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9 September 2024 | Online

Special Collection Policy Briefs

Circular Economy

Policy Briefs – 01/2024

Maastricht University

STUDIO EUROPA MAASTRICHT

Focused Chapters

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Chapter 1 - Introduction to the policy briefs series on Circular Economy

The '**Green Deal'** presents a roadmap to achieve EU climate neutrality by 2050.

The **Circular Economic Action Plan** has defined the first series of concrete legislative measures and actions that must be developed to achieve the EU's ambitions in terms of sustainability.

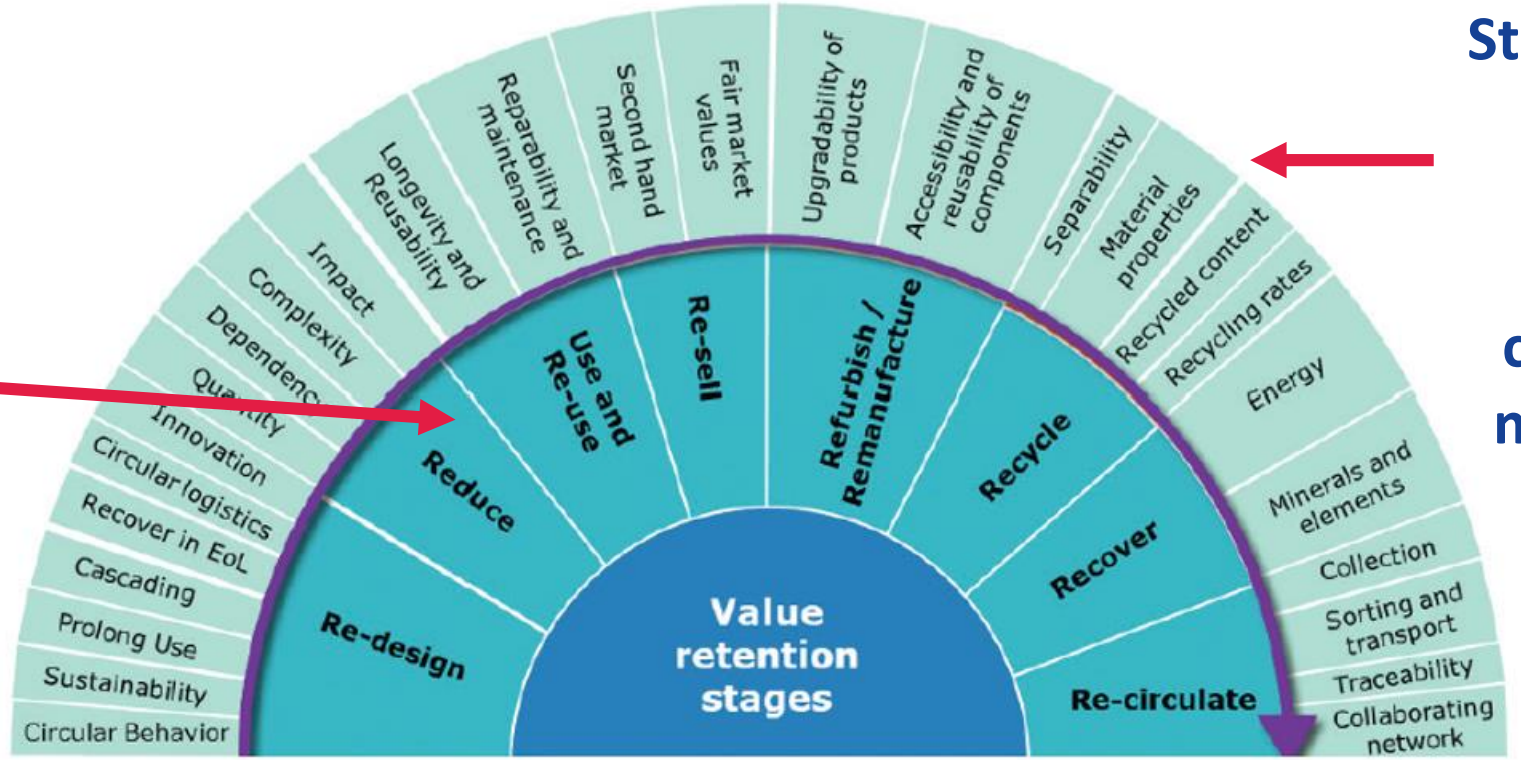
Nature regeneration becomes increasingly important to restore the damage done so far and improve the natural environment [7,10,11].

