

Assessing Circularity Potentials and Customer Education to Drive Ecologically and Economically Effective Materials Design for Circular Economy - A Case Study

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Abstract : Circular Economy, as the counterargument to the 'make-take-dispose' linear model, is an approach that includes a variety of schools of thought looking at environmental, economic, and social sustainability. This, in turn, leads to a variety of strategies and often confusion when it comes to choosing the right one to make a circular transition as effective as possible. Due to the close interplay of circular product design, business model and social responsibility, companies often struggle to develop strategies that comply with all three triple-bottom-line criteria. Hence, to transition to circularity effectively, product design approaches must become more inclusive. In a case study conducted with the University of Bayreuth and the ISPO, we correlated aspects of material choice in product design, labeling and technological innovation with customer preferences and education about specific material and technology features. The study revealed those attributes of the consumers' environmental awareness that directly translate into an increase of purchase power - primarily connected with individual preferences regarding sports activity and technical knowledge. Based on this outcome, we constituted a product development approach that incorporates the consumers' individual preferences towards sustainable product features as well as their awareness about materials and technology. It allows deploying targeted customer education campaigns to raise the willingness to pay for sustainability. Next, we implemented the customer preference and education analysis into a circularity assessment tool that takes into account inherent company assets as well as subjective parameters like customer awareness. The outcome is a detailed but not cumbersome scoring system, which provides guidance for material and technology choices for circular product design while considering business model and communication strategy to the attentive customers. By including customer knowledge and complying with corresponding labels, companies develop more effective circular design strategies, while simultaneously increasing customers' trust and loyalty.

Keywords : circularity, sustainability, product design, material choice, education, awareness, willingness to pay

Conference Title : ICCES 2022 : International Conference on Circular Economy and Sustainability

Conference Location : London, United Kingdom

Conference Dates : June 27-28, 2022