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Simulation and Study of Standalone Hybrid Grid (Involving Biogas, Solar, Wind and Biodiesel -based Generation)

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Abstract

The demand for electrical power is increasing constantly for several applications due to its flexibility and efficiency. The utilities are unable to cope up with this requirement from the existing captive generation using conventional sources. The recent liberalization policy encourages exploring Independent Power Production (IPP) avenues and use of renewable energy sources. Hence attention must be turned to generate power from locally available resources like biogas, solar, wind, biodiesel, micro hydro etc. The power available is fluctuating when all the above are implemented as standalone system. But the integrated operation of all these sources leads to a reliable, robust and cost effective system to provide sustainable power. The paper discusses the task involved in design, implementation of standalone sy stems and integration of the renewable energy sources. The design of power electronic circuitry for superior and trouble free performance is a challenging engineering issue. The simulation study of standalone hybrid grid is carried out to confirm the integration of the sources and is validated by the simulation results.