ABTRACT

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Study Program : Teknik Elektro
Title : *Electrical Energy Efficiency Analysis with Energy Audit at PT. Al Hadj Jaya Mandiri*

This research aims to analyze the efficiency of energy use and identify Energy Saving Opportunities (ESO) that can be implemented at PT. Al Hadj Jaya Mandiri using the Energy Audit method. The parameters of the Energy Audit analysis conducted at PT. Al Hadj Jaya Mandiri include comparing the Energy Consumption Intensity (ECI) of the building with standards, comparing the room lighting intensity with standards and providing improvement recommendations and ESO that can be implemented, analyzing the cooling load requirements or AC capacity and providing improvement recommendations and ESO that can be implemented, and comparing the efficiency of production machines (sewing machines) with standards and providing improvement recommendations that can be implemented. The results of the analysis conducted show that the IKE value of PT. Al Hadj Jaya Mandiri is 23.27 KWh/m²/year, which falls into the efficient category as it is below the standard value. However, the research continues with the aim of obtaining an even lower IKE value. Further analysis was conducted on the room lighting intensity, showing that 7 out of 22 rooms did not meet the lighting standards. A simulation was then performed using DIALux software to ensure the lighting intensity met the standards, resulting in improvement recommendations and a PHE of 123,096 kWh/month obtained from the lighting system analysis. The results of the air conditioning load requirement analysis show that 1 out of 3 rooms do not meet the cooling load requirements or air conditioning capacity, so it is recommended to replace the air conditioning units according to the needs, with a PHE obtained from the cooling load requirement analysis or air conditioning capacity of 23.52 kWh/month. The analysis of the efficiency of the production machines (sewing machines) shows that 8 out of 48 production machines (sewing machines) have efficiency values below the standard. Therefore, it is recommended to replace the electric motors with new ones so that the efficiency can operate above the standard and the use of the production machines can be optimal again. After conducting the PHE, the new building's IKE result was 21.93 KWh/m²/year.

Keywords*: Energy Consumption Intensity (ECI), Lighting Intensity, Cooling Load Requirement or AC Capacity, Production Machine Efficiency*