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Review article

Smart grid communication and information technologies in the perspective of Industry 4.0: Opportunities and challenges

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HIGHLIGHTS

- This paper presents a comprehensive presentation on critical smart grid components with international standards and information technologies.
- This study gives an overview of different smart grid applications, their benefits, characteristics and requirements.
- This research investigates and explores different wired and wireless communication technologies.
- This article discusses a number of critical challenges and open issues and future research directions.

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ABSTRACT

The fourth industrial revolution known as Industry 4.0 has paved the way for a systematical deployment of the modernized power grid (PG) to manage continuously growing energy demand by integrating renewable energy resources. In the context of Industry 4.0, a smart grid (SG) by employing advanced Information and Communication Technologies (ICTs), intelligent information processing (IIP) and future-oriented techniques (FoT) allows energy utilities to monitor and control power generation, transmission and distribution processes in more efficient, flexible, reliable, sustainable, decentralized, secure and economic manners. Despite providing immense opportunities, SG has many challenges in the context of Industry 4.0 (I 4.0). To this end, this paper presents a comprehensive presentation on critical smart grid components with international standards and information technologies in the context of Industry 4.0. In addition, this study gives an overview of different smart grid applications, their benefits, characteristics, and requirements. Also, this research investigates and explores different wired and wireless communication technologies used in smart grid with their benefits and characteristics. Finally, this article discusses a number of critical challenges and open issues and future research directions.

Contents

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