



MGX Minerals Enters Final Phase of Product Development for Next Generation Zinc Air Fuel Cell Systems

VANCOUVER, BRITISH COLUMBIA / December 4, 2018 / **MGX Minerals Inc.** ("MGX" or the "Company") ([CSE: XMG](#) / [FKT: 1MG](#) / [OTCQB: MGXMF](#)) is pleased to announce that its wholly owned subsidiary **MGX Renewables, Inc.** ("MGXR") has entered the final phase of development for its next generation zinc-air mass storage systems. All components of the system have been designed, tooled and received with the exceptions of the fuel cell and regenerator plates which comprise the housings, and the final system enclosure. Housings are expected to arrive this month, followed by subsystem testing, this will be proceeded by system level testing in January. All components are designed for mass production. Many of the most sophisticated and proprietary components such as the cathode are manufactured in-house.

MGXR Energy Storage System

The MGXR ESS is a modular Energy Storage System designed to deliver power in the range 20 kW – 50MW and storage in the range of 120Kwh – 1GWh over extended periods of time. With the advantage of rechargeable zinc-air fuel cell technology, the system can be configured to support a wide range of discharge power, recharge power and duty cycle requirements. Since the energy storage capacity of the system is determined only by the size of the fuel tank, a very cost-effective scalable solution now exists as an alternative to the linear power storage ratio in the lithium ion battery.

Li-ion versus Zinc-Air

The fundamental limitation of a linear power to storage ratio and cost burden associated with both lithium-ion and lack of flexibility gives an overwhelming advantage to MGXR's zinc-air fuel cell technology. In addition to containing no expensive commodities such as lithium or cobalt, the zinc air fuel cell battery has a much lower cost of storage reflecting a paradigm shift essentially eliminating the traditional linear fixed power / storage ratio and allowing for scalable power with highly flexible storage capacity at essentially any ratio, limited only by the physical parameters of the fluidized zinc storage tank(s). The zinc-air fuel cell battery has completely decoupled power and storage subsystems with ratios of 1:5 up to 1:20 and conceptually 1:100, giving significant advantage in any scenario requiring more than a few hours of storage. This fills the need in both renewables storage as well as industry and grid scale opportunities in power acquisition and distribution along with the inherent benefits of clean steady power; with the potential to acquire power not just overnight and discharge on demand during the day but to take advantage of much larger swings in power demand and supply such as weekly, monthly, and potentially seasonal fluctuation. Charging is also flexible and is scaled to match discharge but is a separate subsystem that can be scaled to match

supply markets and timeframe of power availability whether long or short windows for power acquisition. This creates both an arbitrage opportunity and cost savings opportunity but a policy level opportunity to enhance localized power infrastructure without the need to build new power plants or transmission lines.

Figure 1. MGXR modular Energy Storage System (ESS)



Technology

The MGXR ESS is based upon unique and patented zinc-air fuel cell technology. Energy is stored in the form of zinc particles, similar in size to grains of sand. When the system is delivering power, the zinc particles are combined with oxygen drawn from the surrounding air. When the system is recharging, the zinc particles are regenerated and the oxygen is returned to the surrounding air.

Applications

The flexibility of the MGXR ESS enables it to service a wide range of applications. Typical examples include:

- Storage and smoothing current from renewable energy sources such as wind and solar
- Commercial, industrial backup replacing diesel generators
- Industrial scale on demand power for peak shaving or standby

