Environmental Engineering and Management Journal xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu

"Gheorghe Asachi" Technical University of Iasi, Romania

CARBON REDUCTION ASSESSMENT OF SHANGHAI INDUSTRY UNDER THE CONSTRAINT OF "CARBON PEAK": ANALYSIS BASED ON CARBON FOOTPRINT ACCOUNTING

Guangcheng Ma[1*], Zhenyu Wang[2], Jiahong Qin[1], Jianhua Cao[1]

[1]School of Urban and Regional Sciences, Shanghai University of Finance and Economics, No. 777 Guoding Road, Shanghai, 200433, China
[2]Department of Earth System Science, Ministry of Education Key Laboratory for Earth System Modeling, Institute for Global Change Studies, Tsinghua University, No. 30 Shuangqing Road, Beijing, 100084, China

Abstract

Under the constraint of the "carbon peak" target, Shanghai, a metropolitan area in China, is one of the most concentrated for human economic activities. Implementing sustainable development policies and promoting emission reduction is even more necessary. This paper develop a carbon footprint accounting and full decomposition system based on the input-output model. Then, this paper conducts a scenario simulation to discuss the carbon footprint and emission sources caused by the production linkage of 42 industries in Shanghai in closed and open environments. According to the results, this paper finds that the carbon footprints of high-emission industries in Shanghai are closely linked to the closed situation. In almost every production stage, Shanghai's high-carbon industries require producing and supplying electricity and heat. The carbon emissions of the electricity and heat production and supply industries are provided by themselves and do not rely on other industries. In the open situation, most of emissions are generated in the production process. In the energy-saving industries, the carbon emissions contributed by all energy-saving industries at the production end are at the back. In the scenario simulation, the carbon footprint level of various industries in production linkage is gradually decreasing. However, the service industry is the most responsible for emission reduction.

Key words: carbon footprint accounting, carbon peaks, industrial carbon reduction, regional input-output analysis, Shanghai

Received: December, 2024; Revised final: January, 2025; Accepted: February, 2025

[*] Author to whom all correspondence should be addressed: e-mail: mgc@163.sufe.edu.cn; Phone: +86 13151055575