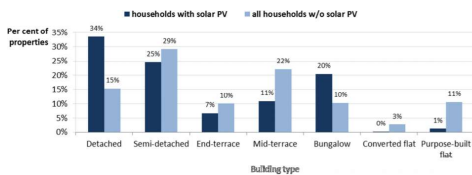


# Solar Shutters

## Introduction

Solar energy is gaining tremendous popularity in the building industry with architects aiming to design solar houses. However, not all buildings could support their electricity needs from this type of energy due to the lack of space on their roof. Thereby, it was thought to create the Solar Shutters. Solar shutters follow the environmentally friendly philosophy for the energy generation on houses without occupying any space. Creating a shutter that would function as a shield for the house and that would minimise the energy costs of a household was seen as an opportunity.



## Aims

The aim of this project was to design and build an exterior solar shutter. The solar shutter was aimed to be built based on the traditional shutters, maintaining the basic principles of them, but to also be capable to produce energy for the home grid in a cost-effective manner.

## Objectives

- To test a system that would decrease the angle of incidence by optimising the angle that the solar panel receives solar radiation.
- To do research and try to choose the most suitable solar panel to be used.
- To place the solar panel shutter on a sliding window track for convenience of opening and closing it, and so that will be facing the sun even when opened.
- To study and compare similar products/systems that already exist.
- To provide the user the ability to have an energy outcome from his shutter.

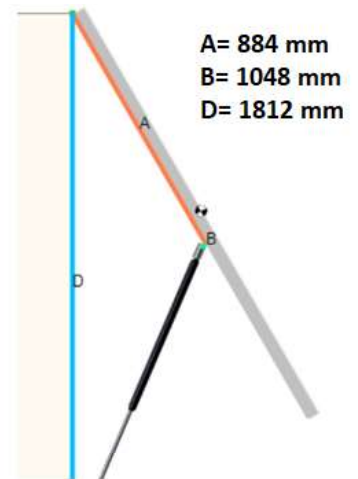
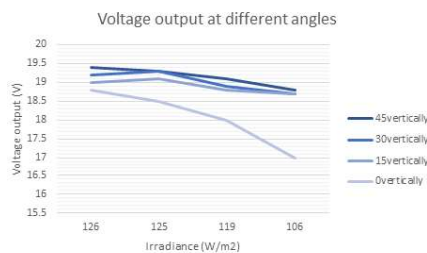
## Design

For the design of the Solar Shutters there were four areas to be studied and evaluated. The solar panel, the wiring connection to the subsystems, the tracking of the sun, and the supporters/hinges were developed based on criteria selected.



- For the solar panel, a research on the best solar energy companies was conducted and the LG NeON R was chosen.
- For the wiring connection, a cable roller was chosen to enable the cable to move while being safely adjusted on the window track.
- For the tracking of the sun, a pyranometer was chosen to be placed on the bottom window track.
- For the supporter/hinges, the Bahama hinges were used with two gas struts.

Gas struts were used to support the panel and move the bottom part forwards to minimise the angle of incidence. The length of the gas struts was carefully chosen to position the panel at an opening angle of 30 degrees after a test and a detailed research were developed..



## Conclusion

Theoretically, the project successfully met the objectives set. However, it was not made possible to build a prototype.

"Solar Shutters" are an innovative product for the eco-friendly houses of the future and not only. A product that could protect from the weather conditions and at the same provide green energy at every household.

