

Regional carbon footprint and interregional transfer of carbon emission in China

Topic: Carbon footprinting and trade

Author: YAN WANG

Co-Authors: Minjun Shi

Carbon footprint is the total amount of greenhouse gases produced to directly and indirectly support human activities, usually expressed in equivalent tons of carbon dioxide. Carbon footprint of a region can be calculated as sum of CO₂ emissions that are induced by final demands in the region. Due to the embodied CO₂ emission may be transferred across regions through interregional commodity trade, carbon footprint of a region is affected by regional industrial structure and interregional commodity trade. This paper aims to measure carbon footprint of each province and CO₂ emission transfer across provinces through interregional commodity trade in China, based on China interregional input-output model 2002. The results show that there is significant difference of carbon footprint across provinces in China. Carbon footprint per capita in Shanghai is over than 12 tons, which is equivalent to the level of European countries. However in most of provinces carbon footprint per capita is less than 4 tons. More than 1/3 of provinces have a carbon footprint per capita less than 2 tons, where is almost inland areas with a GDP per capita less than 10 thousands CNY, the average level of China in 2002. A significant correlation between carbon footprint and GDP can be observed (correlation coefficient is 0.785). In most of developed coastal provinces, carbon footprint is higher than real CO₂ emission of that province, except Shandong, Liaoning and Zhejiang. In developing inland regions, real CO₂ emission is higher than carbon footprint in the provinces with rich mineral resources, but real CO₂ emission is less than carbon footprint in the provinces of the middle part. It indicates that livings of developed coastal provinces depended on support of carbon emission from inland provinces. On the other hand, geographical transfers of embodied carbon emission are concomitant with commodity flow across provinces. The inland provinces get commodities for livings or capital use from the provinces with large production capacity. It resulted in CO₂ emission transferred from developed coastal provinces to developing inland provinces.