

E100

Full Battery Electric Mining Truck

<https://www.epca.net.au>

EPCATM
ELECTRIC POWER CONVERSIONS AUSTRALIA



OVERVIEW

Energy density: 1.74 MWh

Motor Power: 850 kW / 1140 hp

Runtime: 10h00*

*Effective grade 17% at 30°C

Nominal Payload: Up to 100 t

Top Speed: 60.4 km/h

Torque: 5200 Nm

Recharge Time: 50 min



GREEN AND LEAN MINING FLEET

Fuel Costs



Electric motors are **3x more efficient** than traditional diesel engines.

27% less

Maintenance

Electric trucks **eliminate the need for engine maintenance and filter replacement**, with only the running gear requiring servicing.



Driverless

The truck's electric powertrain is **remotely monitored**, and the Battery Electric Truck (BET) is designed to be **driverless**.

Charging Time

The charger can accept direct current from a **100 m x 100 m solar farm** per truck or alternating current from the grid.



Run Time

The standard truck provides **10 hours of runtime** for heavy operations.

Power

The electric conversion increases power **from 1,000 to 1,140 hp**, with **higher torque** at standstill.





Introducing the Future of Mining

The EPCA Full-Battery Electric Mining Truck is a cutting-edge solution designed to tackle emissions and operational costs head-on. With zero diesel and impressive battery performance, this truck redefines mining efficiency while reducing environmental impact.



Key Features

Up to 50% Reduced Haulage Costs

Over 20 years, the total cost of ownership for a diesel truck will be approximately A\$40.5 million, while the battery-electric truck's total will come in at A\$20.8 million.

Fast Recharge

50min recharge time using a 3.7MW charger, supported by a 9MWhr battery capacity, enabling 24/7 charging. Compatible with both AC and DC input for versatile charging options.

Patented Active Cooling System

Innovative active cooling system capable of maintaining optimal performance even in ambient temperatures of up to 55 degrees Celsius.

Additional Features

- Autonomous and Driverless Technology
- Advanced remote monitoring: real-time tracking, diagnostics, and performance optimisation.

EPCA MINING TRUCK E100

Cost Analysis

Electric truck CAPEX is at \$3.2 million compared to \$2.8 million for diesel. The initial investment is offset by substantial operational savings over the vehicle's lifespan.

Fuel and Electricity Costs:

The electric truck eliminates fuel costs entirely, resulting in substantial long-term savings compared to diesel trucks, especially considering the rising costs of fossil fuels.

Electricity costs are significantly lower at \$135 per MWh compared to \$1.60/L of diesel, further contributing to cost savings.

Maintenance and Operating Costs:

The electric truck delivers a 27% reduction in maintenance costs thanks to its simplified and efficient electric powertrain.

Operating costs are 80% lower, primarily due to the elimination of fuel expenses and lower electricity rates.

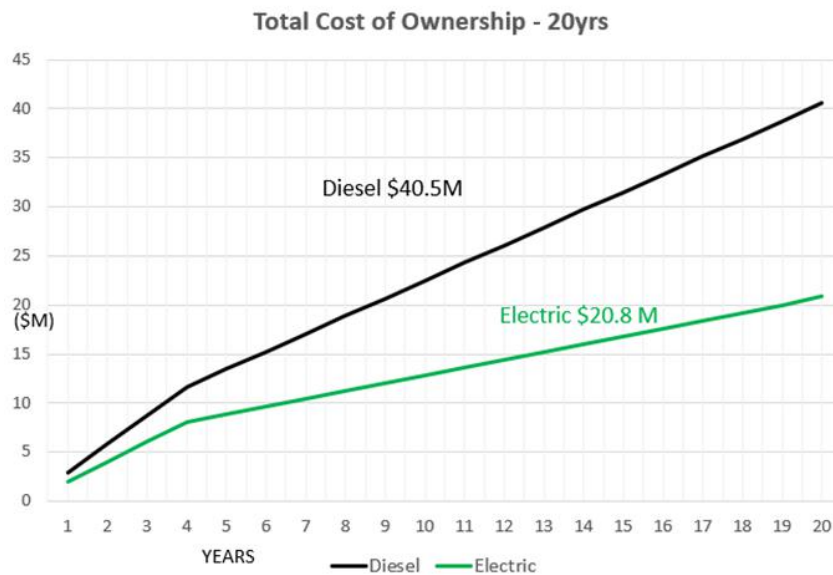


Figure 2 Total cost of ownership of diesel vs electric over 20 years.

