

研究综述与进展

生态效率方法研究进展与应用

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摘要 生态效率同时考虑经济效益和环境效益, 是将可持续发展的宏观目标融入中观(区域)和微观(企业)的发展规划与管理中的有效工具。回顾了生态效率的概念和发展过程, 分析了其内涵和指标体系, 探讨了几种典型计算方法与模型, 并介绍了国内外在企业、行业和区域3个层次上的应用实践, 讨论和提出了进一步开展生态效率研究的焦点问题和未来方向。

关键词 [生态效率](#); [环境管理](#); [经济效益](#); [环境效益](#)

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Review of methodology and application of eco-efficiency

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Abstract Eco-efficiency, as an effective tool which integrates the sustainability into the development planning and management initiatives at company and regional level, combines the economic value and environmental value. Although there are several definitions of Eco-efficiency, 'Creating more value with less impacts', defined by the World Business Council for Sustainable Development (WBCSD), is generally accepted. Compared with concepts such as Factor X and Ecological Footprint (EF), Eco-efficiency mainly focuses on integrating the environmental impact and economic value, while Factor X and EF concern more on the environmental impact. Cleaner Production also concerns about both environmental performance and economic performance. However, Eco-efficiency takes economic value in high priority whereas Cleaner Production emphasizes on the environmental impact. There are some methods for calculating the Eco-efficiency. Value-Impact ratio method is commonly used, which defines Eco-efficiency as the ratio of economic value of product (service) to its environment impacts. Since the goal and scope for Eco-efficiency analysis varies, the calculation methods for both economic value of product or service and related environmental impact has not come to an agreement. Additionally, some alternative methods like DEA model, Eco-cost/Value Ratio have also been applied in some cases. Eco-efficiency is applied widely at a company, industrial and regional levels. At the company level, Eco-efficiency application methods vary according to the scales of the companies. At the industrial level, Data Envelopment Analysis (DEA) is widely used because of its objective method to weight various environmental impacts. Eco-efficiency calculations for regional industrial systems have also been developed, especially in the product recycling systems. Research and application of Eco-efficiency in China have made progress in the last few years. On the basis of introduction of foreign theory system, promotion of circular economy development by Eco-efficiency theory and methodology has become one of the hottest topics. Applications of Eco-efficiency at company level have also developed rapidly. The analysis of Eco-efficiency theory and applications shows that applications at the company level emphasize on the practicability, while the ones at the regional and industrial levels have a trend of more comprehensive and more complicated methods. How to reasonably integrate these two methods will be an important direction of Eco-efficiency theory. Evaluation of time-scale effects on

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n the economic value and environment impact, improvement of DEA model, and development of Eco-efficiency methodology that suits to small and medium-sized enterprises, are the important issues to be solved. Additionally, Eco-efficiency application in waste recycling systems is also one of the hot points of research.

Key words [eco-efficiency](#); [environmental management](#); [economic value](#); [environmental value](#)

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