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Waste Heat Recovery and Solar Integration for Sustainable Electrical Power Generation

Avinash Kumar, Research Scholar, Department of Electrical Engineering, IFTM University, Moradabad
Dr. Anil Kumar, Supervisor, Head of Department, Department of Electrical Engineering, IFTM University, Moradabad

Abstract

Electrical energy demands coupled with the accelerating rates of depletion of fossil fuels have raised a pressing necessity of sustainable and efficient systems of generating power. Two areas that have a high potential to enhance energy efficiency and lower the environmental pollution are waste heat recovery and integration of solar energy. Waste heat recovery systems pluck the wasted energy in thermal form of industrial processes and use it to produce valuable electrical power thus reducing the amount of energy that is wasted. Solar energy is clean and renewable, which will be another source of power generation and a reliable source.

The paper under consideration is concerned with the integrated use of waste heat recovery and solar energy technologies to work out the sustainable system of electrical power generation. Combination of these two systems promotes the overall efficiency, low reliance on traditional sources of energy and ultimately lowers the emission of greenhouse gases. The article brings into the limelight, the operating principles, benefits, and possible uses of hybrid energy works in the industrial and commercial industries. The findings show that the combined solution is a viable, cost effective and environmentally friendly solution to addressing future energy demands.

Keywords: Waste heat recovery, Solar energy integration, Sustainable power generation, Renewable energy, Energy efficiency, Hybrid energy systems

