# *ABSTRACT*

*Coal consumption continues to dominate the global energy mix, particularly in major countries such as China and the United States. This study aims to analyze the trend of coal consumption in power generation and examine both the short-term and long-term relationships between coal-based electricity consumption and GDP per capita in these two countries. The research employs the Monte Carlo Simulation method to forecast coal consumption for the 2025–2026 period and the Autoregressive Distributed Lag (ARDL) model to analyze the dynamic relationship between GDP per capita and coal-based electricity consumption. The data used consist of monthly time series from 2014 to 2024.*

*The results of the Monte Carlo simulation indicate that coal consumption in China tends to increase, albeit fluctuating, while the United States shows a declining trend due to the transition toward renewable energy. Furthermore, the ARDL estimation results reveal both short-term and long-term relationships between GDP per capita and coal-based electricity consumption in China and the United States. These findings highlight the importance of energy transition policies that balance economic growth with environmental sustainability.*

*Keywords: Coal, Power generation, China, United States, Monte Carlo, ARDL, GDP per capita, Forecasting.*