

Are electric haul trucks a viable solution for the mining industry?

The incorporation of electric-powered haul trucks is a huge opportunity for the mining industry. Designing a solution that can integrate battery-powered equipment with existing mining processes, without disrupting current (non-stop) operations, will be critical to achieving emission reduction targets.

Can battery electric vehicles save energy in underground mines?

In the case of underground mine electrification, the utilization of battery electric vehicles (BEVs), which are instrumental in diminishing emissions and curtailing environmental impacts, is anticipated to yield substantial energy savings in ventilation and cooling systems within mining operations (Glencore, 2019).

How do weather conditions affect haulage trucks in mining operations?

Weather conditions, especially precipitation and temperature, play a significant role in the operational dynamics of haulage trucks in mining operations. These conditions directly impact travel times, rolling resistance, and energy or fuel consumption.

Are battery-powered mining trucks heavier than diesel?

In mining operations, battery-powered mining trucks are typically heavier than their diesel counterparts due to the substantial weight of batteries and electric drive systems.

Can electric trucks be used in open-pit mining?

A fleet size of 16 trucks was selected, considering that full-scale electric trucks have not yet been deployed commercially in open-pit mining operations. Mining companies typically conduct small-scale or pilot tests to evaluate operational feasibility before scaling up.

How much energy does the mining industry use?

Studies show that 62 % of the mining industry's final energy consumption comprises oil, gas, and coal; electricity accounts for 35 % of energy consumption, but a significant portion of electricity generation depends on fossil fuels (Maennling and Toledano, 2018).

To help future-proof against rising fuel costs, mines are now adding renewable energy sources and storage technologies to run mining operations, while improving power quality efficiently ...

The four-wheel distributed drive pure electric mining truck, featuring a hybrid energy storage system with battery and supercapacitor, is a promising solution for achieving zero-emission in ...

The record mining truck project is part of Anglo American's commitment to reduce global greenhouse gas emissions by 30% by 2030 and, after completion of FCEV's test ...

Abstract: The power system of electric-drive truck equipped with hybrid energy storage is proposed to efficiently utilize the engine power and braking regenerative energy.

Technical considerations for operating electric trucks Haul road gradient: One of the major constraints for EVs in mining is the selection of appropriate routes, as the battery performance ...

Request PDF | On Nov 1, 2024, Qingsong Tang and others published Optimal energy efficiency control framework for distributed drive mining truck power system with hybrid energy storage: A ...

This study implemented a design optimization method to create a hybrid energy storage system for mining haul trucks. The onboard housing space and the duration of ...

The mining trucks with heavy loads are widely used in open-pit mines, which are usually under working conditions where the recoverable potential energy accounts for more ...

This paper innovatively adopts a new perspective of minimizing global energy transfer chain losses and proposes a mining truck energy efficiency optimization control ...

Smart planning of grid infrastructure and battery energy storage systems, combined with mine production forecasting, can be used to minimize load peaks and address possible volatility on ...

transportation can be gradually replaced with a combination of electricity-powered and energy storage solutions. The switch to an "all-electric" mine will likely lead to greater emphasis on ...

Caterpillar Inc. (NYSE: CAT) announced today a successful demonstration of its first battery electric 793 large mining truck and a significant investment to transform its ...

Abstract Based on the theory of the traditional hydraulic braking system of mining trucks and under the condition of safety, in order to maximize the regenerative braking ...

A novel coupled hydro-pneumatic energy storage system is proposed to improve the energy and power performance of the energy storage system in hybrid mining trucks. Based on four basic ...

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