

Riding the Wave: Energy in Motion

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The purpose of this project was to design, construct and test a device that could utilize the motion of waves to generate electricity. Subsequently, a system was developed that allowed for the upscaling of the provided unit to increase the produced power. The unit functions by applying Faraday's Law which dictates that the movement of a magnet through a coil, or the passing of a coil over a magnet, induces an electric current within the coil. The constant motion of the waves is used to push the floating coil around the magnet, inducing a current with each pass. The results of testing indicated that a significant amount of energy can be generated in this fashion, and that more importantly, the concept can be up-scaled and modified to function in nearly any region in the world. Because waves vary in frequency, period and irregularity, multiple aspects of the design allow for simple reconfiguration to allow for utilization in entirely different environments. Once up-scaled, extrapolations from the obtained testing data indicate that wave-powered magnetic generators will have the ability to compete with coal and renewables for grid space, while utilizing previously unwanted geographic locations, and without the auxiliary costs of fuel and disposal. The ability to scale is also beneficial for more residential use, for units of smaller sizes could be deployed for any purpose ranging from running a light to charging a battery. Wave powered generators have no detrimental environmental effects, and pose no safety hazards to neither humans nor ecosystems.

Awards Won:

Third Award of \$1,000