

Title: Time Series Analysis for Forecasting Carbon Dioxide Emissions in Thailand

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ABSTRACT

This study focuses on forecasting carbon dioxide (CO₂) emissions time series in Thailand across three sectors: the electricity generation sector, the transportation sector, and the industrial sector. The study uses publicly available data from the Office of Energy Policy and Planning, covering the period from January 1987 to December 2022, covering 444 months. The data is divided into two sets: a training dataset from January 1987 to December 2022, containing 432 months, and a test dataset from January 2023 to December 2023, containing 12 months. Four statistical forecasting methods are applied: the Box-Jenkins method, the Holt-Winters exponential smoothing method and decomposition methods. The models are evaluated by comparing the Mean Square Error (MSE), Mean Absolute Error (MAE), and Mean Absolute Percentage Error (MAPE) to determine the most accurate forecasting model for each sector. The results suggest that the Holt-Winters and Box-Jenkins methods are the most likely to be used for CO₂ emissions forecasting the abstract content here.

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