

Review of: "Internet of Things in Smart Grid: A Comprehensive Review of Opportunities, Trends, and Challenges"

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Potential competing interests: No potential competing interests to declare.

Review Comments on "Internet of Things in Smart Grid: A Comprehensive Review of Opportunities, Trends, and Challenges"

- The paper is well-organized but would benefit from clearer subheadings for each section to enhance readability.
- Ensure that each section logically transitions to the next for better flow.
- The literature review is comprehensive but could include more recent studies to reflect the latest advancements in IoT and smart grid technologies.
- Incorporate a comparison of different IoT frameworks and their effectiveness in smart grid applications.
- Expand on the security and privacy challenges of IoT in smart grids. Discuss specific threats such as data breaches, hacking, and unauthorized access.
- Include recommendations for security protocols and privacy-preserving techniques to mitigate these risks.
- Discuss the importance of standardization in IoT devices and protocols to ensure interoperability across different systems and devices within the smart grid.
- Some of the images were sourced from the web; however, all figures should be original and drawn by the author.
- Highlight current efforts and initiatives towards achieving standardization in IoT for smart grids.
- Provide examples of successful large-scale IoT deployments and the strategies used to overcome scalability challenges.
- Elaborate on how IoT can specifically enhance energy efficiency in smart grids through real-time monitoring and management.
- Include a cost-benefit analysis of implementing IoT in smart grids, considering the initial investment, maintenance costs, and long-term savings.
- Discuss the role of IoT in integrating renewable energy sources into the smart grid, including solar and wind energy.
- Provide more detail on how IoT contributes to data management and analytics in smart grids.
- Discuss the use of big data analytics and machine learning to predict energy demand and optimize grid operations.
- Briefly mention the regulatory and policy considerations for IoT deployment in smart grids.
- Provide a detailed explanation of the IoT architecture used in smart grids. Include diagrams to illustrate how different IoT components interact within the smart grid ecosystem.
- Discuss specific IoT security protocols and frameworks that can be implemented to protect smart grids. Examples

include encryption techniques, blockchain for secure transactions, and multi-factor authentication.

- Explore existing IoT interoperability standards (e.g., IEEE 802.15.4, Zigbee, LoRaWAN) and how they can be applied in smart grid environments to ensure seamless integration of devices from different manufacturers.
- Detail strategies to address scalability issues, such as the use of edge computing to reduce latency and load on central servers, and network slicing to efficiently manage network resources.
- Discuss the potential for IoT devices in smart grids to utilize energy harvesting techniques, such as solar or kinetic energy, to reduce reliance on external power sources.
- Discuss the integration of machine learning and artificial intelligence in IoT-enabled smart grids. Explain how these technologies can improve predictive maintenance and demand forecasting.