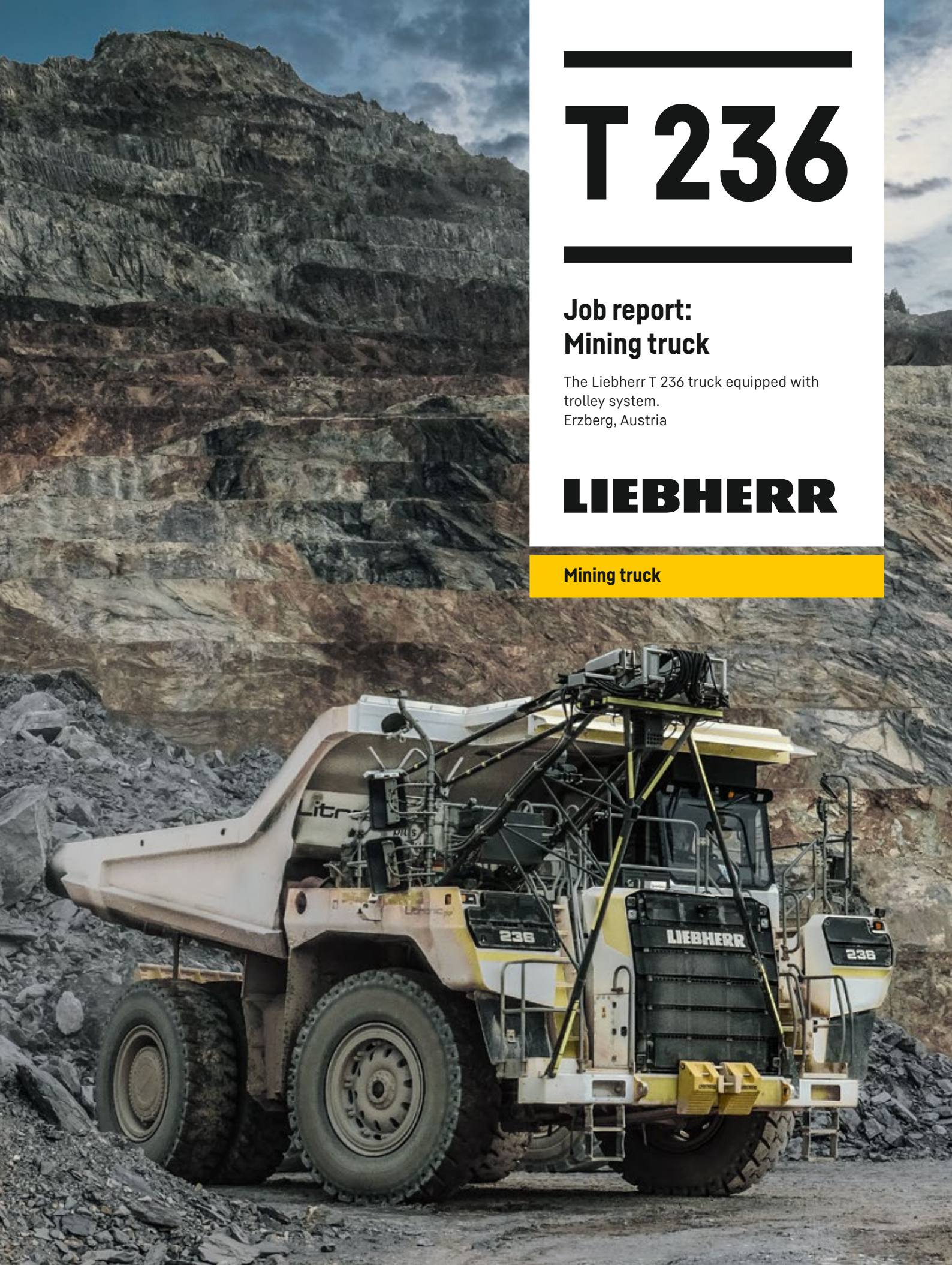
T 236

Job report: Mining truck

The Liebherr T 236 truck equipped with trolley system.
Erzberg, Austria

LIEBHERR

Mining truck



Situation

Austria

Eisenerz

VA Erzberg GmbH is an iron ore producer located in Austria. The mine site has a history that goes back to 712 A.D. and produces today 3 million tonnes of iron ore per annum with a total mass movement of 13 million tonnes per year. Erzberg mine operates at 340 days per year with 240 employees.

