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DYNAMIC CHANGE AND INFLUENTIAL FACTORS OF CARBON FOOTPRINT FOR ENERGY CONSUMPTION: A CASE STUDY OF WUHAN CITY, HUBEI PROVINCE, CHINA

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Abstract

As the threat posed by global climate change becomes more acute, action must be taken to mitigate carbon emission. Carbon footprint, as a widely used term and concept, is increasingly being recognized as a valuable indicator in the field of GHG and carbon emissions management. However, few attempts have been made to investigate precise relationship between carbon footprint and influential factors. In this paper, STIRPAT model was employed to reveal the dynamic relationships between carbon footprint and influential factors by means of the ridge regression for a case study of Wuhan city, Hubei province in central China. The results are as follows: (1) Carbon footprint for energy consumption has increased from 188.46 ten thousands hm^2 in 1995 to 331.50 ten thousands hm^2 in 2009, which of the annual average growth rate was 4.12%. (2) Coal consumption accounted for the largest share in carbon footprint for energy consumption. Petroleum and natural gas consumption showed fluctuating trend. (3) According to STIRPAT model, population and economic development were the main influential factors of carbon footprint for energy consumption. 1% increase of population has resulted in 3.229% increase in carbon footprint for energy consumption, and 1% increase of per capita GDP in 0.261%. (4) The relationship between per capita GDP and carbon footprint for energy consumption did not prove the environmental Kuznets curve (EKC). (5) Comparing with other provincial cities in China, the per capita carbon footprint in Wuhan city is lower than Beijing, Shanghai, Tianjin, while much more than Chongqing city.

Key words: carbon footprint (CF), dynamic analysis, driving factors, energy consumption, STIRPAT model, Wuhan City

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