



Lessons Learnt on FCB Maintenance (2015 – 2022)

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JIVE user group event, Madrid 2022

VDL Citea SLF120



VH EXQUICITY



Wrightbus Pulsar



Safran Businova H2



VH A330 Fuel Cell



Cities

London

Rotterdam

Versailles

Pau

Aalborg

Background

29 FC Buses

5 Cities

7 FCB operators

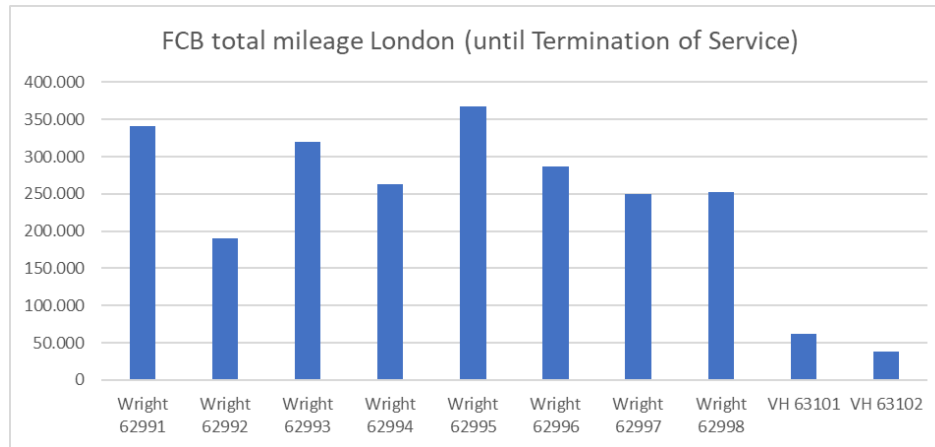
2 FC providers

4 Bus manufacturers

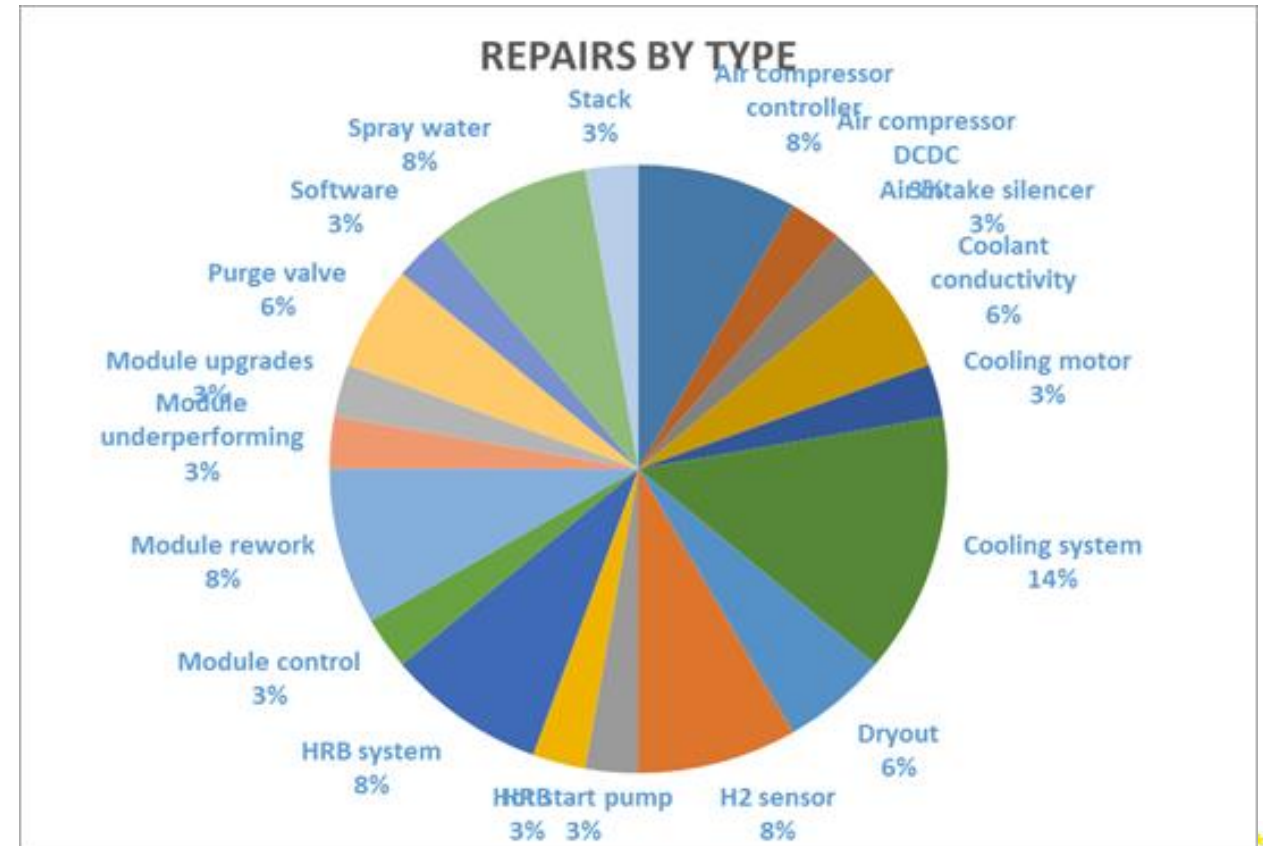
3 London (8 Wright buses + 2 VanHool buses)

