Seamless

Circular clothing design foundations

An introduction to the principles of circular clothing design

June 2025

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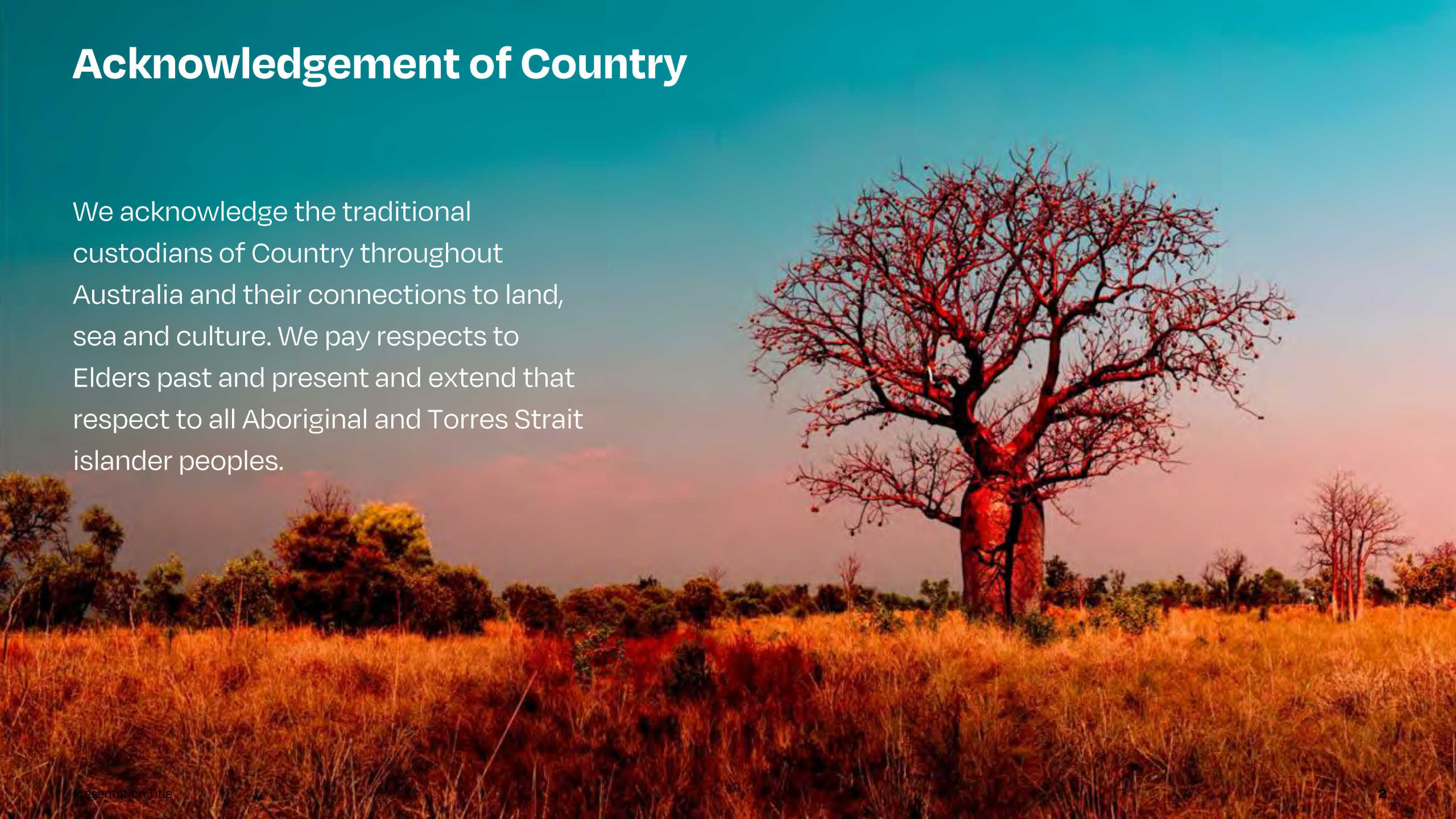
Acknowledgement of Country

We acknowledge the traditional custodians of Country throughout Australia and their connections to land, sea and culture. We pay respects to Elders past and present and extend that respect to all Aboriginal and Torres Strait islander peoples.



What we'll cover

01 Welcome and introduction

02 The challenge

03 Introducing circular clothing design

04 The role of stewardship schemes

05 The imperative for circularity

06 Practical starting points

07 Questions

01.

Welcome and introduction

Meet the trainers

Courtney Holm

- CEO and Founder of A.BCH World and Circular Sourcing.
- Circular fashion designer and systems thinking.

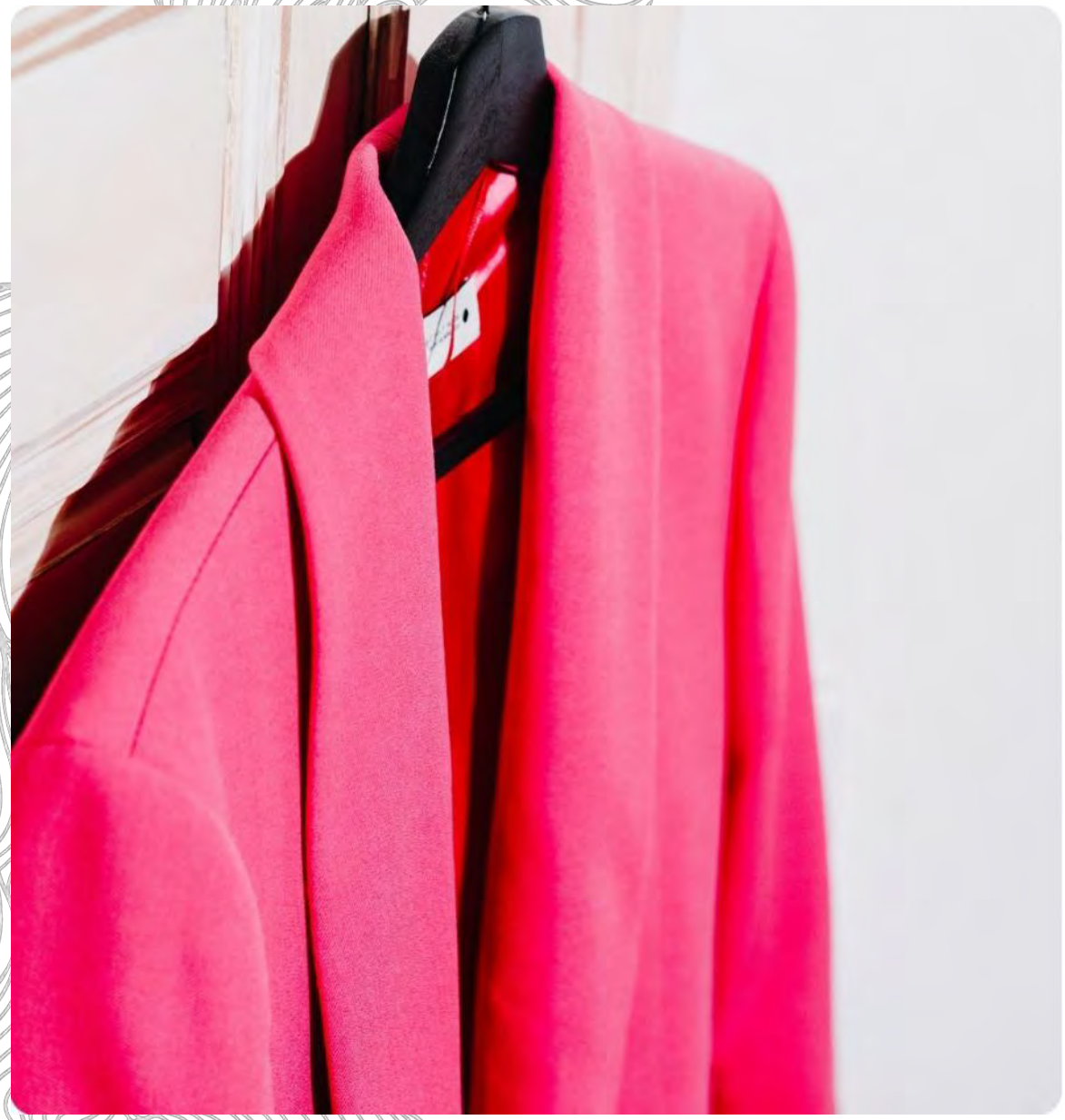
Julie Boulton

- Leading sustainability expert in application of futures thinking, circular principles and systems design.
- Advises business and government on implementing sustainability frameworks.

Learning objectives

01 Describe the global and local context for circular clothing design, including the drivers, impacts, and system-level changes influencing the shift from linear to circular models.

02 Apply the foundational principles of circular economy including resource efficiency and lifecycle thinking to identify practical starting points for your organisation to integrate circular thinking and support sustainable transformation of business models and the Australian clothing industry.



