stakeholders, leveraging their expertise and insights.

Example

- Global Organic Textile Standard (GOTS)
- Cradle to Cradle Certified
- OEKO-TEX Standard 100
- Better Cotton Initiative (BCI)
- Cotton Made in Africa
- Fairtrade Certified Cotton
- Recycled Claim Standard (RCS)
- Global Recycled Standard (GRS)
- Sustainable Apparel Coalition - SAC SANE Standard
- EU Eco-Label
- Bluesign
- OceanSafe Certified

Module 03: 3.2 Different Policy Instruments for Textiles

Global Organic Textile Standard

Goal:

The primary objective of the Global Organic Textile Standard (GOTS) is to establish guidelines that ensure the organic integrity of textiles, encompassing the entire journey from raw material harvesting to environmentally and ethically sound manufacturing, concluding with reliable labeling for consumers.

Requirements:

To earn GOTS certification, textile items must contain a minimum of 70% organic fibers. Additionally, all chemical inputs, including dyes and additives, must meet specific environmental and toxicological criteria. Accessory choices are restricted to align with ecological considerations. Moreover, any wet-processing facility involved is required to have an efficient waste water treatment plant, and all processors must uphold minimum social standards.

Source: GOTS (n.d.): https://global-standard.org/de/der-standard

3.2 Different Policy Instruments for Textiles

Cradle to Cradle Certified

Goal:

"Cradle to Cradle Certified™ is a rigorous sustainability standard that evaluates products and materials based on their positive impact on people and the planet. It assesses *five key categories: material health, material reutilization, renewable energy and carbon management, water stewardship, and social fairness*. This certification encourages companies to design products with circularity in mind, ensuring they are safe for human health, can be recycled into new materials, utilize renewable energy sources, conserve water, and uphold fair labor practices.

Requirements:

To receive Cradle to Cradle Certified™ recognition, products must meet stringent criteria across these categories. Companies need to demonstrate that their products are not only environmentally friendly but also safe for human health, designed for circularity, utilize renewable resources, manage their carbon footprint, conserve water, and ensure fair labor practices throughout their production lifecycle.

Source: CradleToCradle (n.d.): https://c2ccertified.org/the-standard

3.2 Different Policy Instruments for Textiles

OEKO-TEX® Standard 100

Goal:

The OEKO-TEX® Standard 100 focuses on ensuring that textile products are free from harmful substances and safe for consumer use. It encompasses strict criteria and testing parameters across various categories to guarantee product safety. Key emphasis is put of consumer safety, stringent testing and a comprehensive scope (applying to various textile products, covering materials used in clothing, home textiles, accessories, and more.)

Requirements:

To obtain OEKO-TEX® Standard 100 certification, textile products must undergo comprehensive testing for a wide range of potentially harmful substances. These tests cover substances such as harmful chemicals, pesticides, heavy metals, and other toxic compounds that could pose risks to human health. The standard sets limits and thresholds for these substances, ensuring that certified products meet stringent safety criteria.

Source: OekoTex (n.d.): https://www.oeko-tex.com/de/unsere-standards/oeko-tex-standard-100

Module 03: 3.2 Different Policy Instruments for Textiles

Recycled Claim Standard (RCS) and Global Recycled Standard (GRS)

- The Recycled Claim Standard (RCS) and Global Recycled Standard (GRS) set the criteria for third-party certification of recycled materials and chain of custody. The GRS includes a higher (50%) minimum recycled content percentage and additional social and environmental requirements related to processing and chemical use.
- They have three main objectives: aligning definitions of “recycled” across different applications, verifying recycled content in products and giving brands and consumers a means to make informed buying decisions.
- Materials are verified to meet the ISO definition of “recycled”. Both pre- consumer and post-consumer material is accepted.
- The RCS and GRS are managed with the input of producers, suppliers, brands, and retailers from all parts of the globe.

Source: TextileExchange (n.d.): https://textileexchange.org/recycled-claim-global-recycled-standard/

Module 03: 3.2 Different Policy Instruments for Textiles

Wrap up – Effectiveness of different standards

Name of instrument	Coverage of material efficiency aspects			
	Durability	Reusability	Repairability	Recyclability
EU Ecolabel	✓	✗	✗	✗
Nordic Swan	✓	✗	✗	✗
Textile Exchange – Global Recycled Standard	✗	✗	✗	✗
Textile Exchange – Recycling Claims Standard	✗	✗	✗	✗
Blue Angel	✓	✗	✗	✗
WRAP Sustainable Clothing Action Plan – Design for Longevity	✓	✓	✓	✓
WRAP – Clothing Longevity Protocol	✓	✗	✗	✗
Nordic Council of Ministers – Potential Ecodesign Requirements for Textile and Furniture	✓	✓	✓	✓

Source: ecos (2021): https://circulareconomy.europa.eu/platform/sites/default/files/ecos-report-how-ecodesign-can-make-our-textiles-circular.pdf

Module 03: 3.2 Different Policy Instruments for Textiles

Wrap up – Effectiveness of different standards

Name of instrument	Coverage of material efficiency aspects			
	Durability	Reusability	Repairability	Recyclability
Interreg North-West Europe Fibersort – Policy recommendations towards a zero waste textiles industry	✓	✓	✗	✓
Global Organic Textile Standard v6.0	✗	✗	✗	✓
JRC – Environmental improvement potential of textiles	✗	✗	✗	✓
Ellen MacArthur Foundation – A new textiles economy: Redesigning fashion's future	✓	✓	✗	✓
Cradle-to-Cradle	✗	✗	✗	✓
OEKO-TEX Made in Green	✗	✗	✗	✗
Green Button	✗	✗	✗	✗
The Jeans Redesign Guidelines	✓	✗	✗	✓

Source: ecos (2021): https://circulareconomy.europa.eu/platform/sites/default/files/ecos-report-how-ecodesign-can-make-our-textiles-circular.pdf

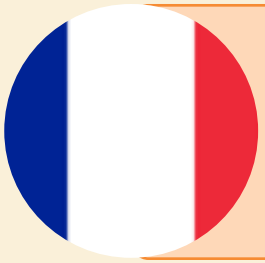
Module 03: 3.3 Best Practice Policy Examples

Brazil: Minimum Durability Criteria

The legislation establishes the National Policy for Natural Resource Conservation and stipulates that all products sold in Brazil must feature a "Durability Seal" prominently displayed in an easily readable format, disclosing the anticipated lifespan of the product under regular usage conditions

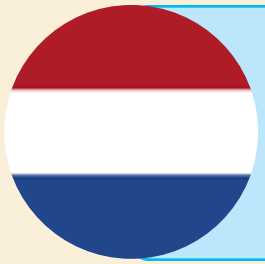
Argentina: Product Repairability

The law mandates that producers, importers, and vendors of long-lasting consumer products must guarantee the provision of sufficient technical support and a steady availability of components and replacement parts.



France: EPR, Repair Incentives

France introduced its initial legal structure for handling textile waste through the Extended Producer Responsibility (EPR) policy in 2007 (reference Article L-541-10-3 of the Code de l'Environnement, effective from January 1, 2007). This policy's objective is to assign responsibility to textile manufacturers for the collection and recycling of discarded clothing, linens, and shoes at their end of use.



The Netherlands: EPR

The introduction of EPR for textiles in the Netherlands began on July 1, 2023, impacting manufacturers, local and foreign retailers selling textiles to Dutch consumers, and importers supplying textiles to other businesses in the Netherlands—all required to register with a legally recognized EPR system and provide specified information, while also obligated to offer collection containers for customers to deposit used textiles.

Module 03: 3.3 Best Practice Policy Examples

Sweden: Tax break for repair services

Sweden's tax breaks on repairs for various items aim to curb its throwaway consumer culture, reducing VAT on clothes and bikes from 25% to 12%, allowing income tax reclamation on repair labor for white goods, with hopes of altering consumer behavior to align with environmental goals.

USA – Care Labelling Rule

The Care Labeling Rule obliges manufacturers and importers of textile clothing and select piece goods to attach care instructions; exemptions include certain apparel items like shoes, gloves, and hats, while specific guidelines ensure complete care instructions or warnings to prevent substantial harm to the product, requiring a reasonable basis for the provided instructions.

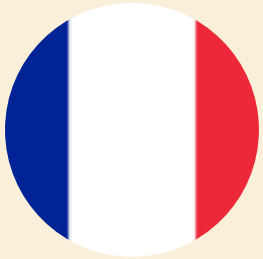
Germany: The Textile Labelling Act

The textile labelling act mandates labeling for textiles sold or imported into Germany, specifying their composition based on weight fractions of textile raw materials, ensuring consumer protection and requiring disclosure in commercial materials.

South Africa: Consumer Protection Act

The article 57 of this Act requires that a service provider must warrant every new or reconditioned part installed during any repair or maintenance work, and the labour required to install it, for a period of three months after the date of installation or such longer period as the supplier may specify in writing.

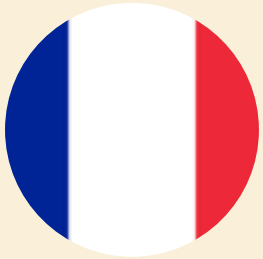
Module 03: 3.3 Best Practice Policy Examples



EPR Policy in France for Textiles

- EPR has been a legal requirement since 2007 for clothing, linen and footwear items.
- It requires producers to contribute to the collection, sorting and recovery costs of used textile items.
- Re-Fashion is a take-back scheme operator who is the acting PRO (Producer Responsibility Organization)
- With contributions paid by producers, they ensure the waste management and prevention costs.
- All producers concerned by the EPR must register with an administrative authority. This registration guarantees a membership to a take-back scheme operator, or the producer can instead implement an individual waste management system.
- The eco-fee modulation is the first driver for progress in order to promote high environmental value products.
- The fees for producers vary between 10 Cents and 4.50€ with an average of 0.5€ per item. Those who design or import goods in an ecological way will benefit from a bonus in regards to the financial contribution.

Source: Lewe (2023): Extended Producer Responsibility in the textiles industry – Finix (aalto.fi) Nazena (2022): Extended Producer Responsibility: EPR for textiles (nazena.com)



EPR Policy in France for Textiles

- 250,000 tonnes of textile waste were collected, out of the 648,000 tonnes of textile products placed on the market, with a collection rate of 38%.
- Of the total amount of waste recovered, 58% was reused, 33.5% recycled, 8% used for energy recovery and only the remaining 0.5% went to incineration.
- France therefore has an average of 3.7kg of fabric recovered perinhabitant.

Source: Lewe (2023): Extended Producer Responsibility in the textiles industry – Finix (aalto.fi) Nazena (2022): Extended Producer Responsibility: EPR for textiles (nazena.com)

The Netherlands´ EPR for Textiles

Background:

- In the Netherlands, households discarded 305 kilotons of textiles in 2018, with only 44.6% collected separately. This increase in waste is attributed to rising production and consumption
- Circular Textile 2020-2025 programs announced the introduction of an extended producer responsibility scheme for textiles.
- Previous attempts via subsidies or voluntary agreements for EPR didn't significantly increase separate collection, hence the necessity for this Decree.

Specific contents of the decree:

- **Producers:** The party introducing a textile product into the Dutch market professionally is considered the producer, including importers
- **Textile scope:** Initially covers newly manufactured clothing and household textiles with a potential extension to other textile products.
- **Obligations:** Producers must annually report the quantity of textiles placed on the Dutch market for sale and use, excluding goods intended solely for transit.

Source: ecos (2021): https://circulareconomy.europa.eu/platform/sites/default/files/ecos-report-how-ecodesign-can-make-our-textiles-circular.pdf

The Netherlands´ EPR for Textiles

Targets for 2025

- 50% of textiles placed on the market prepared for re-use or recycled.
- 20% prepared for re-use, with the rest through recycling or re-use.
- 10% intended for re-use in the Netherlands.
- 25% of recycled material must be fiber-to-fiber.

Targets for 2030:

- 75% of textiles prepared for re-use or recycled.
- At least one-third prepared for re-use, rest via recycling or re-use.
- 15% intended for re-use in the Netherlands.
- 33% of recycled material must be fiber-to-fiber.

- Combined targets offer flexibility for producers to focus on recycling or re-use, maintaining minimum percentages for each
- Emphasis on high-quality fiber-to-fiber recycling.
- Targets based on an independent study report from the Rebel Group, indicating achievable and realistic goals for the textile industry.

Source: Government of the Netherlands (2023): https://www.government.nl/documents/decrees/2023/04/14/decree-rules-extended-producer-responsibility-for-textile-products

The Netherlands´ EPR for Textiles – Wrap-up

Which textiles are covered under the EPR scheme?

Consumer clothing
Corporate clothing

Household textiles

The EPR does not apply to parties that sell second hand clothing

What are the goals/requirements?

2025 textile put on market in 2024

At least 50% needs to be recycled and/or prepared for reuse

- Of which at least 20% prepared for reuse
- And 10% for reuse in NL
- Of which at least 25% fibre-to-fibre recycling

2030 textile put on market in 2029

At least 75% needs to be recycled and/or prepared for reuse

- Of which at least 25% prepared for reuse
- And 15% for reuse in NL
- Of which 33% fibre-to-fibre recycling

Source: Government of the Netherlands (2023): https://www.government.nl/documents/publications/2023/05/01/infographic-extended-producer-responsibility-for-textiles

Sustainable Apparel Coalition (SAC)

USA – Care Labelling Rule

The Sustainable Apparel Coalition (SAC) is a **global**, non-profit alliance of 300 leading apparel, footwear, and textile brands, retailers, manufacturers, sourcing agents, service providers, trade associations, NGOs and academic institutions.

SAC has developed the **Higg Index** in collaboration with their members, to create a global approach for effectively measuring and evaluating the social and environmental impacts of value chains and products.

SAC tools support resource efficiency and circularity across the value chain, particularly through the product tools which promote eco-design.

Source: SAC (n.d.): https://apparelcoalition.org/tools-programs/higg-index-tools/;
Worldly: https://worldly.io/resources/new-sustainability-tool-helps-brands-evaluate-total-environmental-impact-of-products-and-pursue-circularity-goals/

Platform for Accelerating the Circular Economy (PACE) / Textiles Program

PACE is a public-private collaboration platform made up of global changemakers and their organizations working together to accelerate the transition to a circular economy. PACE was launched by the World Economic Forum and is a delivery platform hosted by the World Resources Institute.

PACE's Textiles Program builds collaborative actions guided by the Action Agenda and informed by the PACE community. It focuses on transforming the textiles industry to a circular economy by keeping textiles in use for longer, making them recyclable, and using safe, recycled, or renewable inputs for textiles

1. Incentivize and Support Design for Longevity and Recyclability
2. Encourage the Market to Use Less Clothing, and for Longer
3. Guide and Support New Business Models for Environmental, Financial, and Social Triple-Win

Source (n.d.): PACE: https://pacecircular.org/textiles-action-network

Global Fashion Agenda

Global Fashion Agenda is a non-profit organization that fosters industry collaboration on sustainability in fashion to accelerate impact. With the vision of a net positive fashion industry, it drives action by mobilizing, inspiring, influencing and educating all stakeholders.

Circular Fastion Partnership

The Circular Fashion Partnership is a cross-sectoral initiative to support the development of effective circular fashion systems in textile, garment and footwear manufacturing regions, by capturing and recycling post-industrial fashion waste.

It aims to accelerate textile-to-textile recycling to reintroduce 'waste' materials back into fashion products. Currently active in Bangladesh and Cambodia, the partnership demonstrates shared responsibility by facilitating circular commercial collaborations between manufacturers, recyclers and fashion brands.

Brands, manufacturers, collectors, sorters and textile recyclers are eligible to participate in the Circular Fashion Partnership when they are committed to demonstrating shared responsibility for the valorization of post-industrial textile waste.

Source: GFA (n.d.): https://globalfashionagenda.org/

Organic Cotton Accelerator

Organic Cotton Accelerator is a multi-stakeholder organization advancing farmer prosperity whilst creating a transparent, resilient, and responsible organic cotton supply chain.

Since its establishment in 2016, with its founding partners Laudes Foundation, H&M, Kering, Eileen Fisher, Textile Exchange, Tchibo, Inditex, and C&A, OCA has committed to convening the sector around a common agenda and to act as a catalyst for change.

OCA has made a commitment to bring integrity, supply security and measurable social and environmental impact to organic cotton. OCA programs deliver the key solutions required for the organic cotton sector to flourish. OCA Platform facilitates the collaboration needed to create meaningful impact throughout the value chain.

Three focus commitments:

- Convening the sector around a common agenda
- Improving farmer profitability and prosperity
- Enhancing the integrity of the organic cotton sector

Source: OCA (n.d.): https://organiccottonaccelerator.org/

Global Fashion Agenda

Better Cotton is a sustainability initiative for cotton. Their mission is to help cotton communities survive and thrive, while protecting and restoring the environment.

Along with the extensive network of partners and members, BCI is making cotton farming a more climate-resilient, environmentally friendly and responsible business. Already nearly a quarter of the world's cotton is produced under the **Better Cotton Standard**.

BCI has a network of almost 70 partners working with farmers on-the-ground. They work with donors, civil society organizations and governments and other sustainable cotton initiatives too.

They have a **10-year strategy** mapped out to deliver real, measurable change, in line with the 2030 Sustainable Development Goals.

Source: BCI (n.d.): https://bettercotton.org/

Zero Discharge of Hazardous Chemicals (ZDHC) Program

ZDHC is a multi-stakeholder organization comprising over 320 signatories from across the industry including Brands, Suppliers, Solution Providers and Chemical Suppliers.

The Roadmap to Zero Program, by ZDHC, leads the fashion industry to eliminate harmful chemicals from its global supply chain by building the foundation for more sustainable manufacturing.

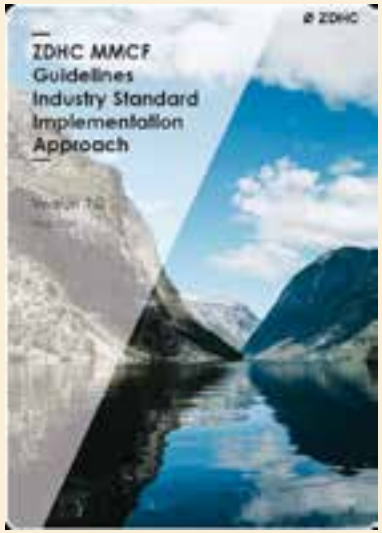
The Roadmap to Zero Program is organized into **three focus areas** which are interlinked to improve **chemical management**. Within each of the focus areas, it is our priority to develop and maintain the **ZDHC Guidelines, Platforms and Solutions** to enable and accelerate the implementation of the program.

Input

Safer Chemicals
A good start transforms the end result.

Process

Smarter Processes
The positive impact of doing things right



Output

Better Output
Safer and cleaner - for producers, people and planet

Source: UN Global Compact (n.d.): https://ceowatermandate.org/resources/zero-discharge-of-hazardous-chemicals-zdhc-programme-2018/ ZDHC Foundation (n.d.): https://www.roadmaptozero.com/

Fashion Industry Charter for Climate Action

UN Climate Change has initiated a climate action work program, convening fashion stakeholders to develop a coherent, unified position on climate. The work program aims to connect the diverse stakeholders in the fashion industry, including raw material producers, textile producers, apparel manufacturers and brands, to identify new areas for action and to scale up existing initiatives that connect the value chain.

The Fashion Industry Charter for Climate Action goes beyond previous industry-wide commitments. Companies should pursue Science Based Targets or 50% absolute reductions and commit to decarbonization no later than 2050. The Charter provides a plan pointing to key areas of focus in commitments and requires accountability through public reporting and preparation of reduction pathway plans to be submitted to UN Climate Change.

The Charter's primary mission is to drive the fashion industry to net-zero GHG emissions no later than 2050. In addition, signatories commit to key principles on climate action that go beyond industry-wide commitments.

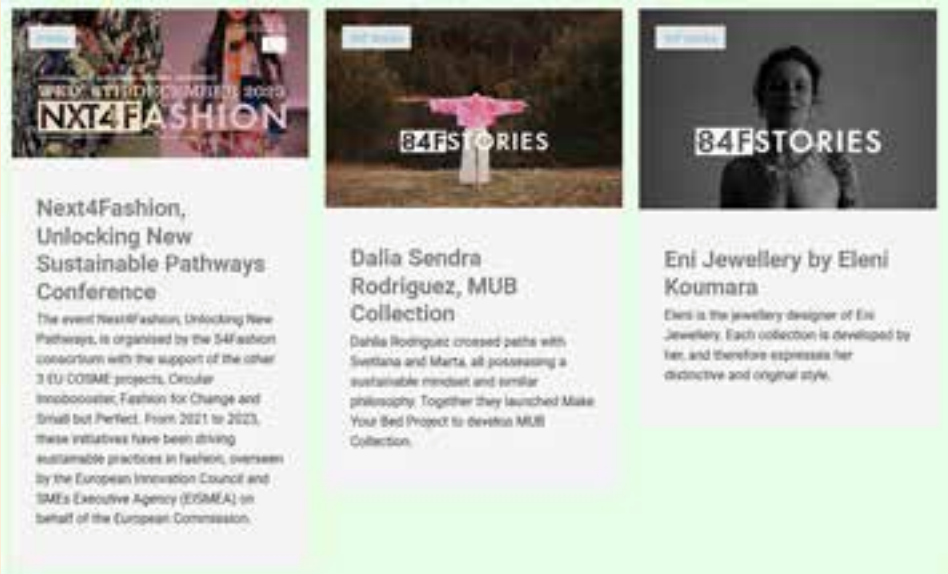
The commitments also include supporting the movement towards circular business models and acknowledging the positive impact this will have towards reducing GHG emissions within the fashion sector.

Source: UNFCCC (n.d.): https://unfccc.int/climate-action/sectoral-engagement-for-climate-action/fashion-charter?gclid=EAIaIQobChMIitnos-eGgwMVLYdQBh2JoARoEAAYASAAEgLQUvD_BwE UNFCCC (2020): https://unfccc.int/sites/default/files/resource/20_REP_UN%20FIC%20Playbook_V7.pdf

S4Fashion

"S4Fashion" is dedicated to empowering SMEs in the fashion industry to adopt sustainable and circular practices. Its goal is to showcase and enhance the most effective and current methods for a more environmentally friendly fashion sector.

Chosen partnerships stand to receive direct funding of up to EUR 15,000 for their innovative projects, accompanied by additional business support services including workshops, mentorship, networking events, and investment forums. The project is backed by an international consortium consisting of the European Creative Hubs Network, Envolve Entrepreneurship, DataScouts, Istituto Europeo di Design, and ZIPHOUSE.



Source: S4F (n.d.): https://s4fashion.eu/

Circular InnoBooster

CircularInnoBooster Fashion and Textile (F&T) is a European Union-funded project under the COSME Programme. Its centerpiece is the innovative Business Support Scheme known as CirCoAX. Over a 2-year period and with a budget of €1,128,000, mostly financed by the European Commission, it aims to revolutionize the fashion and textile industry, steering companies towards sustainability, circularity, and regeneration. Led by the European Institute of Design (IED) in collaboration with Texfor, Circulab, Finnova, and The Circular Project with HumanNation, the project adopts a holistic approach to the circular economy, focusing on environmental, social, and economic aspects.

