EE/CprE/SE 491 REPORT 13

10/15/23 - 10/28/23

Group number: **16**

Project title: **Photovoltaic Feasibility in Puerto Rico**

Client &/Advisor: **Prof. Vikram Dalal**

Team Members/Role: **Isaac Buettner, Adam Curtis, Hannah Nelson, Manuel Perez-Colon, Larry Trinh**

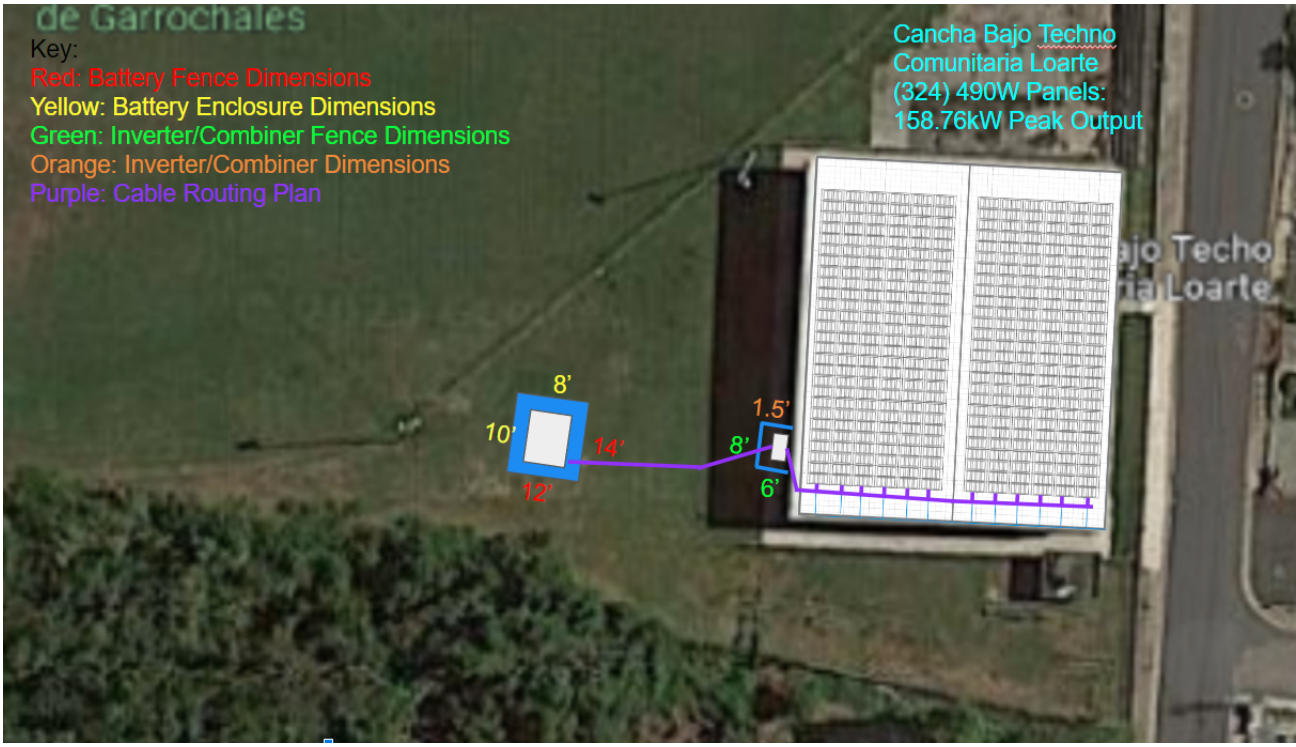
- **Weekly Summary**

We started having weekly meetings with Professor Dalal, to make sure we can get everything done by the end of the semester. We have continued having a split approach to different aspects of the project, we each have areas we are more knowledgeable in. We have the majority of our details nailed down, finishing up the cost analysis and sensitivity analysis, the challenge is mainly how to present the information.

