

**Advisors:** Venkataramana Ajarapu

**Client:** Venkataramana Ajarapu

**Members (roles):**

- Daoxi Sun- *web master*
- Riley O'Connor- *team leader*
- Trevor Webb-*communication leader 1*
- Shihao Ni – *web master*
- Xiaokai Sun- *communication leader 2*
- Ben Ryan- *concept holder*

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**Project Title: Hybrid Solar Wind Generation System**

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## Weekly Summary

At the end of fall semester our team had successfully simulated both the solar and wind generation systems in Matlab Simulink. The challenge for this semester is now to implement our designs with equipment, and produce the desired results.

During this first week we endeavored to become familiar with the hardware components already available for our use in the power systems lab. There are a few components that we do not have available, and which have either been ordered or will be put together by us. In particular, the wind team has to create and lay out the majority of their equipment while the solar team has a portion of their equipment in place from a previous project.

Our entire group was able to meet with our advisor. Now that we are familiar with the equipment that we need to use, we began testing the components that we have already available to ensure functionality. Both the solar and wind teams have components that are no longer useable. To remedy this new part requests have been submitted in addition to the few requests we already placed.

A significant challenge so far has been obtaining access to the power systems lab which contains access to all the equipment that we need to work on this project. In addition, some of the components we thought were already available to us from a previous project are no longer useable, which is causing a delay.

## Meeting notes:

### General Notes

- I. Present solar material and wind material to our advisor
- II. Focus on becoming familiar with equipment
- III. The solar system has not been providing output to the load because the batteries are dead and the MPPT will not output anything without at least 7V from the batteries. New batteries will be ordered.
- IV. The wind team is facing up the induction motor controlling part and the rectifier. New capacitor and inductor will be used to the original rectifier. All team members are researching for how to control the motor by Matlab.

## 10/2 Group Meeting with Advisors

**Duration:** 60 min

**Members Present:** 5

### **Purpose and Goals:**

Present relevant background information over our project to both our advisor and our fellow group members. Both the solar and wind teams now have made some progress with hardware, and will present that progress while getting useful advice on how to proceed from our advisor.

### **Achievements:**

Both groups obtained advice for moving into week two of working on this project.

The solar team has now identified all the outputs from the solar panels, but the power we were expecting was not being delivered to the load or the batteries in our system. After trouble shooting the circuit and testing the individual components, we found that the batteries left over from a previous project are dead and this is the root of our systems failure. New batteries will be ordered soon.

The wind team was able to get serial data from the wind sensor. A Simulink model is built up to import the data into the computer. The data will be somehow analyzed to be used for controlling the induction motor.

## Pending issues

1. Obtaining access to the power systems lab at our convenience
2. Altering existing systems to suite our needs
3. Successfully creating solar and wind generation individually
4. Combining both forms of generation to supply one load

## Plans for next week

1. Wind team: (Ben, Xiaokai, Shihao) will meet to designing and implementing their wind generation system
2. Solar team: (Riley, Daoxi, Trevor) will meet to continue troubleshooting the circuit, although progress will depend on how quickly we can obtain new batteries
3. Each team will also develop results that can be presented at our next meeting with our advisor and his grad student.

## Individual Contributions (this week)

Daoxi Sun: 3

- Attended weekly meeting with advisor
- Found battery is dead and went to part shop for information on requesting new ones
- Label output wire from solar panel for hall effect, irradiance, temperature, humidity and so on
- Improved and updated documents on team website with SFTP

Riley O'Connor: 3

- Read solar panel schematics
- Troubleshooting the solar system
- Attended weekly advisor meeting
- Looked up battery prices

Trevor Webb: 2.5

- Troubleshooting the solar system
- Attended weekly advisor meeting
- Updated information in the weekly report

Shihao Ni: 8

- Attend weekly meeting with advisor
- Searching for appropriate universal bridge rectifier and heat sink
- Make a list of required equipment

Xiaokai Sun: 6

- Attend weekly meeting with advisor

- Research for how to control induction motor by Matlab
- Searching for appropriate universal bridge rectifier and heat sink
- Go through the labs of EE452 for the microcontroller and induction motor

Ben Ryan: 12

- Attend weekly meeting with advisor
- Worked with the Matlab controlled wind generator
- Created a model for a new mount for the wind generator
- Researched method of constructing the buck boost converter that could be controlled by a mini-controller of some kind
- Researched previous wind team documents
- Attended the weekly advisor meeting

## **Total contributions for the project**

Daoxi Sun (71 hr)

Riley O'Connor (72.5 hr)

Trevor Webb (71.5 hr)

Shihao Ni (83 hr)

Xiaokai Sun (79 hr)

Ben Ryan (89 hr)