Partners

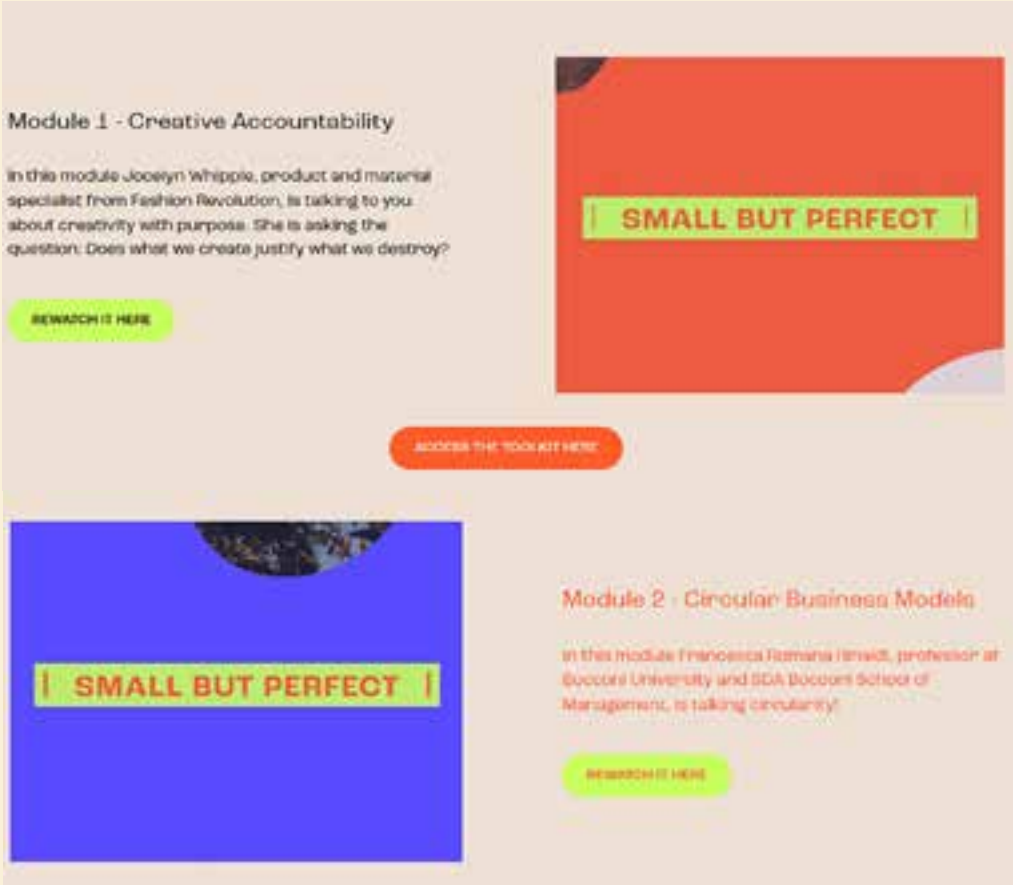
IED, Finnova, Texfor (Confederación Industria Textil), Circulab, The Circular Shop Project, HumanNation

Source: Circular InnoBooster (n.d.): https://circoax.eu/

SMALL BUT PERFECT

Small but perfect

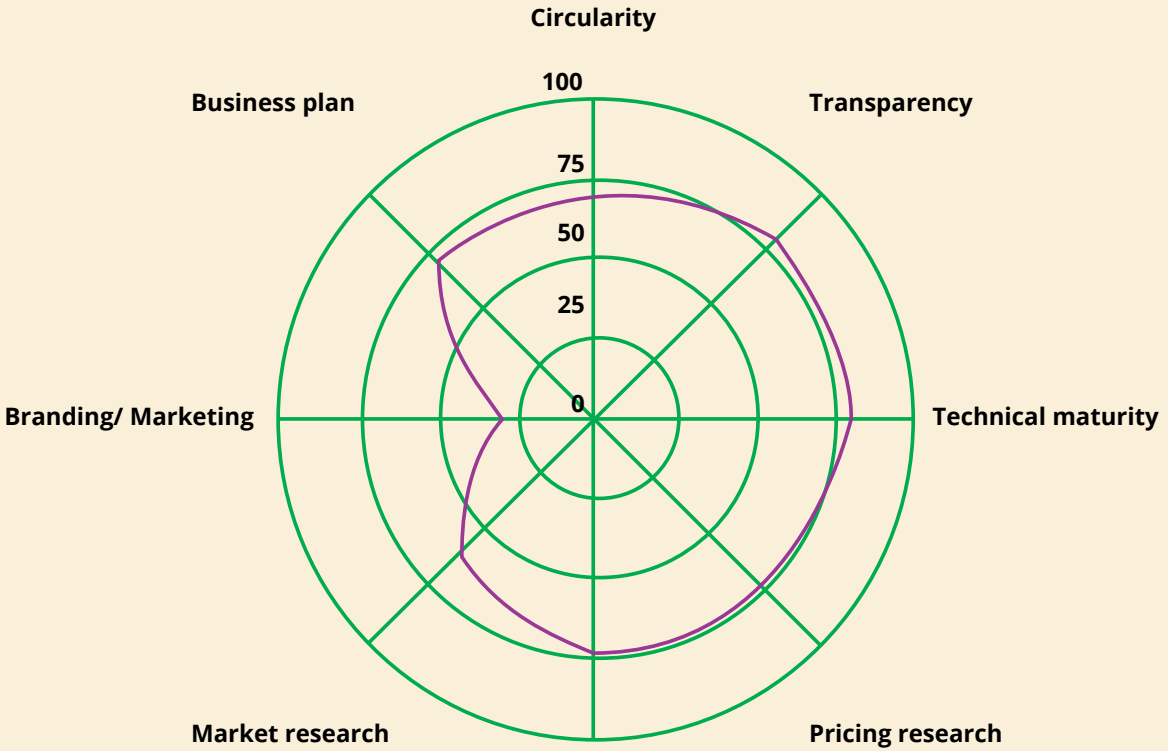
The project “Small but Perfect” operates on the premise that sustainable changes must stem from systemic shifts. It aims to accelerate change within fashion support organizations, fashion councils, industry bodies, and policymaking bodies by integrating circularity, social, and environmental sustainability into their initiatives. Over 30 months, it will build a network among SMEs transitioning towards sustainability and their supporting organizations, fostering knowledge exchange for systemic change. Led by the Athens University of Economics and Business, partnered with organizations like the World Fair Trade Organisation, Bocconi University, and Fashion Revolution, they’ve opened their call for proposals until October 3, 2021.



Source: Small But Perfect (n.d.): https://www.small-but-perfect.com/resources

Fashion for Change

Fashion For Change, a 3-year initiative funded by COSME, the EU's programme for SME competitiveness, aims to boost the competitiveness and sustainability of European fashion SMEs, designers, and startups. It focuses on two key elements: a Knowledge Hub fostering knowledge exchange among sustainable fashion entities, and an Acceleration Programme offering technical and financial support to transition towards circular business models. The project aims to create valuable resources including a map of EU fashion actors, analyses of industry challenges and solutions, methodologies for design hackathons and growth programs, a dissemination plan, policy recommendations, and a management plan. These resources are available on their website, offering insights and tools for stakeholders in the fashion industry.



Source: Fashion for Change (n.d.): https://www.fashionforchange.eu/

Module 04: Needs and Potentials in India

1 Introduction to Circular Economy (CE)

2 CE in the Context of Textiles

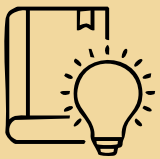
3 CE policies and enablers for textiles

4 Needs and Potentials in the Indian context

5 Policy Prototyping for CE in textiles

6 Best Practice Examples Booklet

7 Repository of Toolkits



Objective: This chapter will start of with **facts and figures about the textile industry in India**, followed by the outlining of **national policies, strategies and action plans** in regards to waste management. The module ends with an **exercise of analyzing and identifying gaps and needs** in the Indian regulatory framework.

Module 04: 4.1 Facts and Figures about the Indian Textile Sector

- India is the second-largest producer and exporter of textiles and garments.
- Projections suggest that India's textiles and apparel market will continue growing in the coming years.
- One of India's main products is cotton, making India the largest producer of cotton in the world.
- Cotton production in India is projected to reach 7.2 million tonnes by 2030, driven by increasing demand from consumers.
- India's textile and apparel exports (including handicrafts) stood at US$ 44.4 billion in FY22, a 41% increase year over year. Exports of ready made garments including cotton accessories stood at US$ 6.19 billion in FY22.
- India enjoys a comparative advantage in terms of skilled manpower and in cost of production, relative to major textile producers.

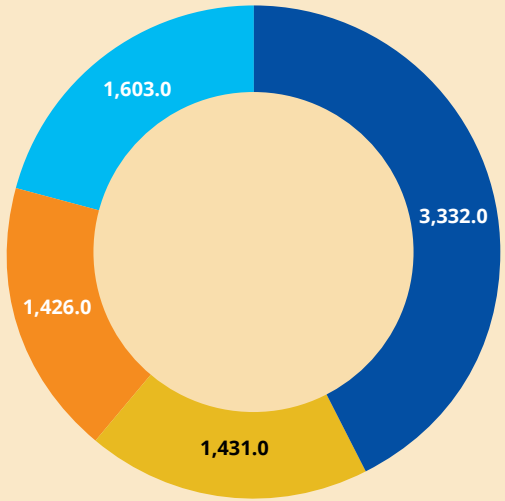
Key Facts as of FY20

Contributes 2% to India's GDP

Employs over 45 million people

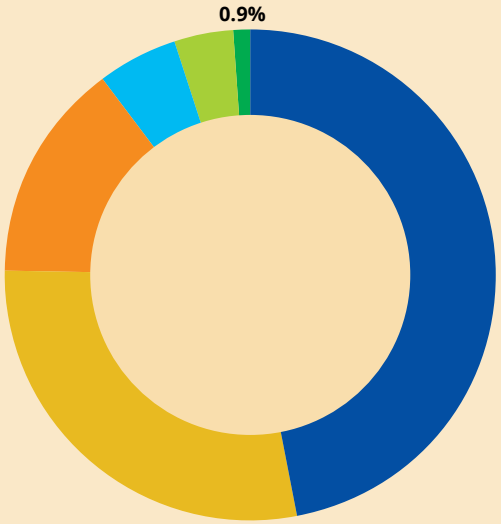
Contributes 12% to India's export earnings

Fabric Production in FY20* (million square metre)



Note*-until January 2023

Share of India's textile exports (Between April-January 2022-23)



Source: IBEF (2023): https://www.ibef.org/industry/textiles

Module 04: 4.1 Facts and Figures about the Indian Textile Sector

- In June 2022, it was stated by the Minister of Textiles, Commerce and Industry, Consumer Affairs & Food and Public Distribution that the Indian government wants to establish 75 textile hubs in the country.
- Production-linked Incentive (PLI) Scheme is in place for man-made fibre and technical textiles over a five-year period.
- In June 2023, Government has approved R&D projects worth US$ 7.4 million in textile sector.
- Huge funds in schemes such as US$ 109.99 million for Amended Technology Upgradation Fund Scheme (ATUFS) have been released by the Government in the union budget of 2023-24 to encourage more private equity investments and provide employment.

Source: IBEF (2023): https://www.ibef.org/industry/textiles; Picvisa (2023): https://picvisa.com/en/waste-management-industrial-post-industrial-waste/

Module 04: 4.1 Facts and Figures about the Indian Textile Sector

Important challenges faced by the Indian Textile industry

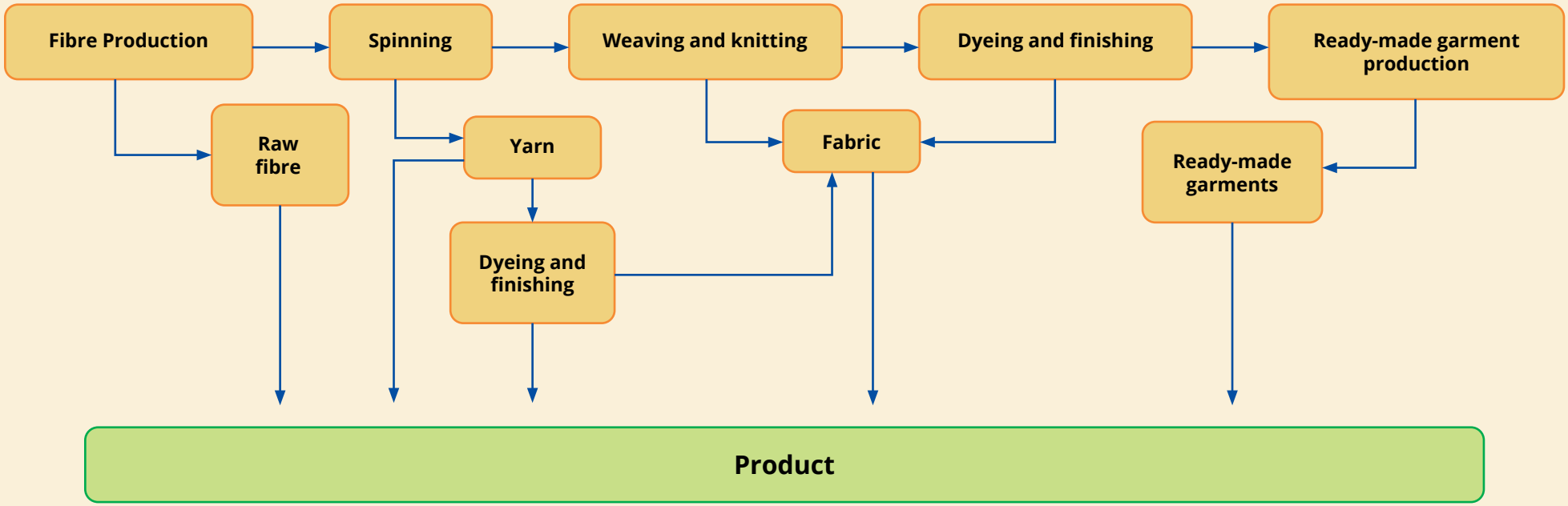
- Highly fragmented industry
- Lack of Technological advancement
- Lack of product diversification in alignment with the global demand
- Lack of price competitiveness
- High competition form other Emerging Markets
- Infrastucture Bottlenecks
- Differential Taxation System

Source: CRB (2022): https://c4rb.org/wp-content/uploads/2022/04/Circular_Apparel_Status_Paper_140422.pdf/

Module 04: 4.1 Facts and Figures about the Indian Textile Sector

Textile Production in India

- India is one of the few countries in the world to have all the components of the textile manufacturing value chain, from fiber production to ready-made garments.
- The different stages of textile manufacturing include fiber production, spinning, weaving and knitting, dyeing and finishing, and ready-made garment production.



Source: SEI (2023): https://www.sei.org/wp-content/uploads/2023/05/sustainable-garment-manufacturing-india-sei2023.033.pdf

Module 04: 4.1 Facts and Figures about the Indian Textile Sector

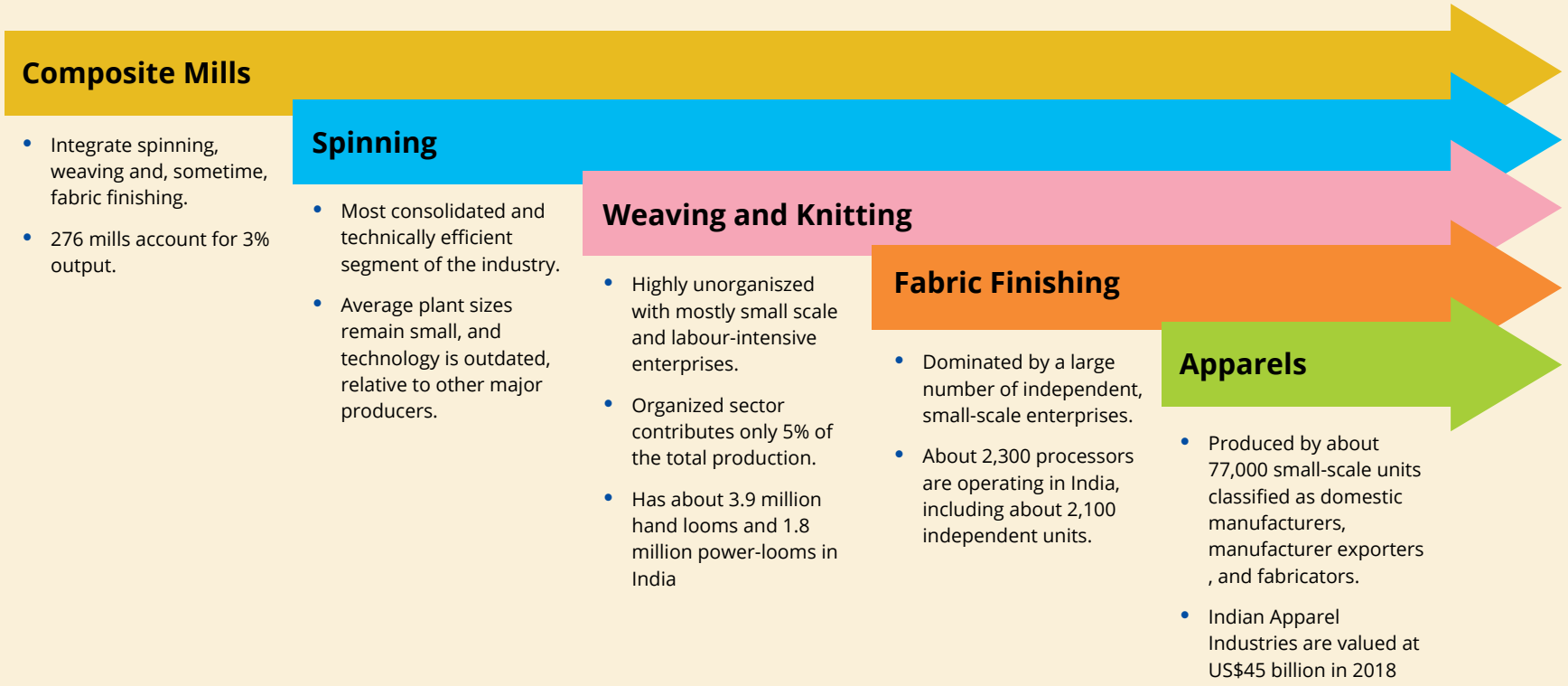
Textile Production in India - Example of Ludhiana Cluster

- **Fibre production:** The total production of textile fiber in India in 2021 was 2.4 million tons, cotton being the most widely produced one. Man-made cellulosic fibers have also been adopted in the industry.
- **Spinning:** As of 2022, India has about 3400 textile mills with a capacity which is the second largest spinning capacity in the world.
- **Weaving and knitting:** The production has gradually shifted to power looms over the years. In 2022, about 58% of cloth production is done using power looms.
- **Dyeing and finishing:** Most of the finishing processes in India are done independently or as a part of a compost mill that uses automated large bath or continuous processing at the rate of about 20,000 m of cloth per day.
- **Ready-made garment production:** This involves cutting, shaping and stitching the garments to create the final ready-made garment. About 45 million people are employed by India's ready-made garment industry, which makes it the largest employment provider for all the sectors. As of 2016, India has eight major manufacturing clusters for ready-made garment production: Gujarat, Maharashtra, the National Capital Region (NCR), Uttar Pradesh, West Bengal, Tamil Nadu, Madhya Pradesh and Rajasthan. Cotton garments currently lead in market share, at 65% (Kalhan, 2008).

Source: SEI (2023): https://www.sei.org/wp-content/uploads/2023/05/sustainable-garment-manufacturing-india-sei2023.033.pdf

Module 04: 4.1 Facts and Figures about the Indian Textile Sector

Textile Production in India



Source: UNIDO (2023): https://hub.unido.org/sites/default/files/publications/Textiles%20SSI%20Report.pdf#page=43&zoom=100,93,609

Module 04: 4.1 Facts and Figures about the Indian Textile Sector

Textile Production in India - Example of Ludhiana Cluster

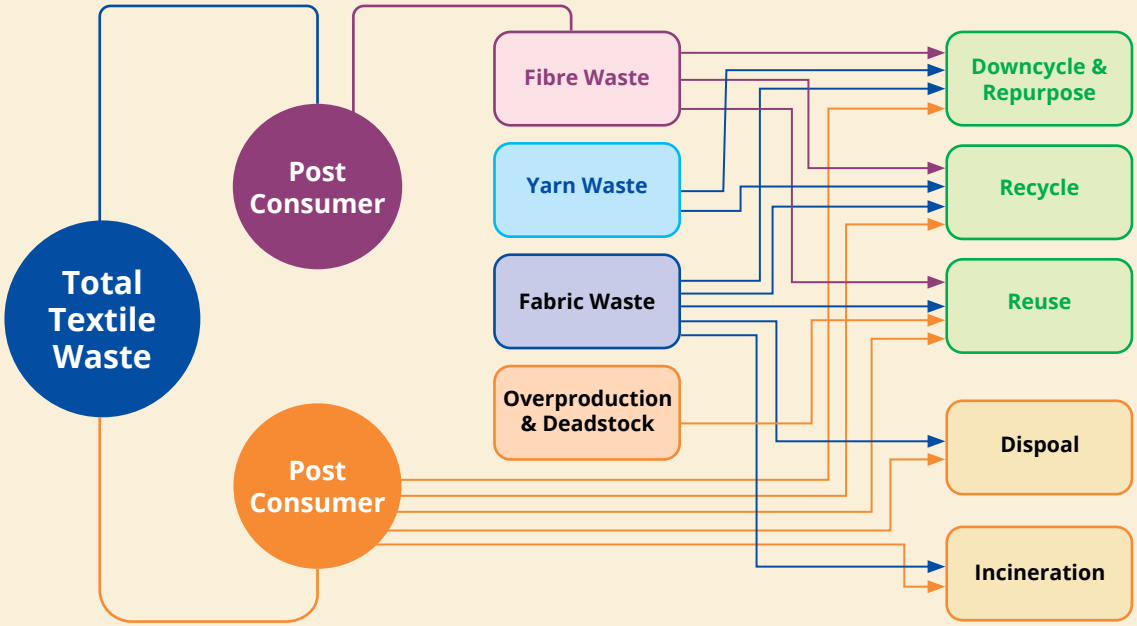
- BCI cotton as well as recycled fiber and yarn is used in accordance with the requirements of the buyers. Price of recycled and virgin yarns are the same.
- Organic and certified chemicals are used in a few units as required by buyers. Organic chemicals are available in the market although at a higher cost.
- Dyeing units are incurring higher costs/ more consumption of dyes due to the zero tolerance to color deviation of the brands.
- Water consumption is high and there is heavy reliance on ground water for operations.
- Flow meters to ensure optimum use of water in machines are not widely used.
- There is potential to use recycled water for processes.
- Major energy source is grid electricity. There is interest in installation of solar energy units but support is required for investments.

Consists of mainly dyeing, spinning, knitting, printing and finishing units.

Source: Outcomes and Findings of the EU-REI Enabling Indian SMEs for Sustainable and Circular Textiles Project

Module 04: 4.1 Facts and Figures about the Indian Textile Sector

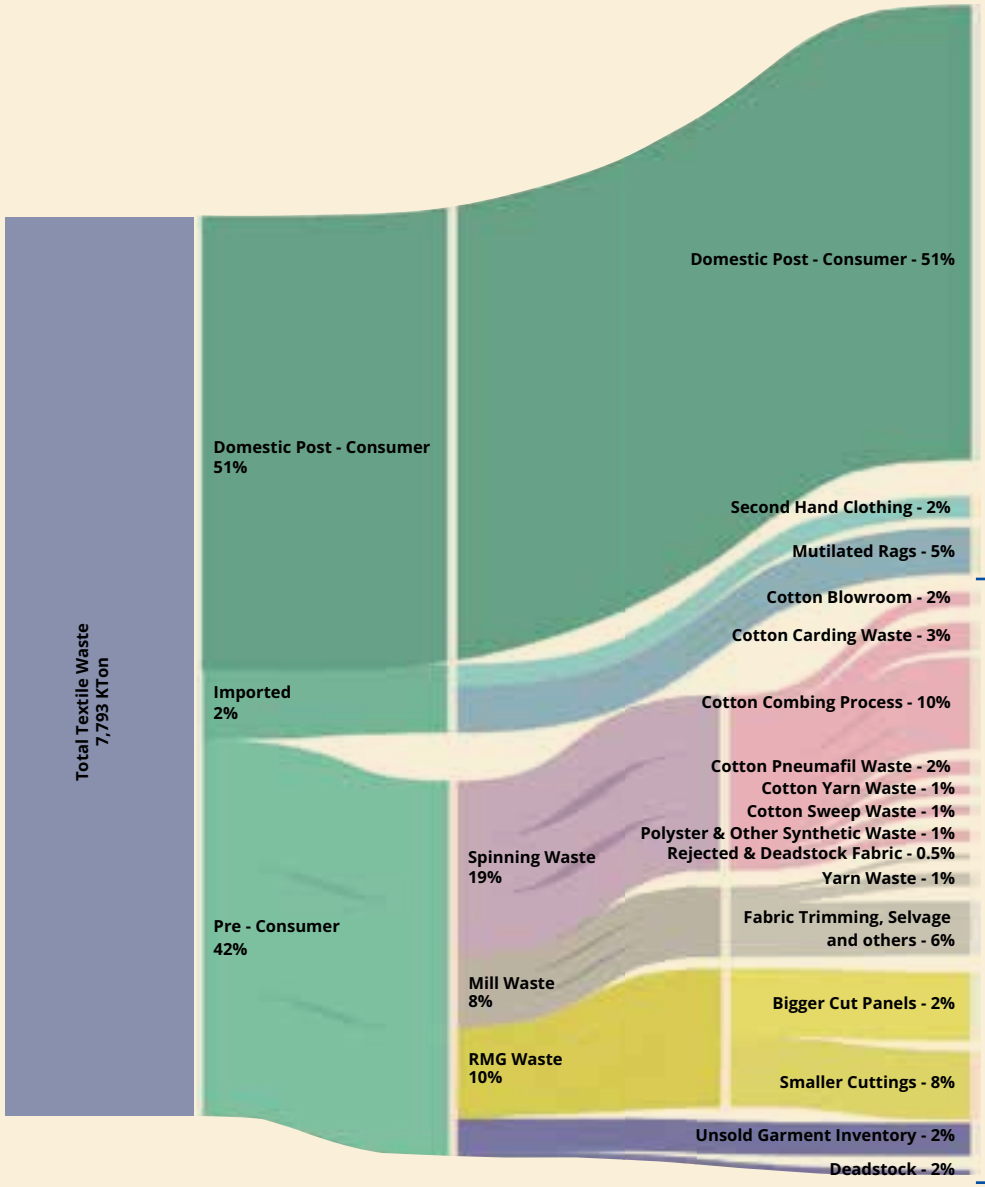
- Studies have shown that wet processing units, the most water- and energy-intensive processes following fabric production, contribute to high resource consumption and low process efficiencies.
- Neither a national quality benchmarking system nor data were found for variables such as the quantity and quality of chemicals and auxiliaries used, water consumption per kg of fabric, etc.
- Typically, cutting waste is sold as “mixed waste” and is divided hierarchically at its source into small, medium, and large pieces.
- In apparel industries, cutting waste is collected from production facilities and transported to India’s main recycling and downcycling plants that manufacture recycled fibre.
- Small-cut waste is shredded into fibres and blended with virgin fibres to produce recycled clothing. Pre- and post-consumer wastes are not sorted or pre- processed, resulting in higher virgin resource demand.
- Circularity is still in early stages of development. Lack of infrastructure and technology are two major challenges limiting the progression of circularity. Consumer awareness and linear habits are also posing threads to circular innovation.



