Powering Change Cummins In GSE

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Sustainability achievements

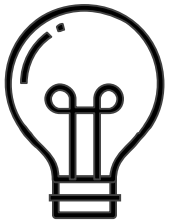
Here are some significant sustainability developments at Cummins in the past year.

2050

PLANET 2050

Adopted strategy to address climate change and other environmental challenges, including science-based goals timed to 2030.

$1 billion



Research & Development

Exceeded $1 billion in annual spending for the first time on research, development and engineering expenses.

2

Hydrogen MW Production

Selected to provide 20 and 5 megawatt electrolyzer to produce hydrogen within North America

100,000

Women's Equality

Impacted the lives of 100,000 people around the world in the first two years of Cummins Powers Women, a program to improve the lives of women and girls.

365

X15 Diesel Engine

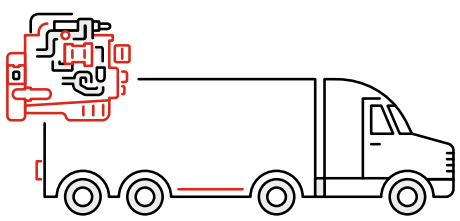
Offered the new Efficiency Series diesel engine, which achieves a 3.5% improvement in fuel economy over the 2017 model, a year ahead of EPA greenhouse gas requirements.

5 OPERATING SEGMENTS

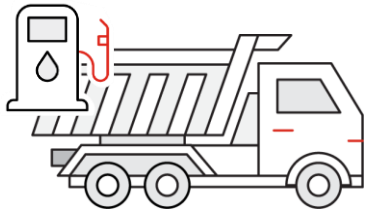
1. Engine
2. Power Systems
3. Components
4. Distribution
5. New Power

Developing Future Powertrains

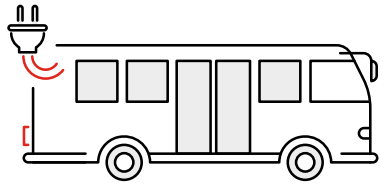
Cummins is developing a range of efficient, clean and capable powertrains, using our integration expertise to help manufacturers define the best power source for their equipment.



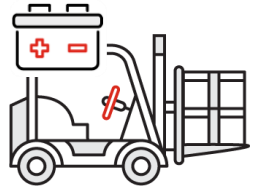
Diesel powertrain



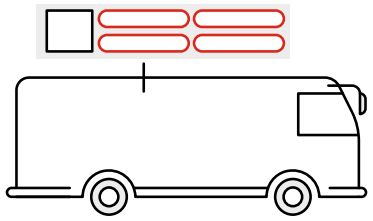
Natural gas powertrain



Hybrid electric



Battery electric



Fuel cell

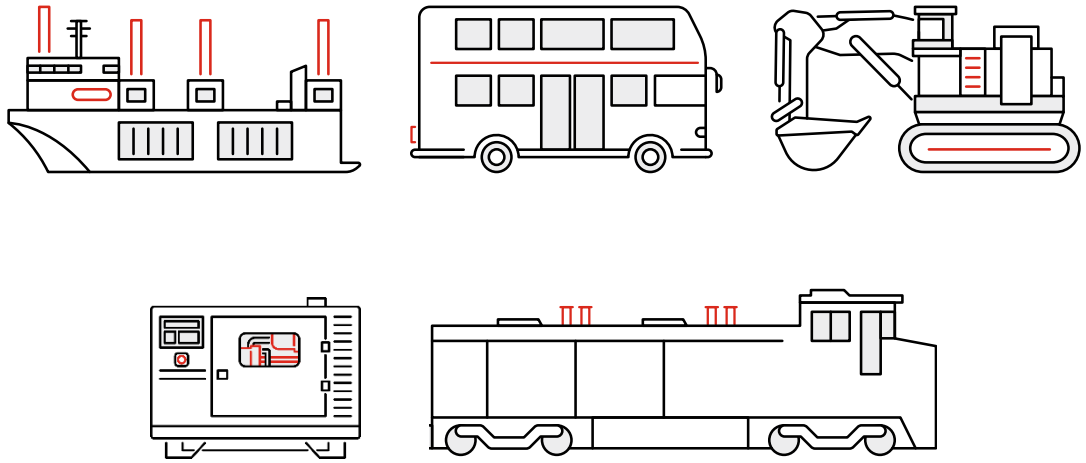
PEM & solid oxide fuel cell & hydrogen production technologies will be important elements in our portfolio of products & technologies.

