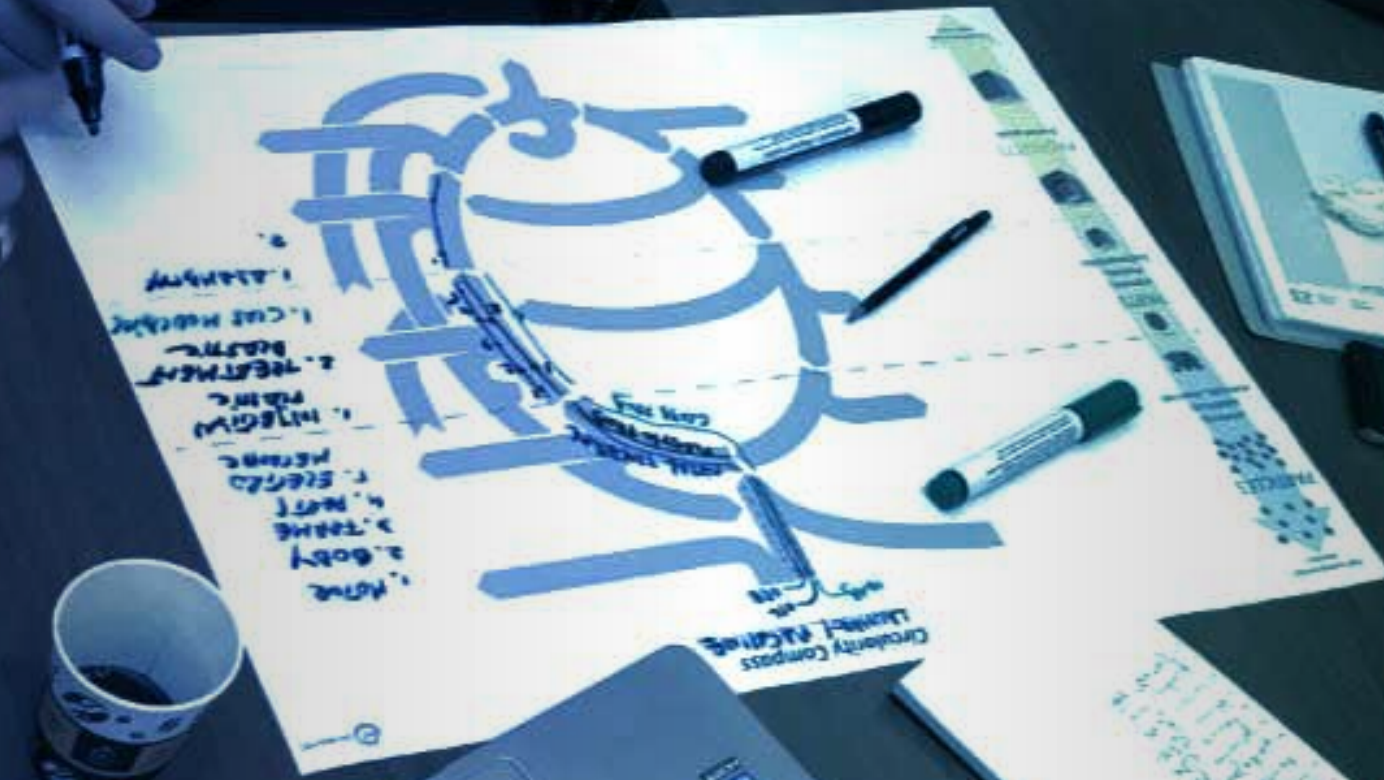


Circularity Thinking and Tools

An Introduction



Co-funded by the European Union



Circular economy

A hand holding a small globe of the Earth against a blue sky background. The hand is positioned in the lower right quadrant, with fingers gently cradling the globe. The globe shows the Western Hemisphere, including North and South America. The background is a clear, bright blue sky with some light clouds.

Circular economy (CE) has a simple and elegant idea at its core: use resources efficiently and effectively, and wherever wastes or residues are created, redirect these away from landfill and use them again in the same or other parts of the economy.

