

IoT-Based Surveillance of Solar-Wind Hybrid Power Charging Systems

Shreya Salve¹, Kushal Fegade², Shivraj Khairnar³, Aditi G. Ambekar⁴
Bhimrao Dabhade⁵, Dr. Sunil Magan More⁶

Final Year Student, Department of Electrical Engineering^{1, 2, 3, 4}

Assistant Professor, Department of Electrical Engineering^{5, 6}

Guru Gobind Singh College of Engineering & Research Centre, Nashik, Maharashtra, India

Abstract: *To enhance the use of renewable energy sources for electric vehicle charging and auxiliary power applications, this research introduces an advanced hybrid charging system integrated with Internet of Things (IoT) capabilities. The system efficiently harnesses both solar and wind energy, making it a sustainable and high-performance solution. A key component is the battery storage unit, which ensures effective storage and utilization of renewable energy, minimizing dependence on fossil fuels and improving system reliability. When the vehicle is not connected, the inverter plays a vital role by converting direct current (DC) from renewable sources into alternating current (AC), reducing energy wastage and enabling surplus energy to power other electrical devices. The IoT-enabled real-time monitoring mechanism continuously tracks essential parameters such as energy production, consumption, and battery health. This allows for smart energy management, enabling the system to adapt its operation based on live data to maintain optimal efficiency and reduce energy losses.*

Keywords: Energy optimization, System performance, Sustainable infrastructure, Auxiliary power applications, Energy consumption

