



# Design for Circularity

Interdisciplinaire benadering van duurzame verpakkingen

**Transforming the Dutch Linear Plastic Packaging System Towards a Circular Economy:  
Challenges, Opportunities, and Implications**

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## Aim

- Starting with an analysis of how the Dutch plastic packaging system is currently organized, we developed, prioritized and elaborated on various conceivable and effective policies to create a more circular plastic packaging value chain in the Netherlands.
- The focus of this study is on business model changes induced by these policy interventions, their contribution to a sustainable development, and the resulting implications for various actors involved in the packaging system.
- Adopting an interactive and dynamic system level approach to observe industry level outcomes and through an interactive workshop designed as a serious game, we explored how the industry stakeholders react to prospective policies with their business model adaptations and we used simulation and statistical analyses to explore the effects of these policies on material and financial circularity of the plastic packaging value chain in the Netherlands.

## Policy Development

**Policy 1:** *Quadrupling the incineration fee.*

**Policy 2:** *Establishing a center of excellence that specifically supports SME's in their R&D efforts, development of technical expertise (e.g. common labelling and chemical marking well aligned with standardised separation and sorting systems) and access to the state of the art in their relation to plastic packaging.*

**Policy 3:** *The amount producers and importers of plastic packaged goods pay as a waste management contribution to Afvalfonds is halved for recycled plastics and doubled for virgin material use in plastic packaging.*

## Impact Estimation



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	Material Circularity (%)	Financial Circularity (%)
<b>Status Quo</b>	29.63	36.17
<b>Policy 1</b>	25.71	38.69
<b>Policy 2</b>	36.89	48.48
<b>Policy 3</b>	31.84	40.29

## Contribution

- A new list of policy measures has been derived and confirmed by industry experts in terms of their feasibility and effectiveness in making plastic packaging chain more circular.
- Quantify the system level effects of these policy interventions regarding material and financial circularity.
- A serious game tool to facilitate an interactive workshop with industry stakeholders to simulate alternative policy adoptions and scenarios in a systematic structure. This tool is able to integrate mutual dependency dynamics we observe in real life situations
- The computer simulation model again developed within this study and its user-friendly interface also equips policy makers with a test platform to assess policy interventions in terms of their quantitative effects at the system level before their actual implementation. The program user can conduct several *what if* analyses exploring a wide range of policy options and parameter space combinations.