Discussion

Consider the clothing item you brought with you or something you're wearing today:

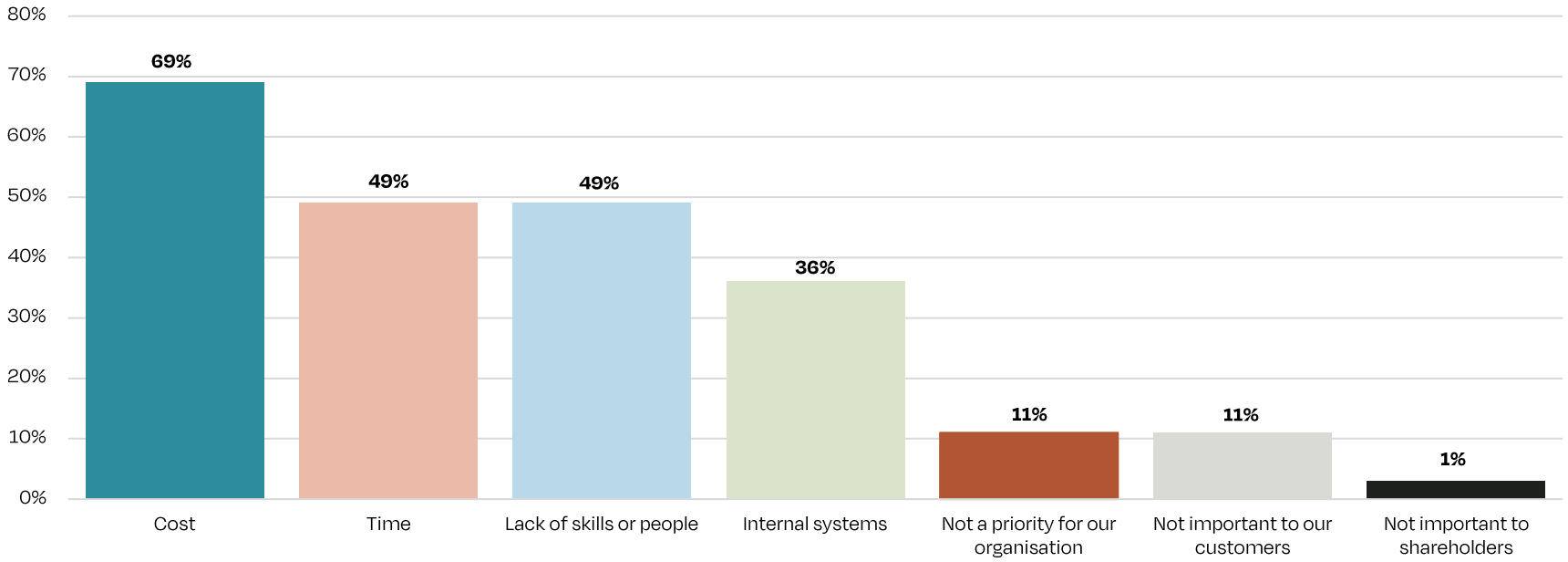
01 Are there aspects of your clothing item that reflect circularity principles?

02 Which aspects aren't circular?

What you told us

Cost, time and skills are your most significant barriers

We asked you to nominate the barriers that may prevent their organisation from adopting circularity principles more widely.



The pre course survey also demonstrated you have varied levels of understanding of circularity. Also, while you told us that all aspects of this course are important, understanding the foundational principles of circularity and getting practical starting points for your organisation were slightly more important

02.

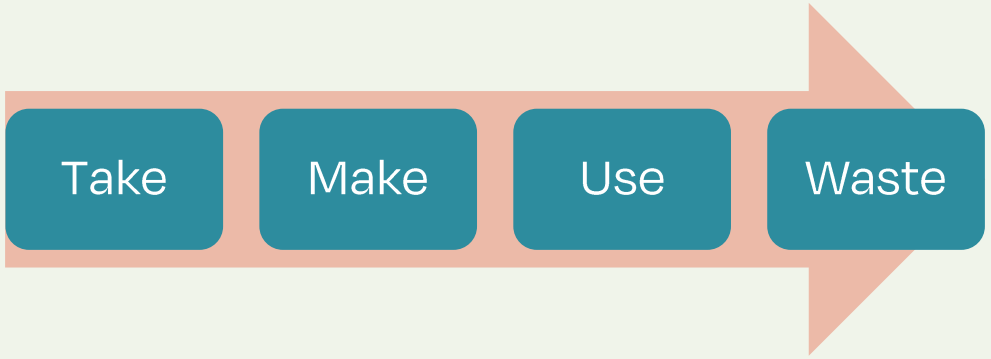
The challenge

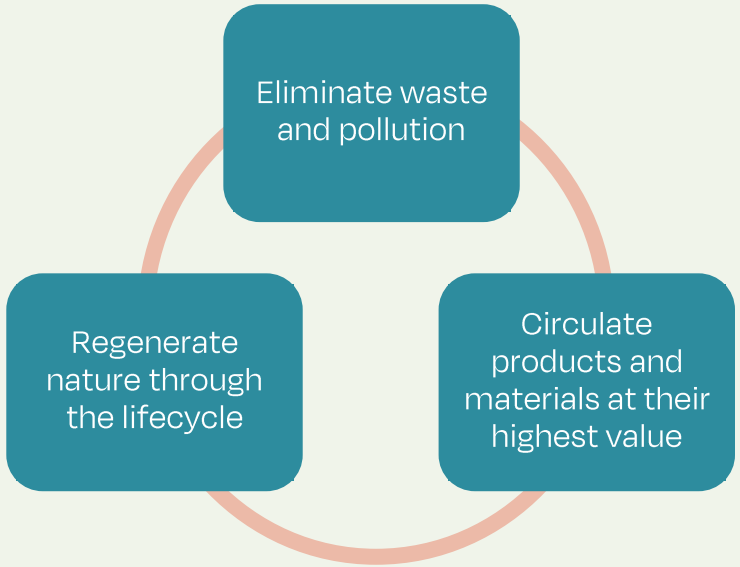
The current challenge

In Australia in 2024:

- Over 1.46 billion items of clothing were imported.
- Australians bought 1.5 billion garments, or 55 items per person.
- Households held over 4.9 billion garments in their wardrobes, with 255 million items unworn.
- 180,000 tonnes of clothing were resold, swapped, donated and shared, an average of 11 second hand items per Australian.
- 220,000 tonnes (880 million garments) ended up in Australian landfill.

Linear vs circular





- A **linear economy** is where products are made, used and discarded – the 'take, make, waste' economy.
- A **circular economy** eliminates waste throughout a product's lifecycle by ensuring that safe, recyclable or renewable inputs are used and that what we make is used for longer, and made to be reused.

Principles of a circular economy

"A circular economy is a regenerative system in which input system and waste, emission and energy leakage are minimised by slowing, closing and narrowing energy loops." (UNFCCC, 2019)

The three principles of a circular economy are:

Material flows

- The circular system can be understood within two material flow cycles: **biological** and **technical.**
- The **biological cycle** refers to a natural systems process for materials that are generated, consumed and returned to the earth safely.
- In the **technical cycle**, products and materials are kept in circulation for as long as possible so as to maintain the value embedded in the product.

