

Does digital energy storage technology improve system operation and maintenance?

It is also related to previous evidence on the significance of digital energy storage technology in enhancing system operation and maintenance[1,55],which implies the global efforts towards the development of digital and intelligent energy-storage systems.

What is the role of digitalization in energy storage development?

Booming digital technologies have brought profound changes to the energy sector. Digitalization in energy storage technology facilitate new opportunities toward modernized low-carbon energy systems. This study offers a technological perspective to help understand the role of digitalization in energy storage development.

What are emerging digital technologies in energy storage?

Under a global wave of digital transformation, a growing body of research has recognized and introduced the significance of emerging digital technologies embedded in energy storage [16, 17], particularly on the blockchain [18, 19], energy big data and cloud computing [20, 21] and the energy Internet of Things (IoT) [18, 22].

What is energy storage technology?

Energy storage (ES) technology has been a critical foundation of low-carbon electricity systems for better balancing energy supply and demand [5, 6]. Developing energy storage technology benefits the penetration of various renewables [5, 7, 8] and the efficiency and reliability of the electricity grid [9, 10].

Is digital data processing a trend in energy storage?

Although we illustrated this trend mainly based on patent data in China,our findings agree with Mejia and Kajikawa ,who found that digital data processing for multi-power systems has been one of the main trends in energy storagein both academia and industry research with a global data set.

Does digital strategy affect firm energy storage innovation?

It is observed that the positive impactof digital strategy on firm energy storage innovation is much more significant in the regions and industries with higher convergence between digital and energy storage technologies.

The role of energy storage as an effective technique for supporting energy supply is impressive because energy storage systems can be directly connected to the grid as stand-alone solutions to help balance fluctuating power supply and demand. This comprehensive paper, based on political, economic, sociocultural, and technological analysis ...

This paper focuses on the role of electricity storage in energy systems with high shares of renewable sources. The study encompasses a model comparison approach where four models (G E N e S Y S-M O D, M U S E, N

A T E M, and u r b s - M X) are used to analyse the storage uptake in North America. The analysis addresses the conditions affecting storage ...

We depict the landscape of convergence between digital and energy storage technologies based on a patent co-classification analysis and investigate the impact of the digital transformation...

Future trends underscore the potential of emerging technologies like quantum computing, edge computing, and 5G to revolutionize energy systems further. Additionally, digital tools are identified ...

Overall, the role of artificial intelligence in energy storage is poised to transform the energy industry by enabling more efficient, reliable, and sustainable energy systems leveraging AI algorithms and machine learning techniques, energy storage systems can become smarter, more adaptive, and more responsive to the changing dynamics of the energy landscape.

In this paper, we first analyzes the current situation of BESS. Then, oriented to the development demands of DI-BESS, we develop the digital-intelligent control architecture and key technical ...

Our findings demonstrate a significant upward digital trend in energy storage technology, with main interaction fields ranging from daily life power supplies to regional energy power...

meeting future energy needs. Energy storage will play an important role in achieving both goals by complementing variable renewable energy (VRE) sources such as solar and wind, which are central in the decarbon.

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