

ID: W2490954318

TITLE: Overview of energy storage in renewable energy systems

AUTHOR: ['S. Ould Amrouche', 'Djamila Rekioua', 'Toufik Rekioua', 'Seddik Bacha']

ABSTRACT:

This paper presents an overview of energy storage in renewable energy systems. In fact, energy storage is a dominant factor in the integration of renewable sources, playing a significant role in maintaining a robust and reliable modern electricity system. It can reduce power fluctuations, enhances the electric system flexibility, and enables the storage and dispatching of the electricity generated by variable renewable energy sources such as wind and solar. Different storage technologies are used in electric power systems. They can be chemical, electrochemical, mechanical, electrical or thermal. Energy storage facility is comprised of a storage medium, a power conversion system and a balance of plant. This work focuses on hydrogen, batteries and flywheel storage used in renewable energy systems such as photovoltaic and wind power plants, it includes the study of some economic aspects of different storage technologies. Finally, the behavior of battery and flywheel storage systems in photovoltaic and wind energy applications is studied under Matlab/Simulink and some obtained results are presented.

SOURCE: International journal of hydrogen energy

PDF URL: None

CITED BY COUNT: 496

PUBLICATION YEAR: 2016

TYPE: article

CONCEPTS: ['Renewable energy', 'Energy storage', 'Pumped-storage hydroelectricity', 'Flywheel', 'Stand-alone power system', 'Photovoltaic system', 'Wind power', 'Grid energy storage', 'Intermittent energy source', 'Hydrogen storage', 'Computer data storage', 'Electric power system', 'Process engineering', 'Electricity', 'Automotive engineering', 'Environmental science', 'Computer science', 'Flywheel energy storage', 'Distributed generation', 'Electrical engineering', 'Engineering', 'Power (physics)', 'Materials science', 'Physics', 'Alloy', 'Quantum mechanics', 'Composite material', 'Operating system']