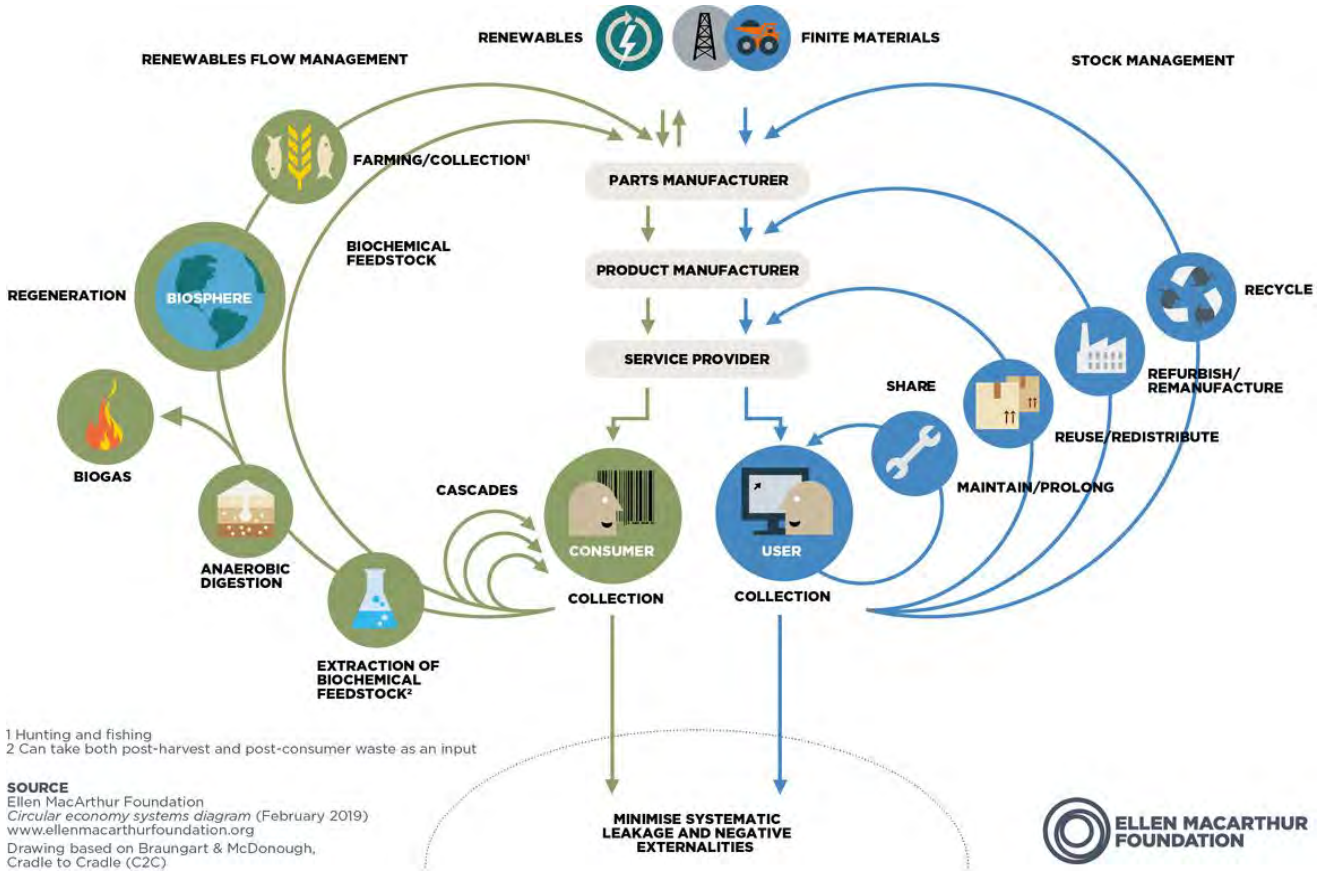
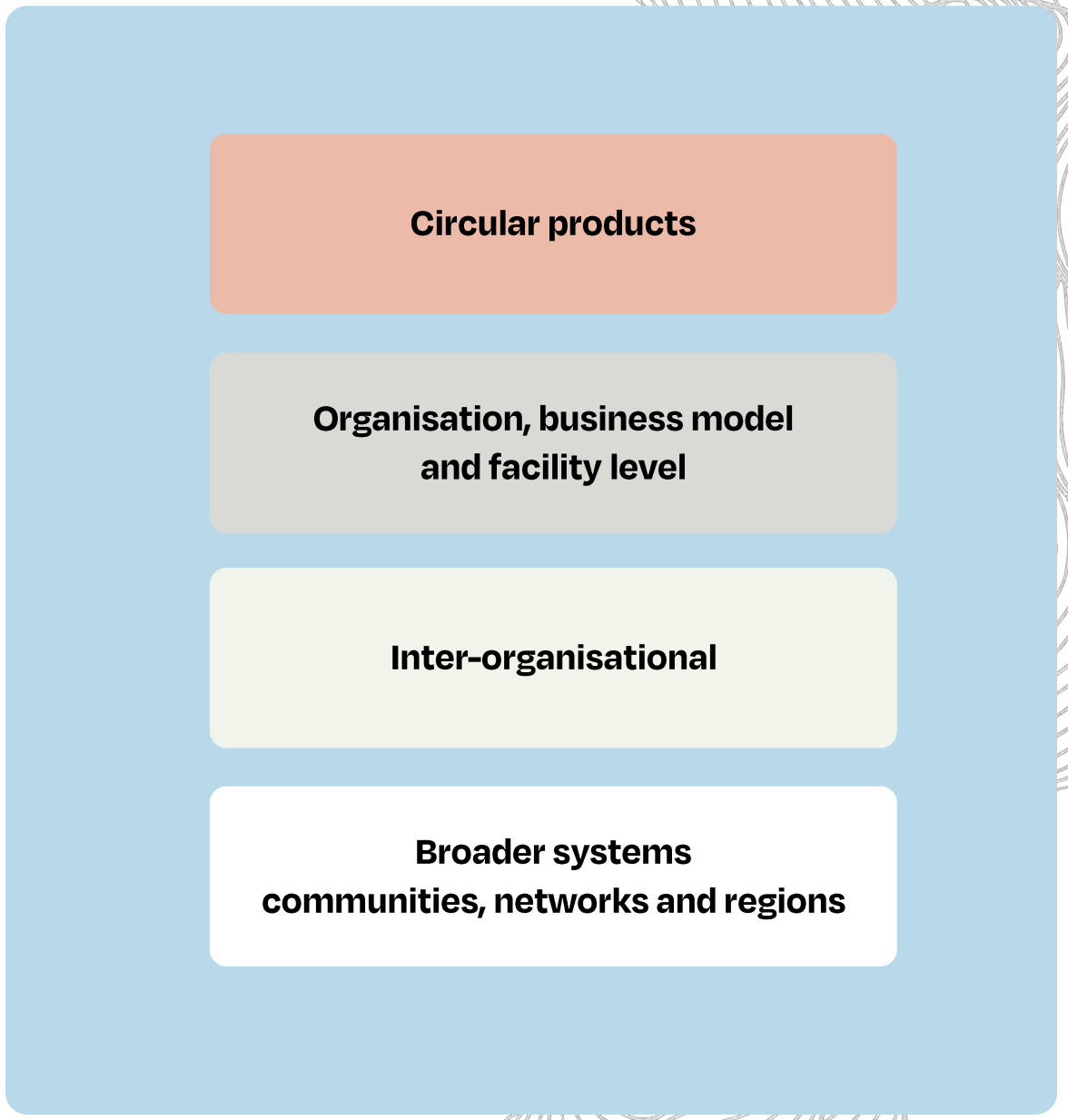


Image courtesy of the Ellen Macarthur Foundation

Circular system levels

- Businesses will be impacted by the circular economy through standards, regulation and consumer demand.
- Businesses play a critical role in the transition to a circular economy through:
  - Product transformation
  - Organisation adaptation
  - Inter-organisational cooperation
  - Global and regional systems



Discussion

Why do you think design is a key driver for a circular economy?

03.

Introducing circular clothing design

Refashioning

- **Refashioning: Accelerating Circular Product Design at Scale** (Refashioning) is an innovative circular design guide for all clothing brands, no matter the scale.
- It was produced by a collaboration led by RMIT University's School of Fashion and Textiles and delivered in partnership with Country Road Group, A.BCH World and Julie Boulton Strategy and Sustainability.
- This training program leverages this guide, which was published in 2024.

