Metro energy saving and storage

Overview

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 simultaneous application of s.

What are the benefits of storing energy in Metro stations?

In turn the stored energy could power upon demand selected stationary electrical loads in Metro stations of a non-safety critical character (such as lighting, ventilation, pumps, etc.) leading to very significant energy savings and to a corresponding reduction of greenhouse gases.

Why is energy conservation important for Metro Trains?

Quantitative analysis of the factors affecting the energy consumption of metro trains and finding out the breakthrough points of energy conservation is of great practical significance for reducing transport costs and improving energy utilization.

How many kWh a day can a power station save?

Depending on the desired value of energy savings, it appears that storage savings of up to 1900 kWh/day are possible for the said station, corresponding to 100 % of its measured daily energy demand .

How much energy does a metro station use?

A typical Athens Metro station stationary electrical loads consumption has been experimentally measured to be of the order of 2000 kWh/day hence the HESS energy could cover most of these loads, as long as they are not of a safety critical nature (e.g. tunnel ventilation).

What are the advantages and disadvantages of a metro system?

As a new type of urban transport, the metro has the advantages of large carrying capacity, punctuality, efficiency, and environmental protection, and has developed very rapidly [, ,]. Electric locomotives are widely used in metro systems. Compared with other transportation modes, they have greater

advantages in energy conservation.

Can a hybrid energy storage system save energy?

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. 1.

Metro energy saving and storage

Metro energy storage and energy saving system

Hybrid energy storage technology, which consists of lithium-ion batteries (LiB) and super capacitors (SC), is an effective way to ensure the safety of power supply and realize ...

(PDF) Metro Braking Energy for Station Electric ...

This article will assess the installation of stationary super capacitor based energy storage systems (ESS) along a metro line for energy ...

Real-time train regulation in the metro system with energy storage

Real-time train regulation in the metro system with energy storage devices: An efficient decomposition algorithm with bound contraction

An integrated optimization model of metro energy consumption ...

Energy consumption by metro trains has attracted considerable attention due to economic

and environmental concerns. Passengers want convenient travel that takes less ...

Study of trackside photovoltaic power integration into the traction

It concludes that DC side PV integration can help to compensate the traction voltage and reduce the catenary transmission loss in the traction stage of trains, thereby it has ...

Metro traction power measurements sizing a hybrid energy ...

This energy could then be used through a storage system to supply several of the electrical loads of the passenger station, saving energy and reducing the greenhouse effect ...

Proceedings of

To capture and reuse this energy, Metro contracted with VYCON Inc. to design, supply, and integrate a flywheel Wayside Energy Storage Substation (WESS). WESS will capture and ...

Saving Money Every Day: LA Metro Subway Wayside Energy Storage

To reduce energy usage, LA METRO implemented a flywheel-based Wayside Energy Storage Substation (WESS), which reduces energy usage by capturing and reusing braking energy ...

Metro Braking Energy for Station Electric Loads: The

The paper describes real data obtained through on-site and train on-board measurement schemes and a methodology to achieve metro system energy savings ...

Energy-Efficient Train Control With Onboard Energy Storage ...

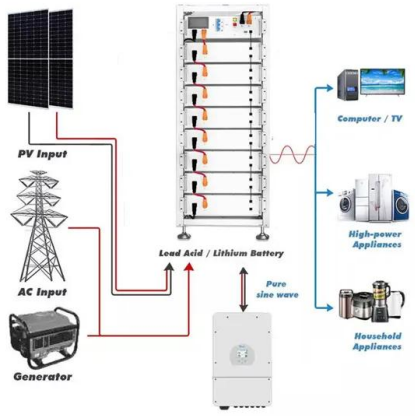
With the rapid development of energy storage technology, onboard energy storage systems (OESS) have been applied in modern railway systems to help reduce energy consumption.

Real-time train regulation in the metro system with energy storage

Real-time train regulation in the metro system with energy storage devices (ESDs) is a significant and practical issue in enhancing the efficiency, reliability and ...

JRC2015-5691

ABSTRACT 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 ...



Modeling of energy saving in substations feeding DC metro ...

