

[Show full abstract] super capacitor type, battery type, and flywheel type energy storage devices. This paper focuses on the urban rail transit energy storage recycling method based on the ...

The performance requirements of the energy storage device in a hybrid rail vehicle which is storage device dominant are derived. A rail vehicle simulator has been developed in order to compute the drive train duty cycle in typical high-speed and commuter passenger services. The outputs from the simulator have been inputted into a series hybrid ...

As a hypothetical example of application, the paper concludes that the energy consumption in existing urban rail systems could be reduced by approximately 25-35% through the implementation of energy-optimised timetables, energy-efficient driving strategies, improved control of comfort functions in vehicles and wayside energy storage devices.

Recuperation of braking energy offers great potential for reducing energy consumption in urban rail transit systems. The present paper develops a new control strategy with variable threshold for wayside energy storage systems (ESSs), which uses the supercapacitor as the energy storage device. First, the paper analyzes the braking curve of the train and the V-I ...

transit, this paper builds a simulation model of urban rail power supply system including energy storage device. The urban rail transit DC traction power supply network structure is shown in Fig. 1 [24]. It includes traction substations, trains and wayside BESS. The upline and downline trains run at the same time.

The high-energy device can be used as an energy supplier to meet long-term energy needs, while the high-power device can be used as a power supplier to satisfy short-term high power demands. Batteries and fuel cells are ESS devices that can be integrated into an HESS to meet the energy requirements in railway systems.

The objective of this research was to optimize the number of locations of the energy storage devices and speed profiles. First, kinematic equations were applied to simulate energy consumption. ... A., R. Palacin, and P. Batty. 2013. "Sustainable urban rail systems: Strategies and technologies for optimal management of regenerative braking ...

The storage and reuse of RBE is managed by energy-storage devices depending on the purpose of each system [5,6]. By lowering the frequency of battery charge ... Wei, H.; Wei, L. Study of trackside photovoltaic power integration into the traction power system of suburban elevated urban rail transit line. Appl. Energy 2020, 260, 114177 ...

Urban rail energy storage device

This paper investigates the benefits of using the on-board energy storage devices (OESD) and wayside energy storage devices (WESD) in light rail transportation (metro and tram) systems.

The installation of stationary supercapacitor energy storage systems in urban rail transit will effectively recover the regenerative braking energy of the trains and reduce the energy consumption ...

In the field of urban rail transit, an optimal method with the minimum energy storage capacity configuration and an optimal recovery power target has been proposed for an on-board HESS, which can quickly recover braking energy and be used for starting and accelerating. The results showed that this method can effectively reduce operating costs ...

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At present, the recovery of energy storage systems includes super capacitor type, battery type, and flywheel type energy storage devices. This paper focuses on the urban rail transit energy storage recycling method based on the utilization of regenerative braking energy, studies the basic working principle of the energy storage recovery device ...

Aimed to increase usage of regenerative energy and stabilize voltage variation of traction supply grid, an energy-saving model with on-board energy storage devices is proposed by jointly ...

On-board energy storage devices are not always an economically nor technically a feasible option, especially when it comes to heavy haul trains. ... Y. Yuan, L. Xiaobao, X. Huafeng, and F. Jingjing, "An ultra-capacitor based regenerating energy storage system for urban rail transit," in Energy Conversion Congress and Exposition, 2009 ...

In the field of urban rail transit, an optimal method with the minimum energy storage capacity configuration and an optimal recovery power target has been proposed for an on-board HESS, which can quickly recover ...

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