Chapter 2 – How Can We Promote the Circular Economy?

- Current **metrics** do not allow to assess the **full potential of a CE**, as **they do not allow all possible strategies for maintaining circular product value to be measured.**

- To bridge this gap, a CE framework is proposed.

Eight value retention Stages



Strategies to extend the value and lifetime of any product, its components, and materials within a system.

Figure 1. CE Framework, adapted from Garcia-Saravia Ortiz-de-Montellano et al. [4]

Chapter 3 - Intellectual Property Rights in the Circular Economy

- **Intellectual Property (IP) rights** are considered a barrier to the cooperation and collaboration essential for achieving the objectives of the circular economy.[12].

- **The incentives established by the international trading system**, especially the WTO (World Trade Organization) TRIPS Agreement [18], **encourage and enable technology diffusion between partners of vertically integrated multinational firms**, but **limit horizontal diffusion to other firms in the same or similar industry in those countries**.

- This policy brief will suggest targeted intervention at the intra-firm and innovation ecosystem levels. At the inter-firm level, targeted intervention becomes crucial for creating predictable rules that prefer scalable solutions for the circular economy. **This requires addressing specific rules for reuse, refurbishment, and remanufacturing in many sectors.**

Note: The TRIPS Agreement requires Member countries to make patents available for any inventions, whether products or processes, in all fields of technology without discrimination, subject to the normal tests of novelty, inventiveness and industrial applicability.

Chapter 5 - Regenerative Economics for Planetary Health and *Thrivability*: The European Green Deal.

- **The document explains the importance of regenerative economic principles for achieving climate neutrality by 2050.**

- Some **challenges** with **recommendations** for **policy designers**, **sustainability leaders** and **decision-makers** are identified:

1. Governments, industries, and corporations must strongly commit to resolving the sustainability crisis. This requires using and trading energy and resources regeneratively, i.e., within planetary boundaries [16].

- 2. **Lack of Policy implementation for biodiversity regeneration and sustainable development**

- 3. **The energy transition and digitalisation of societies increase resource demands of rare minerals and metals**. - Thirty of these have been listed as critical within the European context.[7] Furthermore, technologies for healthcare and defence also require increasing resource budgets. Control over critical and rare minerals is becoming a geopolitical security issue.

- 4. **The energy transition focuses on limiting global warming; however, this increases demand for rare metals and minerals used in many renewable technologies.**

- 5. Socioeconomic inequalities between people and nations are increasing. - This adds to growing distrust in existing governance institutions and corporations. Populist groups and authoritarian political leaders are on the rise by exploiting these divisions.

Sustainability Policies for Achieving the European Green Deal

- The 2020 European Green Deal for reaching climate neutrality by 2050 includes a 10-step action plan which unfolds through the following new policies and regulations:
- The EU taxonomy scales up sustainable investment and implements the European Green Deal with classifications for environmentally sustainable economic activities. To further develop this taxonomy a Platform on Sustainable Finance has been tasked. (Development of EU taxonomy for sustainable activities - https://bit.ly/3GHykdu)
- The **Circular Economy Action Plan** (CEAP) sets Europe's new agenda for sustainable growth starting in March 2020.
- **Climate benchmarks and environmental, social and governance** (ESG)
- **The 2022 European Critical Raw Materials (CRM) Act** addresses the resource nexus of the energy transition. In particular, how critical raw materials (CRMs) are the originators of industrial value creation and therefore have a significant effect on downstream sectors**. The CRM Act also recognizes the strategic importance of reducing European dependencies on potential conflict countries based on a comprehensive CRM strategy**.

