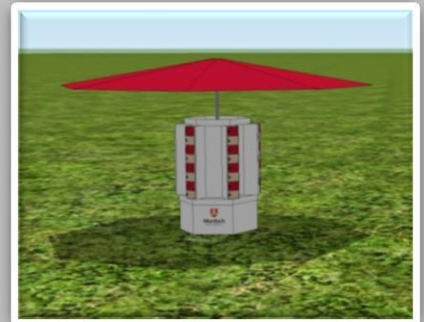
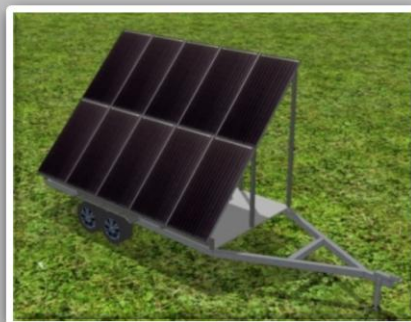




Murdoch UNIVERSITY



Mobile Phone Charging Station

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A report submitted to the School of Engineering and Energy, Murdoch University in partial fulfilment of the requirements for the degree of Bachelor of Engineering.

2010

ENG460: Engineering Thesis

ENG460 Engineering Thesis
Academic Supervisor endorsement pro forma

This is to be signed by your academic supervisor and attached to each report submitted for the thesis.

I am satisfied with the progress of this thesis project and that the attached report is an accurate reflection of the work undertaken.

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Date:

Declaration

I declare that this thesis is my own work, it contains no material previously published or written by any other person, except where due reference is given in text.

Acknowledgments

Special thanks to my supervisors, Dr Martina Calais and Simon Glenister.

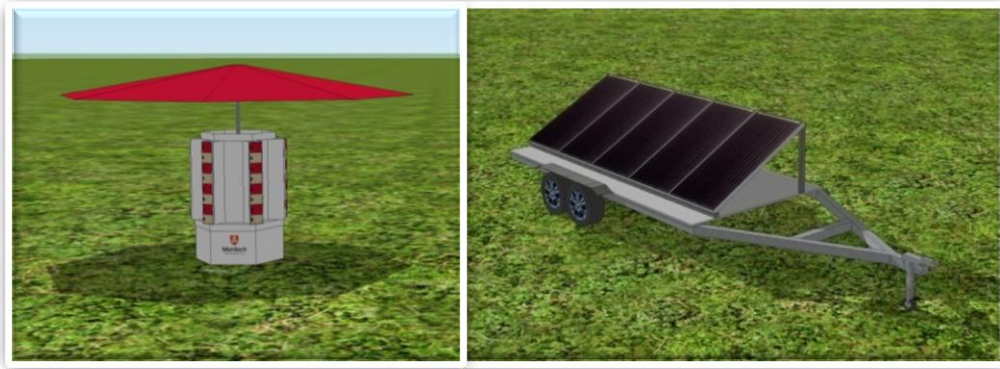
Abstract

This thesis project set out to design a mobile phone charging station that is Photovoltaic (PV) powered. It was to be designed so that it could be used at outdoor festivals and events such as the Southbound Music Festival. For this reason the charging station had to be portable and as it would be used at night there had to be an appropriate lighting set up. The design of the charging station had to be eye catching and could be based on a similar device called the LG Skycharger.

As this project was being designed for Murdoch Events to be used by Sunset Events, communication with the client was critical. An original design was created and then proposed to the client during a presentation, to determine if the design was appropriate. Once discussed it was decided that a few requirements needed to be modified. This original design was then customized to meet the new requirements and a second larger station design was also produced.

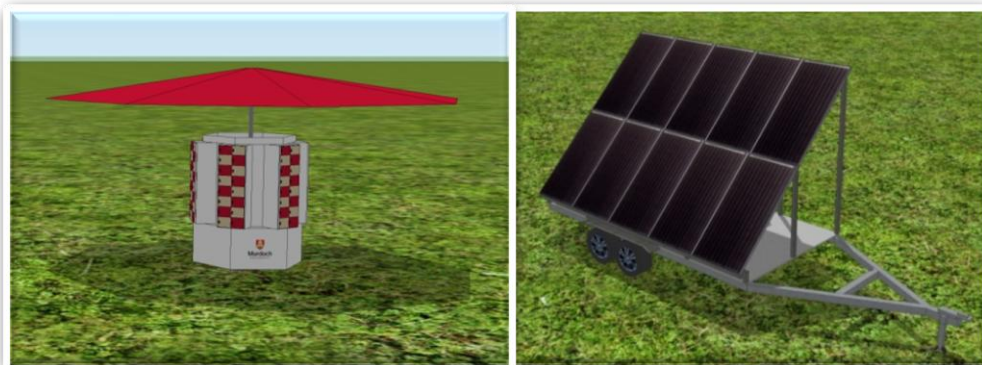
This resulted in two final designs, which meant that the client has two options and can select the design which is most suitable and meets their budget. The two stations that were designed were a 48 locker design and a 96 locker design. As it was assumed the stations would have access to the main power both have been configured so that if the battery bank is running low it can be charged using mains power. This makes it more versatile so that it has the ability to be used during winter, or for a number of continuous days.

The 48 locker charging station contains a PV system that has a rating of 875 W and a battery bank rated at 240 Ah. This battery bank has enough capacity to power the system for 17.4 hours assuming there is no solar power. It has been designed so that the PV system can be mounted on the back of a trailer to increase portability. The charging station is eye catching and will be constructed out of aluminium so that it is durable. For there to be appropriate lighting at night time LED lighting has been selected; this includes multi colour LED lights for decorative purposes, as well as white LED flood light which will provide a substantial amount of light surrounding the charging station. The total estimated price to construct the 48 locker version is \$30,500.



The 48 Locker System

The larger 96 locker charging station contains a Photovoltaic system that is twice as large as the 48 Locker Charging station, which results in a PV system rated at 1750 Watts and a battery bank of 480 Ah. This battery bank has enough capacity to power the system for 17.7 hours assuming there is no solar power. The PV system will also be mounted on the back of a trailer. The charging station is a similar design to the 48 locker version but to house the increased amount of lockers it is slightly larger. It is also constructed out of aluminium. This station contains the same lighting set up as the 48 locker version. The total estimated price to construct this 96 locker version is \$43,500.



The 96 Locker System

All of the main aspects of the project have been completed however there are some sections that could be looked into in more detail. These include, finding an appropriate all in one charger, finding a way to connect the AC loads and also selection of an appropriate system configuration. This leaves further study for the project. Both of the designs meet the budget, for this reason the larger 96 locker charging station would be the recommended option because it can charge twice as many phones.

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