

ETI ALPHADIRECT MANAGEMENT SERIES

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IN FOCUS: BALLARD POWER SYSTEMS, ITS GROWTH STRATEGY AND THE RAPID GLOBAL COMMERCIAL DEPLOYMENT OF FUEL CELL SYSTEMS.

This report focuses on Ballard Power Systems Inc. (BLDP), its growth strategy and the factors that are paving the way for the rapid commercial deployment of fuel cell systems.



Source: www.energytechinvestor.com

THE ALPHADIRECT ENERGYTECH INVESTOR INSIGHT

We believe that the underlying strengthening of the fuel cell business is reflected in Ballard's record revenue year and strong 2017 year-end results. The Company achieved positive adjusted EBITDA for a full fiscal year and we believe Ballard is well positioned to satisfy the growing global interest and increased demand for fuel cell-powered transportation applications. In our view, Ballard is poised at the intersection of three global megatrends, namely, decarbonization, air quality, and electrification of transport which are all part of the global movement toward significantly reducing or even eliminating internal combustion engines from urban centers. In vehicle use cases where customers require long range, rapid refueling and full route flexibility, fuel cells offer a compelling value proposition. We believe that fuel cells offer a viable customer solution in the near- and mid-term timeframe for a growing range of heavy and medium duty vehicles. Additionally, Ballard anticipates growth in global markets like China, Europe and North America over the medium term.

BLDP Business Snapshot

Founded: 1979

Headquarters: Burnaby, Canada

Ticker: BLDP (NASDAQ/TSX)

Stock Price: USD\$3.23*

Market Cap: USD\$569 million*

Website: www.ballard.com

*As of March 19, 2018



About alphaDIRECT EnergyTech Investor

EnergyTech Investor, LLC (ETI), a division of AlphaDirect Advisors, is a research and Investor Intelligence firm that creates and implements digital content and programs to help investors better understand a company's key drivers including industry dynamics, technology, strategy, outlook and risks as well as the impact they could have on the stock price. EnergyTech Investor's expertise encompasses a variety of sectors including Clean Transportation, Emerging EnergyTech, Energy Services, Smart Buildings, Solar, Water Value Chain and Industrial. EnergyTech Investor was founded by Wall Street veteran and research analyst, Shawn Severson, after seeing a significant shift in the investment industry that resulted in less fundamental research conducted on small cap companies and a significant decline in information available to all investors. ETI's mission is to bridge that information gap and engage companies and investors in a way that opens information flow and analytical insights.

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Participants

Mr. Randy MacEwen
President & Chief Executive Officer
Ballard Power Systems Inc.

Mr. MacEwen has been the President & CEO and a member of the board of directors of Ballard since October 2014. He has held executive roles in clean energy companies for over 15 years, including fuel cells and solar. From 2009 to 2014, Mr. MacEwen was Founder and Managing Director of NextCleanTech LLC, a cleantech consulting firm. From 2005 to 2009, Mr. MacEwen served as President & CEO of Solar Integrated Technologies, Inc., a commercial rooftop solar company. From 2001 to 2005, he served as Executive Vice President, Corporate Development of Stuart Energy Systems Corporation, a leading supplier of hydrogen generation systems. Mr. MacEwen began his career as a corporate associate at Torys LLP, a leading business law firm, where he specialized in M&A and corporate finance from 1995 to 2001.

Mr. Shawn Severson
Founder and CEO
EnergyTech Investor, LLC

Mr. Severson is the founding partner and CEO of EnergyTech Investor, LLC. He has over 20 years of experience as a senior research analyst covering the technology and cleantech industries. Prior to founding ETI he led the Energy, Environmental and Industrial Technologies practice at the Blueshirt Group. Mr. Severson was frequently ranked as a top research analyst including one of the Wall Street Journal's "Best on the Street" stock pickers and multiple awards as Starmine's top three stock pickers.



ABOUT BALLARD POWER SYSTEMS INC.

Ballard Power Systems Inc. engages in the design, development, manufacture, sale and service of proton exchange membrane (PEM) fuel cell products for a range of applications. The company provides Power Products for Heavy Duty Motive, Portable Power, Material Handling and Backup Power applications and also provides Technology Solutions that help customers accelerate their fuel cell development programs.