From Circular to Regenerative Economies for Planetary Health and Thrivability

- **Main critiques for explaining why circular economies are not regenerative by design and do not guarantee thrivability:**

- **Circular economies do not incorporate the human factor. Instead, they merely focus on life cycles, resources (production and consumption) and energy usage. This ignores economies' vital social and human dimensions, including equity, well-being and evolutionary development.**

- **Circularity does not imply regeneration or thrivability. In some cases, purchasing new, more energy-efficient equipment or entirely new carbon-neutral technologies can lead to more sustainable and regenerative outcomes [21].**

- **By design, the circularity of resources goes against the second law of thermodynamics, which indicates that systems become more entropic over time and biological processes are irreversible [21,29]. Regeneration is cyclical and not just circular. As such, circularity does not guarantee regeneration (15).**

- **Regenerative economics for thrivability invites participation in the making and transforming our economies as an evolutionary learning process and provides reinforcing feedback loops and attractors for the collective caring of our planet and bioregions. Circular economies tend to exclude the dimension of societal learning and engagement.**

Chapter 6 - Role of Business in the Circular Economy: a Focus on Sufficiency and Regeneration.

Why Sufficiency and Regeneration are Important: Less and More

Sufficiency is an important strategy for preventing unnecessary consumption. Sufficiency **is at the top of the waste hierarchy, representing strategies such as avoidance, reduction, and reuse** [10].

- This principle of not consuming at all, or consuming much less, is required because affluent parts of society are overconsuming our planet's resources [11]. While circularity and efficiency gains are crucial for sustainability, sufficiency is needed to outweigh rebound effects and the highly extractive or intensive processes and energy needed for new production and recycling. Hence, sufficiency is essential because of its preventive and corrective character.
- **Regeneration is needed to tackle the damage already done to the natural environment and allow for future adaptation to the unavoidable aspects of climate change.**
- This goes beyond strategies that just focus on minimising harm, and instead actively works towards restoring and regenerating the natural environment. Consider organisations such as Ocean CleanUp whose goal is cleaning up the so-called plastic soup in the ocean; and others such as Patagonia who pursue organic regenerative agriculture to improve soil health. **At the product level, regeneration can involve using biobased, biodegradable and/or non-toxic renewable materials.**

Policies for Sufficiency

Several of the circular economy policies in the EU Green Deal can support sufficiency on the product/ industry level [22]. Examples include:

- the right to repair;
- mandatory spare-parts and upgrades/support;
- product warranties;
- • Minimizing product lifetimes and banning planned obsolescence.
- **At the consumer level, it is important to create awareness and provide options to consume more prudently.** This may be achieved through policies that, for instance:
- increase awareness about product longevity, repair and maintenance;
- enable repair and maintenance, e.g., tax breaks, as done in Sweden [23];
- **discourage unsustainable alternatives**, e.g., **taxes** or bans on premature product disposal or flights (e.g., higher flight tax in Netherlands since 2023 and ban of air journeys in France that can be completed conveniently by train in under four hours).

