

**ECE Capstone program  
Spring 2018  
Project Abstract & Info**

**1. Project number:** 26

**2. Project title (as will appear on the poster):** SolarSmarts

**3. Team members:**

Mit Patel

Nill Patel

Prabhjot Singh

Raj Patel

**4. Adviser(s) name(s):**

Hana Godrich

Michael Kornitas

**5. Up to 5 keywords that will help to classify the project scope:**

Energy Management

Machine Learning

Self-correcting predictions

Cost efficient

**6. Project abstract (up to 250 words) to be shared with judges:**

**Problem**

Solar energy is largely influenced by weather events. These events can not only influence the availability of energy, but the stability of the entire power grid. Our goal is to utilize previous solar panel and weather data using Machine Learning to predict the availability of energy in the future. This will allow optimal energy management decisions that can help reduce costs and increase efficiency.

By collecting previous data from solar panels and the weather, it is possible to use Machine Learning to extract useful information. Data from existing solar panels will give experimental results that are affected by the weather. Additionally, solar irradiance maps provide theoretical values of energy production by solar panels by region. By combining the theoretical value of solar irradiance with both previous and future weather data, a Machine Learning model can be used to create a predictor for the actual value of energy production. In the event that our predictions don't match up with the experimental values on a given day, our algorithm will reevaluate the prediction to match up with the actual values.

When it comes to energy management, storage capacity is a constraint. It is often hard to make decisions regarding when to store energy and when to buy electricity. If we could predict the amount of energy that will be produced by solar panels such decisions would become easier to make.