

BALLARD

**FUEL CELL POWERED
ZERO EMISSION**

TRANSPORTATION



FC *veloCity*®

Advanced Clean Transit Technology Symposium
Sacramento, CA - February 8, 2016

Dr. Christopher Guzy
Vice President and Chief Technology Officer

Ballard's Market Leadership

BALLARD®

OVER 7 GENERATIONS OF HD DEVELOPMENT, BALLARD HAS :

- Partnered with over 10 bus manufacturers
- Integrated 4 different drive systems
- Powered more than 100 fuel cell buses in 20 cities
- Driven over 8 million km across 12 countries with challenging climates and road conditions
- Created 6 service centers around the globe to ensure fleet availability
- Achieved 20,000 hrs of operation on individual fuel cell stacks in London



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

Fuel Cell Bus Program Evolution

BALLARD®



PHASE 7 – Lower-Cost, Longer-Life Power Module
2015 – Introduced at UITP 2015 in Italy



PHASE 6 - Hybridization of Fuel Cells
2009-2014, Whistler, Canada



PHASE 5 - Serial Production
2002-2009, 5 Continents, CUTE (30), Perth (3),
California (3), Beijing (3)



PHASE 4 - Fuel Cell Engines Beta Sites
1999-2002, Palm Desert, USA



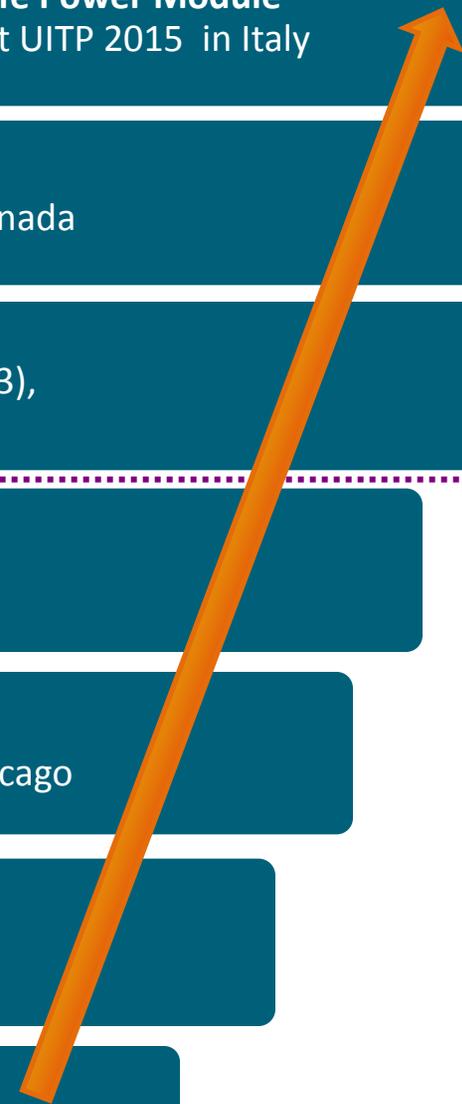
PHASE 3 - Fleet Demonstration Alpha Sites
1996-1999, 3 Vancouver, Canada & 3 Chicago