- Grid scale energy storage for energy trading and arbitrage

Architecture

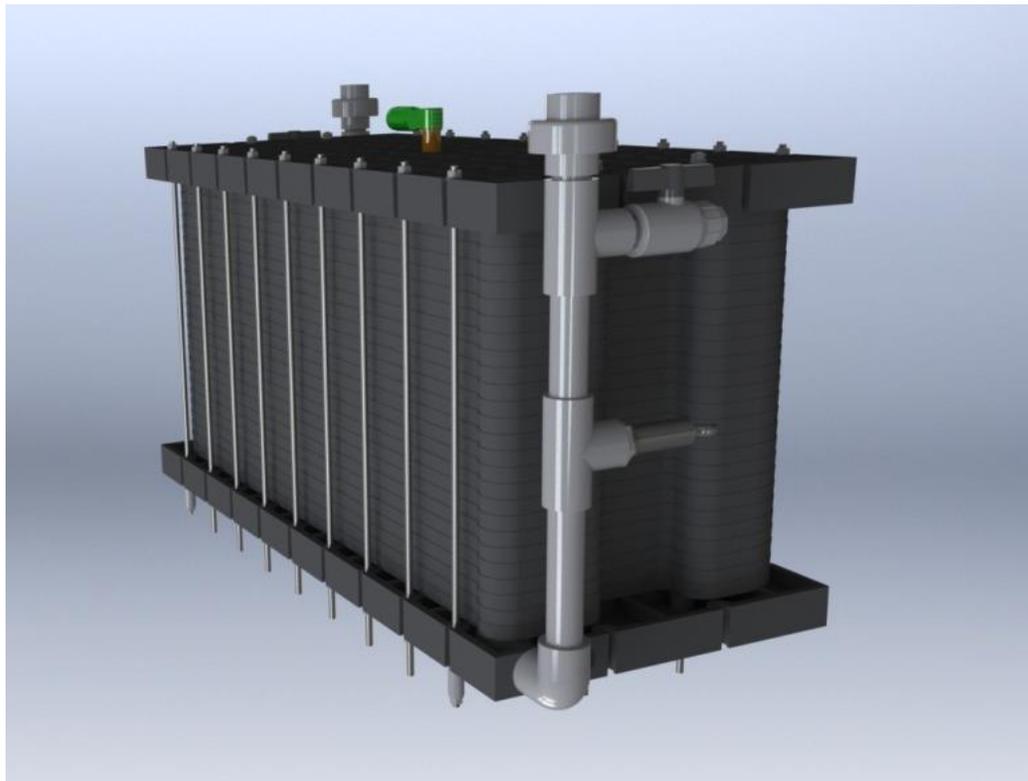
The MGXR ESS is designed according to a modular architecture that enables a wide variety of system configurations to be created from a small number of common subsystems. Each subsystem implements a single element of the technology:

- The Zinc Regeneration Subsystem (ZRS) provides the recharging function
- The Fuel Storage Subsystem (FSS) provides the energy storage function
- The Power Generation Subsystem (PGS) provides the discharging function

PGM-5000 Power Generation Module

The MGXR PGM-5000 is a power generation module that combines oxygen from the atmosphere with zinc particles drawn from a storage tank to generate electricity. It is composed of 24 bipolar plates connected in series to produce a nominal 24 Volt output. Optional instrumentation includes an embedded microprocessor control system and associated voltage, temperature and pressure sensors.

Figure 2. PGM-5000 Power Generation Module



Technology

The PGM-5000 is a key component of MGXR's unique and patented zinc-air energy storage

