May1727

Project Title: Stand-alone Hybrid Solar/Wind Power Plant
Advisors: Dr. Venkataramana Ajjarapu & Ankit Singhal

<u>Team Member – Roles</u>

Nathaniel Byrne - Group Leader

Brian Gronseth - Solar Tech. lead

Jeffrey Szostak - Wind Tech. Lead

Matthew Lee - Communications Lead

Mike Trischan - Key Concept Holder

Eric Cole - WebMaster

Executive Summary:

After reporting our measurements from the existing hardware we realized we need to obtain more data. We also began parameterizing the wind turbine along with WESO to create more accurate simulations.

Past Week Accomplishments:

Worked on simulink model issues.
Solar team took measurements for voltage and power under various conditions, including with battery and solar isolation and increasing load. We tested the irradianice sensor and tracked down the computer tower that had all of the sensor software needed for the rest of the project.
It appears Eric is getting close to finishing wind simulations. Solar team
This week the team tested the individual hardware components for the Solar panels. We graphed the output power and current and verified that these values do indeed change with respect to sunlight shining on the two solar panels. We also ensured that our purely resistive load (incandescent LEDs) do turn on and that the load is effected by the amount of sunlight shining on the solar panels. The group also did research on the wind turbine's generator, which is the Ultra Core 24 AC made by Hornet Power Systems. The manufacturer does not have data on the generators, so we created tests to test for these parameters. We ran into two small problems with the generator which have since been fixed.
Got measurements on solar equipment. Calculated power in/ power out on equipment to verify. Continued to finalize wind simulations and testing of turbine
Solar tested the hardware and obtained measurements at various points within the system. We obtained data for one lightbulb and two lightbulb loads and also calculated power inputs and outputs. We experienced some difficulty getting accurate measurements and verifying the data but it was a good exercise in working with the equipment. Wind team fixed their simulations but was unable to parameterize the wind turbine.

Individual Contributions:

Name	Hours this week	Cumulative	Contribution
Nathaniel Byrne	3	52.5	I was not very productive this week. I at least attended the advisor meeting on friday.
Brian Gronseth	6	60	I worked with Matt to take the measurements and put together a table to show the data we collected, as well as the power calculations from the voltage and current measurements. I also worked with him to test the irradianice sensor.
Jeffrey Szostak	7	77.4	I worked primarily on the wind generator setting up the tests. This took a great deal of hands on work. This also required knowing a great deal of power electronics and how to operate

			the software required to operate the tests. The test is done by hooking up the wind turbine generator to a motor with a belt. We then input a specific power into the motor which spins the generator at an undefined speed (which we calculate ourselves).
Matthew Lee	6	68.3	Brian and I obtained all the measurements of solar hardware as well as tested the sensors. We created an organized spreadsheet of the data and also a presentation of the data to present to our advisor.
Mike Trischan	8	74	Setting up turbine in wind lab to run tests with motor to calculate parameters needed for simulations
Eric Cole	3	62	Worked on simulink model issues.

Summary of Weekly Advisor Meeting:

Fix the generator part of the model.
We presented the progress made from the prior week and determined that most of our measurements were fairly accurate with the exception of the load current.
We met with Dr. Ajjarpu and Pranav Friday at 1pm in Coover. We showed them our advancements in the hardware and were given their input. Later in the meeting, Dr. Ajjarpu taught us more about the solar sensors by bringing us down to the power lab and pointing out the specific hardware components we should focus on.
Discussed past accomplishments and future plans
We showed him all of our data and he menioned that we need to take more data and verify that it's all correct. He also suggested we contact ETG to find the missing computer.

Plan for Next Week:

Fix the generator part of the model.
Look into new irradianice sensor that does not require a scaler to determine what the irradianice actually is. Redo current measurements and make sure that they match with proper power consumption. Claim possession of the computer tower. Think about possible experiments with hardware for students to perform.
Ajarrapu wants to make sure we know that our equipment is working and we know how to use ALL of our equipment. We're getting our tower and we get our sensors working.
Run the Wind tests and obtain the values, write both a solar and wind lab manual based on our project's hardware and Simulink models, ensure the solar panel's sensors work and purchase new hardware where applicable.
Make sure pin/pout calculations are on point, retrieve tower that has NI software, continue to test wind turbine
Re-do the measurements in order to verify the accuracy. Find the missing computer tower. Find a new irradiance meter. Analyze the lab manual to see what we can change. Wind team needs to parameterize the wind turbine still. Additionally we will be meeting with our Sister design group to

get them up to speed with the project.

Pending Issues:

Na
Team participation
Na
None.
Na
We are missing a computer tower that has a very important sensor interface file on it. Dr. Ajjarapu recommended we contact ETG in order to find out if they took it.

Comments/Extended Discussion:

none
Na
Career fair was this last week. I had to deal with getting a class switched because it's gen ed was not going to apply on the degree audit.
None.
NA
None