Source: FashionForGood (2022): https://citiindia.org/pdf-uploads/resources/Sorting-for-Circularity-Wealth-in-Waste.pdf

Module 04: 4.1 Facts and Figures about the Indian Textile Sector

Textile Wastes



Cotton solids, natural and man-made fibre blends, and printed textiles constitute a major portion of total waste generated in the process.

Note:

1. The values represented above are measured in KiloTon (KTon)
2. Base value for % is total waste (7793ktons)
3. All The figures have been rounded off to the nearest whole number

Source: FashionForGood (2022): https://citiindia.org/pdf-uploads/resources/Sorting-for-Circularity-Wealth-in-Waste.pdf

Illustration 10: Total quantity of textile waste in India and quantities by waste steams and types

Module 04: 4.1 Facts and Figures about the Indian Textile Sector

Textile Wastes

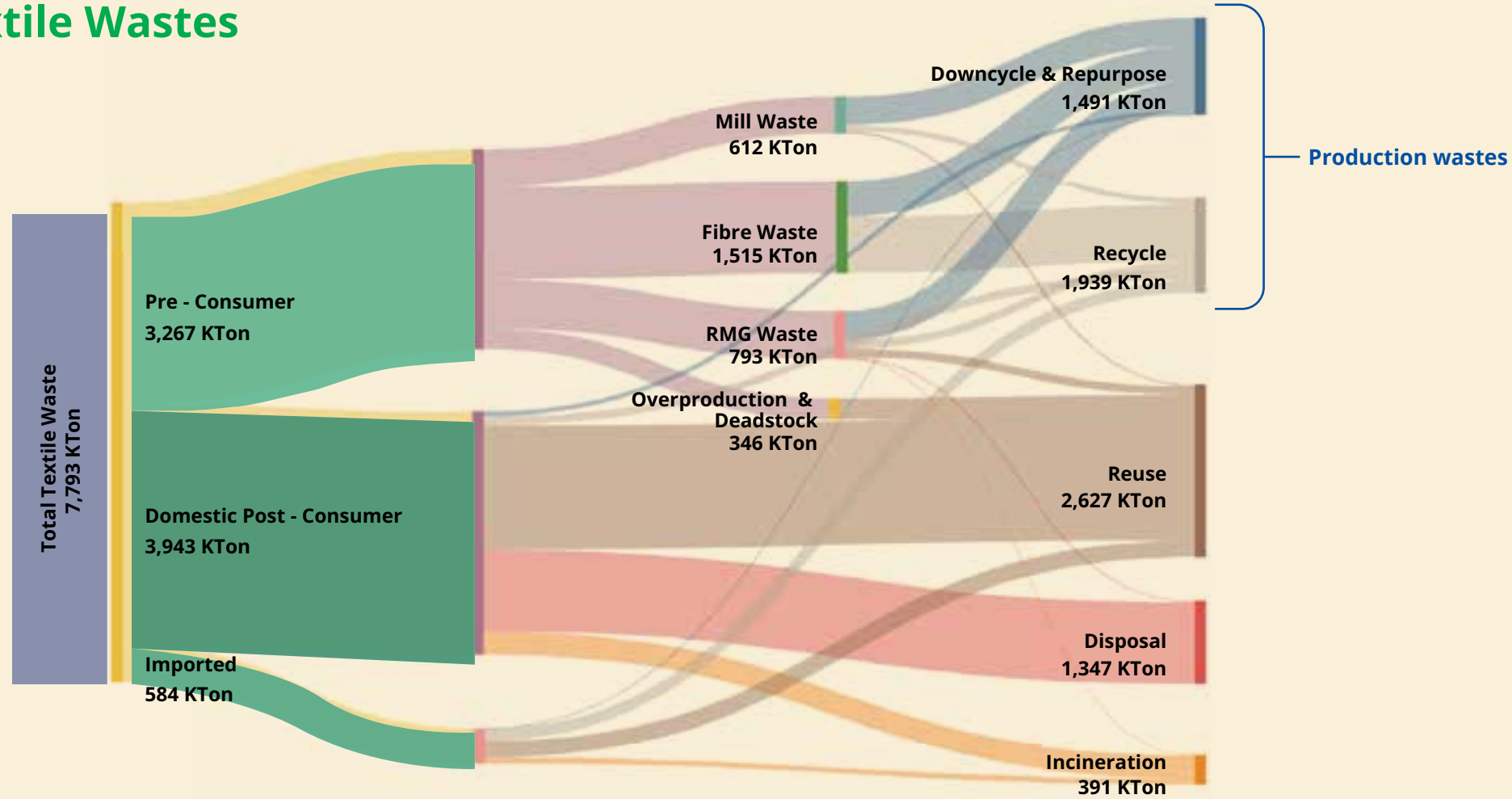


Illustration 10: End-use of textile waste in India

Source: Fashion For Good (2022): https://citiindia.org/pdf-uploads/resources/Sorting-for-Circularity-Wealth-in-Waste.pdf

Module 04: 4.2 Sustainability and Circularity Efforts

Background Information

- BCI cA large part of textile sector-specific policy development has occurred in the past decade.
- Indian Government has been focusing on the integration of sustainability in order to diminish its adverse environmental impacts and to comply with the related guidelines.
- The focus has been mainly on increasing the value of local products, reducing waste and other environmental impacts created by both **production and consumption**.
- The government also launched Project SU.RE. – Sustainable Resolution in 2019. It is a commitment by India's apparel industry to establish a sustainable pathway for the fashion industry. This project has supported the sector achieve Sustainable Development Goals (SDGs) and long- term environmental, social, and corporate governance goals.

Source: SEI (2023): https://www.sei.org/wp-content/uploads/2023/05/sustainable-garment-manufacturing-india-sei2023.033.pdf
InvestIndia (2021): https://www.investindia.gov.in/siru/india-goes-green-textile-industry#:~:text=They%20are%20committing%20to%20plastic,Equity%2C%20Environment%2C%20and%20Economics.

Module 04: 4.2 Sustainability and Circularity Efforts

Background Information

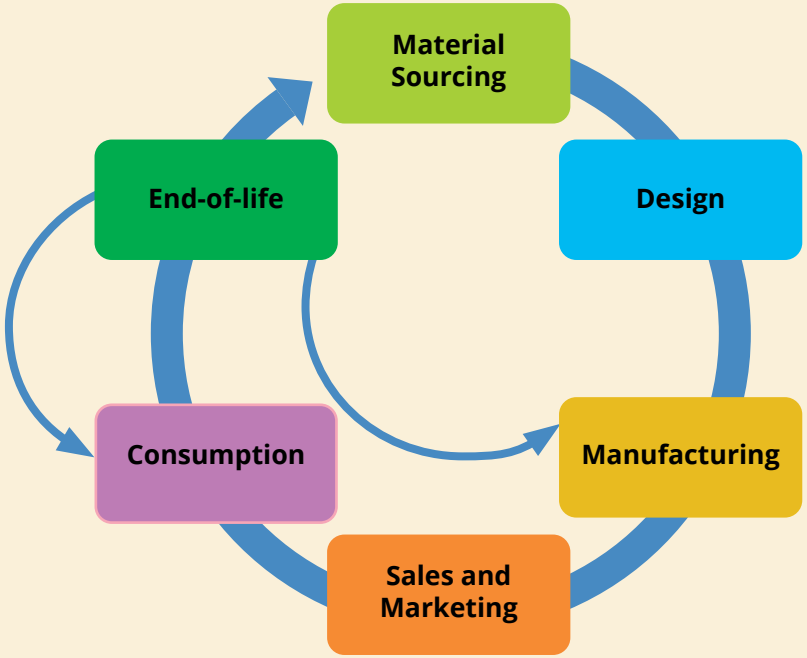
- Some companies are also setting sustainability and circularity in their value chain, sourcing raw supplies, production, supply chain, and waste recycling.
- To remodel from linear to circular operations, they are concentrating both on pre-and post-consumer waste.
- Research and academics are helping to foster circular textile technologies, discovering new textile materials, and guiding the next generation of textile professionals.
- Besides innovation programs and centers, educational workforce development programs, including certificate and diploma programs on fundamentals of sustainability, fashion sustainability, ESG, circularity, etc. are being put into practice.

Source: SEI (2023): https://www.sei.org/wp-content/uploads/2023/05/sustainable-garment-manufacturing-india-sei2023.033.pdf
GIZ (2023): https://www.ceeindia.org/pdf_files/Baseline%20Assessment%20Report%20(Digital%20Version).pdf
InvestIndia (2021): https://www.investindia.gov.in/siru/india-goes-green-textile-industry#:~:text=They%20are%20committing%20to%20plastic,Equity%2C%20Environment%2C%20and%20Economics.

Module 04: 4.2 Sustainability and Circularity Efforts

- Initiatives have been taken to focus on input materials and generate a sustainable ecosystem from farm to fabric by adopting the **Regenerative Organic Farming** practice.
- Companies are committing to plastic recycling for packaging as they are substituting virgin polyester with recycled LDPE. Disposed PET bottles are turned into flakes that are finely turned into a thread in several deniers and cut for spinning into yarn.
- Innovation Center for Natural Fiber.

- The industry is also seeing the creation of eco-friendly textiles to process waste material into a fiber.
- NGOs, brands and charitable organizations collect post-consumer wastes via donation campaigns and take-back programs.



- Fashion Innovation and Sustainable Design for Circularity (Postgraduate Diploma Program developed by NIFT in collaboration with UNEP)

- Buyer demands have started to influence Indian companies to raise production and product standards towards a more sustainable way.
- Significant acitivity in rental of clothing (although limited to luxury wear)

- Government schemes, such as Mega Investment Textiles Park (MITRA) and the Production Linked Incentive (PLI) Scheme enable the financial affordable adaptation to sustainable manufacturing practices in clusters, on a larger scale.
- Both solar energy and biomass usage have been applied to green the power mix.

Source: SEI (2023): https://www.sei.org/wp-content/uploads/2023/05/sustainable-garment-manufacturing-india-sei2023.033.pdf
GIZ (2023): https://www.ceeindia.org/pdf_files/Baseline%20Assessment%20Report%20(Digital%20Version).pdf InvestIndia (2021): https://www.investindia.gov.in/siru/india-goes-green-textile-industry#:~:text=They%20are%20committing%20to%20plastic,Equity%2C%20Environment%2C%20and%20Economics.

State of circular innovations along the value chain

Sourcing

- Natural and regenerative fibres as key focus are of innovation in India (but still at early stages).
- Biosynthetics relatively unexplored (rather emerging as new are of raw material innovation) fundamentals of sustainability, fashion sustainability, ESG, circularity, etc. are being put into practice.

Manufacturing

- Innovations to reduce water usage and priority on green chemistry
- More frequent use of natural dyes and pigments
- Increasing focus on digital printing as sustainable alternative to traditional water-heavy dyeing processes
- Cut-make-trim and other innovative technologies such as zero-waste manufacturing and additive manufacturing are still emerging
- To date, focus on mass customisation such as digital design and e-commerce solutions.

Source: FashionForGood (2020): https://www.oneplanetnetwork.org/sites/default/files/from-crm/20201019_State-of-Circular-Innovations-in-the-Indian-Fashion-and-Textile-Industries-Final.pdf

State of circular innovations along the value chain

Retail and Use

- New circular business models like rental, rework, repair and re-commerce focused on extending the lifespan of clothes emerging
- Significant acitivity in rental of clothing (although limited to luxury wear)
- Digital solutions (virtual reality and augmented reality), increasing efficiencies and customer experience, emerging

End-of-Life

- Dominated by mechanical recycling
- Chemical recycling and automated sorting technologies still not very developed
- Mature innovations in area of non-textile to textile recycling (PET into polyester fibres)
- 59% of textile waste in India finds way back into textile industry through reuse and recycling (only fraction of this used in high-end global supply chains due to quality and visibility challenges)
- 19% is downcycled, 5% is incinerated and 17% ends up in a landfill

Source: FashionForGood (2020): https://www.oneplanetnetwork.org/sites/default/files/from-crm/20201019_State-of-Circular-Innovations-in-the-Indian-Fashion-and-Textile-Industries-Final.pdf; FashionForGood (2022): https://citiindia.org/pdf-uploads/resources/Sorting-for-Circularity-Wealth-in-Waste.pdf

Technological trends in the Indian textile sector

Raw Materials

India as one of the largest producers and exporters of cotton yarn. With challenges like water scarcity sustainable fibre alternative (hemp, agricultural waste and banana fibre) provide exciting solutions for the textile industry: Nanotechnology for more energy-efficiency, water resistancy and low- maintenance in sourcing and production

Wet and dry processing

- Focus on innovation landscape to reduce and eliminate the need for water in wet processing. Role of 3D design and printing is growing, but still in a developmental stage in India. Other focus areas for processing are plasma, ultrasonic and foam, spray and supercritical CO2 dyeing as well as cationic and enzymatic pre-treatment and finishes.

- Plant based dyes and pifments as well as microbial pigments as alternatives

Cut-Make-Trim

Innovative technologies for zero-waste manufacturing and additive manufacturing exist but are yet to find mass adoption. Examples of additive manufacturing are flocking, spraying, 3D printing and 3D knitting. Also the use of Big Data and AI as a means to embark on zero-waste manufacturing are gaining attention in India but are still at very early stages.

Source: Fogla (2022): How Is Technology and Innovation Helping The Indian Textile Industry? (jumaccans.com)
Citiindia (2021): https://citiindia.org/img-uploads/2021/Textile-Times-Nov-Dec-2021.pdf;
Pells (2023): From forests to catwalks - How Nordic countries became a hub for a new textile revolution? | UPM.COM FashionForGood (2022): https://citiindia.org/pdf-uploads/resources/Sorting-for-Circularity-Wealth-in-Waste.pdf

Technological trends in the Indian textile sector

Retails and use

Use if augmented and virtual reality by retailers to improve online shopping experiences (3D Tyron technology to try on products virtually), still a niche, but the sector is growing slowly; Digitization to make production cycle more transparent and traceable

End-of-use

Automated sorting technology can enhance the speed and scale of recycling, but also here it would have an impact on local employment and should go hand in hand with upskilling and training interventions, chemical recycling technologies could use existing mechanical recycling supply chains for reaching faster implementation.

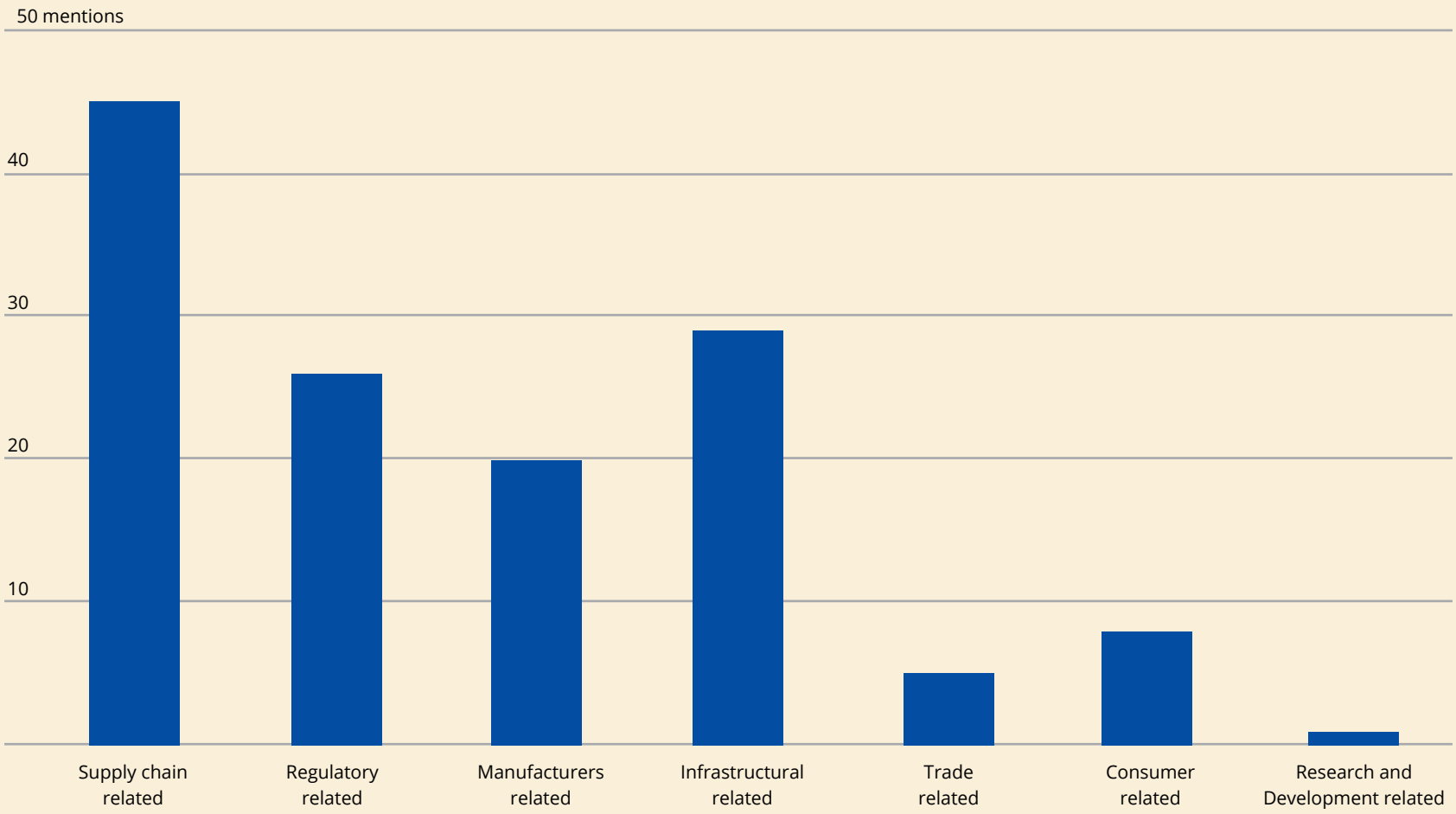
Source: Jumac (2022): How Is Technology and Innovation Helping The Indian Textile Industry? (jumaccans.com)
Citiindia (2021): https://citiindia.org/img-uploads/2021/Textile-Times-Nov-Dec-2021.pdf;
Pells (2023): From forests to catwalks - How Nordic countries became a hub for a new textile revolution? | UPM.COM
FashionForGood (2022): https://citiindia.org/pdf-uploads/resources/Sorting-for-Circularity-Wealth-in-Waste.pdf

Technological trends – way forwards

- Investments and testbeds are required to improve processing technology for alternative low- footprint natural fibres, such as the spinnability and compatibility with the current equipment & infrastructure.
- A significant part of the industry is unorganised, with several small dye houses that are unable or
- Unwilling to invest in sustainable solutions. Larger players' adoption would hopefully bring in economies of scale and trickle down this effect to India's unorganised sector.
- Sludge treatment and water purification needs to go hand in hand with replacing chemical- based dyes, ensuring that where the industry does not change its input, its output is reduced in toxicity. Policy intervention alongside innovation would enable this.
- Additive manufacturing and 3D printing are a huge opportunity in India especially in footwear and garments, an infusion of funding and large scale adoption can help bring economies of scale in these processes. At the same time garment workers should be upskilled so that they are not adversely affected by growing automation.

Source: Jumac (2022): How Is Technology and Innovation Helping The Indian Textile Industry? (jumaccans.com)
Citiindia (2021): https://citiindia.org/img-uploads/2021/Textile-Times-Nov-Dec-2021.pdf;
Pells (2023): From forests to catwalks - How Nordic countries became a hub for a new textile revolution? | UPM.COM
Fashion For Good (2022): https://citiindia.org/pdf-uploads/resources/Sorting-for-Circularity-Wealth-in-Waste.pdf

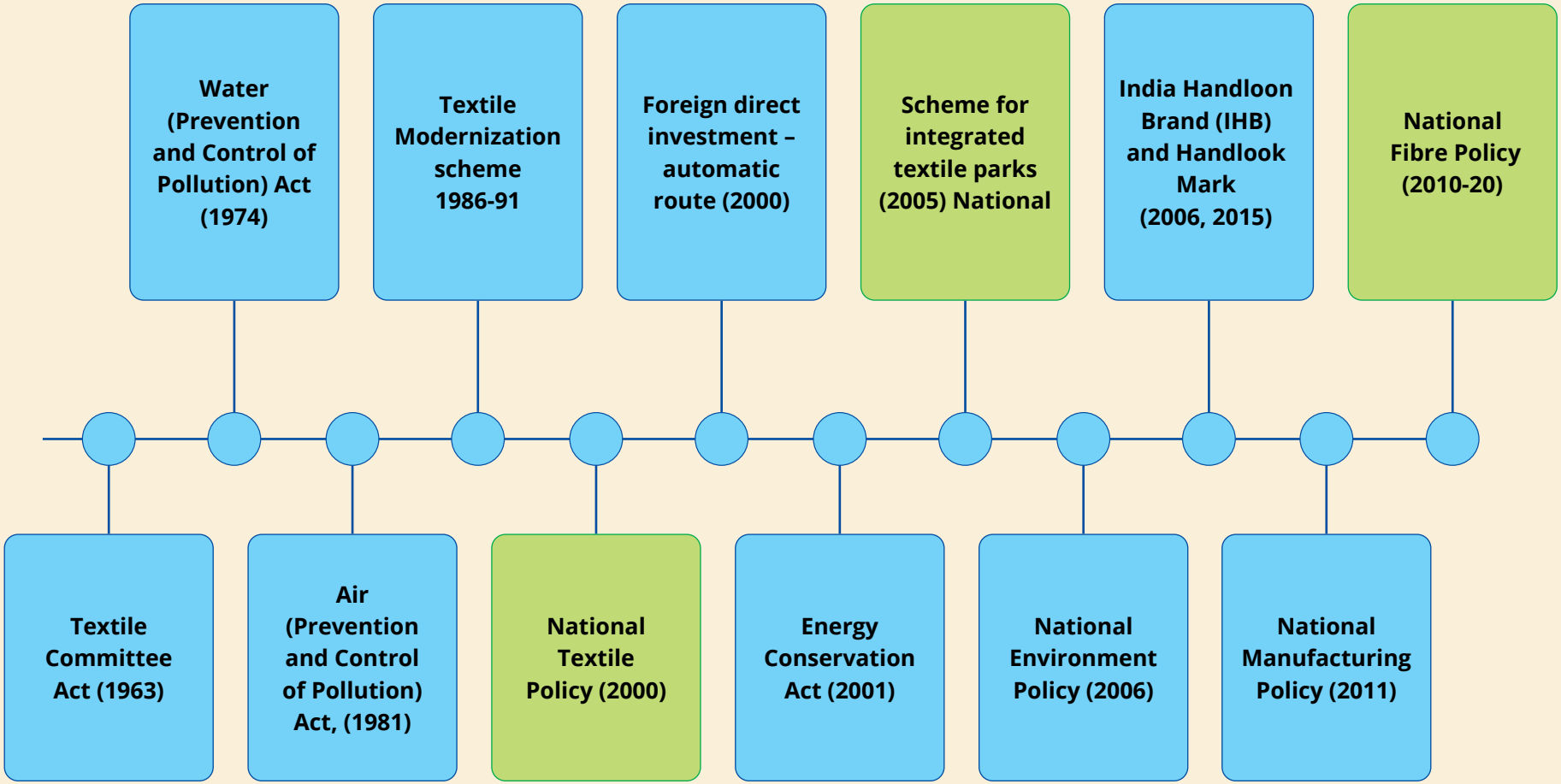
Challenges Identified



Source: SEI (2023): https://www.sei.org/wp-content/uploads/2023/05/sustainable-garment-manufacturing-india-sei2023.033.pdf

