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Respondent

26

Peter Giannetos

17:37

Time to complete

## Project Questionnaire

Please provide proper and accurate information.

1. Name of project \*

Power Station

2. Date project received financial award letter \*

November 9, 2023

3. Date of forecasted project completion \*

December 11, 2024

4. Date of report submission \*

May 11, 2024

5. Marketing and promotion efforts to date \*

Currently there hasn't been much marketing or promotion of Power Station as we're still finalizing the design. However afterwards we intend to promote our design online and share it with other makers who are interested in building their own. We'll also start incorporating it into our society's larger events such as Engineering Open House or Illinois Space Day.

## 6. Please describe project progress \*

Over the course of this semester, we have made significant progress in building a portable power station and beginning to retrofit old 18650 batteries, but we still have a few important milestones ahead before the project is finished.

We spent the majority of the winter researching and designing a prototype power station system that we then built as a small proof of concept. Overall, it was promising and helped solidify our manufacturing techniques and overall design architecture. The next step was to scale up to our full design. We put a focus on getting the system to work electrically as we had with our prototype and left most of the structural aspects for after we had tested integrated everything.

We've just finished the test integration of our full sized power station and successfully powered it on. We also gathered enough practical data during integration to start designing a more long term internal housing. Additionally, we put a limited amount of focus on getting its charging addons to work such as a 100W USB-C charger but we've left the majority of these improvements for the upcoming semester.

During our initial testing we were able to draw approximately 1kW of power with manageable thermals but in order to increase our safety margin we will be increasing the gauge of our wires as well as researching 24V systems instead of 12V to reduce the overall operating current. We're excited to continue our testing over the summer and incorporate our solar panels in a few outdoor tests.

Besides the main power station, prototype assembly of our reclaimed 18650 batteries has also shown good initial success as we've been able to use some of these batteries in other projects. It took a bit of research to find a protection circuit for these batteries that could handle their rated current output. However, the one that we did end up selecting appears to work reasonably well. In the future we plan to continue searching for a better protection circuit and potential to make our own to completely ensure its reliability and functionality. In the immediate future we plan to continue reintegrating more batteries as our other projects require.

## 7. Please describe how your project integrates student involvement and community outreach \*

Over the course of development our student team has had the opportunity to learn about designing and integrating various power systems such as batteries, inverters, and solar panels within the context of sustainability. Power station provides a unique opportunity for students to experience hands-on learning while also significantly benefiting the operation of our team.

Once Power Station is completed we plan to use it at our RSO's community outreach activities across campus to help power equipment and provide an opportunity to learn about solar powered systems. For example, depending on Power Station's progress we may plan to use it for Illinois Space Day which is our society's largest community outreach event for elementary and middle school students. It'd most likely be used to power outdoor displays but also provide an opportunity to teach students about solar powered systems.

Externally, we're also planning to share our design for other collaborators to create their own version and build off of our work, or provide us with design feedback.


## Project Documentation

## 8. Please upload updated financial documentation for your project


<https://studentengagement.illinois.edu/student-sustainability/ssc/docs/SSC-Supplemental-Budget-Timeline.xlsx> \*

 [Power-Station-Budget-Spring-2024\\_Peter Giannetos.xlsx](#)

## 9. Please upload project photography \*

 [18650-Assembled-Prototype-Batteries\\_Peter Giannetos.jpg](#)

 [18650-Battery-Testing\\_Peter Giannetos.jpg](#)

 [Power-Station-Solar-Panels\\_Peter Giannetos.jpg](#)

 [Power-Station-Test-Activation\\_Peter Giannetos.jpg](#)

 [Power-Station-Test-Integration\\_Peter Giannetos.jpg](#)