Design Smart Grid Hybrid in Faculty of Engineering Universitas Negeri Yogyakarta

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ABSTRACT

The Faculty of Engineering, Universitas Negeri Yogyakarta (UNY), as one of the educational institutions in Engineering, still uses electrical energy from PT PLN, mainly generated from steam and gas power plants. Dependence on fossil energy can be reduced by utilizing renewable power plants, both solar and wind. For this reason, it is necessary to study the use of a Smart Grid system that can regulate electricity needs by optimizing renewable power plants. The Smart Grid components consist of solar power plants, wind power plants, batteries, inverters, and grid power sources from PLN integrated into the Smart grid system. We have designed the Smart Grid system through field observations and data processing with the HOMER Pro software to obtain an optimal hybrid power generation system and wind turbine.
The study results indicate that the Faculty of Engineering, UNY has excellent potential to develop smart grids. The potential for solar energy is 418.393 kWh/year, and wind energy is 2.78 kWh/year. The Smart grid system is sufficient to meet the electricity consumption of only 205.5 kWh/year.

Kata Kunci: *Smart Grid, design, hybrid, UNY*