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## EE/CprE/SE 491 WEEKLY REPORT 1

1/30/23 - 2/6/23

**Group Number: 16**

**Project title: Feasibility of Solar PV Energy for Puerto Rico**

**Client &/Advisor: Vikram Dalal**

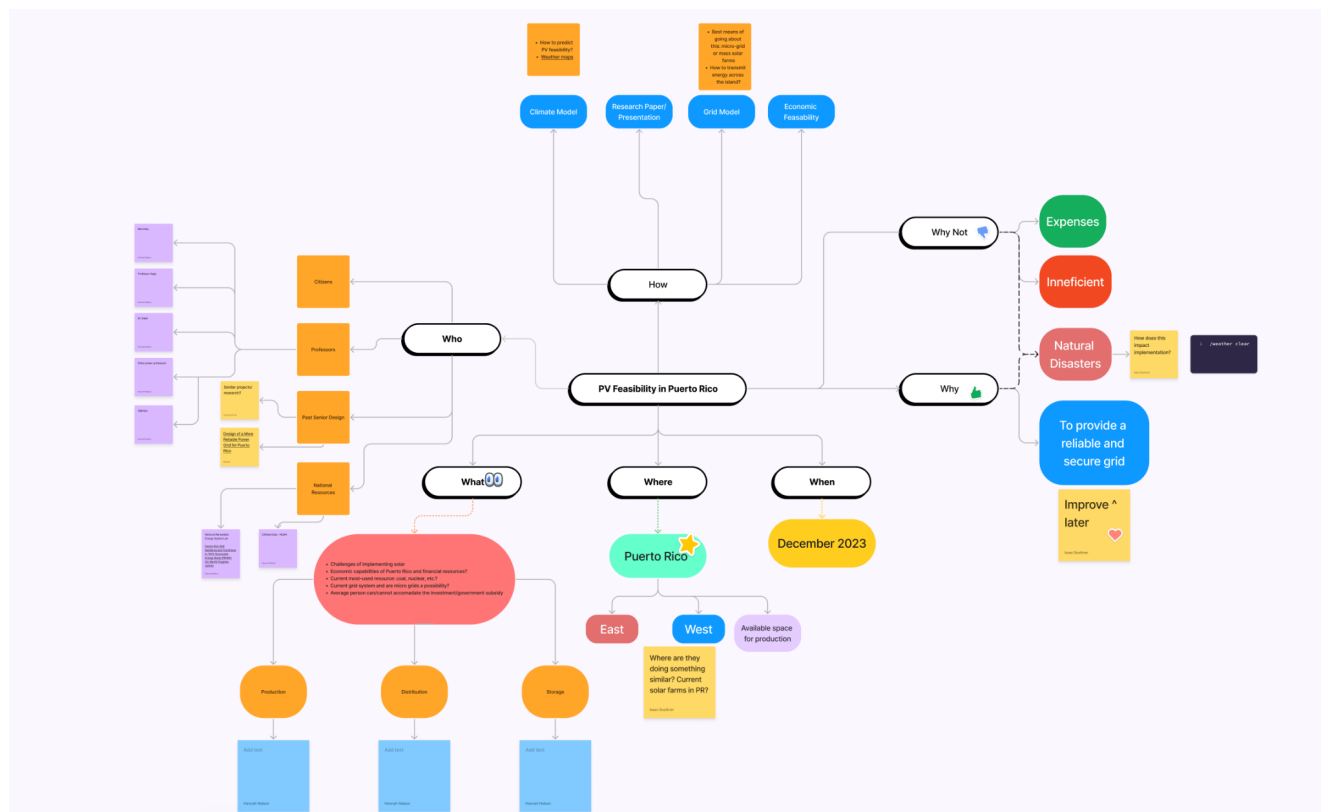
**Team Members/Role: Adam Curtis, Hannah Nelson, Isaac Buettner, Larry Trinh, Manuel Perez-Colon**

### o Weekly Summary

We had our second all-group meeting, this was without Professor Dalal. He will be meeting with us every other Monday. In this meeting, we decided how to divy the research for the week. For our individual work, we focused on the research topics that Professor Dalal suggested. This includes climate models, current grid situation, economic challenges, ect. Of course, this is only a starting point as there is so much broad information and we will narrow down from here.

