Project Bazaar Day #2

Scrum dates

Jan. 25, 2022 - Mar. 1, 2022

Status description

Project Status - Green

We feel like we are "on track". We implemented ROI and annual cash flow calculations as well as optimal solar installation analysis.

Team Member Contributions

Tristan - Add inputs for ROI calculation and input icons, Update python to accept list of different solar panel types, Determine solar production of an array of different solar installations, Summary page updates (cash flow diagram, optimal installation details)

Karlee - Researched and implemented ROI and annual cash flow calculations, Project day abstract, Trello board, Documentation

Kaden - Solar model testing, Confirm linear scaling of panel generation, Implement radial degree slider input
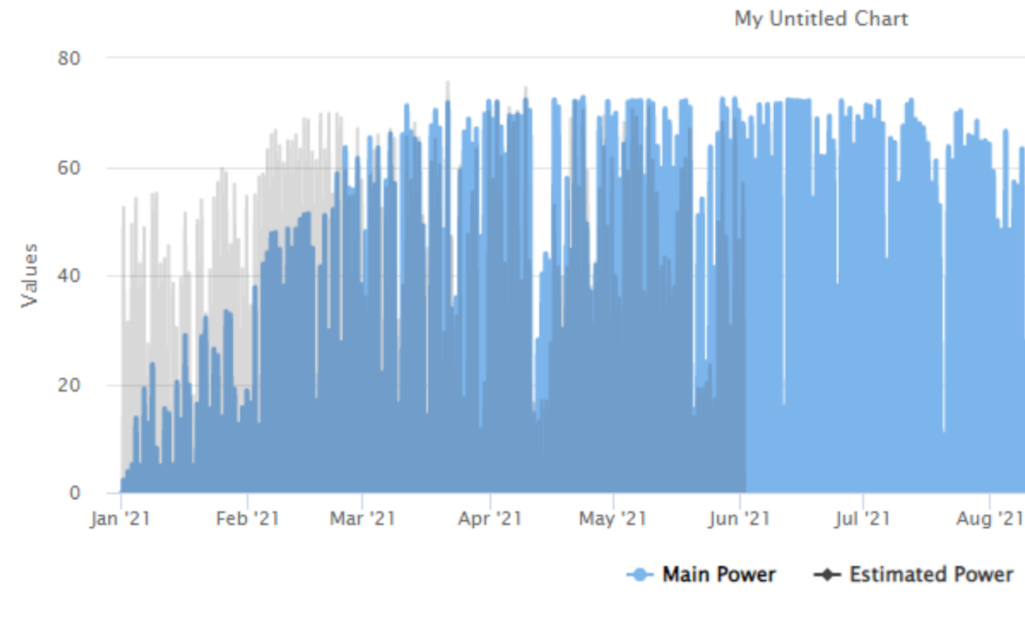
Group - Completed MVP #4, Met with Greenwave Innovations, Determined how we would approach handling optimal installation calculations

Project issues/changes

- Focus more on optimal solution calculations rather than custom solution analysis

Documentation overview and/or project demo

- Solar Model Testing

My Untitled Chart

By analysing this chart, we can see that the model is accurate within 5% of peak production, with a maximum value of 75KwH compared to a real value of 72.5 kwH. This is good as it does not overestimate how much the system will produce.

By looking at the winter months, we can see how much production is lost due to snow and ice coverage in the real data. While it is often not worth it to clean snow off of panels due to man hours costing more than the power saved, this demonstrates the real effects of snow being on the panels.

Lastly, we can see that the model sometimes underfits with how much power is produced, this can be attributed to the fact that the NASA API data is at a resolution of 10km and their methodology of producing GHI values may be overly aggressive when it comes to cloud cover.

- ROI and Annual Cash Flow Calculations

$$Balance\ Remaining\ (end\ of\ 1st\ year)\ =\ Capital\ Cost\ +\ Loan\ Interest\ -\ Amount\ Saved$$
$$Balance\ Remaining\ (2nd\ year\ and\ on)\ =\ Balance\ Remaining\ +\ Loan\ Interest\ -\ Amount\ Saved$$

$$Capital\ Cost\ =\ (System\ KW\ \times\ Cost/KW\ Installed)\ +\ Interconnection\ Study\ Fee$$
$$+\ Bidirectional\ Meter\ -\ Grants/Rebates$$

$$Amount\ Saved\ =\ (Power\ Produced\ \times\ Price\ of\ Power)\ -\ Maintenance\ Costs$$

$$ROI \ \% \ = \ \frac{Total \ Savings}{Total \ Cost} \times \ 100$$

$$Years \ Until \ Paid \ Back \ = \ \frac{1}{ROI \ \% \ / \ 100}$$

- Webpage Demo

Next up

Overview of next several weeks: project day documentation, summary page updates/additions, work on saving location-based data

Tristan - Allow for extrapolation of ROI based on current data, Help page (optimal solar installation analysis), Caching repeated location, UI improvements

Karlee - Help page (ROI and annual cash flow calculations), Look into poster design, User testing, Documentation, Meeting minutes

Kaden - Save configurations, Help page (solar model information)

Group - Meet with Greenwave Innovations, Meet with Dr. Yow, Work on MVP #5, Complete Vlog #5, Complete project day requirements

Team reflection

Discuss:

- Does the team feel "on track"? (reiterate the above colour status)
    - Green status
    - Yes, we feel like we are "on track"
- What progress does the team particularly feel good (great) about?
    - ROI, annual cash flow, and optimal solar installation analysis
- What barriers (if any) does the team feel are a current impediment to success?
    - No barriers at this time
- What help (if any) does the team require to move positively forward?
    - No help required at this time
- What questions or concerns does the team have (if any)?
    - No questions or concerns at this time