Introduction for the special issue

Circular Economy: "Rising Star" and Challenges

By Frieder Rubik, Sabrina Schmidt and Eva Wiesemann

The shift towards a circular economy (CE) has become a key element of the transformation of current production and consumption patterns. It plays a key role within the European Green Deal (European Commission 2019; Friant et al. 2021) and within the policies of the European member states (Marino/Pariso 2021; Smol 2021). Because it is equally seen as an approach to decouple growth from resource consumption and to increase competitiveness and consumption, it is high on the political agenda.

Within science, CE has gained a lot of attention, what has led to a mushrooming of publications on CE over the past decade. There are a number of different approaches which might contribute to CE, for instance industrial ecology (Graedel/Allenby 1995; Yu et al. 2013), industrial symbiosis (Ehrenfeld/Gertler 1997; Salomone et al. 2020), obsolescence (Packard 1960), zero waste (Pauli 1997; Zaman 2015), cradle to cradle (McDonough/Braungart 2002), eco design (Brezet/van Hemel 1997; Tischner/Moser 2015), resource efficiency (Gregson et al. 2015), sharing and product-service systems (Goedkopp et al. 1999; Tukker 2015), waste to resources (Frosch/Gallopoulos 1989; Kama 2014), and many others. Some concepts have a microeconomic view on businesses, others focus on a meso-level, for example on regions, yet others on the macro level. Not surprisingly, there are a lot of different interpretations as to how CE can be defined. Kirchherr et al. (2017) systematically analysed more than 100 of these. They propose the following definition: Circular economy is "(...) an economic system that replaces the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes (...), with the aim to accomplish sustainable development, thus simultaneously creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations" (Kirchherr et al. 2017, 229).

The distance to the target of a CE is illustrated by the *Circularity Gap Report 2021* (Haigh et al. 2021), which measures the degree of circularity, that is the share of all circular resources in the total resource input into the global economy in one year: In 2020, only 8.6% of the global economy was "circular". In connection with this finding, we focus on the circular economy and its challenges. Which concepts exist? What does the circular economy look like in practice? What role do companies, politicians and consumers play in implementing the circular economy? Will the CE be effective in decoupling growth from resource extraction?

Contributions to this issue

Green public procurement (GPP) plays a considerable role within the EU's economy as it accounts for approximately 14% of total GDP. In their article, ***Heidi Simone Kristensen***, ***Mette Alberg Mosgaard*** and ***Arne Remmen*** introduce the concept of Circular Public Procurement (CPP) as an extension to the current approach. Based on an example from the furniture industry in Denmark, they highlight the benefits of integrating circular principles into current public procurement practices.

Repairing products and thus prolongating their lifetime is an element of CE. ***Carl Dalhammar***, ***Mariana López Dávila***, ***Leonidas Milios***, and ***Jessika Luth Richter*** reflect the role of public policy to support consumer repairs. They list main barriers for repair and report on recent policy developments in the European Union and its member states to stimulate consumers towards repairing their products. They conclude that industry resistance must be reduced and that current practices of producers and users as well as governance structures must be further developed.

In another contribution, ***Walter J. V. Vermeulen***, ***Kieran Campbell-Johnston*** and ***Kaustubh Thapa*** are discussing the ex-

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tended producer responsibility (EPR), a concept widely practised in Europe. They have observed the failure of current EPR approaches to stimulate a redesign of products and services towards sustainability and propose to improve EPR by three measures: (1) introduce explicit policy targets for the short and middle-term options; (2) include all crucial economic actors into the set-up of EPR systems; (3) improve the traceability of "to-be-recycled" products after their collection by producer responsibility organisations and other actors in the market, especially in case of exports.

Korevaar Gijsbert explains how CE and industrial ecology can be integrated to support the transition to a more sustainable society. In his conceptual contribution, he links the historically older idea of Industrial Ecology as well as the associated method of Industrial Symbiosis with the more recent CE principles. He argues that linking Industrial Ecology and Circular Economy can lead to a more holistic approach and in particular contribute to the development of Industrial Symbiosis.

Laura Nießen and ***Nancy Bocken*** introduce the concept of circularity in business and explain different strategies of companies to slow, narrow or even close the resource loop by reuse, recycling or composting. They also discuss the partial insufficiency of these supply-side measures when consumption levels are continuously rising. Finally, Nießen and Bocken showcase six circular business models that companies have implemented while also promoting sufficiency to their respective customers.

Finally, ***Eva Wiesemann***, ***Sabrina Schmidt*** and ***Frieder Rubik*** take a step back from the business perspective and investigate the bigger picture: They shed some light on how the CE relates to bigger sustainability debates and discuss whether and how it can actually bring about the desired reduction in overall resource consumption. They particularly connect the current CE initiatives to the growth debate and highlight current gaps in business models, consumption patterns and overarching narratives.

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