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The circular economy offers bio-based sectors a licence to produce

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Aim
This paper analyses the transition from fossil-based into bio-based products for food packaging and construction in the Netherlands. So far, there is little knowledge developed on the upscaling of the bio-based economy that goes beyond adoption models, and which focus on the required changes in user practises and institutional structures. The Multi-Level Perspective (MLP; Geels and Schot, 2007[1]; Loorbach et al., 2017[2]), analyses transitions through interactions between different levels, i.e. landscape, regime and niches. The landscape level includes macro-economic and macro-political trends, such as the societal urgency to shift from linear to circular production and consumption models. The regime concerns the deep structure of the socio-technical system. Niches are the spaces where various innovations are created and tested.

[1] Geels, F.W. & J. Schot (2007). Typology of sociotechnical transition pathways. Resource Policy 36, 399–417.

[2] Loorbach, D., N Frantzeskaki & F. Avelino (2017). Sustainability Transitions Research: Transforming Science and Practice for Societal Change. Annual Review of Environment and Resources 42, 599–626.

Methods
Our contribution is to use the MLP framework to shed light on the functions needed for scaling up bio-based food packaging and construction through literature and dialogues with entrepreneurs, policy makers, citizens and researchers. In 2019 we organised four meetings with 30-45 participants each.

Results
There are in both sectors a number of growing pains which need more guidance to contribute to the circular bio-based economy. Shared visions with action plans are missing for plastics, where bio-based plastic producers are still discussing the end-of-life options. For construction, there are shared visions available and thresholds agreed to lower the greenhouse gas emissions. This will enhance the use of recycled and renewable materials. More cross-sectoral cooperation in the value chains is necessary to fit with the objectives of the circular economy. Bio-based plastic producers have to find solutions with waste handlers and other actors to recycle more biodegradable plastics instead of focussing at composting. Policy makers could guide this cooperation by increasing the minimum share a recycled plastics in new products. Within construction, more cooperation among large construction actors with end-users and architects is necessary to speed up the use of bio-based materials that deliver good end-of-life options. Policy makers could guide this cooperation accepting only low CO2 emissions in plans for new buildings or renovations.

Conclusion
The results show that innovation policies for transitions in these sectors should not only focus on the creation of new activities to enhance BBP, but also on a wider change of socio-technical systems with BBP that provide better circular end-of-life options.

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