

ABSTRACT

Indonesia has high energy consumption, and the same time fossil energy reserves are decreasing. Therefore, the need and research for alternative energy is increasing. Several alternative energy sources that can be utilized are water, wind, biomass, and so on. One of the alternative energy sources being researched at this time is sound energy. Sound energy can be converted into electrical energy to be used for daily needs.

Sound energy can be converted into electrical energy using piezoelectric materials. Piezoelectric material is a material that when applied a compressive or tensile force to the material, it will produce a potential difference at the poles. This potential difference can generate an electric current to charge a battery.

In this study, data collection will be carried out for use in the modeling process of the conversion of sound energy into electrical energy. After the model for the conversion of sound energy into electrical energy is made, it will be simulated in Matlab. The purpose of this study was to determine how the process of converting sound energy into electrical energy using piezoelectric materials, to determine the effect of noise levels on the electrical energy that can be generated, and to model the sound energy conversion circuit into electrical energy in Matlab. The parameter of the success of this research is when the results of the conversion of sound energy into electrical energy on Matlab Simulink. The results of sound energy conversion into electrical energy modeling are 2,922 Pa of sound wave pressure dan $0,67 \times 10^{-12}$ N/C of electrical field at 100 dB of sound intensity. With 2,922 Pa of sound wave pressure at 100 dB of sound intensity, resulting in a voltage of 0,083 V and electrical current of $3,35 \times 10^{-6}$ A.

Keywords: energy conversion, sound energy, piezoelectric material, matlab modeling