

Portable Green Energy Mobile Laptop Charging Station

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Abstract

Mobile phones and laptop computers require electrical power to recharge when the battery is down. As a result, it would be very useful if a portable charging station derived from renewable energy harvesting could be built, so that individuals could recharge their phones and laptops whenever needed. The objective of this project is to design and develop a green energy mobile and laptop charging station that uses wind and solar energy and evaluate the performance of the designed station under different working conditions. The efficiency of the power generated to charge the station is achieving 95.6% for solar charging, which is considered a high efficiency for a renewable energy charging station. Based on the analysis of the charging station results, it has been proven that it can provide sufficient power and is safe for use as a portable mobile laptop charging station.

Keywords: Energy conversion, Portable power supply, Universal mobile laptop charging

1. Introduction

Electricity is a vital part of modern life and for a country's economic growth and development. Over the next two decades, average power consumption is predicted to nearly double, with overall electricity demand expected to rise by 2.3 percent per year on average from 13,290 billion kWh in 2001 to 23,072 billion kWh in 2025 [1]. In Malaysia, home electric power consumption has grown substantially over the past years, resulting in high demand for energy to satisfy increasing social and economic activities.

Fossil fuels are the most famous resources used. However, these fuels are creating huge carbon emissions to the atmosphere which has negatively impacted the environment. As the demand for electric power rises, additional power generation is required to meet the demand. Due to the depletion of conventional resources, renewable energy resources are the most suitable resources for generating electric power with little environmental effect. Renewable or non-conventional energy are tidal energy, wind energy, hydropower, biomass, geothermal energy, and solar energy [2]. It also