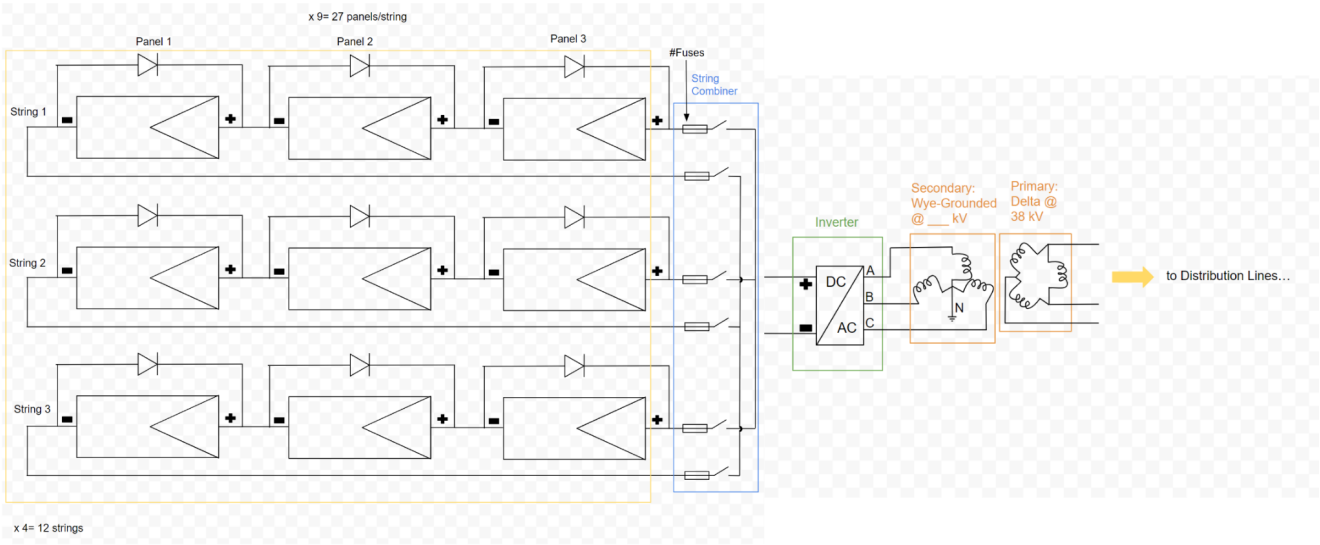
- **Past week accomplishments**

  - **Isaac**: Kept working with Xendee software, switched up the city model to a dedicated island mode in the settings to keep the results from purchasing utility electricity. A lot of this week has been learning to work around errors that this switch has made and also switching over to multi-nodal analysis so that I can include more items and important variables such as transformers and wires so that they can be included in costs. I've been refining my matlab code as well to help make every result easier to find and read so I can keep my Xendee model updated with more ease.

  - **Adam:** Continued to add to the Bill of Materials, finding costs and estimating quantities for all components we expect to need for the project, from wire to the solar panel mounts to the large components such as the inverter, using information from the supplier. Helped review the design document from the first semester and begin to update it as necessary. Create a birds eye view layout of an example installation at a specific location in PR, highlighting security features that will be implemented.



- **Hannah:** Progressed on the schematic diagram/high-level diagram of the system. The last thing to do is incorporate the battery with the inverter. I also have been looking into the type of transformer we need and (hypothetically) where we could buy it from. We will list the specifics of connecting to the grid in the design document. Lastly, I have been updating our design document with our work throughout the semester.



- **Manuel:** Reached out to a contact within the company Burns & McDonnell, requesting help with the software we have used to compile reports for our system and what the industry standard rates are for these types of projects.

- **Larry:** Worked on the schematic of the grid connection. I have found a couple more papers about how to connect components of the grid and share with the team. After discussion with our team and from professor Dalal's suggestion, we decided to move to the next part of the design is researching the battery.

- **Individual contributions**

Name	**Individual Contributions** *(Quick list of contributions. This should be short.)*	**Hours for (2) weeks**	**Hours cumulative**
Adam Curtis	Rooftop redesign, standards verification, bill of materials, battery backup research	10	96
Hannah Nelson	Transformer, schematic, updating design document	8	94
Isaac Buettner	Xendee island mode and multi-nodal analysis, matlab code updating, Xendee troubleshooting and tutorials.	9	76
Larry Trinh	Schematic.	8	78
Manuel Perez	Locations, calculation on production, reaching out for assistance from professionals.	6	78

- **Plans for the upcoming week**

  - **Isaac:** Finish up analysis for city layout, get solid results, move on to rural location next. I need to get my sensitivity analysis working as well as looking into power flow analysis for both test sites.
  - **Adam:** Add more detail to bird's eye view layout, including verification of spacing for main components, and finding location for power to connect to the grid. Continue adding to Bill of Materials, begin work on final presentation.
  - **Hannah:** Larry and I will incorporate the battery into the schematic diagram, and it should be mostly finished by the end of the week. Get a quote for the cost of the transformer. Continue updating the design document and brainstorm/start on the slides and/or infographic for the final presentation.
  - **Manuel:** I should receive a response from the Burns & Mc contact within the week and then use the knowledge we gain from that to edit our reports and possibly our sourcing for different components.
  - **Larry:** I will be working with Hannah to research the battery for the grid. At the same time, I will be helping other team members as needed.