Circular design method

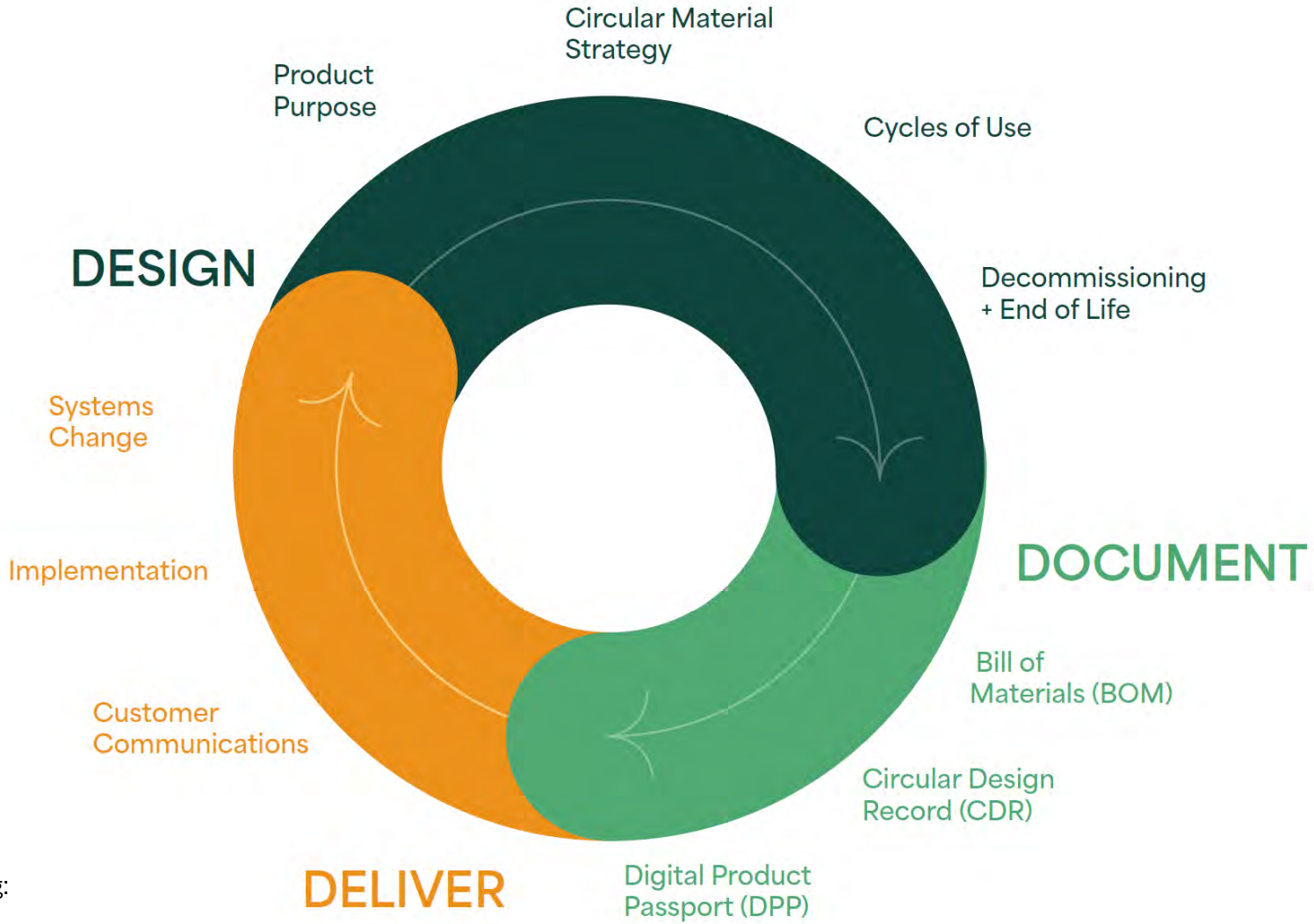
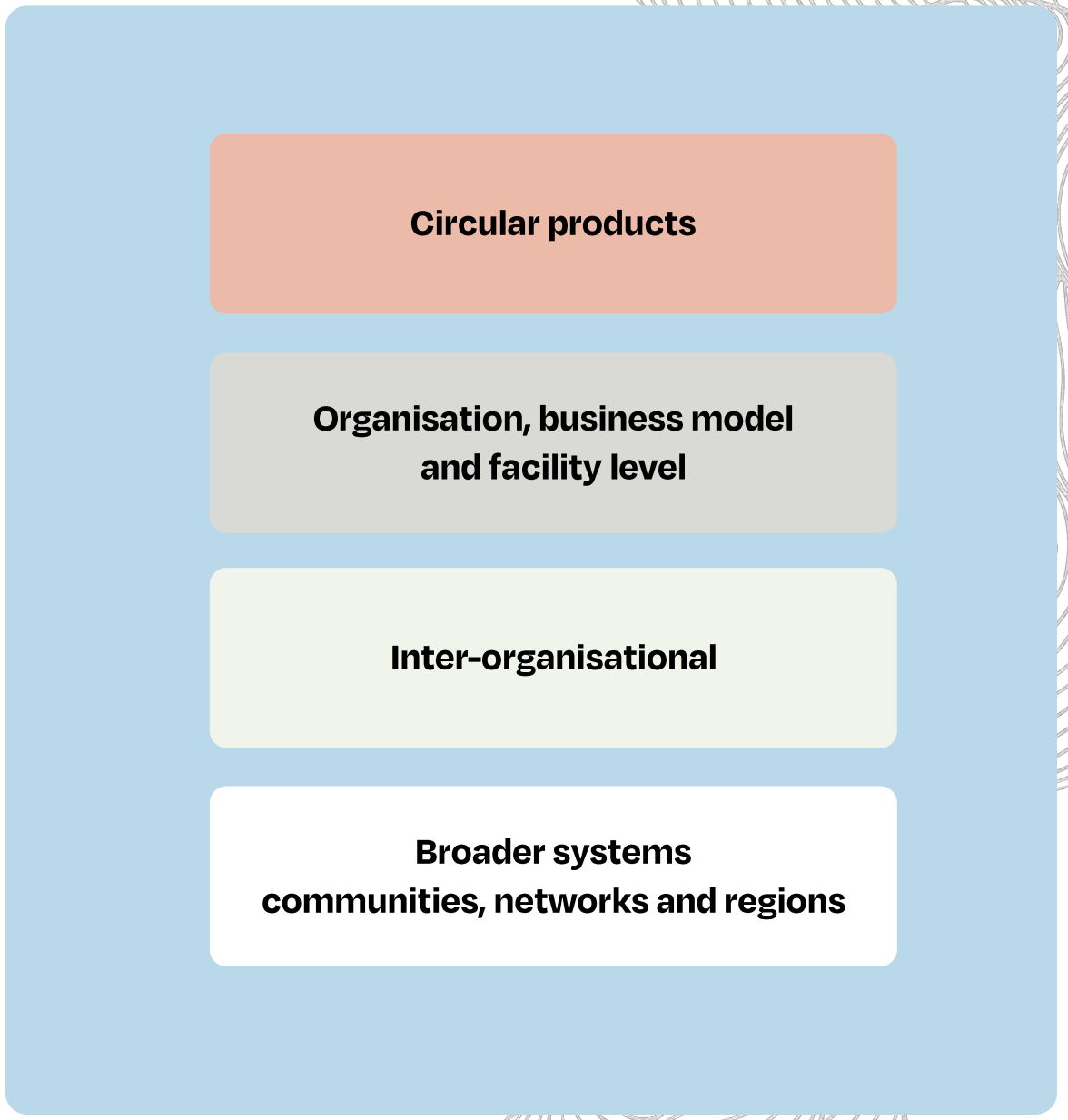


Image: Refashioning circular design method, 'Refashioning: Accelerating Circular Product Design at Scale', 2024

Leading with product design

- By leading with design, we're investing in more circular products immediately.
- With more circular feedstock flowing through the system, circular business models can thrive, and suppliers can enact changes to increase efficiencies.
- Inter-organisational and broader system change may take longer due to multiple stakeholders and, ideally, should be supported with policy.



Circular design

- **Circular design** embeds circular economy principles into the design process. The objective is to produce products that can flow through a circular system.
- **Slowing the flow** is about designing products for a long life - they are kept in use at their highest value, for longer.
- **Closing the loop** is about designing for end of life – identifying how material value can be captured and reclaimed from the beginning.

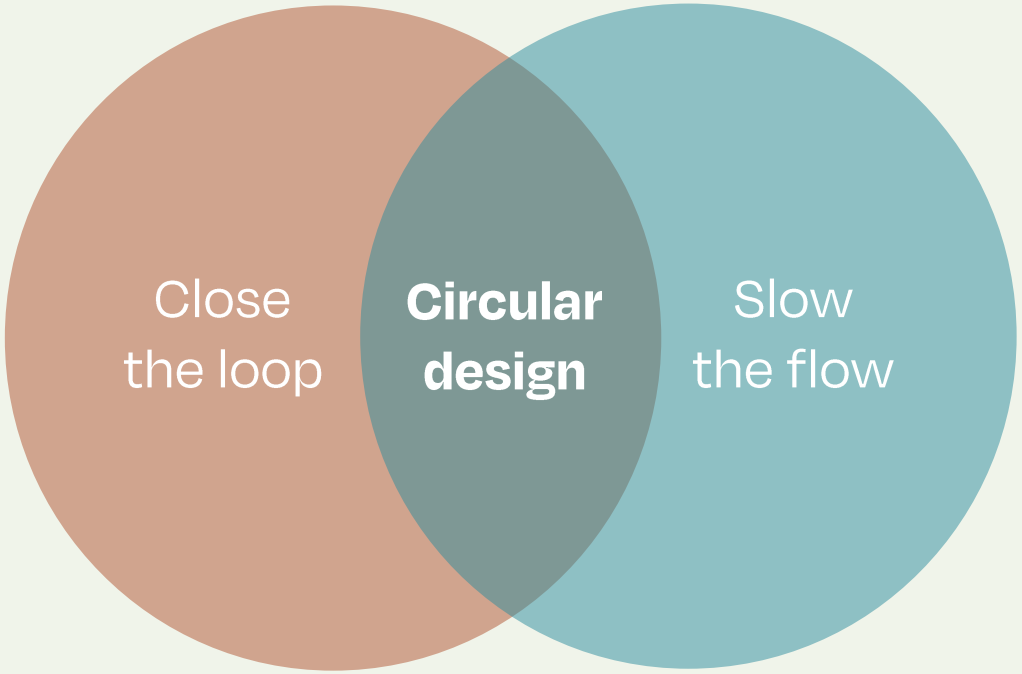


Image adapted from 'Refashioning: A Practical Guide'

Circular principles for clothing

- Clothing is used more
- Clothing is made to be made again
- Clothing is made from safe and recycled or renewable inputs