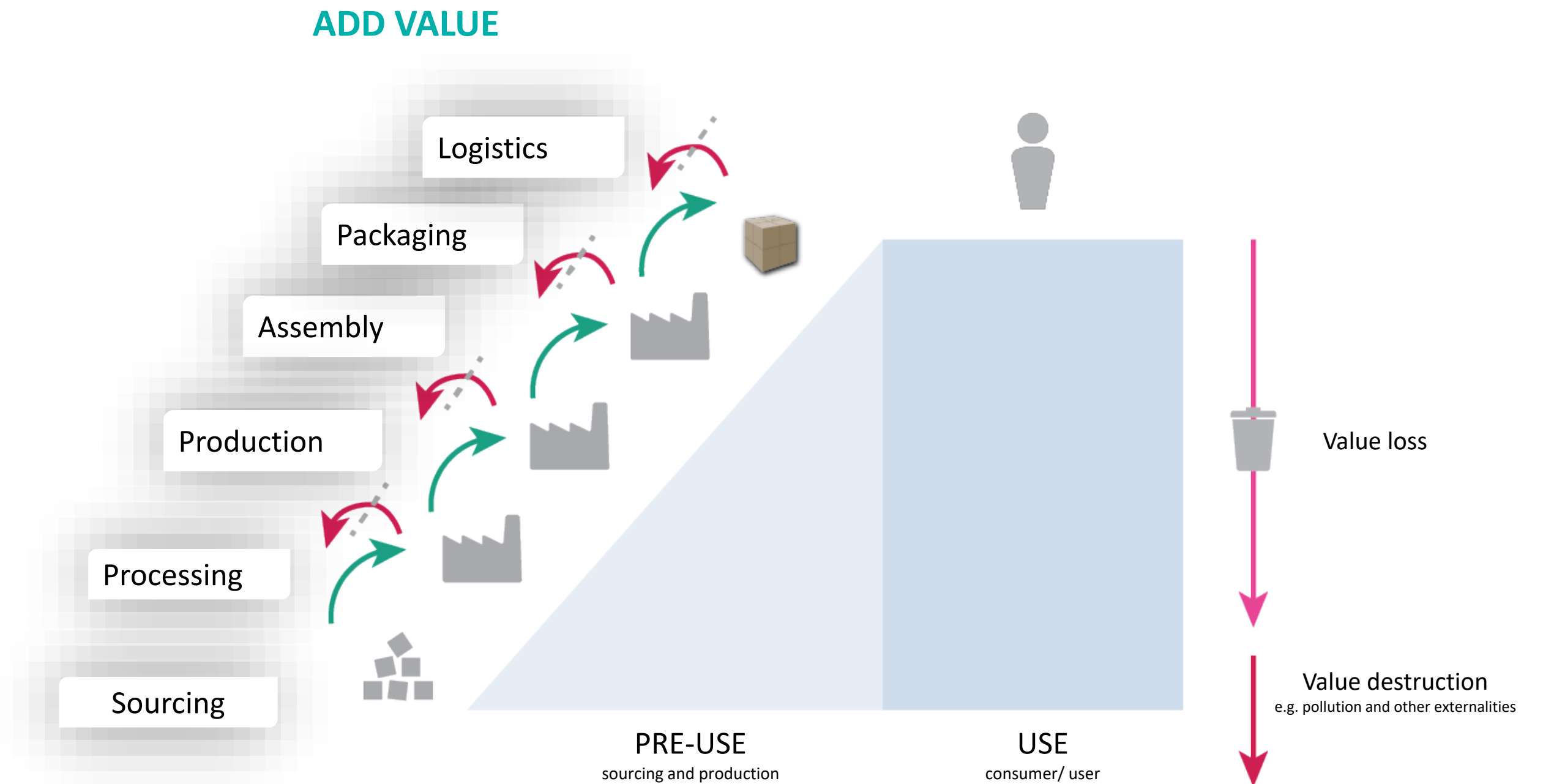
This enables the creation of different types of value, such as, for example, the provision of products with a long life, continued use of materials, and a focus on performance and services. At the same time as creating value, CE aims to reduce or avoid value loss and destruction, such as pollution, harmful emissions and other externalities. Capturing this value involves process, product, and business model innovation, and can involve multiple value chain actors as well as a variety of stakeholders. Therefore, CE represents an exciting new area for business innovation, and is rich in opportunities to have positive impact.

The Linear Economy

The **Value Hill** can be used in this context as a means to illustrate the economy.

Value is added during production as a product moves 'uphill' on the left side: we take resources, process them, manufacture products, and get them to users, who then use them for a while (middle section), and at the end of life all that added value is lost (right side), and we fall down a 'value cliff'. Not only the product and its embedded materials end up in the environment, they also create pollution and waste, essentially 'negative value', less than zero. If replacement products need to be created, then this linear take-make-use-dispose logic is repeated.

