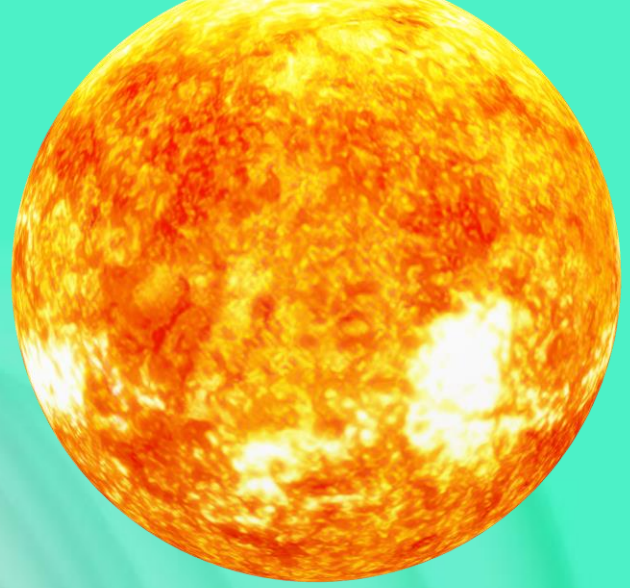
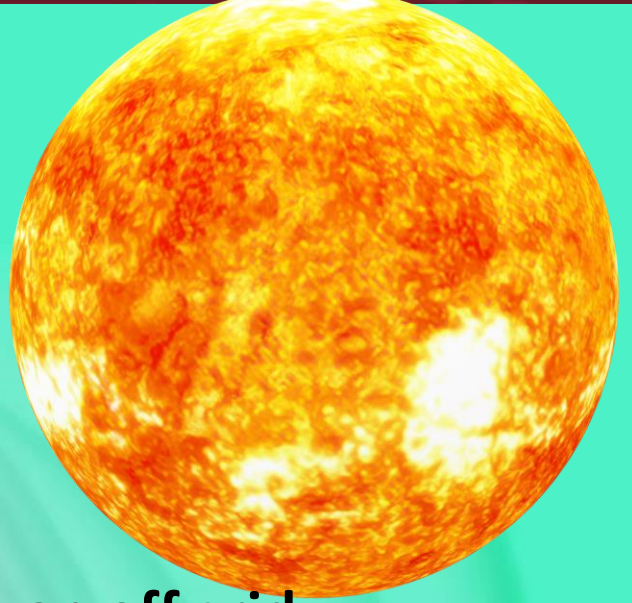


