

New Strategies and Business Models for a Circular Plastics Transition

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Context: *My pitch will focus on the ongoing work for my first study. I am currently conducting semi-structured interviews with founders of circular economy start-ups. I hope to have some early results in time for the doctoral workshop in June. Looking forward to your inputs!*

Introduction: The plastics industry is a key contributor to the European economy, creating billions of euros for public finances and providing jobs to over 1.5 million people (PlasticsEurope, 2020). Plastics have transformed society (Bucknall, 2020) and have become integral to how we live today (PlasticsEurope, 2020). However, growing plastics production inevitably creates more waste (Dijkstra et al., 2020), causing widespread damage to our ecosystems (Paletta et al., 2019).

The circular plastics economy has been envisioned as a means to address these problems: it will supersede the current system that produces waste by design with one that preserves the value of plastics without producing negative impacts (Crippa et al., 2019). This study will focus on the budding field of circular business models (CBMs), specifically on their ability to contribute to the circular plastics economy. Circular business models follow principles of the circular economy, incorporating elements that slow, narrow, or close resource loops to minimize resource input into and waste generation out of the system (Bocken et al., 2016; Geissdoerfer et al., 2018). Previous research has explored different types of circular business models in various industrial contexts (Lüdeke-Freund et al., 2019; Rosa et al., 2019; Henry et al., 2020), but none has focused on circular plastics. Similarly, barriers and drivers to circular business models focusing on plastics has not yet been investigated, although earlier work has explored them for textiles, construction, electronics, and manufacturing (Vermunt et al., 2019). Given the urgency of bringing plastics into the circular economy, further research on CBMs for plastics is imperative.

Within sustainable plastic management, extant businesses remain highly centered around recycling (Dijkstra et al., 2020), a widespread strategy that does not require a shift in their core business models (Bocken et al., 2017 and Stewart & Niero, 2018 as cited in Henry et al., 2020). While undoubtedly beneficial, incremental progress is not enough to enact a circular transition (Crippa et al., 2019). Thus, in order to uncover more radical innovations, it would be valuable to investigate circular start-ups (CSUs) along the entire value chain of the circular plastics economy as they are expected to be more open to disruptive CBM approaches (Henry et al., 2020). Examining these CSUs might help us identify novel, radical, or disruptive approaches to business model design for the circular plastics economy. Moreover, to better support the creation of CBMs in this context, it will be beneficial to understand the barriers and drivers for their development and implementation.

Therefore, this research will shed light on how start-ups involved in the plastics industry capitalize on the circular economy, specifically by elucidating how they design circular strategies into their business model. The questions addressed in this paper are as follows:

- What kind of circular business models exist in the circular plastics economy?
- What barriers/drivers influence CBM design for start-ups in the circular plastics economy?
- How can future plastics start-ups incorporate circularity in the design of their business model?

The study will build on previous work on circular business model design, barriers, and drivers to generate research-based principles which are then empirically validated in a multiple case study of Dutch start-ups in the circular plastics economy. At the same time, these interviews will reveal new insights from practice. Ultimately, the research will foster a better linkage between academic and practitioner approaches to CE, deepening our understanding of CBM design while providing prospective entrepreneurs with practical guidance for startups in a circular plastics economy.

Methods: We combine a systematic literature review with a multiple-case study to devise a set of principles that will guide firms on how to incorporate circularity into business model design.

[1] *Literature Review:* The literature is systematically reviewed in order to derive research-based principles for designing circular business models, and also to create an initial list of barriers/drivers for developing circular business models.

[2] *Empirical Validation:* A multiple-case study is conducted, focusing on Dutch startups in the plastics economy who employ circular strategies in their business models. The purpose is two-fold: interviews with practitioners validate the relevance of the principles, barriers, and drivers derived from literature, while also providing the researchers with practical insights for CBM design in the circular plastics economy. For this, we collaborate with a Dutch circular hub hosting a number of start-ups involved in plastics, polymer, and material science. Startups are chosen over SMEs and incumbents as they are more likely to adopt more disruptive business models and radical approaches to the circular economy (Henry et al., 2020). The Netherlands is chosen as the focal region because of its leadership in circular economy initiatives, plastics recycling, and innovation. To further expand the range of start-ups we cover, we built a database of circular start-ups based on earlier scientific work, awards lists, and online searches of sustainable/ circular plastics firms. Because of the explorative nature of the study, we select a wide variety of cases (Seawright & Gerring, 2008) to represent the different CBM possibilities at all parts of the plastics value chain. Semi-structured interviews will be conducted with founders to understand their business models, how they designed circularity into their business model, what barriers/drivers they encountered in the process, and what barriers/drivers they face for their future CBM innovations. In addition, to further enrich this, archival data will be collected from a variety of sources, such as online reports and articles. Data will be subjected to careful coding and reduction following Strauss & Corbin (2015), and the findings will be distilled into a set of practice-based principles. The cross-synthesis of the practice- and research-based principles results in business model design recommendations.

Results: Interviews are ongoing and preliminary results should be available for the doctoral workshop. We expect to map several circular business models in the Dutch plastics economy and have a deeper understanding of how the plastics context shapes the business models applicable for it. Although previous research has pointed to the large number of plastics business models centered around widespread strategies such as recycling, we hope to find a number of more radical, novel approaches to integrating circularity in the business model which might inspire deeper insights into the possibilities open for CBM design in the circular plastics economy.

Contribution: After data collection and analysis, we hope to have (1) a better understanding of the landscape of CBMs being used in the circular plastics economy, (2) a richer understanding of the barriers/drivers influencing CBM design in the said context; and finally, (3) a set of recommendations for future start-ups in the plastics economy aiming to design a new circular business model.