Ideally, we should control how this process happens, identify the hotspots and retain value as long as possible. This is where circular economy comes into play.

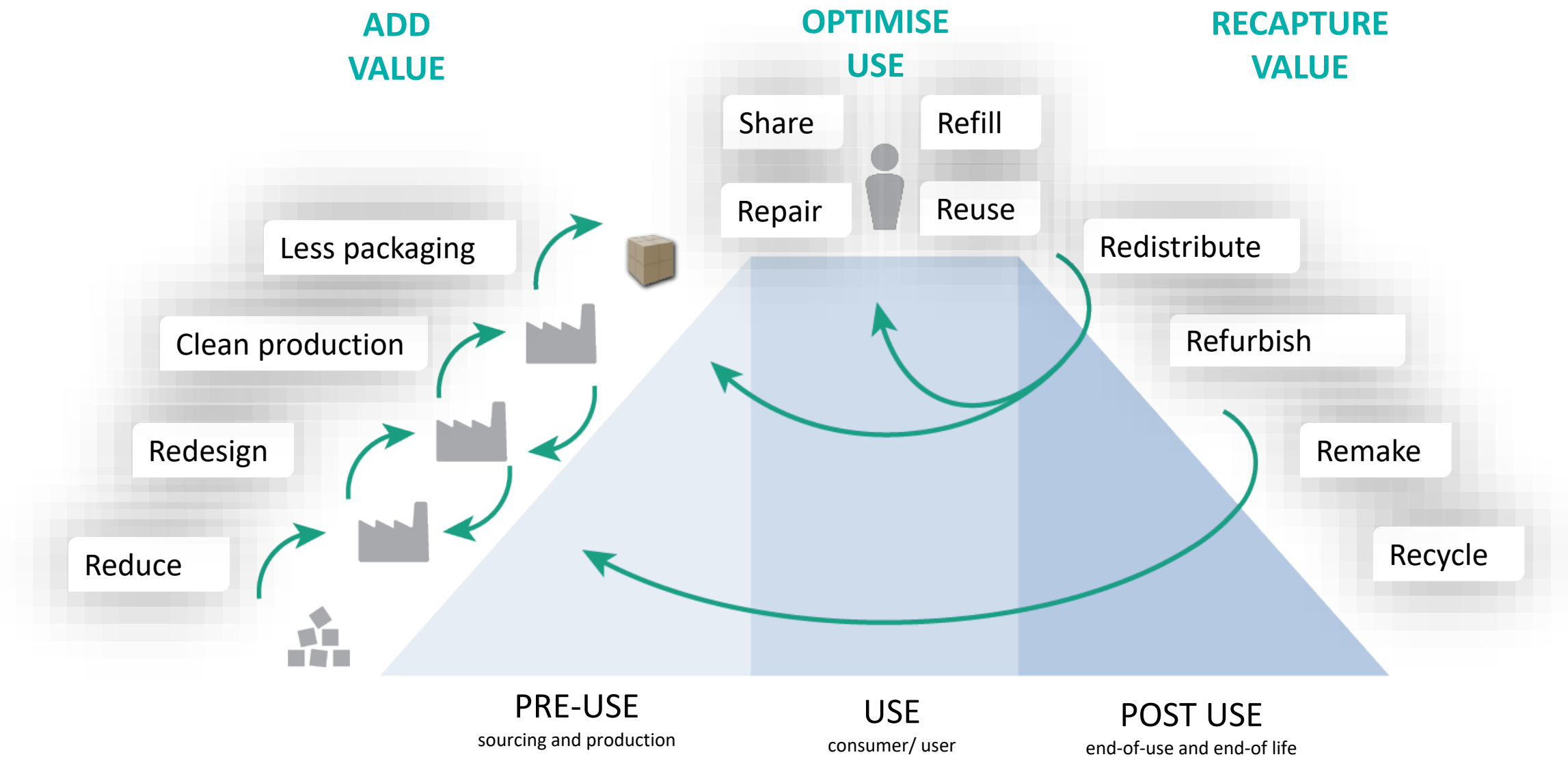


The Circular Economy

Circular economy aims to save resources and keep value high as long as possible. In the pre-use phase, circular products are designed to use less resources, be long lasting, or easy to maintain. In the use phase use it to full capacity and prolong its high value period with repair or sharing. When a product is ready to start its downhill journey, it is not a cliff, but a slow descent because useful resources can still be of service to other systems or feed back to previous phases, through refurbishing or recycling, thus some value is retained.