Solar plant efficiency

Colin lovestad

Project Scope

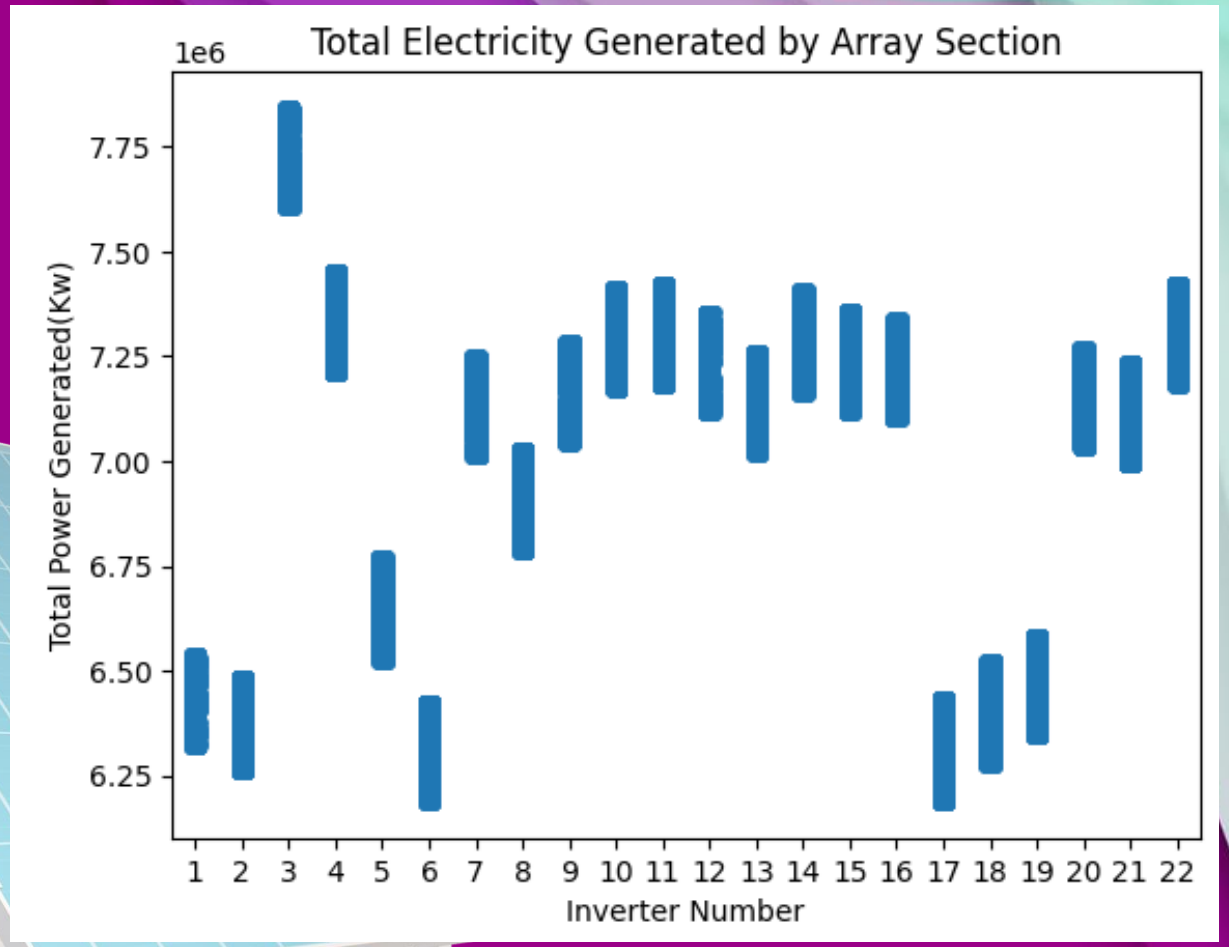


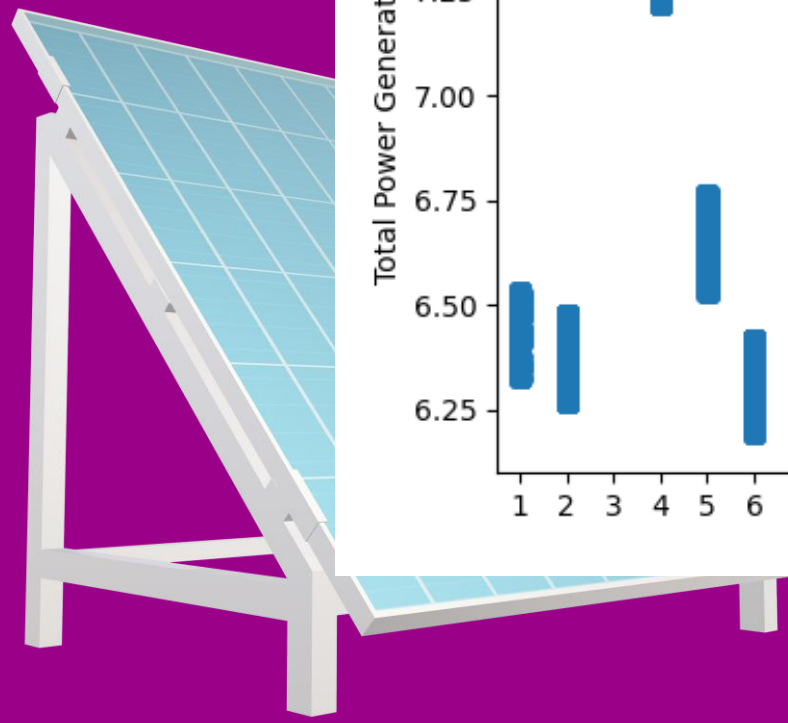
Steak-holders**

small city council considering allocation of funds to start an off grid subdivision , with the question of "how much power can be generated to support the subdivision and its network of buildings and how reliable on a month to month basis will the generation be to gauge the need(if any) for alternative power sources(grid power).

DF info- Power production predictions to gauge duty cycle of plant components to maintain peak efficiency.