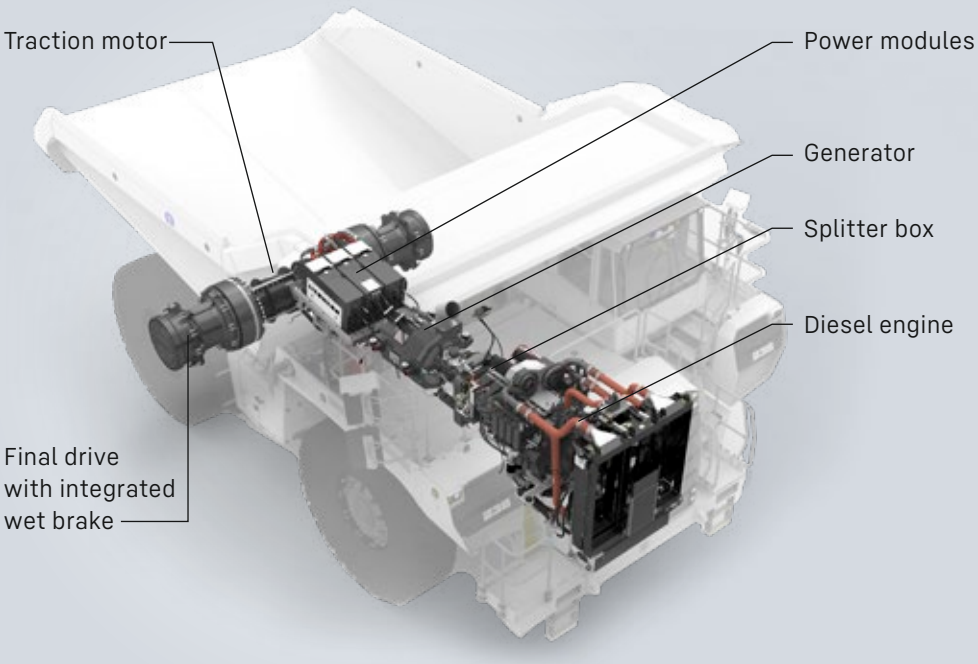
Mining the highly variable siderite orebody is achieved using selective drilling and blasting, with wheel loaders and 100 t class dump trucks performing loading and hauling. The surface mining conditions vary throughout the year due to the alpine conditions, extreme weather situations, and the mine's specific topography.

The mine was facing an increase of fuel costs and CO_2 taxes as well as a significant increase in the overburden haulage distance and altitude. This required a change from the traditional way of operation in order to offer low or zero emission mining.

T 236 performance

The Liebherr T 236 drive system enables a constant application of power to ground that is less sensitive to grade and payload variations. With a high take-off torque capability, the T 236 is designed to meet the most challenging operating environment. Together with small and mid-size Liebherr hydraulic excavators, the T 236 offers the most complete high performance and scalable truck match.

Nominal payload
100 tonnes / 110 tons
Gross vehicle weight (GVW)
180 tonnes / 198 tons
Gross power
Diesel: 895 kW / 1,200 HP
Trolley: 1,080 kW / 1,448 HP



Project

Study conditions

The project included the development of a trolley catenary line and an on-board current collector system to address the specific needs of the brownfield operation. The technology allows 24-hour operation on uneven haul road conditions even during extreme weather, thanks to an easy “hook-on” process, 180° switch back capability, and the possibility to deviate +/- 1.5 m from the line.

The overall catenary system covers 4.7 km of ramps with the longest consecutive line with 3.8 km long. The system incorporates three substations which divide the system in segments. At least three trucks can operate directly behind each other in every segment.

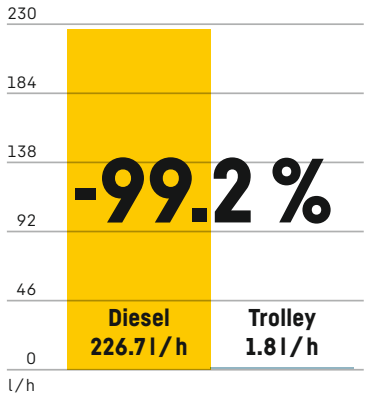
Haul profile

Overall catenary system on ramp	4,700 m
Longest trolley segment	3,800 m
Elevation gain	320 m
Average ramp gradient	6.8 %
Average truck payload	104.6 t

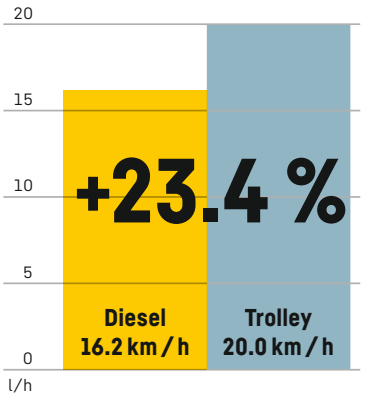
Machine productivity & fuel consumption

Trolley segment (average electricity consumption: 172.1 kW.h)

