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SOTEC mobile charger

Introduction

For the past few years, we have seen development in affordable renewable energy systems and their innovation, development and implementation taking place every day. Most of these systems are embedded with previous existing systems and some are completely new systems. Due to an increase in gas emissions due to use of fossil fuels, its a great concern as global warming impacts keep facing us in the form of floods and other natural phenomena occurring everywhere across the globe.

I and my team of 3 decided to work on a system that can be used for recharging Phone gadgets other than using electricity at our homes.

The system is fully portable, lightweight and affordable for everyone.

About SOTEC mobile Charging system

SOTEC mobile charges is a very simple device that has been designed with locally available materials. The body has been designed using septic PVC pipe which is easy to mold and design any item we want.

Being the core designer in this project, My aim is to make the design as simple as possible.

Below shows the completed design of SITEC mobile charging device.



Power system design using Proteus

The images below show the power system design that is used for Charging the Lithium 3.5V battery by stepping up 5.5V delivered from the solar panel to 6V.

The device has also been designed to charge Mobile phones by recharging the Lithium Battery stored energy.



Image: Design using Proteus by Engr. Ouma

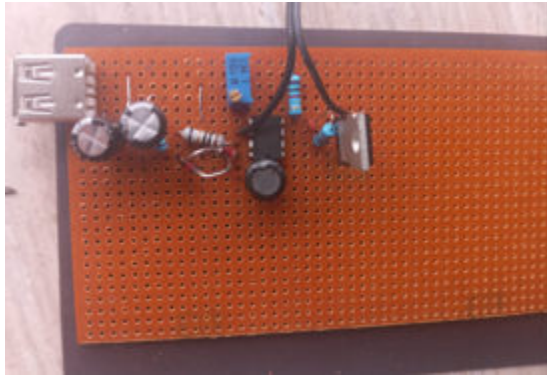


Image: Implemented Proteus design into a dc-dc step up converter



Image: Completed design of SOTEC mobile Charger

Benefits of using SOTEC mobile Charging device

1. Light weight (0.2Kg)
2. Easy to manufacture locally
3. Portability- Can be placed on windows, car bonnets or even outside when there is solar energy to recharge the device.
4. Unique design - The design makes the system more compatible with our daily lives routines and solar angular changes. The panel can be placed to face any direction by rotating the device using hands at any angle.
5. In case the device is placed outside and weather gets chilly or rainy, the components are safe from damage and if there was a phone charging, its well enclosed inside the device on the lower compartment.

Demerits of using SOTEC mobile Charging Device

1. Due to the lightweight nature of the device, it needs to be placed at a place where there are no strong winds as it could be blown away.
2. Lithium Batteries wear out after a period of about 3 to 4 years so the battery needs to be replaced once it wears out.

Commercial benefits of SOTEC mobile charging device

Due to an increase in use of renewable energy systems and Carbon credits across the globe, this device will bring fundamental benefits to everyone who has access to power and most importantly a great impact to communities which are off grid.

The product will also create employment in manufacturing industry, marketing, overall maintenance of the device and also some commercial benefits to vendors selling the electronics items which we will be using in this project.

Budget requirements in the design of One SOTEC device

1. 5.5V solar panel - \$3.5
2. DC -DC converter overall assembly budget - \$4
3. PVC pipe 0.5M length - \$1
4. Paint - \$0.5

Overall cost: \$9

Estimated sale value: \$15

Customer visibility

I designed this project after realizing most of our communities in Kenya and Africa are offgrid and there is a high demand for solar energy products especially for charging smart gadgets like phones. Most of African homes rely on solar energy as a source of energy. Up to 3% use solar energy every day according to a report generated by IMF in 2018. Over the years there has been an increase in this number.

This device will enable most of poor families who cant afford expensive solar systems whose installation goes up to \$500 to have a simple device for charging phones hence enabling them to be connected always and even use the internet for educational purposes..

In conclusion

SOTEC mobile charges will revolutionize how we charge our mobile gadgets and even save on electricity bills.

Investing in this project is worth a try as market demand is high and green energy is the way to go worldwide.