

## ABSTRACT

*Renewable energy can be created by conducting research with energy sources derived from water, wind, sound, nuclear etc. Sound is a mechanical energy that can be used as an alternative energy source in conducting such research, thus sound energy can be converted into electrical energy. The energy source used comes from the speakers and uses wind energy. The study had several objectives: converting sound energy into electrical energy with additional pressure energy, and designing a prototype to convert sound energy and additional pressure energy into electrical energy. This research also has some limitations, namely research only made to realize alternative electrical energy sources that produce current and voltage, and the design of prototype with hybrid output.*

*The study will be designed to prototype the conversion of sound energy into electrical energy with the help of piezoelectric materials where piezoelectric materials can transform mechanical energy into electrical energy equivalent to piezoelectric effect. The energy source that will be utilized in this study is the sound energy that comes from the speakers. The sound produced from the speaker can be used as a source of sound energy that will be converted into electrical energy. In this study, it was only a lab scale. In this study there are inputs and outputs, inputs in this study are sound energy and wind energy which will eventually take the form of hybrid energy.*

*In pure sound energy testing, 5 tests were conducted. For each test it is divided into several sound intensities up to the last sound intensity, with a sound intensity of 70 – 110 dB. And after testing the electric current and electric voltage obtained electric current and maximum electric voltage at a sound intensity of 100 - 110 dB which is 1,1448V and 0,045 $\mu$ A.*

*In pure wind energy testing after testing with a difference in wind speeds of 4m/s and 5m/s it can be concluded that the output yield is higher at wind speeds  $\pm$  70cm of 5m/s than at wind speeds of 4m/s which is 0,53V and 39,6 $\mu$ A.*

*In hybrid energy testing using two capacitors namely capacitors 10 $\mu$ F and 22 $\mu$ F. From the test data the hybrid method uses 10 $\mu$ F better when compared to 22 $\mu$ F which is 1,27V and 308,60  $\mu$ A. And if using wind energy the distance is best  $\pm$ 70cm from the source to maximize output.*

**Keywords:** *Piezoelectric, sound energy, wind energy, hybrid energy, electrical energy, energy conversion, prototype*