

Solar PV based Smart Nanogrid Design for Promoting Entrepreneurship and Economic Growth in Underserved Areas Using AutoCAD and MATLAB Simulink

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Access to reliable and affordable electricity is very critical for fostering entrepreneurship and economic growth in underserved areas. The conventional grid-based electricity systems can be expensive,

unreliable, and difficult to maintain, particularly in remote or off-grid locations. Therefore, we propose a solar PV-based smart nanogrid system that is designed to provide efficient, reliable, and sustainable power source for various applications. The proposed system integrates with load management techniques to ensure optimal usages of energy resources and improve the lifespan of the energy storage systems. AutoCAD and MATLAB Simulink are utilized for the design and simulation of the nanogrid system.

The proposed system can bridge the digital divide by providing internet connectivity and access to essential services such as telemedicine and online education. Furthermore, the system can support the development of smart cities, smart grids, and improve energy management in buildings. The simulation results demonstrate that the proposed system can provide reliable and sustainable power while promoting economic growth and social mobility in underserved areas. This study highlights the potential of solar PV-based smart nanogrid systems for

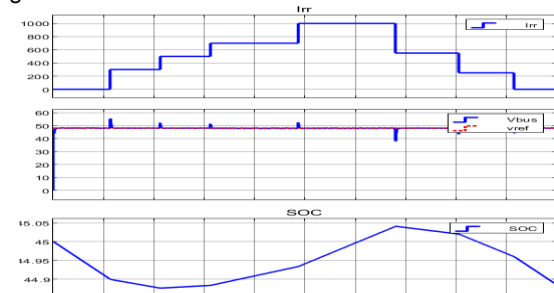


Fig.1 Irradiation vs Battery Charging (SOC) Curve

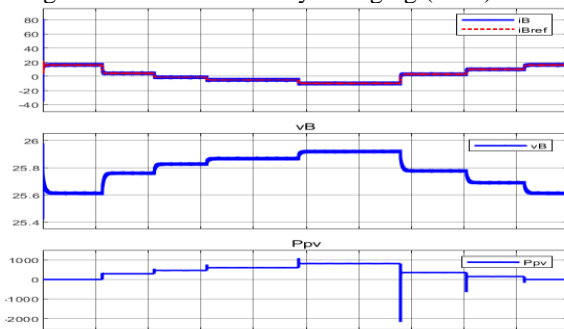


Fig.2 Battery SOC and DOD vs PV Power Curve

promoting sustainable development and improving the quality of life in underserved areas. By providing access to affordable and reliable electricity, the proposed system can contribute to the economic development of these areas and improve the overall well-being of their communities.

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