4.3 National Policies, Strategies, Action Plans

Most relevant policies and programs for the Indian Textile Industry (1963 – 2011)



Module 04: 4.3 National Policies, Strategies, Action Plans

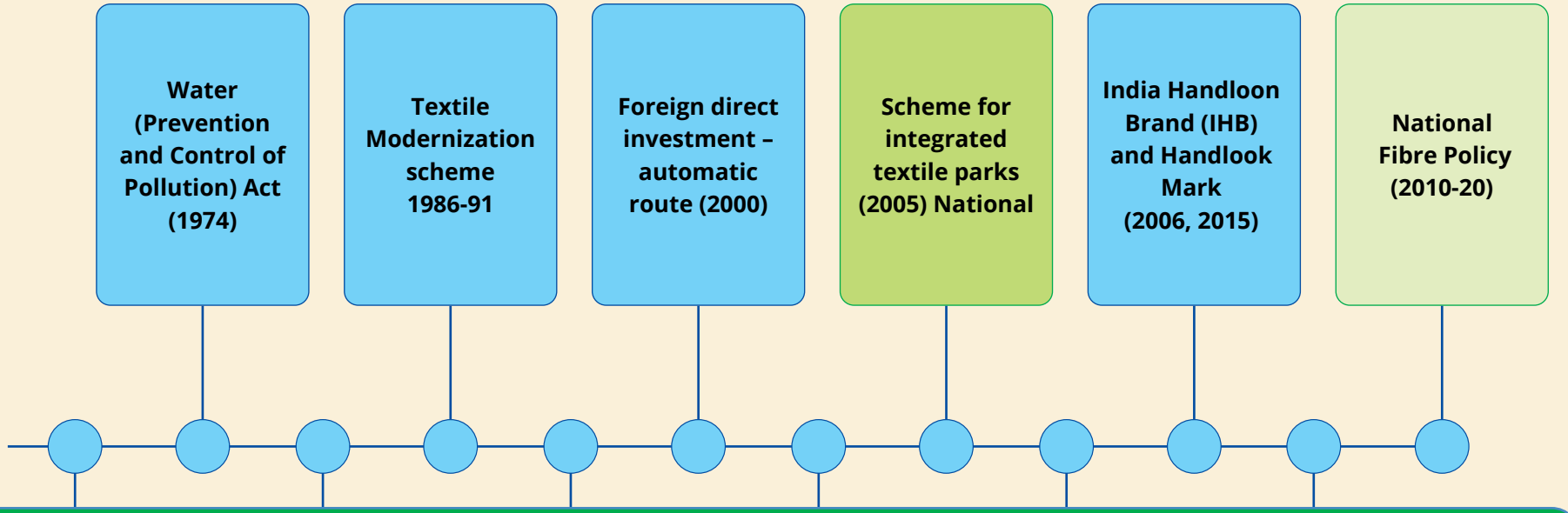
Most relevant policies and programs for the Indian Textile Industry (1963 – 2011)

The National Textile Policy 2000 aimed to propel the industry forward by adapting to global changes, aiming for high-quality production at competitive prices, fostering employment, and contributing to the nation's economic growth. It strived to preserve traditional weaving skills while promoting advancements in manufacturing aligned with environmental standards. This policy sought collaboration among various stakeholders, including state governments, financial institutions, entrepreneurs, farmers, and NGOs, to achieve its goals.

- **Textile Committee Act (1963)**
- **Air (Prevention and Control of Pollution) Act, (1981)**
- **National Textile Policy (2000)**
- **Energy Conservation Act (2001)**
- **National Environment Policy (2006)**
- **National Manufacturing Policy (2011)**

Module 04: 4.3 National Policies, Strategies, Action Plans

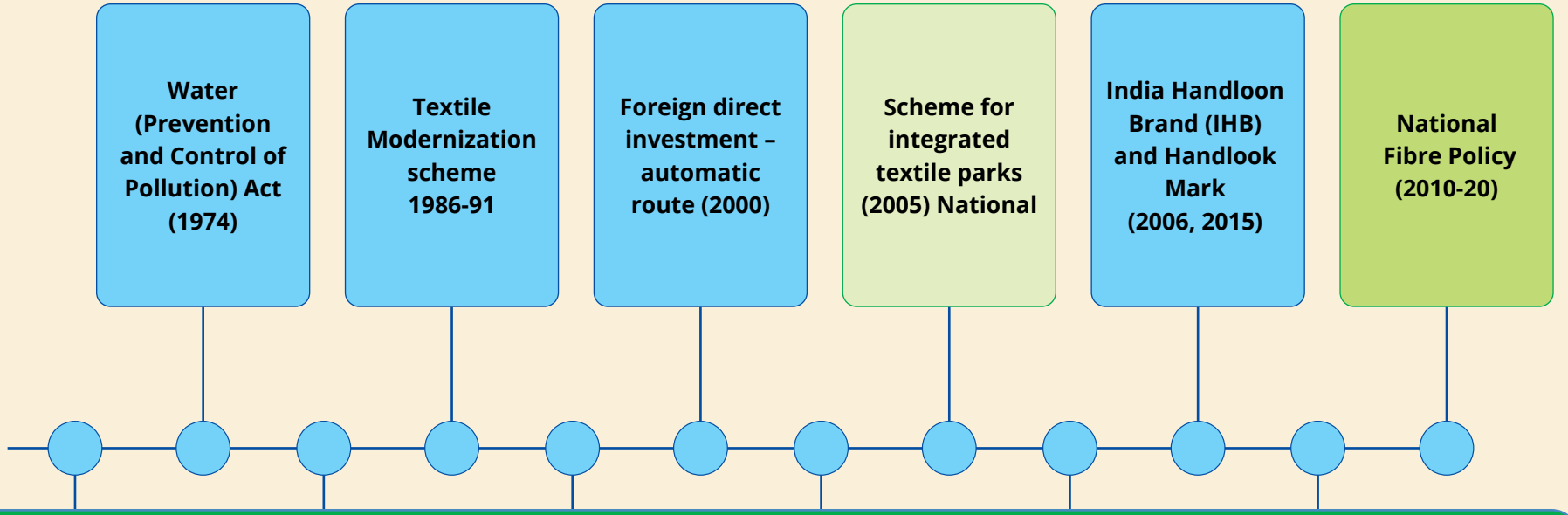
Most relevant policies and programs for the Indian Textile Industry (1963 – 2011)



The Scheme for Integrated Textile Parks (SITP) initiated in the 11th Five Year Plan aimed to resolve infrastructure limitations in the Indian textile industry by creating top-tier textile parks, encouraging compliance with global environmental and social standards. The scheme, continuing in the 11th Plan, targeted strategic growth centers, facilitating investment, employment generation, and increased textile production through the approval of ten Textiles Park projects initially. Detailed guidelines and assistance, available on the Ministry of Textiles' website, emphasized the scheme's focus on infrastructure, professional agency engagement for project execution, and flexible components tailored to local needs within each Integrated Textile Park.

Module 04: 4.3 National Policies, Strategies, Action Plans

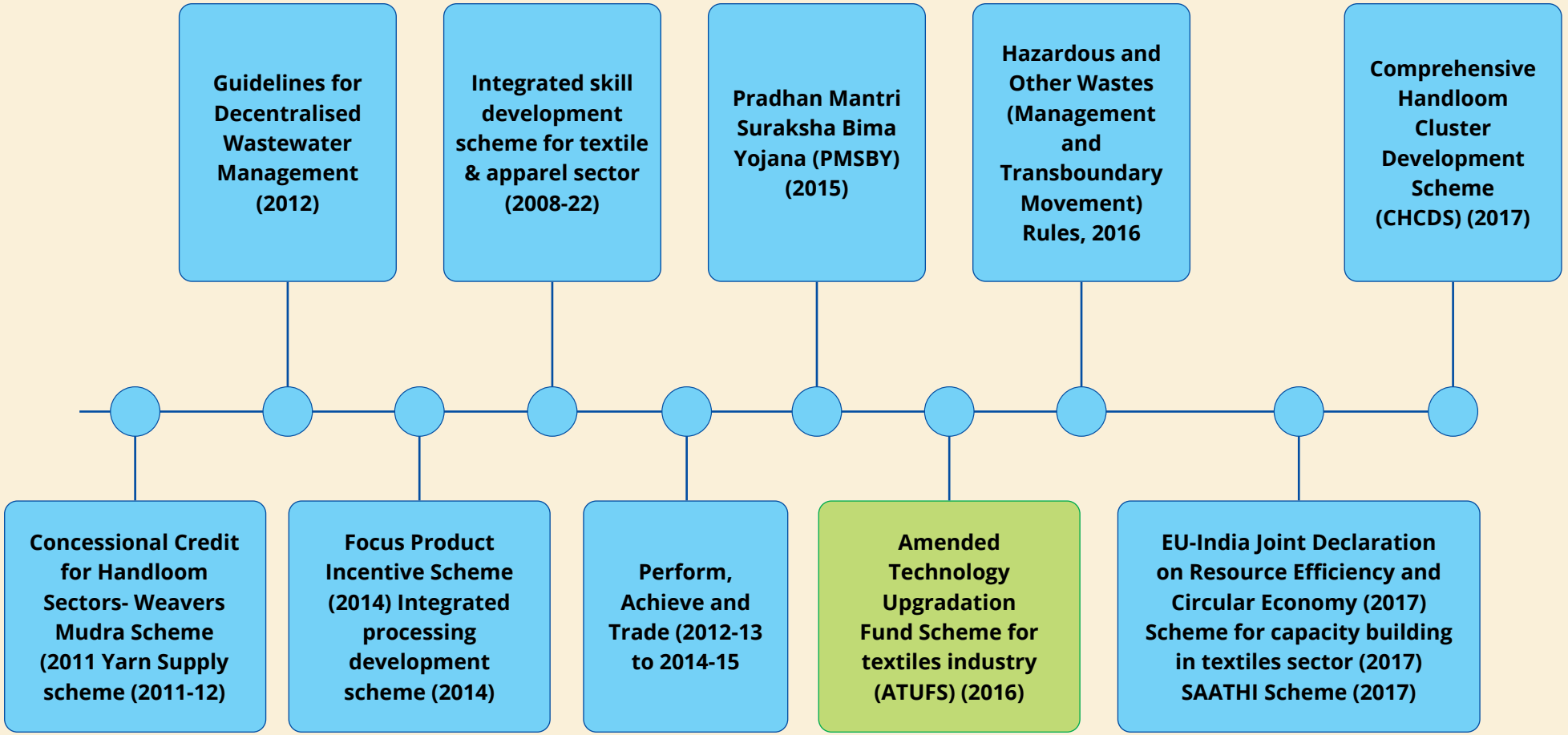
Most relevant policies and programs for the Indian Textile Industry (1963 – 2011)



The National Fibre Policy 2010-20, designed by India's Ministry of Textiles, aimed to fortify the country's fibre economy and enhance competitiveness in the textile industry. It focused on equitable promotion of all fibers, technological upgrades, and institutional support to foster growth while addressing infrastructure challenges and human capital development. To execute the policy's measures, a substantial budget of INR 32,000 crore was allocated under the Technology Upgradation Fund Scheme, incorporating fiscal (duty structure rationalization) and non-fiscal (market development, R&D support) measures. Despite these efforts, challenges such as global competitiveness, limited market players, anti-dumping duties, and tax discrepancies persisted in the fiber industry.

Module 04: 4.3 National Policies, Strategies, Action Plans

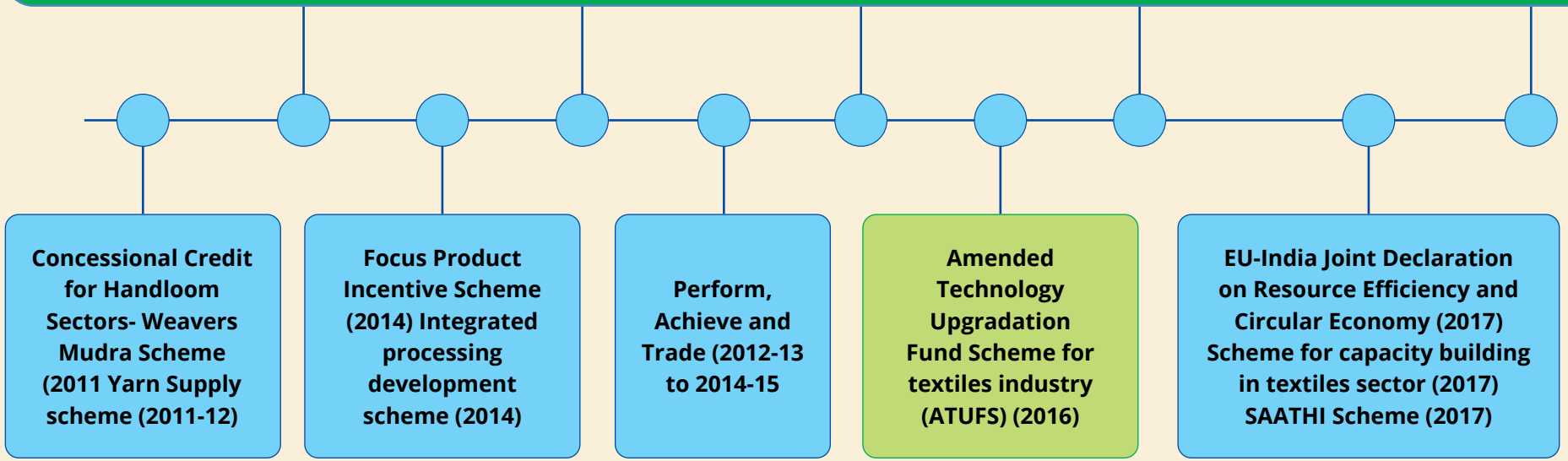
Most relevant policies and programs for the Indian Textile Industry (2011 – 2017)



4.3 National Policies, Strategies, Action Plans

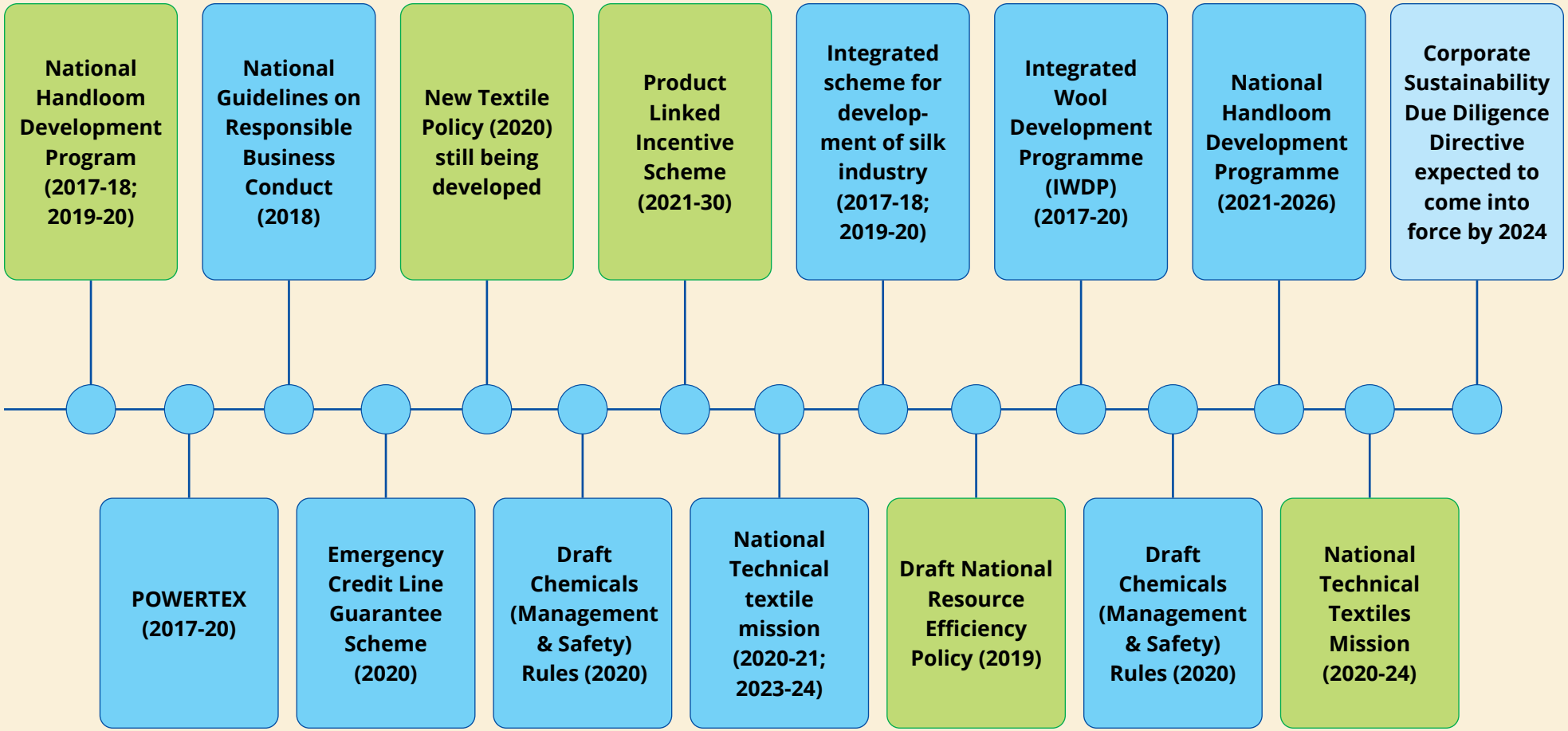
Most relevant policies and programs for the Indian Textile Industry (2011 – 2017)

The Ministry of Textiles introduced the Amended Technology Upgradation Fund Scheme (ATUFS 2016-22) aligning with initiatives like “Make in India” and “Zero Defect and Zero Effect.” It aimed to offer capital subsidies for technology-intensive segments in textiles, promoting exports and reducing imports. Notably, it excluded the spinning sector. To address this, a new scheme was proposed to replace ATUFS, incentivizing machinery manufacturers. While these schemes facilitated modernization and expansion, delays in fund disbursement emerged as a significant challenge, prompting the need for improvements in implementation timelines.



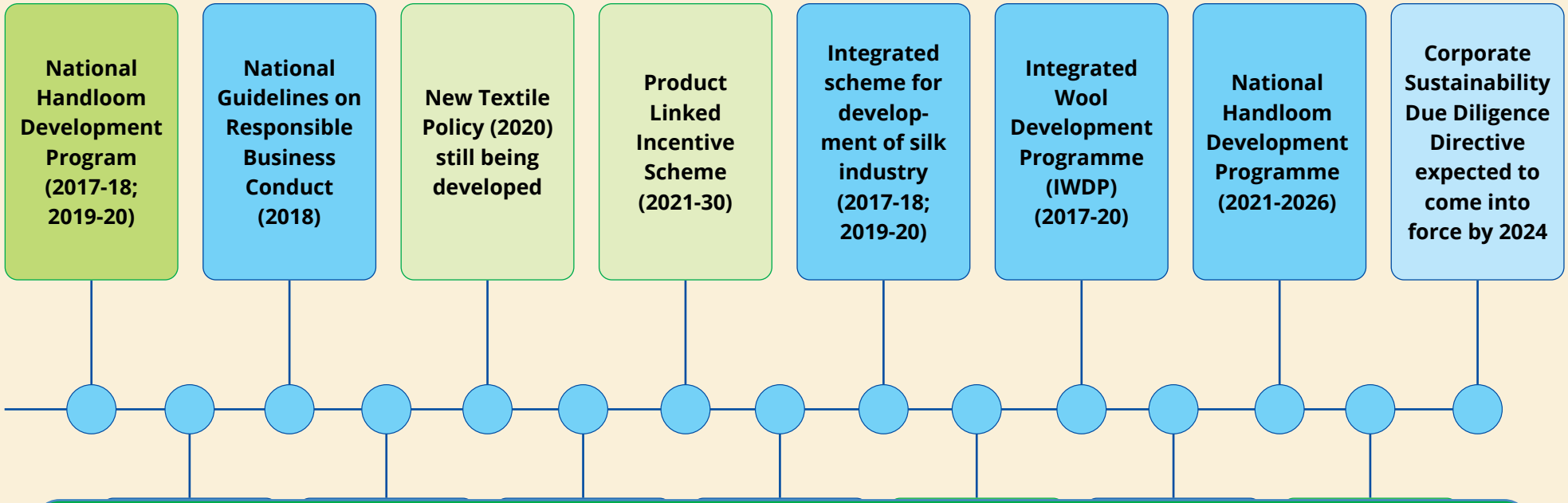
Module 04: 4.3 National Policies, Strategies, Action Plans

Most relevant policies and programs for the Indian Textile Industry (2017 – today)



Module 04: 4.3 National Policies, Strategies, Action Plans

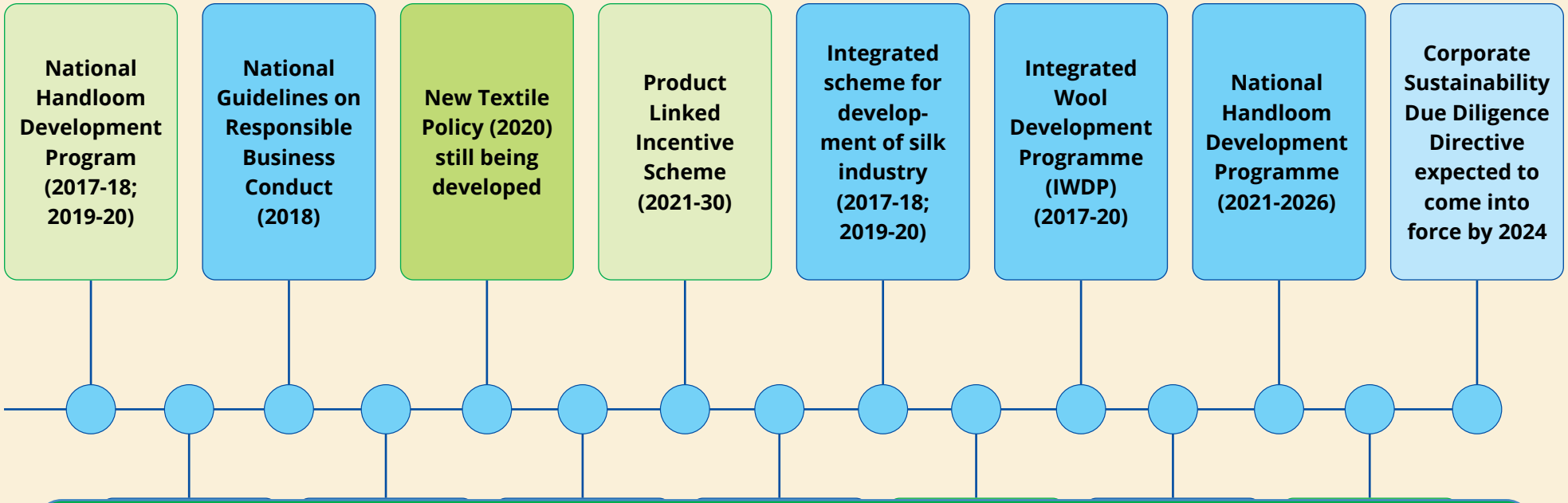
Most relevant policies and programs for the Indian Textile Industry (2017 – today)



The National Handloom Development Programme (NHDP) from FY 2021-22 to FY 2025-26 aims to support the handloom sector, engaging 3.5 million people, notably empowering 2.5 million female weavers. It offers resources like raw materials, design inputs, technology upgrades, concessional credit, and marketing aid through exhibitions. NHDP aims to create infrastructure such as Urban Haats and Mega Handloom Clusters, benefiting both cooperative and non-cooperative weavers, including self-help groups, for holistic development and welfare.