8 London FCB in operation since 2011 (under CHIC). Total 2.120.000 km. Service Termination in March 2020.

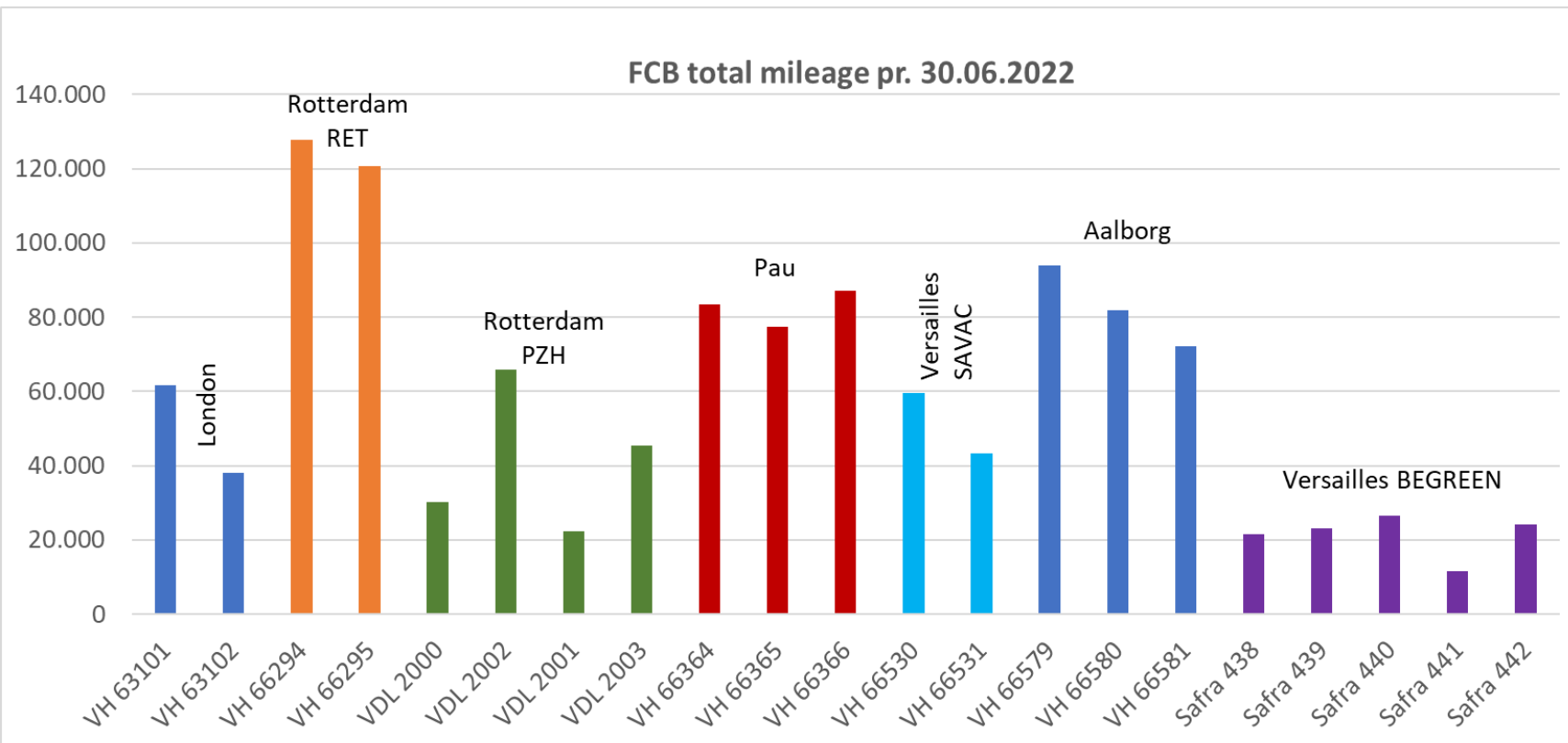
2 London FCB (VanHool) in operation since 2017 (under 3Emotion). Service Termination in March 2020 – re-deployment in October 2021)



