

The Los Angeles County Metropolitan Transportation Authority (LA METRO) subway provides service with up to six-car trains at up to 65 mph at five minute headways on weekdays. To reduce energy usage, LA METRO implemented a flywheel-based Wayside Energy Storage Substation (WESS), which reduces energy usage by capturing and reusing braking ...

Download Citation | LA Metro Red Line Wayside Energy Storage Substation Revenue Service Regenerative Energy Saving Results | The Los Angeles County Metropolitan Transportation Authority (LA Metro ...

When the metro starts, the energy storage motor releases energy and the speed of the flywheel decreases. By installing a high-speed flywheel array in the DC traction grid and utilizing regenerative braking energy, it is an effective method to realize energy saving.

In particular, optimizing the train regulation is cost-effective ways of energy saving in the worldwide metro society (Anderson et al., 2009, Chang and Sim, 1997, McFadden, 2009, Wong and Ho, 2004), and energy saving through the train regulation reported ranged from 5 % to 30 % (Anderson et al., 2009, Bocharnikov et al., 2007).

With the accelerated urbanization in China, along with the growing scale of the metro transportation network, the energy consumption of metro systems continues to increase. To face the tough challenge of climate change, China has put forward the goal of peak carbon emissions by 2030 and achieving carbon neutrality by 2060. Energy consumption has become ...

DOI: 10.1016/j.cie.2018.02.019 Corpus ID: 68245744; Real-time optimal train regulation design for metro lines with energy-saving @article{Zhang2018RealtimeOT, title={Real-time optimal train regulation design for metro lines with energy-saving}, author={Huimin Zhang and Shukai Li and Lixing Yang}, journal={Comput.

Preliminary results confirm the feasibility of the energy saving concept indicating a significant potential for the hybrid energy storage devices and subsequent energy re-use of 4000-6000 kWh/day per rectifier substation of otherwise unused train braking energy, with a typical Metro station stationary loads consumption of 2000 kWh/day.

The Hybrid Energy Storage System (HESS) design developed for the Athens Metro combines efficiently the higher power density and (dis)charging cycles of supercapacitors (coping the high frequency ...

A considerable reduction in consuming energy obtained for Cat Linh-Ha Dong metro line, Vietnam has been verified by simulation results on MATLAB and MAPLE software indicating that applying PMP, the highest operation energy saving is 10.15%, but if both solutions PMP and SCESS are applied, the energy saving level increases up to 14.7% in comparison ...

Aiming to address power consumption issues of various equipment in metro stations and the inefficiency of peak shaving and valley filling in the power supply system, this study presents an economic optimization scheduling method for the multi-modal "source-network-load-storage" system in metro stations. The proposed method, called the Improved Gray Wolf ...

Currently, there is a strong demand for an energy-efficient metro system as the city's sustainable development and carbon-neutral requirement. Therefore, this paper presented a generalized framework to evaluate the energy performance of metro systems, and the framework was applied to a case study in Tianjin, China.

Although studies have investigated metro energy consumption, the existing research is insufficient to develop an energy evaluation system that summarizes the characteristics of historical metro energy consumption and to clarify the applicability of indicators.

Energies 13(22), pp. 1-17, 2020. We propose a model for optimising driving speed profiles on metro lines to reduce traction energy consumption. The model optimises the cruising speed to be maintained on each section between two stations; the functions that link the cruising speed to the travel time on the section and the corresponding energy consumption are built using ...

The experiment made in 2012 in Moscow metro shows advantages of energy storage elements installation at 2 substations even at the worst conditions for regenerative braking. Authors ...

The REGEN model has been successfully applied to the L.A. metro subway [7] as a Wayside Energy Storage Substation (WESS). It was reported that the system had saved \$10-18 worth of traction energy ...

DOI: 10.1016/J.ENCONMAN.2011.11.019 Corpus ID: 109012849; Stationary super-capacitor energy storage system to save regenerative braking energy in a metro line @article{Teymourfar2012StationarySE, title={Stationary super-capacitor energy storage system to save regenerative braking energy in a metro line}, author={Reza Teymourfar and Behzad ...

