

ABSTRACT

Indonesia in fulfilling energy still relies on energy that comes from 92% fossil and 8% renewable energy. One of the industrial estates is an area that still uses fossil energy to fulfill its needs. Renewable energy is one solution to reduce dependence on the use of energy derived from fossils in the industrial area.

In this research, a prototype of a hybrid conversion of sound energy and footing pressure energy will be designed into electrical energy with piezoelectric materials in an industrial area. By utilizing sound energy from speakers and footing pressure energy from human activities, the two energy sources will be converted into electrical energy with a conversion medium, namely piezoelectric material. The electrical energy produced will be stored temporarily in the capacitor.

In the prototype, the hybrid energy conversion of footing pressure energy and sound energy into electrical energy can produce current and voltage values. The highest output from the test is to use a sound intensity of 100 dB to 110 dB and a human mass of 95 kg. Conversion of sound energy into electrical energy with a sound intensity of 100 dB to 110 dB produces a DC open circuit voltage value of 1.14 V and a DC short circuit current of 48.02 A and the conversion of footing pressure energy into electrical energy with a human mass of 95 kg produces a value of the maximum open circuit DC voltage is 27.07 V and the maximum DC short circuit current is 13.66 mA. In testing the prototype to analyze the output of the hybrid energy conversion using 10 μ F, 100 μ F, and 1000 μ F capacitors with open circuit voltage values and short circuit current stored on the capacitor for 60 seconds of 11.49 V and 6.60 mA, 4.04 V and 1.76 mA, and 0.54 V and 0.014 mA. The value of the capacitance affects the speed at which the capacitor charges.

Keywords : Sound Energy, Stepping Pressure Energy, Electrical Energy, Energy Conversion, Piezoelectric