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A User-Friendly Approach for Design and Economic Analysis of Standalone PV System for the Electrification of Rural Area of Eritrea

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Abstract : The potential of solar energy in Eritrea is relatively high, based on this truth, there are a number of isolated and remote villages situated far away from the electrical national grid which don't get access to electricity. The core objective of this work is to design a most favorable and cost-effective power by means of standalone PV system for the electrification of a single housing in the inaccessible area of Eritrea. The sizing of the recommended PV system is achieved, such as radiation data and electrical load for the typical household of the selected site is also well thought-out in the design steps. Finally, the life cycle cost (LCC) analysis is conducted to evaluate the economic viability of the system. The outcome of the study promote the use of PV system for a residential building and show that PV system is a reasonable option to provide electricity for household applications in the rural area of Eritrea.

Keywords : electrification, inaccessible area, life cycle cost, residential building, stand-alone PV system
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