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MEASURING EFFICIENCY OF RECYCLING SYSTEMS BASED ON DATA ENVELOPMENT ANALYSIS (DEA) NETWORK: A CASE FROM CHINESE PROVINCIAL CIRCULAR ECONOMY

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Abstract

As a typical environment-economy linking system, recycling and its efficiency measurement with a triple-bottom-line (TBL) thinking, increasingly play an important role in the development of real economies and environmental protection. Since the classic black-box-based data envelopment analysis DEA model may over-estimate the operation performance of a decision making unit (DMU), this paper describes a novel network based on DEA model to narrow the gap between the DEA theory and practical needs on decision making. The proposed DEA model firstly accesses the overall efficiency of recycling systems and then divides it into efficiencies of two sub-systems. Finally, a case from Chinese provincial economy is applied to verify the novel model and the related results with comparing them with those of traditional black box DEA model so as to indicate a more accurate efficiency measurement with the new DEA model.

Key words: efficiency measurement, Data Envelopment Analysis (DEA), network, recycling system

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