Solar panel research and development has been around for many years, since the 1800s, and in recent times they have become more popular as a means of primary power generation. Since the sun’s energy is an unlimited resource, it has the potential to become the main source of energy in the future. All other forms of energy can be indirectly sourced back to the sun and solar movements. The motivation behind our project is to harvest the sun’s energy in the most efficient manner, thus reducing dependence on fossil fuels, and greatly reducing the cost of electricity. Since our design will be portable, we will be able to reach remote areas that either don’t have an energy source, or can’t afford one.

The main objective of our project is to find the most efficient geometry possible for a solar panel, in order to maximize the energy generated for a given base area (energy density). The common geometry of most solar panels is a basic, rectangular shape. While this shape has proven to be effective, it also has many downfalls. The sun is a moving source, and therefore the amount of sunlight, and the angles of approach are always changing. The most efficient position for a solar panel will always be ninety degrees, or perpendicular, to the rays of sunlight. For the final design, we decided that to maximize absorption at all times we would construct a parabolic curved geometry. Testing was done with this geometry by comparing it to the basic rectangular solar panel of the same surface area over a full solar day. The results proved that the curved panel did indeed generate more energy throughout the day than the flat panel, with an improvement of 75%.

There is room for improvement on this curved panel, as it can be further optimized and prepared to be used for potential applications in commercial and residential areas as opposed to industrial. Places such as Florida, Central America and the Caribbean that have a year round supply of sunlight and hot climate can implement this design and eventually reduce dependence on fossil fuels and make solar power their primary energy source.