2012

Project Progress Report For

Rain & Solar Power Generation System

Project Team: Frank Feng

Zhiyu Hu

Max Liu

Jeff Bian

Xiao Dong

Contact Person: Frank Feng

ffa5@sfu.ca

Submitted to: Dr. Andrew Rawicz - ENSC440

Steve Whitmore - ENSC305

Issued date: March 19, 2012

Revision: 1.1

Introduction

Over the past two months, Green Power Innovation was working diligently to complete RPG&SPG on time and on budget. Now most of the functionalities are either partially or fully working. However, some of the sub systems are idle due to the shortage of parts. The CFO is trying his best to get all the required components on time. Overall, we are able to complete the project on April 20th as scheduled.

This report will outline the progress we have made for various areas of this project in the last two months, including: electrical circuit design, water tank design, turbine fan assembly and the User Interface.

1. Electrical Circuit Design

The circuit has been constructed on a breadboard with an on/off switch and a LED indicating the status. We used LM317T voltage regulator instead of LM117 due to the operating temperature (LM317T has a wider temperature range). In addition, we added an on/off switch in order to cut off the power delivery. Also, a LED was added to indicate on/off status of the circuit. The following provides an outline of the status of the circuit function:

Things reached:

- Switch connected to cut off the power delivery
- LED mounted to indicate on/off status
- Circuit output is adjustable between 1.5V to 15V for a certain DC input level
- Additional diodes used to protect the circuit

Things not reached:

- Ability to operate with DC power generator
- Water proof

As shown above, the electrical circuit is making much progress and most of the main functions have been developed. We will keep on stabilizing the electrical system to make sure the progress remains on schedule.

2. Water tank

So far, we have collected all the parts needed for the water tank and there are mainly 5 parts in total:

- The water container box with a size of 45cm * 45cm * 35cm
- The flush valve
- The tank lever with the handle
- The float ball with an approximate radius of 5cm
- The water pipes needed for water flow-in and flow-out

The total price for the items mentioned above is 59.34 dollars.

Things reached:

- Holes have been cut on the water container box
- The flush valve has been installed on the bottom of the water container box
- The water pipes have been connected to the water container

Things not reached

- The handle has not been installed
- The float ball and the tank lever have not been connected to the flush valve yet

After we finish the thing have not reached, our next step is to test the water tank to make sure it meets the requirements. Everything is on schedule for now.

3. Minihydro Turbine assemblies

Turbine blades have been successfully mounted on a 2cm Blade hub. Blade hub has been secured on DC power generator's shaft.

Things reached:

- Spoon-shaped Blades
- Secured lock between power generator's shaft and blade hub
- Able to produce power under normal household water pipe pressure.

Things not reached:

- Only 6 Spoon-shaped blades mounted on blade hub and the positions are not symmetrical
- Turbine blades is not covered
- Water injection is not regulated
- Water proof of the power generator is not reached yet

Although we still have some problems, the basic function of Minihydro Turbine is reached as designed. More spoon-shaped blades will be mounted on blade hub and water proof of the power generator and power generation performance under our systems water pressure will be made.

4. User Interface

The user interface consists of a switch and a LED indicating the entire system on and off status, output capacity display system, power generation mode display system, and battery charge display system.

Until now, the battery charge display system has been created and tested. There are also three LEDs shows the battery charge situation. The first LED shows the battery charge on and off mode, the second LED displays the over voltage situation, and the

third LED will light on when the battery is fully charged.

After the solar and rain power generator are constructed and tested, GPI members will build the remaining parts of user interface. All members will keep on struggling so that the user interface can be created and tested on time.

Budget

Currently our actual expenditures are approximately $405. Most of the money was spent on the DC power generator, and the items needed for the water tank were purchased at Home Depot at cheaper price. Our prototype development fund from ESSS covered the cost of these items. The extra cost will be shared among the team members and we will apply for the Winton fund after the termination of the project.

Conclusion

GPI members have made great progress towards the completion of the Rain&Solar Power Generator. Currently, the schedule and budget are well controlled and GPI should be able to complete this project close to the initial estimated cost outlined in the proposal. The team will continue to work diligently and efficiently so as to complete the project on time and meet the functions outline in the design specification.