World Academy of Science, Engineering and Technology
International Journal of Electrical and Information Engineering
Vol:17, No:06, 2023

Security Issues on Smart Grid and Blockchain-Based Secure Smart Energy Management Systems

Authors : Surah Aldakhl, Dafer Alali, Mohamed Zohdy

Abstract : The next generation of electricity grid infrastructure, known as the "smart grid," integrates smart ICT (information and communication technology) into existing grids in order to alleviate the drawbacks of existing one-way grid systems. Future power systems' efficiency and dependability are anticipated to significantly increase thanks to the Smart Grid, especially given the desire for renewable energy sources. The security of the Smart Grid's cyber infrastructure is a growing concern, though, as a result of the interconnection of significant power plants through communication networks. Since cyber-attacks can destroy energy data, beginning with personal information leaking from grid members, they can result in serious incidents like huge outages and the destruction of power network infrastructure. We shall thus propose a secure smart energy management system based on the Blockchain as a remedy for this problem. The power transmission and distribution system may undergo a transformation as a result of the inclusion of optical fiber sensors and blockchain technology in smart grids. While optical fiber sensors allow real-time monitoring and management of electrical energy flow, Blockchain offers a secure platform to safeguard the smart grid against cyberattacks and unauthorized access. Additionally, this integration makes it possible to see how energy is produced, distributed, and used in real time, increasing transparency. This strategy has advantages in terms of improved security, efficiency, dependability, and flexibility in energy management. An in-depth analysis of the advantages and drawbacks of combining blockchain technology with optical fiber is provided in this paper.

Keywords : smart grids, blockchain, fiber optic sensor, security
Conference Title : ICSGCNA 2023 : International Conference on Smart Grid Communications and Networking Applications
Conference Location : New York, United States
Conference Dates : June 05-06, 2023