

PRODUCT SPECIFICATION

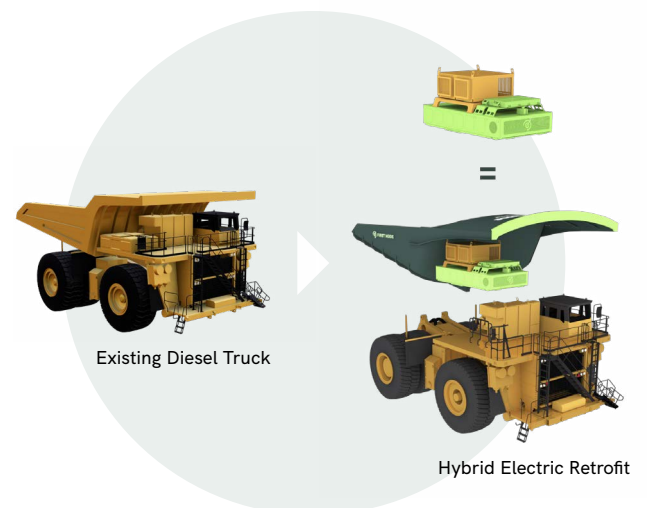
# Hybrid Electric Retrofit



The most sustainable and cost-effective path to haulage decarbonization begins with the truck you already own.

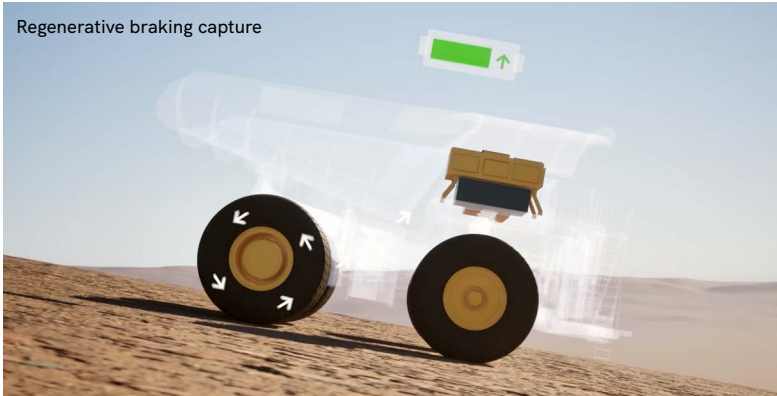
## Our Retrofit at a Glance

- Reduces fuel use and emissions by up to 25%
- Designed to be safe to install, operate, and maintain
- Requires no new infrastructure
- No modifications to base truck functionality to ensure continuous operations even when the hybrid system is inactive
- Up to 5% decrease in haulage cycle time
- Life extension of key truck components (e.g., engine, resistor grid) by up to 25%



The First Mode **Hybrid Electric Retrofit** product delivers immediate fuel savings and reduces emissions by up to 25% with minimal changes to your existing ultra-class electric drive haul truck and requires no additional infrastructure. Its low-risk design uses regenerative braking to capture, store, and redeploy energy to the drivetrain while ensuring continuous truck operations when the hybrid elements are inactive.

Regenerative braking capture



Energy redeployed



## First Mode Hybrid Electric Retrofit

Our hybrid system is comprised of proprietary building blocks that are integrated into a robust system designed to perform in any mining environment.

- **Battery Pack.** Rugged, long-lasting, and safe LTO battery solution that can withstand the harshest conditions.
- **Battery Management System.** State-of-the-art controls charge and discharge cycles while monitoring thermals and battery health to ensure seamless operation.
- **DC/DC Converter.** Proprietary solution that allows reliable and efficient bi-directional power conversion and isolation to enhance battery system safety, reliability, and performance.
- **Control Cabinet Integration.** Custom-built control system links the battery system with the existing traction drive cabinets and motors.
- **Supporting Hardware.** Equipped with electrical harnesses, thermal management, mounting hardware, and structural reinforcement for the deck.

## Product Specifications

Performance Metric	Limited Production Release*	Production Release*
Availability	H2 2025	2027
Applicable Truck Platforms	<ul style="list-style-type: none"> <li>• Komatsu 830E-1AC/-5</li> <li>• Komatsu 930E-4/-5</li> </ul>	<ul style="list-style-type: none"> <li>• Komatsu 830E-1AC/-5</li> <li>• Komatsu 930E-4/-5/-4SE/-5SE</li> </ul> <p><i>Komatsu 730E and 980E platforms will be evaluated for the production release.</i></p>
Average % Reduction in Diesel	10-25%	10-25%
Hybrid Battery Lifetime	6-12 years	6-12 years
Hybrid Battery Capacity	~185 kWh	~185 kWh
Retrofit System Mass	~7.5 tonnes	~6.5 tonnes
Maximum Regen Power	~1,000 kW	~1,400 kW
Additional Features	<ul style="list-style-type: none"> <li>• Power Boost (up to 5% reduction in cycle time)</li> </ul>	<ul style="list-style-type: none"> <li>• Power Boost (up to 5% reduction in cycle time)</li> <li>• Anti-Idle</li> <li>• EV Mode</li> <li>• AHS Compatibility</li> <li>• Onboard Energy Optimization</li> </ul>
Truck Retrofit Time	3-7 days	3 days

\*The limited production release and the production release versions are still in development with their specifications subject to change.



## Additional Customer Support

With offices in key regions, we are equipped to provide you:

- Pre-deployment services such as simulations, safety assessments, operational readiness planning, product installation, and commissioning.
- Insights on diesel savings and greenhouse gas offsets, including integrated analysis of outcomes and recommendations for further diesel consumption improvements.
- Preventative maintenance and replacement of critical hybrid system parts.
- Ongoing technical support and troubleshooting for deployed First Mode equipment.

Contact us today at [hello@firstmode.com](mailto:hello@firstmode.com). **Hablamos Español.**

Photos of the First Mode hybrid system are from the First Mode Proving Grounds in Centralia (USA).

## Interested in hybrid rail?

First Mode's **Hybrid Electric Rail Retrofit** will immediately reduce diesel consumption without additional infrastructure. **Contact us to learn more.**



 **FIRST MODE** For people and planet.

**London**  
10 Bloomsbury Way  
London, WC1A 2SL  
United Kingdom

**Seattle**  
2454 Occidental Ave S  
Seattle, WA 98134  
United States

**Perth**  
165-169 Aberdeen St  
Northbridge, WA 6003  
Australia

**Santiago**  
Cerro El Plomo 5931  
Oficina 1011, Las Condes  
Santiago, Chile