Ballard believes it is poised with highly-disruptive and field-proven technology at the convergence of three global megatrends – decarbonization, air quality and electrification of propulsion systems – presenting a compelling future for the business. The company's fuel cell value proposition is gaining traction across a broadening array of fuel cell electric vehicles (FCEVs) that include buses, commercial trucks and rail, in the key geographic markets of China, Europe and the U.S. In the company's view FCEVs will become a meaningful portion of the heavy, medium and light duty transport markets where long range, rapid refueling and route flexibility are customer requirements. In addition, in management's view the company also offers significant embedded optionality in such markets as fuel cell passenger vehicles and drones.

Ballard Power Systems Inc. was founded in 1979 and is headquartered in Burnaby, Canada, a suburb of Vancouver. To learn more, please visit www.ballard.com.



Randy MacEwen, CEO of Ballard Power Systems Inc. Source: Ballard Power Systems

Shawn Severson: First, thank you for taking the time to speak with us and the investment community today, Randy. Ballard Power Systems had a very strong 2017 in terms of executing your growth strategy for fuel cell products and services, particularly in the transportation space and continuing to deliver positive financial results. Could you discuss the factors that are opening a path for the rapid commercial deployment of fuel cell engines?

Randy MacEwen: Thanks Shawn, I appreciate the chance to share an update on our corporate strategy.

You are correct – we had a strong 2017, and this is reflected in the underlying strengthening in our business and strategy. To begin, let me spend just a moment on our 2017 financial results. Ballard delivered record revenue of \$121.3 million, positive Adjusted EBITDA of \$3.3 million for the full year and year-end cash reserves of \$60.3 million. I believe we are the first publicly-traded fuel cell company to achieve positive Adjusted EBITDA for a full fiscal year. With our top line growth, bottom line performance and strong balance sheet, Ballard is relatively well positioned as we move forward in the exciting fuel cell industry.

You are quite right that certain key global factors have converged in a way that provides a compelling opportunity for zero-emission fuel cell technology and underpins our strong financial performance.

We are poised at the intersection of three megatrends – decarbonization, air quality and electrification of transport. These megatrends are global, secular and

converging. We are now seeing countries and cities around the globe stating their intention to limit or outright ban internal combustion engines, or ICEs, by specific dates between 2025 and 2040 – including Norway, India, Britain, France, Germany, The Netherlands, China, and California in the U.S. – all seemingly moving in this same direction.

This global movement has now increased the focus on electrification of propulsion systems as a logical alternative to ICEs. For certain limited applications and use cases, battery electric vehicles, or BEVs, offer a viable alternative. For other applications and use cases – where long range, heavy payload, fast refueling and route flexibility are important – then fuel cell electric vehicles, or FCEVs, offer an attractive zero-emission solution. In FCEVs, you typically package and optimize fuel cells and batteries together in complementary hybrid integration, where an onboard fuel cell system recharges the battery in order to extend vehicle range and enable fast refueling.

These trends have led to a situation in which clean energy FCEVs are now being viewed as a practical and highly attractive alternative for vehicles in particular use cases.

Shawn Severson: For investors new to Ballard, can you briefly explain which key transportation applications currently represent the largest opportunities for fuel cells?

Randy MacEwen: Our focus today – where the value proposition offered by our products is unique and very compelling – is to satisfy the growing global interest in fuel

cell-powered heavy and medium duty transportation applications. This includes buses, commercial vehicles, trains and trams in the short- to mid-term. We also see longer term opportunities in heavy trucks, marine, commercial drones, and even passenger cars.

The typical use cases for many of these vehicles are driven by customer requirements for long range, rapid refueling, heavy payload and full route flexibility and that is where fuel cell solutions are really the strongest fit. Of course, fuel cells and batteries can be packaged and optimized together in a complementary hybrid solution, effectively addressing the limitations of stand-alone battery electric solutions that are range-constrained, require long recharge times or on-route recharging infrastructure and may be limited to certain routes.

Many of these applications and use cases, including city buses and delivery vans, as examples, also use return-to-base or centralized depot refueling, consistent with the legacy diesel experience.

As I mentioned, we are making considerable progress already in the transit bus market, where just a few months ago 12 of the world's C40 cities signed up to a "Fossil-Fuel-Free-Street Declaration", under which they have committed to procuring only zero-emission buses by 2025. These 12 cities between them have about 60,000 buses, so this alone represents a significant shift in demand away from diesel.

