

The Sources of Carbon Intensity Change in China: 1997-2007

Topic: Climate policy issues: analyses

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This paper employs non-competitive input-output model and structural decomposition analysis to analyze the historical change in energy-related carbon intensity in China in the period of 1997-2007, based on the 1997, 2002 and 2007 Chinese input-output tables. The carbon intensity (CO₂ emission per unit of GDP) is explained from the demand side and also the supply side. The main factors affecting carbon intensity include the production technology, the energy and environmental technology, the final demand allocation structure, the product structure of each kind of demand (including household consumption, capital formation, exports and others), and the household emission intensity. We can induce the effect of the industrial structure change by the production technology and the demand pattern. The results show that the big decrease of carbon intensity in 1997-2002 mainly attributes to the technology, the great reduction of energy intensity and the change of the production technology. However, in 2002-1997, there are significant changes: (1) the production technology makes the carbon intensity increase, because of the increases in input coefficients of high carbon emission materials; (2) exports becomes much more important for its great negative effect on carbon intensity; (3) the potential of household consumption in decarbonizing decrease, and the negative effect of capital formation increase; (4) the negative influence of industrial structure increases greatly, and the reasons from long term and short term aspects are given in the paper. The policy implications are also investigated at last.

Keywords: Carbon intensity; input-output model; structural decomposition analysis