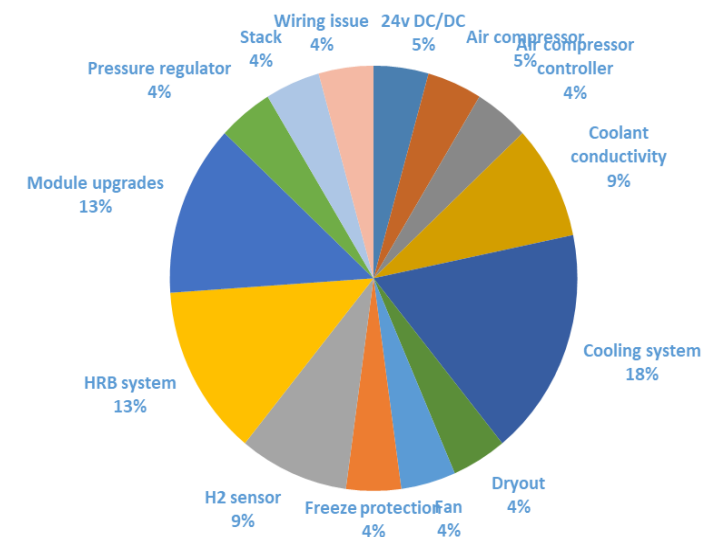
Site	Fleet No.	Module No.	Fuel cell hours
London	62991	HD 6 – 75 - 002	26.108
London	62992	HD 6 – 75 - 003	32.281
London	62993	HD 6 – 75 - 004	32.618
London	62994	HD 6 – 75 - 005	27.571
London	62995	HD 6 – 75 - 007	28.128
London	62996	HD 6 – 75 - 023	35.018
London	62997	HD 6 – 75 - 06	25.825
London	62998	HD 6 – 75 - 022	35.186



