



# **Transportation Electrification at Scale - Power of Cummins**

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# ABOUT CUMMINS INC.

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**190**  
Countries



**57.8K**  
Global Employees



**1.3M+**  
Engines built in 2020



**8K**  
Distributor & dealer locations



**\$903M**  
Invested in research &  
development in 2020



**102**  
Years of industry leadership



# Global partnerships

**PACCAR**

**KOMATSU**



**HITACHI**  
Inspire the Next

**SCANIA**

**NAVISTAR®**



**DAIMLER**

**LIEBHERR**



**SIEMENS**



*Companies listed on this slide reflect a view of top customers globally but is not an exhaustive list of global partnerships. Companies are listed in no particular order.*

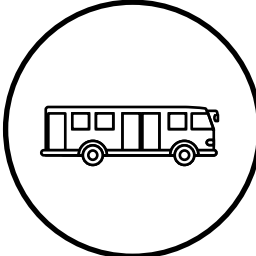
# We serve many markets and applications



Heavy-duty  
Truck



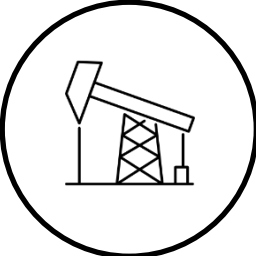
Medium-duty  
Truck



Bus



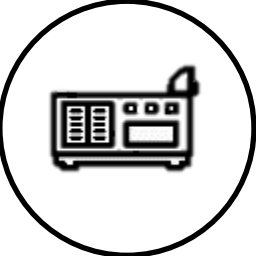
Construction



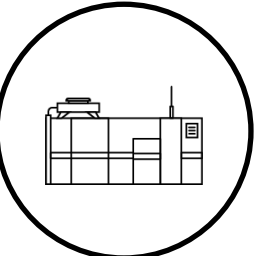
Oil & Gas



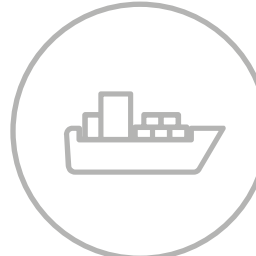
Fire &  
Emergency



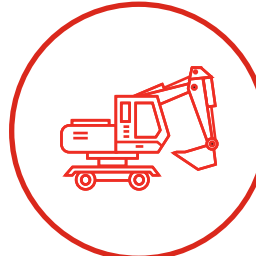
Power  
Generation



Electrolysis



Marine



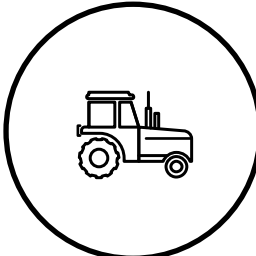
Mining



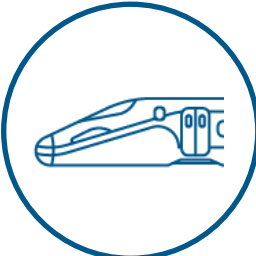
Light-duty Automotive  
& Recreational  
Vehicle



