



## STUDENT SUSTAINABILITY COMMITTEE

### Semesterly Report

*Thank you for your commitment to green initiatives at the University of Illinois. One of the ongoing requirements listed in the terms of the funding agreement for your project is the submission of semesterly reports with key information about your project. In addition to this form, please provide additional financial documentation and/or progress photos if available.*

*Please be as accurate as possible in describing the project (including possible setbacks or challenges in meeting the initial goals of the project). Not fully meeting your project's goals will not disqualify you from making future funding requests as long as your reports are as complete and accurate as possible. If you have any questions, please contact the Student Sustainability Committee, at [sustainability-committee@illinois.edu](mailto:sustainability-committee@illinois.edu).*

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**Project Name:** InSPIRE Solar Powered Outdoors Table (SPOT) Project; formerly InSPIRE Solar Charging Station

**Date of Report Submission:** 12/26/2021

**Project Purpose:**

The SPOT project is a completely student designed and implemented outdoors table which will be retrofitted with solar panels used to charge an off grid solar energy system. The plan is to provide students in UIUC a space to sit and study outside while charging their devices (cellphones, tablets, laptops etc.) using solar energy. It will also better promote solar energy by allowing students to interact with solar energy first-hand through solar panels they can clearly see in-front of them. Lastly, we will provide a QR code on the SPOT which will direct students and RSOs to a website detailing the design and construction plans for the project. This will allow students and other RSOs to replicate the project or parts of it in their own endeavors. The website will also include a tutorial on how to create an off-grid solar energy system.

**Detailed Accounting of Expenditures to Date:**

Shown in attached spreadsheet

**Project Progress to Date:**

| Major Milestone                                | Approx. Time Completed | Description   |
|--|------------------------|---|
| Creation of Project Design Concept             | Fall 2017              | Decided on a picnic table fitted with solar panels and outlets to charge laptops and cellphones   |
| Found Sponsor and Funding                      | Early Spring 2018      | Gained funding from Student Sustainability Committee and sponsorship of prof Erik Benson  |
| Found Technical Support for PV System          | Late Spring 2018       | Found technical advice and support from Philip T. Krein for the design of off-grid PV system  |
| Proof of Concept                               | Fall 2018              | - Created small version of solar PV system for practice<br>- Initial 3D model of completed<br>- Gained an "ok" from Craig P. Grant and Joseph Y. Youakim regarding the structural design. |
| Technical Knowledge Preparation                | Early Spring 2019      | - Gained approval and permission to start building the solar PV system from Philip T. Krein<br>- Began learning and gaining skills related to concrete/masonry work                       |
| Electrical System Construction                 | Summer 2019            | - Completed electrical system and began testing   |
| Structural Design                              | Fall 2019              | - Finalized structural design<br>- Compiled purchased list of parts of the structural system<br>- Began concrete masonry work   |
| Attained Approved Space for Installation       | Spring 2020            | - Gained permission from the UIUC F&S Architectural Board and local facility managers in the College of Engineering for a permanent location northeast of the Holonyak Labs               |
| Began construction of structural components    | Spring 2020            | - Began carpentry and concrete work for multiple significant components<br>- Gained approval to receive and store large structural components in ECEB drydock                             |
| Began Construction & Finished Draft of Signage | Fall 2021              | We finished...<br>- Assembly of the table<br>- Anchoring of the table<br>- Installation of one of the poles<br>Finished draft of signs and graphics to be placed on the project           |

In late March to May, we plan on...

- Installation of the second pole
- Installation of off grid PV system

From November 2021 onward, we have and will continue to check up on the constructed project with advice from the relevant people in UIUC F&S.

As for the website tutorial, it has been approximately 90% complete and can be found here <https://www.inspireuiuc.com/off-grid-solar-pv-system-tutorial>

The permanent QR code for the website has been made and will be placed on the SPOT project near the end of the project construction.

### Student Involvement and Outreach to Date:

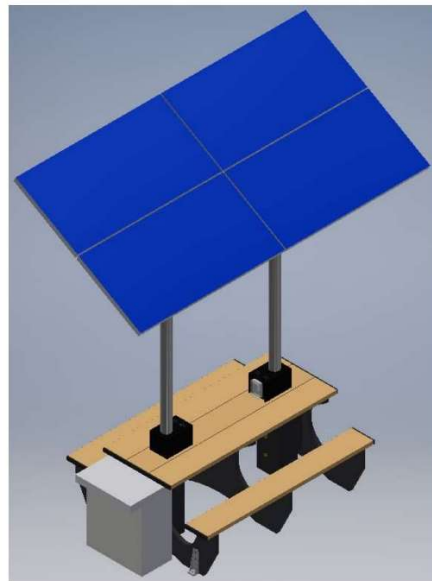
Students were involved in the following.

