

SUMMARY

Dimas Mudya Permadi, *Department of Electrical Engineering, Faculty of Engineering University of Brawijaya , April 2018, **Comparison Analysis of Solar Radiation Forecasting Using Extreme Learning Machine and Multiple Linear Regression**, Academic Supervisor: Hadi Suyono.*

Solar power plant is one of the electric energi resource that utilizes solar energi. Solar power plant is very dependent on the availability of solar radiation. Solar radiation is not available all day in every place. The availability of unpredictable solar radiation can be predicted by the methods that exist today. Forecasting method using Artificial Intelligence with Extreme Learning Machine (ELM) has good forecasting accuracy. The conventional forecasting method using multiple regression is used as a comparison of the ELM method.

This research, aimed to : 1). know the optimal ELM modeling to predict the intensity of solar radiation; 2). know the forecast of solar radiation intensity in Malang and Basel City with ELM method; 3). know the forecast of solar radiation intensity in Malang and Basel City with multiple regression method; 4). know the comparison of solar radiation intensity forecasting between ELM and multiple regression method; 5). know the comparison of short-term forecasts of solar radiation intensity in Malang and Basel City with ELM and Multiple Regression methods.

The results showed: 1). The optimal modeling for ELM forecasting with 85% -15% composition of 60 hidden neurons; 2). ELM forecasting of Malang City has error value RMSE 54,431 and MAE 31,919, smaller than Basel City which has value of RMSE 85,064 and MAE 56,749; 3). Multiple Regression forecasting of Malang City has error value RMSE 107,575 and MAE 86,899, smaller than Basel city which has value RMSE 101,978 and MAE 71,088; 4). ELM can better forecast radiation intensity than Multiple Regression for long-term forecasting; 5). ELM can forecast radiation intensity better than Multiple Regression for short-term forecasting.

Keywords: *extreme learning machine, solar radiation, forecasting*