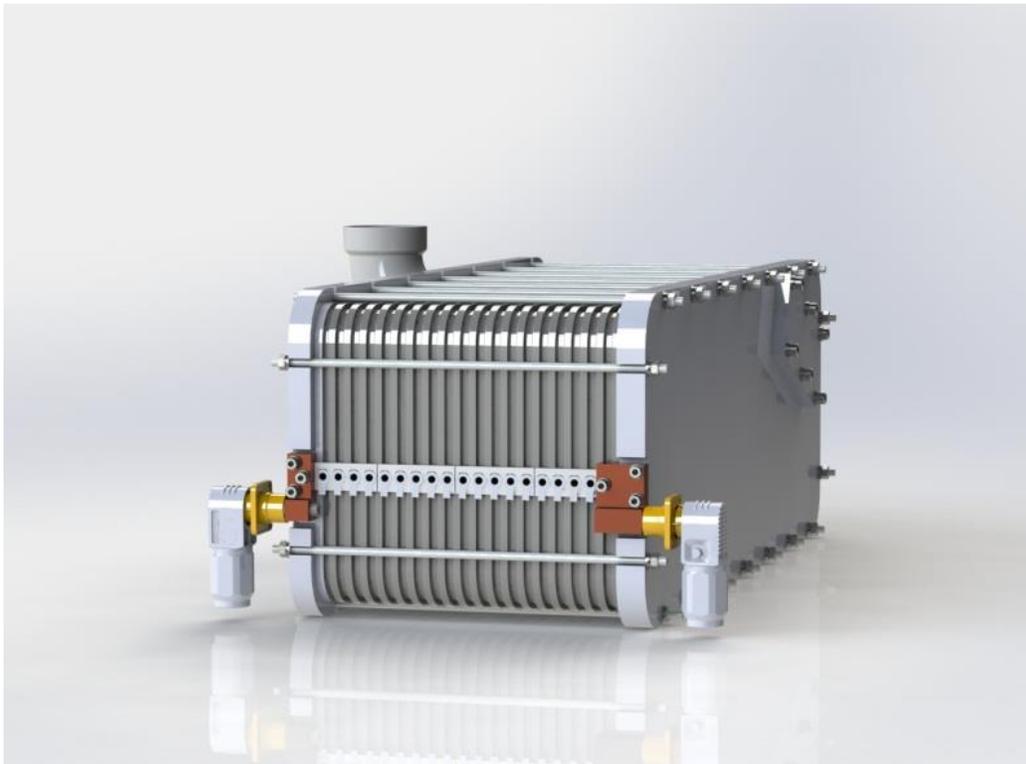


system. In this system, energy is stored in the form of zinc particles, similar in size to grains of sand. When the system is delivering power, the zinc particles are combined with oxygen drawn from the surrounding air in the Power Generation Module (PGM).

ZRM-4500 Zinc Regeneration Module

The MGXR ZRM-4500 is a zinc regeneration module that uses electricity to extract zinc particles from a potassium zincate solution. It is composed of up to 18 bipolar plates connected in series and driven from a nominal 60 Volt input. The unit is constructed of Noryl plastic and magnesium alloy and is fitted with SurLok connectors for quick electrical installation. Optional instrumentation includes an embedded microprocessor control system and associated voltage sensors.

Figure 3. ZRM-4500 Zinc Regeneration Module



Technology

The ZRM-4500 is a key component of MGXR's unique and patented zinc-air energy storage system. In this system, energy is stored in the form of zinc particles, similar in size to grains of sand. When the system is recharging, the zinc particles are regenerated and the evolved oxygen is returned to the surrounding air by the Zinc Regeneration Module (ZRM).



Spin-Off of MGX Renewables

MGX has previously announced arrangement agreement, dated October 31, 2018 with its wholly-owned subsidiary, MGX Renewables Inc. whereby MGX will complete the spin-out of 40% of the common shares of MGX Renewables (“MGX Renewables Shares”) pursuant to a plan of arrangement (the “Plan of Arrangement”) under the *Business Corporations Act* (British Columbia) as part of a going public transaction. For further information see the recent press release dated [November 30, 2018](#).

About MGX Renewables

MGX Renewables, has developed a patented zinc-air flow battery that efficiently stores energy in the form of zinc particles and contains none of the traditional high cost battery commodities such as lithium, vanadium, or cobalt. The technology allows for low cost mass storage of energy and can be deployed into a wide range of applications scalable energy storage applications.

Unlike conventional batteries such as lithium-ion, which have a fixed energy/power ratio, the technology uses a fuel tank system that offers flexible energy storage to power ratios and scalability. The storage capacity is directly tied to the size of the fuel tank and the quantity of recharged zinc fuel, making low cost scalability a major advantage of the flow battery system. In addition, a further major advantage of the zinc-air flow battery is the ability to charge and discharge simultaneously and at different maximum charge or discharge rates since each of the charge and discharge circuits is separate and independent. Other types of standard and flow batteries are limited to a maximum charge and discharge by the total number of cells as there is no separation of the charge, discharge and storage components. For more information visit www.mgxrenewables.com.

About MGX Minerals

MGX Minerals is a diversified Canadian resource company with interests in lithium, magnesium and silicon assets throughout North America. Learn more at www.mgxminerals.com.

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Forward-Looking Statements

This press release contains forward-looking information or forward-looking statements (collectively "forward-looking information") within the meaning of applicable securities laws. Forward-looking information is typically identified by words such as: "believe", "expect", "anticipate", "intend", "estimate", "potentially" and similar expressions, or are those, which, by their nature, refer to future events. The Company cautions investors that any forward-looking information provided by the Company is not a guarantee of future results or performance, and that actual results may differ materially from those in forward-looking information as a result of various factors. The reader is referred to the Company's public filings for a more complete discussion of such risk factors and their potential effects which may be accessed through the Company's profile on SEDAR at www.sedar.com.