BALLARD®

FUEL CELL POWERED
ZERO EMISSION
TRANSPORTATION

FCveloCity™

BALLARD®

"The reliability and performance of this bus in revenue service shows the maturity of the fuel cell hybrid technology."

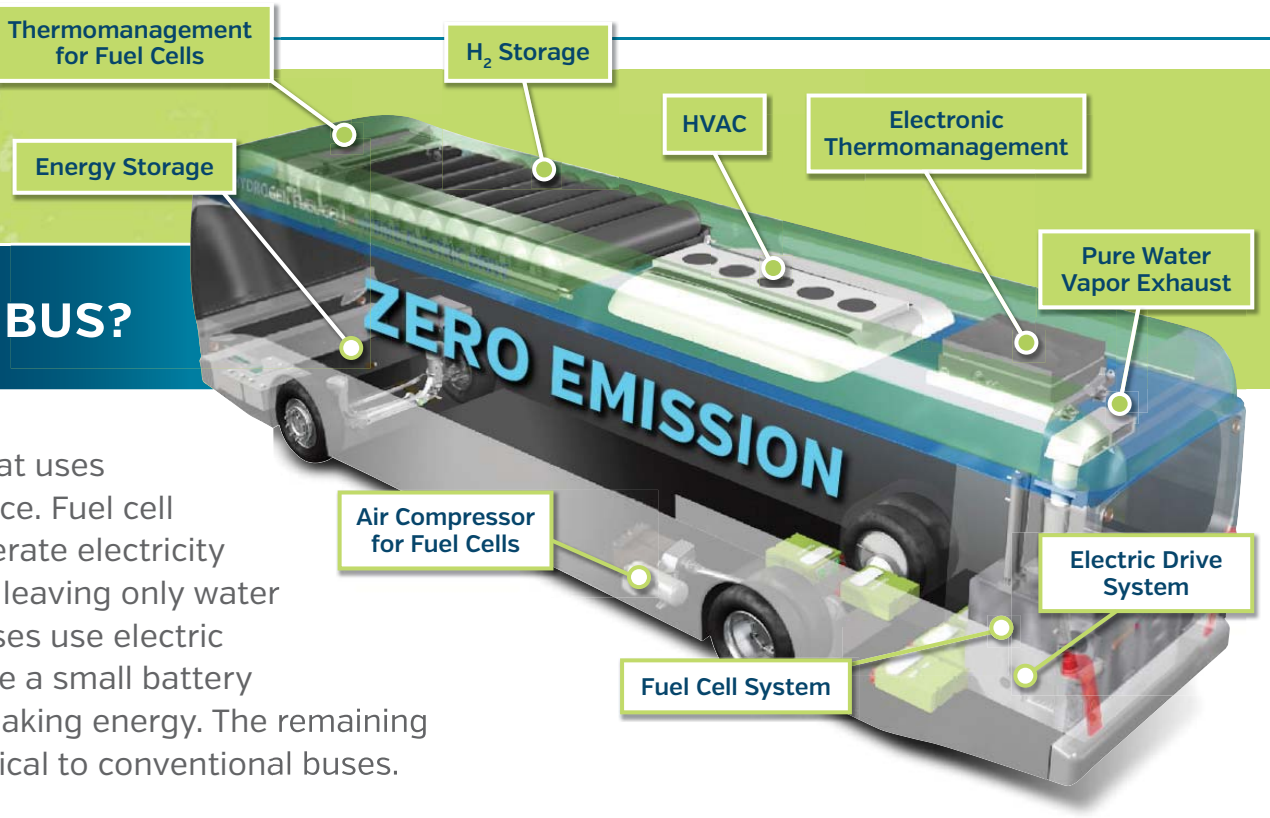
– **Tommy Edwards**, Deputy Chief Performance Officer for SunLine Transit Agency

WHY FUEL CELL BUSES?

Transit bus duty cycles are extremely challenging. Fuel cell hybrid buses are the only solution to deliver zero emissions at the tailpipe with no compromise in vehicle performance.

- **ZERO-EMISSION**
  Improve air quality by eliminating GHG emissions & particulate matter
- **OPERATIONAL FLEXIBILITY**
  Provide long driving range and short refueling times with route flexibility
- **PERFORMANCE**
  Comparable to diesel buses in terms of acceleration, speed & gradeability
- **TECHNOLOGY MATURITY**
  More than 100 fuel cell buses in operation by late 2016, with a further 300 planned for China
- **EFFICIENCY**
  Two to three times more efficient than diesel buses, reducing fuel costs
- **PASSENGER COMFORT**
  Quiet and smooth driving experience

WHAT IS A FUEL CELL BUS?



A fuel cell bus is an electric vehicle that uses compressed hydrogen as its fuel source. Fuel cell power modules onboard the bus generate electricity through an electro-chemical reaction leaving only water and heat as by-products. Fuel cell buses use electric motors for propulsion and may include a small battery to boost acceleration and capture breaking energy. The remaining bus structure and operation are identical to conventional buses.

FCveloCity® PRODUCT FAMILY

Ballard supplies the FCveloCity® power module to manufacturers for integration into bus and light rail applications, ready for deployment in transit fleets. Designed for scalability, ease of integration and serviceability the FCveloCity® module product range is available in various configurations between 30kW and 200kW.

Before starting its daily route, a fuel cell bus is refueled with hydrogen in less than 10 minutes.

"We are very pleased with the performance of the fleet of fuel cell buses, as well as with the ongoing service and support that Ballard is providing."

– **Mike Weston**, Transport for London's Director of Buses

WHY BALLARD?

Ballard's high performance FCveloCity® power modules have demonstrated exceptional reliability while clocking millions of kilometers on the road in transit bus fleets. Over seven generations of product development, Ballard has:

- Partnered with more than 10 bus manufacturers and integrated with four different drive systems.
- Powered more than 100 fuel cell buses at transit agencies in 20 cities.
- Created 6 global service centers to ensure fleet availability.

BALLARD FUEL CELL BUS CASE STUDIES

Transport for London

FCveloCity® powered fuel cell buses operated by Transport for London (TfL) are now an established fixture of the scenic RV1 route, taking passengers past major landmarks.

The fleet has been operating in service for more than 73,000 hours, with fuel performance and reliability exceeding expectations. The lead fuel cell module in this program has exceeded 20,000 hours of operation without failure.

SunLine Transit Agency

Over the years, SunLine Transit in California has pursued an aggressive strategy for implementing clean technologies into its fleet. The FCveloCity® powered American Fuel Cell Bus developed by BAE Systems, ElDorado and Ballard began operation at SunLine Transit, in 2012.

Ballard now has five fuel cell powered buses in operation at SunLine Transit – four developed by BAE/ElDorado and one designed by NewFlyer. To date, the fleet has traveled 480,000 kilometers and operated more than 20,000 hours.

CONNECT WITH BALLARD®

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