

Integrated assessment of China's provincial low carbon economy development towards 2030 – Jiangxi as an example

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This study assesses China's low-carbon economy development towards 2030 with Jiangxi Province as an example. For this purpose a two-region computable general equilibrium (CGE) model is constructed for China. Scenario analysis shows that with economic growing by around 6–7 times over 2005–2030 periods, the primary energy consumption would increase by 2.5 times in Jiangxi Province and 2.7 times in the rest of China in the baseline scenario, accordingly carbon emissions would increase by 2.4–2.6 times in both regions. GDP loss in the carbon mitigation scenarios depends on many factors such as carbon constraints, burden share schemes and low-carbon countermeasures. The more the reduction is, the more GDP loss there would be. It is beneficial for an under-developed region like Jiangxi Province to adopt per capita emission based burden share scheme. Moreover, in the absence of additional countermeasures carbon price and GDP loss resulted from deep carbon reduction would be unacceptably high at around over 850 US dollar/ton and 25%, respectively; however, with various low-carbon countermeasures, carbon price and GDP loss would be brought down significantly to about 380 US dollar/ton and 12%, respectively. In addition, remarkable co-benefits associated with low-carbon economy are identified in terms of improvement in air quality and energy security.