I. Introduction

Electricity has become essential to human civilization, as the promotion of green energy is more advocated than fossil fuel energy. Moreover, most of the human activities require the use of electricity as a source of energy. This fact makes the demand for electricity loads continue to increase, causing an energy crisis that may occur in the future. Electricity load management is needed to monitor energy demand with a high-efficiency level to accommodate the reliability of the delivery of electricity. Applying prediction to electricity loads is vital in energy management efforts in conducting energy planning [1].

Planning of electricity demand can be done by forecasting electricity load based on historical data. The electricity load forecasting aims to match the electricity supply with electricity demand to increase efficiency in electricity production. The electricity load prediction plans electricity generation and distribution to the electricity customers. Moreover, until now, electricity energy is still relatively difficult to store on a large scale; therefore, it must be distributed directly to the customer. Environmentally friendly sources of electrical energy are also important issuesthat need attention. Therefore, precise and accurate electricity load forecasting is required to avoid losses that may arise in the future. If electricity energy is not handled correctly, many negative impacts will occur and cause a domino effect that is detrimental to human life [2].

The forecasting methods can be based on statistical or machine-learning approaches. Especially with the machine learning approach, many studies have been conducted to predict electricity demand, both short, medium, and long periods of electricity load. For example, the use of the Convolutional Neural Network (CNN) - Long Short-Term Memory (LSTM) method shows better results than the regular LSTM model, especially for forecasting 1 to 3 hours ahead [3]. Another predicting model has also been used to perform electricity load forecasting, i.e., the Support Vector Machine (SVM) that reached the performance of RMSE and MAPE with values of 1.682 and 12.364 [4]. In [5], the LSTM and RNN model results for short-term electricity forecasting produce an MSE of 0.098 and MAPE of 1.23% for prediction one day ahead. A combination of two or a hybrid model can also produce better results, as shown in [6], where the LSTM RNN algorithm's combination makes better accuracy than the usual LSTM model. Moreover, the combination of the CNN BiGRU model gives better results than the standard LSTM model for short-term forecasting, as shown in [7]. In [9], they show that an additional attention mechanism to the hybrid model CNN-BiLSTM can produce better results than the model without an attention mechanism. They applied the hybrid model for earthquake forecasting, resulting in an RMSE of 0.24 [9].

In this paper, we propose to use a hybrid model to forecast the time series of electricity load, i.e., combined CNNBiLSTM, with additional attention mechanisms. We chose the CNN model since this model can handle data with long time series when combined with Bidirectional Long Short Term Memory (BiLSTM). The BiLSTM model is designed using the reverse direction of LSTM [10], producing better performance than the LSTM. Adding an Attention Mechanism can help the model focus on essential parts of the BiLSTM output. By using this hybrid method, this research is expected to out perform the previous research that has been mentioned previously. We choose electricityload data

in Bali, Indonesia, as a case study. The area was selected since Bali Island is a somewhat isolated area with relatively few sources of electricity generators. Moreover, in [8], they studied the forecasting of the electricity load in Bali based on weather data using two models, i.e., the GRNN and SVM. They produced correlation coefficients of 0.950 and 0.965, respectively, for the predicted values of GRNN and SVM.

The structure of this paper is as follows. Section 2 contains a literature review as a theoretical basis used in research. Section 3 contains further discussionsregarding the research method performed in this paper. Section 4 discussed the presentation of experimental results and continued with some conclusions in the last Section 5.