



Hydrogen Technology for Freight Rail

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2

Global Leader in Freight and Transit Rail Technologies



+50

COUNTRIES

~29K

EMPLOYEES

FREIGHT: 72%

TRANSIT: 28%

GEOGRAPHY

**~55% NON-U.S.
REVENUES**

34%
Services

18%
Equipment

12%
Components

8%
Digital Intelligence



PORTFOLIO

\$9.7B

2023 REVIEW

28%
Transit

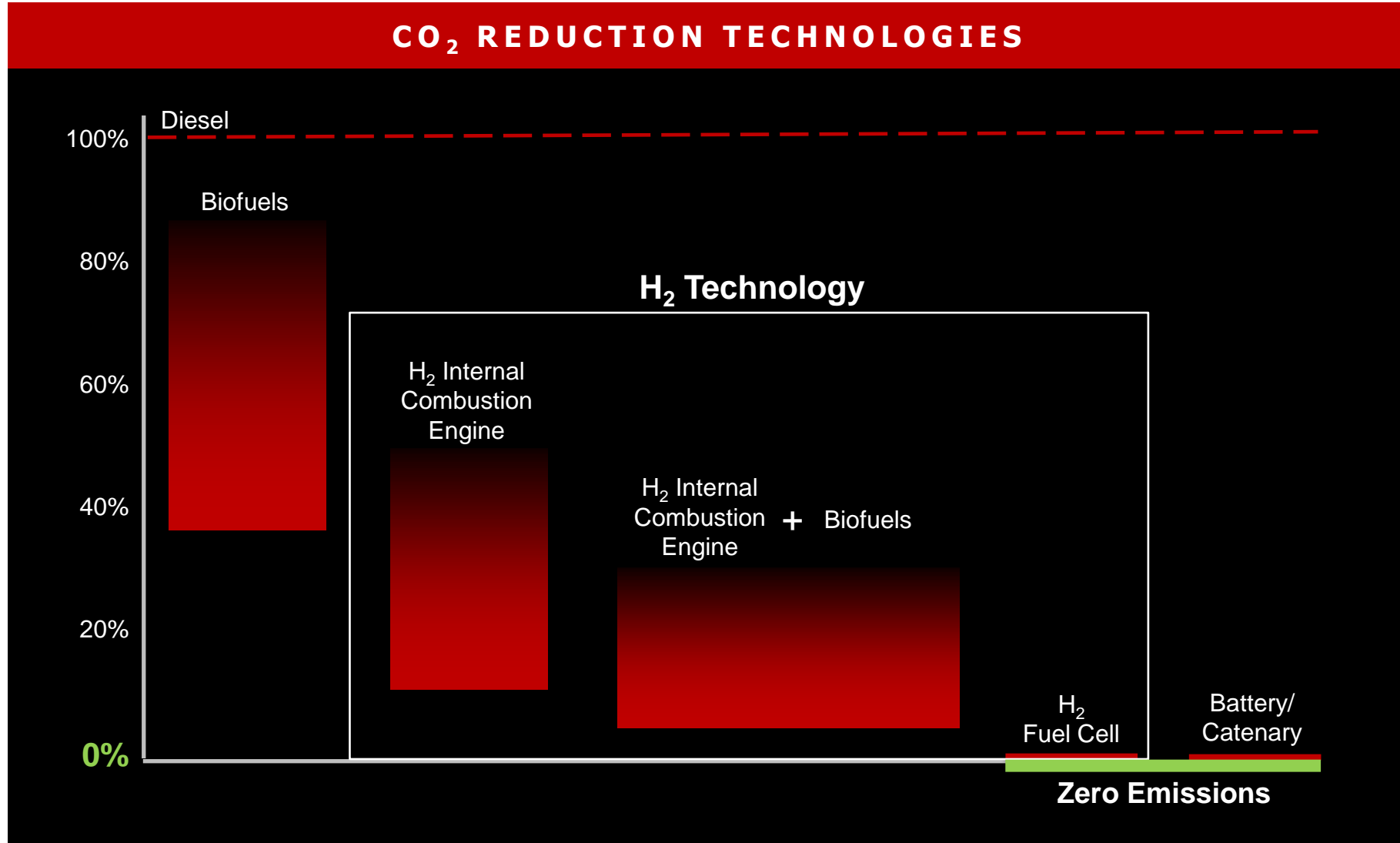
Leader in North American
Freight Locomotives Mfg.
& Services

1 out of 5 rail shipments
in the world is pulled by
a Wabtec Locomotive



Role of H₂ in Achieving Net Zero

3





Hydrogen Power Technologies

4

H₂ Engine

Substitution of diesel fuel with hydrogen. Can also be combined with bio-based fuels to further reduce CO₂.