Module 04: 4.3 National Policies, Strategies, Action Plans

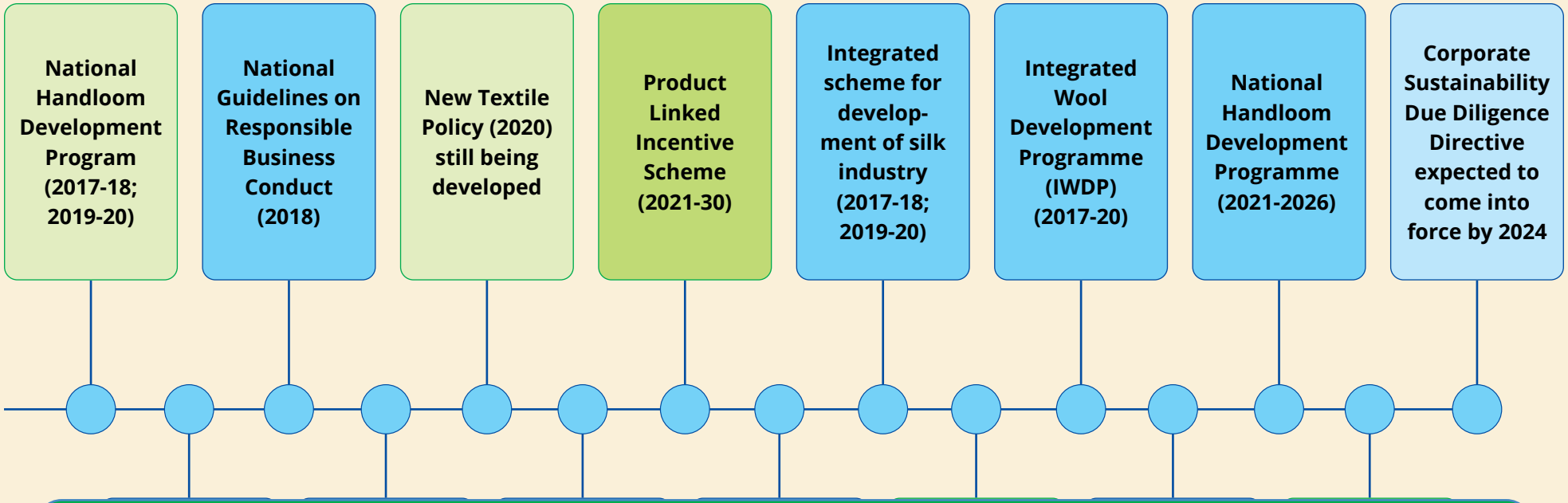
Most relevant policies and programs for the Indian Textile Industry (2017 – today)



The Ministry of Textiles is in the process of developing a New Textile Policy, currently in its draft stage. This policy aims to emphasize enhancing export performance and fostering improved employment opportunities. Extensive consultations are underway with diverse stakeholders, including associations, industry bodies, State Governments, and representatives from subsectors like Cotton, Silk, Jute, Wool, Handloom, Handicrafts, and Powerloom, as part of formulating this comprehensive policy.

Module 04: 4.3 National Policies, Strategies, Action Plans

Most relevant policies and programs for the Indian Textile Industry (2017 – today)

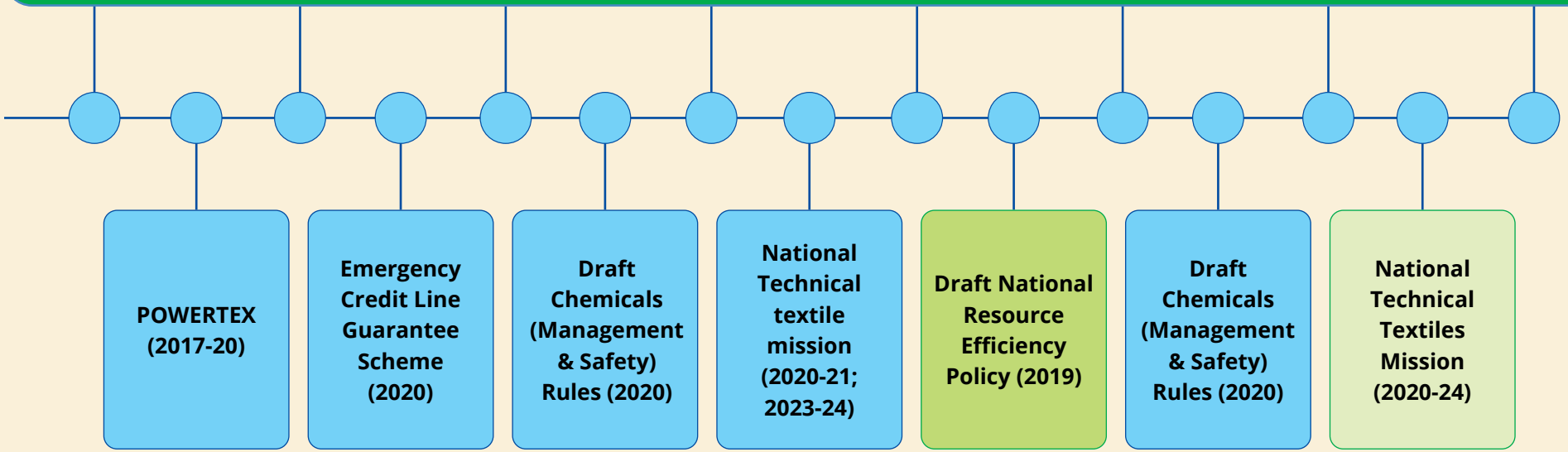


The Production-Linked Incentive (PLI) Scheme for Textiles – focuses on manmade fiber (MMF) apparel, MMF fabrics, and products of technical textiles to enhance India's manufacturing capabilities and exports. India's PLI Scheme for Textiles has selected 64 eligible investors, including seven foreign enterprises, for incentives spanning five years. Gujarat leads in proposed projects, while Madhya Pradesh attracts the largest investment. A second round is expected in 2023, focusing on small and medium-sized businesses.

Module 04: 4.3 National Policies, Strategies, Action Plans

Most relevant policies and programs for the Indian Textile Industry (2017 – today)

The National Resource Efficiency Policy (NREP) of 2019 aims to mainstream resource efficiency across all sectors by fostering collaborations, policy development, and efficient implementation, guided by principles like reducing primary resource consumption, waste minimization, and creating employment opportunities. It seeks to implement resource efficiency across biotic and abiotic resources, sectors, and life cycle stages, offering benefits like cost savings, reduced environmental impact, and support for sustainable consumption patterns. While the policy prioritizes sectors like textiles, packaging, and plastics, there's a crucial need to mandate a shift toward circular processes in the textile and apparel sector, despite existing environmental standards.



Module 04: 4.3 National Policies, Strategies, Action Plans

Most relevant policies and programs for the Indian Textile Industry (2017 – today)

The National Technical Textiles Mission (NTTM), initiated in March 2020 with a budget of INR 1480 crore over four years, aims to position India as a global leader in technical textiles. Its components focus on R&D, market development, export promotion, education, and skill development. It aims to boost domestic market levels, enhance exports, and create skilled manpower resources while promoting innovation, incubation centers, and indigenous machinery for technical textiles. With projects focused on specialty fibers and geotextiles, NTTM aims to cultivate a skilled workforce and promote biodegradable materials for sectors like agriculture, infrastructure, and medicine. Pilot projects for geotextile skilling have been launched under NTTM, emphasizing collaboration with academic institutions for specialized training.

- POWERTEX (2017-20)
- Emergency Credit Line Guarantee Scheme (2020)
- Draft Chemicals (Management & Safety) Rules (2020)
- National Technical textile mission (2020-21; 2023-24)
- Draft National Resource Efficiency Policy (2019)
- Draft Chemicals (Management & Safety) Rules (2020)
- National Technical Textiles Mission (2020-24)

4.3 National Policies, Strategies, Action Plans

EcoMark Label

Background

- Introduced in 1991, the Eco-mark stands as one of India's initial voluntary labeling initiatives geared towards recognizing eco-friendly products.
- Spearheaded by the Ministry of Environment and Forests at that time, this scheme is currently overseen by the Bureau of Indian Standards (BIS).
- It outlines environmentally friendly products as those crafted, utilized, or disposed of in a manner that substantially mitigates their environmental footprint. The criteria encompass a cradle-to-grave perspective, encompassing raw material extraction, production, and disposal methods.
- Manufacturers of prodcuts apply for testing and certification of products which fall under the notified categories in terms of their compliance with published environmental criteria in the prescribed from.

Products covered

- Soaps, detergents, paints, paper, plastics, cosmetics, textiles, batteries, wood substitutes, food items, electrical and electronics, packaging materials, leather, etc.

Source: Rana & Chopra (2020): https://ssrana.in/articles/eco-mark-scheme-bis/

Module 04: 4.3 National Policies, Strategies, Action Plans

Most Recent Developments

- **Foreign Direct Investment (FDI) Policy (Ongoing) :** India has a liberal and transparent FDI policy that allows 100% FDI in the textile sector under the automatic route. From 2017 to 2022, the textile sector attracted US $ 1522.23 million (equals approximately 1444.37 million Euro) in FDI, indicating its attractiveness to foreign investors.
- **Production Linked Incentive (PLI) Scheme for Textiles (2020):** The PLI scheme, launched in 2020, with an approved outlay of Rs. 10,683 crore (approximately 1141045.80 Euro), promotes the production of Man-Made Fibre (MMF) Apparel, MMF Fabrics, and Technical Textile products. It aims to make the textile sector more competitive and sustainable.
- **National Technical Textiles Mission (NTTM) (2020):** In 2020, the government allocated Rs. 1,480 crore (approximately 11415.86 Euro) for the NTTM, focusing on promoting and developing the technical textiles sector in India. This mission recognizes the potential of technical textiles in various applications.
- **Mega Investment Textiles Parks (MITRA) (2021):** This scheme will build a world-class infrastructure with plug-and-play facilities to let global champions in exportation. This project will tender India a hotspot for national and international divers seeking to enter the realm of textiles and garments.

Source:
Ministry of Textiles (2022): https://pib.gov.in/PressReleasePage.aspx?PRID=1885410
Cabinet of India (2021): https://www.pib.gov.in/PressReleasePage.aspx?PRID=1753118
Ministry of Textiles (2020): https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1601536
Ministry of Textiles (2021): https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1694058

Module 04: 4.3 National Policies, Strategies, Action Plans

Most Recent Developments

- **Silk Samagra-2 Scheme (2021):** Implemented from 2021-22 to 2025-26, this scheme is dedicated to the development of the sericulture industry, which is crucial for silk production in India.
- **New Bureau of Indian Standards (BIS) Circulars:** Mandatory Compliance for Protective and Geotextile Products in India (2023): To further enhance consumer protection and standardize manufacturing practices, the BIS has issued new circulars specifically targeting protective and geotextile products. These circulars outline mandatory compliance requirements that textile companies must adhere to by the 10th of October 2023.
- **New Textile policy (still being drafted):** The policy will focus on enhancing export performance and generating more employment opportunities in the textile sector. It is being developed through consultations with various industry associations, stakeholders, and state governments, representing subsectors such as Cotton, Silk, Jute Wool, Handloom, Handicrafts, Power loom, and more.

Source:
Ministry of Textiles (2022): https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1883509
Ministry of Textiles (2023): https://pib.gov.in/PressReleasePage.aspx?PRID=1915526
Ministry of Textiles (2021): https://www.pib.gov.in/Pressreleaseshare.aspx?PRID=1697401

4.3 National Policies, Strategies, Action Plans

Wrap-up Indian policy landscape

Commitments to transitioning to CE need to be mainstreamed in national and local policy contexts

- **Current policies** focus on individual areas and themes, are **fragmented, lack a systemic approach**.
- **Lack of support** on market access , technology adoption, and inadequate financial support **hindering scaling up**
- Few policies and schemes exist to help promote lean manufacturing –bringing down costs, facilitate funding mechanisms, and increasing demand for MSME products and services through public procurement.
- But only a handful of policies target resource efficiency and circular economy
- Focus on the downstream EoL management activities

Key overarching policy initiatives to foster circular economy and resource efficiency in India

- Strategy on Resource Efficiency by the National Institution for Transforming India (NITI)
- Establishment of the inter-departmental group to ensure implementation and mainstreaming of the agenda in allied Ministries
- Establishment of the Resource Efficiency Cell by the MoEFCC (Ministry of Environment, Forest and Climate Change of India)
- Draft National Resource Efficiency Policy of India
- A Joint Declaration that established the India-EU Resource Efficiency and Circular Economy Partnership

Source: adelphi (2021)

Module 04: 4.3 National Policies, Strategies, Action Plans

Better tracking/ collaboration trust

Structure: Industry is highly fragmented with 90% of the textile units in India being MSMEs, poor traceability due to informality and decentralized nature of sector.

Fibers used: Mix of fibers: Cotton most dominant one with growing trends towards synthetic fibers (e.g. polyester), mostly virgin material over recycled material.

Better tracking/ collaboration trust

Better tracking/ collaboration trust

Design: Clothes are mainly not designed to be recycled, so that technical problems arise at end- of-life stage.

Regulatory framework: The framework lacks sectorial standardization and clarity on requirements for uniform implementation of certain codes for sustainable manufacturing.

Evaluate & strengthen governmental schemes

Trainings and workshops about CSR, waste minimization and resource efficiency

Structure: Industry is highly fragmented with 90% of the textile units in India being MSMEs, poor traceability due to informality and decentralized nature of sector

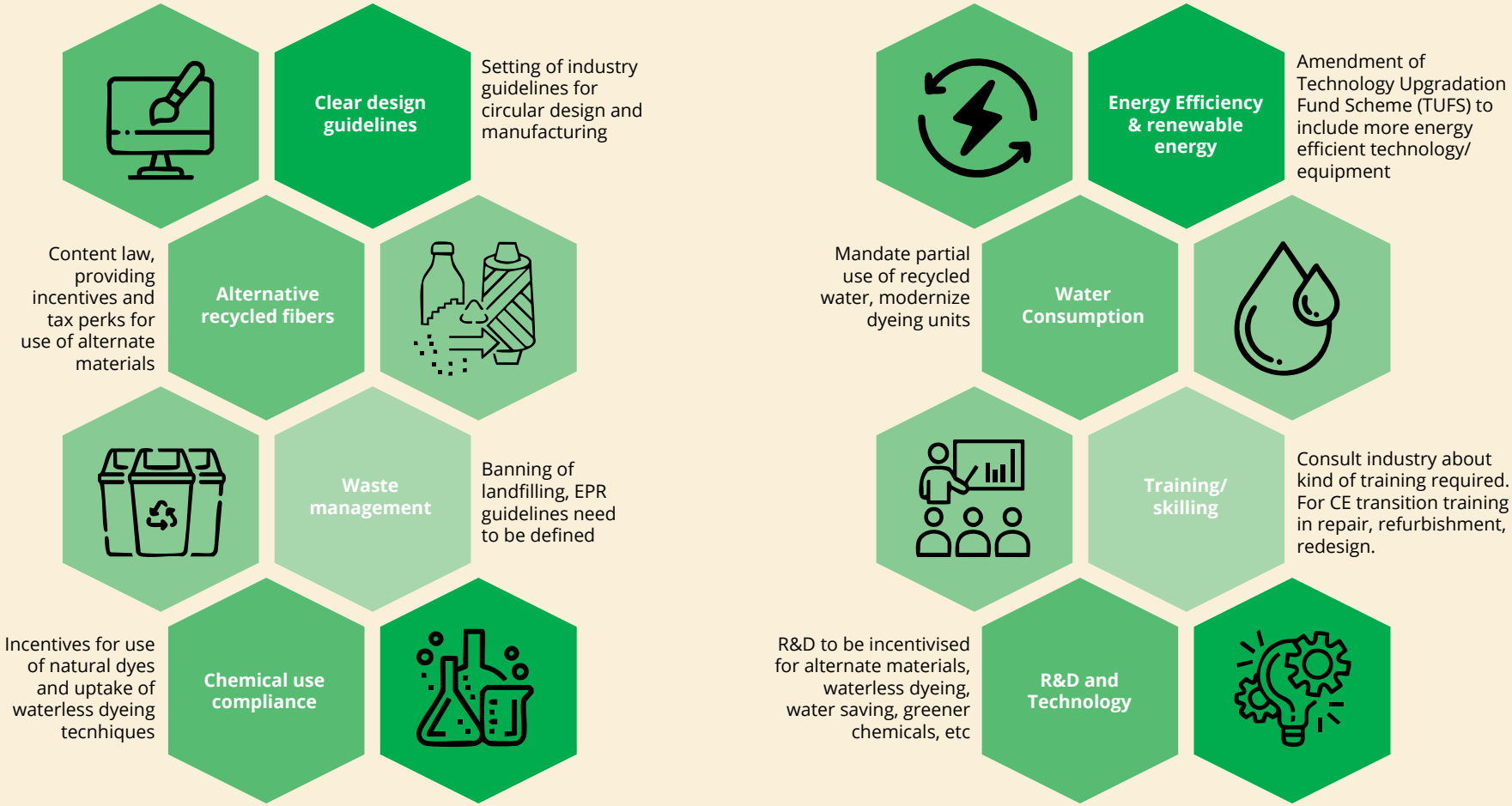
Infrastructure: There is uneven growth and accessibility to technological innovations due to high excise duty for machinery and little knowledge among small factories.

Development of mega textile park for new technologies, AI and IT systems

Source: SEI (2023): https://www.sei.org/wp-content/uploads/2023/05/sustainable-garment-manufacturing-india-sei2023.033.pdf

4.4 Needs & Potentials in the Indian textile sector

Policy intervention priorities and ideas



Source: CRB (2022): https://wwww.oneplanetnetwork.org/sites/default/files/from-crm/Circular_Apparel_Status_Paper_140422.pdf

Module 04: 4.3 National Policies, Strategies, Action Plans

Typical barriers for implementation of CE and RE

Which one are most prominent ones in the Indian context, which ones should be added?

Regulatory barriers

- Policies that encourage recycling, incineration or disposal rather than other circular strategies such as reuse and repair
- Lack of tax or other fiscal instruments (e.g. CO2 tax), lack of resource taxation
- Lack of incentives for circularity investments
- Legislation being waste and not product focused (no extended producer responsibility)
- Unclear compliance rules on circularity, lack of standards/ certification for circular products
- Lack of defined circularity indicators
- Lack of concrete targets and conflicting targets

Financial barriers

- Risk of not achieving cost-effective repair, reuse or refurbishment,
- High costs associated with take-back of products and high labor costs for dismantling and separation of material fractions
- Declining sales of new products due to increased sales of repaired, refurbished and reconditioned products
- High capital or pre-financing demand, e.g. for leasing models

Source: Circular Economy Initiative Deutschland (2020): https://static1.squarespace.com/static/5b52037e4611a0606973bc79/t/6437a399eee7ce0e050a5a6b/1681368086463/AG+GM_Gesamtbericht+EN_DOI_Stand+12.04.23_NEW

Module 04: 4.4 Needs & Potentials in the Indian textile sector

Typical barriers for implementation of CE and RE

Which one are most prominent ones in the Indian context, which ones should be added?

Organisational barriers

- Hesistant corporate culture and predominant linear thinking
- Lack of support from top management
- Lack of internal strategic positioning of circular
- business models (sales of new vs. Used goods)
- Lack of willingness to cooperate in the value chain (also due to high fragmentation)
- Unclear internal responsibilities
- Uncertainty about circularity legislations

Consumption-related barriers

- Lack of consumer awareness and interest in circularity and longevity
- Misunderstandings about refurbishments, reuse, servicising, etc.
- Rigidity of consumer behaviour (linear thinking patterns)
- Lack of consumer information and education
- Expecations for low prices
- Mishandling of products by customers

Source: Circular Economy Initiative Deutschland (2020): https://static1.squarespace.com/static/5b52037e4611a0606973bc79/t/6437a399eee7ce0e050a5a6b/1681368086463/AG+GM_Gesamtbericht+EN_DOI_Stand+12.04.23_NEW

4.3 National Policies, Strategies, Action Plans

Typical barriers for implementation of CE and RE

Which one are most prominent ones in the Indian context, which ones should be added?

Value-chain barriers

- Component manufacturers and other non-OEMs can only establish circular business models to a limited extent due to their value chain position
- Lack of trust and exchange of information
- Lack of market incentives (high-quality materials not competitive in price)
- Lack of networks and supply chains for dismantled products and components and recycled materials (reverse logistics)
- Low quality of recycled material flows

Technical barriers

- Lack of design tools for CE and circular products
- Lack of data availability (material, composition, ingredients, products life cycle)
- Lack of digital tools
- Lack of treatment and recycling infrastructure
- Lack of standards and design requirements (non-toxic ingredients, material substitution, design for repair/ remanufacturing/recycling)

Source: Circular Economy Initiative Deutschland (2020): https://static1.squarespace.com/static/5b52037e4611a0606973bc79/t/6437a399eee7ce0e050a5a6b/1681368086463/AG+GM_Gesamtbericht+EN_DOI_Stand+12.04.23_NEW

Module 05: Developing Policy Instruments

1 Introduction to Circular Economy (CE)

2 CE in the Context of Textiles

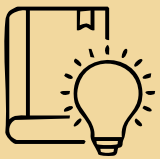
3 CE policies and enablers for textiles

4 Needs and Potentials in the Indian context

5 Developing Policy Instruments

6 Best Practice Examples Booklet

7 Repository of Toolkits



Objective: In this chapter tailored to the Indian **country-specific pains** and potentials will be defined and a future-oriented policy making training will be provided to the stakeholders. A methodology for policymakers to accelerate the transition to a more circular textile industry will be presented and practical exercises will be conducted.

Module 05: 5.1 Policy Prototyping Methodology

Background on SEED Policy Prototyping

SEED is a global partnership for action on sustainable development and the green economy.

Eco-inclusive enterprises provide **practical solutions to social and environmental problems** that serve communities at the base of the pyramid. These enterprises create lasting collective impacts across their value chains, eliminating poverty while tackling environmental issues.

SEED was founded at the 2002 World Summit on Sustainable Development in Johannesburg by UN Environment, UNDP and IUCN as a global partnership for action on sustainable development and the green economy.

SEED Theory of Change

Seed Established by

UN environment programme, UNDP, IUCN

Seed Hosted by

adelphi

Seed Funded by

Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection

Flanders State of the Art

Seed Supported by

environmental affairs, Department: Environmental Affairs, REPUBLIC OF SOUTH AFRICA

Ministry of Economic Affairs and Climate Policy

CONSERVATION INTERNATIONAL

Ministry of Environment, Forest and Climate Change, Government of India

UNIDO

Hogan Lovells

Module 05: 5.1 Policy Prototyping Methodology

How does policy prototyping work?

- **Lean and feedback oriented process** to design policy instruments that meet the demands of their target groups while achieving policy objectives relating to sustainable development and climate change mitigation and adaptation
- **Bottom-up exercise** which lives from co-creation, experimentation and adjustments based on feedback
- Usually, the **policy prototyping programme spans over a series of labs** center on pinpointing and defining the policy hurdles encountered by enterprises, creating prototype solutions, incorporating feedback from eco-inclusive enterprises, and strategizing for the implementation and pilot phases of these solutions.