- Overall design of the table including what major components will be commercially bought and what will be created from scratch.
- Cooperating with professionals for consultation on the design, construction, and compliance with local campus codes as well as statewide & national codes.
- Construction
- Marketing
- Creation of signs
- Creation of the website with the design documents available to the public
- Hands on carpentry and masonry work

### Marketing and Promotion Efforts to Date:

On the finished assembled table, we posted a weatherproof sticker shown on the right.

On another matter, a model of the SPOT project is also included in our InSPIRE recruitment posters scattered across campus. Although, said posters are for the purpose of gaining new members and not to promote the SPOT project.



## **Solar Powered Outdoors Table (SPOT)**

Student Designed  
and  
Student Built

Coming April 2022 !!

Developed by InSPIRE-UIUC  
Funded by UIUC Student Sustainability  
Committee (SSC)

\* Please feel free to sit and enjoy the table even while it's still unfinished :D

### Additional Comments:

Expected to finish on May 2022

## List of Expenditures from 2019

| <b>21-Jan-19</b>                |           |            |                   |
|---------------------------------|-----------|------------|-------------------|
| Item                            | Quantity  | Price/Unit | Price             |
| DC Circuit Breaker #1           | 2         | 14.55      | \$29.10           |
| Ground Faults Protection Device | 1         | \$51.23    | \$51.23           |
| MPPT Charge Controllers         | 1         | \$399      | \$399             |
| DC Circuit Breaker #2           | 1         | \$28       | \$28              |
| Battery Bank                    | 1         | \$99.99    | \$99.99           |
| Inverter                        | 1         | \$642.08   | \$642.08          |
| AC Circuit Breaker              | 1         | \$8.94     | \$8.94            |
| Outlets                         | 2         | 10.5       | \$20.99           |
| Low Voltage Disconnect          | 1         | \$55.50    | \$55.50           |
| <b>Total</b>                    | <b>11</b> |            | <b>\$1,334.62</b> |

| <b>12-Feb-19</b>                |          |            |                 |
|---------------------------------|----------|------------|-----------------|
| Item                            | Quantity | Price/Unit | Price           |
| Battery Bank                    | 1        | \$107.96   | \$107.96        |
| AC Circuit Breaker              | 1        | \$9.20     | \$9.20          |
| Strike anchor                   | 1        | \$57.35    | \$57.35         |
| Orange ASA 3D printing Material | 1        | \$38       | \$38            |
| <b>Total</b>                    |          |            | <b>\$212.51</b> |

| <b>14-Feb-19</b>         |          |            |                 |
|--------------------------|----------|------------|-----------------|
| Item                     | Quantity | Price/Unit | Price           |
| 30amp DC circuit breaker | 2        | \$12.25    | \$24.50         |
| Electrical Enclosure     | 1        | \$931.27   | \$931.27        |
| Rebar Bundle             | 2        | \$17.44    | \$34.88         |
| <b>Total</b>             |          |            | <b>\$990.65</b> |

| <b>20-Mar-19</b>   |          |            |                 |
|--------------------|----------|------------|-----------------|
| Item               | Quantity | Price/Unit | Price           |
| 100% Plastic Board | 1        | \$106      | \$106           |
| <b>Total</b>       |          |            | <b>\$106.00</b> |

| <b>20-Apr-19</b>             |          |            |                 |
|------------------------------|----------|------------|-----------------|
| Item                         | Quantity | Price/Unit | Price           |
| DC Circuit breaker box       | 1        | \$49.88    | \$49.88         |
| Two Hole Conduit Strap (8mm) | 1        | \$8.73     | \$8.73          |
| 16mm Drill Bit for Metal     | 1        | \$15.11    | \$15.11         |
| Cable Glands                 | 1        | \$9.99     | \$9.99          |
| 1/2 screws                   | 1        | \$5.25     | \$5.25          |
| 10 Gauge Silicone Wire       | 1        | \$16.48    | \$16.48         |
| MC4 Connectors               | 1        | \$9.99     | \$9.99          |
| Power Strip                  | 1        | \$12.45    | \$12.45         |
| Temperature Controller       | 1        | \$34.99    | \$34.99         |
| <b>Total</b>                 |          |            | <b>\$162.87</b> |

| <b>10-Dec-19</b>      |          |            |                 |
|-----------------------|----------|------------|-----------------|
| Item                  | Quantity | Price/Unit | Price           |
| Cam Lock              | 1        | \$14.65    | \$14.65         |
| Solar Mounts          | 2        | \$259.20   | \$518.40        |
| 4in Pipe Nipple       | 1        | \$32.75    | \$32.75         |
| 4in dia drill bit     | 1        | \$22.55    | \$22.55         |
| Table grounding Clamp | 2        | \$13.50    | \$27.00         |
| <b>Total</b>          |          |            | <b>\$615.35</b> |