Defense



Agriculture



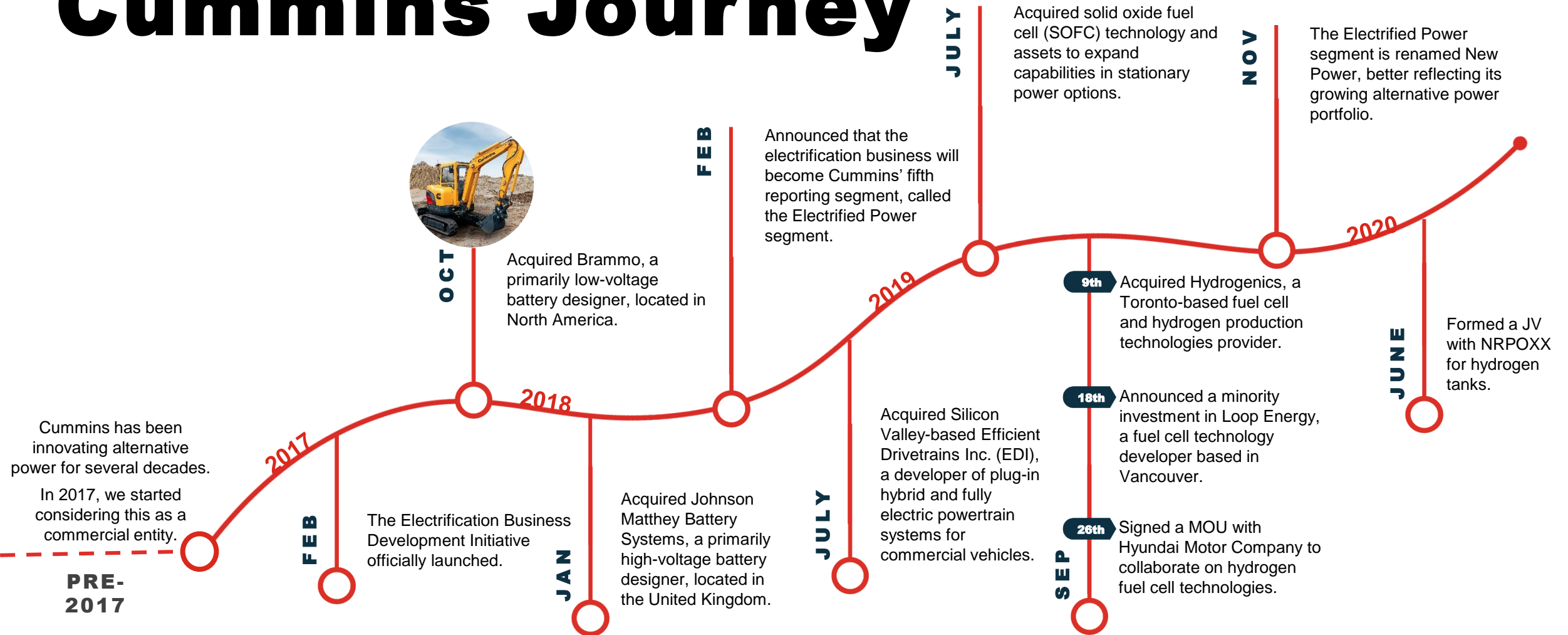
Rail

*This is not an exhaustive display of Cummins-powered markets. Please refer to [cummins.com](http://cummins.com) for the most updated product information.*

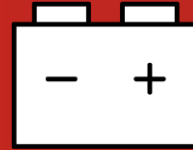


# THE ENERGY SHIFT

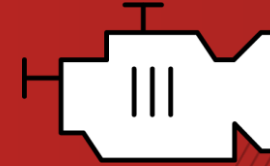
# Cummins Journey



Cummins is a  
global technology  
leader with a  
**broad portfolio** of  
power solutions



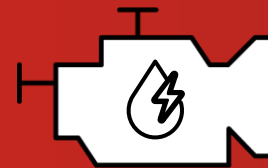
BATTERY  
ELECTRIC



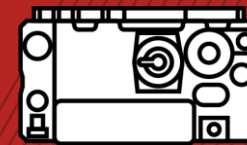
ADVANCED  
DIESEL



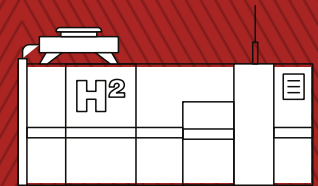
NATURAL  
GAS



HYBRID



FUEL CELL  
ELECTRIC



ELECTROLYSIS

# Cummins Core Technologies



## ELECTRIFIED POWER

Creating technologies and products for commercial battery electric vehicles

- On-highway: transit bus, school bus, medium-duty truck, walk-in van
- Off-highway: construction equipment, terminal tractor, material handling



## FUEL CELLS

Creating and integrating components for hydrogen fuel cell electric vehicles and rail

- Electric vehicles: urban transit bus, commercial fleet, utility vehicle, electric lift truck
- Installation: freestanding electrical power plant



## HYDROGEN GENERATION

Creating solutions for industrial and commercial hydrogen generation and MW-scale energy storage

- Industrial processes and fueling stations: PEM generator, alkaline hydrogen generator
- Critical and uninterruptible power supply, power-to-gas technology



