



**Abstract:**

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***Modeling and Development of Power Management System for Solar-Wind-Diesel Stand-alone Hybrid Energy System***

This work presents a simulation and mathematical model of stand-alone solar-wind-diesel based hybrid energy system (HES). A power management system is designed for multiple energy resources in a stand-alone hybrid energy system. Both Solar photovoltaic and wind energy conversion systems are consisting maximum power point tracking (MPPT), voltage regulation and basic power electronic interfaces. An additional diesel generator is included to support and improve the reliability of stand-alone system when renewable energy sources are not available. A power management strategy is introduced to distribute the generated power among resistive load banks. The frequency regulation is developed with conventional phase locked loop (PLL) system. The power management algorithm was applied in Matlab®/Simulink® to simulate the results.