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DECOMPOSITION OF ENERGY-RELATED CO_2 EMISSION OVER 1998–2017 IN TURKEY

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Abstract

In recent decades, energy-related CO_2 emissions have been a critical priority of global environmental policy. It is a leading cause of the increase in greenhouse gas triggering global warming in the atmosphere. This study is aimed to identify the factors that contribute to changes in CO_2 emissions in Turkey from 1998-2017. Logarithmic Mean Divisia Index (LMDI) method has been used to decompose changes in CO_2 emissions for four industries (manufacturing industries, transportation, commercial & institutional, and agriculture & forestry). It is used to decompose CO_2 equivalent emissions changes in these sectors into five driving forces: economic activity, activity mix, energy intensity, energy mix, and emission factors. Analyses are conducted for four fuel types; liquid, solid, gaseous, and other fossil fuels. Analytical results indicate that economic activity and sectoral energy intensity are vital decisive factors in determining the change in CO_2 emissions. The activity effect has raised CO_2 emissions, while energy intensity has decreased. This method indicates that the impact of the energy intensity, which is a symbol of improvements in energy efficiency, could be the first key determinant for lowering GHG emissions from all sectors. Additionally, the energy mix and energy structure effect perform the second and third driving factors to reduce CO_2 emissions.

Keywords: energy, GHG emissions, driving forces, decomposition analysis, Turkey

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