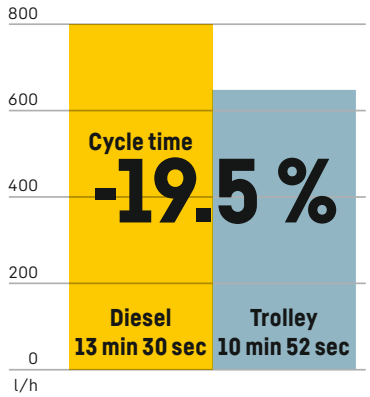
Average fuel consumption

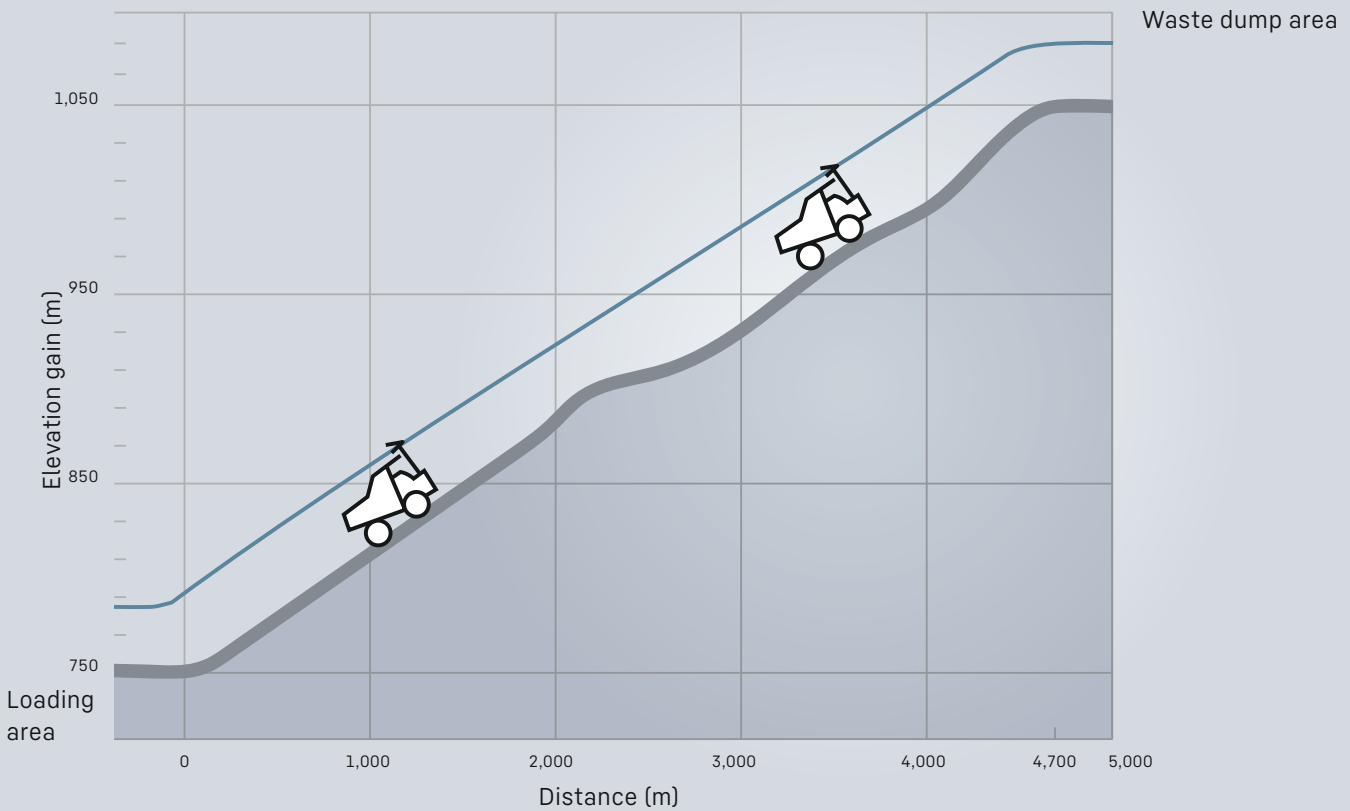


Average speed



Average time

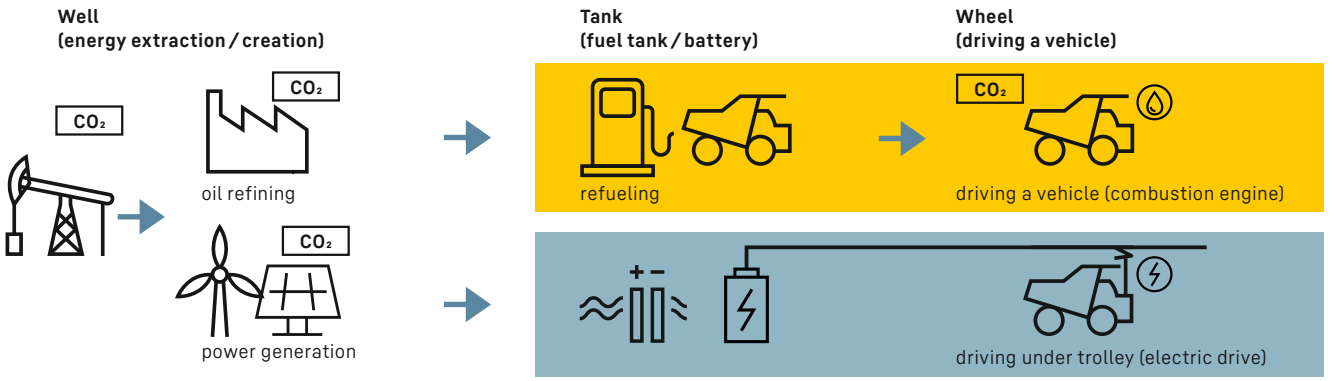




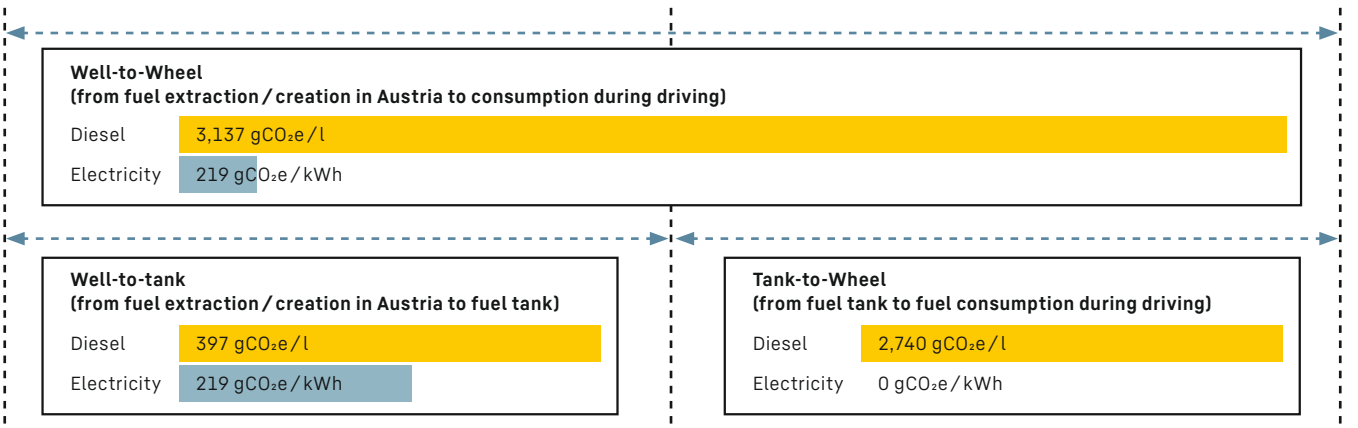
Mining responsibly without compromising performance

Liebherr low emission mine

Providing continuous service to customers, taking into consideration their requirements as well as environmental issues in designing, manufacturing, and managing mining equipment is a top priority for Liebherr. Dedicated engineering teams have developed during the last 30 years the largest 100 % electric hydraulic mining shovels range in the world but also the only 100 t class truck equipped with an electro-diesel powertrain that allow trolley operations.



By assuming the energy mix of Austria and defining local costs of diesel / electricity, an analysis can be performed to demonstrate the benefits of a trolley system installed over the uphill ramp studied inside this document.



Energy cost
per uphill
- 58 %

kg CO_2e emission
per uphill
- 76 %

With the application of this technology, VA Erzberg is aiming to reduce the mine's total fuel consumption by 65 %, whereas the haul trucks under trolley reduce their consumption by 85 %. This fuel saving results in a total CO_2 emission saving of more than 8,000 t / a.

Opportunities

A 1 km extension of the catenary with increased dump height is currently under planning, as well as a 4 MW solar panel investment. Together with the already existing hydroelectric power plant, these solutions will ensure sustainable electricity production for VA Erzberg GmbH mine into the future.

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