Analyzing the Influence of Energy Consumption and Economic Complexity on Carbon Emissions: Evidence from Malaysia

By Afroz, R; Alofaysan, H; Muhammad, YB

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Abstract Due to increasing energy consumption, there has been a significant expansion in worldwide trade, leading to the emergence of severe environmental issues. This situation is further compounded by the non-negotiable requirement to simultaneously mitigate environmental degradation and achieve economic progress. To ensure a healthier future, it is imperative to identify and address the factors that contribute to environmental contamination. The purpose of this study is to examine how Malaysia's carbon dioxide (CO2) emissions are affected by energy consumption, economic growth, and the economic complexity index (ECI). Time series data from 1997 to 2020 are used in this study, along with the autoregressive distributed lag model. The environmental Kuznets curve theory

holds true in Malaysia, according to the study's findings, and energy use has a negative impact on CO2 emissions. There is also evidence suggesting that a higher ECI is linked with increased levels of CO2 emissions over a prolonged period. Malaysia's main export, electrical and electronic goods, generates substantial CO2 emissions during the manufacturing process. The outcomes of this research have important ramifications for environmental strategies concerning the mitigation of CO2 emissions. The electrical and electronics industries can implement energy-efficient technologies and practices in manufacturing processes. This would include upgrading to more efficient machinery, optimizing production schedules, and reducing idle times. It is also crucial to work with governments and industry bodies to advocate for policies that support sustainable manufacturing practices.

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