50-90%
CO₂ Reduction

Partial PM Reduction
No NO_x Reduction

Flexible Fuel



H₂ Fuel Cells

Utilize hydrogen fuel to generate zero emission power. Provides traction power and energy to charge batteries.

Net Zero Potential

100%
PM & NO_x Reduction

Fixed Fuel



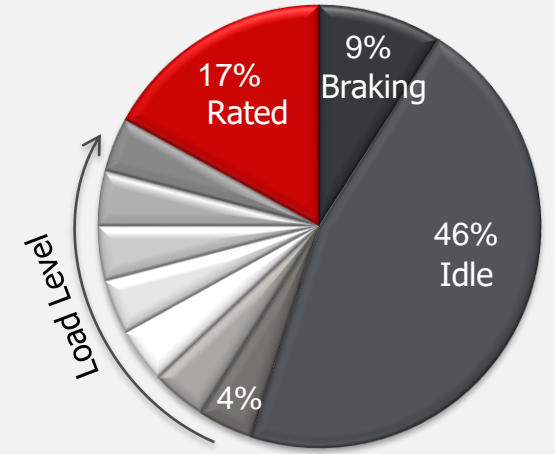


Locomotive Challenges

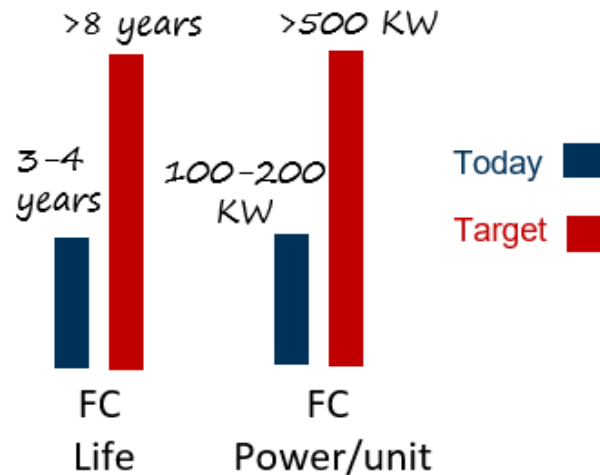
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Aggressive Duty-Cycle

MWh/Yr	:	3500-4000
Power (kW)	:	~3300
Loco Operation	:	30+ Yrs.
Daily Uptime	:	80%+
Diesel used/yr	:	~940,000 L
Refuel freq.	:	~1 week/fill



