Smart grid mobile energy storage

The article includes an analysis and a list of energy storage systems that are applied in smart grids. Various energy storage systems are examined raging from electrical, electrochemical, thermal, and mechanical systems. Two case studies are presented that show the role of energy storage in effective management of energy demand and supply.

DOI: 10.1109/TSG.2019.2930012 Corpus ID: 155100284; Rolling Optimization of Mobile Energy Storage Fleets for Resilient Service Restoration @article{Yao2019RollingOO, title={Rolling Optimization of Mobile Energy Storage Fleets for Resilient Service Restoration}, author={Shuhan Yao and Peng Wang and Xiaochuan Liu and Huajun Zhang and Tianyang ...

1 Grid Electric Power Research Institute Corporation, Nari Group Corporation State, Nanjing, Jiangsu, China; 2 Tianjin Key Laboratory of Power System Simulation Control, Tianjin, China; 3 Key Laboratory of Smart Grid of Ministry of Education (Tianjin University), Tianjin, China; Mobile energy storage has the characteristics of strong flexibility, wide application, etc., with fixed ...

Electrochemical energy storage (ES) units (e.g., batteries) have been field-validated as an efficient back-up resource that enhances resilience of distribution systems. However, using these units for resilience is insufficient to justify their installation economically and, therefore, these units are often installed in locations where they yield the greatest economic ...

Mobile energy storage (MES) has the flexibility to temporally and spatially shift energy, and the optimal configuration of MES shall significantly improve the active distribution network (ADN) operation economy and renewables consumption.

Extreme events are featured by high impact and low probability, which can cause severe damage to power systems.There has been much research focused on resilience-driven operational problems incorporating mobile energy storage systems (MESSs) routing and scheduling due to its mobility and flexibility. However, existing literature focuses on model ...

With the growing use of EVs and their potential to act as mobile energy storage units, ... A Contract Game for Direct Energy Trading in Smart Grid. IEEE Trans. Smart Grid 2018, 9, 2873-2884. [Google Scholar] Panthi, M.; Kanti Das, T. Intelligent Intrusion Detection Scheme for Smart Power-Grid Using Optimized Ensemble Learning on Selected ...

Abstract Mobile battery energy storage systems (MBESSs) represent an emerging application within the broader framework of battery energy storage systems (BESSs). ... The power consumption profiles are modified ...

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A novel restoration mechanism in PDSs for routing and scheduling of MESSs integrated with stochastic RESs to achieve agile system response and recovery in facing the aftermath of high-impact low-probability (HILP) incidents is developed. With the spatial flexibility exchange across the network, mobile energy storage systems (MESSs) offer promising ...

Traditional energy grid designs marginalize the value of information and energy storage, but a truly dynamic power grid requires both. The authors support defining energy storage as a distinct asset class within the electric grid system, supported with effective regulatory and financial policies for development and deployment within a storage-based smart grid ...

NAZEMI et al.: UNCERTAINTY-AWARE DEPLOYMENT OF MOBILE ENERGY STORAGE SYSTEMS FOR DISTRIBUTION GRID RESILIENCE 3201 NMES i Number of MESSs that are allowed to be connected to node i. Ttravel m,ij Travel time of MESS m from node i to j. t Duration of one time period. M A large enough positive number. SoC m Minimum SoC of MESS m ...

Vehicle-for-grid (VfG) is introduced as a mobile energy storage system (ESS) in this study and its applications are investigated. Herein, VfG is referred to a specific electric vehicle merely utilised by the system operator to ...

With the increasingly serious energy shortage and environmental problems, all sectors of society support the development of distributed generation[1].As an intelligent terminal form of the new power system, smart buildings can better integrate flexible resources and improve the user-side flexible scheduling capability[2].Nevertheless, the resources inside a smart building have many ...

In the high-renewable penetrated power grid, mobile energy-storage systems (MESSs) enhance power grids" security and economic operation by using their flexible spatiotemporal energy scheduling ability. It is a crucial flexible scheduling resource for realizing large-scale renewable energy consumption in the power system. However, the spatiotemporal ...

IEEE"s Smart Grid website provides information, resources and expertise about smart grid. IEEE has been at the forefront of the global smart grid movement since the development of the smart grid concept. ... Merging and proliferation of distributed stationary energy storage as well as mobile energy storage (e.g. Electric Vehicles) in the ...

Energy storage technologies are a need of the time and range from low-capacity mobile storage batteries to high-capacity batteries connected to intermittent renewable energy sources (RES). ... as well as the opportunities and challenges the power systems faces for successful integration of RES into the smart grid. 13.1. Energy storage. There is ...

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