# Engineering Team Goal – Environmental Impact

By March 22, 2021, in order to be powered by completely renewable sources, connect a solar power unit to run the system completely from battery power, for at least 4 hours on a full charge.

## Plan of Action to Achieve This Goal

1. Research possible battery options that can hold the estimated power consumption of 4+hours usage and choose the one that has the longest lifetime with reasonable price by March 1, 2021.
2. To achieve a full charge over 3 days in good weather conditions, select a solar panel with enough efficiency to generate that power in 24 hours of direct sunlight by March 1, 2021.
3. Acquire or construct a maximum power point controller to optimize battery charge time based on our battery and solar panel statistics by March 15, 2021.
4. Test the prototype in various conditions from March 15-22, 2021.
5. Using the results from step 4, determine if our system can function without any external power sources, and rate the success based on

## Goal Metrics

### Metric Measurand

The charge rate will be the metric since it will determine if the user will have the light system available for usage when needed.

### Goal Achievement Threshold

Success will be based on the ratio of charge time to operational time. The system will need to charge in a reasonable time in order to have enough availability that the user does not resort to plug-in lighting outside of extended bad weather circumstances. Ideally, it will achieve a charge rate of greater than one hour operating power per day charging in partly cloudy to clear conditions.

### Measurand Measurement Method

From full discharge, measure how much charge per hour and per day the battery stores under various weather conditions. As a secondary test, measure the total time to fully charge the battery.