

# **Zenyatta Ventures and Ballard Power announce a successful test of Albany pure graphite**

**Zenyatta Ventures {TSX.V: ZEN} and Ballard Power Systems {TSX: BLD} have announced a successful performance testing of Albany Pure Graphite.**

The phase 4 test was performed on a Ballard fuel cell stack.

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## **Zenyatta & Ballard Power Systems Achieve Success on Performance Testing Using Natural Albany Graphite Versus Synthetic Graphite in a Fuel Cell Stack.**

THUNDER BAY, ON— **Zenyatta Ventures Ltd. {TSX.V: ZEN} and Ballard Power Systems Inc.{TSX: BLD}** are pleased to announce successful performance testing of high-purity Albany graphite in components of a Ballard fuel cell stack.

This Phase 4 testing program was designed to show viability of Zenyatta's Albany graphite compared to synthetic graphite in realistic fuel cell operating conditions.

Zenyatta natural graphite material was prototyped, tested and compared for key mechanical and electrical properties against Ballard's baseline synthetic graphite in a commercial product platform.

Importantly, the properties of Zenyatta's Albany graphite material were all within the specifications needed for high performance of Ballard products in a number of commercial fuel cell applications. **The components made from Albany graphite were equivalent to the existing synthetic graphite made components. This is another significant step in the process of qualifying Zenyatta's Albany graphite for existing fuel cell markets in transportation and stationary energy storage.**

**From an environmental and cost advantage, the Ballard report also concluded:**

1. Zenyatta graphite provides a clean carbon option for fuel cell components (i.e. plates and membrane electrode assembly).
2. If Zenyatta's hydrothermal graphite can also be low cost compared to existing synthetic graphite, it will facilitate fuel cell cost reduction and market penetration.

Synthetic graphite is not only used in major components of fuel cells, but also many other applications such as the manufacture of anodes for lithium-ion batteries and the

fabrication of high-purity graphite powder into complex industrial parts. It is a large and high value global market (~US\$15 Billion) that is growing rapidly but the cost to produce synthetic graphite is high and its production also has significant environmental impacts.

Finding alternative graphite with a cost and environmental advantage is important as the global green movement against pollution intensifies. [Zenyatta has shown an estimated operating cost of ~US\\$2 per kilogram for purified Albany graphite in the preliminary economic assessment and can also potentially show a significant environmental advantage over synthetic graphite.](#)

The fuel cell market is showing high growth potential globally. Proton Exchange Membrane (PEM) fuel cells convert hydrogen and oxygen to produce electricity and water. This technology has the potential for wide-spread usage in many sectors, including transportation and stationary energy applications. Original Equipment Manufacturers ('OEMs') such as Honda and Toyota are already making fuel cell powered vehicles available in limited volumes. Significant efforts are also being made to develop hydrogen storage and distribution infrastructure.

**Bharat Chahar, VP Market Development, Zenyatta** noted that, *"This is the fourth round of successful test results which continue to prove the suitability of Albany graphite in an exciting and high growth cleantech application like fuel cells. We are extremely pleased with the progress and Ballard's involvement in testing the viability of Albany graphite in this application. It is very important to note that the material being tested by Ballard was 'run-of-the-lab'"*

*Albany graphite material produced with no special processing or customization for these tests."*

The membrane electrode assembly ('MEA'), which includes the gas diffusion layer ('GDL'), is a critical component of a PEM fuel cell that must meet exacting performance standards for the fuel cell to be robust and reliable. Ballard prototyped GDL's from Zenyatta graphite, which included an anode and cathode sub layer, and then incorporated it into a MEA that was tested in a fuel cell stack to characterize fuel cell performance. Given the positive results from this Phase 4 testing, Zenyatta and Ballard will study the scale up of various fuel cell components made from Albany graphite and develop plans to carry out additional rigorous testing specifically related to automotive applications.

Zenyatta started Phase 1 testing of Albany graphite for fuel cell components in early 2015 with an initial screening by the National Research Council of Canada and Ballard Power Systems. Test results released in March of 2015 showed the Albany graphite to be suitable for hydrogen fuel cell components.

A Phase 2 testing program by Ballard was initiated immediately afterward and announced in August of 2015. This revealed that Albany graphite exhibits high thermal and corrosion resistance properties. High thermal stability and corrosion resistance is critical in the performance of certain fuel cell components.

The results of a Phase 3 program were released by Zenyatta in December 2015. All functional tests completed at that time showed the properties of Zenyatta's Albany graphite to be as

good as the benchmark synthetic graphite presently used by Ballard in fuel cell technology. These positive results led Ballard to incorporate Zenyatta material into a fuel cell stack in order to test it under realistic operating environments.

Zenyatta Ventures Ltd. continues to develop the Albany graphite material from a deposit located in northeastern Ontario, Canada. The Company's 100% owned graphite deposit is located 30 km north of the Trans-Canada Highway, power line and natural gas pipeline near the communities of Constance Lake First Nation and Hearst. A rail line is located 70 km away with an all-weather road approximately 10 km from the graphite deposit.

Dr. Bharat Chahar, P.E., VP Market Development for Zenyatta, is a Qualified Person for the purposes of National Instrument 43-101 and has reviewed, prepared and supervised the preparation of the technical information in this news release.

CAUTIONARY STATEMENT: This analysis does not represent a statistically large sample size. Furthermore, these positive results do not mean that Zenyatta can extract and process Albany graphite for graphite applications on an economic basis. Without a formal independent feasibility study, there is no assurance that the operation will be economic. Neither TSX Venture Exchange nor its Regulation Services Provider (as that term is defined in the policies of the TSX Venture Exchange) accepts responsibility for the adequacy or accuracy of this release. This news release may contain forward looking information and Zenyatta cautions readers that forward looking information is based on certain assumptions and risk factors that could cause actual results to differ materially from the

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