

| Project #  | Project Name             | Project Track   | Project Family |
|------------|--------------------------|-----------------|----------------|
| P12414     | Bicycle Energy Harvester |                 |                |
| Start Term | Team Guide               | Project Sponsor | Doc. Revision  |
| 2011-2     | Sarah Brownell           | Sarah Brownell  |                |

## Project Description

### *Project Background:*

People in countries with inadequate infrastructure have an unmet need for electricity. A possible source for creating and storing power is a bicycle rotation energy harvesting system. This system could provide the energy required for light, communication or water treatment. This device converts rotational kinetic energy to electrical energy for small electronic devices. Several available products satisfy the basic requirement of supplying power. These products operate constantly while the bicycle is in motion.

### *Problem Statement:*

Our goal is to transform kinetic energy within a bicycle into an electric power source intended to charge a cell phone. Our creation is expected to be cheap to build, and easy to install, maintain and use.

### *Objectives/Scope:*

- Charge cell phone or battery using a bicycle.
- Design around the most affordable options.
- Create a casing that is durable enough to withstand debris and other environmental damage.
- Create an assembly that requires only the most basic tools, if any, to install repair and maintain.
- Implement materials that are durable and easy to assemble.
- Create product that adds minimal work to the rider.

### *Deliverables:*

- Cheap power source design for the benefit of many people's most basic electric needs.
- A lightweight, low cost, durable charging device that can be attached to a variety of bicycles to charge a cell phone battery.
- Documentation for proper assembly and manufacturing.
- Test plan for development.
- Test results of designs.
- Documentation of actual cost.
- Opportunities for growth.
- Poster detailing power collection for a bicycle.
- Formal Paper

### *Expected Project Benefits:*

- A well-documented attempt at creating a lightweight, inexpensive to manufacture, durable charging device that can be attached to a variety of bicycles to charge a cell phone battery.
- A very low cost and efficient energy source that could benefit many people
- A product that would allow those who do not have ready access to power to have a way to power communication devices and lights that assist in their lives.

### *Core Team Members:*

Amina Purak - Facilitator  
Daniel Tobin – Project Manager  
Aaron Sieczkarek – Chief Engineer  
Brenda Lisitano  
Zheng Li

## Strategy and Approach

### *Assumptions and Constraints:*

- Time is restricted to 22 weeks for project.
- Parts must be low cost in a lot of 100; Development and analysis of custom designs vs. existing materials intended for this application.
- Device is self-contained and able to withstand environmental damage.
- Cyclist does not have fundamental knowledge of installation and use.
- Device will endure heavy usage.

### *Issues & Risks:*

- Design specifications may need to be modified, as the device is tested/designed to be reproducible.
- Design may not be able to meet cost specifications
- Additional experts and consultants may be needed to supplement design and analysis skills of the team.
- Significant testing needs to be conducted to verify solution.
- Design may not be accommodating to all bicycle style.