

Title: Impacts of renewable and disaggregated non-renewable energy consumption on CO2 emissions in GCC countries: A STIRPAT model analysis

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Abstract: This research investigates the effects of renewable (REC) and disaggregated non-renewable energy consumption (coal, oil, and natural gas) on CO2 emissions (CO2) in GCC countries, employing the STIRPAT model. The research also compares the impact of various non-renewable energy (NREC) sources to identify their contributions to CO2 emissions. Demographic factors like population and economic growth are considered main determinants of CO2. Panel data econometric methods are used, including diagnostic tests and unit root tests, to found long-run relationships among the variables. The study reveals significant positive associations between coal, natural gas, oil consumption and CO2, with oil having the highest impact. Conversely, REC shows a significant negative correlation with CO2. Economic growth and population are also linked to increased CO2. The findings emphasize the need for strategies promoting renewable energy usage, energy efficiency, public transportation, carbon pricing, and research in green technologies to alleviate CO2 and enhance sustainable development in the GCC countries.

Keywords: Renewable energy consumption, Disaggregated nonrenewable energy consumption, Economic growth, CO2 emissions, GCC countries

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