CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)

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Project Number

38195

Project Title

An Alternative Choice for Alternative Energy

Abstract

Objectives/Goals

The objective of this experiment is to create a more reliable renewable energy source that can outperform current methods for clean energy collection.

Methods/Materials

Created a scale model consisting of a hydroelectric unit and a Vertical Axis WindTurbine (VAWT) Unit. A stopwatch, voltmeter, and a controlled environment were used while conducting time trials on the scale model. A controlled amount of water and a controlled wind speed were used when testing each individual unit.

Results

After multiple trials on the scale model, it was determined that the overall model could outperform each individual unit. While each unit was able to perform in a 5% range efficiency to the hypothesis, the overall unit was able to perform more reliably and therefore had a higher efficiency. The efficiency of the overall model depended on how well each unit performed with the other. Each unit cooperated with the other, which resulted in a greater efficiency than expected.

Conclusions/Discussion

From multiple trials, it was evident that combining renewable energy sources can result in higher efficiencies of the overall model, because of the compliance of each unit. The overall scale model was able to perform at a higher efficiency than expected because the a small portion of the energy produced by the VAWT unit was used in pumping for the hydroelectric unit. Additionally, combined renewable energy sources can outperform individual sources in the power obtained and efficiency, and therefore can be used to provide energy more reliably.

Summary Statement

I developed an eco-friendly renewable energy source that outperforms current renewable energy sources in efficiency, and tested the design with a scale model.

Help Received

I built the scale model by myself. I was assisted in testing the model by my father, in order to obtain accurate data for each time increment.