| <b>11-Dec-19</b>                |          |            |                |
|---------------------------------|----------|------------|----------------|
| Item                            | Quantity | Price/Unit | Price          |
| Grounding Rod Clamp             | 4        | \$2.35     | \$9.40         |
| 6 awg bare solid grounding wire | 1        | \$20.96    | \$20.96        |
| Normal grounding lugs           | 3        | \$3.15     | \$9.45         |
| Bus Bar                         | 1        | \$3.99     | \$3.99         |
| 12 awg stranded wire            | 1        | \$7.77     | \$7.77         |
| <b>Total</b>                    |          |            | <b>\$51.57</b> |

|   |                   |
|---|-------------------|
| Initial Amount                                      | 5800              |
| Est Sub-Total Expenses (excluding shipping & taxes) | <b>\$3,473.57</b> |
| Est Total (w/ shipping, no taxes)                   | \$4,168.28        |
| Est Remaining                                       | \$1,631.72        |
| Confirmed Remaining Amount (As of March 16 2021)    | \$1,752.41.       |

### Expenditures after 2019

| Purchase Date - Store Name | Item Name                                       | Cost/unit | Qt    | Subtotal |
|----------------------------|---|-----------|-------|----------|
| 21/01/04 Amazon            | Stainless Flat Head Phillips Wood Screws        | 6.01      | 1     | 6.01     |
|                            | Stainless Steel L Brackets                      | 9.59      | 1     | 9.59     |
|                            | Foam Seal Tape                                  | 10.35     | 1     | 10.35    |
| 21/01/15 Amazon            | Loctite Self Mixxing Epoxy Syringe              | 3.59      | 6     | 21.54    |
|                            | Screw Post Fasteners                            | 17.18     | 1     | 17.18    |
| 21/01/22 Amazon (1)        | HDPE Recycled Plastic Sheets 1/8" x 24" x 48"   | 15.60     | 2     | 31.20    |
| 21/01/22 Amazon (2)        | HDPE Recycled Plastic Sheets 1/4" x 12" x 24"   | 44.99     | 1     | 44.99    |
|                            | Stainless Steel Hinges                          | 11.99     | 1     | 11.99    |
|                            | White Paint Pen                                 | 10.99     | 1     | 10.99    |
|                            | HDPE Recycled Plastic Sheets 1/2" x 12" x 24"   | 23.99     | 6     | 143.94   |
| 21/02/12 Amazon            | HDPE Recyclpled Plastic Sheets 1/4" x 12" x 24" | 44.99     | 1     | 44.99    |
| 21/04/13 Belson            | Recyclpled Plastic Picnic Table                 | 891.00    | 1     | 891.00   |
| 21/04/13 Home Depot        | Grounding Rod                                   | 11.85     | 2     | 23.70    |
|                            | Grounding Rod Clamp                             | 2.70      | 2     | 5.40     |
| 21/05/08 Amazon (1)        | Movers Dolly                                    | 20.99     | 1     | 20.99    |
| 21/05/08 Amazon (2)        | Cam Lock  | 12.00     | 1     | 12.00    |
| 21/05/08 Amazon (3)        | Adjustable wrench                               | 5.99      | 1     | 5.99     |
|                            | Self Adhesive cable Labels                      | 5.99      | 1     | 5.99     |
|                            | 10 AWG wires                                    | 52.73     | 1     | 52.73    |
|                            | Y Branch MC4 Solar connectors                   | 7.99      | 1     | 7.99     |
|                            | Carbide Scraper                                 | 25.11     | 1     | 25.11    |
|                            | Multimeter                                      | 21.99     | 1     | 21.99    |
|                            | Hammer Drill Bit                                | 6.54      | 1     | 6.54     |
|                            | Grounding Pipe Clamp                            | 20.90     | 2     | 41.80    |
| MC4 Solar Connectors       | 20.89   | 1         | 20.89 |          |
| 21/06/30 Amazon            | Battery Equalizer                               | 19.66     | 1     | 19.66    |
| 21/07/13 Amazon            | Tile Grout                                      | 10.99     | 1     | 10.99    |
|                            | 1/2" Diameter Rope                              | 19.99     | 1     | 19.99    |

**Totals:** 42 1545.53

**Total Shipping Cost** 209.69

**Grand Total** 1755.22

\*\* The above expenditures were made by RSO members and reimbursed using SSC funds. The reimbursed amount did not exceed the remaining SSC available funding.