# Engineering Team Goal – Environmental Impact

By March 22, 2021, connect a solar power system to run the lights for at least 4 hours on a full charge, while being fully off-grid and charging rapidly enough to avoid the user needing other light sources.

## 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.

## 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.