

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 analysed benefits are the use of OESD and WESD as a source of supply in an emergency metro scenario to safely evacuate the passengers blocked in a metro train ...

?CUNY-City College? - ??Cited by 762?? - ?Energy storage? - ?Distribution system? ... Modeling and Simulation of Hybrid Reversible Substation and Wayside Energy Storage System for Electric Rail Transit System. M Khodaparastan, A Mohamed. 2020 IEEE Transportation Electrification Conference & Expo (ITEC), 273-276, 2020.

ENVILINE ESS is a wayside Energy Storage System (DC connected) which recovers, stores and returns the surplus braking energy to the DC network, helping to reduce the total energy consumption of a rail transportation system up to 30 percent. The ESS can be configured with batteries, super capacitors or in a

Furthermore, Ref. [33] states that the wayside energy storage system (WESS) is limited by energy transmission distance. In urban rail transit with a 750 V voltage level, even if the capacity configuration of the WESS is large enough, the regenerative braking energy cannot be fully absorbed, so the braking energy is dissipated on the braking resistor.

In this paper, a general computation model of wayside energy storage device is built, which can be solved in DC traction power supply system by a new algorithm based on Bang-Bang control and multi-state switch strategy. Four indexes are proposed to evaluate the energy saving and voltage stabilizing effect of energy storage system, which can guide the parameter selection. ...

In a white paper published in 2018, the interest of New York City Transit (NYCT) in application of wayside energy storage systems for recuperation of regenerative braking energy is expressed [85 ...

In this paper, the non-dominated genetic algorithm with elite strategy is used to optimize the capacity configuration of the on-board and wayside energy storage systems, while improving the energy ...

side (substation) supercapacitor (SC) energy storage system (ESS). Firstly, the structure of the wayside energy storage system is introduced. Secondly, the model of energy storage system is built and the control strategy is described. Thirdly, in order to estimate the required energy storage system, a useful method is proposed to predict the

Among the various on-board or wayside measures proposed, one of the most promising solutions is based on

using wayside energy storage systems (WESSs). A WESS is a storage installation which can be integrated ...

IEEE Guide for Wayside Energy Storage Systems for DC Traction Applications IEEE Std 1887 -2017 IEEE Vehicular Technology Society Sponsored by the Rail Transportation Standards Committee IEEE 3 Park Avenue New York, NY 10016-5997 USA Authorized licensed use limited to: Iowa State University. Downloaded on March 22,2017 at 14:45:19 UTC from ...

Traction power systems experience some of the most extreme variations in local power loads as compared to most other large scale electric power supply networks. These variations create challenges in the construction of reliable electric power delivery systems and in the performance of the rolling stock dependent on power supplied by the system. A solution is ...

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Electric rail transit systems use energy storage for different applications, including peak demand reduction, voltage regulation, and energy saving through recuperating regenerative braking energy. In this paper, a ...

Energy storage systems in tramway applications aim to increase energy efficiency through adequate energy planning and control. Typically, storage systems for tramway installations encompass batteries and super-capacitors (SCs) [1], [2], [3]. Stationary battery energy storage (BES) systems compared to other technologies improves traction efficiency and ...

1.2 Wayside Energy Storage System Wayside Energy Storage System (WESS) saves otherwise lost regenerative braking energy by capturing and storing braking energy from a Regen Train. The WESS then delivers the captured energy to a Load Train without the Load Train being close in time or position to

Wayside energy recovery systems (WERS), i.e. stationary energy storage systems that are connected to the tram grid, absorb this excess energy and thus improve the energy efficiency or increase voltage stability. Simulations of DC tram grids with WERS are an important tool to find the optimal system design and evaluate the operation.

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Wayside energy storage systems (WESS) capture energy from braking trains, but instead of releasing it as heat they store it for later use. In SEPTA's case, this was accomplished using a lithium-ion battery combined with ABB converters. How much energy the system can capture from any one train depends on a variety of factors (see boxed text).

Rainer vor dem Esche, managing director at Stornetic, said: "Electricity costs are a decisive factor for companies who run train, tram or metro systems. Our wayside storage device helps bring down these costs. "It stores the braking energy of trains and makes it available for the acceleration to leave the station.

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In April of 2020, a Group including Independent Power and Renewable Energy LLC, Scout Economics and Beacon Power LLC, a developer, operator, and manufacturer of kinetic energy storage devices, was awarded a \$1 million grant by the New York State Energy Research and Development Authority to develop, design, and operate a 1 MW flywheel-based ...

There are three major challenges to the broad implementation of energy storage systems (ESSs) in urban rail transit: maximizing the absorption of regenerative braking power, enabling online global optimal control, and ensuring algorithm portability. To address these problems, a coordinated control framework between onboard and wayside ESSs is proposed ...

In recent years, wayside supercapacitor energy storage systems have been increasingly used in urban rail transit. But it has been found in practical applications that the energy storage devices have a slow dynamic response in certain operating conditions. Therefore, this paper analyzes the factors affecting the dynamic response of the energy storage device. In order to improve its ...

work, is the use of wayside energy recovery systems (WERS), i.e. stationary energy storage systems or reversible substations (in-verters). These can be installed at suitable locations in the grid, e.g. in appropriate substations. The space and weight play a subordinate role in comparison to on-board systems, which enables larger dimensioning.

The first results carried out on real case studies can be very promising, evidencing peaks of about 38.5% of total energy sold back to the grid [].Differently, the installation of energy storage equipment in the RSO's power system can be considered. "on-board" and "wayside" solutions are widely proposed [8-11] the first case, trains are equipped with on ...

Among the various on-board or wayside measures proposed, one of the most promising solutions is based on using wayside energy storage systems (WESSs). A WESS is a storage installation which can be integrated into mass transit systems in urban areas as well as into long-distance railway lines. It can operate as a smart storage system able to ...

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Venezuela wayside energy storage system

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