1. **Identification and contextualistion of key challenges facing eco-inclusive MSMEs in the country**

2. **Development and refinement of a problem statement that addresses these challenges**

3. **Co-creation of potential interventions and solutions to the problems**

Source: Shearman (2019): https://www.seed.uno/articles/blog/designing-policy-instruments-to-benefit-green-and-social-enterprises-in-southern-africa

Module 05: 5.1 Policy Prototyping Methodology

Policy Prototyping Toolkit

- **Regional Policy Labs Process & Toolkit:** Labs consist of a 2-day multi-stage process to create policy solutions using SEED tools and experiences. Solutions are adapted with policy makers, green & social enterprises and intermediaries to address policy challenges faced by small and growing enterprises

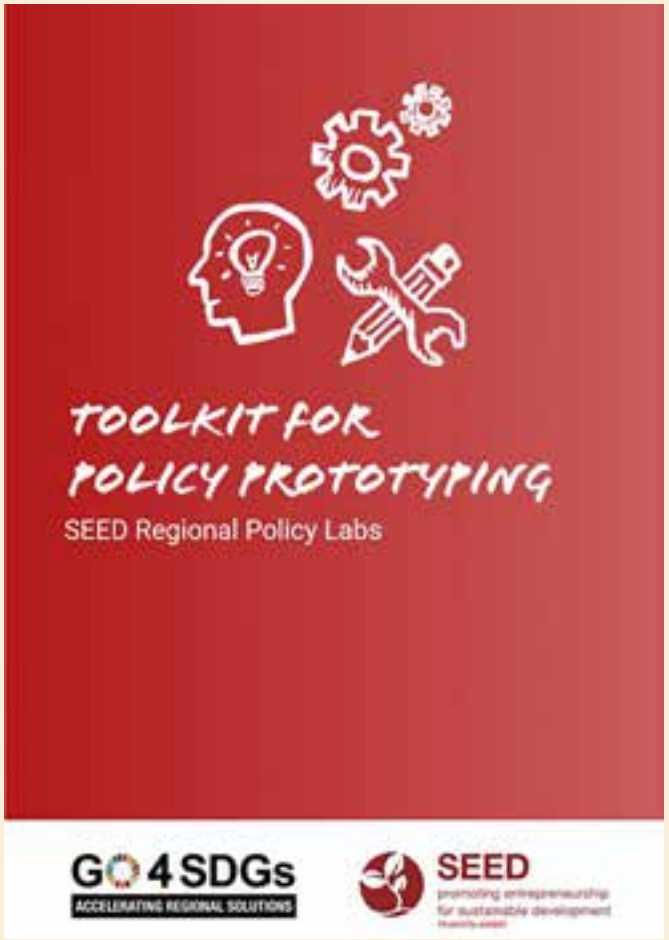
This toolkit consists of Tools used across 2-days in the Regional Policy Labs

Lab Day 1: Knowledge transfer & poor sharing

- Policy solutions showcase
- Working session on replicable and best practice elements

Lab Day 2: Replication & Innovation

- SME Perspectives
- Replication to support exploration of local adapation and implementatio

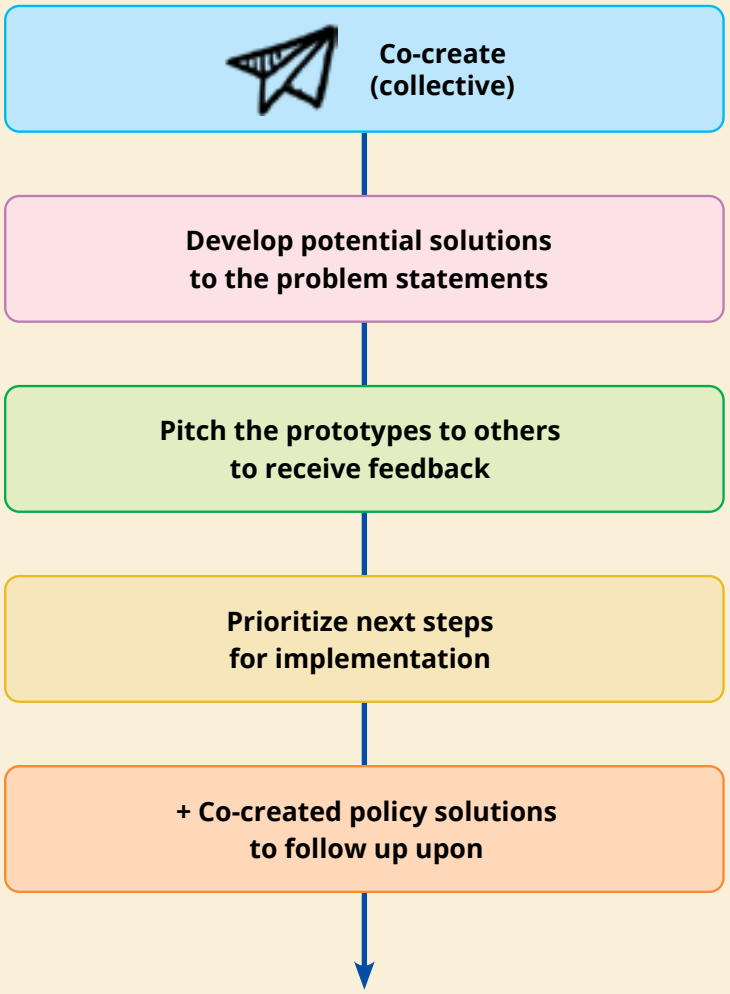


Source: Wolters & Ong (2021): https://seed.uno/articles/seed-toolkit-for-policy-prototyping-replication

Module 05: 5.1 Policy Prototyping Methodology

Focus of this toolkit – Challenge-Solution Mapping

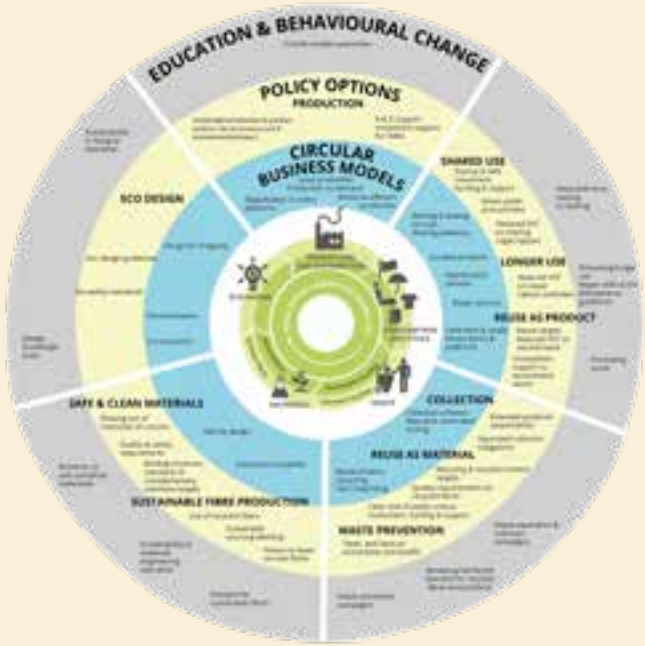
- **Policy Mapping Exercise:** Collectively map out the existing policies related to textiles in India. Analyze strengths, weaknesses, gaps, and areas requiring improvement.
- **Challenges Identification:** Share the challenges you've encountered in promoting circularity within the textile sector. Let's build a comprehensive understanding together.
- **Solution Generation:**
  - **Best Practice Insights:** Explore successful policy models from across the globe, like EPR in France and the Netherlands. Let these examples inspire innovative solutions suitable for India.
  - **Brainstorm Solutions:** Engage in brainstorming sessions. Think creatively and propose solutions that could address the identified challenges in our context.

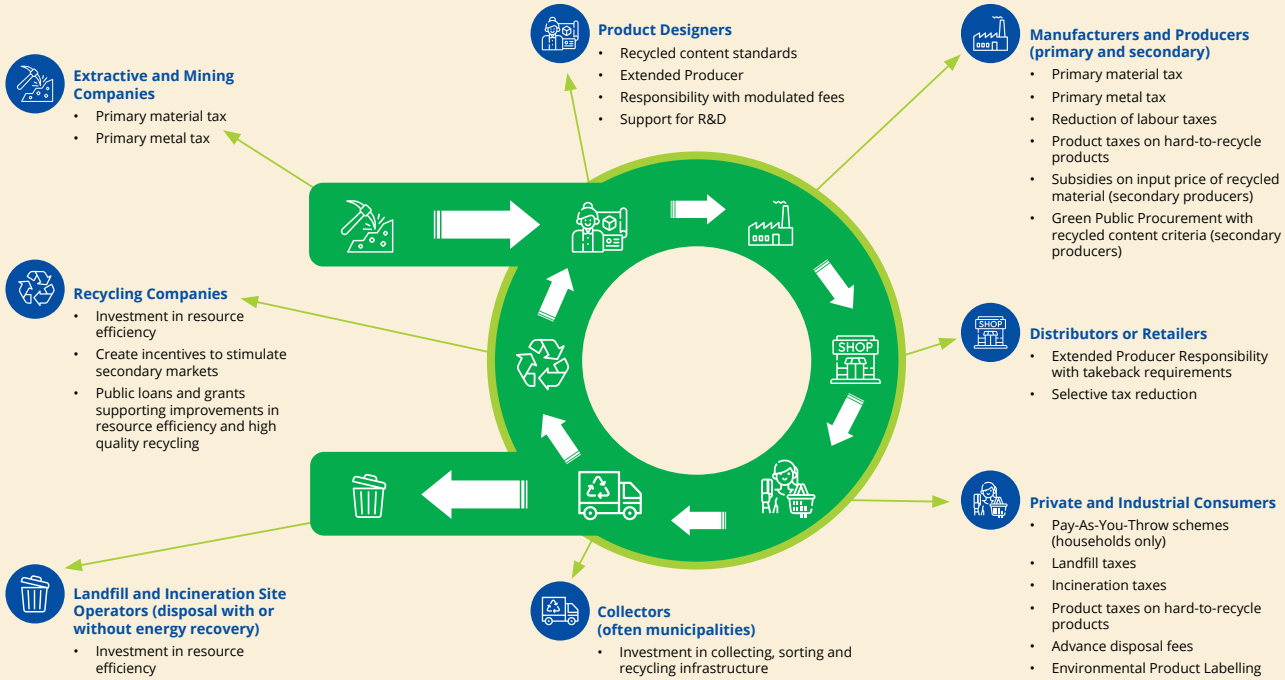


Module 05: 5.1 Policy Prototyping Methodology

Focus of this toolkit – Challenge-Solution Mapping

Keeping in mind different policy options for solution generation





Source: EEA (2019): https://www.eea.europa.eu/publications/textiles-in-europes-circular-economy/textiles-in-europe-s-circular-economy;
OECD (2020): https://www.oecd.org/environment/synergies-and-trade-offs-in-the-transition-to-a-resource-efficient-and-circular-economy-e8bb5c6e-en.htm

Module 05: 5.1 Policy Prototyping Methodology

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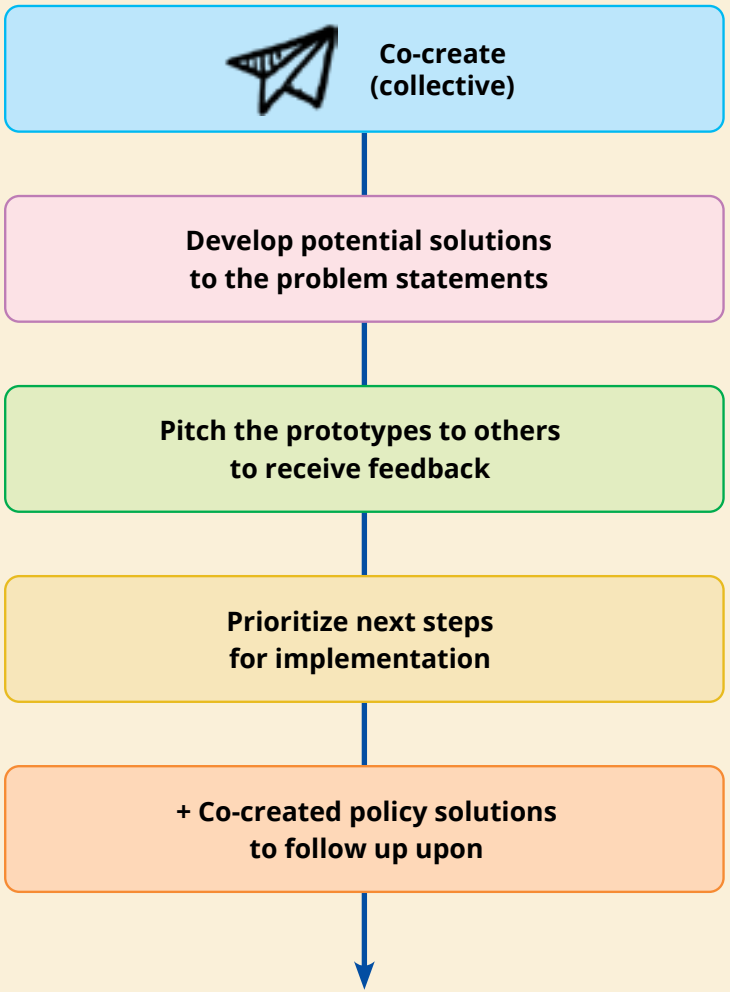


Module 05: 5.2 Policy Prototyping Exercise

Challenge – Solution Mapping

WHERE ARE WE AT NOW

- *Collect already existing policy solutions directed towards CE or RE in the Indian textile sector.*

CHALLENGES

- *What are challenges present in the current policy context?*
- *Which gaps exist in the current policy framework?*
- *Which challenges are not even addressed by existing policies?*

SOLUTIONS

- *Find solutions to address before mentioned challenges.*
- *Get inspired by best practice examples and policy solutions presented in this toolkit.*

Module 05: 5.2 Prioritizaion of policies targeting gaps and needs

Policy Pitching

A - Attention	Catch the **attention** of your audience! Comparisons, personal stories, bold statements, questions or visual descriptions of the problems you aim to tackle can help you catch the attention of your audience and make them curious to learn more!
I - Interest	Raise the **interest** of your audience! Connect to their context and emphasise advantages and benefits of your idea for the audience you're speaking to. Focus on how your solution is unique, and what you have already achieved.
D - Desire	Awaken the **desire** of your audience to work with you! Explain how you are solving a need for them and demonstrate how they will gain from working with you or investing in you!
A - Action	Call to **action** for your audience! Invite the audience to learn more about you, support you, partner with you, purchase from you, or invest in you. Offer concrete possibilities and let them know how to get in contact with you.

WHAT CHALLENGE ARE YOU ADDRESSING?

Summarise the challenge succintly and in an engaging way

WHAT SOLUTION ARE YOU PROPOSING AND FOR WHO?

Summarise the solution, who benefits from it, and what positive impact you anticipate to create for them

WHO ARE YOU TALKING TO AND WHAT ARE YOU ASKING FOR?

Share who do you need resources and support from

Module 06: Best Practice Example Booklet

1 Introduction to Circular Economy (CE)

2 CE in the Context of Textiles

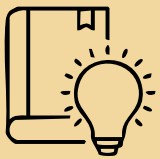
3 CE policies and enablers for textiles

4 Needs and Potentials in the Indian context

5 Policy Prototyping for CE in textiles

6 Best Practice Examples

7 Repository of Toolkits



Objective: In this chapter some **best practice examples** which were already outlined in module 2 will be explained in-depth. There will be presented **one case study for each value chain step**. Mostly practical case studies (mostly from the Indian country context) will presented.

Module 06: Material Sourcing – Case Study Usha Yarns Limited (India)

Enterprise Brief

Name: Usha Yarns Limited

Website Link: A Sustainable Textile Company - Recycled Cotton Colored Yarn Manufacturer (ushayarns.com)

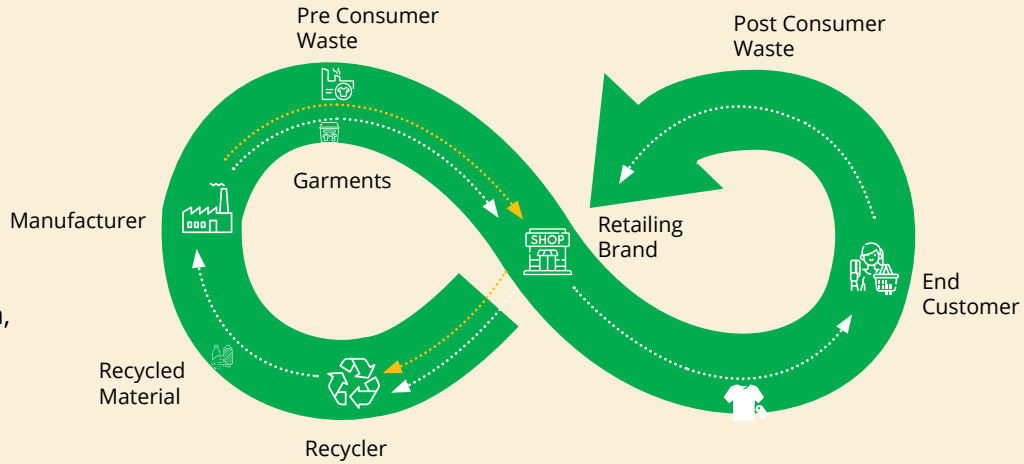
State: Punjab

Established in 1996

Products or Services Offered: Recycled Knitting Yarn, Recycled Melange Yarn, Recycled Denim Yarn, Recycled Weaving Yarn, Recycled Specialty Yarn, Recycled Textile Yarn Color Range

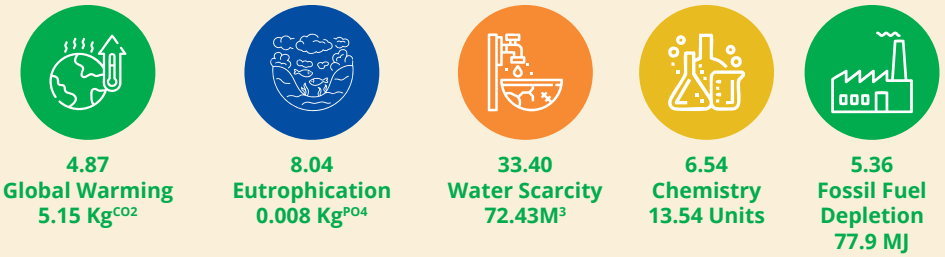
Short description: The product portfolio offered by Usha Yarns includes a variety of circular items crafted from recycled Cotton, Poly, and Viscose fibers, available in a wide range of solid and mélange shades. These products cater to the knitting and weaving industry, providing a sustainable and cost-effective alternative. Usha Yarns is dedicated to producing and promoting pure recycled textiles, embracing green alternatives such as zero discharge, closed-loop systems, and renewables.

Business Model



Impact

Saved emissions through operations



Module 06: Material Sourcing – Case Study Usha Yarns Limited (India)

Alignment with SDGs

ESG parameters	Reporting Indicators	Corresponding SDGs
GOVERNANCE	Legal Compliance	
	Ethics, Fraud Prevention and Transparency	
	Sustainable Supply Chain	
	Equal employment Opportunity & Unit Discrimination Policy Statement	
	Sexual harassment	
	Board Independence	

ESG parameters	Reporting Indicators	Corresponding SDGs
Environment	Energy Conservation and Energy reduction	
	Recycling - Circular economy	
	Water conservation	
	Waste Treatment	
	Protecting the biodiversity	

ESG parameters	Reporting Indicators	Corresponding SDGs
Social	Putting the youth in front	
	Diversity in the workplace	
	Participation of women in the workforce	
	Employee hire and turnover	
	Employee training	
	Fulfilling the social responsibility	
	Employee Health and Safety	
	Employee engagement	
	Succession Planning	

Certifications and Standards


Module 06: Design – Case Study Freitag (International)

Enterprise Brief

Name: Freitag

Website Link: FREITAG | One-off pieces made from recycled truck tarps

Location: Zürich (Switzerland)

Established in 1993

Products or Services Offered: Bags from recycled truck tarpaulins, discarded bicycle tubes, seat belts, and other recycled materials.

Short description: Freitag is a renowned Swiss brand that stands out for its innovative and sustainable approach to fashion and accessories. What sets Freitag apart is its commitment to sustainability through a unique and creative concept. The brand specializes in creating bags, wallets, and accessories using recycled materials, particularly old truck tarps, discarded bicycle inner tubes, and seatbelts. Apart from the sustainable design and production of the products, Freitag also offer services like bag customization, bag repairs, bag swaps and take back schemes. Apart from their textiles-related services they also rent out cargo bikes fully in line with the concept of "use over ownership"

Design specifications

Choose of purposeful materials: They select their materials according to strict criteria. They prioritize circular, recycled, and environmentally friendly materials while avoiding those that do not comply with their Restricted Substance List (RSL).

Design for Durability: They achieve the longevity of their products through the selection of robust materials and a timeless design that increases the emotional value of the product over time.

Design for Disassembly: They opt for a modular structure and reversible material connections, simplifying the repair, replacement, refurbishment, and recycling of the product. They promote this by keeping the number of materials used low.

Bag Customization: With customized bags the value of the product is more personal and it is more likely that the consumer is going to extend the use phase of the product before discarding it.

Alignment with SDGs

Module 06: Manufacturing – Case Study Vardhman

Enterprise Brief

Name: Vardhman

Website Link: https://www.vardhman.com/Sustainability/Economic

State: Head office in Gurugram (Haryana); Recycling factility in Baddi (Pradesh)

Established in 1965

Products or Services Offered: Yarns, Facribs, Acrylic Fibre, Garments, New recycling facility established

Short description: Vardhman is a prominent textiles company in India. It is known for its extensive range of textile products and services, including yarns, fabrics, and garments. With a rich history dating back to 1962, Vardhman has established itself as a leading player in the Indian textile industry. The company is recognized for its commitment to quality, innovation, and sustainability in its manufacturing processes. Vardhman serves both domestic and international markets and has a strong presence in various textile segments, making it a significant contributor to India's textile and apparel sector.

Good Practices

Examples for Innovations in Finishing of Textiles

- **Fluorine-Free Water Repellent Finish:** Uses 60% renewably sourced raw materials and is up to three times more durable than existing fluorinated repellents.
- **Midori Biodry 1.0:** A plant-seed based softener that uses no crude oil and/or palm oil and has a considerably lower Carbon footprint.
- **Silvadur Antimicrobial:** effective odour control technology for textiles that is recyclable and reusable. It uses silver ions (Ag+) instead of silver particles and is non-toxic, non-sensitising, and non-irritating to human skin.

Resource-efficient use of resources on the production sides

- **Water Management:** 9 Sewage Treatment Plants and 4 Effluent Treatment Plants across our units, out of which 3 are Zero Liquid Discharge facilities.



Module 06: Manufacturing – Case Study Vardhman

Alignment with SDGs

Certifications and Standards

FAIRTRADE

FSC

better cotton

Global Recycled Standard

OEKO-TEX®
CONFIDENCE IN TEXTILES
STANDARD 100

ORGANIC BLENDED content standard

ISO

COTTON AFRICA

intertek
Total Quality. Assured.

Module 06: Manufacturing – Case Study Vardhman

Enterprise Brief

Name: TrusTrace (Indian founder, Swedish Business)

Website Link: About Us - TrusTrace – Leading Fashion Supply Chain Traceability Software

Location: Headquartered in Stockholm, with offices in Coimbatore (India), US and France

Established in 2016

Products or Services Offered: Guides firms in using traceability data to achieve better visibility and control of their supply chain data and to meet supply chain compliance requirements.

Short description: TrusTrace harnesses AI, Blockchain, and BOTS to help the fashion industry move closer to a sustainable future by providing verified supply chain data to more than 40 global fashion and retail brands. Involves tracking the inception, journey, and transformations of products and materials. As supply chains grow in complexity, particularly for major brands with extensive product portfolios and sprawling networks of suppliers across multiple continents, achieving Supply Chain Traceability becomes increasingly intricate. This endeavor necessitates cooperation, automation, and the allocation of resources towards data-driven systems. To assess the supply chain traceability does not only help to comply with future regulations, but also to promote firms products better and build a sales & marketing strategy around it.

Resources

Knowledge Hub about Traceability, Laws & Regulations, Fashion´s Future and more

Events about Sustainability in the Textile Industry and Supply Chain Data Compliance

Traceability Playbook and Roadmap containing a traceability outlook on product and material level , proven models and trend insights from experts to assist you on your journey and guidance to successfully implement.

Traceability Self-Assessment to find out what the current level of ones supply chain traceability is

Alignment with SDGs

Module 06: Consumption – Case Study ReLove

Enterprise Brief

Name: ReLove

Website Link: ReLove

Location: Mahim (Mumbai)

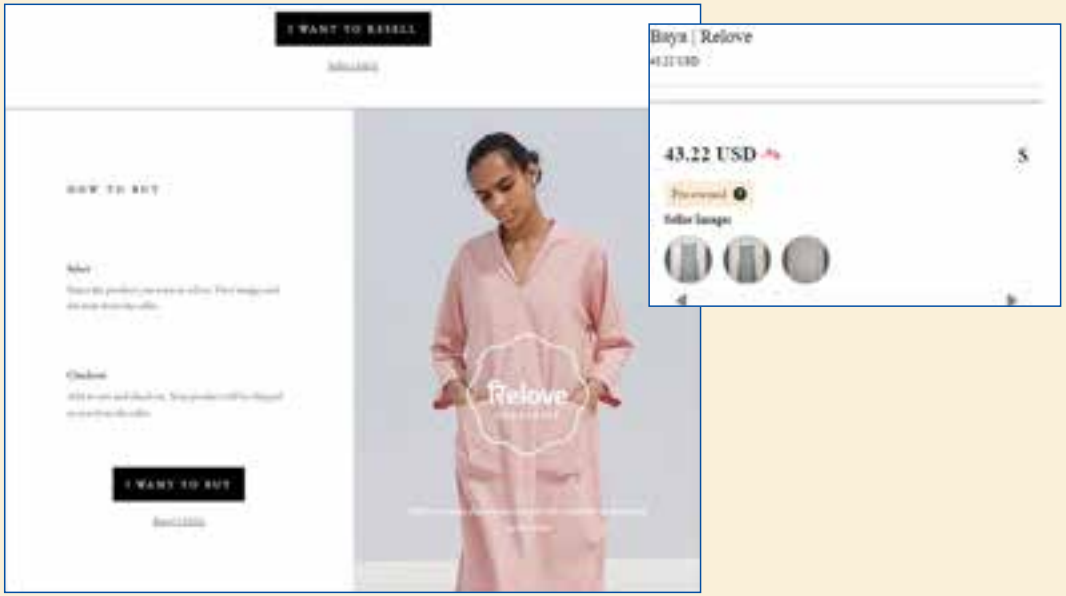
Products or Services Offered: Offer platform for sellers and buyers of used clothes

Short description: Relove is a pioneering service provider that equips fashion brands with cutting-edge resale technologies and digital factory outlets. This empowers fashion brands to seamlessly incorporate a dedicated section on their website for both sellers and buyers of pre-owned garments. Through this platform, the brand's customers can effortlessly resell their pre- loved items within just 60 seconds directly on the brand's own website. Relove takes care of essential aspects such as customer support, fraud prevention, and the logistics of the resale process. By implementing a resell-focused strategy instead of the traditional return-only approach, customers are incentivized to prolong the lifespan of their textiles, leading to the potential for increased profits and sustainability.

