

Why is energy storage system on trams important?

The energy storage system on the trams has been convinced to meet the requirements of catenary free tram network for both at home and abroad. This technology improves the technical level of domestic tram development greatly and promotes the development of China's rail tram industry.

What is the energy storage system of catenary free trams?

On the basis of the research on the energy storage system of catenary free trams, the technology of on-board energy storage, high current charging and discharging and capacity management system has been broken through. The trams with the energy storage system have been assembled and have completed the relative type tests.

Can supercapacitor-based energy storage system be used on trams?

To solve technical problems of the catenary free application on trams, this chapter will introduce the design scheme of supercapacitor-based energy storage system application on 100% low floor modern tram, achieving the full mesh, the high efficiency of supercapacitor power supply-charging mode, finally passed the actual loading test [8,9].

How much energy does a MTS tram use?

In MTS trams, the Ni-MH battery features rated energy and power of 18 kWh and 85 kW, respectively, while the supercapacitors' rated power output is 288 kW. The total weight of the hybrid storage system is 1646 kg, resulting in specific energy and power of 11.45 Wh/kg and 226 W/kg, respectively.

How much energy does a tram use?

The greater the distance between stations, the greater the demand energy. The first interval has the largest distance and maximum energy consumption. If the recovered braking energy is not included, the energy consumption is 7.012 kWh. Fig. 3. DC bus demand energy curve. The tram adopts the power supply mode of catenary free and on-board SESS.

What is a hybrid energy storage system?

A hybrid energy storage system (HESS) of tram composed of different energy storage elements (ESEs) is gradually being adopted, leveraging the advantages of each ESE. The optimal sizing of HESS with a reasonable combination of different ESEs has become an important issue in improving energy management efficiency.

This paper introduces an optimal sizing method for a catenary-free tram, in which both on-board energy storage systems and charging infrastructures are considered. To quantitatively analyze the trade-off between ...

Subsequently, this study designs two energy storage systems (ESSs), the EV energy storage system (EVESS),

which solely exploits EV batteries for energy storage, and the combined ...

A tram's hybrid power system mainly consists of an energy storage system and a motor system. The motor system is connected to the DC bus through the inverter, whose power is all from ...

Semantic Scholar extracted view of "Energy management strategy optimization for hybrid energy storage system of tram based on competitive particle swarm algorithms" by ...

Energy storage systems designed for microgrids have emerged as a practical and extensively discussed topic in the energy sector. These systems play a critical role in supporting the sustainable operation of ...

Trams, for their merits of comfortable, environmentally friendly, great passenger capacity, low energy consumption and long service life, are popular public transport in large ...

Once the coil springs reach full energy storage or when the tram vehicle braking concludes, the coil spring set must maintain its energy storage state. ... Fig. 7 (b) shows the ...

energy storage for urban dc tram systems as a method of reducing the capital expenditure required to achieve operational efficiency improvements in the tram system. In a typical tram ...

An alternative is catenary free trams, driven by on-board energy storage system. Various energy storage solutions and trackside power delivery technologies are explained in ...

Abstract: A tram with on-board hybrid energy storage systems based on batteries and supercapacitors is a new option for the urban traffic system. This configuration enables the ...

energy storage models at the time of the project, wayside and on-board tools were built separately to design the new tram traction-braking characteristics emulating energy storage functionality. ...

SITRAS SES: The SITRAS SES (stationary energy storage) system was one of the products from Siemens Transportation Systems designed for public transportation, such as metro trains and trams. ... The chopper, a ...

