I. INTRODUCTION

Population growth around the world is increasing every day. In 2022, as many as 7.96 billion people were recorded, with a birth rate of 85 million worldwide [1]. Indonesia ranks fourth with the world's largest population after China, India, and the U.S.A., with a total population of 270 million recorded as of 2020 [2]. As the number of people in Indonesia increases, the need for various basic things, such as food, house, and even the need for electric energy are increasing also. Emerging technologies and increased use of electronic devices resultedin increased electrical energy requirements. Electric energy consumption saw an average increase of 4.8 per year over the past five years [3].

The company in charge of electric energy needs to do calculations to plan for electric energy resources in the future. Hence, there are no power outages when more electricity is needed than usual because there are insufficient electric energy resources. According to data from PT. PLN, the total installed capacity and number of PLN (parent and subsidiary companies) generating units reached 44,174.79 MW and 6,059 units, respectively, at the end of December 2020, where 30,970.93 MW (64.24) is located on Java island. In 2020, Banten province's electric power requirement was 22,268 GWh, with the highest demand coming from the industrial sector at 13,027 GWh. In DKI Jakarta province alone, 32,166 GWh was required that year, with the highest demand coming from the household sector at 14,576 GWh [4].

Good development planning must be used to anticipatefuture electricity needs to predict future electricity demands. Creating the plan takes multiple steps so that it can be optimized. It begins with data gathering, continues with data processing, and concludes with data projection for future electricity needs. This prediction calculation uses electricity usage data from the previous four years, which will later beapplied using the Transformer methods. Afterward, an analysis will be conducted on the electricity usage prediction process inDKI Jakarta and Banten Province areas. The methods that will be used to calculate the prediction is the Transformer. Research [5] uses the Transformer method as one of its research methods. The results obtained from the study are that predictions using the Transformer method are more accurate than other methods used in the study (LSTM, ARIMA, Seq2Seq). In 2019, Zeyer's research [6] uses two methods: Transformer and LSTM. This research presented end to end speech recognition ASR for both models. It was found that the Transformer has a more stable result and is trained faster than LSTM, but the Transformer has an overfit.

The approach used for this research is a time series forecasting approach using the Transformer model and is applied to predict the electricity data for DKI Jakarta and Banten. We propose that the Transformer model can handle long-term dependencies better than the RNN-based model, the LSTM model. As a result of the success of Transformer in optimizing machine learning models for forecasting [5][6][7], we decided to utilize it as our model for this experiment. There were one-hour lookback periods, as well as 24-hour, 48-hour, and 72-hour lookback periods utilized to forecast 7 days in this study to examine the forecasting performance of the models.

This research article is divided into introduction, literature review, methodology, results and discussion, and conclusion sections. In the literature review part, we will explore the related work of electricity load forecasting and the Transformer method. In the methodology section, we elaborate on the data used, the experimental model training, and the performance analysis to be conducted. The results section consists of the outcomes and analyses of the conducted experiments. The conclusion section summarizes all the results of the performed experiments.