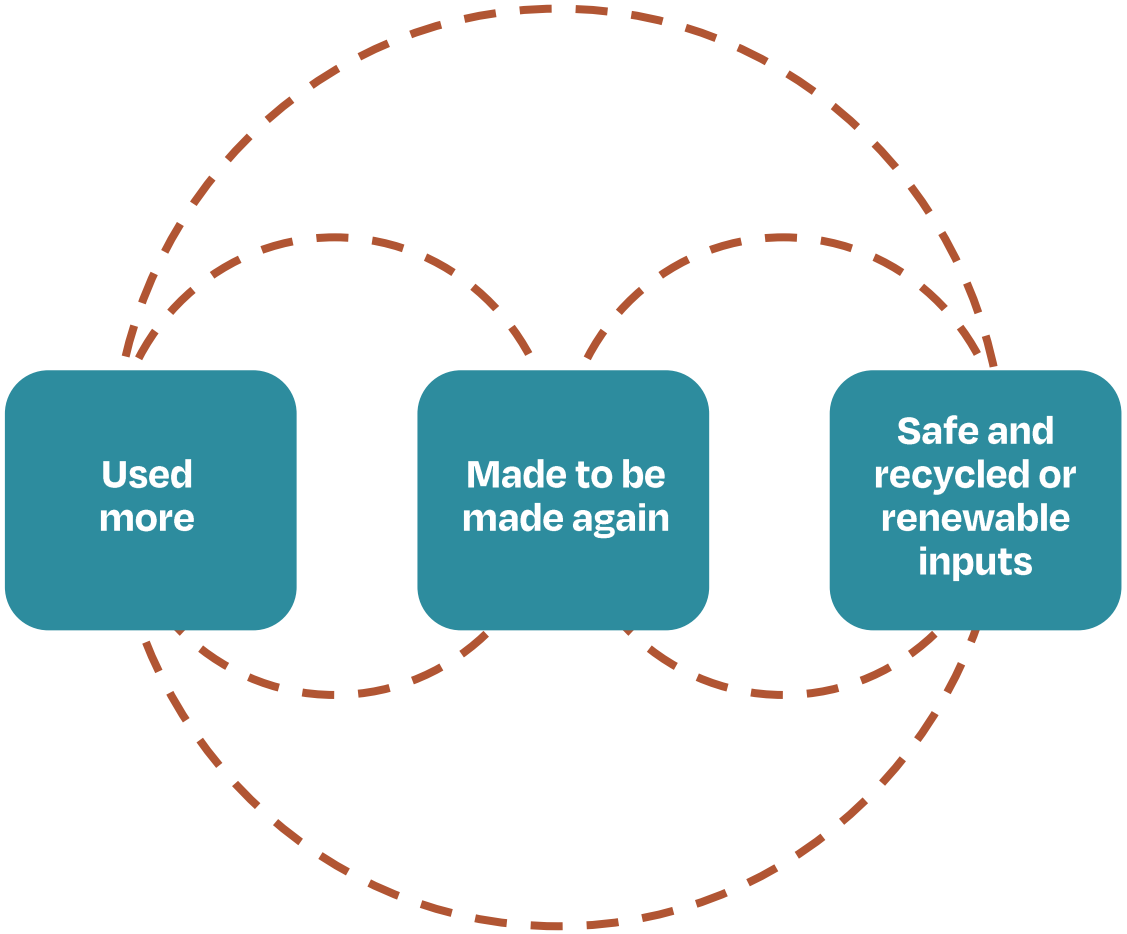


Image adapted from 'Principles for Circular Fashion', Ellen MacArthur Foundation

Circular design for the full lifecycle

- Designing clothing for circularity requires knowledge of the full product lifecycle.
- It's crucial that designers consider the full lifecycle and if the product is not able to circulate past the use phase, to question whether the product needs to be created in the first place.
- Products that are not able to flow through this system are not circular.

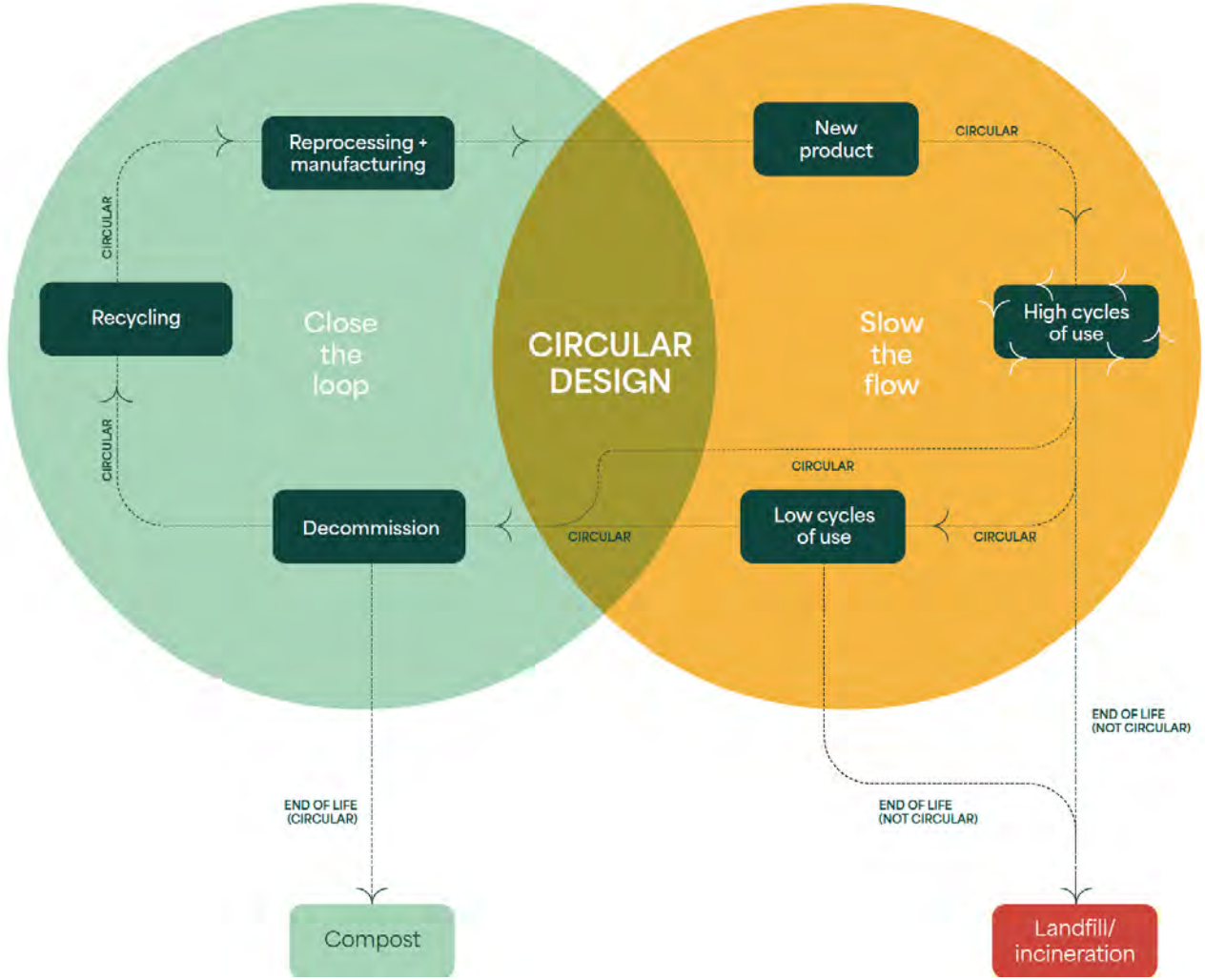


Image: Refashioning circular design systems approach, adapted from A.BCH World

Lifecycle design

- To achieve full circularity, circular design processes must cover the entire lifecycle of a product and the system it cycles within.
- Each stage in the lifecycle design should be planned for, documented and communicated.
- The integrity of lifecycle design is maintained through excellent record keeping and communication with internal and external stakeholders.

