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Comment

EU Initiative: Circular Economy Act

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Summary

To improve the competitiveness of circular practices, EU policies should focus on instruments that limit resource consumption, such as taxes, tradable permits, or quotas. Subsidies for circular products should be used with care, as they can backfire into increased resource consumption. Where subsidies are used, these should be limited to innovations, including for the market-penetration of novel solutions. This way of financial support can help to limit transition costs for businesses and consumers without triggering circular economy rebound effects. A sustainable circular economy possibly also requires border adjustment measures to avoid competitive imbalances and leakage risks in global markets. Finally, the EU needs to define clearer targets for future resource uses and circular practices to create necessary investment certainty.

The DBFZ (German Centre for Biomass Research) is a federal institution conducting interdisciplinary research for a sustainable circular bioeconomy. With circularity being at the heart of a sustainable bioeconomy, the DBFZ welcomes the EU Commission's initiative for a Circular Economy Act (CEA).

The initiative lists several problems that it aims to tackle: lack of competitiveness, import dependency, suboptimal resource efficiency as well as environmental pressures.

The following remarks highlight options to address these challenges for both non bio-based and bio-based materials, in line with the existing EU policy framework and under consideration of regulatory and market failures.

Competitiveness of circular practices

As mentioned in the initiative text, the lack of competitiveness of secondary materials and practices is rooted in market failures including lack of information and external environmental effects. While information challenges are usually best addressed with information instruments, internalizing environmental externalities can be achieved in multiple ways. Next to extended producer responsibilities, basically taxes, tradeable permits, subsidies or standards (e.g., quotas) can be used.

In line with the subsidiarity principle, EU framework policies such as the envisaged CEA typically leave the choice of instruments open to the member states. In the context of far reaching policies such as circular economy regulations, however, **it can be reasonable to restrict the use of certain instruments by member states, notably the use of subsidies**. This is because subsidies tend to increase total resource consumption, whereas taxes or tradeable permits tend to decrease resource use (Baumol und Oates 2005). For the circular economy, Hoogmartens et al. (2018) have demonstrated that promoting recycling with the help of subsidies leads to inefficiently high resource use. This is because subsidies, e.g. for

secondary materials, incentivize a faster disposal of used goods and provide additional income that can be used for additional consumption.

Even very high recycling rates do not prevent this effect: In a growing economy, total consumption of virgin raw materials can increase even when recycling rates approach 100 % (Bongers und Casas 2022). Such paradoxical effects are not limited to recycling: Due to rebound effects, even re-using products can increase total resource consumption (Zink und Geyer 2017).

To minimize such undesired side-effects in a circular economy, **the CEA should prioritize policy instruments that curb total resource use**, such as taxation, tradeable permits or quotas. For example, instead of subsidizing re-use or recycling, competitiveness of circular practices could be improved by taxing the extraction, import or use of virgin raw materials.

Import dependency and EU competitiveness

The section above illustrates that using subsidies to boost circularity can backfire into increased resource consumption. This can also lead to larger import dependency. Applying taxes or quotas, on the other hand, tends to increase resource costs and product prices. This potentially challenges EU competitiveness in global markets.

A possible solution to this dilemma is to complement resource-saving policies such as taxes with subsidies that do not increase resource consumption. This can be achieved by **subsidizing not circular products but innovations**. Innovation-related externalities are another key barrier slowing down sustainability transitions (e.g., Jaffe et al. 2005). Supporting innovations not only avoids the trap of stimulating higher resource consumption. It

also contributes to a lower use of raw materials by promoting resource efficient technologies, thereby reducing import dependency. If taxes or tradeable permits are used to improve circularity, revenue from these instruments can provide the financial means for innovation support policies.

Resource efficiency and environmental pressures

Traditionally, worries about the inefficient use (extraction) of virgin raw materials have been related to overexploiting nature and, later, to environmental damages from extraction and landfilling. It is important to note, that this focus has shifted in the last decades (Krautkraemer 2005). This is because the large variety of market failures and uncertainties associated with natural resource use makes it very difficult to determine if and to what extent resources such as minerals and metals are actually overused (Gaudet 2007; Kronenberg 2008). In addition to this, landfill bans and the accelerating climate change have led to a situation where **the impacts of climate change are possibly the most pressing issue related to natural resource use in terms of both efficiency and the environment**. This does not mean that the EU does not require circularity policies. Rather, the implication is that circularity policies should also prioritize decreasing the climate impact of resource use.

Often, recycling is suggested as a means to achieve this. However, recycling technologies can themselves cause high emissions and contribute to resource depletion (Baumol 1977; Tian et al. 2020). Hence, simply promoting practices like recycling may actually not sufficiently contribute to climate change mitigation and other circular economy goals. Therefore, **circularity policies should more directly address climate emissions from material**

uses of fossil carbon instead of relying on proxy measures like recycling.

Including waste emissions in the EU ETS is equally unlikely to solve the climate challenge of a circular economy, because its price signal is often distorted by the common practice of lump sum waste fees. Such fees often eliminate any incentive for consumers to buy low-carbon products, rendering the ETS ineffective for material uses of carbon. Therefore, the CEA should outline alternative policy options to reduce greenhouse gas emissions related to natural resource use. For example, an EU minimum tax rate for (downstream) material uses of carbon intensive virgin raw materials[1] could contribute to reducing material-related emissions, increasing resource efficiency and making circular practices more competitive.

Additional remark on EU circularity policies

In addition to the selection of policy options that advance the circular economy, another pressing issue is to set clear targets. However, **the EU's circular economy goals such as climate-neutrality, resource efficiency and competitiveness are still too vague to define such targets**. These goals leave considerable leeway in regard to how the circular economy will eventually look like. This uncertainty poses a major obstacle for any business affected by the transition process. Some key uncertainties include:

- **Unclear recycling ambition**: How much and what kind of recycling is efficient and sustainable in the long term, given that recycling processes themselves require resources and produce pollution?

- **Unclear efficiency goal**: Does resource efficiency include the way natural resource stocks are exploited, or does it only mean to optimize production and consumption of any amount of resources once they are extracted? For example, should the EU only worry about how to meet its rising demand for critical raw materials – as the EU's Critical Raw Materials Act currently sets out –, or should

[1] Similar to the miimum tax rates of the EU Energy Tax Directive.

it also limit the demand to a level that is consistent with an efficient rate of depleting natural resource stocks? Another question is whether resource efficiency also uncludes labor, or if labor should be employed excessively (inefficiently) to raise natural resource use efficiency (e.g., by expanding manual waste collection and separation)?

- **Unclear decoupling goal**: Does the CEAP's[2] goal of decoupling resource use from economic growth refer to decoupling in absolute or relative terms? I.e., is it enough to stabilize resource consumption in a growing economy, or should resource use go down in absolute terms?

How these questions are answered may lead to substantially different circular economies and may require different policies. For example, relative decoupling could be achieved mainly by decreasing the resource intensity of *future* economic growth, possibly leaving many existing practices unchanged. By contrast, absolute decoupling implies to a larger extent rethinking also *existing* production and consumption. Hence, absolute decoupling may require more stringent and fundamentally different policies than relative decoupling. EU policies should therefore create a more tangible vision of the circular economy by answering such questions, to avoid economic insecurity, inconsistent policies and expensive errors on its transition pathway.

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