RUTGERS
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Department of Electrical and Computer Engineering

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Powering a House through Solar with Storage Utilizing Batteries

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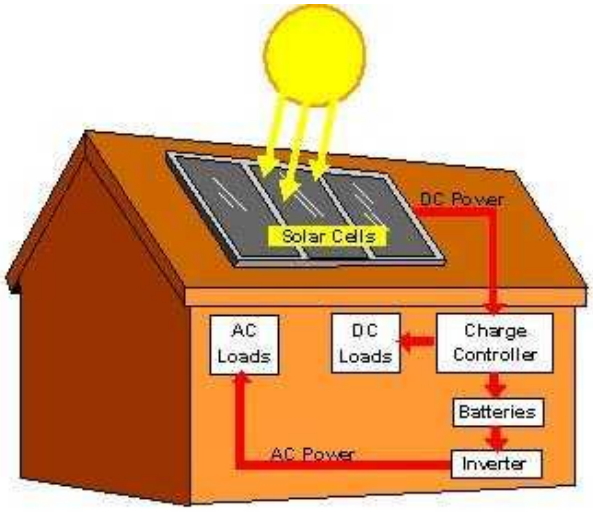

Abstract

In this project the main goal was to build an inverter that converts a 12 V DC source in to a 120 V AC to power a house that uses solar panels. The aim of this experiment is to act as a backup generator when power goes off so we can use this inverter to provide power for a house. This inverter would use 30 batteries that we can store in a basement and we can charge it and even use it daily even when power is present. So we see that during the Storm Sandy many people lost power but if we have this backup generator that can be provided to the consumers at a reasonable price. In an average house it is known that the average annual electricity consumption for a U.S. residential utility costumer is 11,496kWh so in this project I assume that I need 2000 W daily so I built an inverter based on this information. I first built a DC-DC converter which converts 12 V DC into 169.7056 RMS voltage using a buck-boost single ended fly back converter and then taking this voltage and converting it into 120 V AC voltage using a full bridge converter. But to connect this converter we have a feedback network to regulate the loads. For the solar panels that need to be installed in an house I see that the total area need for 2000 W solar panels is 1/3 * 2000 W = 700 sq feet which is approximately 27 ft * 27 ft so we need approximately 2000 panels with each panel giving 1 watt power since 12V* 1/12 Amp = 1 watt.