Monthly production





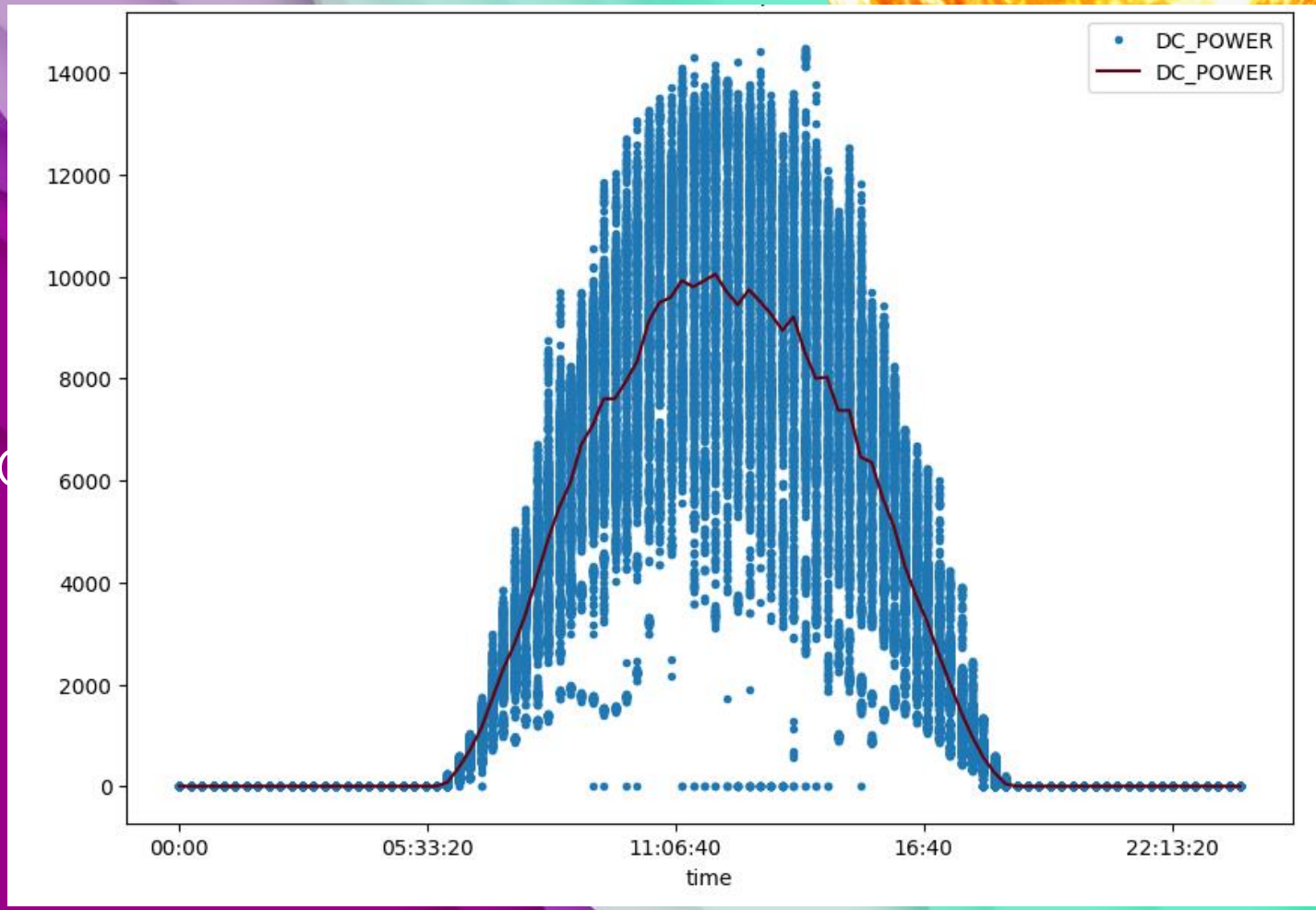
The visual represents the total monthly electricity generated by each of the 22 separate stings of solar panels called "Strings". The total output generated is measured in Kilowatts.

For presentations purpose the needed KW output for the community would need to be around 700kw, which as shows is surpassed even with the (7) underproducing units.

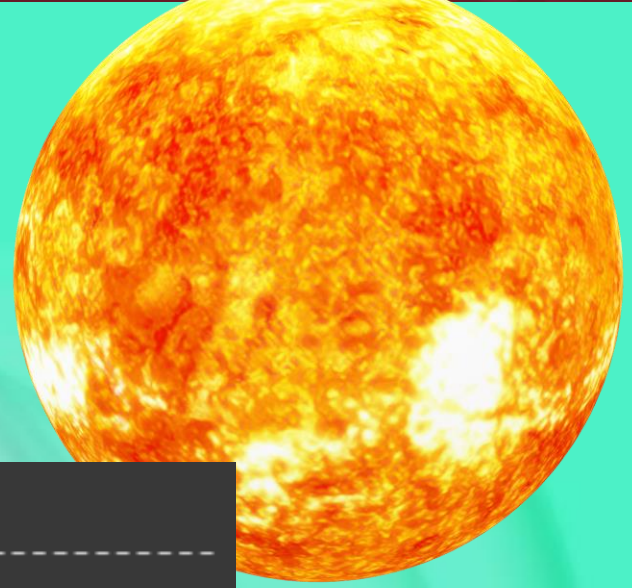
Daily Production

The following visual CLEARLY relates that the sun is in fact shining its strongest, in the “mid day ”, resulting in the very consistent daily production curve displayed .

Contrary to popular belief that panels cannot generate while in cloudy/overcast conditions the UV rays pretty much disregard the clouds shade tactics.
Beyond hazardous weather, the panels will continue to generate.



Evaluation



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Regression Metrics: Test Data
-----------------------------------------------------------
- MAE = 21,545.492
- MSE = 2,173,544,460.114
- RMSE = 46,621.288
- R^2 = 0.987
```

monthly generation levels exceed project scope/needs even with outliers(low generating units), due to maintenance or other technical difficulties

model cannot predict possible natural disasters(weather)that could impact plant generation or downtime.

Takeaways

- The Monthly generation levels surpass the monthly goals required by the stakeholders, even with the underperforming strings.
- The need for additional sources of power will not be required in the original scope and layout of the subdivision given the current predictions.
- However , that does not bar normal duty cycle of components
- Sever inclement weather or other component damage from occurring and contributing to an interruption of power.
- Recommend a system of 25 strings to accommodate any combination of occurrences while maintaining fully off-grid system demands.