

# AI-Based Power Management A Comprehensive Review

**Vijay Shivaji Chavan, Vaibhav Sakharam Bodhe,  
Deepak Ravindra Narkhede, Ganesh Subhash Changan**

Sanjivani KBP Polytechnic, Kopergoan, Pune, India  
deepaknarkhede@gmail.com, gschanganee@sanjivani.org.in  
vschavanee@sanjivani.org.in, deepaknarkhede@gmail.com

**Abstract:** *Artificial Intelligence (AI) is revolutionizing power management by enabling intelligent control, optimization, and predictive capabilities across various sectors. This review explores the state-of-the-art AI techniques, including machine learning (ML) and deep learning (DL), and their applications in load forecasting, fault detection, optimal power flow, and renewable energy integration. While AI enhances efficiency and reliability in power management, challenges such as computational complexity, data availability, and model interpretability remain. This paper provides a comprehensive analysis of AI-driven power management solutions, discussing current limitations and future research directions to improve system performance and sustainability.*

**Keywords:** Artificial Intelligence, Power Management, Machine Learning, Deep Learning, Renewable Energy, Smart Grids