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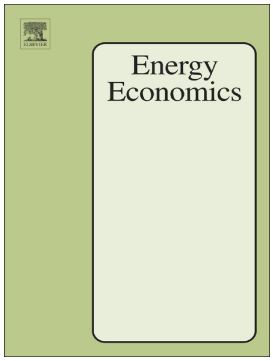

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The achievement of the carbon emissions peak in China: The role of energy consumption structure optimization

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Abstract

Optimizing the coal-dominated structure of energy consumption would effectively contribute toward ensuring that China's carbon emissions peak by 2030. To investigate whether this goal can be achieved through such optimization, the present study proposed a new economic-carbon emission-costs (ECC) multi-objective optimization model. Our findings show that the carbon emission peak will be achieved between 2025 and 2028, most likely in 2028, with 10.12 billion tonnes CO_2. The peak of coal consumption was achieved in 2013 whereas the oil consumption cannot be peaked before 2035 in the GDP preference. In the process, China's GDP will be able to maintain an average annual growth rate of 5.9% -6.3% between 2017 and 2030, while the carbon emission average annual growth will be 0.5%-1.1%. The carbon intensity in 2030 can drop to 71.9% based on the 2005 level, which would exceed the committed reduction goal of carbon intensity equal to 60-65%.

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