Policies for Regeneration

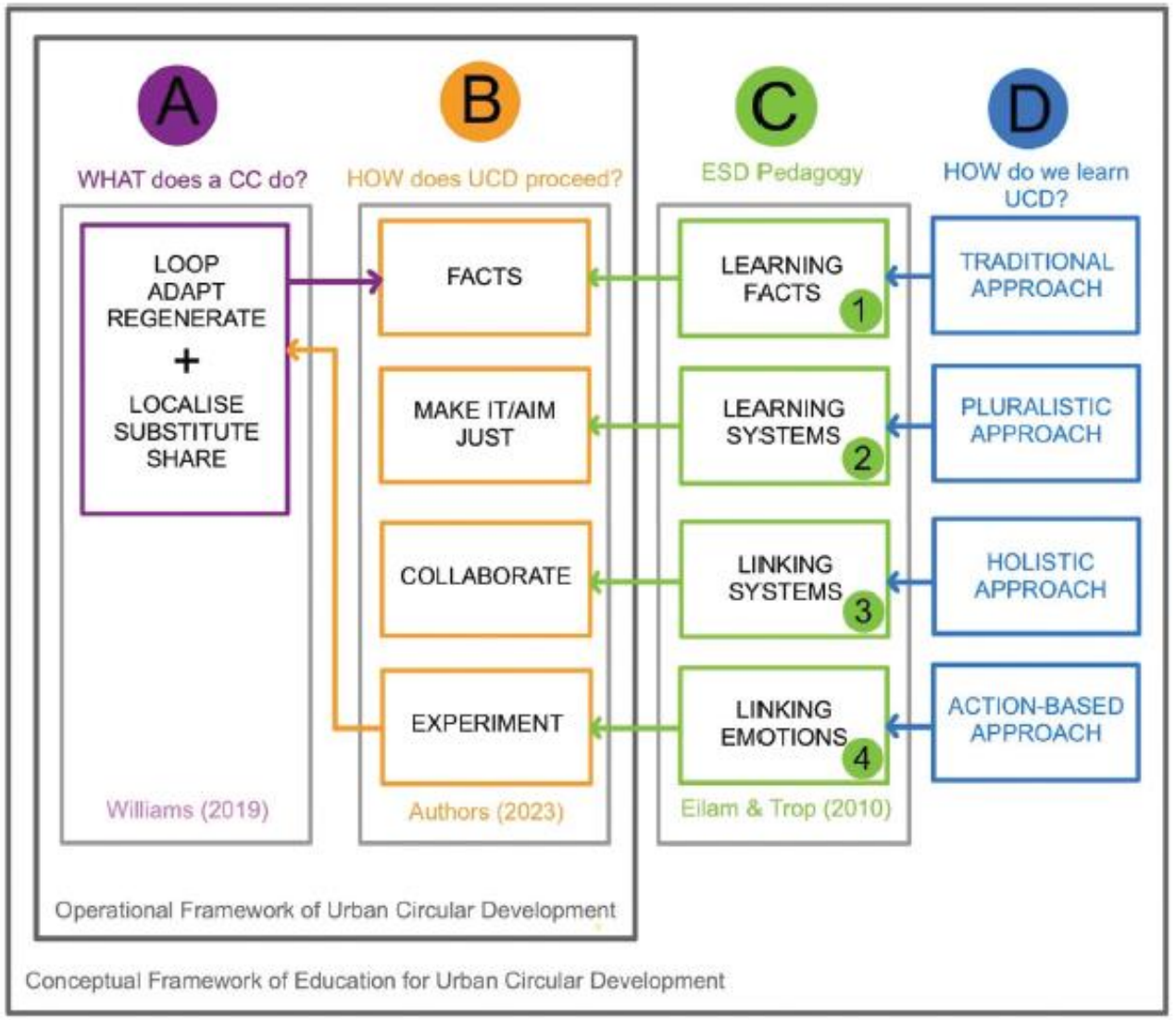
- **Incentivise business practices that use regenerative means in their production and manufacturing processes through, for example, access to innovation funds.**
- Promote and enforce transparency in reporting of environmental and social impact of business.
- **Disincentivise greenwashing in marketing that uses regenerative claims only superficially**.
- From a consumer perspective, this can be achieved through policies like:
- Funding the cost of regenerative products and services in the short term to raise awareness.
- Awareness campaigns that show how particular buying practices are helping improve nature and society.

Chapter 7 - Towards Education for Urban Circular Development in Secondary Education

- In this context, there is a growing need to **empower citizens by enhancing their capacities to create resilient communities that can withstand transitions and ensure the survival and well-being of both people and places through sustainability in transition** [10].

- **Various city-related sustainability transition approaches exist, such as eco-cities [11], carbon-zero cities [12], and smart cities [13].**

Figure 1. Conceptual Framework of Education for Urban Circular Development



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The Centro 2030 Regional Program is actively working towards a Circular Economy. In the context of the RIS3 (Centro S3), CCDRC, together with relevant regional stakeholders (including University of Coimbra), has developed a Regional Agenda for Circular Economy. This is a strategic framework that takes into consideration the region's productive base and that is constituted by five priority axes (1.Research and technology to support the transition; 2. Circular procurement; 3. Education, awareness and capacity building; 4. Business models and industrial symbiosis; 5. Circular economy for innovation and territorial cohesion).