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THE ESTABLISHMENT OF EIPs-MFA MODEL FOR THE EVALUATION OF MATERIAL METABOLISM EFFICIENCY IN INDUSTRIAL AREAS

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Abstract

Material Flow Analysis (MFA), as a method of Industrial Ecology (IE), is a useful tool to measure and analyze the material metabolism or physical dimensions of a society's production and consumption at various scales. However, there are different MFA frameworks and points corresponding to different researching scales. This paper proposes to introduce a physical Input-Output Table (PIOT), as means to establish the Eco-industrial parks MFA model (EIPs-MFA) and indicator systems, for analyzing the material metabolism based eco-efficiency at the industrial area scale. The model is applied to a case study of the National Economic & Technological Development Area located in Zhengzhou (ZZEDA), Henan province, China, who faced the challenge of transformation into Eco-industrial parks (EIPs). By analyzing the accounting results, the paper found that there are different problems in different types of industrial sectors and companies. The indicators helped to detect many companies with high material consumption (including water) or inefficiency, which was especially concentrated in three enterprises in the sector of nonmetal mineral products making. It is necessary for these enterprises to increase their eco-efficiency, and ultimately improve their ecological or environmental performance.

Key words: material flow analysis, eco-industrial parks, physical input-output table

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