In addition, the China market has been a major catalyst for the deployment of fuel cell powered transit buses. China has, as we

all know, a major air quality issue in many of its cities and the central government made this an important issue to be addressed as part of its most recent 5-Year Plan. A focus on city buses is one of the tactical approaches being used – and China literally has orders-of-magnitude more buses than either North America or Europe. China manufactures about 400,000 new buses annually, compared to about 5,000 in North America and 14,000 in Europe. China is formally planning to put at least 100,000 fuel cell buses on its roads.

We are also seeing growing momentum in Europe and in the U.S. market for buses as well as other transportation applications. We just recently announced that Ballard will be powering the next tranche of 40 fuel cell buses to be deployed in Germany under the JIVE funding program with our partner in Belgium, Van Hool. This will be the largest order for fuel cell buses ever in Europe. We have also begun a 3-year program with Siemens AG in Germany to develop a customized fuel cell engine for its state-of-the-art Mireo commuter train platform, in addition to our ongoing work with CRRC in China, the world's largest train OEM, on several of its train and tram platforms.

Shawn Severson: Can you briefly outline your growth strategy in the China market?

Randy MacEwen: Yes, we are executing a capital light, risk adjusted and core IP protected strategy in China. Ballard and our partner, Guangdong Synergy, have set up a joint venture in Yunfu to manufacture liquid-cooled fuel cell stacks – the ones used inside our modules. We set up the JV in anticipation that a certain amount of local content will be required in China to qualify

for very substantial government subsidies for fuel cell buses and trucks. The JV has been commissioned and operating since last September.

In addition, we are protecting our core intellectual property by continuing to manufacture all MEAs in our Vancouver facility and shipping these to the JV. Membrane electrode assemblies are a critical component of each fuel cell and represent the majority of a fuel cell's value. The joint venture has agreed to a take-or-pay agreement for a minimum of \$150 million in MEAs over 5-years and also paid us \$20 million for technology transfer to enable the set-up of the JV.

We have also issued a limited number of licenses to partners in China to assemble Ballard-designed engines for the Chinese market using stacks purchased from the JV. Ballard will be paid a royalty for each engine assembled and sold into China. One of our license partners, Broad-Ocean Motor, plans to set up three assembly operations in three locations in China – their first module assembly operation is now commissioned and live in Shanghai.

Just to take a brief moment, let me explain that Broad-Ocean is also a strategic investor in Ballard with a 9.9% position. It is a global manufacturer of small motors for electric vehicles and for appliances and the HVAC industry, producing about 60 million motors in 2017. We are very pleased to have our relationship with Broad-Ocean, a well-positioned and significant player in the vehicle leasing business in China.

The market for transit buses in China shows great promise. Until the recent

commissioning of the stack JV and the Shanghai module assembly operation, we have been manufacturing engines at our Vancouver facility to meet early demand in China for almost 1,000 buses, with many more sales opportunities now on the horizon.

We recently announced that the world's largest fleet of fuel cell-powered commercial trucks is expected to be deployed in Shanghai in 2018. Ballard fuel cell stacks are powering 500 Dongfeng Special Vehicle delivery trucks that are now licensed, plated and ready for deployment – a real testament to the traction for FCEVs in China.

Shawn Severson: Beyond the transit bus market, are you seeing other heavy-duty transportation applications emerge that could be large opportunities in the mid-to-longer term? Can you also talk about your "30 by 30" vision in this context?

Randy MacEwen: As I mentioned earlier, we are also seeing the front edge of market development for fuel cell power in trucks, trains and even ships. For example, the policy push in China includes a recently announced "Shanghai Fuel Cell Development Plan", which calls for \$15 billion in annual fuel cell value chain output, including annual production of at least 30,000 fuel cell vehicles by 2025 including trams, commercial vehicles and consumer cars.

At Ballard, we have also been working with Kenworth Trucks on a trial program to power a Class 8 drayage truck being used at the Ports of Los Angeles and Long Beach. And, I would point out that the medium and heavy-duty trucking market is substantially

larger than the global transit bus market. We are also working in the marine industry - where fuel cells can be used to provide hotel power when cruise ships are in port - with ABB and Royal Caribbean Cruise Lines.