NEAR-TERM FOCUS:

- Strategic commercialization when market conditions such as technology maturity, regulations, economics and infrastructure are favorable

LONG-TERM FOCUS:

- Scale up when market adoption indicates appropriate
- Continue to invest in development of differentiated next generation technology



Fuel Cells - “The Advantages of both Batteries and ICE’s”




Attribute	Electric	Combustion Engine	Fuel Cells
Zero Emissions	✔		✔
Extended Runtime		✔	✔
Fast Fueling		✔	✔
Quiet Drive	✔		✔
High Efficiency	✔		✔
Route Flexibility		✔	✔
Renewable Capable	✔		✔
Maintenance	✔		✔

Ground Support Equipment- Key OEM partners

TLD - Ground Support Equipment

JBT- Aircraft Ground Support Equipment

ITW GSE (formerly Hobart)- Ground Power Units

RampMaster- Aircraft Refuelers

Wollard International- Ground Support Equipment

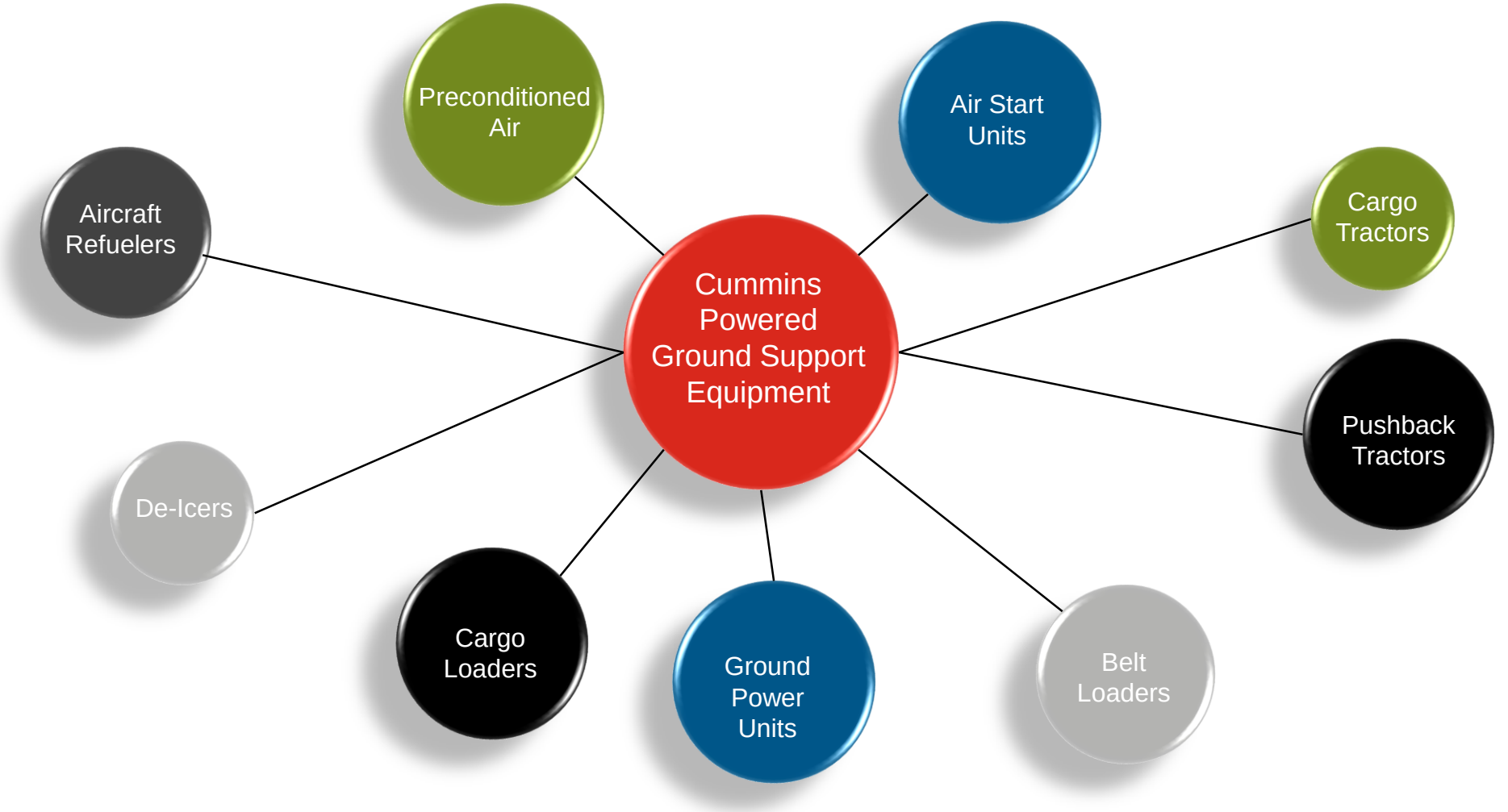
Textron GSE (Formerly TUG)- Ground Support

