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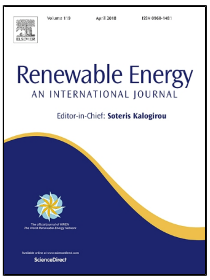

The role of renewable versus non-renewable energy to the level of CO_2 emissions A panel analysis of Sub- Saharan Africa's Big 10 electricity generators

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The role of renewable versus non-renewable energy to the level of CO_2 emissions

A panel analysis of Sub- Saharan Africa's Big 10 electricity generators

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Abstract

Undoubtedly, the increasing rates of CO_2 emissions contribute highly to climate change. Studies stress the importance of understanding the determinants of emissions, in order to implement appropriate policies. In the past, literature only looked at the effect of aggregate energy to emissions; while nowadays, with the increasing role of renewables, they aim at evaluating the impacts of renewable and non-renewable energies separately. Also, studies ignored possible cross-dependence among countries; concept particularly important for countries linked by trade or geographical position. Also, only lately, studies focused on developing economies.

In this study, we aim to address these gaps of the literature by estimating the determinants (renewable and non-renewable energy, income and trade openness) of CO_2 emissions for the ten biggest electricity generators in Sub-Saharan Africa for the period 1980 to 2011 by employing panel estimation techniques robust to cross dependence. A long-run relationship between the main variables is confirmed. Increases in non-renewable energy consumption intensify pollution while the opposite holds for renewable energy. With regards to direction of causal relationships, we observe a unidirectional causality running from emissions, income, trade and non-renewable energies towards renewable energies; from non-renewable energy to emissions; and from emissions and non-renewable energies to trade.

Keywords: renewables; CO_2 emissions; Sub-Saharan Africa; Big 10

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