So how is the circular economy different from a linear economy, then?

It requires less resource extraction, because materials are used for longer, repaired, reused, and recycled, so it decreases environmental impacts associated with extraction of resources, but also processing, manufacturing, and logistics. It also requires less waste disposal because materials are reused, repaired, recycled, and therefore it decreases environmental impacts and economic costs on both ends.



Circular economy

Overall, CE is an umbrella term that puts forward many different waste and resource management strategies that have the capacity to avoid, reduce or remove structural waste, such as, but not limited to: upgrading, reuse, repair, recycling, refurbishment, remanufacturing, industrial symbiosis, composting, digitalisation, co-use, sharing and redistribution, as well as material, parts, product and energy cascading.

Whilst this means that a large variety of actions are available, it may not always be self-evident which can be used to generate and capture value. Before change can be made, therefore, it needs to be understood which of these strategies are appropriate to use, and if and how they can be applied synergistically, on a case-by-case basis.

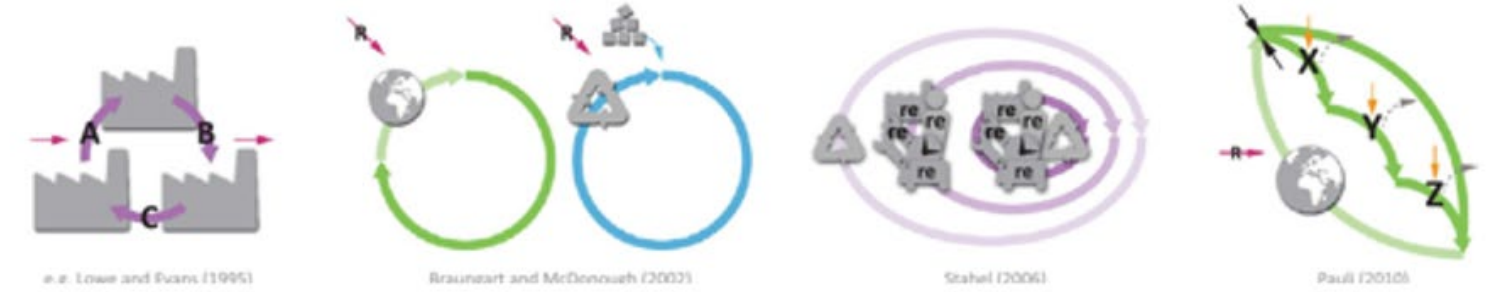


Visualizing Circularity

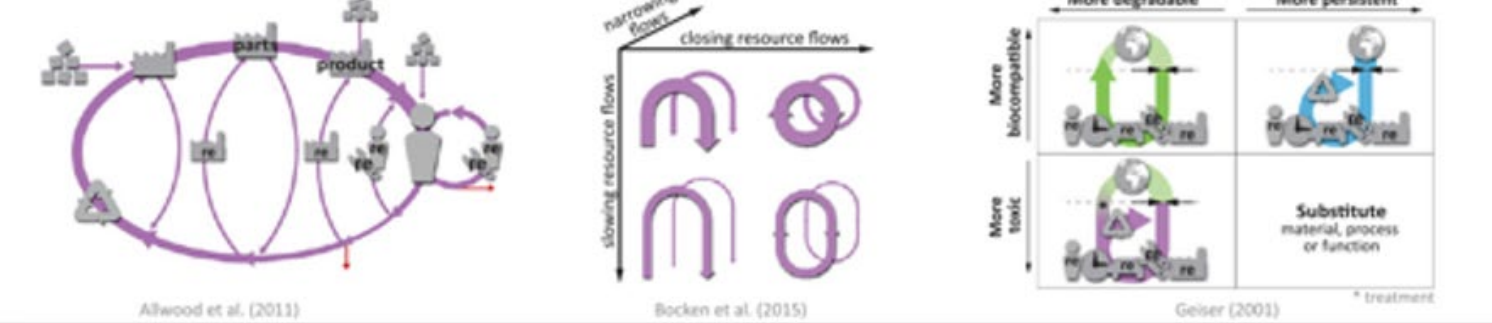
There are many different different models and approaches about the circular economy, largely depending on perspective and context. This means that circular economy can really be seen as an umbrella concept that encompasses a wide range of strategies to address problems that exist within a linear economy, and it can be depicted in various ways.

