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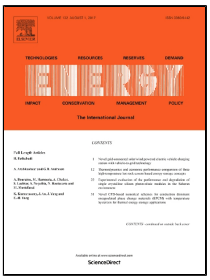

Environmental Kuznets Curve of greenhouse gas emissions including technological progress and substitution effects

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Environmental Kuznets Curve of greenhouse gas emissions including technological progress and substitution effects

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Abstract

The relationship between greenhouse gas (GHG) emissions and economic growth has been intensively analysed. The literature criticizing Environmental Kuznets Curve (EKC) hypothesis is very rich as well. Therefore, the aim of this paper – including the majority of world countries and considering the criticism on EKC, to estimate the impact of growth on GHG emissions in a way to account for technological progress (energy efficiency) and substitution (share of renewable energy consumption) effects. The analysis revealed that if we take into account robustness tests and appropriate estimation techniques the GHG pollution increases with total production output monotonically. When classic EKC function was modified, we revealed that if we hold other factors of growth fixed, increase in efficiency of energy usage by 1% would lead to direct reduction of GHG pollution by 0.87% and indirect increase of pollution through induced economic growth effect by 0.18%. Meanwhile, if share of renewable energy sources in total final energy consumption would increase by 1 percentage point it would reduce GHG pollution by 0.92% holding other factors fixed. Therefore, the increase of energy efficiency and promotion of renewable energy consumption are one of the main tools to achieve the EKC occurrence at the world level.

Keywords: Greenhouse gas emissions, Environmental Kuznets Curve, renewable energy consumption, energy efficiency.

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