Plastic Recycling Fueled with Blockchain-Driven Tokenization: ESG Optimization and Implications

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Abstract:

The plastic waste crisis has been exacerbating nowadays. To address the burgeoning challenge, one innovative solution is to incentivize recycling via leveraging tokenization thanks to Blockchain technology (BCT). In this study, we device an optimization model considering the tokenization to examine the environmental and social governance (ESG) performance. In particular, we investigate the optimal decisions of tokenization rewards and the government enforcement as well as their interplay on the ecosystem. We demonstrate the potential for significant ESG improvements by managing enforcement and tokenization jointly. Extensive numerical experiments and sensitivity analysis are performed to provide rich insights. For example, the value of tokenization in terms of ESG is visualized.

Keywords:

Plastic, Recycling, Blockchain Technology, Token-based incentives, Environmental and Social Governance (ESG).