

# Science for Environment Policy

## Bioeconomy perceptions of the circular economy, Germany

**To support the move towards a circular economy, in which resources are kept in use for as long as possible to minimise waste, there is great potential for the bioeconomy** — those parts of the economy linked to the use of renewable biological resources — to adopt innovative business models and practices, says a new study. However, the study found that bioeconomy businesses instead perceive the circular economy in terms of well-established practices, such as recycling.

**The bio-based sector, or bioeconomy, is one of the most resource-intensive in Europe.** It is also one of the most vocal in discussions on the circular economy. However, to date, there have only been a few academic studies which scrutinise the relationship between the bioeconomy and the circular economy, or of bio-based industries' understanding of the circular economy<sup>1</sup>.

To explore how the bio- and circular economies could share an integrated, sustainable path, this study assessed the perspectives of bio-based industries in the EU on the circular economy, with a focus on businesses in Germany. One may expect the German bio-based sector to be a front-runner in such practices, given that the translation of 'circular economy', *Kreislaufwirtschaft*, has been part of business debates and practices since the 1980s — and that Germany is also one of few European countries with government policy that actively supports a bioeconomy.

The researchers analysed 45 documents referring to the circular economy, such as reports and position papers, published by stakeholders who identify with the bioeconomy — such as those who deal with bioplastics and compost — and observed discussions at relevant events. Stakeholders included business associations, networks, and individual companies that either operate within Germany or across the EU as a whole, such as European industry associations and policymakers.

The analysis revealed diverse perceptions, but the researchers noted certain 'hotspots', as well as 'blind spots', of activity. The business stakeholders emphasise re-making practices, or 'rematerialisation', in the circular economy — particularly recycling, but also cascade use (downcycling).

Business stakeholders showed little consideration of less well-established practices that are also important to a circular economy. These include social or organisational strategies, such as product-sharing and leasing business models, which reduce resource use. Dematerialisation strategies, which lower the amount of material used in a product, while providing the same function, were far less represented than rematerialisation approaches. The researchers, therefore, suggest that these under-explored strategies offer great innovation potential for businesses in the move towards a circular economy.

*Continued on next page.*

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**Source:** Leipold, S. and Petit-Boix, A. (2018). The circular economy and the bio-based sector – Perspectives of European and German stakeholders. *Journal of Cleaner Production*. 201: 1125–1137. DOI: 10.1016/j.jclepro.2018.08.019 This study is free to view at: [www.sciencedirect.com/science/article/pii/S0959652618323503](http://www.sciencedirect.com/science/article/pii/S0959652618323503).

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1. Two recent studies are: D'Amato, D. *et al.* (2017) Green, circular, bio economy: A comparative analysis of sustainability avenues, *Journal of Cleaner Production*. 168: 716–734. <https://doi.org/10.1016/j.jclepro.2017.09.053> and EEA Report 8 (2018) *The Circular Economy and the bioeconomy: partners in sustainability*.

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*(continued)*

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The study also indicates that circular-economy development may need to differ between individual EU Member States. They show, for instance, that German stakeholders consider a lack of secondary raw materials as a major barrier to the circular economy. However, this issue is not raised by EU-wide stakeholders<sup>2</sup>.

The study also picked up on debates concerning the scope of a circular economy. Some stakeholders focused on cycling resources within products. Others, particularly German businesses, focused on bio-products' potential to feed into the Earth's biogeochemical cycles of elements and resources (the ways in which an element —or compound such as water or nitrogen— moves between its various living and non-living forms and locations in the biosphere), such as the carbon cycle, through biodegradation or incineration. This focus on the Earth's cycles carries some controversies; for example, some stakeholders argue that growing plants to make bio-plastics has carbon-cycle benefits; but others say it could create major land-use issues. This debate highlights the need to define which cycles contribute most to a sustainable economy, say the researchers.



2. However, at the EU's recent 2019 Circular Economy Stakeholders Conference, the need for citizen engagement for choices of circular bio-based materials was raised.