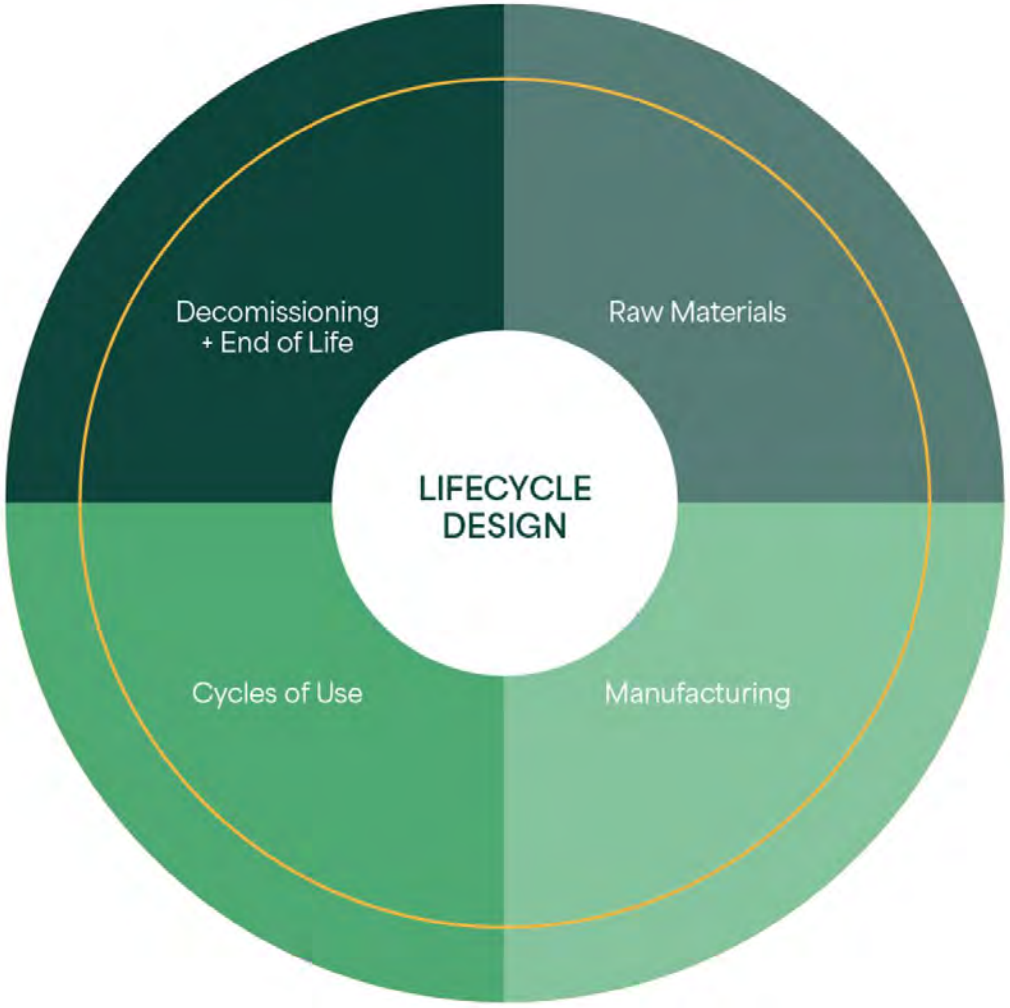
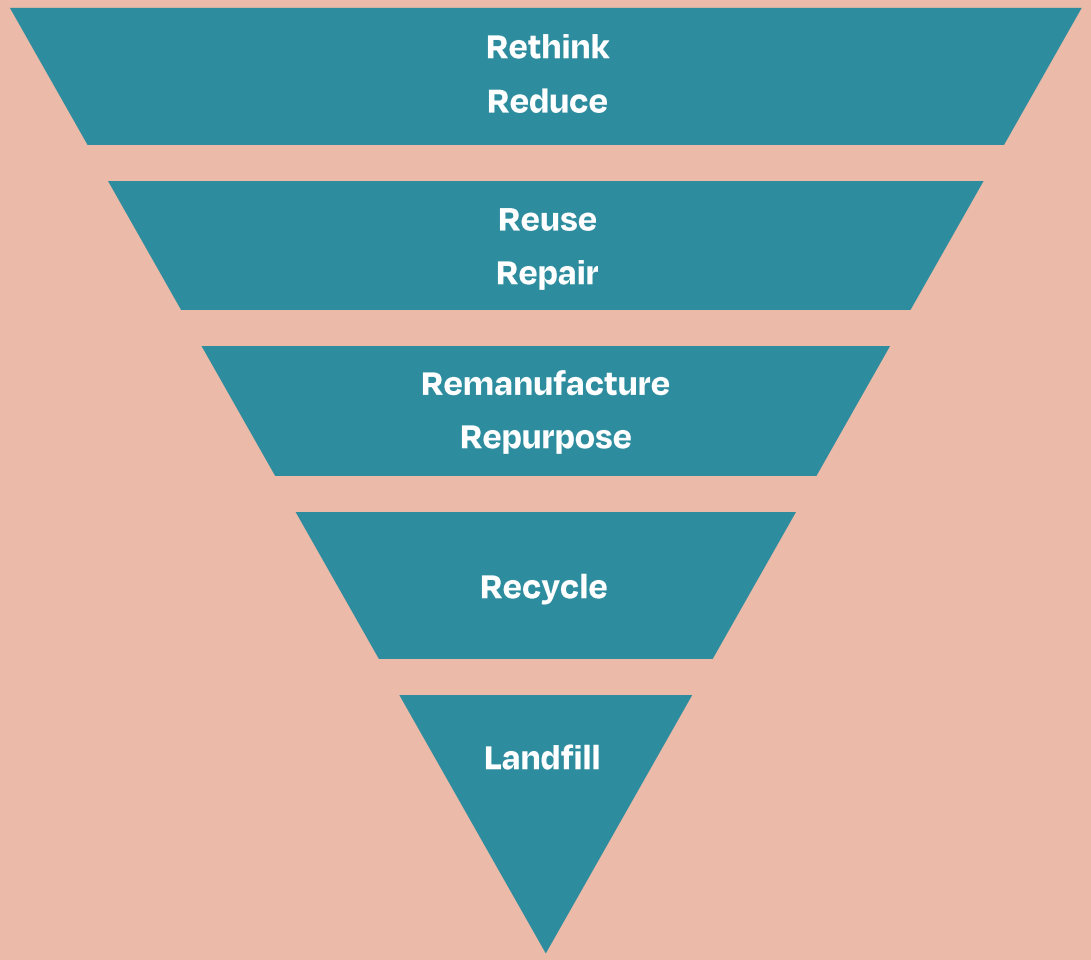


Image: Refashioning lifecycle design



The resource hierarchy

The resource hierarchy

- The resource hierarchy refers to product flowing through a technical cycle.
- The logic applies to the circular system as a whole, meaning that strategies and actions with both ‘slow the flow’ and ‘close the loop’ should be pursued.
- The diagram flow speaks to the key circular economy principles.

Applying circular design principles

Milestone	Actions	Potential leaders	Why it's important
Set a circularity goal	Agree on one tangible target for the next season/quarter (e.g. "25 % of fabric sourced from circular inputs" or "launch a take-back pilot")	Leadership, Sustainability	Aligns teams on a measurable north star
Circular design brief	Update design briefs to include targets for circular material strategies such as mono-material or simple disassembly	Design	Embeds circularity at the concept stage where 80 % of impact is locked in
Lifecycle partner mapping	List all potential lifecycle partners through each of the 4 stages and set up partnership discussions	Design, Procurement	Builds relationships and enacts partnerships with value chain suppliers for full circularity realisation
Pilot and iterate	Pick one hero product, run a limited circular edition, gather real-world data on cost, quality and sell-through	Cross-functional	Low-risk proof-point; builds confidence and an internal case study
Story and signal	Craft a simple, factual narrative and share early wins with the team and customers	Marketing, Compliance	Drives demand, educates stakeholders, and keeps momentum high
Measure and report	Track material-diverted, CO_2e saved, margin uplift and feed results into next goal cycle	Leadership, Sustainability, Finance	Quantifies value, secures executive buy-in and aligns budgets

Discussion

Has anything we've covered so far surprised you?

04.

The role of stewardship schemes

Extended producer responsibility schemes

- Product stewardship or Extended Producer Responsibility (EPR) schemes recognise that the organisations who place products on the market are responsible for their entire lifespan.
- EPRs are used to support the environmentally sound management of products and materials over their life.
- In Australia, EPR schemes can be voluntary, mandatory or co-regulated with industry.
- In Australia, EPR schemes already exist for many products including mobile phones ('Mobile Muster'), printer cartridges, batteries, mattresses and tyres.

Seamless is a circular EPR

- EPR schemes tend to focus only on collection and recycling with limited results.
- A circular approach to EPR, which covers upstream actions like circular design, extending the use phase and changing citizen behaviour, is a more holistic solution.
- Seamless is Australia's first **clothing** product stewardship scheme, and the world's first **circular** product stewardship scheme.

Seamless, Australia's clothing stewardship scheme

Priority areas

CIRCULAR DESIGN

Brands to design garments that are more durable, have recycled content and are recyclable.

- Design
- Materials
- Manufacturing

CIRCULAR BUSINESS MODELS

Pilots and support to de-risk new business models to extend the life of clothing.

- Rental
- Reuse, resale and repair
- Subscriptions
- Made to order

CLOSING THE LOOP

Support payments for effective collection, sorting and recycling. Establish trusted end markets for resource outputs.

- Recycling
- Collection and sorting

CITIZEN BEHAVIOUR CHANGE

Nationwide education campaigns to help Australians choose clothes better, enjoy them for longer and recycle them with care.

The road to regulation

- Textiles have been identified as a problematic product and remain on the Federal Government Environment Ministers product stewardship priority list.
- Other signals that the government is focused on circular economy are:
  - Productivity Commission Interim Report: ‘Unlocking the opportunities from Australia's Circular Economy’
  - Circular Economy Ministerial Advisory Group report: ‘Circular Advantage’
  - Federal Government Recycling and Waste Reduction Act Review

International stewardship

- Around the world, mandatory EPR schemes for textiles exist in France, Hungary, Latvia and the Netherlands.
- A voluntary EPR scheme for textiles exists in Colombia.
- EPR schemes are also under consideration in the EU, Kenya, California and New York.
- Also, the EU Green Deal proposes mandatory sustainability and circularity requirements for textiles, and some American states and EU nations ban textiles from landfill.

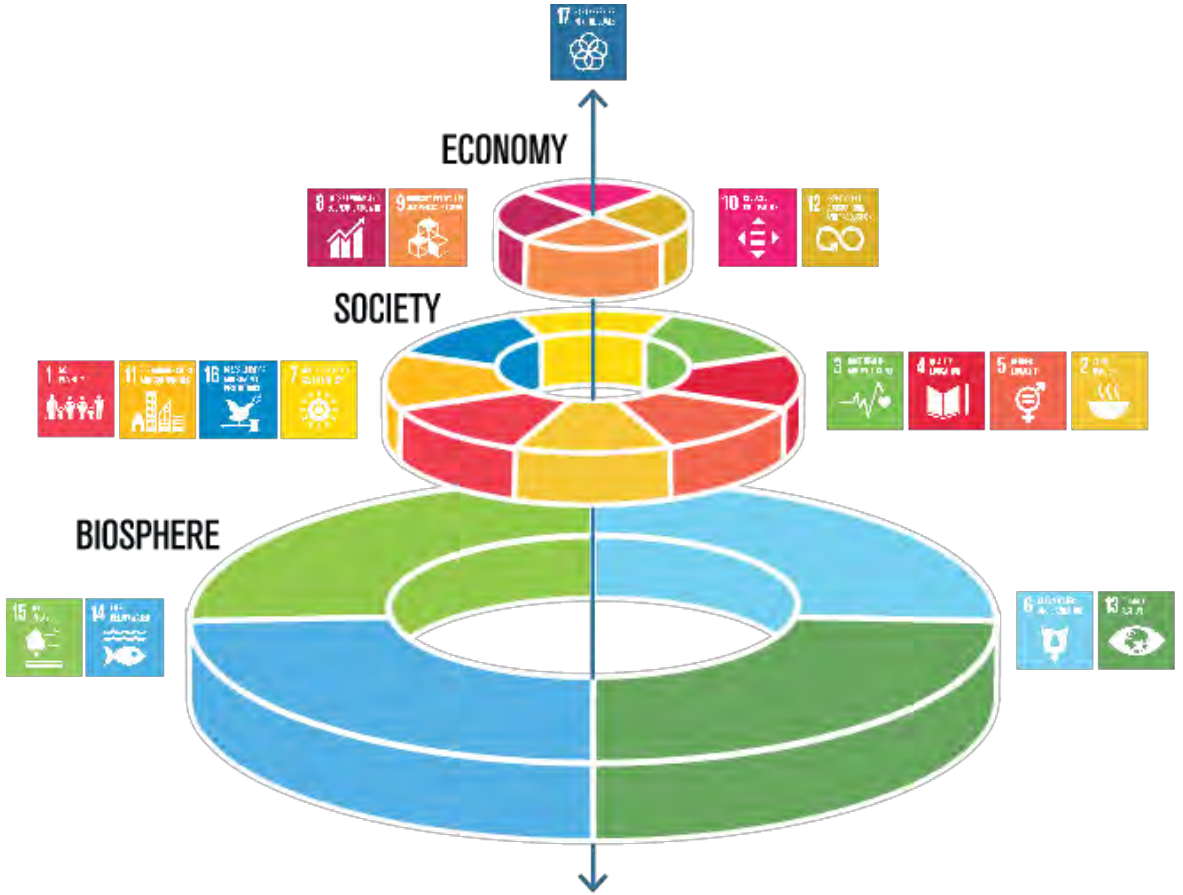
05.

