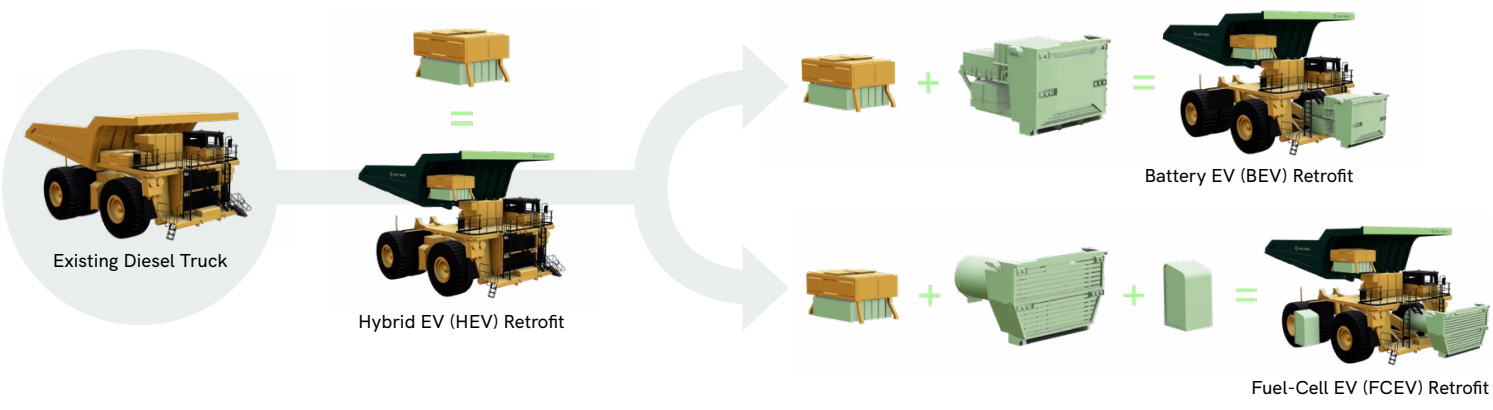
PRODUCT SPECIFICATION

Hybrid Electric Vehicle Retrofit

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

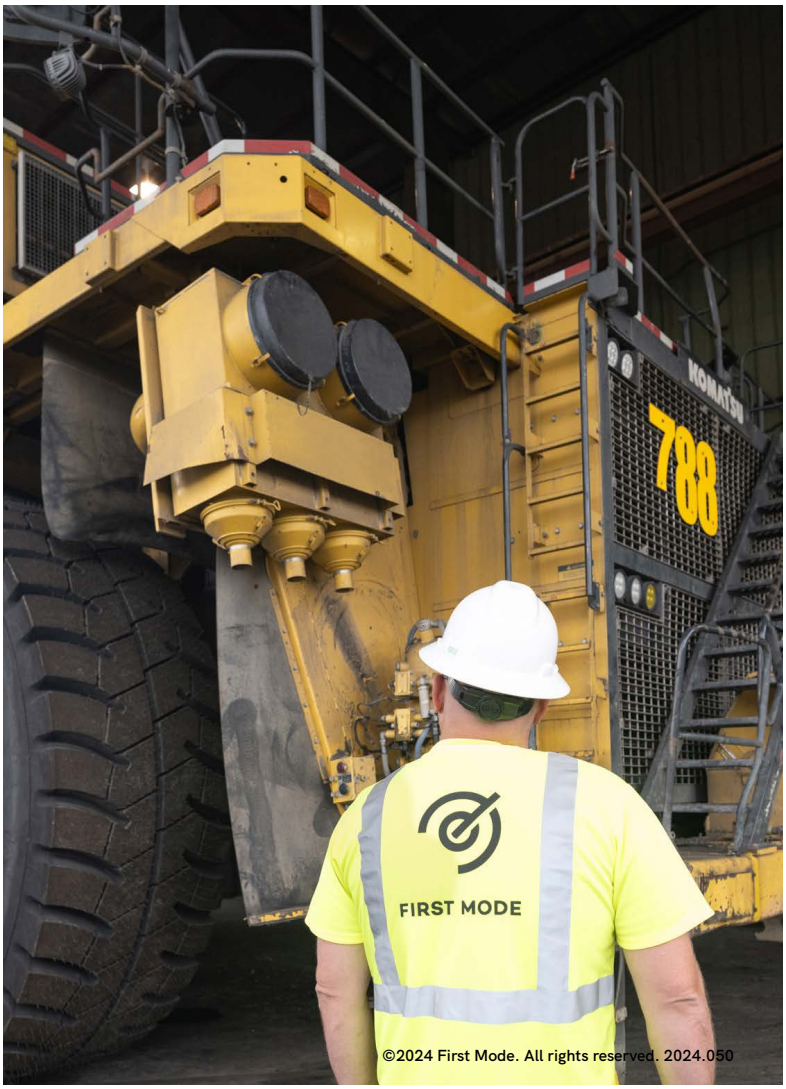
The First Mode **Hybrid Electric Vehicle (HEV)** retrofit product delivers immediate fuel savings and reduces emissions by up to 25% with minimal changes to your existing ultra-class electric drive haul truck and no additional infrastructure. Its low-risk design uses regenerative braking to capture, store, and redeploy energy to the drivetrain while ensuring continuous truck operations when the hybrid elements are inactive. As a modular platform, it also enables the future conversion to either a **full-battery electric vehicle (BEV)** or **fuel-cell electric vehicle (FCEV)** at a pace that you control. No other product in the market provides such proven impact and versatility as you begin on your **Path to Zero**™ today.



At a Glance

- Reduces fuel use and emissions by up to 25%
- Captures and deploys energy through regenerative braking
- Requires no new infrastructure
- Leaves existing drivetrain fully intact
- Ensures continuous operations even when hybrid system is inactive
- Includes fuel savings reporting tools
- Enables seamless upgrade to zero-emissions solutions

Proving Grounds / 46.758267772458986, -122.79399483088939



Product Components

- **Battery Pack.** Rugged, long-lasting, and safe 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, plus galvanic isolation at each battery pack 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.

Key Specifications

Performance Metric	Currently Available Retrofit Platforms	
	Komatsu 930E-4/-5	Komatsu 830E-1AC/-5
HEV Commercial Availability	Q2 2025	Q2 2025
Average % Reduction in Diesel	10–25%*	8–20%*
HEV Battery Lifetime	6–12 years	6–12 years
HEV Battery Capacity	~375 kWh	~250 kWh
Maximum Regen Power	1,500 kW	1,000 kW
Retrofit Kit Mass	~10t	~7t
Max % Reduction in Payload	~3%	~4%
Nominal Loaded Speed	Unchanged from Baseline Truck Platform	
Braking Performance	Unchanged from Baseline Truck Platform	
Truck Retrofit Time	3–7 Days	

*Dependent on various factors like haul routes type and operator driving characteristics

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 HEV parts.
- Ongoing technical support and troubleshooting for deployed First Mode equipment.
- Customer-specific guidance on how to convert the HEV to either First Mode's full battery or hydrogen fuel-cell electric vehicle drivetrains, which are zero-emissions.

Photos of the proof of concept HEV in a controlled test area at the First Mode Proving Grounds in Centralia (USA). Do not attempt.

FIRST MODE For people and planet.

London
10 Bloomsbury Way
London, WC1A 2SL
United Kingdom

Seattle
542 1st Ave S., Suite 300
Seattle, WA 98104
United States

Perth
165-169 Aberdeen St
Northbridge, WA 6003
Australia

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

Johannesburg
144 Oxford Rd, Rosebank
Johannesburg, 2196
South Africa