Personal Hydroelectric Generator
Team 7

2015 - 2016

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Sponsor: Michael Devine **Advisor:** Dr. Seungyong Hahn **Instructors:** Dr. Nikhil Gupta and Dr. Chiang Shih

Project Scope

The project will consist of creating a marketable portable power generation system that harnesses power from flowing water. These generators will create a realistic means of providing sustainable power to any location with accessible flowing water.

Background

- Takes kinetic energy of flowing water and converts it to storable electrical energy
- Flowing water spins a turbine which spins an alternator which then charges a battery
- Process is more environmentally friendly than traditional methods
- A drawback is that the kinetic energy in flowing water is much smaller than its potential static energy from head

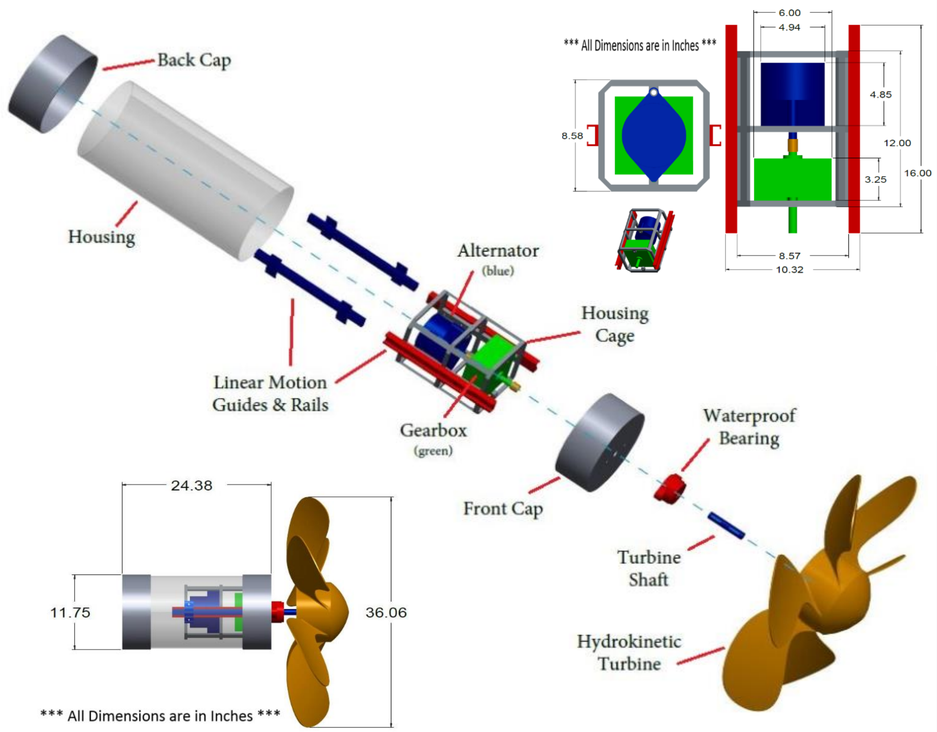
Project Constraints

1. Weight: <100 lbs
2. Noise Level: <50 dB
3. Waterproof: Protect electrical components
4. Safe and Reliable: Little environmental and human impact
5. Generate Electricity: In order to charge a battery

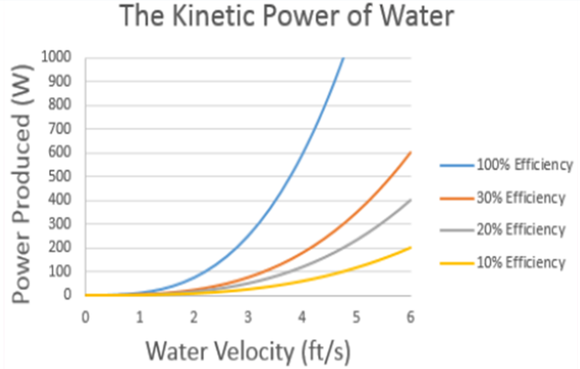
Acknowledgements

Everyone in team 7 would like to thank Dr. Gupta and Dr. Shih for their support and generosity in teaching the class. We would also like to thank Dr. Devine our sponsor, for bringing this project to fruition and analyzing our marketability every step of the way. Lastly we would like to thank Dr. Hahn for advising us on the best course of action to take in order to accomplish our project.

Design



Kinetic Power of Water



A plot describing the kinetic power output of water at different velocities given a 3 ft diameter blade. Power is plotted at 100%, 30%, 20%, and 10% efficiencies.

Potential Challenges

- Heat dispersion inside the housing
- Water contacting electrical components
- Achieving proper gear ratio for desired output
- Submerging the apparatus to desired depth
- Anchoring the system to withstand the necessary forces
- Keeping the design compact and easy to assemble

Entrepreneurial Aspects

The Business Model Canvas

Team or Company Name: Personal Hydroelectric Generator | Date: 11/18/2015 | [X] Primary Canvas [ ] Alternative Canvas

Key Partners	Key Activities	Value Proposition	Customer Relationships	Customer Segments
• Payment service such as *paypal* • Distribution partners –USPS, FedEx, etc. • Suppliers – generators, alternators, and turbine components • FSU – (senior design) supplies initial funding for the project • Kickstarter – entry level fundraising • Grants from competitions such as InNolevation Challenge	• R&D –improve on hydroelectric generator design • effective sales team • establish premium models with added features **Key Resources** • Brand name • Product design • Sales and support teams • Sales of parts and expanded features	• Provide a constant, clean energy source with enough power to supply a small home or cabin with electricity • Utilize the power of flowing water in order to generate electricity • Significantly quieter than its gasoline counterpart • Portability	• Dedicated sales for large purchase accounts • Support staff • Automation (where possible) • Periodic newsletter **Channels** • Global sales and support team • Online website with product information • Social media accounts	• Developing countries – specifically villages and homes near bodies of water • Humanitarian organizations • Outdoorsmen – riverside camp sites • Military

Future Work

- Finalize component designs and selections
- Complete commercialization business plan and next stages of InNOLEvation challenge
- Investigate measures to protect turbine and turbine user during operation
- Test alternator for heat dissipation issues
- Order components
- Machine and construct base and mounting for components in housing