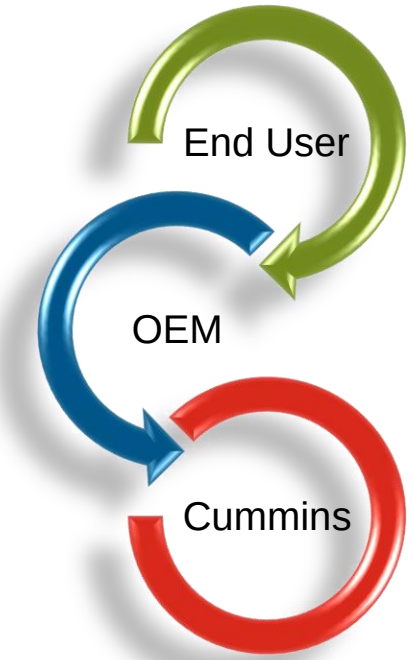
Eagle / Tronair- Ground Support Equipment

RCL- Ground Support Equipment Refurbishment

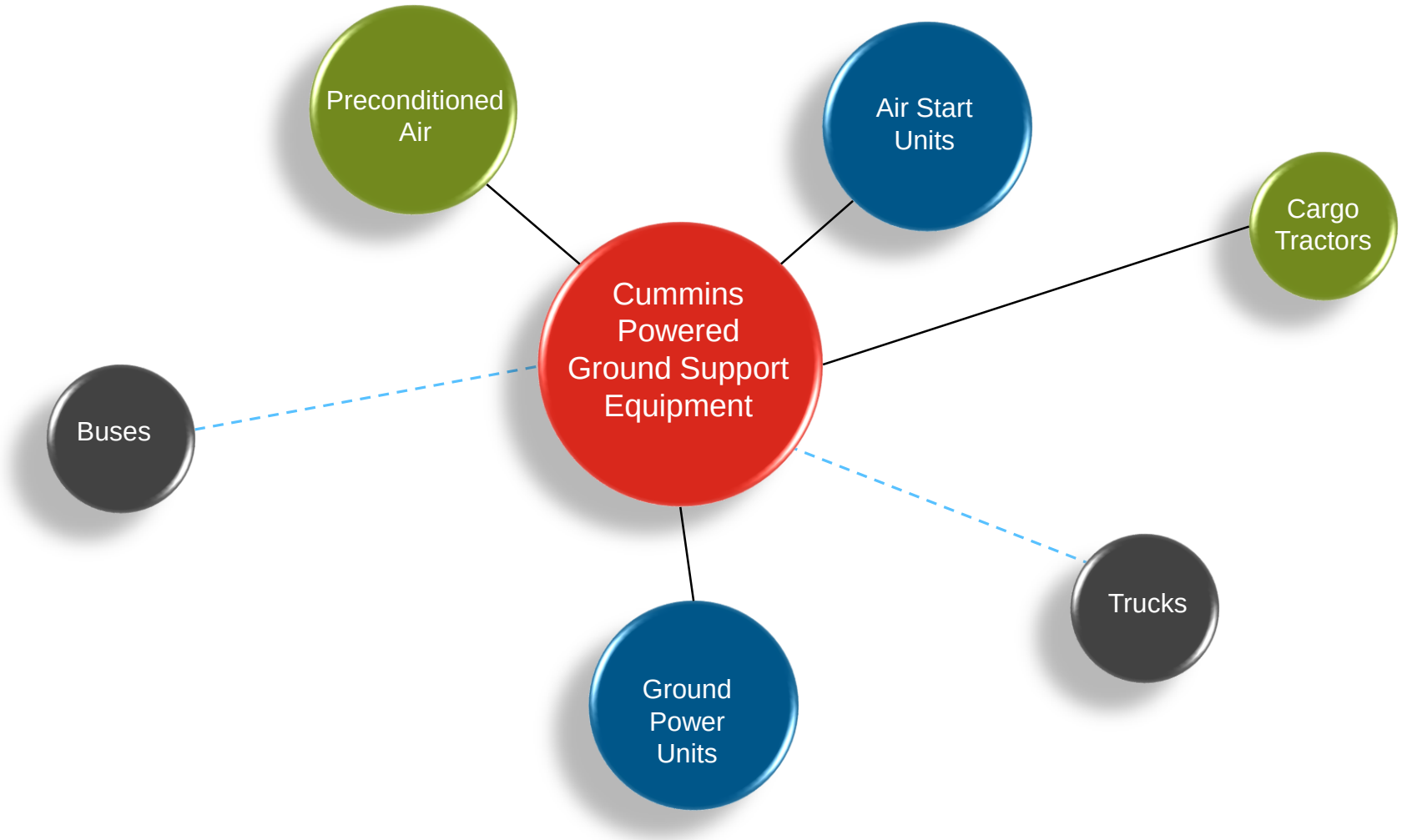
Air + Mak Industries- Ground Support Equipment

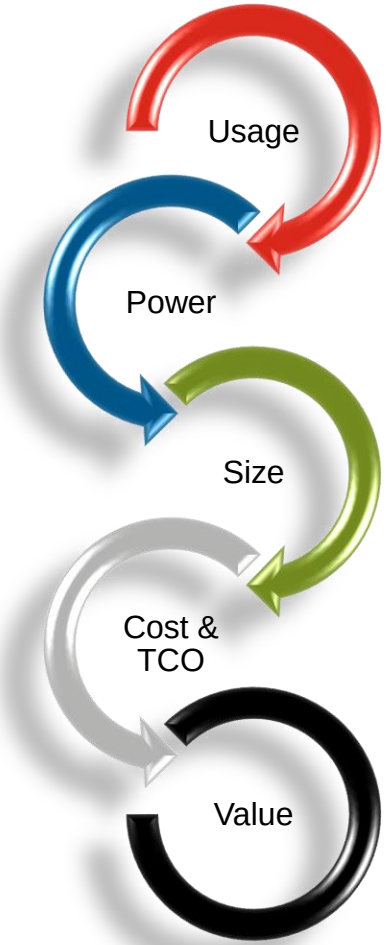
Cummins - GSE applications





Potential H2 early adapters - GSE





Hamburg Airport says “Yes” to Hydrogen

“The Hydrogen tow tractors are already today so mature that in the coming years they can be can be further-developed for mass production without a problem.“

Axel Schmidt (L.) Department Director Environment, with Wolfgang Schümann (R.), Project leader Hydrogen Tow Tractors at the Hamburg Airport

Source http://www.airport.de/resources/downloads/GB_2009_web(5).pdf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