Alignment with SDGs

Examples of Indian brands using Relove

The Summer House: Relove – The Summer House



Khara Kapas:
Relove - Khara Kapas

Module 06: End of Life – Case Study Saahas Zero Waste

Enterprise Brief

Name: Saahas Zero Waste

Website Link: About Us - Saahas Zero Waste - Who We Are and How We Got Here

State: Bengaluru (Karnataka)

Established in 2013

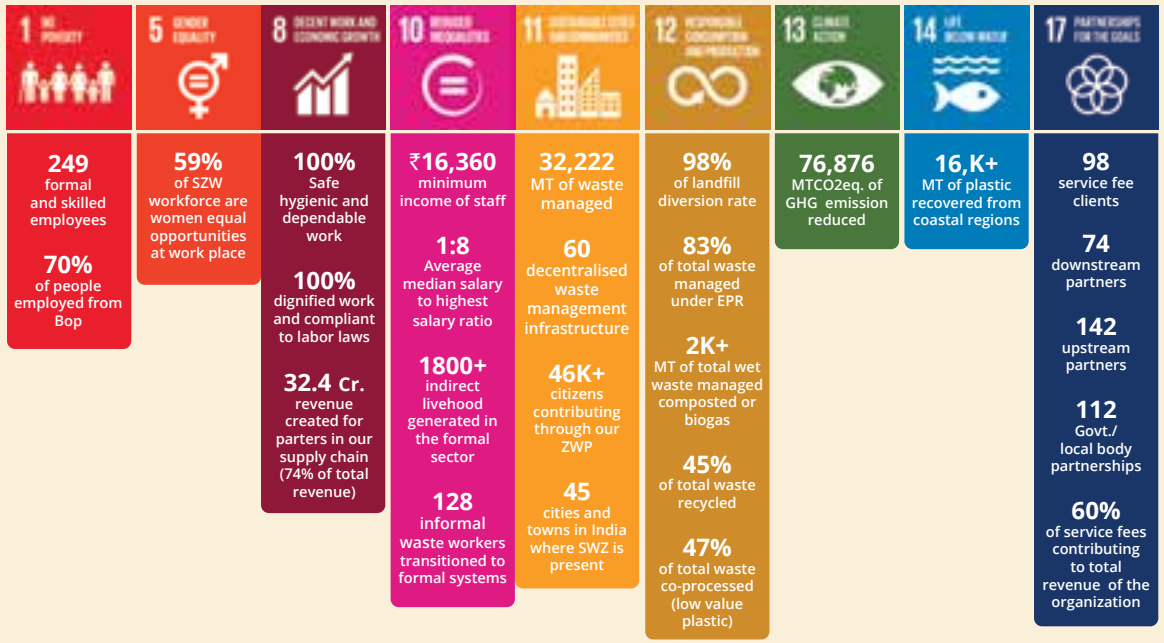
Products or Services Offered: Zero Waste Programme, Extended Producer Responsibility and Circle Up.

Short description: SZW is a consulting firm specializing in circular economy strategies, waste reduction, and resource recovery for organizations. Through waste audits, it evaluates waste streams at specific locations and recommends infrastructure and operational improvements. The Smart Waste Program assists large organizations in achieving zero waste status by implementing waste segregation, awareness programs, collection, processing, and on-site waste management units. For smaller waste generators, SZW offers the Kasa Rasa Model, which collects waste and transports it to a nearby hub for composting and recycling. The Exchange Program promotes a circular economy by exchanging waste for recycled stationery products. SZW also provides compost and various recycled products.Furthermore, SZW acts as a waste aggregator for E-Waste and packaging waste, assisting companies in fulfilling their Extended Producer Responsibility (EPR) through a reverse logistics system

Resources directly connected to textiles

Textile Recovery Facility (TRF): Their Textile Recovery Facility (TRF) is one of the first of its kind in India, dedicated to maximizing textile recovery by segregating, sorting, and processing incoming textile waste for reuse, repair, upcycling, and recycling. They have established a supply chain, ensuring compliance with labor laws and safety standards while providing fair wages and social benefits to their staff.

Alignment with SDGs



Module 06: Overarching Case Study

Enterprise Brief

Name: Circular Apparel Innovation Factory (CAIF)

Website Link: Circular Apparel

Established in 2018

Products or Services Offered: consulting, testing, and innovative solutions in the textile value chain to drive the transition towards a circular textiles economy.

Short description: CAIF is a team of consultants, industry experts, and impact professionals that works to identify opportunities and gaps in the textile industry, broker alliances, and create prototypes and test beds for circular innovations. They also convene stakeholders from both within and outside the textile industry to foster collaboration, engage in policy discussions, and shape the narrative around a circular apparel and textiles industry. Additionally, CAIF leverages its association with the Aavishkaar Group to provide access to knowledge, networks, and capital to facilitate the growth of circular innovations with the ultimate goal of enabling the transition towards circularity in the textile industry.

Collaborations:

Aditya Birla Fashion & Retail Pvt Ltd

The Doen Foundation

Associations:

Pilot to test a waste management service system for local collection and sorting of post-consumer textile waste

Pilot to work with hyperlocal waste micro- entrepreneurs and build a model for pre-consumer waste management

Pilot to test a micro-entrepreneurship led approach for local collection and sorting of post-consumer

Module 07:

1 Introduction to Circular Economy (CE)

2 CE in the Context of Textiles

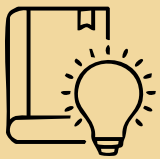
3 CE policies and enablers for textiles

4 Needs and Potentials in the Indian context

5 Policy Prototyping for CE in textiles

6 Best Practice Examples Booklet

7 Repository of Toolkits



Objective: In this chapter tailored to the Indian **country-specific pains** and potentials will be defined and a future-oriented policy making training will be provided to the stakeholders. A methodology for policymakers to accelerate the transition to a more circular textile industry will be presented and practical exercises will be conducted.

Module 07: 7.1 Example 1: Circular Business Model Canvas

SCP/RAC and BCSD-Turkey use the business model canvas in their paper "Circular Business Opportunities in the South Mediterranean: How can Businesses Lead the Way to Sustainable Fashion". The business model canvas is then developed for each strategy (the example on the right for leasing of clothes)

Key Partners / Stakeholders

- Garment and accessories providers: brands, retailers, boutiques, garment manufacturers, small producers, secondhand sellers, etc.
- Online platform and technology suppliers and maintenance service providers
- Suppliers that repair, clean, and maintain garments and accessories
- Logistics suppliers that provide storage, transportation, and packaging
- Communications and branding partners
- Insurance and legal services partners
- Customers that provide feedback and comments
- Banks, investors, and other organizations that provide access to funding
- Citizens that benefit from sustainable practices

Key Activities

- Identifying the details of the model, i.e. renting/leasing terms and the subscription system (if applicable)
- Establishing technological infrastructure and a digital platform and its continuous maintenance and tracking and/or establishing an offline store (if applicable)
- Engaging with brands, retailers, and other sources to build up a garment and accessories inventory and its continuous improvement
- Setting up the infrastructure for logistics (storage, packaging, and transportation)
- Managing demand, inventory, and deliveries
- Establishing a system for the regular maintenance, cleaning, tagging, registration, and repairing of garments and accessories
- Developing an effective distribution and takeback scheme
- Managing agreements and other legal relationships (warranty procedures, etc.) with customers
- Communication and marketing activities especially focused on the advantages of rental/leasing systems

Value Propositions

- Give consumers access to a shared wardrobe, reducing the environmental footprint of using fashion products
- Offer consumers the flexibility and convenience of wearing a variety of garments and accessories that can be used on different occasions, eliminating the need to purchase new items
- Provide brands&retailers with an infrastructure through which to rent out their garments and accessories
- Help brands keep track of their garments and accessories and collect them when they become unwearable, supporting their circularity strategies

Key Resources

- Human resources
- Online platforms and technological infrastructure (websites, apps, and social media capabilities)
- An inventory of garments and accessories (stock)
- Offline shops (if applicable), storage, and logistics infrastructure
- Office equipment
- Investment capital

Customer Relationships

- Long-term and strong relationships with consumers through subscriptions
- Trust and attachment generated through an attractive inventory and intense cleaning and maintenance services
- Opportunity to share experiences and interact through an online platform
- Business-to-business commercial relationships and offline/ online points of sale provide opportunities to create CE-related relationships with customers
- Long-term and strong partnerships with brands&retailers

Channels

- Sales: Website, app, shops
- Communication: websites, social media

Customer Segments

- Consumers wanting high-quality garments and accessories and unlimited wardrobes at a low cost
- More common for fast fashion wearers, millennials, young to middle-aged, from upper to middle class, or individuals that have temporarily/ rapidly changed sizes
- Consumers who consciously choose renting as a way of decreasing their environmental footprints
- Brands willing to rent/lease their products (generally luxury, premium products)

Source: SPC/RAC (2020): https://switchmed.eu/wp-content/uploads/2020/11/Circular-business-opportunities-in-SouthMed_Fashion.pdf

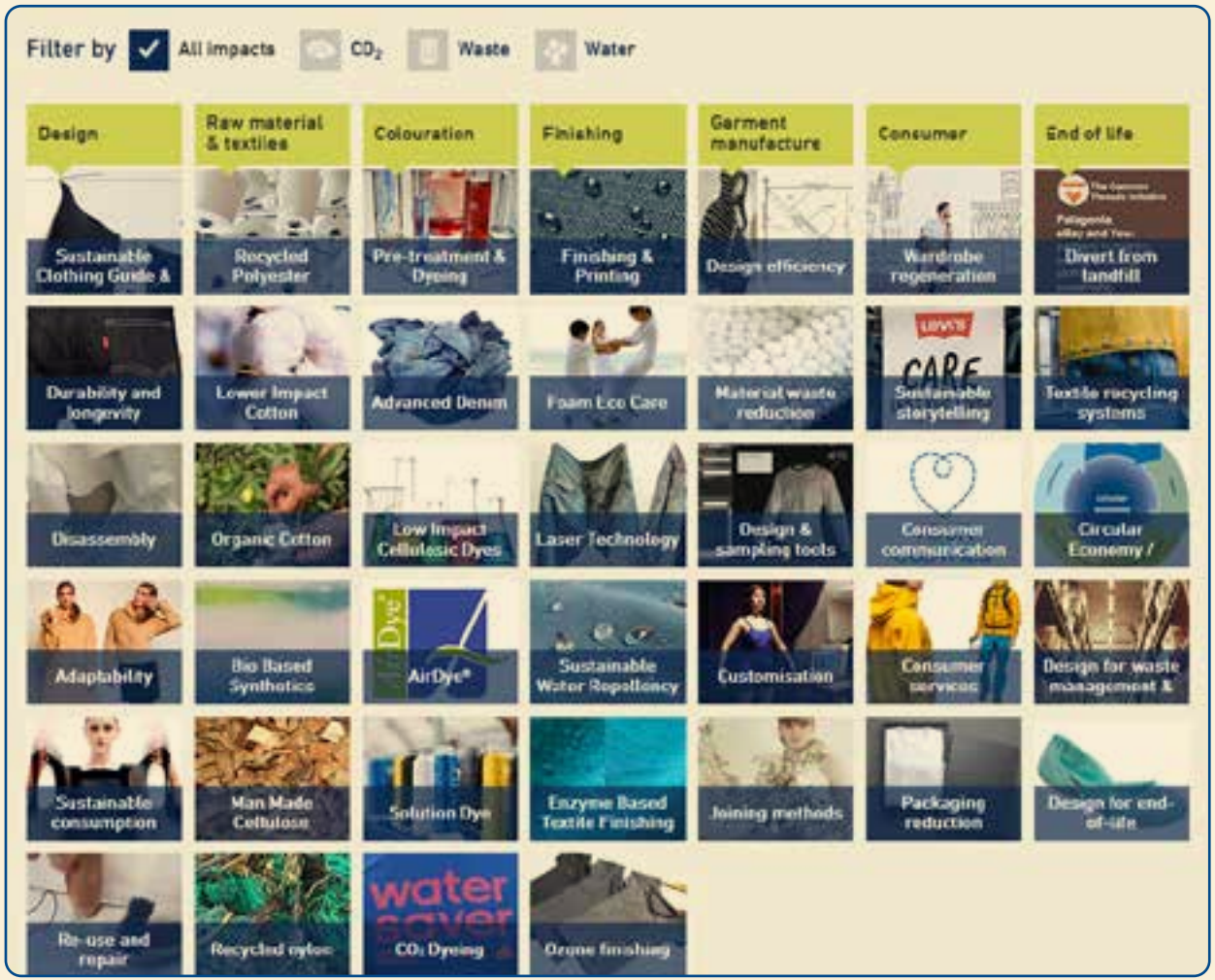
Module 07:

7.2 Example 2: Knowledge Clothing Hub

WRAP (Waste and Resources Action Program) envisions a sustainable world by working at the intersection of governments, businesses, communities, and individuals, forming partnerships and initiatives to promote sustainability. They have created the **Clothing Knowledge Hub**, which raises awareness of eco-friendly initiatives and technologies along each of the value chain steps.

Impacts

This SCAP Knowledge Hub brings together a wide range of studies on the carbon, water and waste savings that are possible throughout the clothing life cycle. Explore the site to find bite-sized summaries of the best available evidence on improving the environmental performance of clothing.



Source: WRAP (n.d.): https://ckh.wrap.org.uk/rawMaterialsAndFabrics/recycledPolyester?breadcrumb=Explore+by%3A+Impact

Module 07: 7.3 Example 3: Production Lifetime Extension Hub

The **Product Lifetime Extension Hub** serves as a centralized platform for gathering resources and tools that **promote the extension of product lifetimes** to support a more circular economy. It offers reports, case studies, and relevant materials focused on measures and processes aimed at postponing product obsolescence through deliberate interventions, thereby contributing to the principles of the circular economy.

Source: UNEP (2019): https://www.oneplanetnetwork.org/programmes/consumer-information-scp/product-lifetime-extension

Report on Policy Instruments on Product Lifetime Extension (PLE)

Relevant policies that countries have in place, or aspire to, for addressing product lifetime extension.

The report aims to provide an overview of diverse policies and regulatory approaches for product lifetime extension across the globe. The current review may provide a useful illustration of the main instruments and initiatives through which some countries have promoted the topic of product lifetime extension. This mapping focuses exclusively on policies and regulatory measures that aim to extend product lifetimes by designing more durable products, by extending their desirability or their use through maintenance, upgrades and repurpose, and by recovering broken products through repair, refurbishment or remanufacturing.

Case Studies

Various case studies were collected to illustrate product lifetime extension strategies and to showcase how consumer information tools can be used to enhance communication to consumers. The objective of these case studies is to inspire and encourage organisations to shift to more circular models, to improve their business models towards prolonging or extending a product's lifetime, and to better communicate it to consumers.

FEBRUARY 23, 2020 | UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)

Save Your Wardrobe - Product Lifetime Extension Case Studies on Electronic and Fashion Sectors

The case studies highlight the step-by-step behind their PLE strategies, success factors that can encourage other businesses...

ORGANISATION:
United Nations Environment Programme (UNEP)
TYPE:
Case studies, Concrete Applications and Best Practices
REGION(S):
Global
SECTOR(S):
Consumer Goods

FEBRUARY 23, 2020 | UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)

Revoada - Product Lifetime Extension Case Studies on Electronic and Fashion Sectors

The case studies highlight the step-by-step behind their PLE strategies, success factors that can encourage other businesses...

ORGANISATION:
United Nations Environment Programme (UNEP)
TYPE:
Case studies, Concrete Applications and Best Practices
REGION(S):
Global
SECTOR(S):
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FEBRUARY 23, 2020 | UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)

Newsan - Product Lifetime Extension Case Studies on Electronic and Fashion Sectors

The case studies highlight the step-by-step behind their PLE strategies, success factors that can encourage other businesses...

ORGANISATION:
United Nations Environment Programme (UNEP)
TYPE:
Case studies, Concrete Applications and Best Practices
REGION(S):
Global
SECTOR(S):
Consumer Goods

Module 07: 7.4 Example 4: Close the Loop Toolkit

The **Close the loop toolkit** is a guide encouraging fashion entrepreneurs to contribute to the shift towards a circular economy by **implementing strategies at various phases of a garment's lifecycle:** Resources, Design, Production, Retail, Consumption, and End of life. They are advised to choose strategies that align with their business's size, focus, and location. The guide provides **practical tips, directs to existing resources and organizations supporting the circular economy,** and continually updates a database with inspirational cases.

RESOURCES Materials matter
Go for low impact materials
Choose recycled or recyclable fibers
Reuse and redesign waste
Learn form nature
Think every aspect of you product

END OF LIFE Consider every ending as a new beginning
Biodegrade organic textile
Create new life through redesign and upcycling
Recycle textile
Organize collection and take-back systems
Prolong life through reuse

CONSUMPTION Go slow and take good care
Plan your wardobe
Take good care of your clothes
Recycle textile
Organize collection and take-back systems
Prolong life through reuse

FAN?

ABOUT THIS GUIDE

In a circular fashion industry, designers, producers, retailers & consumers are challenged to take the whole life cycle of a garment into account. Flanders DC and Circular Flanders guide you through the principles of this sustainable way of working.

GET TO WORK Don't put off till tomorrow what you can do today
Explore the vocabulary of sustainability
Start with your quick wins
Draw up an action plan with the Planner
Get the entire company involved
Move transparency and communication to the top of your priorities

Design Design for eternity
Design to last
Design for rebirth
Design to minimize waste
Design to reduce the need for rapid consumption
Design with new technologies in mind

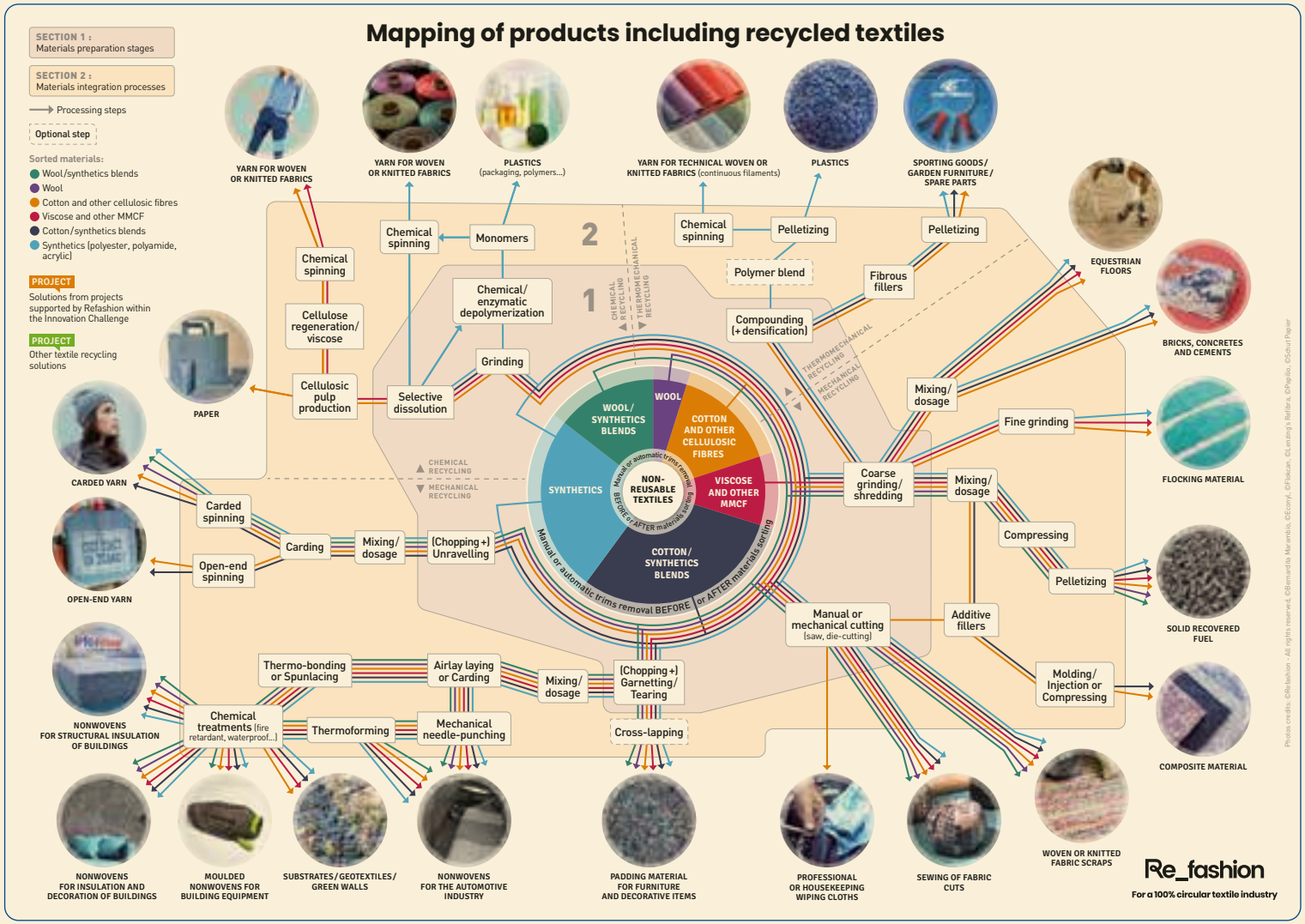
Production Produce clean, local and with respect
Mind people and planet
Try new technologies
Produce locally, match supply and demand
Avoid waste and surplus
Go for long life and durability

Retail Hack the take-make-waste model
Keep your e-commerce sustainable
Rethink the definition of ownership
Go for a more service-oriented business
A second life at the online marketplace
Think about the impact of your marketing

Source: Flanders DC (n.d.): https://close-the-loop.be/en/the-loop/cases?form=projectsIndexForm&phases%5B%5D=2&phases%5B%5D=5&q=&countries=

Module 07: 7.5 Example 5: Recycle Re_Fashion

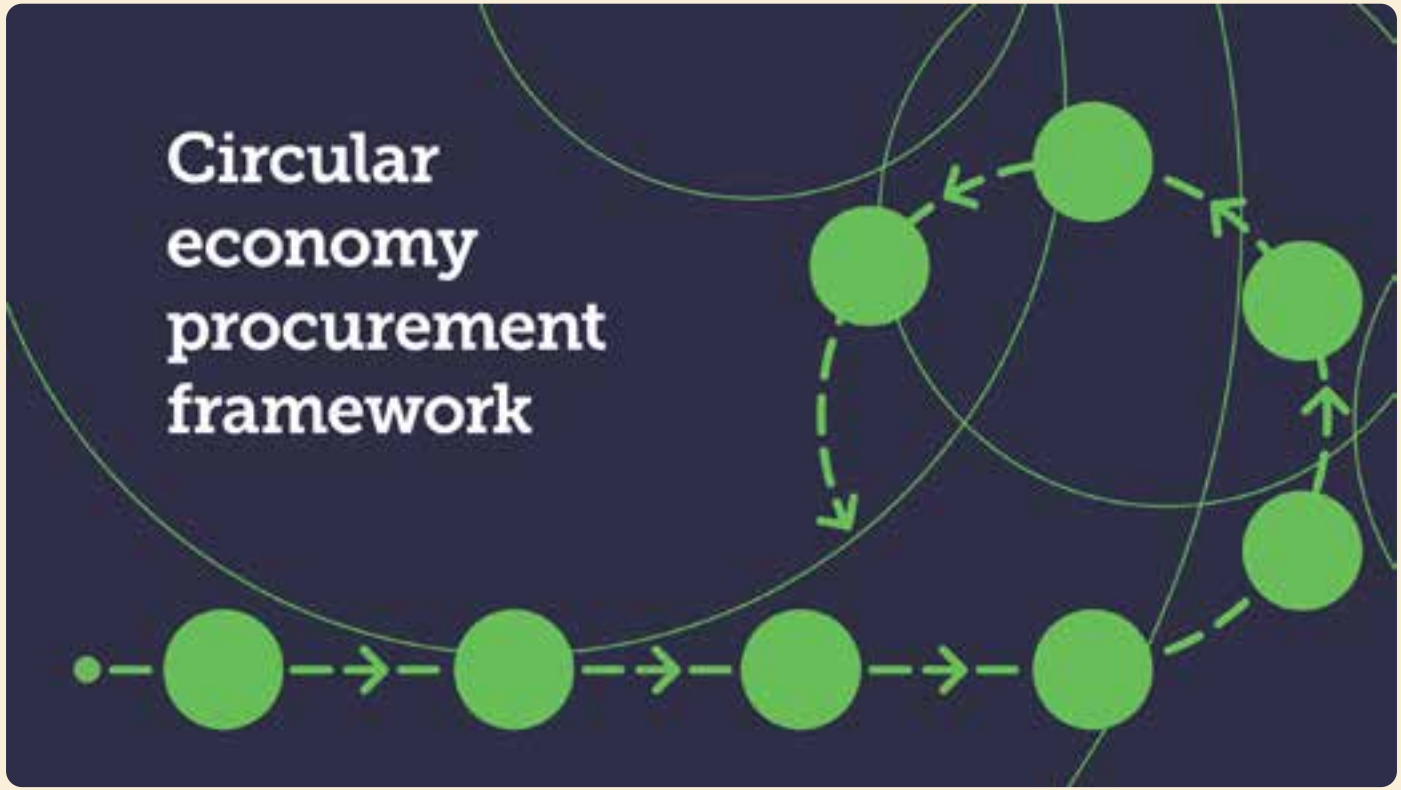
Recycle by Refashion, a digital platform and website, innovates within Refashion's mission to advance post-consumer clothing and footwear recycling. Through a subscription-based platform, it **maps recycling resources and connects professionals to accelerate the adoption of recycling solutions**, while the open- access website shares industry news and educational resources. This unique European platform streamlines sourcing recycled polyester, finding solutions for shoe recycling, accessing fabric swatches, and promoting the industrialization of recycling solutions, covering various materials like wool, cotton blends, synthetics, and more.



