

PICO-HYDRO DESIGN FOR THE DEVELOPING WORLD

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Problem:

Currently 1.6 Billion people in developing countries live without electricity.

Access to electricity advances economic opportunity, improves socio-economic standing, and increases participation in the information age.

Our Mission:

The Pico-Hydro Energy Project (PHEP) believes that all people deserve economic prosperity to financially support themselves and their families. We believe small-scale hydro can bring jobs and economic prosperity to underdeveloped communities.

Solution:

Provide a small scale hydroelectric system that uses run-of stream water movement to generate electricity.

Clients:

EMI Vision:

“...see people restored by God and the world restored through design.”

Rio Missions Vision:

“Cultivate relationships with local Panamanians in poor and marginalized communities...”

Further Information:

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- Produce 300-800 watts of electrical power
- Operate in stream velocities as slow as 2 ft./sec
- Operate continuously for 3-5 years with no major component replacement
- Manufactured for under \$500—USD

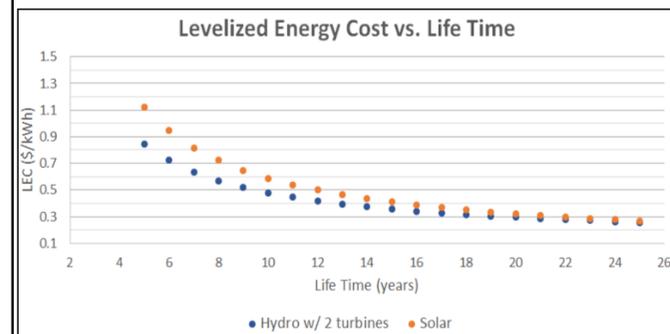


WEDGE 4.2



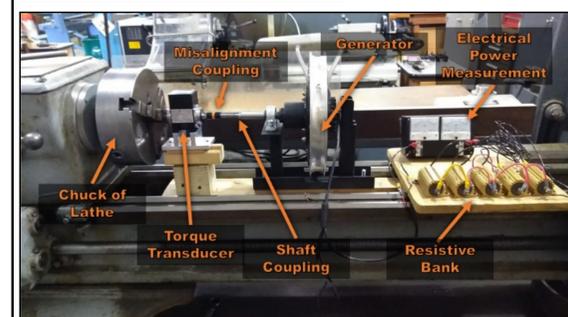
Undershot Water Wheel Mounted on Pontoon—WEDGE 4.2 testing produced 3 watts of mechanical power

Levelized Cost of Energy



Hydro is competitive with an equivalent solar system

Generator Testing



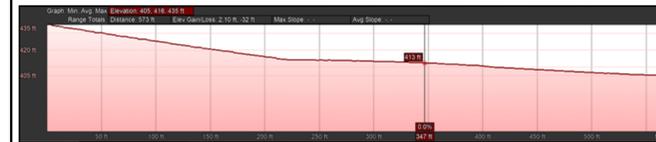
Using this set up the team determined the efficiency of the chosen generator to be approximately 54%

Provide continuous electrical power to support phone charging and lights at church



Pressure head system

- Intake
- Penstock
- Turgo Generator
- Inverter
- Electrical Wiring
- Housing



Future Plans:

- Continue to analyze WEDGE 2, 3, and 4.2 performance
- Identify most cost effective WEDGE solution
- Continue to work with Rio Missions Panama to refine scope and details of design
- Potential team site visit to LaGigi Panama

Conclusions:

The PHEP is on its way to developing a small scale hydropower system that meets EMI needs. The team will continue to work with Rio Missions Panama to produce designs for their needs. The future holds much excitement as we look forward to modifying initial prototype.

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- Dan Cotton (Rio Mission Panama representative)

