DIY Solar: Phone Chargers

Demand for Energy Equality

June 2019
Root source version: Version 2.0
Translation version: Version 0.1

TODO ADD IMAGE

Contents

Preface

Introduction

This PDF has taken the content of the "DIY Solar: Phone Chargers" PDF and put them into a form which can be easily corrected, improved and translated by the community using LaTeX a markdown language for technical topics.

Notes

Please note the modifications which have been made & where you can find updates.

1. All the content of the PDF and put them into a form which can be easily corrected, improved and translated by the community using LaTeX a markdown language for technical topics.
2. Any updates, corrections or translations to the PDF will be available at https://github.com/darigovresearch/DIY-Solar-Phone-Chargers so do return periodically to check if you have the latest version.
3. Modifications from the original work includes typo correction, card merging & consistency consolidation (see the commit history for [en] for the specific changes if any).

Feel free to share the PDFs and give the repository a star so more people are likely to see this work and can get the most out of it.

License

Introduction

The Demand Energy Equality project

Demand Energy Equality (DEE) is a UK based community energy project that seeks to provide practical energy education using solar photovoltaics. We are a group working for systemic change in the way energy is produced, distributed, controlled, delivered and used. These aims are within the context of rising energy inequality (in the UK, at least), rising fuel bills, climate change and the increasing cost of fossil fuel extraction. See our website to find out more about the project.

Through teaching people DIY solar PV skills we also aim to develop their relationship with energy, and enable them to understand it better: where it comes from, how it is used and how it relates to their demand and needs. Ultimately we aim for this to change behaviour, leading to better use of energy and overall reduced demand. Reduced energy use is an unavoidable fact of the relatively near future – far better to prepare now than be surprised later on.

Using this guide

This written guide is for anyone interested in building their own solar phone charger, or learning more about the concepts involved. It assumes no prior knowledge of any kind relevant to building a fully functioning panel. The guide is designed to be used alongside other DIY guides and resources provided by DEE.

The guide starts with a summary of the tools and materials used. This is followed by a description of each of the steps in the process of building a portable 10W solar phone charger. At the end of the guide is an appendix with supplemental detailed information about the tools and materials needed.

For other types of DIY solar panel that can be made, instructables.com is a good place to start looking for alternative designs. DEE (and other organisations) run workshops based on other panel designs – you will find information about the workshops that we are currently running on the DEE website.

You will find the latest version of this guide available to download from the DEE website, as and when this guide is updated, alongside our other guides and resources.

We encourage you to share the skills you learn with others through your own workshops, particularly if you are able to target and work with low-income communities. Please contact us for any support you feel you may need if you plan to do this.

The design

The basic components of the design, and that which makes it economically and practically feasible are the "broken" solar cells. These are cells produced in the industrial manufacture process (mainly in China) that are broken either in transit, or during assembly on arrival. Because they are of no commercial use, these cells can be bought relatively cheaply.

The solar charger this guide describes is a self-contained design, and can be connected directly to USB devices with no additional equipment needed.

This particular guide reflects the latest iteration in the construction of DIY photovoltaic panels as practiced by DEE, but it is likely that it may evolve and expand over time. Because we occasionally introduce new materials and construction methods, the guide may not always be in line with the other DIY resources published by DEE, and may not exactly reflect the content of current workshops. Contact DEE if you need

an update on any recent changes.

Disclaimer

This guide is for general guidance only and whilst every effort is made to ensure that the information it contains is correct, it should not be relied upon as accurate. The information / advice contained within this guide is intended for use within the UK only and by persons of no less than 18 years of age. Use this guide at your own risk.

DEE will not accept any liability for any loss, damage, injury or negligence direct or indirect from use of the information / advice contained within this guide.

Before starting

Staying safe

Tools and materials

How to Solder

Building the panel

Step 1: Soldering tabbing wire to the top of the cells

Step 2: Preparing the polycarbonate and placing the cells

Step 3: Heating the EVA to stick the cells

Step 4: Tabbing the other side of the cells

Step 5: Cross tabbing

Step 6: Encapsulation

Step 7: Bonding the panel into the neoprene case

Step 8: Attach USB DC-DC voltage converter

Appendix: Sourcing materials (and possible alternatives)