In Circularity Thinking, we have refined existing models and developed our own visualizations and visual tools to aid the transformation process.

Seminal thinkers/ frameworks



Academia



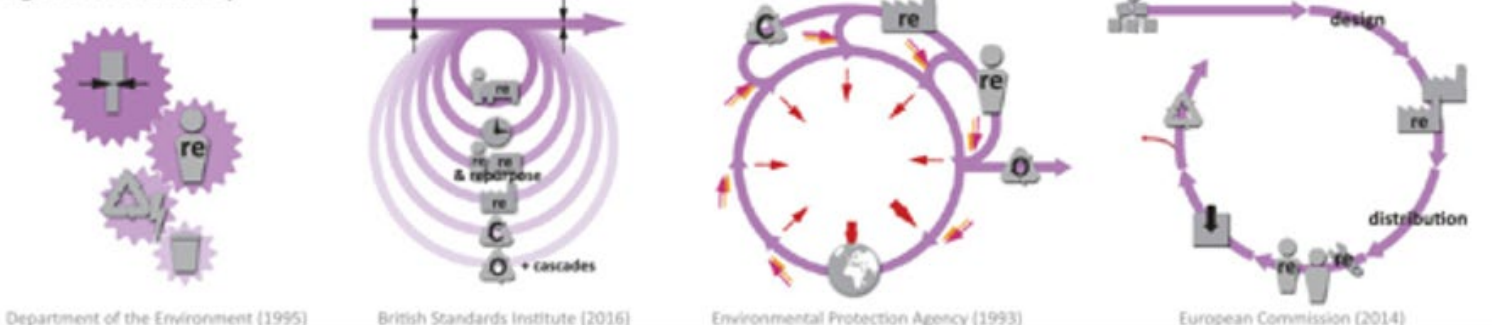
Business



Think tanks



Legislative & advisory



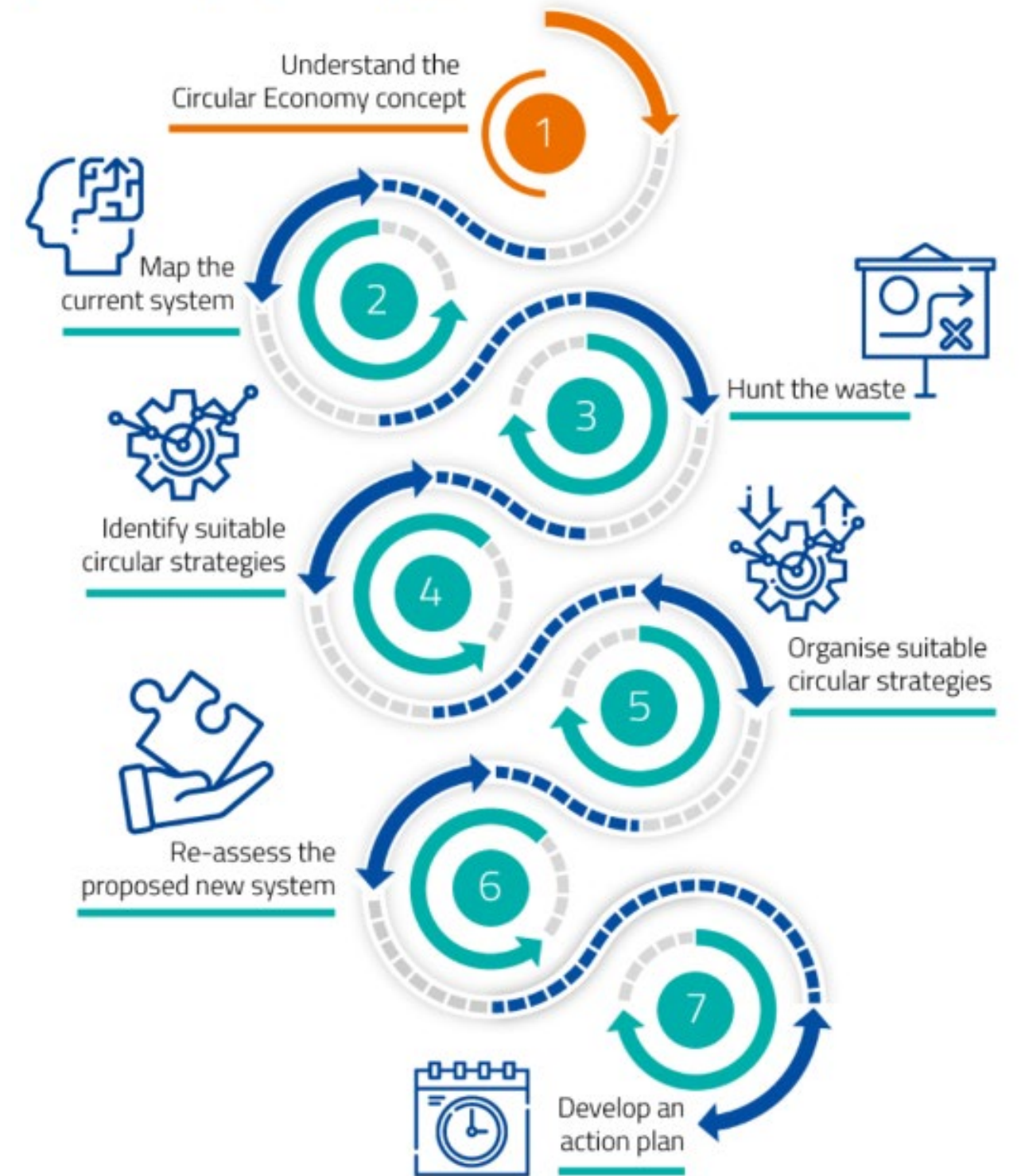
Introduction to Circularity Thinking

In order to identify CE related opportunities, explore and develop the possibilities, we draw on Circularity Thinking, which draws on the concepts of systems thinking, life cycle thinking, resource management, structural waste and value creation, and compiles them in a manner suitable for facilitating CE-oriented innovation processes.

Circularity Thinking is designed to help structure the analysis of CE complexities by ‘following the flows,’ finding the value for both the company and the environment, and by making sure that one is ‘asking the right questions’ regarding scale, complexity, people, competences and technology.

Circularity Thinking is a set of integrated tools that allow users to create circular strategies to tackle linear economy problems. The tools shape a process based on identifying problems or missed opportunities, and then developing innovative business solutions.

