Characteristics and Drivers of the Household Carbon Footprint: An Age Structure Perspective

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The study of driving factors behind residents' carbon footprints aids in identifying starting points for carbon reduction. Research that categorizes results by age can reveal the carbon emission characteristics of different age groups in more detail, providing a scientific basis for the formulation of targeted carbon reduction strategies. This study employs a systematic technique that utilizes the environmental inputâ€“output life cycle assessment model (EIO-LCA) and IO-based structural decomposition analysis (IO-SDA). The results show that the carbon footprints of 0-14 year olds are mainly concentrated in the mining and washing of coal, the processing of petroleum, cooking, and the processing of nuclear fuel; those of 15-64 year olds are concentrated in manufacturing; and those of people aged 65 and above show obvious geographical differences. Consumption value and the consumption structure of consumption types are the main drivers that increase the carbon footprint, and changes in the structure of industry can effectively promote carbon emission reduction. The structure of the consumption industry is the main driver of the housing consumption carbon footprint, and changes in the value of housing consumption are conducive to carbon emission reduction. It is recommended that policymakers focus on carbon emissions based on the breakdown of population structure, pay attention to carbon emission reduction from housing consumption, and actively optimize both industrial and consumer structures.

This study includes the following innovative points: (1) This article examines the carbon footprint resulting from Chinese residents from the perspective of demographics, which aligns with the current reality of an aging society. (2) This study offers a multidimensional analysis of carbon footprints. Unlike previous studies, which often focus on the consumption carbon footprint of a single age group, this study conducts a systematic and comparative assessment of factors including age structure, consumption types, regional distribution, and industrial composition during the 2015â€“2020 period. (3) This article provides a quantitative analysis of the socioeconomic drivers of the carbon footprint from Chinese residents and how these factors evolve over time and across different types of consumption.