- o **Past week accomplishments** *(Please describe/summarize as to what was done, by whom, when and, collectively as a group. This should be about a paragraph or two in length. Bulleted points are acceptable as well. Please keep only your technical details related to your project. Figures, schematics, flow diagrams, pseudocode, and project related results are acceptable, but please ensure that they are legible (clear enough to read) and to provide an explanation. If researching a topic, please add a few details about what was learned and how it is relevant to the project. If two or more people worked on a single task, be sure to distinguish how each member contributed to the task. Specific details relating to the assistance provided to other members may be included here. **Do not include classwork, such as individual reflection assignments, and group meetings as part of your duties.**)*

Together we developed a Figma model to brainstorm how/where/what to start research. This helped us develop specific topics for this weeks' research.



<https://www.figma.com/file/briP6DAH0cPsdQsGZik7Zi/Discover-%7C-Empathize-%7C-Research-%5BTeam-16%5D?node-id=0%3A1&t=jRmC28RUUqw0vAI3-1>

- Hannah did research regarding the existing grid and transmission system. This included mainly looking into the power outage issues that have occurred in the past few years, and the impacts of those. There is public debate regarding the publicized or privatization of the power grid, and that greatly impacts whether solar energy is made a priority. Currently, the goal is to reach 40% renewable energy by 2025; however, they are only at 4%. Additionally, the grid has never been permanently rebuilt– but has gone through many partial patchups.
- Adam performed research on the senior design group who completed a similar project to the one we are working on now about 5 years ago. Their project focused mainly on rebuilding Puerto Rico’s grid which had about 80% of it destroyed as a result of Hurricane Irma. New questions were brought up regarding potential primary sources we could consult for a better understanding on how a power grid is actually run and maintained, including getting in contact with people from MidAmerican Energy and Ames Power. We also found that some companies like Tesla had already begun work installing solar microgrids in some places in Puerto Rico at the time this old project was completed, so we could look into how well those grids are working today.
- Manuel has reviewed the PR100 Study of Grid Reliability and Transition to 100% Renewable Energy. This report in particular is a review of the first six months after the Puerto Rico Energy Public Policy Act was enacted in February 2022

- Larry did research on the economy of Puerto Rico. The information about Puerto Rico's economy varies on the internet such as Wikipedia, and some government websites like US Bureau of Labor Statistics. The purpose of doing these researches is to identify how the economy affects the power consumptions of Puerto Rico citizens , and how their income will challenge solar energy solutions. For example, how many percent of their income is spent on electricity? and can they afford it if solar energy is implemented.
- Isaac did research on all things surrounding energy storage for solar power in Puerto Rico. This included looking at past present and future projections for the battery storage capacity that they want to implement. How they want to achieve this and when was also looked into, as well as how much it would cost them or how much they'd be willing to pay contractors. Puerto Rico has been submitting many RFP to contractors to come and give estimates, making bids for their power grid reconstruction after the natural disasters in 2017. They are making the pledges and offering the work, but so far not much progress has been made as all forms of renewable energy in Puerto Rico still only make up 3% of the total energy produced for the 2022 fiscal year.

o **Pending issues** *(If applicable: Were there any unexpected complications? Please elaborate.)*

- Team Member 1: Worked on...
- Team Member 2:
- Team Member 3:

- o **Individual contributions** (Creating this section is optional, but it is **Required to include the “Hours Worked for the Week” and their “Total Cumulative Hours” for the project for each member somewhere relevant in your report. Your individual weekly hours should be at a minimum of 6-8 hours for this course. So please manage your time well. Also, ensure that individual contributions support your claim to the weekly hours. Be honest with the reports.**)

<u>NAME</u>	<u>Individual Contributions</u> (Quick list of contributions. This should be short.)	<u>Hours this week</u>	<u>HOURS cumulative</u>
Adam Curtis		4	4
Hannah Nelson		3.5	3.5
Isaac Buettner		3	3
Larry Trinh		4	4
Manuel Perez		3	4

- o **Plans for the upcoming week** (Please describe duties for the upcoming week for each member. What is(are) the task(s)?, Who will contribute to it? Be as concise as possible.)
  - Hannah: Continue research on existing grid. Found multiple resources from Department of Energy and Puerto Rico 100 initiative– both have technical documents and studies done on the grid to determine renewable energy feasibility.
  - Adam: Look at the prior Senior Design groups final design proposal and evaluate whether sources they used can be applied to our project today. Look into Photovoltaic and energy storage regulations in the NEC (National Electrical Code), and costs of potential battery backup options that could be integrated with PV.
  - Larry: Continue research on Puerto Rico economy, and search more resources about income, labor, economy, human resources and their background to understand more about Puerto Rico and how these factors affect power consumption in Puerto Rico.
  - Isaac: Continue researching energy storage in Puerto Rico, search more for storage solutions and create references for how much storage capacity they would reasonably need, and what that would cost. Will also be looking into case studies and reports for how energy storage investments have worked out for other islands in the region, for instance, the Dominican Republic.