The imperative for circularity

Sustainability and circularity

Sustainable: causing or made in a way that causes little or no damage to the environment and therefore able to continue for a long time.

A **circular economy** is a regenerative system in which input system and waste, emission and energy leakage are minimised by slowing, closing and narrowing energy loops. (UNFCCC, 2019).



Global goals for sustainable development

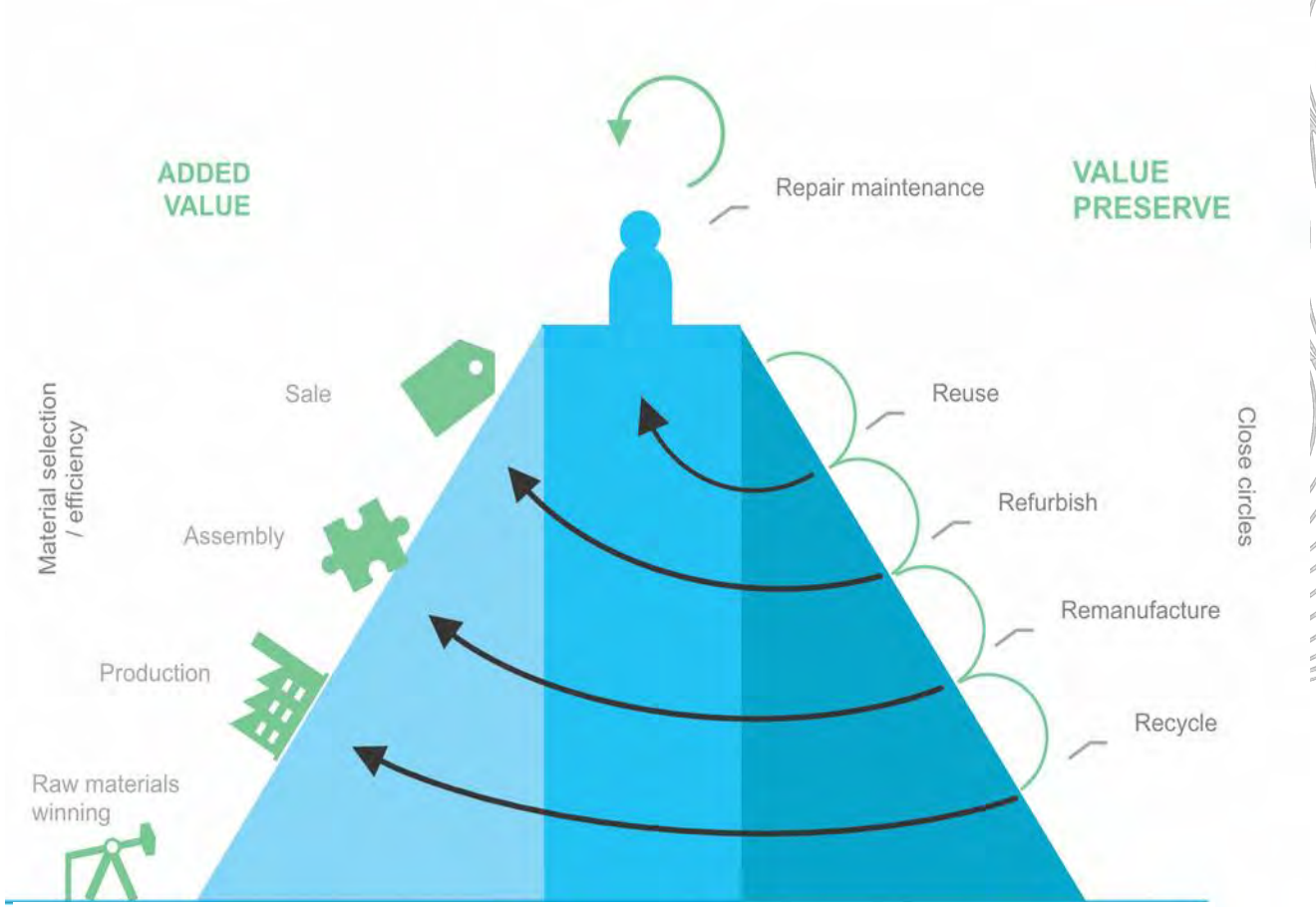
Image courtesy of stockholmresilience.org

Imperatives for circularity

Economic: opportunities for increased revenue and reduced costs

Environment: resource conservation and reduction in landfill

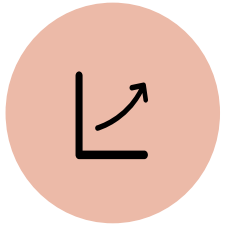
Social: enhanced customer and staff loyalty and retention



The Value Hill

Image source: 'Master Circular Business with the Value Hill', Circle Economy & Sustainable Finance Lab, September 2016

Imperatives for circularity



Economic

Reduced costs for new materials, storage and landfill

New circular business models generate revenue

Reduced risk from decreased reliance on virgin materials

Circularity leadership positioning provides market differentiation

Operational efficiencies gained from more durable products

Environment

Reduction in landfill, waste and pollution

Reduced reliance on natural resources encourages regeneration and biodiversity

Reduced demand for new raw materials lessens the pressure on natural habitats and ecosystem

Reduced greenhouse gas emissions

Social

Attracting and retaining staff

Increasing customer loyalty

Improved durability reduces total cost of ownership

Greater utilisation through the additional choices circular business models provide

Increased job growth in new markets

Clothing and textiles impact

Annually, the global clothing and textiles industry:

Extracts 98 million tonnes of non-renewable resources

Utilises 93 billion cubic metres of water

Is the third highest emitter of greenhouse gases

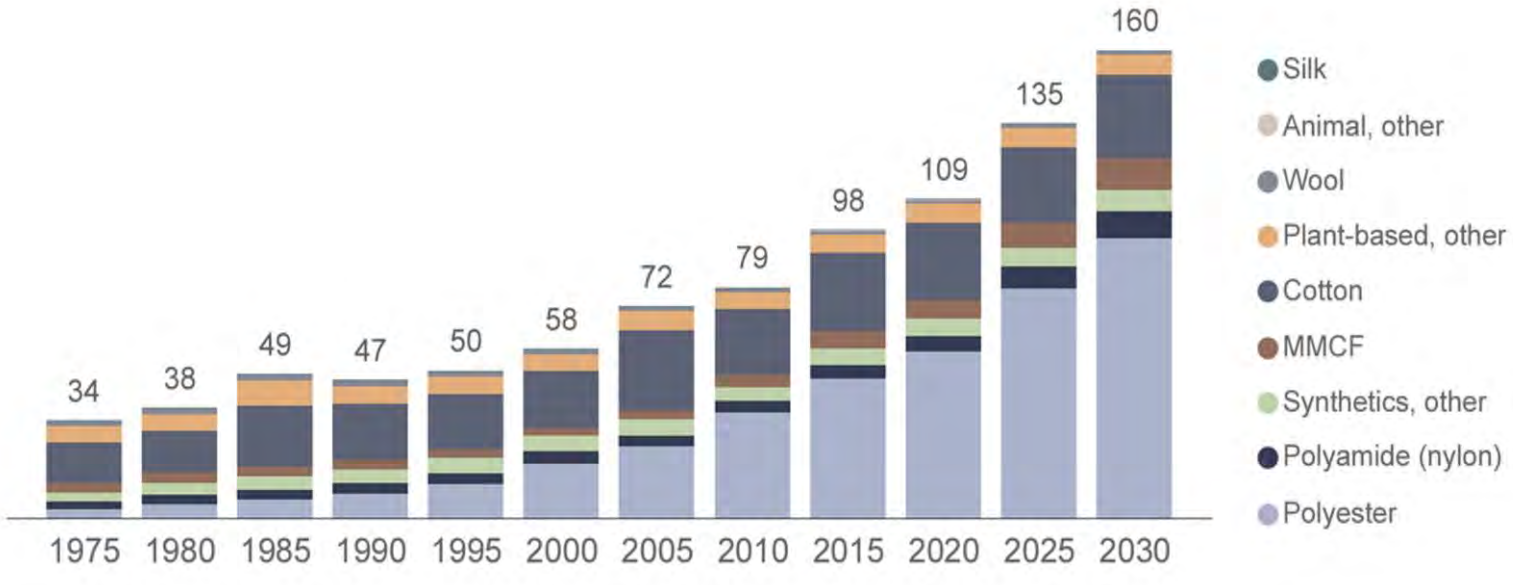
	Raw materials	Production	Use	End of life
Carbon	30.7%	51.8%	23.8%	-6.3%
Water	92.4%	6.7%	0.9%	0%
Waste	4.5%	38.5%	0.1%	56.9%

Sources: WRAP UK Textiles 2030 Report (2021) & WRAP Design for Circularity Toolkit; Institute of Positive Fashion, 2021, The Circular Fashion Ecosystem: A Blueprint for the Future; and Ellen MacArthur Foundation, 2017, A New Textiles Economy: Redesigning Fashion's Future

Clothing and textiles impact

Global fibre extraction for textiles

Global fibre production reached a record 124 million tonnes in 2023 and is expected to increase to 160 million tonnes by 2030.



