



# The Role of Renewable, Non-renewable Energy Consumption and Technology Innovation in Testing Environmental Kuznets Curve in Malaysia

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Received: 01 October 2018

Accepted: 29 November 2018

DOI: <https://doi.org/10.32479/ijeeep.7327>

## ABSTRACT

This current paper investigates the role of renewable energy, non-renewable energy and technology innovation in testing the environmental Kuznets Curve in Malaysia by using the annual data over the time from 1980 to 2017. We applied the advance econometrics to serve the purpose of investigation and therefore used the auto regressive distributed lags (ARDLs) bound testing approach for assessing the presence of long-run relationship between the variables. The results of ARDL bound testing approach confirm the valid long run relationship between renewable energy, non-renewable energy, technology innovation and economic growth with carbon dioxide emission in Malaysia. The empirical results indicate that renewable energy consumption and technology innovation have significant and negative impact on carbon dioxide emission whereas, the non-renewable energy consumption and economic growth have a significant and positive impact on carbon dioxide emission. Furthermore, results also confirm the existence of inverted U-shape curve in Malaysia.

**Keywords:** Sustainable Energy, Green Technology, Renewable Energy, Technological Innovation, Environmental Kuznets Curve, Malaysia

**JEL Classifications:** Q20, Q56, O31

## 1. INTRODUCTION

The rising change in the climate condition has increased the concerns of people all around the globe as it entails the tendency to influence human, social and economic development of the countries. The orthodox practices of certain businesses are also a contributing factor of witnessing increasing environmental degradation (Jebli and Youssef, 2015). On the other hand, energy is considered as a vital element of economic progress by being a critical catalyst of economic activities (Shahbaz et al., 2018). However, the excessive dependence of economies on fossil fuels and other non-renewable sources of energy has enhanced the adversity of the existing climate situation. In addition, the harmful emissions from industrial processes not only increases

the level of pollution but also cause permanent damages to the atmospheric condition.

As a result, economies have started to give the supreme attention to the notion of sustainability in ensuring economic development. In this regard, the conception of non-renewable sources of energy play a substantial role in curtailing the negative effects of environmental degradation. Non-renewable energy is defined as the form of energy that is obtained from environmental friendly sources and bring minimum damage to the environment (Kobayashi et al., 2013; Apergis and Payne, 2014; Henry, 2014; Ekpung, 2014; Zomorrodi and Zhou, 2016; Danbaba et al., 2016; Zomorrodi and Zhou, 2017; Chen et al., 2018). These include the energy attained from sources such as solar, wind, bio-fuels etc. In addition, the progressions in energy efficiencies alongside the