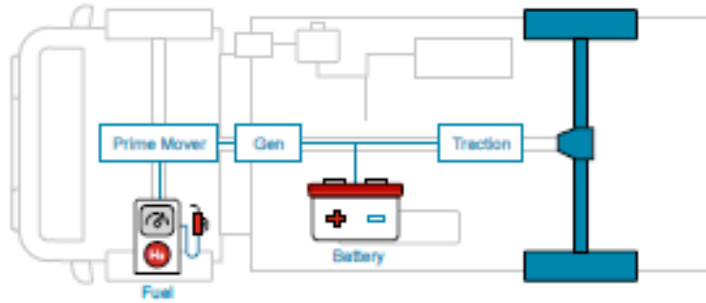


# Cummins Complimentary Technologies

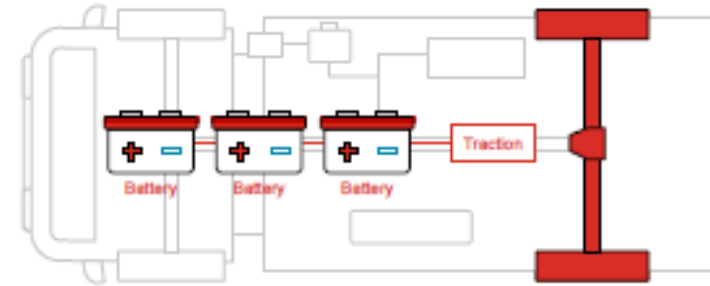
SERVICE + SUPPORT

System Offerings

FUEL CELL & IC ENGINE HYBRIDS



FULL ELECTRIC



BATTERY MATERIALS, MEA'S & CELLS



Fuel cells

+



Battery pack

+



Inverters & converters

+



Controls

+



Engines

+



Accessories, cooling, wiring

+



Storage

=

INTEGRATED POWERTRAIN SYSTEM

BATTERY/ STACK REUSE OR RECYCLE

Components

CHARGING, CONNECTIVITY, HYDROGEN GENERATION + SUPPLY

# In the Field

## BATTERY ELECTRIC

1. GILLIG battery electric transit bus
2. Blue Bird School Bus



## FUEL CELLS

1. Scania Trucks
2. Alstom passenger train
3. Refuse Truck: Cummins fuel cells power FAUN electric refuse trucks on the road today in Europe



## ELECTROLYZERS

1. Hybalance - 1.2-megawatt PEM electrolyzer
2. Cummins-Enbridge Power-to-Gas Facility
3. 5-megawatt PEM electrolyzer for Douglas Co Public Utilities District in Washington State (US)
4. HyLYZER 1000 – 20 MW PEM electrolyzer system
5. Uniper (power-to-gas)



## HYDROGEN FUELING STATION

1. Hydrogen fueling station: Delivered electrolyzers for more than 50 hydrogen fueling stations

# PLANET 2050 aspirational targets

## COMMUNITIES ARE BETTER BECAUSE WE ARE THERE

### 2050 Targets

- Net positive impact in every community in which we operate  
*= sum of environmental good > local environment footprint*
- Near zero local environmental impact

## DOING OUR PART TO ADDRESS CLIMATE CHANGE AND AIR EMISSIONS

### 2050 Targets

- Customer success powered by carbon neutral technologies that address air quality
- Carbon neutrality and near zero pollution in Cummins' facilities and operations

## USING NATURAL RESOURCES IN THE MOST SUSTAINABLE WAY

### 2050 Targets

- Nothing wasted
  - Design out waste in products and processes
  - Use materials again for next life
  - Reuse water and return clean to the community



# PLANET 2050

PROSPERITY | LEADERSHIP | ADVOCACY | NURTURE | ENVIRONMENT | TOGETHER

**NOTES** References to “facilities” relate to all consolidated operations and joint ventures subscribing to Cummins’ Enterprise Environmental Management System. Goals will be periodically assessed for progress and continued practicability

**“Our industry is in a transition. Technology, regulations and customer expectations are changing rapidly, requiring our teams to innovate so they can deliver the value our customers expect.”**

**Vice President and Chief Technical Officer Jim Fier**