Source: Textile Exchange based on data from CIRFS, FAO, ICAC, IVC, IWTO, Maia Research and Textile Exchange modelling

Material flows

Textile Exchange has set the goal for the industry to reduce greenhouse gas emissions generated from fibre and material production by 45% by 2030.

This will be made possible by:

1. Strong investment in known solutions
2. Filling the innovation gap
3. Decoupling value creation from resource extraction

Each of these actions shift us further towards circularity.

Getting there: reducing greenhouse gas emissions by 45% by 2030
in apparel, home textiles and footwear

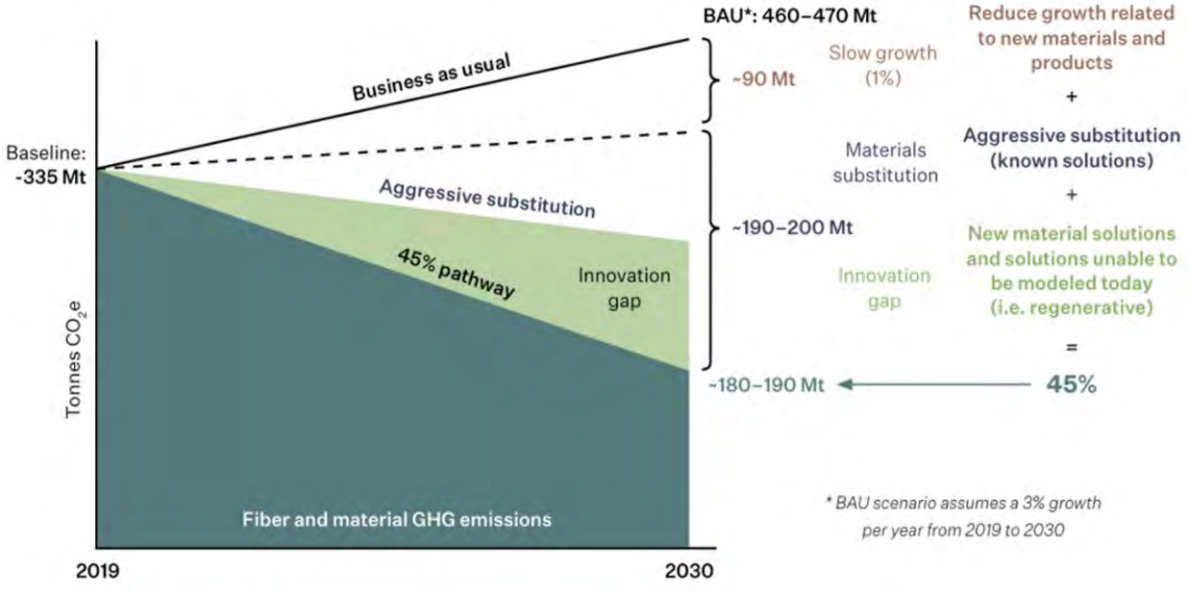


Image: modelling of interventions needed in the apparel and footwear raw materials extraction phase to achieve a 45% reduction in greenhouse gases by 2030 as measured against a 2019 baseline

06.

Practical starting points

What you can do now

As a clothing designer

Take the next practical step by joining our Circular Clothing Design Implementation course which begins next week

Download and read the Refashioning guide

Share your challenges and experiences with colleagues in your organisation or your network

As a team member

Follow the progress of a designer as they participate in the Implementation course

Write an article for your newsletter, Intranet or employee magazine

Talk with your team about the changes you can make across your business area

Get that circular business model pilot or trial started – start small, learn and improve

As an individual

Had an "A-ha" moment? Pursue it!

Shop purposefully – ask yourself, will it go with other pieces in my wardrobe? Will I wear it for years to come? Is it from a Seamless member?

Repair and care for your clothes – avoid washing them too frequently

Donate or sell your wearable clothes and research textile recyclers for clothes that can no longer be worn

Implementing Circular Clothing Design

When

- Wednesday, 2 July 2025 in Melbourne
- Friday, 4 July 2025 in Sydney

Before the course

- Choose a garment to redesign
- Research materials used in the garment
- Understand your business requirements

Have questions? Email info@seamless.org.au

Circular design method

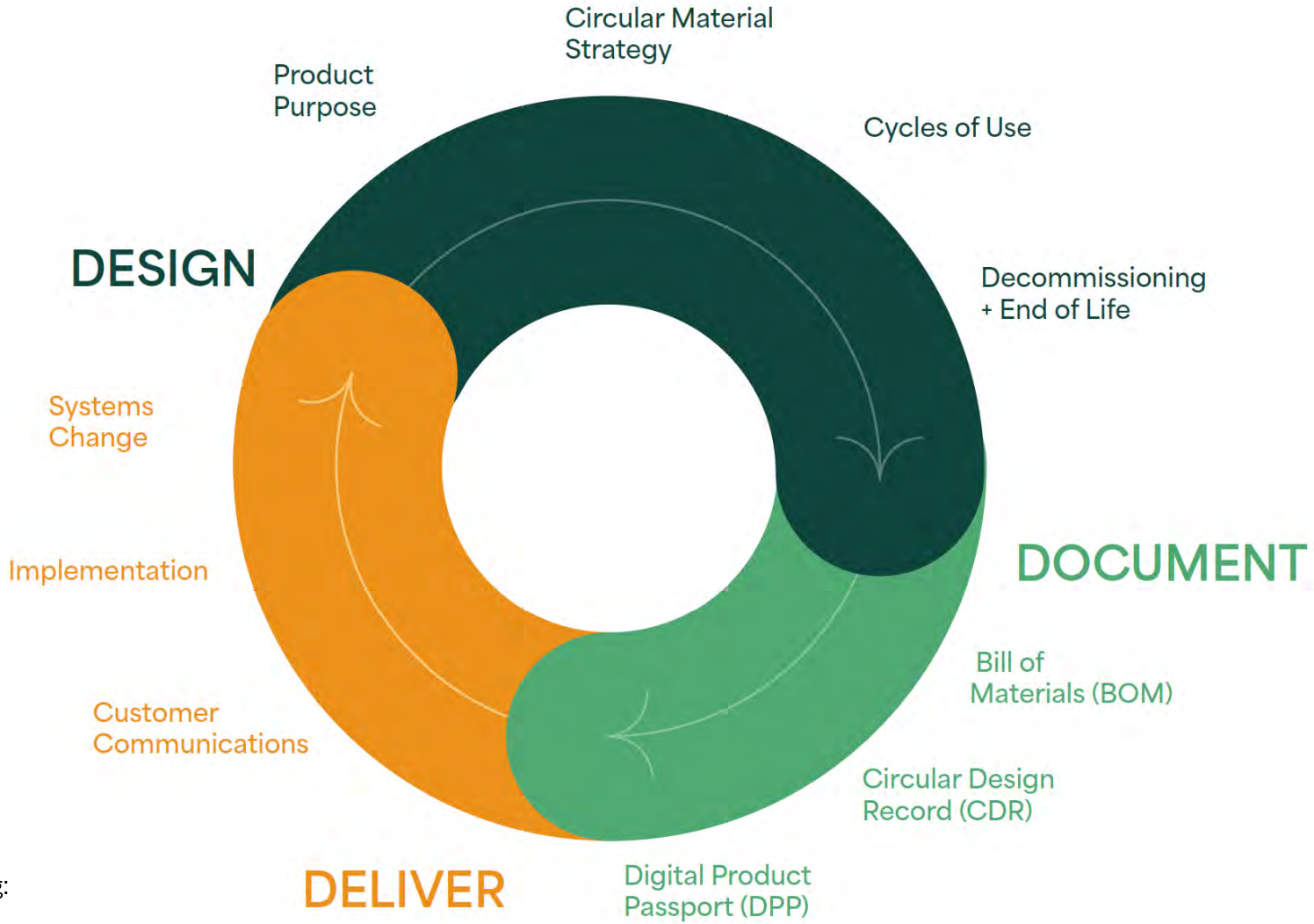
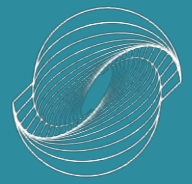


Image: Refashioning circular design method, 'Refashioning: Accelerating Circular Product Design at Scale', 2024

07.

Questions



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Thank you