

Decomposition and econometric analysis of the changes in China's industrial carbon emissions over 2005-2011

—— discussing China's first efforts on industrial carbon emission mitigation

ZHANG Qiyue

Key words: Climate Change, China, Industrial carbon emission, Energy Intensity, Structure change, Emission factor, Decomposition analysis, LMDI, panel regression, 11th Five Year Plan

ABSTRACT

China has become the world's largest carbon emitter. In response, Chinese government has set a long-term target to reduce carbon intensity by 40-45% by 2020, and included carbon intensity target into the 12th Five Year Plan. The targets are ambitious for China, given its increasing economic development. In order to improve the climate change policy mix, learning from the relevant experiences in the past is very important. This research focuses on the energy policy apparatus of the 11th Five Year Plan, which can be considered as the first step and foundation of China's climate change policies. By adopting decomposition analysis and econometric analysis to examine industrial carbon emission changes over 2005-2011, the target and implementation channels of the energy policy apparatus are examined from the perspective of carbon emission mitigation. As for the target, the implementation of relative energy intensity reduction target has failed to lead to absolute emission decrease. However, it did help to narrow the gap, based on comparison with the previous period. As for the implementation channels, sectoral energy intensity and emission factor have imposed greater impacts on industrial carbon emission mitigation, while the impact of industrial structure change remains small and negative. Therefore, further analysis is conducted to clarify the drivers behind industrial structure related carbon emission changes, which is considered as essential for China to achieve its 2020 40-45% target. However, the supporting policies for the energy intensity- associated carbon emission mitigation, although proved to be well designed for energy intensity- associated carbon emission mitigation, are less effective for structure change. Additional policy shall be introduced, and profitability of the sectors shall be taken into consideration when designing and implementing such policies. These lessons and experiences can serve as valuable references for China's further steps to combat its climate change issue.