

## Mapping Potential Energy Use at Yogyakarta State University

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### ABSTRACT

Until now, UNY has not received accurate data related to the need and use of energy at UNY. The majority of the energy used is from PLN, of which only the amount of the account that must be paid is known. This condition can be very detrimental to UNY in terms of energy efficiency. The specific objectives are as follows (1) to map energy use at UNY (2) to map the use of energy efficient electrical appliances (3) to map types of buildings that can reduce the use of electrical energy (4) to recommend energy use at UNY to the leadership. The method used is distributing questionnaires related to stakeholder behavior related to energy saving. Research respondents included lecturers, students, and students of UNY. The sampling used is purposive and quota sampling. The method for knowing energy use at UNY is by conducting a survey and inventory of electrical equipment and assets that require energy. Survey to inventory electrical assets, especially lighting and air conditioning equipment and to determine energy saving strategies. The method for knowing the condition of the building is by conducting a survey and assessing the energy efficiency aspects of the existing building. The method to find out the potential for renewable energy at UNY is by conducting surveys and mapping related to potential renewable energy sources. The energy sources studied are potential solar energy and wind energy. The last step is the Focus Group Discussion (FGD) which aims to determine strategies for saving energy and also determine policies for fulfilling energy in the campus environment based on data and asset management. The results of the stakeholder behavior survey include the behavior of caring for energy in the positive category with a percentage of 87.34%, the behavior of conserving energy is in the positive category with a percentage of 84.76%, the behavior of limiting usage time is in the positive category with a percentage of 81.98%, the behavior of replacing energy-saving electrical equipment is in the positive category with a percentage of 73.79%, overall the behavior of stakeholders in saving energy is in the optimal category, namely with a percentage of 81.97%. Energy use at UNY can be summarized as follows: the percentage of electricity used for lamps is 13% and AC is 87%, conventional lamps are 19% and CFL lamps are 81%, AC uses inverters 32% and non-inverter AC 68%. The results of the survey of existing buildings at UNY can be explained as follows. The measurement results of 100% of the existing IDB Building rooms do not meet lighting standards when using natural lighting. The measurement results are 93% of the existing rooms meet the air temperature standard, while only 27% of the rooms meet the relative humidity standard. The results of measurements in the Digital Library Building showed that 74% of the room had met the temperature standard and 65% had met the relative humidity standard. The measurement results in the Digital Library Building, most of the rooms have natural lighting standards that are smaller than the standard values. Some rooms are in a state of glare (glare), with natural lighting values greater than the standard values. The results of the survey on the potential of renewable energy can be concluded as follows. PV installations carried out on rooftops of buildings produce varying electrical power, this is because the roof area of the building is different. Based on the results of the analysis, the largest electric power from the installation of PV is from GOR UNY which can produce 467 kWp with a total of 1112 PV units. The results of the analysis carried out, all use the same type of PV, namely Longi Solar with the LR4-72HPH-420M series. The implementation of rooftop solar panels from 29 buildings needs to be done in order to save electrical energy by 16.09%.

*Kata Kunci: Energy, renewable energy, mapping, building design, perception of energy use*