CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)

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Project Number

34445

Project Title

Rain to Renewables: Harnessing the Power of Rain Water in Street Gutters

Abstract

Objectives/Goals

My objective for my project, Rain to Renewables, was to test various turbines and an aqueduct system to see if I could harness rainwater from a street gutter during a storm to create enough electricity to power an emergency communications device.

Methods/Materials

A 40 foot long aqueduct was constructed in order to channel rain water into a sono tube for temporary water collection. The sono tube was fitted with water resistant lining, a downspout and a large plastic end cap. Three turbines,a water wheel, an 8 ounce 13 spoon Pelton turbine and a 30 ounce 13 spoon Pelton turbine, were constructed. The downspout sprayed water at the each turbine, tested individually.

Results

The 8 ounce 13 spoon Pelton turbine generated the most electricity under 12 and 24 in. head, and the water wheel generated the most electricity under 36 in. head.

Conclusions/Discussion

My conclusion is that a light-weight Pelton turbine can generate enough electricity from rain water in a street gutter to power an emergency communications device. This engineering design shows that renewable energy geneators can be used during storms, rather than turning to fossil-fuel based generators.

Summary Statement

Rain water in street gutters can be harnessed to create renewable energy generators, reducing reliance on fossil fuel generators.

Help Received

I sought some advice about implementation of my device from my parents and their friends who work in climate and energy.

Preliminary