

May1727

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

**Advisors: Dr. Venkataramana Ajarapu & 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:

The team focused on verification of the simulations and related hardware. The solar simulations needed to be verified for the conservation of energy as a whole and on a piece-by-piece basis. This required the help of one of the TA's (Ankit) for assistance.

Past Week Accomplishments:

Verified solar simulations with Ankit and got more accurate results.
Got the wind Simulation to function with battery storage. Started combining of both systems.
The group continued our efforts to combine the two simulink files together. We also fixed a simulink problem pertaining to the current flows out of the batteries in our wind simulink file. We also ran more solar hardware tests and ran a mock lab for the solar hardware.
Solar team met with Ankit to fix our solar simulation, and proceeded to take solar measurements in the simulation - Still attempting to prove law of energy conservation.
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Combined wind and solar simulations, started working on IRP material, tested lab experiments for solar

Individual Contributions:

Name	Hours this week	Cumulative	Contribution
Nathaniel Byrne	2	63.5	NA
Brian Gronseth	3	70	Helped take Solar simulation measurements.
Jeffrey Szostak	5	89.4	I helped fix the wind simulink current problem. I also tried out the solar hardware lab.
Matthew Lee	7	99.3	I met with Ankit on wednesday to have him help me debug the simulation and verify its accuracy.
Mike Trischan	6	87	Helped combine and debug wind and solar simulations, started working on IRP material, tested lab experiments for solar
Eric Cole	6	80	Got the wind Simulation to function with battery storage. Started combining of both systems.

Summary of Weekly Advisor Meeting:

Adviser is uncooperative at (most) times.
The meeting took place 24-Mar-2017. We discussed what we're currently working on and we were given suggestions on how we can fix our current problems.
Discussed plan for coming week and updated on previous weeks accomplishments.
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Talked about past accomplishments and plan for next week

Plan for Next Week:

1) Retake voltage and current measurements from the hardware. Specifically, we need: $V_{battery}$, V_{solar} , V_{mppt} (Inverter), $V_{inverter}$, V_{load} and the corresponding currents in order to add power and current values/verify that conservation of energy exists. With that, we need to find where the loss of power is coming from, and or give more explanation to the efficiency of the inverter and MPPT.
-Mike, Jeff, Matt, and I (along with anyone else who is available and willing) will be meeting tomorrow in the power lab to take these measurements at 1PM. Prof. mentioned having the wind team complete the lab manual we wrote up for the hardware.
2) Match the hardware results with the simulation results (adjust the irradiance and temperature to match what we are getting on the hardware.
3) Simulate the cases that were missed for software (increased load to view the battery compensation)
Test systems to see if they are functioning properly and fix the combined model so that it simulates correctly.
We plan to complete our hybrid simulink file and run more solar hardware tests when the sun is shining.
Solar team will take hardware measurements in order to prove energy conservation and run these results with the simulation in order to verify that software is working properly.
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Finish combined model, test solar experiments on wind team, IRP

Pending Issues:

NA

Finding a proper way to measure the power throughout the wind system.

None.

National instruments software and current sensors.
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NA

It has been very cloudy lately, hard to get a good output from PV array

Comments/Extended Discussion:

NA

na

None.

NA

None.

none
