ABSTRAK

Permintaan Liquefied Petroleum Gas (LPG) yang bersifat fluktuatif dan memiliki pola musiman menyebabkan perencanaan distribusi menjadi lebih kompleks. Penelitian ini bertujuan membandingkan kinerja metode *Autoregressive Integrated Moving Average* (ARIMA) dan *Seasonal Autoregressive Integrated Moving Average* (SARIMA) dalam melakukan *Forecasting* permintaan LPG berdasarkan data historis penyaluran PT Pertamina Patra Niaga Regional Sumbagut periode Januari 2023 hingga Desember 2025. Tahapan penelitian meliputi *preprocessing* data, pembagian data *training* dan *testing*, pengujian stasioneritas menggunakan *Augmented Dickey-Fuller* (ADF), pembentukan model menggunakan Auto ARIMA, serta evaluasi menggunakan MAE, RMSE, MAPE, dan AIC. Hasil penelitian menunjukkan bahwa ARIMA(2,1,4) menghasilkan MAE sebesar 114.426,79, RMSE sebesar 219.563,18, dan MAPE sebesar 55,48%, sedangkan SARIMA(3,1,3)(1,0,1,7) menghasilkan MAE sebesar 114.663,22, RMSE sebesar 219.532,32, dan MAPE sebesar 55,46%. Meskipun ARIMA menghasilkan MAE yang lebih rendah, SARIMA dipilih sebagai model terbaik karena memiliki nilai RMSE, MAPE, dan AIC yang lebih rendah. Model SARIMA selanjutnya digunakan untuk peramalan periode Januari–Februari 2026, termasuk pada lima kabupaten/kota dengan jumlah penyaluran LPG terbesar. Model *Forecasting* juga diimplementasikan ke dalam sistem berbasis web untuk mempermudah proses peramalan dan penyajian hasil prediksi. Hasil penelitian ini dapat digunakan sebagai informasi pendukung dalam perencanaan distribusi LPG secara lebih terarah dan berbasis data.

Kata Kunci: *Forecasting*, ARIMA, SARIMA, *Time series*, LPG.

ABSTRACT

The fluctuating demand for Liquefied Petroleum Gas (LPG) and its Seasonal patterns make distribution planning more complex. This study aims to compare the performance of the Autoregressive Integrated Moving Average (ARIMA) and Seasonal Autoregressive Integrated Moving Average (SARIMA) methods in Forecasting LPG demand based on historical distribution data from PT Pertamina Patra Niaga Regional Sumbagut for the period January 2023 to December 2025. The research stages include data preprocessing, splitting the data into training and testing sets, stationarity testing using the Augmented Dickey-Fuller (ADF) test, model development using Auto ARIMA, and evaluation using MAE, RMSE, MAPE, and AIC. The results show that the ARIMA(2,1,4) model produces an MAE of 114,426.79, an RMSE of 219,563.18, and a MAPE of 55.48%, while the SARIMA(3,1,3)(1,0,1,7) model produces an MAE of 114,663.22, an RMSE of 219,532.32, and a MAPE of 55.46%. Although ARIMA produces a lower MAE, SARIMA is selected as the best model because it has lower RMSE, MAPE, and AIC values. The SARIMA model is subsequently used to forecast LPG demand for January–February 2026, including forecasts for the five regencies/cities with the highest LPG distribution volumes. The Forecasting model is also implemented in a web-based system to facilitate the Forecasting process and the presentation of prediction results. The findings of this study can serve as supporting information for more targeted and data-driven LPG distribution planning.

Keywords: *Forecasting*, ARIMA, SARIMA, *Time series*, LPG.