Freight Duty Cycle

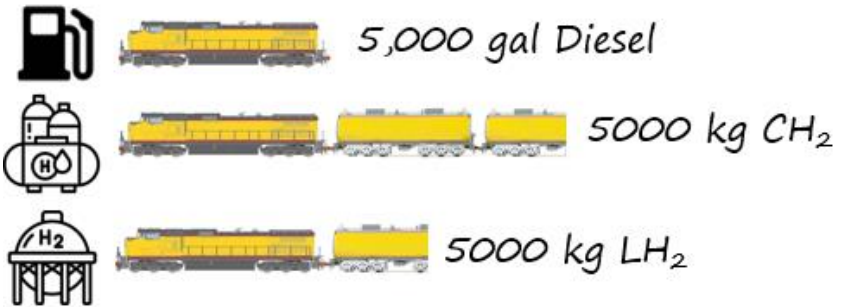
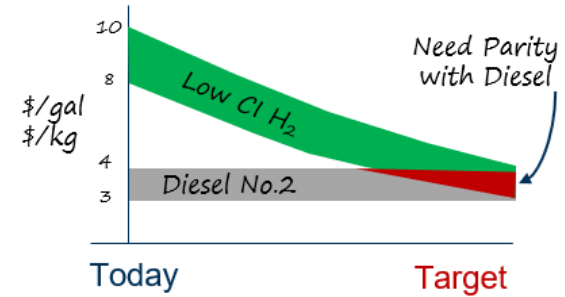
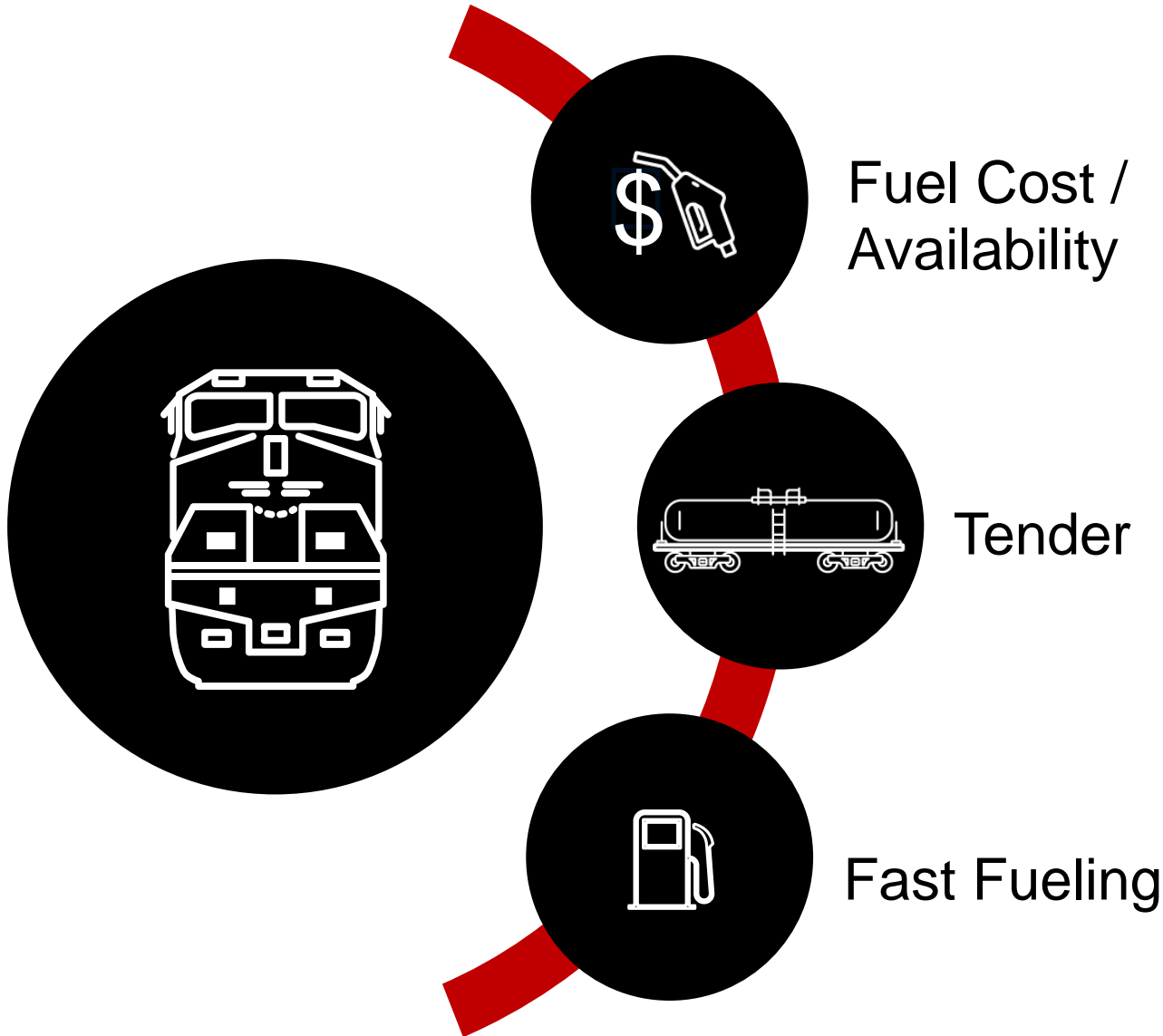


Fuel Cell Technology Maturity



H₂ Ecosystem Challenges

6



	Today	Target
Diesel	00:30	LH ₂
CH ₂	06:30	00:40
LH ₂	01:30	



THANK YOU