

# Microgrid Test Bed

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## Project Objective and Intern Contribution:

Our team's goal is to balance out the three main power concerns of an island microgrid: cost, CO2 emissions, and resiliency. These three concerns often come into conflict with one another when making decisions regarding hardware upgrades and implementation.

Our team performed on-site interviews and surveys to more accurately model the costs associated with energy generation. Using power grid modeling software, we ran multiple optimizations to compare different scenarios. The financial and utility results extracted from these simulations show the trade-offs between the three main concerns; for example, increased resiliency comes at a higher financial cost and potentially higher CO2 emissions. A remedy to the trade-off between CO2 emissions and financial cost is proper energy storage to capitalize on the energy that would have been wasted.

Ultimately, our team found alternative solutions that implemented electric vehicle energy storage and inverter resiliency within budget. These solutions are specific to this location; other microgrids may have different solutions based on their own specific goals.



- **We are most proud of contributing to the Naval base's resilience while also cutting into its carbon emissions.**
- **The internship was valuable because we met professionals and learned about the practical side of our field of study.**
- **Our advice for future cohorts would be to keep an open mindset and take advantage of all applicable resources.**

## Results / Accomplishments / Next Steps:

- We demonstrated economically viable microgrid configurations.
- Our proposed configurations will help the Navy reach its net zero goal.
- Resilience is important because it prepares the Navy for large scale power outages.
- This work provides insight into how the Navy can provide power for military personnel in remote locations.

