



Implementing the dimension of quality into the conventional quantitative definition of recycling rates



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ABSTRACT

With the proposed Circular Economy Package, the European Union is striving to play a leading role in the implementation of recycling goals. The significantly increased recycling targets are just some of the defined objectives. However, to assess the Member States' attainment of the new recycling targets, the European Union still builds on a purely quantitative recycling rate assessment procedure that neglects to include qualitative recycling aspects. This circumstance could lead to additional quality losses in recycling processes because recyclers might tend to focus exclusively on higher quantities to achieve the stricter recycling targets on time. To prevent such a development, the aim of this study is to establish a complementary recycling indicator that combines quantitative and qualitative recycling aspects in one single metric. The basis of this assessment method is the statistical entropy approach, which enables the concentrating or diluting effect of a recycling process brought about through the separation or mixing of materials to be measured. The results of the statistical entropy metric will provide greater insight into recycling processes (or systems) and thereby yield enhanced information on the quantity and purity of recycling outputs. The simple structure of the new approach will allow enhanced comparisons between technologies as well as national recycling performance. A case study on plastic packaging recycling demonstrates that the new recycling indicator provides multifaceted findings relative to the hitherto purely quantitative recycling assessment data, hence enriching conclusions on the recycling performance.

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