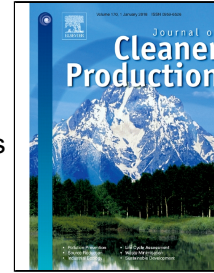


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Factors influencing renewable energy consumption in China: An empirical analysis based on provincial panel data

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Abstract: The development of renewable energy is the key to deal with climate change and low-carbon economy development in China. Here, based on a balanced panel dataset of 30 provinces in China cover the period of 1996-2013, this paper explores the effect of economic growth, CO₂ emissions, foreign trade (exports or imports) and urbanization on renewable energy consumption at the national and regional levels by using a dynamic system-GMM panel model. The empirical results show that the influence of economic growth, CO₂ emissions, foreign trade and urbanization on the renewable energy consumption is heterogeneous across regions. First, economic development has an important positive impact on renewable energy consumption in the four panels we consider and the impact is the greatest in the eastern region, follows by the national, central and western regions. Second, CO₂ emissions have a significant positive impact on renewable energy consumption in the central and national regions. However, CO₂ emissions have a weak negative impact on the consumption of renewable energy in the eastern region, and have no impact in the western region; Third, per capita exports are found to have a positive effect on the renewable energy consumption, with the greatest impact in the central region, followed by the eastern and national regions and have a weak negative impact in the western regions; Fourth, per capita imports have a negative effect on renewable energy consumption in the eastern, western and national regions and have a weak positive effect in the central region; Finally, the changes in the urbanization level significantly affect the renewable energy consumption in the four panels we consider and the impact is the greatest in the eastern region with high level of urbanization, follow by the central and western regions. On the basis of this study, we put forward the corresponding countermeasures and suggestions to achieving sustainable development in China.

Keywords: CO₂ emissions; renewable energy consumption; foreign trade; urbanization

1 Introduction

In 1997, more than 100 countries and regions in the world signed the "Kyoto Protocol" and promised to promote renewable energy sources. Over the past few years, China's economy has grown at an average of over 7%. With the rapid development of economy and population, China has become the largest energy consumer and the greatest emitter of CO₂ in the world. Therefore, China government attaches great importance to promoting the work of CO₂ emissions reduction [1]. In 2014, the Chinese government promised to reach the carbon peak in 2030 in U.S.-China Joint Announcement on Climate Change. Economic development is the most important macroeconomic goal in developing countries. Thus, how to deal with the relationship between economic development, energy consumption and environmental pollution has become the focus of policy makers and scholars concerned. The consumption of non-renewable energy (oil, coal, natural gas) is a direct cause of increased CO₂ emissions in China. The energy situation in China is

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