Innovative Multifunctional Portable Cooler Capable of Efficiently Using Solar Energy During Emergency Situations: A Life-Changing Device

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Due to the devastation caused by recent hurricanes and earthquakes in Puerto Rico, the access to regular power has become a serious issue in the Island. The residents constantly battle against blackouts that last from a few hours to several days. It has become necessary to develop ideas that aid the population whenever there is a power outage. These need to be accessible and low-cost considering that 39.8% of the population is below the poverty thresholds (SDC-PR, 2022). In the search for affordable options, the main objective of this research was to create an intelligent solar-powered beach cooler to aid in emergency situations. This innovative device was created with a parallel circuit with two 20W solar panels, a 30amp intelligent voltage controller, two 12V lithium batteries, a battery capacity indicator, solar panel voltage indicator, digital thermometer with 2 sensors, a 120V inverter, and switches. The device created can provide 4 hours of interrupted power to measure the temperature in and out of the cooler, charging IOS and Android devices by using USB connections, powering an AM/FM radio and waterproof marine speakers. The system also has the capability of indicating the amount of charge left in the battery and when it needs to be recharged. One vital feature of this system is that it can power a nebulizer machine for 30 minutes for people who need respiratory therapy, thus, aiding people with medical conditions during an emergency. This revolutionary invention represents a sustainable and affordable solution during a power outage.

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