Cost Comparison

	Diesel	Electric
Energy Cost (fuel/electricity)	\$1.60/L	\$135/MWh
CAPEX	\$2.8M	\$3.2M
Maintenance	\$107/hr	\$62/hr
Total cost of ownership (over 20 years)	\$40.5M	\$20.8M

Datasheet

E100 - 100t Dump Truck

Motor

Power	850 kW	1140 hp
Peak Torque	5200 N·m	
Run Time	10 Hrs	

- Actual runtime may vary based on mine site conditions, such as terrain, load, and temperature.

Battery

Overall Capacity	1.74 MWh
Charging Outlet	CCS2
Chemistry	NMC

Charging

Charging Time	50 Min
Charging Outlet	CCS2
No. of Outlets	6
Power Supply	Grid, Solar or Genset

Weights – Approximate

Target Gross Machine	163 360 kg	360,143 lb
Operating Weight		
Operating Weight – empty	64 670 kg	142,573 lb

Operating Specifications

Nominal Payload Capacity	90.4 tonnes	100 tons
Body Capacity – Struck	42.1 m ³	55.06 yd ³
Body Capacity – SAE 2:1	60.1 m ³	78.6 yd ³

- Refer to the Caterpillar 10/10/20 Payload Guidelines.

Transmission

Forward 1	10.5 km/h	6.5 mph
Forward 2	14.3 km/h	8.9 mph
Forward 3	19.3 km/h	12 mph
Forward 4	26 km/h	16.2 mph
Forward 5	34.9 km/h	21.9 mph
Forward 6	46.6 km/h	29.4 mph
Forward 7	60.4 km/h	39.9 mph
Reverse	11.9 km/h	7.4 mph

- Maximum travel speeds with standard 27.00-R49 tires.

Final Drives

Differential Ratio	2.74:1
Planetary Ratio	7.00:1
Total Reduction Ratio	19.16:1

- Planetary, full-floating.

Brakes

Brake Surface – Front	2787 cm ²	432 in ²
Brake Surface – Rear	102 116 cm ²	15,828 in ²

Body Hoists

Pump Flow – High Idle	498 L/min	131.5 gal/min
Relief Valve Setting – Raise	18 962 kPa	2,750 psi
Relief Valve Setting – Lower	18 950 kPa	3,450 psi
Body Raise Time – High Idle	15 Seconds	
Body Lower Time – Float	13 Seconds	
Body Power Down – High Idle	13 Seconds	

Capacity – Dual Slope – 100% fill factor

Struck	42.1 m ³	55 yd ³
Heaped 2:1 (SAE)	60.1 m ³	78.6 yd ³

Weight Distributions – Approximate

Front Axle – Empty	47%
Front Axle – Loaded	33%
Rear Axle – Empty	53%
Rear Axle – Loaded	67%

Suspension

Effective Cylinder Stroke – Front	318 mm	12.5 in
Effective Cylinder Stroke – Rear	165 mm	6.5 in
Rear Axle Oscillation	5.4°	



Q&A

FULL BATTERY ELECTRIC TRUCK

RUNTIME

We committed to the market to achieve **8hrs runtime** under a heavy-duty, i.e. mine haulage, and we achieved **10h00** on a 17% incline during our mine site testings.

Recharge

Our trucks achieve a **50-minute recharge time**, with the potential for even faster charging in favourable climates, as performance is temperature-dependent.

Productivity

Our electric motor outperforms diesel, providing **5200Nm of torque** compared to diesel's 4700Nm, delivering full torque from a standstill. Diesel only reaches its max torque at around 1750rpm, whereas our motor continues delivering full torque **up to 2000rpm**. Additionally, the parasitic loads on the diesel engine, such as pumps and compressors, have been isolated, resulting in the full motor power of **1140HP** for the wheels compared to diesel's 1000HP. The electric truck also has **15% better ramp performance**.

Charging Method

The truck charges via **CCS2 plugs**. It can also operate 24/7 using solar power, with the DC charger storing energy during the day for night-time use. The charger can accept **both DC and AC inputs**.

Cost

A retrofit costs **\$3.2 million**, whereas a new CAT777F costs \$2.8 million.

OPEX

A diesel-powered 777 truck consumes 64L/hr at \$1.60/L, translating to \$102/hr. In comparison, our electric truck operates at **\$22/hr** based on an electricity rate of \$135/MWhr.

Maintenance Savings

With no engine and reduced brake wear thanks to regenerative braking, maintenance costs are projected to drop from \$107/hr to **\$62/hr**.

Larger Trucks

Yes, we can retrofit larger models such as the **CAT785 (150t)**. Our technology is proven, but we haven't yet done an AC electric truck.

International Service

We partner with overseas companies that handle retrofits, servicing, and maintenance for our international clients.

Other Mining Equipment

EPCA can retrofit loaders, dozers, drill rigs, and graders to electric as well.