When you look at all the heavy- and medium-duty application areas, the opportunity is tremendous. The Hydrogen Council, which was launched at the World Economic Forum in Davos last year, is comprised of leading energy, transport and industrial companies. The Council has published a target for FCEVs in 2030 that includes 50,000 buses, 350,000 commercial trucks, thousands of trains and ships as well as 1 in 12 cars sold in California, Germany, Japan and South Korea. Their 2050 FCEV targets include 5 million buses, 15 to 20 million commercial trucks, 25% of passenger ships and 20% of trains.

So, to be clear, these high utilization applications are emerging not just in China, but in Europe as well as North America. We anticipate growth in all these markets over the medium term.

At Ballard, we see FCEVs as offering high safety, high reliability and uptime, high durability and high operational flexibility, while also offering the most compelling total cost of ownership economics. We issued a 'call to action' in 2017 for the fuel cell industry that we called "30 by 30" - a target of 30% of commercial electric vehicles to be FCEVs by 2030 in the key markets of China, the U.S., Europe, Japan and South Korea.

Shawn Severson: What about light duty transportation uses for fuel cell modules - you just referred to passenger cars, for

example, so you believe that this is real opportunity for fuel cells?

Randy MacEwen: The consumer car market is massive, of course - at least \$1.5 trillion annually. Most major automotive OEMs are working on electric vehicles, whether battery or fuel cell. At Ballard, we are working today with a number of global OEMs, including Volkswagen Group and Audi, to help them advance their fuel cell car programs. With the leaps made in the past number of years in terms of both performance and cost reduction, we are now in a world where viability of fuel cell consumer cars is at-hand. And, the economics will only improve with the movement toward ridesharing and autonomous systems which are going to dramatically drive up utilization rates and likely transform the consumer car model from an ownership paradigm to a service paradigm.

At that point, the only practical hurdle will be moving from centralized hydrogen fueling - which we have with today's emerging applications, like buses and trucks - to distributed fueling stations. And, that is where the Hydrogen Council initiative can potentially make a major inroad by seeking ways to accelerate the wide availability of hydrogen fuel.

So, we believe that the prospects for fuel cell deployment in light-duty cars are getting close. There are other light duty applications that hold a promise of very strong growth in the mid- to longer-term, including fuel cell powered drones - or unmanned aerial vehicles - used for an increasing number of commercial applications from agriculture to the

monitoring of infrastructure to construction. These are very exciting opportunities.

Shawn Severson: What would you say is Ballard's biggest risk factor in existing and emerging markets and in particular versus batteries?

Randy MacEwen: Well, it is of course possible that market demand will not materialize in the way or in the timeframe that we anticipate. However, all signs strongly suggest that the fuel cell industry, and Ballard in particular, has reached a critical turning point in terms of market awareness, customer interest and future product adoption. We are at the cusp of a very exciting period of growth, with broadening global acceptance of fuel cells as a key part of the solution to global air quality concerns in fuel cell-only and hybrid configurations and Ballard is extremely well positioned as the leader in the proton exchange member fuel cell space!

Shawn Severson: Thank you very much, Randy, and we look forward to our next discussion in the near future.



Ballard's FCveloCity®-MD 30-kilowatt power module. Source: Ballard Power Systems Inc.

SHAWN SEVERSON FOUNDER AND CEO

Mr. Severson founded EnergyTech Investor in 2016 after seeing a significant communication and information gap developing between small and micro-cap companies and the financial community. Mr. Severson has over 20 years of experience as a senior research analyst covering the technology and cleantech industries. Previously, he was Managing Director at the Blueshirt Group where he was the head of the Energy, Environmental and Industrial Technologies practice. Prior to the Blueshirt Group, Mr. Severson was at JMP Securities where he was a Senior Equity Research Analyst and Managing Director of the firm's Energy, Environmental & Industrial Technologies research team. Before joining JMP, he held senior positions at ThinkEquity, Robert W. Baird (London) and Raymond James. He began his career as an Equity Research Associate at Kemper Securities. He was frequently ranked as a top research analyst including one of the Wall Street Journal's "Best on the Street" stock pickers and multiple awards as Starmine's top three stock pickers.



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