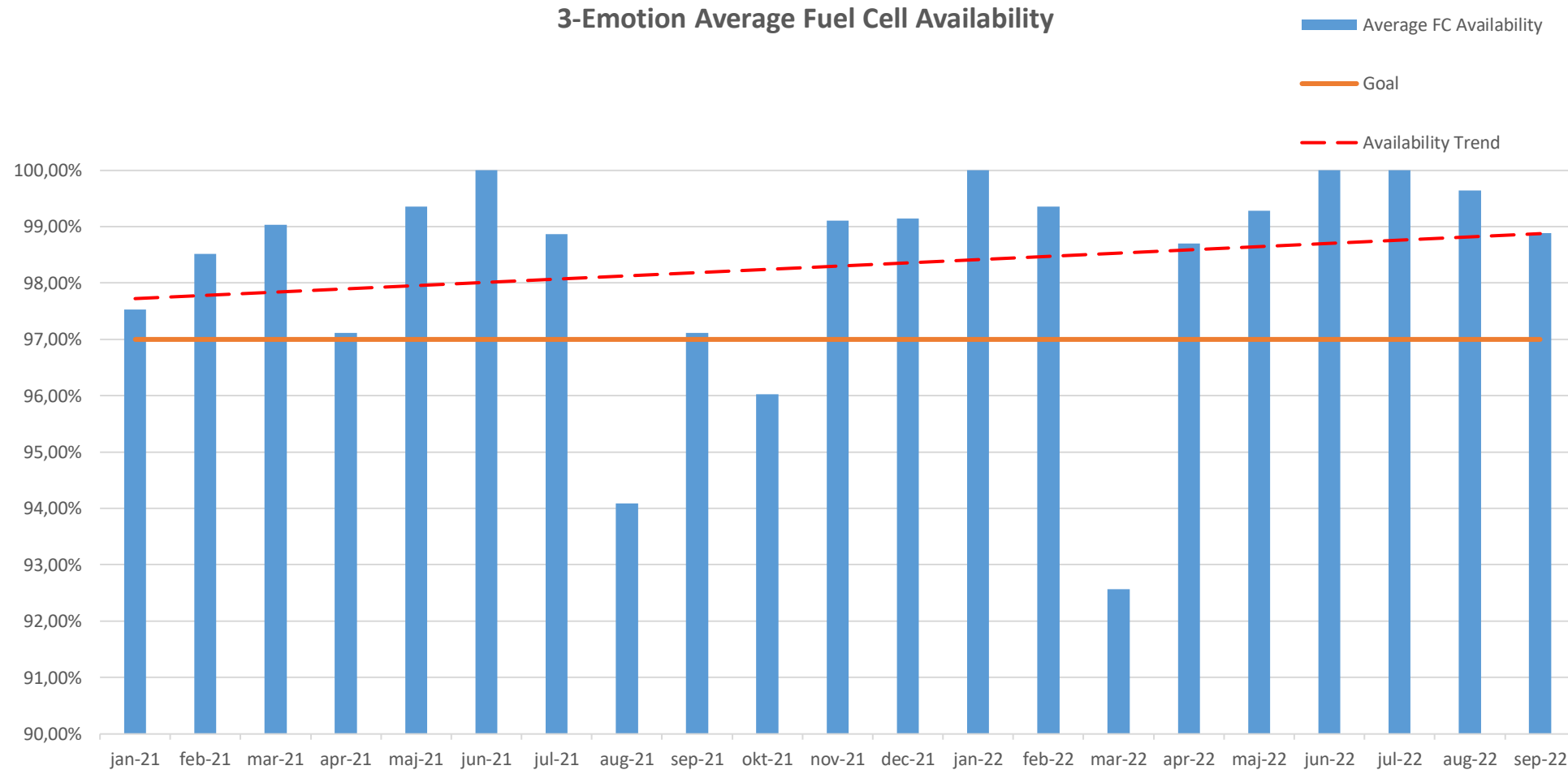
FCB total mileage pr. 30.06.2022



REPAIRS BY TYPE

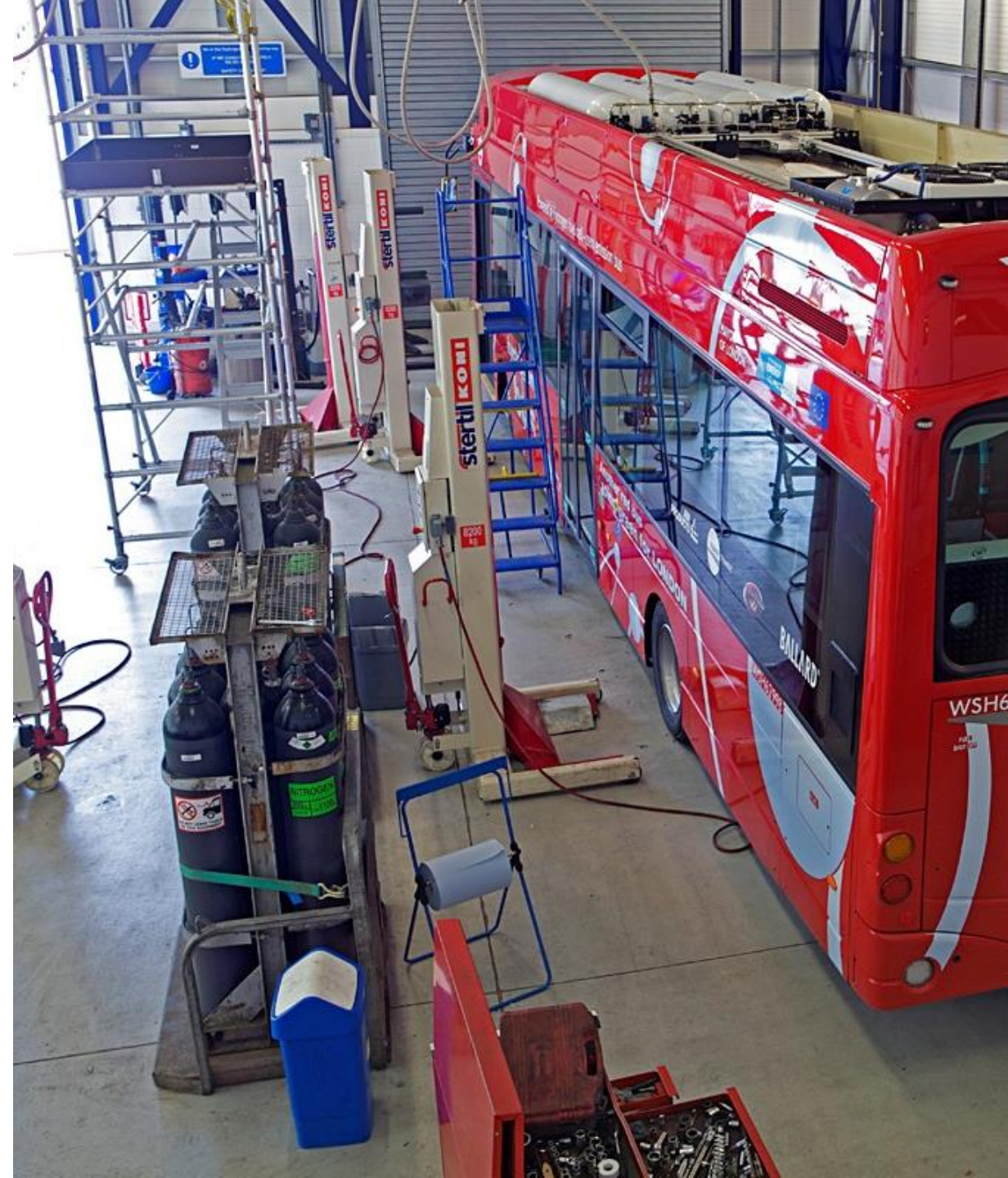


Fuel Cell Availability



Maintenance is key to any bus operation

Hydrogen fuel cell buses can fit into the same maintenance regime as diesel buses.



Hazards

Not just hydrogen



High Voltage

High Pressure

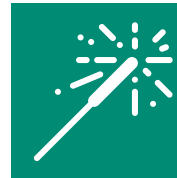
Hydrogen



H₂

Hydrogen

Hydrogen is in an enclosed system within the bus



Heat – ignition source

No naked flames, ATEX wiring, certain spark resistant tools



Alarm system

Detection of hydrogen, especially where hydrogen would be expected to form a cloud



Venting

If hydrogen is in building it is removed

Technicians and Training

What is required and how do you get there.



No need to recruit outside organisation

A good diesel technician can be converted.



Dedication and focus is required

Technicians must want to undertake FCEBs



Manufacturer's training

Ballard offer 3 tiers of training



3 new areas

Hydrogen, high voltage, pressure

FCEB operating in normal service



us-depots-for-hydrogen

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Blog

How to Adapt Your Bus Depot to Refuel and Service Hydrogen Fuel Cell Buses

[Clean Energy Fuel Cell Electric Buses](#)
Nov. 19, 2020 5 minute read

Article by [David Yorke](#)

As community leaders and transit operators plan the transition to zero-emission bus fleets, the question arises: "How can we adapt our existing bus depots to refuel and service a fleet of hydrogen fuel cell buses?"

As you'll learn in today's article, the modifications are simple, straightforward, and well-understood. We'll walk you through what depot adaptations are needed so you can successfully transition your fleet and begin providing clean, zero-emission transit service to your community.

Hundreds of major transit providers have successfully and safely transitioned to hydrogen

Today, there are 3,400 fuel cell electric buses (FCEBs) in operation all over the world. Collectively, these buses operate from hundreds of facilities that have been converted for hydrogen. So, you can rest easy knowing that the question of how to convert and maintain your facility for hydrogen fuel cell buses has already been answered hundreds of times.

[See all...](#)

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INFORMATIONAL:

Fuel Cell Electric Buses

Adapting Maintenance Facilities for Hydrogen

This informational will provide you with essential details on what's involved when modifying your bus depot to service hydrogen buses.

Key Topics:

- The properties of hydrogen and how to adapt your bus depot with safety in mind
- Key requirements for any facility servicing hydrogen fuel cell buses
- How to put the right procedures and documentation into place
- A case study on how London's Tower Transit adapted their depot for hydrogen

Get informed and inspired. Download this free informational.

<https://blog.ballard.com/adapting-bus-depots-for-hydrogen>

<https://info.ballard.com/adapting-maintenance-facilities-for-hydrogen>



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Thank you

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