

DOI: 10.1109/ECCE.2015.7309851 Corpus ID: 20627362; Optimal energy management of a battery-supercapacitor based light rail vehicle using genetic algorithms @article{Herrera2015OptimalEM, title={Optimal energy management of a battery-supercapacitor based light rail vehicle using genetic algorithms}, author={Victor Isaac Herrera and Haizea ...

Mobility light rail vehicles. Cleveland, Ohio Cleveland was the first city to use electricity on a large scale in their public square. It will now continue that theme with Siemens Mobility's latest technology in high-floor vehicles replacing two legacy fleets with one common vehicle design. This S200 light rail vehicle has been fitted

The recovery of regenerative braking energy has attracted much attention of researchers. At present, the use methods for re-braking energy mainly include energy consumption type, energy feedback type, energy storage type [3], [4], [5], energy storage + energy feedback type [6]. The energy consumption type has low cost, but it will cause ...

where  $E$  is energy,  $c$  is the speed of light ( $3 \times 10^8$  m/s). Therefore, when the amount of  $4.29 \times 10^{-29}$  kg mass loss occurs,  $3.86 \times 10^{-12}$  J energy is released. Calculating with current thermonuclear reaction rate, the lifetime of sun is  $5 \times 10^9$  years.. Affected by the existing of the atmosphere, sun radiation that reaches the earth's surface can be defined as ...

In this paper, an optimal energy management strategy (EMS) for a light rail vehicle with an onboard energy storage system (ESS) combining batteries (BT) and supercapacitors (SC) is presented. The optimal operating targets for the proposed EMS and ESS sizing (BT+SC) are obtained by multiobjective (MO) optimization with genetic algorithms.

These models are used to study the energy consumption and the operating cost of a light rail transit train with and without flywheel energy storage. Results suggest that maximum energy savings of 31% can be achieved using a flywheel energy storage systems with an energy and power capacity of 2.9 kWh and 72

The hybrid energy storage system (HESS) helps to lighten the power supply equipment of light rail vehicles (LRVs), and the static wireless power transfer (WPT) technology can improve the disadvantages of wired charging. This article focuses on the WPT-based charging strategy for HESS, the efficiency and cost of the WPT system are focused. ...

Bombardier Transportation has equipped one bogie of a prototype LRV (light rail vehicle) for the public transportation operator RNV in Mannheim with a MITRAC Energy Saver. ...

With some advanced features such as high power efficiency, high energy intensity, and brilliant energy storing performance, the lithium battery is quite suitable to be the ...

Onboard energy storage in rail transport: Review of real applications and techno-economic assessments. Emanuele Fedele, ... From a system-level perspective, the integration of alternative energy sources on board rail vehicles has become a popular solution among rolling stock manufacturers. Surveys are made of many recent realizations of ...

These models are used to study the energy consumption and the operating cost of a light rail transit train with and without flywheel energy storage. Results suggest that maximum energy savings of 31% can be achieved using a flywheel energy storage systems with an energy and power capacity of 2.9 kWh and 725 kW respectively.

8 TRACTION SYSTEMS OR LIGHT RAIL VEHICLES . SELECTED REFERENCES -- SEATTLE DEPARTMENT OF TRANSPORTATION | SEATTLE, US. Tailored propulsion enabling . catenary-free operation. Customer benefits o Customized solution based on well-proven standard building blocks o Minimized space consumption on the vehicle roof -- Light rail vehicle. Photo ...

Download Citation | The design of regeneration braking system in light rail vehicle using energy-storage Ultra-capacitor | After analyzed the running mode of city light rail vehicles, the author ...

HES Hybrid energy storage LRV Light rail vehicle NiMH Nickel-metal hydride OLE Overhead line equipment VRLA Valve regulated lead acid 1 ELECTRIC TRACTION The first application of electricity to practical traction purposes dates back to the now famous Siemens locomotive first exhibited at the Berlin Industrial Exhibition in 1879. [3]

The new articulated light rail vehicle platform utilizes industry-proven systems, subsystems and components to meet the needs of modern cities and overcome the challenges of pre-existing infrastructures. ... Through the Liberty Modern Streetcar, the customer has the option to utilize a pantograph, on-board energy storage (batteries/super ...

The train runs a track of 86 km, for a cumulative length of 172 km and 63 stations. Studies on energy storage in railway applications [22] [23] [24][25][26][27][28][29] have been carried out ...

In this paper an optimal energy management strategy (EMS) for a light rail vehicle with an onboard energy storage system combining battery (BT) and supercapacitor (SC) is presented.

This energy can be used by an accelerating vehicle, reducing the net energy usage. Please rotate your screen. Vision; Applications; Products; Tech; News; Careers; Contact; Wayside energy storage solutions. Light rail transport: challenges and goals. Metro and trams have high and variable energy consumption, sometimes coupled with aging systems ...

To further reduce energy demand and greenhouse gas emissions, onboard storage devices are being integrated

into the propulsion system of light and conventional rail vehicles at an increasing pace. On high-density urban tracks that are mostly or entirely electrified, SCs and small-size batteries enable full exploitation of regenerative braking.

over 400 light rail systems worldwide, interest is strong the experience gained in operating these systems is to facilitate additional improvements and can provide specific information on operating costs, including lifespan of energy storage devices, and thus cycle costs. This will hopefully provide decision makers with

This article will propose different energy storage systems, ranging from 0.91 kWh to 1.56 kWh, suitable for a 30 m long tram. To configure the system regarding energy content, voltage variation ...

Hybrid energy storage system (HESS) helps to lighten the power supply equipment of light rail vehicles (LRVs), and the static wireless power transfer (WPT) technology can improve the disadvantages ...

This article provides a detailed review of onboard railway systems with energy storage devices. In-service trains as well as relevant prototypes are presented, and their characteristics are ...

USA: Bi-State Development Agency has formally awarded Siemens Mobility a contract supply 55 high-floor light rail vehicles with battery onboard energy storage for the MetroLink network serving the greater St Louis region.. Siemens was the sole bidder for the order, which the agency approved last year. The 73 km Y-shaped network is currently operated by a ...

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The hybrid energy-storage systems, which combine batteries, ultracapacitors and fuel cell stacks, are beneficial to provide energy for the light rail vehicles during the travel [1] [2][3] ...

Keywords Solar electric vehicle, Sustainable power management, Light electric vehicles, Hybrid energy storage solution, Supercapacitors, PV-battery interface, SRM EV drive, Machine learning

Quantitative Estimation of Railway Vehicle Regenerative Energy Saving: "A Case of Addis Ababa Light Rail Transit (AALRT)" May 2021 International Journal of Engineering Technologies IJET 7(1):9-19

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