May1727

Project Title: Stand-alone Hybrid Solar/Wind Power Plant

Advisors: Dr. Venkataramana Ajjarapu & Ankit Singhal

Team Member – Roles

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:

This week the teams focused on finish the simulations and preparing to present our findings and research to Dr. Ajjarapu. Because Dr. Ajjarapu is so infrequently available, we often meet with Ankit Singhal (the graduate TA) for counsel and project updates. He has helped us formulate our project plan and is making sure we are on track, plus giving us pointers on how we will present to Dr. Ajjarpu to best convey our knowledge and have him give us the go ahead to move to hardware.

Past Week Accomplishments:

Solar team was able to get the solar array simulation working and recorded output data.
Eric got the web page going, doing a good job. Matt doing his thing and doing a good job communications.
I fixed the wind simulink model so that it now operates without errors. I also began building the website and filling out the personal bios and such.
Set up 13' anemometer to get more data; researched more turbines and have an idea of what we want, just waiting on others for approval, presented to Ankit, made progress on Simulink model.
Solar Team finished debugging and simulating the solar system. Obtained output graphs to demonstrate learning and understanding. Wind Team met with more building manager who may help us get permission to install a wind turbine. They also created a list of list of potential wind turbines to purchase. At this time both simulations are complete or nearly complete.
The Wind Team fixed a major problem with our Simulink model. The two parts of the model now work together without errors. We also changed a few parameters to make the Simulation more accurate. We researched different ways to add sensors onto the Wind Turbine. Specifically, we intend to attach a sensor onto the pole which will operate separate from the Turbine. We also asked for approval to set up a 13 foot anemometer in Coover's courtyard and Northwest corner. The Solar team fixed a major problem in their Simulink model as well as well as answered Ankit's questions he had for the team.

Individual Contributions:

Name	Hours this week	Cumulative	Contribution
Nathaniel Byrne, Group Leader	4	24.5	I worked with the solar team on almost finishing the simulations. I made a suggestion about having our entire operation mobile in order to get around red tape.
Mike Trischan- Key Concept holder	6	27	Set up 13' anemometer to get more data; researched more turbines and have an idea of what we want, just waiting on others for approval, presented to Ankit,

			made progress on Simulink model.
Matthew Lee & Communications Lead	6	23.7	I worked on finishing the solar alb manual and creating a working solar simulation. Debugged the system and replaced the TS_control block with existing MPPT block and created a working, finalized template to gather data from.
Jeffrey Szostak, Tech Lead	8	34	I filed for permission for placing the anemometer in Coover's courtyard. I also used the anemometer on my own and learned how to use it. I also did a great deal of research about different sensors which we will place on the Turbine.
Brian Gronseth Tech Lead	5	19	Worked on solar array simulation
Eric Cole	3.5	24	I fixed the wind simulink model so that it now operates without errors. I also began building the website and filling out the personal bios and such.

Summary of Weekly Advisor Meeting:

We presented the data we had collected from the previous week.
none
none
Presented the following: Set up 13' anemometer to get more data; researched more turbines and have an idea of what we want, just waiting on others for approval, presented to Ankit, made progress on Simulink model.
Teams met with Ankit who helped us determine what aspects of the project we should focus on this week before we meet with Dr. Ajjarpu again on Thursday (27 Oct.) Ankit also informed solar team about why our simulation has to be so perfect. Rather than having us research on our own about solar systems, he wanted us to learn from the lab document and previous groups project (in an attempt to speed things up) but due to some confusion and inconsistencies inthe lab document we have not saved much time.
Professor Ajjarapu was unfortunately unable to attend. Ankit Singhal was there however and he answered our questions pertaining to the Simulink models. He also advised us on what we should do moving forward and what type of research to do.

Plan for Next Week:

Complete the simulation work with outputs that make sense per each part of the lab and be able to explain what we are getting.
Solar team will redo the simulations with the specifications of advising Ankit apart from what we followed with the lab guidelines.
Improving the accuracy of the wind turbine model and adding to the website. Also making the website public so we can access it from any computer.
Hopefully hear back from Matt Post, work on Simulink model, get more wind speed data, call ALEKO for clarification on information they posted online
Solar Team must gather more data about their simulation in order to understand the entire system and begin moving towards hybridization.

Get permission to set up the Anemometer, use the anemometer, and analyze the results to determine whether or not placing a Turbine in Coover's courtyard is a feasible option or not. Continue Sensor research as well as Turbine research. Fix the two Simulink models and plan ways to combine the two models together.

Pending Issues:

A knowledge gap was presented by our ta when we presented our data. After going off of the previous design team's lab, we were able to get outputs, but were unable to explain what or why we were getting the results that we were recording. The data we were able to collect was wrong or incomplete for what the TA wanted us to record.
see comments and extended discussion
Figuring out the relationship between the wind speed and how our circuitry needs to change.
None
MPPT block has one line of code that varied between simulation profiles, seems to have enabled/disabled some feature of the program. Could not discern its function but it prevented our simulations from operating properly and thus has been removed.
A lack of funds seems to be an issue. Also, wind speed in Coover's courtyard may force us to place the Turbine outside of Coover. Placing the Turbine outside of Coover would require additional approval and additional expenses.

Comments/Extended Discussion:

Instead of having us do a lot of research, we were expected to complete the previous design team's lab. After doing so, we found out that there were a lot of inconsistencies that made the lab harder to learn from, which was part of the reason why we had a knowledge gap when presenting the data we had prepared.
We are planning on changing roles soon. Matt had been subtly taking an authority role for some time now, which may suit him as a new team leader but he does good job at communications.
None
This project is pretty cool, believe it or not. I think we can really make something fun and worthwhile.
None
None.