Energy storage elements based on lithium-ion batteries became a part of new generation of power systems. One of the most efficient places of energy storage elements implementation is ...

Cooperative Application of Onboard Energy Storage and Stationary Energy

The transition towards environmentally friendly transportation solutions has prompted a focused exploration of energy-saving technologies within railway transit systems. ...

??????????????????-CSDN??

According to the dynamic simulations of Guangzhou Metro Line 2, the optimization method is verified. Results show that the total energy ...

(PDF) Energy saving in metro systems: Simultaneous ...

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 ...

?????????????????:????????? ...

Real-time train regulation in the metro system with energy storage devices: An efficient decomposition algorithm with bound contraction Focusing on the energy-conservation train ...

Stationary super-capacitor energy storage system to save ...

In this paper, the stationary super-capacitors are used to store a metro network regenerative braking energy. In order to estimate the required energy storage systems (ESSs), ...

Regenerative Braking Energy Recovery System of Metro Train ...

In order to fully utilize the regenerative braking energy of metro trains and stabilize the metro DC traction busbar voltage, a hybrid regenerative braking energy recovery ...

Modeling of energy saving in substations feeding DC metro ...

Energy storage elements based on lithium-ion batteries became a part of new generation of power systems. One of the most efficient places of energy storage elem

Pareto multi-objective optimization of metro train energy-saving

Quantitative analysis of the factors affecting the energy consumption of metro trains and finding out the breakthrough points of energy conservation is of great practical ...

Metro with energy storage

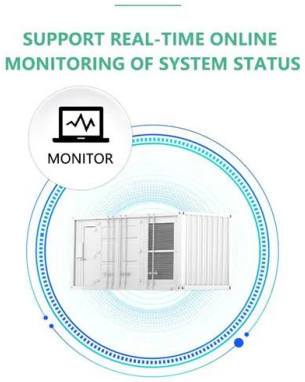
To improve energy sustainability, two different kinds of energy-saving devices have been introduced extensively in metro operations. One is operated with passive control

Metro energy storage reuse system

What is a hybrid energy storage system? A hybrid Energy Storage System termed MetroHESSforesees the storage and reuse of regenerative train braking energy through an ...

Energy-saving optimal scheduling under multi-mode "source ...

Download Citation , Energy-saving optimal scheduling under multi-mode "source-network-load-storage" combined system in metro station based on modified GrayWolf ...



Sustainable Rail Plan May 2013

On-board energy storage systems will reduce the amount of energy dissipated to the resistors, resulting in cooler air under the car and more energy-efficient HVAC systems.

Regenerative Braking Energy Recovery System of Metro ...

ABSTRACT In order to fully utilize the regenerative braking energy of metro trains and stabilize the metro DC traction busbar voltage, a hybrid regenerative braking energy recovery system ...

Two-Stage Integrated Planning of Energy-Saving Operations of Metro

In recent years, with a remarkable increase in urban rail transit operations, the issue of energy efficiency in train operations has attained increasing attention. In this study, a two-stage ...

Modeling of energy saving in substations feeding DC metro ...

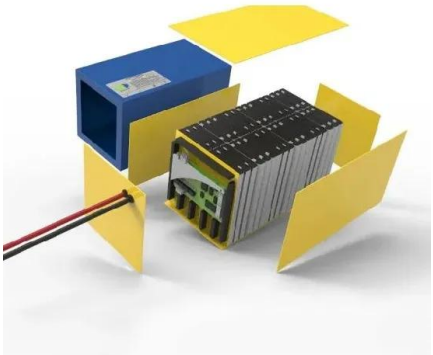
Read Modeling of energy saving in substations feeding DC metro systems based on appropriate location of energy storage elements

Energy-saving optimization strategy of multi-train metro timetable

In metro systems, reducing traction energy consumption and increasing the use of regenerative braking energy (RBE) are two important methods of energy-saving optimization, ...

Metro traction power measurements sizing a hybrid energy storage ...

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 ...



Optimal Energy Management, Location and Size for ...

The installation of stationary super-capacitor energy storage system (ESS) in metro systems can recycle the vehicle braking energy and ...

Saving Money Every Day: LA Metro Subway Wayside Energy Storage ...

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 ...

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