

## Research on Industry Actual Potential for Carbon Emission Reduction based on Optimal Input-Output model

Topic: Environmental IO models 1

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From the perspective of Chinese industries' carbon emission reduction, this article works out the actual potential in industry structure adjustment, which means the change in the ratio of the output of a specific industry to that of the whole economy, under the three kinds of scenarios on constraints of carbon emission reduction, supposed economy increase respective 9%, 8% and 7.5%, according to target of carbon emission reduction in Copenhagen Conference. The industrial structure optimization potential is influenced comprehensively both by the carbon emission coefficients of the difference industries and the contribution of different industry to GDP. According to the computation result of optimal input-output model established based on Chinese 2007 Energy-Carbon-Emission-Economy Input-Output Table we compile, we find that it is necessary to increase the output of high-tech industries and services with a low coefficient of small amount of carbon emission. For examples, mechanism, electricity manufacture should be increased at largest degree at the range from 1.72% to 1.85%, and then real estate, finance and other service should be increase at the range from 1.17% to 1.26%. If the ratio of renewable energy for the change of structure of energy is considered to be increased, then the range of adjustment of industry structure will be decreased, for example, mechanism, electricity manufacture should be increased at largest degree at the range from 1.4% to 1.53%, and real estate, finance and other service at the range from 0.95% to 1.04%. The increase range of industry adjustment will rise with the increase in reduction of carbon emission and decline in the speed of economy growth. Moreover, small amount of heavy industry with high carbon emission coefficients should be decrease its ratio of output to the whole economy, e.g. metal processing and manufacture, declining at the range from 8.13% to 8.74. The degree of decline in ratio of its output to the whole economy should be increase with the increase in reduction of carbon emission and decline in the speed of economy growth. The calculated specific indicators could be in favor of the the plan of industry structure adjustment to achieve emission reduction targets with less damage of optimal economic growth.

Key words: carbon emission, input-out model, optimization, industry restructuring