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(57) Abstract :
The proposed invention presents a smart civil engineering solution for renewable energy management by integrating artificial intelligence (AI) and Internet of Things (IoT) technologies. The system utilizes AI-based energy management algorithms and IoT sensors to optimize energy generation, storage, distribution, and consumption. AI algorithms forecast energy demand patterns, while IoT sensors capture real-time data on critical parameters. The invention facilitates grid integration, demand response mechanisms, and efficient utilization of energy storage systems. It promotes sustainability by reducing carbon emissions, dependence on fossil fuels, and maximizing the efficiency of renewable energy resources. The proposed invention benefits energy providers, consumers, regulatory bodies, and the environment, offering a transformative approach to renewable energy management.

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