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Realizing Carbon Neutrality in Top-Emitter Countries: Do Green Technology Innovation, Renewable Energy, Financial Development, and Environmental Tax Matters?**Olani Bekele Sakilu***Jiangsu University, China*

As a result of the growing global climate crisis, many countries have pledged to cut carbon dioxide emissions and other greenhouse gas emissions to achieve net-zero emission goals. These goals can be successfully realized with the rollout of environmental regulations, utilization of green technology innovations, and a greater use of renewable energies. This study explores the influence of green technology innovations, renewable energy, financial development, environmental taxes, and economic growth on CO₂ emissions in the 19 highest emitting countries from 1994 to 2022. The results reveal that renewable energy use and environmental taxes negatively affect CO₂ emissions, reinforcing the essential role of these variables in the journey toward carbon neutrality. Green technological innovations, financial development, and economic growth have positive effects on CO₂ emissions, suggesting that appropriate regulations and policies are necessary to attain net zero carbon emissions. The findings also indicate that financial development positively affects environmental quality by promoting green technological innovations. The causality results indicate a bidirectional causal link between green technology innovations, renewable energy, environmental taxes, economic growth, and CO₂ emissions. Additionally, a unidirectional causal relationship exists between financial development and CO₂ emissions. Based on these results, the study offers policy suggestions.

Biography

Olani Bekele Sakilu and Haibo Chen are researchers at the School of Finance and Economics, Jiangsu University, Zhenjiang, China. Their academic focus includes economic development, financial systems, and policy analysis, particularly in the context of emerging markets and sustainable growth. Olani Bekele Sakilu offers a global viewpoint, with a strong foundation in development economics and financial inclusion. Haibo Chen specializes in economic modeling, policy evaluation, and quantitative analysis. Their collaborative research explores financial behavior, macroeconomic stability, and the socio-economic effects of public policy in developing regions. They have presented their work at academic forums and published in peer-reviewed journals. Both are dedicated to producing impactful research that supports evidence-based policymaking and inclusive development. In addition to their research, they mentor students and contribute actively to academic initiatives at Jiangsu University, helping to shape future leaders in economics and finance.