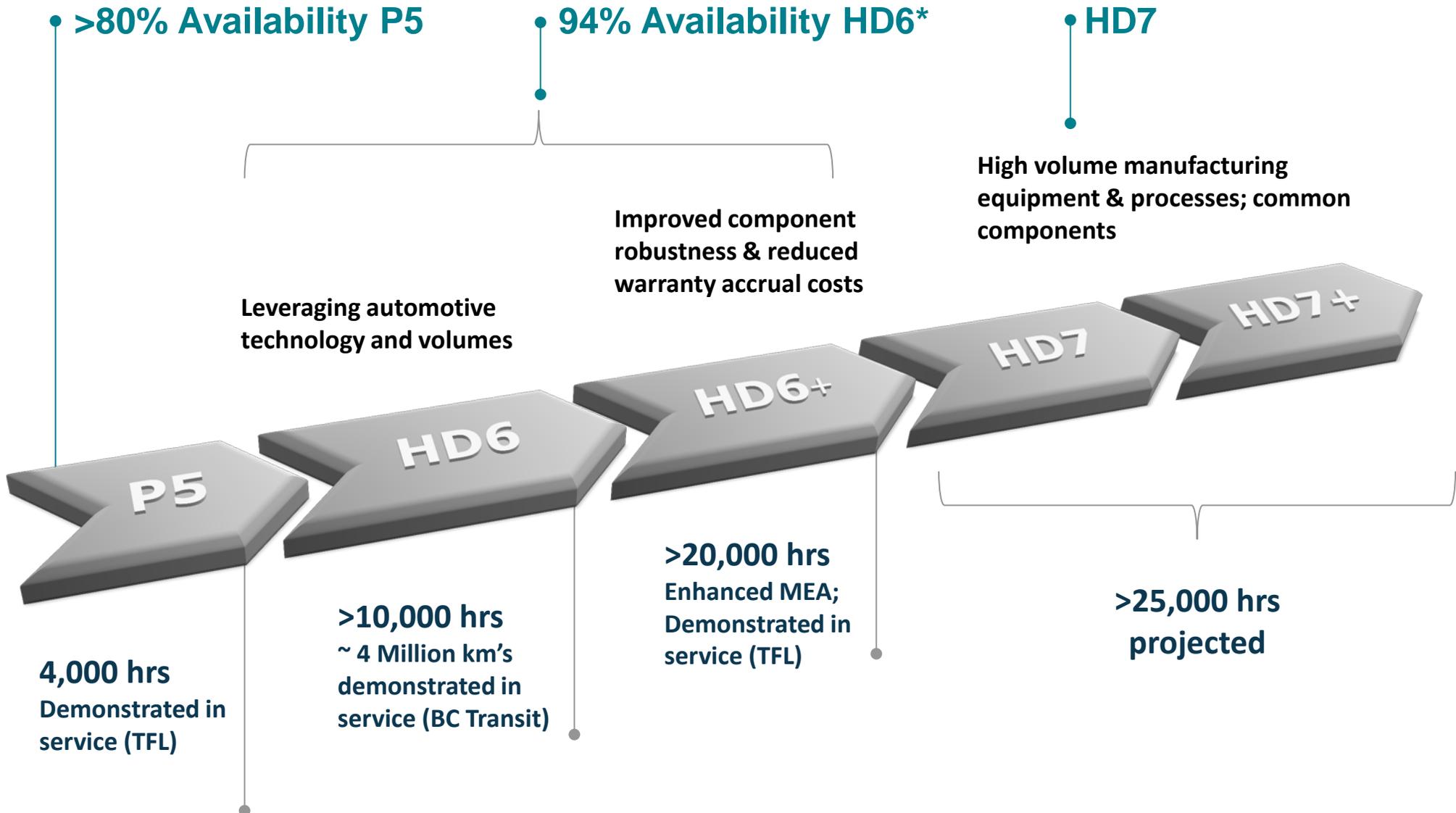
PHASE 2 - Commercial Prototype
1993-1995, Vancouver, Canada



