Park-level energy microgrid

Based on this, this paper proposes a multi-objective expansion planning model for park-level integrated energy system (PIES) that takes into account the volatility trend of CETP. First, the influencing factors of CETP prediction are filtered and downscaled, and a kernel extreme learning machine (KELM) model based on the improved multi-objective ...

Considering the diversity of primary energy resources and load characteristics, this paper proposes a multi-attribute decision analysis method for the optimal design of park-level integrated energy systems (PLIES) in different areas. Firstly, a multi-objective optimization model is established to optimize the configuration designs and operation strategy of the PLIES, taking ...

With regard to influencing factors of economy, reliability, energy consumption and environmental protection, an index evaluation model of park-level integrated energy system for microgrid is ...

Microgrid energy scheduling is a critical area of research aimed ... Another study 28 presented a two-level energy management strategy to optimize operational costs within islanded and networked ...

A park integrated energy system (PIES) is internally coupled with multiple energy sources for joint supply, which can meet the demand of terminal multi-energy loads, realize the energy ladder utilization, and further optimize the economy of multi-energy system (Wang et al., 2020, Li et al., 2023a). With the characteristics of good economic foundation, high ...

The construction of the new energy microgrid fully responds to the ... this scheme chooses to directly connect the photovoltaic power generation to the dc bus to reduce the energy loss caused by multi-level transformation. ... Cui, N., Mu, J. (2020). Application of New Energy Microgrid System in Industrial Park. In: Xue, Y., Zheng, Y., Rahman ...

Considering that integrated energy system (IES) for park-level microgrid has various energy resources and energy conversion equipment to be chosen, and environmental ...

Considering that integrated energy system (IES) for park-level microgrid has various energy resources and energy conversion equipment to be chosen, and environmental and energy ...

For a park-level integrated energy system, a PIES optimization operation model including flexible load, a P2G device, and a carbon trading model was established. Four scenarios are compared and analyzed, and the ...

This study involves the joint operation energy management of three park microgrids and one shared energy storage system. The configurations are as follows: Park Microgrid 1 is equipped with a photovoltaic power

generation unit with a capacity of 750 kW. Park Microgrid 2 is equipped with a wind power generation unit with a capacity of 1,000 kW.

Integrated energy system (IES) is a new type of energy supply/management technology [1], which promotes the consumption of renewable energy sources and reduces the use of fossil energy, and is a key step towards reforming the form of energy supply [2]. Park-level integrated energy system (PIES) [3] is a miniature IES that is directly oriented ...

The paper introduces the power to gas (P2G) devices, the combined cold, heat and power units (CCHP), the gas boilers (GB) and electric chillers (EC) to form an IES to establish a low carbon ...

Each park-level microgrid determines its own operation strategy with the consideration of characteristics of other park-level microgrid energy users, which maximizes the consumption of renewable energy sources and maximizes their own interests. At the same time, a two-stage robust operation model is developed to address the uncertainty of ...

Park-level integrated energy system (PIES) is a specific application of IES, which is rapidly developing in various types of industrial parks across different regions. The ...

Over the past decades, the development of optimal planning for energy systems has become more complex with the interactions among electricity, gas and heating/cooling energy networks [].The integrated energy system (IES), which couples the prime mover, the energy conversion equipments and users as a whole, has been attracting more attention on account of ...

This study takes the park microgrid with multi-stakeholder as the object, establishes a two-level optimisation model of microgrid bidding transaction based on multi-agent system. In the lower level optimisation, considering the deviation penalty of power generation and the previous round bidding results, the optimal bidding strategy model is established by the ...

Yang et al. constructed an industrial park microgrid integrated energy system model to improve the energy efficiency of an industrial park . Hu et al. proposed a structure for an integrated energy system for a coal mine, considering the economic cost, carbon transaction cost for environment protection, and degree of customer dissatisfaction with reducible and ...

Finally, the effectiveness of the proposed model and method is verified by simulation tests based on IEEE-33 node DN and a park-level MEM. AB - With the increasing integration of the multi-energy microgrid (MEM) with the distribution network (DN), the distributed coordination between MEM and DN becomes critical.

In Ref. [21], a multi-objective two-stage optimization design method for park-level microgrid integrated energy system is proposed. In Ref. [22], a three-step method is proposed to deal with the demand uncertainty of mixed integer linear programming model for regional energy systems. In Ref. [23], an interactive

multi-stage programming model ...

internet of things provide support in information, data, and computation to microgrids in market operation, energy management, and coordination interaction. This study takes the park microgrid with multi-stakeholder as the object, establishes a two-level optimisation model of microgrid bidding transaction based on multi-agent system.

Park-level integrated energy system, as a energy coupling component of urban energy systems, plays a great role in promoting various types of energy coupling. ... Power compensation of network losses in a microgrid with BESS by distributed consensus algorithm. IEEE Trans Syst Man Cybern Syst, 51 (2021), pp. 2091-2100. Crossref View in Scopus ...

In this study, a fuzzy multi-objective framework is performed for optimization of a hybrid microgrid (HMG) including photovoltaic (PV) and wind energy sources linked with battery energy storage ...

Zhang et al. [11] established an index evaluation model of park-level integrated energy system for microgrid from the aspects of economy, reliability, energy consumption and ...

Against the background of the "30 × 60" target, low-carbon policies and technologies have become the new starting point and destination of energy conservation and emission reduction in energy systems. Power-to-Gas (P2G), as a new energy conversion mode, provides a new way of consuming energy and reducing carbon emissions. An optimal ...

To promote the development of green industries in the industrial park, a microgrid system consisting of wind power, photovoltaic, and hybrid energy storage (WT-PV-HES) was constructed. It effectively promotes the ...