

## **ABSTRACT**

*The excessive use of fossil fuels in Indonesia's manufacturing sector raises concerns about potential environmental damage and energy crises in the future. Therefore, an analysis of interfactor and interfuel substitution in the Indonesian manufacturing sector has been conducted to obtain information on price responsiveness, the potential for substituting fossil fuels, and production factors. This information can be used in developing policies related to energy conservation and environmental mitigation.*

*This study employs the two-stage translog cost function analysis method introduced by Pindyck (1979), using panel data at the sub-sector level consisting of 150 data points, three types of fossil fuels (gasoline, gas, and diesel), and three types of production factors (capital, energy, and labor). This method was chosen due to its flexibility in assumptions and the factors of production used, as well as its complexity, allowing for a better representation of real-world conditions. The parameters obtained will later be used to calculate elasticity figures.*

*The results of this study indicate that most of the tested variables align with the hypotheses and are significant. Diesel fuel has the highest price elasticity of demand and shows relatively high substitution when its price changes. On the production factors side, capital has the highest price elasticity of demand. Labor shows high substitution potential with capital and energy when its price changes. On the other hand, capital and energy also demonstrate substitution relationships, but most sub-sectors are more likely to substitute capital with energy.*

*Key words: fossil fuels, two-stage translog cost function, inter-fuel elasticity, inter-factor elasticity, capital and energy substitution*