How to develop Circular Economy strategies: your step-by-step guide



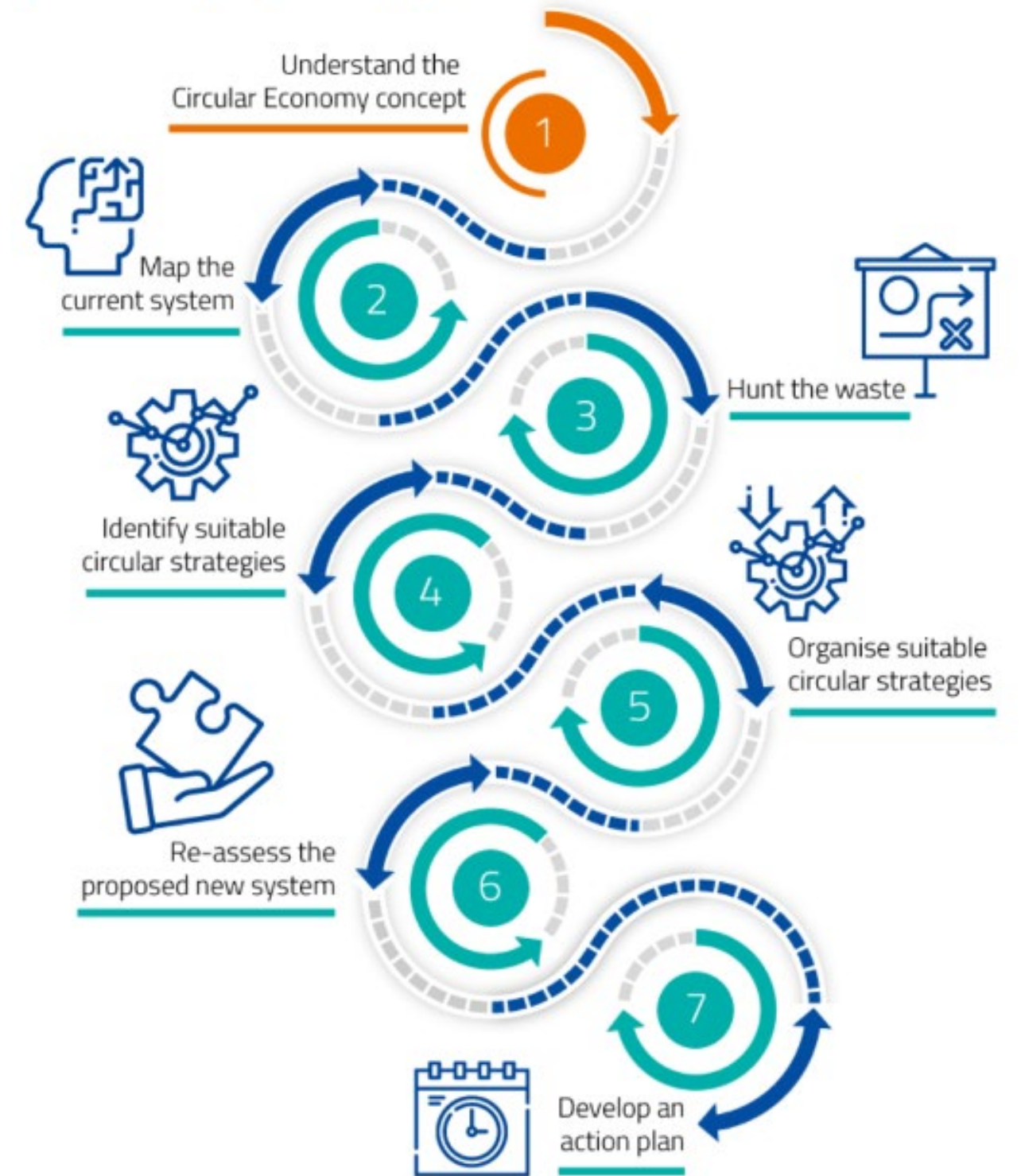
Introduction to Circularity Thinking

Circularity Thinking requires reframing of a problem, to see what the real problem is by mapping the current system and reinforcing the need to understand the context of the problems. This is done in a 'problem space'.

The process moves to a 'solution space' where strategies are identified that can support change. Multiple strategies can be delivered, so the process identifies strategies that connect and support the change objectives and consider the role of different actors and stakeholders in delivering the new action plan.

Being able to map resource flows, to find structural waste, organise circular strategies coherently, and analyse those strategies from a systems perspective creates an excellent basis to deliver circular value and manage a range of relevant factors that influence whether or not a solution is successfully implemented.

How to develop Circular Economy strategies: your step-by-step guide



What these introductory slides are for

Circularity Thinking training workshops take participants through the **five tools** used as part of Circularity Thinking. Working in groups, you will discuss and share ideas on creating circular strategies, building your knowledge as you work on the different tools.

These introductory guides **are intended to supplement the training workshops** and allow participants to enter the training with a basic understanding of each tool. Each of the five tools is introduced in a separate presentation that you will be able to read before the workshops take place.