Metro Storage, a prominent storage facility located in Addison, Illinois, has taken a significant step towards sustainability by investing in a rooftop solar power system. ... This setup is particularly beneficial in regions like Illinois, where maximizing solar exposure is crucial for optimal energy production. Efficient Rainwater Runoff: The ...

Generally, between 50% and 70% of the energy use in metros is attributable to traction requirements. 13, 14 To reduce the use of traction energy, many energy-saving technologies were developed, such as regenerative braking, 15, 16 energy storage system, 17 energy-efficient driving, 18 multiobjective optimization of the transportation organization, 19 and ...

Improving the utilization of regenerative braking energy (RBE) can reduce the energy consumption of metro

transit system. A novel train trajectory optimization method is proposed, ...

The paper describes the measuring systems and methodology for acquiring traction power measurements on the on-board traction systems of two metro trains and three 750 V DC rectifier substations in the Athens Metro Line 2. Being part of a wider investigation to develop a Hybrid Energy Storage System (HESS), the purpose of the present measurements ...

To provide metro passengers with a healthy, comfortable and safe environment, heating, ventilation and air conditioning (HVAC) systems are available in almost every UMS used for regulating indoor environmental parameters, such as air temperature, humidity, air speed and particle concentrations [7, 8]. However, when doing this work, they are consuming high-level ...

DOI: 10.1016/j.aos.2023.114183 Corpus ID: 264359868; Pareto multi-objective optimization of metro train energy-saving operation using improved NSGA-II algorithms @article{Zhang2023ParetoMO, title={Pareto multi-objective optimization of metro train energy-saving operation using improved NSGA-II algorithms}, author={Zhenyu Zhang and Xiaoqing ...

Focusing on the energy-conservation train operation issues, this paper proposes an effective real-time train regulation scheme for metro systems with energy storage devices. Specifically, to minimize train timetable deviation, passenger waiting and energy consumption, we formulate a mixed-integer nonlinear programming model to generate energy-efficient train ...

To encapsulate the essential characteristics of energy usage and to objectively assess the energy performance of metro systems, this study presents a generalized framework and applies it to a case study conducted in Tianjin. The study also employs correlation analysis to investigate the applicability of the indicators relevant to ridership.

Therefore, this paper presented a generalized framework to evaluate the energy performance of metro systems, and the framework was applied to a case study in Tianjin, China. The energy evaluation delivered a detailed analysis of the electricity consumption characteristics and current status of the Tianjin Metro.

A considerable reduction in consuming energy obtained for Cat Linh-Ha Dong metro line, Vietnam has been verified by simulation results on MATLAB and MAPLE software indicating that applying PMP, the highest operation energy saving is 10.15%, but if both solutions PMP and SCESS are applied, the energy saving level increases up to 14.7% in comparison with simulation results of ...

Energy saving Optimal speed profile Metro Urban railway Stationary energy storage system Supercapacitor Optimization ABSTRACT High electric energy consumption is one of the main challenges of metro systems, which the operators deal with. Among several energy saving methods, this paper focuses on the simulta-

This paper focuses on the configuration of a stationary hybrid energy storage system, located in metro traction



Metro energy saving and storage

substations in turn located inside Metro stations. The recuperation energy of the metro braking phase is then reused to feed stationary electrical loads of metro stations.

Beyond solar energy, leading storage providers like Metro Self Storage are embracing green construction methods. One is tilt-up construction, ... Today's Class A storage facilities are equipped with motion sensor LED lights, a cost-effective and energy-efficient lighting solution. These lights consume less electricity than fluorescent bulbs ...

Metro Self Storage is working towards implementing best practices at our storage facilities to achieve net zero energy. Examples of ways buildings achieve this include installing solar panels, high-efficiency windows, energy-efficient HVAC (Heating Ventilation and Air Conditioning) systems, and insulation.

IOP Conference Series: Materials Science and Engineering, 2019. The feedback-based technical scheme of Metro regenerative braking energy can effectively solve the rapid transfer and comprehensive utilization of regenerative electric energy and can effectively alleviate the reverse impact of regenerative electric energy on traction power supply system.

Reducing energy consumption without degrading the normal operation of metro trains and service quality has received increasing attention. Besides, fully automatic operation (FAO), for which no drivers and crew attendants are needed and all functions are controlled automatically, has been applied as a new generation train operation integrated control ...

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