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**EE/CprE/SE 491 REPORT 11**

**9/2/23 - 9/16/23**

**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**

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o **Weekly Summary**

At our team meeting on Friday, we divided up the week's tasks among people. We are continuing down the path of PV + battery on covered basketball courts, as these are popular in Puerto Rico. Our biggest action items of the week are researching the # of potential basketball courts in Puerto Rico and calculating area, power, and % offset. We are also getting in contact with someone who has knowledge of what components are needed for a grid connection. Essentially, our goal for this week is to have a first estimate of the power these could supply.

o **Past week accomplishments**

- Isaac: My goal for these past few weeks has been to look into suitable software to help us model, simulate, and collect data on our photovoltaic microgrid system. I came up with 2 major candidates, the HOMER Pro and Xendee DISCOVER software. I was able to reach out to both companies and was able to confirm my enrollment at ISU and explain our project to obtain academic licenses for both companies' software through the remainder of the semester.
- Adam: My primary goal for the week was to compile a list of technical questions relating to specific design requirements for solar arrays, for example, how much space needs to be left around each panel for maintenance, what kinds of inverters/controls will we need to integrate battery backup and connection to the main electrical grid, as well as how much battery storage we want to provide. I was able to get in contact with an electrical contractor with significant experience in installing solar arrays and hope to get some answers from them as well as my own research.
- Hannah: Goal for the week was to figure out the structural integrity of steel structures for solar panels after receiving questions about that. I reached out to a company that manufactures steel shelters (for basketball courts), but have yet to hear back. In the meantime, have been thinking/researching how to best model our project. There are CAD library downloads, specifically 2 options, that may be useful to show our design as a real-life model. Pairing this with an electrical schematic would be a really strong

presentation.

- Manuel: Researching the amount of basketball courts in Puerto Rico to understand how much a impact instalments like these would have on the grid and the general population. There has been some difficulty finding sources with the information, I have transitioned into calling municipalities to understand where I can find this information. This should give me better access to records that can accurately depict the data we are searching for.
- Larry: Researching the cybersecurity solutions for solar energy grid, and doing some research about any similar projects to see how similar they are with our project. I found some papers writing about those topics and I shared them with my other team members. At the same time, I am also doing some research about the cost of solar panels.

o **Individual contributions**

<b><u>Name</u></b>	<b><u>Individual Contributions</u></b> <i>(Quick list of contributions. This should be short.)</i>	<b><u>Hours for (2) weeks</u></b>	<b><u>Hours cumulative</u></b>
Adam Curtis	Research, drafting email	10	64
Hannah Nelson		10	64
Isaac Buettner	Software Research, License Acquisition	6	47
Larry Trinh		8	48
Manuel Perez	Research	6	48

o **Plans for the upcoming week**

- Isaac: Download and set up simple cases in both software using licenses acquired, I would like to be able to look at the strengths and weaknesses of both programs to determine which is most appropriate for our project scope and timeframe.
- Adam: I will take the information I receive from the contractor next week and compile it with what I have learned from my own research to begin drafting a schematic showing all of the essential electrical components (panels, switchgear, inverters, battery chargers, etc.) and how they are connected in the coming weeks.
- Hannah: Hopefully, I will hear back from the company that manufactures these steel shelters and be able to get structural details from them. This is in order to cover all our bases during final presentations. Additionally, I would like to further detail the panel design on the roofs.
- Manuel: Continue contacting government officials and municipalities to gain records of establishes basketball courts in communities by making phone calls.
- Larry: Continue working on researching some more papers about cyber security, and doing some calculations about the cost of the solar rooftop. I will also be working on helping my team to find some number about basketball courts in Puerto Rico

o **Summary of biweekly advisor meeting**

We meet with Professor Dalal every other Monday. This week was to present sections of our PIRM presentation and inform him of our goals for the semester. We also asked a few guiding questions and what he would like for us to accomplish this semester. In 2 weeks, we will check back in with the research and calculations we have done.