Source: Refashion (n.d.): https://recycle.refashion.fr/en/cartographies-du-recyclage/

Module 07: 7.5 Example 6: Recycle Re_Fashion

The circular procurement framework offers a comprehensive perspective on the key junctures where organizations can transform their **procurement decisions into more circular practices and foster dialogues and cooperative circular alliances** with their suppliers. These overarching principles, as presented in this resource, must be customized to suit each unique business context and can vary based on industry, sector, company size, geographic location, and other pertinent variables.



Source: Ellen MacArthur Foundation (n.d.): https://www.ellenmacarthurfoundation.org/circular-economy-procurement-framework

Module 07: 7.5 Example 7: CE Policy Toolbox

The **CE Policy Toolbox** outlines key policy instruments categorized based on two dimensions: the **type of policy instrument and the circular economy (CE) strategy**. By clearly defining each circular strategy and systematically examining pertinent policies, this toolbox aims to **empower policymakers to move beyond the prevailing emphasis on recycling** in policy development. Furthermore, the differentiation of policy types for each circular strategy facilitates the creation of a comprehensive policy mix, encompassing economic incentives, regulations, information dissemination, and public procurement.

Circular Economy policy enablers	Circular strategies				
	Cross-strategy	**Maintain, repair & upgrade**	**Reuse**	**Remanufacture**	**Recycle**
Other regulations	• Assessment of circular criteria in EU product registry for market access (i.e. "Conformité Européenne"/CE marking)[3] including declaration of toxins[1]/ nontoxic composition (SVHC)[3] • Mandatory producer deposit systems for products reflecting raw material intensity of e.g. technical devices, electronic goods, clothing[3] • Set absolute reduction targets for selected material streams[1, *] • Set absolute waste prevention targets in general and for specific product groups[1, *]	• Extend legal warranties to planned technical lifetime, to three years for all goods, or five years for selected goods[1, 8] as incentive for service business models • Extended commercial producer warranties[2b] to planned technical lifetime[1] or five years[3] • Reversal of the burden of proof in legal warranties[2] • Implement warranty statement obligation of manufacturers, and extension of the limitation period for warranty claims[2, 2b] • "Right to repair" by users and autonomous repair facilities[7,*] including right to update (obsolete) software[7, *]	• Differentiate new vs. used goods in international trade statistics[1] • Mandatory use or quota for retailers to use standardised reusable packaging[1] • Extension of single-use plastics policy to more goods[2] • Prohibition of destruction of returned products from online shopping[3]	• Duty to remanufacture complex technical products if economically and environmentally reasonable[3] • Remove nation, EU, and international regulations which put reman at a disadvantage (e.g. health and safety regulations; regulations prohibiting sale of remanufactured products as "new")[4] • Adopting a government strategy for reman with associated targets and milestones[4]	• Introduce positive lists and "safe-bydesign" chemicals into the EU's product and chemicals regulations[1, 7, 9] • (Candidate) substances of very high concern (SVHC) in materials are declared in safety data sheets with higher resolution (100 ppm instead of REACH's 1000 ppm)[9] • Stricter REACH regulations regarding inclusion of substances of very high concern (SVHC) and their elimination from products[9]
III. Standards	• Supporting the development of broader CE standards (e.g. ISO/ TC 323)[*] • Supporting open-source standard for CE data and information[2]	• Standardisation of components and connectors especially in electronic products[2] • Standardisation of replaceable battery form factors for high impact good categories (e.g. mobile phones)[*]	• Supporting the development of quality standards for used goods by national bodies (e.g. Roundtable Reparatur)[2] • Standardisation of universal electric devices (e.g. chargers)[7, *] • Further standardisation of returnable packaging systems (e.g. standardised bottle)[1]	• Developing quality standards and labels for the reliability of remanufactured products/components[4] • Development of international remanufacturing standards (e.g. RIC001.1-2016)[10] and diffusing them through linkage with environmental management systems and standards[3, 5]	• Development of new and reference to existing standards and certification systems for high quality recyclates with transparency regarding physical, chemical, biological properties and quality assurance regarding toxicological properties (e.g. RAL, cradle to cradle)[1, 2]

Source: Circular Economy Initiative Deutschland (2020):Circular Business Models: Overcoming Barriers, Unleashing Potentials (squarespace.com)

Module 07: 7.5 Example 8: EllenMac Arthur Jeans Redesign Guidelines

The Jeans Redesign Guidelines

The **Jeans Redesign Guidelines** serves as a practical **toolkit for advancing circularity** in the fashion industry, particularly focusing on jeans. Developed through collaborative efforts with input from 80 experts spanning industry, academia, and NGOs, these guidelines encourage prominent brands, mills, and manufacturers to revolutionize the design and production of jeans. **Transparency and shared learning** are integral aspects of the project. Participants are obligated to **publicly update on their progress and showcase the methods employed to align with the guidelines.** In 2021, the guidelines' 'minimum bar' was elevated to heighten ambition levels and propel the industry forward.

Source: Ellen MacArthur Foundation (2023): https://emf.thirdlight.com/link/The_Jeans_Redesign_Insights_report_2021-2023/@/preview/1?o

Module 07: 7.5 Example 9: Circular Toolbox

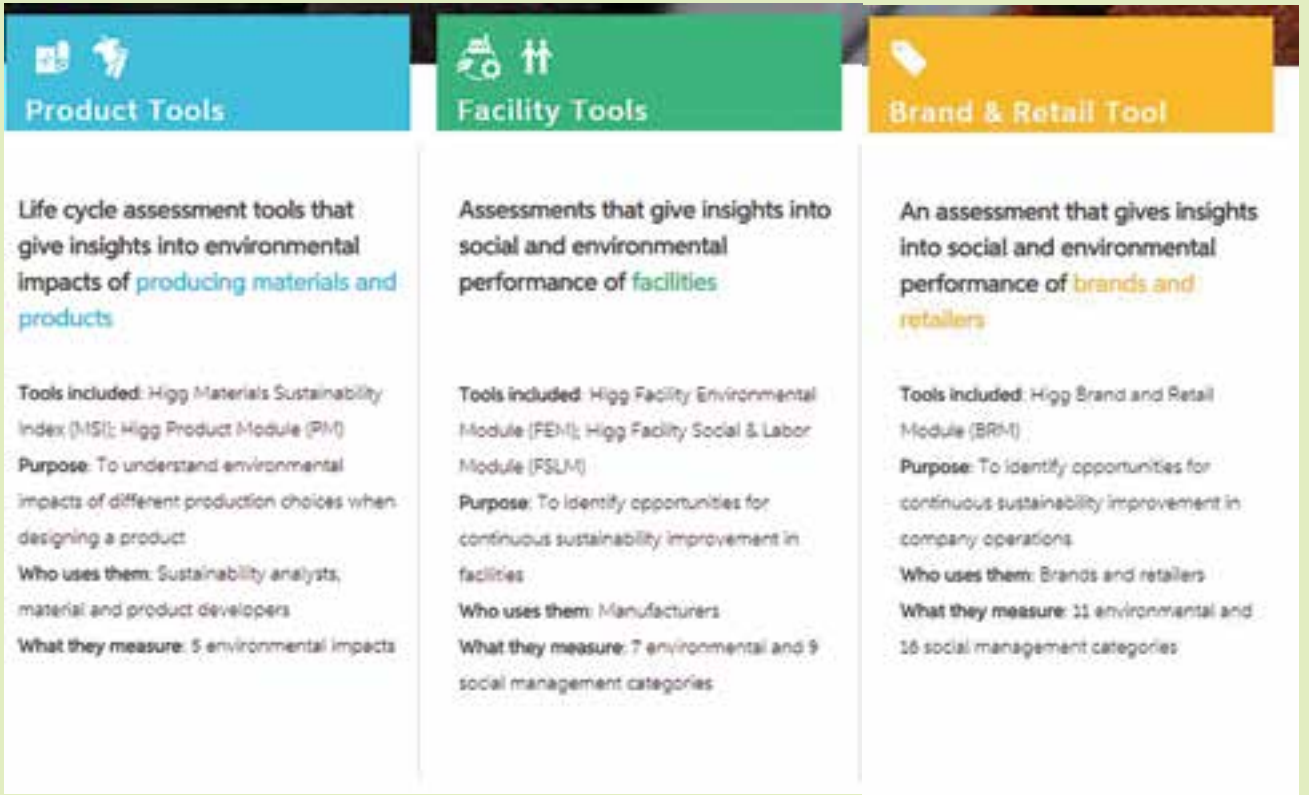
The **Circular Toolbox** is designed to assist apparel brands in creating and launching their own **circular pilots**, specifically focusing on **rental or resale business models**. This comprehensive toolbox leads brands through a five-step circular innovation process, starting from obtaining top-level approval and assembling a team to piloting the new concept on the ground. Included resources consist of **design thinking and research tools, workshop sheets, facilitator's guides, and a podcast featuring brands** that have successfully undergone the same process. The toolbox provides specific guidance on when and how to use each tool.

Source: Circle Economy (n.d.): https://www.thecirculartoolbox.com/module/getting-started

Module 07: 7.5 Example 10: Higgs Index

The **Higg Index** is a comprehensive suite of **tools designed for standardized measurement of value chain sustainability**, serving as a central element in the Sustainable Apparel Coalition's (SAC) mission to drive transformative impact in businesses. It provides a **common language and platform for companies and organizations to track and measure their social and environmental impacts**, enabling them to leverage verified data for performance measurement, improvement, and sharing.

Comprising five tools, including the Higg Facility Environmental Module (FEM), Higg Facility Social & Labor Module (FSLM), Higg Brand & Retail Module (BRM), Higg Materials Sustainability Index (MSI), and Higg Product Module (PM), the Higg Index **assesses both the social and environmental performance of the value chain** and the environmental impacts of products.



Source: Sustainable Apparel Coalition (n.d.): https://apparelcoalition.org/tools-programs/higg-index-tools/

Module 07: 7.5 Example 11: BAT Guidelines Federal Environment Agency

The guideline is directed towards companies involved in textile or shoe production, specifically those operating in the global market and supplying goods to Europe. It's for those who want to enhance environmental standards due to consumer demand or market pressures but are unsure how to start. The document highlights the increasing importance of environmentally-friendly manufacturing in consumer markets. It aims to demonstrate that **adopting the Best Available Techniques (BAT) for eco-friendly production not only benefits the environment but also significantly benefits the company. The guideline is based on Best Available Techniques Reference Documents (BREFs)**, globally recognized resources offering practical experience and continuously evolving expertise in technical environmental protection within the textile and shoe industry.

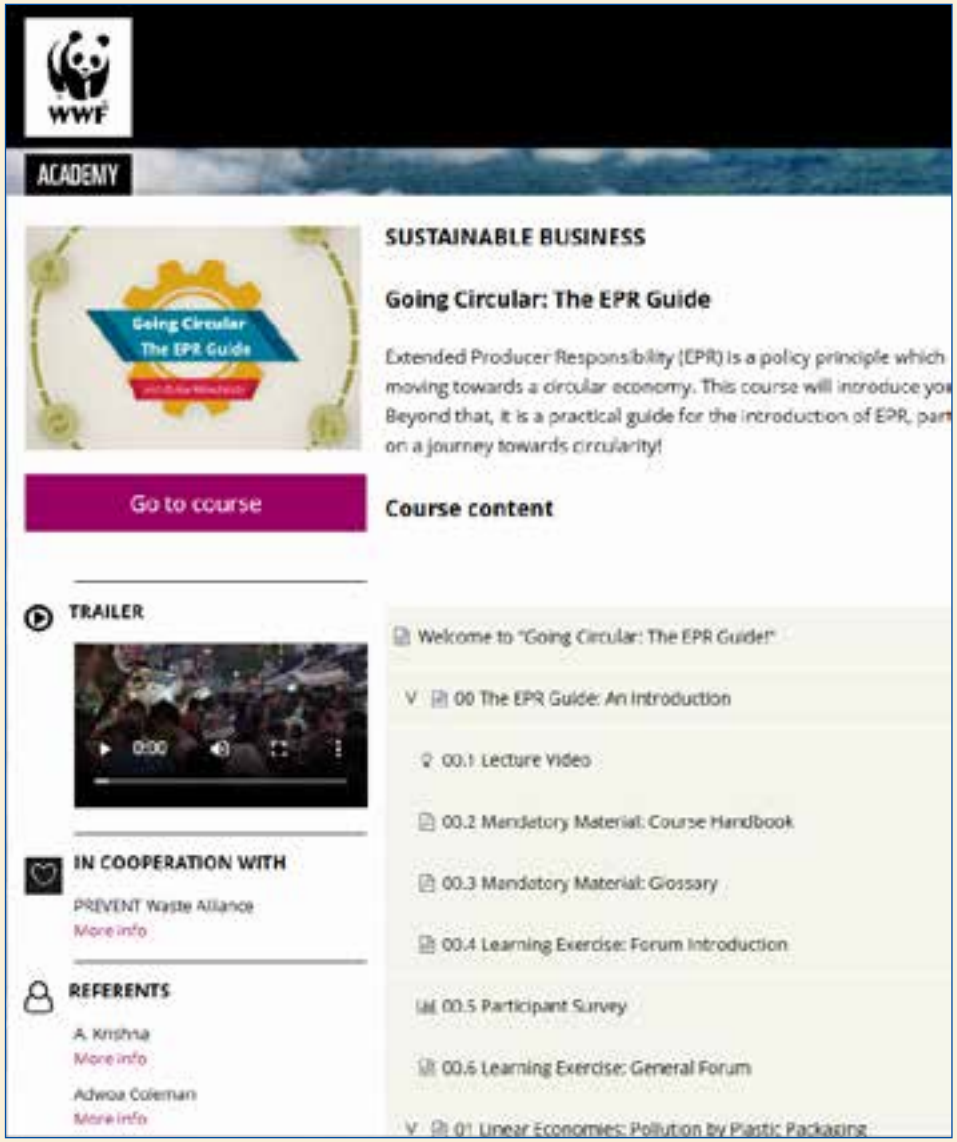
Source: Federal Environment Agency (2011): https://www.umweltbundesamt.de/sites/default/files/medien/publikation/long/4289.pdf

Module 07: 7.5 Example 12: Online training toolkit on EPR by WWF

Extended Producer Responsibility (EPR) stands as a crucial policy principle in eliminating pollution from packaging waste and propelling us toward a circular economy.

This program, hosted on the WWF Academy among a plethora of other online training modules, **targets policymakers, companies engaged in the packaging lifecycle, waste management service providers, and civil society groups** (e.g., NGOs, researchers, students). Its primary objective is to **familiarize participants with the fundamental principles of EPR schemes**.

Furthermore, it provides a practical, hands-on approach to implementing EPR, specifically designed for developing nations. The course is free to register for and spans a duration of 12 hours.



Source: WWF (n.d.): https://www.wwf-akademie.de/catalog/view/course/id/215

Module 07: 7.5 Example 11: BAT Guidelines Federal Environment Agency

- The project focused on establishing **ecodesign standards for non-energy-related products**, primarily using textiles as a case study and extending the approach to the furniture sector. It suggested that existing eco-labels could serve as a starting point for these requirements but highlighted the **need for stricter, evolving standards under the Ecodesign Directive**.
- The proposed requirements revolved around **enhancing durability, facilitating reuse, repair, and recyclability**. It emphasized the importance of consumer guidance on disposal and providing recyclers with detailed material information for effective recycling.
- Additionally, to bolster the market for recycled materials, the project recommended **setting minimum recycled content criteria for new products**.

Requirement	Themes addressed	Description	Type of requirement		
			Informative	Threshold	Other
1. Declaration of, and/or minimum threshold for recycled content	Recycling	Textile products must carry a visible label with a declaration of the percentage by weight content of recycled materials AND/OR Products within [stated fibre group] must contain a minimum of X% recycled material by weight.	✓	✓	
2. Durability of fasteners	Durability	Fasteners should be able to be fastened and unfastened X number of times without failure.		✓	
3. Availability of spare parts	Durability Reparability	The producer must make spare parts available for X years after product has been on sale, or alternatively must provide spare parts with the product (e.g. extra buttons, thread of correct colour, replacement zips etc.).			✓
4. Design for disassembly	Durability Reparability Reusability Recyclability	The product logo, buttons and zips should be removable within X seconds. Seams should be disassembled within X seconds but without reducing durability under normal use and care. Instructions should be provided on how to do this.		✓	
5. Provision of detailed bill of materials	Recyclability Recycled content	The product must include, or link to, a list of all materials included in the product and at what level they are pure or mixed with other materials, and the share they make up by weight of the product down to a chosen threshold (e.g. 1%). Products that are made from a single material (with tolerance around 98%) must be stamped with a "100% recyclable" stamp.	✓		
6. Care and maintenance labelling	Durability Reparability	The product must be accompanied with information (or link to information) on recommended care and maintenance tips that can prolong the lifetime of the product (and reduce use phase impacts).	✓		
7. Dimensional changes during washing and drying	Durability	Between minus X % and plus X % for woven products, and durable non-wovens, other knitted products.		✓	
8. Colour fastness to washing	Durability	Colour-fastness to washing must be at least X (test score) for colour change and at least X (test score) for staining.		✓	
9. Colour fastness to perspiration (acid, alkaline)	Durability	Colour fastness must be at least X (test score for colour change and staining).		✓	

Source: Nordic Council of Ministers (2018): http://norden.diva-portal.org/smash/get/diva2:1221509/FULLTEXT01.pdf

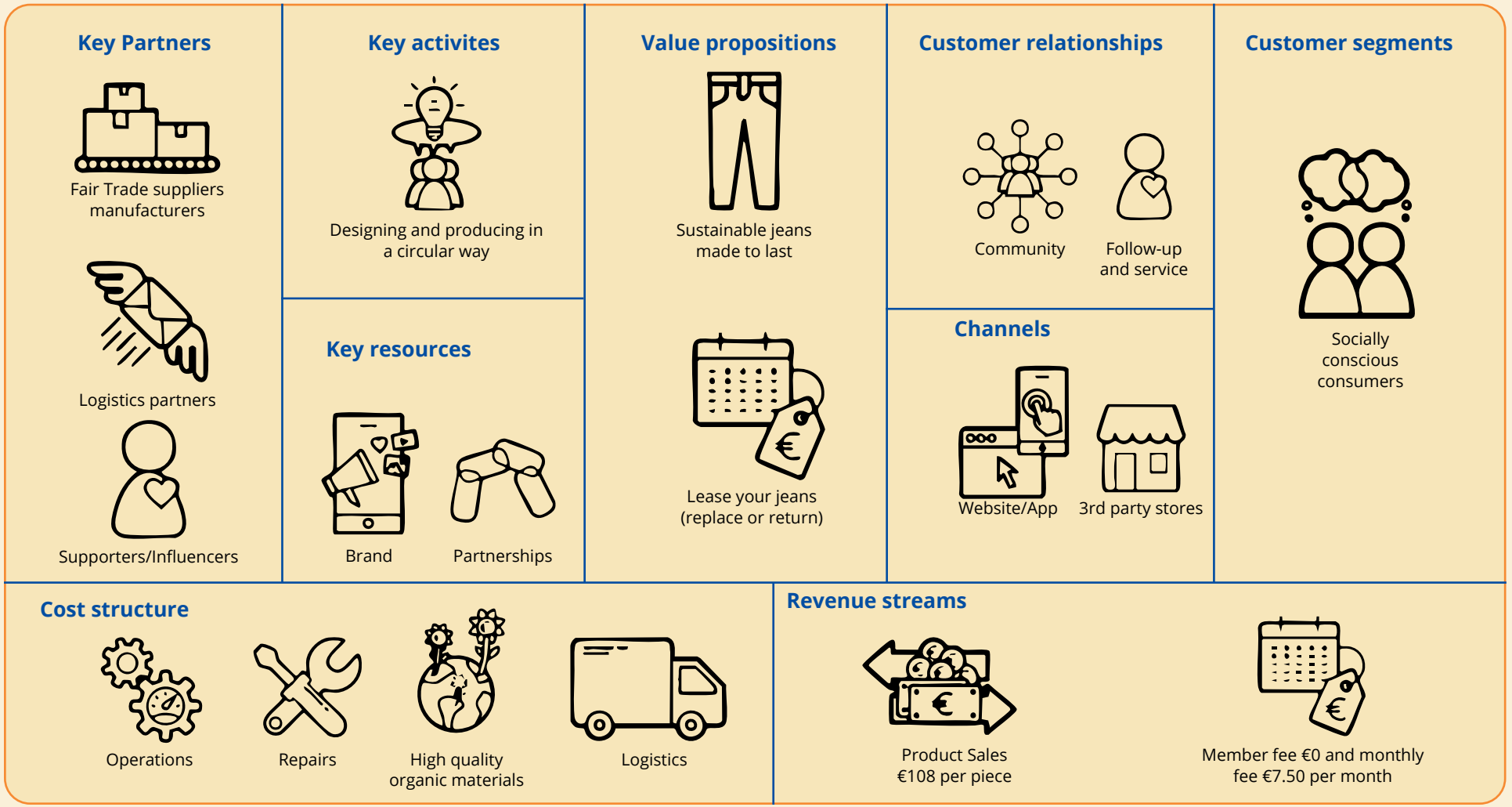
Module 07: 7.5 Example 13: Ecodesign criteria for consumer textiles

- The study categorizes textile products into seven main categories, exploring criteria related to their ecodesign regulation.
- It identifies three key aspects: **life prolongation, closing the loop, and responsible production**, each with subcategories detailing quality, recyclability, and labor conditions. However, implementing clear criteria, especially for recyclability and responsible production, proved challenging due to evolving technologies.
- The study emphasized the **importance of stakeholder collaboration to develop solid quality standards, legislative revisions to combat greenwashing, and the promotion of voluntary** labels to ensure responsible production practices.
- With the Textile Strategy being launched recently, the content of this report, made by experts in the field, could serve as input for further developments on EU policy level

Source: OVAM (2021): https://circulareconomy.europa.eu/platform/sites/default/files/ecodesign_criteria_for_consumer_textiles.pdf

Module 07: 7.5 Example 14: Canva Business Model

Exercise: Select one of the above presented value chain steps and think of a specific business model idea (like the one below) to enhance circularity in this value chain stage.



Source: adelphi (2022)

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Module 08: Additional Readings

The following recommended readings will provide you with further information:

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Notes