While the different tools use several different case examples to demonstrate their structure and approach, there are **three main case examples** that are used throughout the guides to allow you to see how the tools have different purpose within the process of creating circular strategies. This also shows how the tools connect together and need to be used iteratively to create successful circular strategies.

What these introductory slides are for

Please note that none of the companies mentioned in any of our case examples made their own use of the Circularity Thinking tools. We applied the tools based on available information of the companies. We only show **how the Circularity Thinking tools can be applied** on company cases to support the circular innovation process.

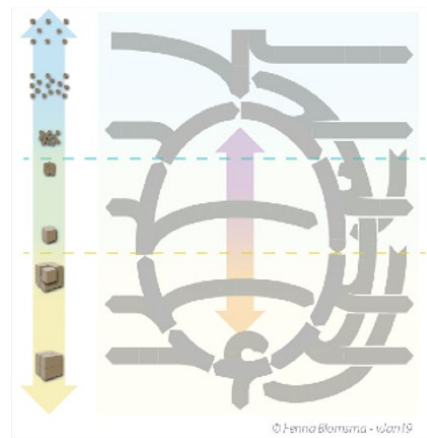
We have also included **examples of tool use** from previous training workshops so you can see how other training participants have developed their understanding of using Circularity Thinking.

The next few pages describe the five Circularity Thinking tools and the main three case examples used.



Circularity Thinking tools and flow

Circularity Compass



Map the resource flows

The Circularity Compass helps to understand how resources flow in the current (product) system and how they could flow instead. In a first step, the user draws a rough reflection of the current resource flows into the template, where they enter the system and where they leave it.

