

Forecasting and Analyzing the Gap between Thailand's Wood Pellet Supply and Global Demand

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Abstract. The issues of global warming and climate change have become an international concern. Carbon dioxide emissions from fossil fuels for generating heat and electricity energy are the primary cause of this phenomenon. To mitigate environmental impacts, biomass wood pellets are being increasingly used as a sustainable alternative to fossil fuels for electricity production in many countries, especially in the European Union, the USA, Canada, Japan, and South Korea. Likewise, the Thai government launched a project to promote the plantation of fast-growing trees such as Acacia, which can be used as a feedstock for biomass power plants both domestically and overseas. Therefore, this article aimed to forecast and analyze the gap between Thailand's wood pellet supply and global demand. First, countries that had significant trade value in terms of imports of wood pellets from Thailand were considered. Based on historical import data from the UN database from January 2015 to December 2022, time series forecasting methods were applied to construct a model which could be utilized to forecast the demand for wood pellets. They include the 3-month Moving Average, the Exponential Smoothing Method (Holt's Two-Parameter Method), and the ARIMA method. All forecasting methods used for analysis were selected based on mean absolute deviation (MAD), mean square error (MSE), and mean absolute percentage error (MAPE). Consequently, the global demand trend compared to Thailand's wood pellets supply can be exhibited as an opportunity in the market. Market growth predictions can be used to plan a comprehensive strategy for the supply chain from upstream tree plantation to downstream demand.

Keywords: Wood pellets, Forecasting, Moving average, Exponential Smoothing, ARIMA