PHASE 1 - Proof of Concept
1991-1992, Vancouver, Canada



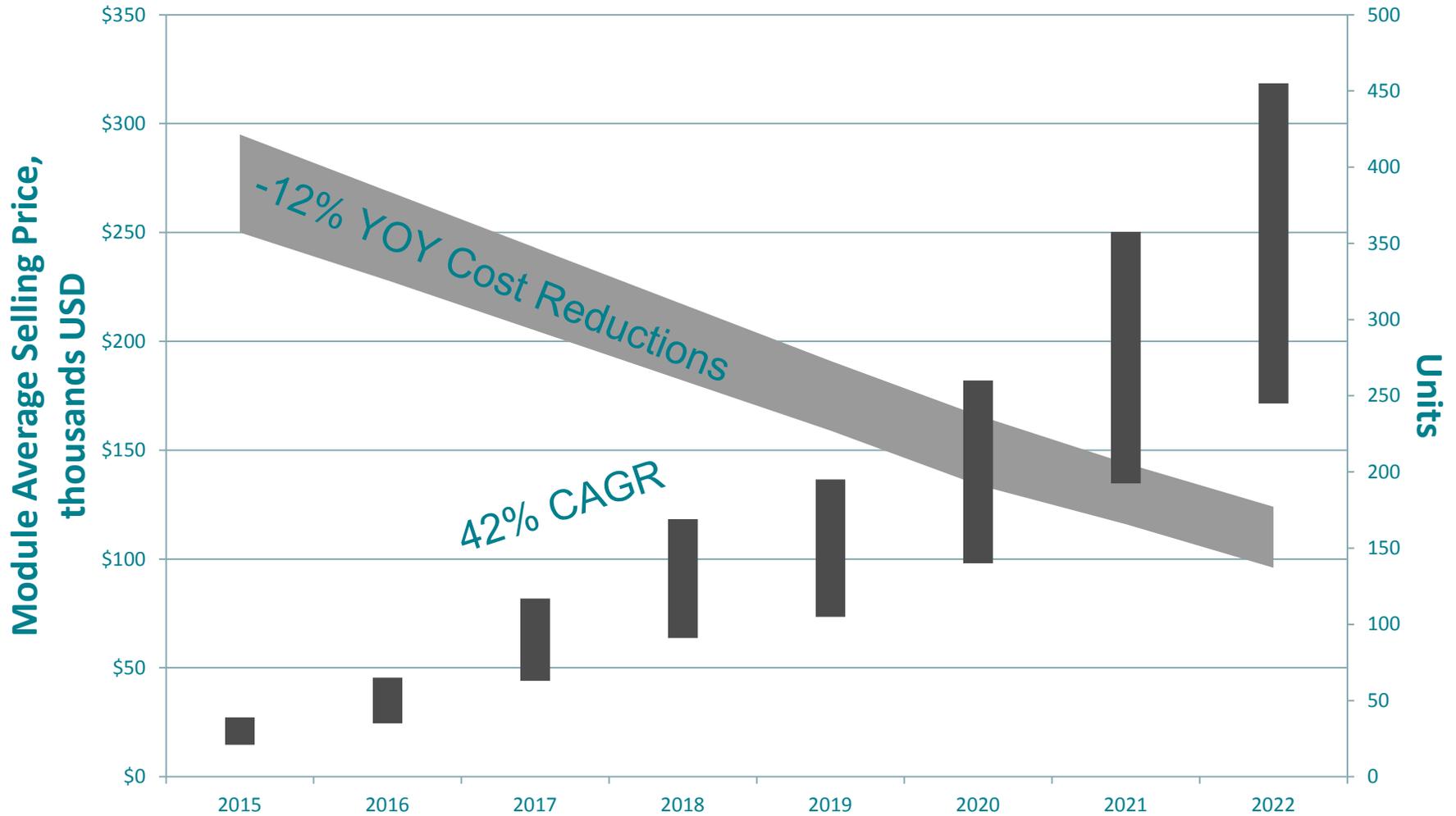
Ballard's Technology Leadership



* AFCBP 2nd Evaluation, <http://www.nrel.gov/docs/fy15osti/64344.pdf>, page 16

Projected HD Fuel Cell Module Capital Costs

Europe and North America



Cost Reduction and Volume Roadmap for the HD Fuel Cell Module

FCveloCity[®] Motive Module Product Line

BALLARD[®]

The FCveloCity[®] motive module product line is designed to meet all motive application power requirements from 30kW to 200kW.

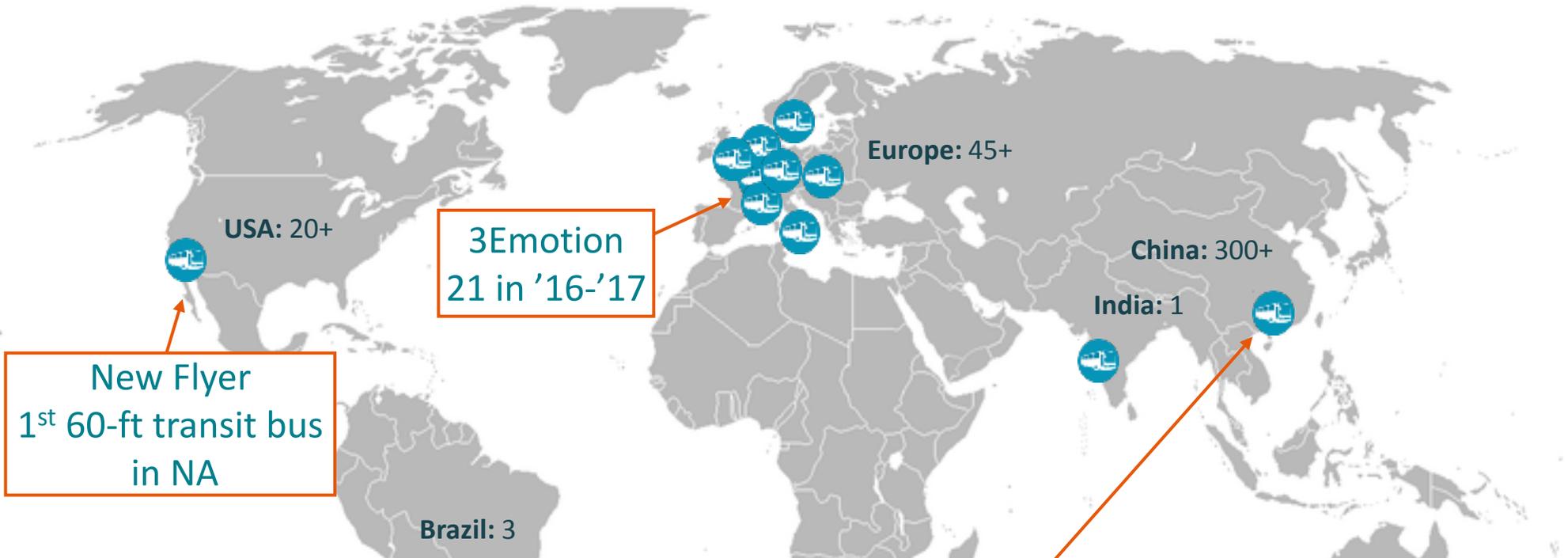
Product Series	FCveloCity [®] -MD	FCveloCity [®] -HD	FCveloCity [®] -XD
Net Power Level	30kW	60kW, 85kW	200kW
Application	8 to 10 meter buses, battery hybrid range extenders	10 to 25 meter hybrid fuel cell buses	Tram, light rail and marine units
Availability	Available now	Available now	Under development for 2016 launch



Extending Ballard's Market Leadership



45 buses in operation today + 350 new fuel cell buses in the next 18 months



New Flyer
1st 60-ft transit bus
in NA

3Emotion
21 in '16-'17

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News Releases

Ballard Lands \$17M Deal For Deployment of ~300 Fuel Cell Buses in China

September 25, 2015

For Immediate Release

- Largest ever global deployment of fuel cell buses
- Deal includes deployment of new 30kW & 60kW power modules

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Thank you

www.ballard.com