Big Five Structural Wastes



Hunt the waste

The Big Five Structural Wastes tool helps identify five types of structural waste. Used in combination, the Circularity Compass and the Big Five Structural Wastes help to indicate and illustrate wasteful practices along the life cycle of a product system.

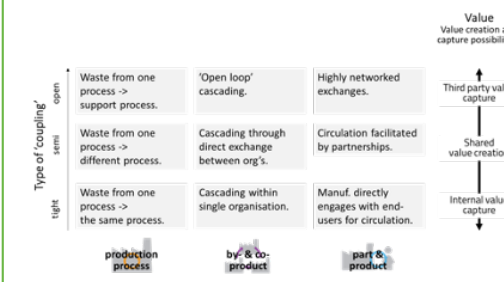
Circular Strategy Scanner



Identify suitable circular strategies

The Circular Strategy Scanner allows for linking circular strategies, business processes and eco-design principles on different levels. It helps the user to get an overview and understanding of potential circular strategies.

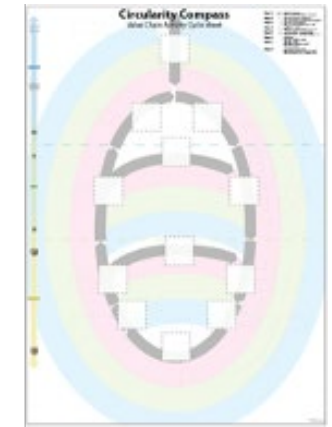
Circularity Grid



Organize couplings and system implications

The Circularity Grid systematically analyses the manner in which circular systems are different from linear ones, and what makes them more complex by understanding the different types of coupling between systems.

Activity Cycle



Manage stakeholder activities

The Activity Cycle can help to identify what the key stakeholders need to do to make the new value chain along the chosen circular solution a reality and help to consider the potential of certain stakeholder collaborations.

Case example | British Sugar

British Sugar is the sole British producer of sugar from sugar beet, partnering with over 3,000 growers to produce homegrown sugar. It is the leading producer of sugar for the British and Irish food and beverage markets, processing around 8 million tonnes of sugar beet and producing up to 1.2 million tonnes of sugar each year, which is over half of the UK's sugar production.

British Sugar is one of the most efficient sugar processors in the world, producing more sugar than 20 years ago on 90,000 hectares smaller land area. Their processes result in less than 200 grams of waste for every tonne of sugar produced. They have strong commitments, such as 30% CO₂ reduction by 2050.

Their innovative approach to manufacturing also enables them to create a range of by- and co-products, that now make up over 50% of their revenue. These include selling removed soil and stone from the cleaning process for the construction sector, lime from the sugar purification process to the agricultural sector (used to correct soil acidification), food-grade CO₂ into industrial refrigeration processes, and waste heat for greenhouses.



Case example | MUD Jeans



MUD Jeans is a sustainable and fair trade certified denim brand based in the Netherlands, which aims to satisfy the principles of the circular economy from design and sales, all the way through sales and recollection at the end of life. The MUD Jeans are made from 40% recycled content, with the material being derived from discarded jeans.

MUD Jeans also experiments with lease models, in which customers are encouraged to send back their old jeans and get a new pair if they wish. Both leasers and buyers are given a discount when they return an old pair of jeans with their new purchase. Customers are also given access to a free repair service during the first 12 months of their lease or purchase.

After the recollection process, jeans that are still in good condition are washed, mended, and sold as vintage apparel. Jeans that are not in sufficient condition are sent to be shredded into fibres and mixed with fresh organic cotton in order to make new products. MUD Jeans also reuses 95% of the water during the production process.

“Our mission is for the fashion industry to be driven by circular production and conscious consumption. We pioneer with jeans, by taking positive action, being transparent and supporting sufficiency.”

<https://mudjeans.eu>



Case example | Interface

Interface, Inc. is a global commercial flooring company with an integrated collection of carpet tiles and resilient flooring. They are global leaders in the design and manufacture of sustainable modular flooring – the design by tile option gives them economic, creative, and aesthetic freedom to offer a high-quality product that is easy to produce, repair, and maintain. Their manufacturing facility in the Netherlands now runs on 100% renewable energy, they virtually use no water in the manufacturing process, and their European facilities send no waste to landfill.

Interface's mission, Climate Take Back™, invites other companies to join them as they commit to running their business in a way that is restorative to the planet and creates a climate fit for life.

<https://www.interface.com/>



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