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Performance indicators for a circular economy: A case study on post-industrial plastic waste

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Highlights

- This paper propose an indicator to measure the circular economy performance.

- The starting point of the indicator is the technical quality of the waste.

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Abstract

A linear economy approach results in many environmental challenges: resources become depleted and end up as waste and emissions. One of the key strategies to overcome these problems is using waste as a resource, i.e. evolving toward a circular economy. To monitor this transition, suitable indicators are needed that focus on sustainability issues whilst taking into account the technical reality. In this paper, we develop such an indicator to quantify the circular economy performance of different plastic waste treatment options. This indicator is based on the technical quality of the plastic waste stream and evaluates resource consumption by using the Cumulative Exergy Extraction from the Natural Environment (CEENE) method. To illustrate the use of this new indicator, it was applied in a case study on post-industrial plastic waste treatment. The results show that the indicator can be a very useful approach to guide waste streams towards their optimal valorization option, based on quality of the waste flow and the environmental benefit of the different options.

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