Generating Energy From Ocean Waves

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As of 2022, less than 3% of electric power generation in Puerto Rico came from renewable sources like wind and sun. Puerto Rico's high dependence on fossil fuels presents significant economic and negative environmental impact. The objective of this project was to design, construct, test, and perform analysis on devices that seeks to produce energy from ocean waves. The investigation included the construction of three devices that captured the kinetic movement of the waves to move a dynamo. The dynamo was connected to a voltmeter. The three devices differed in their constructions by having different columns and linear arm absorber designs. Each design's buoy was put on the surface of a water container, and a mass of 0.44kg was dropped from a height of 20cm to create the effect of wave motion. After dropping the mass, the researchers used a stopwatch to measure voltage values every two seconds. Researchers repeated this step ten times for each device, and the voltage values were recorded. It was concluded that the design that relied on a piston to drive the generator axle was more efficient than the designs that relied on an articulated arm. The next step in the process is to build a larger-scale prototype to be tested on the Atlantic Ocean coast.

Awards Won: