



# Fuel cells for clean ships

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Date: 15<sup>th</sup>-16<sup>th</sup> June 2017

The background of the slide is a photograph of a modern, multi-story building with a light-colored facade. The word "BALLARD" is mounted in large, white, three-dimensional letters on the upper part of the building. A vibrant rainbow is visible in the sky to the right of the building. In the top-left corner, there is a teal square containing the word "BALLARD" in white, sans-serif font with a registered trademark symbol.

**BALLARD®**

## Power to change the World®

- Committed to sustainable mobility and clean air for everyone
- Relentlessly developed technology 38 years
- We have leading talent, with >500 people passionate about our mission
- \$85m in revenue in 2016, up 51%



## We are strategically positioned.

- Customer-centric, diversified & synergistic business model
- Leader in core markets
- Strong balance sheet
- Listed for >20 years on NASDAQ and TSX
- Strategic shareholders:



### Our Platforms

#### Technology Solutions



Intellectual  
Property &  
Engineering  
Expertise

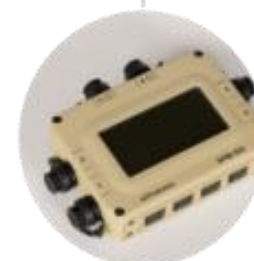
#### Power Products



Heavy Duty  
Motive



Material  
Handling



Portable Power



Backup Power

The image features a teal square in the top-left corner containing the 'BALLARD' logo in white. The background is a photograph of several Ballard fuel cell stacks, which are black rectangular units with silver-colored metal frames and electrical connectors. Some stacks have blue labels with the 'BALLARD' logo and 'FCvelocity-95SL' text. The stacks are arranged in a row, receding into the distance.

**BALLARD®**

## We have leading technology.

- World leader in PEM fuel cells
- 2,000 patents & applications
- 3 million MEAs manufactured
- 320 MW of fuel cell products shipped



# Ballard Technology Solutions.

**Mission:** help our customers solve difficult technical and business challenges in their fuel cell programs through delivery of customized, bundled technology solutions.

**Solutions:** technical expertise, deep IP portfolio, and supply of technology to drive future opportunities





The background of the slide is a photograph of a Ballard FCvelocity-9S5L fuel cell system. The system is a large, rectangular unit with a black top surface and a blue and white front panel. It is connected to various cables and hoses, including a prominent blue hose with a "Manco Sport" logo. The system is mounted on a metal frame, and the overall environment appears to be a laboratory or industrial setting.

**BALLARD®**

## We deliver innovative technology solutions:

- System Interfaces
- Testing Services
- Test Stations
- Product Development
- Component Manufacturing
- Licensing and Technology Transfer

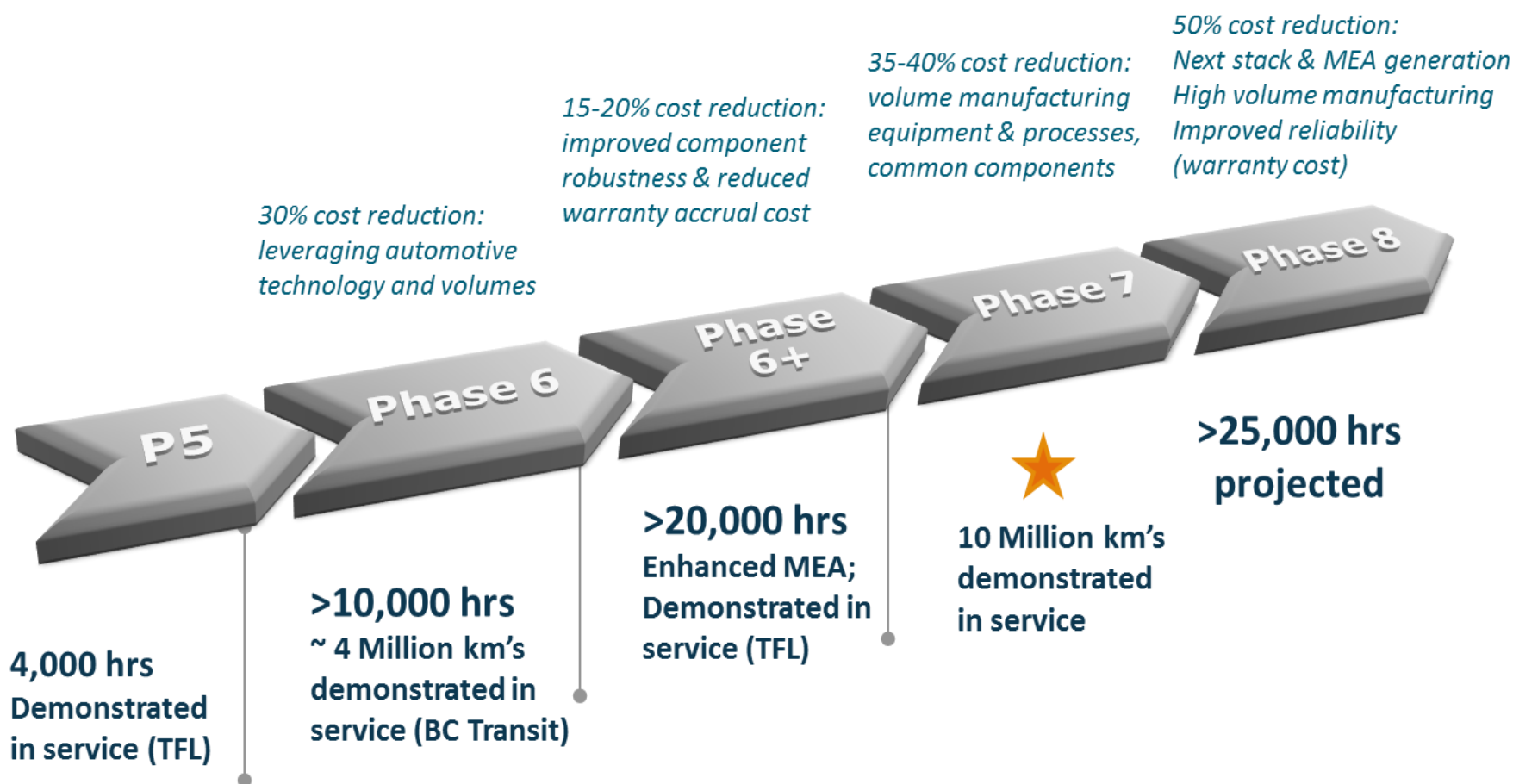
# Several generations of FCveloCity® product improvement.

**2003**

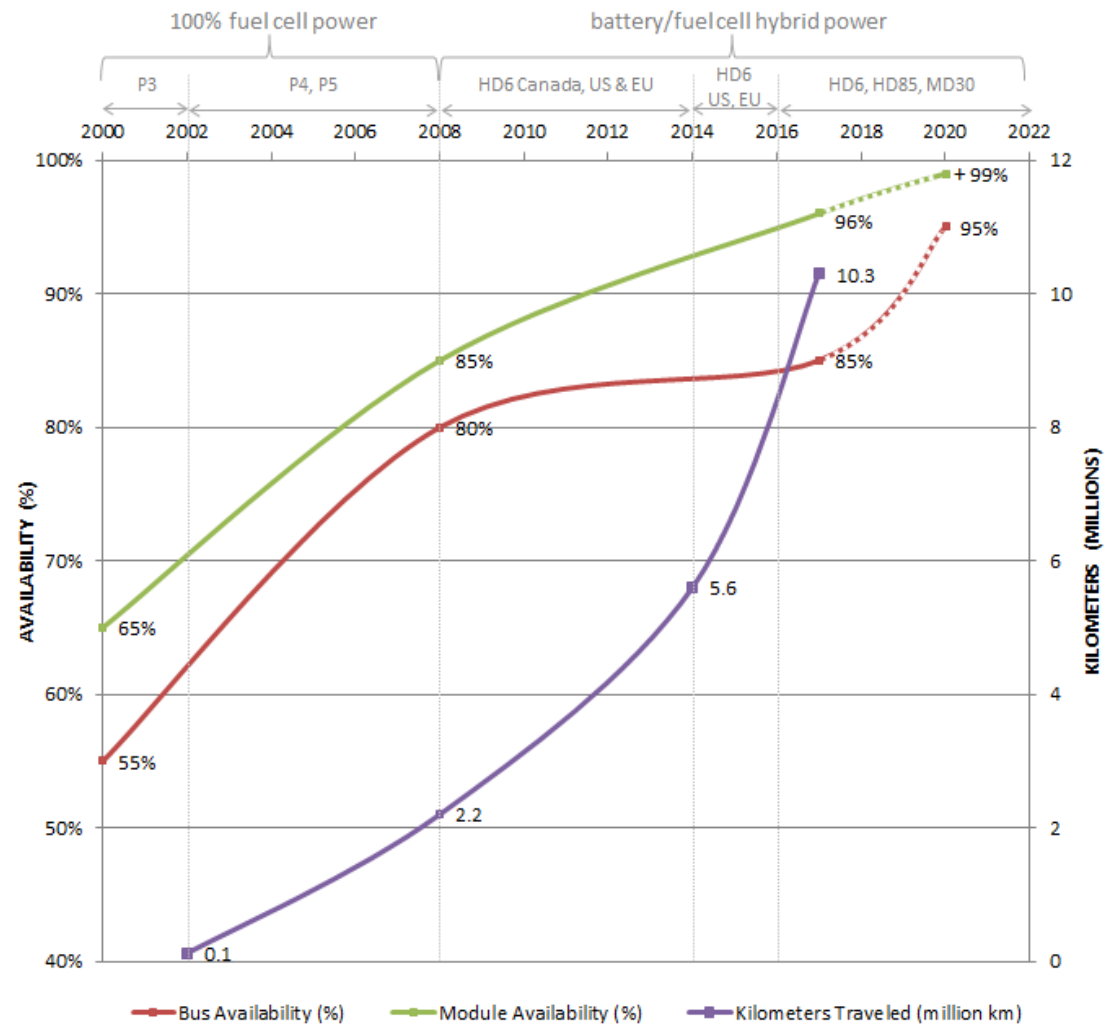
**2008-2015**

**2015-2018**

**2018+**



Years of road experience with performances equivalent to conventional vehicles.





The image shows two large, dark grey, rectangular fuel cell modules mounted on a metal frame. The module in the foreground has a textured top surface and various ports and labels on its side, including 'TO RADIATOR 2', 'HYDROGEN', and 'CTR'. The background module is partially obscured. A teal square with the 'BALLARD' logo is in the top left corner. A semi-transparent white box with text and a bulleted list is overlaid on the left side of the image.

**BALLARD®**

## FCvelocity® Heavy Duty Modules

- Modular product range from 30kW to 200kW integrated power modules (“engines”)
- 100kW and 200 kW designed and tested to rail standards
- Products designed for heavy duty usage
- Durable (>20,000hrs stack life in service)

The background image shows a large, dark blue industrial fuel cell system with its top cover open, revealing internal components like blue and yellow hoses. It is mounted on a metal frame. A semi-transparent grey box containing text is overlaid on the left side of the image.

## Technical features set FCveloCity® apart from the competition.

- Integrated safety system
- Integrated humidification to maximize system performance and durability
- Climate protection
- High efficiency
- Operational flexibility
- World leading PEM fuel cell stack



A detailed view of a Ballard FCveloCity fuel cell system. The system is composed of several blue high-pressure hoses connected by metal fittings. A control unit with a red cap and various sensors is visible. A small white label with the 'BALLARD' logo is attached to the system. The background shows a workshop or laboratory setting with a checkered floor.

**BALLARD®**

## FCveloCity® enables accelerated and flexible vehicle/boat integration.

- Integration ready
- Air and cooling delivery systems
- Onboard controller
- Remote diagnostics
- Applications engineering support
- Integration tool kit



## From bus to boat

- 20 years of experience in designing heavy duty fuel cell engines.
- Integration experience with multiple vehicle platform (bus, truck, train..)
- Proven technology is millions of operating hours in service



# Ballard Maritime Experience.

- We participated to number of studies and evaluations projects.
- Learnings:
  - Access to liquid hydrogen is important for viable business case
  - Fuel cell offers a value proposition for application beyond the reach of battery (larger boats)
  - Marinization of fuel cell module is possible

## Marine Testing Experience

- Complied with draft marine standard developed by Lloyds Register
- FCveloCity® power module have undergone marine testing
- Key tests completed:
  - Inclination
  - Dynamic Inclination (The hoist was raised and lowered to  $\pm 22.5^\circ$  with a 10 second period)
  - Shock and Vibration



*Ballard's 150kW Module Inclination Test*



*Ballard's 150kW Module Vibration Test*

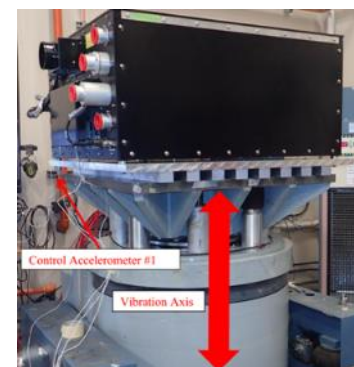


## Product testing capabilities

- Ballard has completed electromagnetic compatibility testing at a module and bus level
- The FCveloCity® modules are designed to minimum of IP55 (IP56 for next generation product)
- Testing to validate the IP rating completed
- FCveloCity® module vibration tested



IP Testing



HD85 Vibration Testing



200kW Module  
Electromagnetic Compatibility Testing





**BALLARD®**

# Ballard Power Systems Europe.

- Headquartered in Hobro, Denmark
- More than 50 people
- European service and repair center
- Applications engineering support
- Product development & manufacturing



The background of the slide features a group of eight Ballard service team members standing in front of white Ballard fuel cell vans. The vans have the Ballard logo and the slogan "PUTTING FUEL CELLS TO WORK" on them. The team consists of seven men and one woman, all dressed in black professional attire with "BALLARD" embroidered on their shirts. They are standing on a paved area in front of a modern building with large windows.

**BALLARD®**

## We have a dedicated service and support team.

- Call center (24 hours a day, 7 days a week)
- After sales service team in DK, Germany, UK
- Regional spare parts inventory (DK)
- Training center (DK)
- Repair centers (DK)



The Ballard logo is displayed in white, bold, sans-serif capital letters within a teal rectangular box. The background of the entire advertisement is a scenic photograph of a city skyline at dusk, with buildings and sailboats reflected in the water.

**BALLARD®**

Power to Change  
the Word®

**[WWW.BALLARD.COM](http://WWW.BALLARD.COM)**