



MGX Minerals Announces Conditional Exchange Approval for Listing of Zinc-Air Flow Battery Subsidiary

VANCOUVER, BRITISH COLUMBIA / April 11, 2019 / **MGX Minerals Inc.** ("MGX" or the "Company") ([CSE: XMG](#) / [OTCQB: MGXMF](#) / [FSE: 1MG](#)) reports that its wholly owned subsidiary **MGX Renewables Inc.** ("MGXR"), a leader in the development of zinc-air flow batteries for applications requiring long duration, high capacity storage, has received conditional approval to list its shares on the Canadian Securities Exchange ("CSE"). MGXR expects the listing to be finalized and shares to commence trading shortly. For more information on the MGXR plan of arrangement, please refer to the Company's news release dated November 1, 2018, available on the Company's profile on SEDAR at www.sedar.com and at www.mgxminerals.com.

UL / CSA / ANSI Approval

MGXR reports regulatory approval for its system under UL / CAN / ANSI Standard 1973 is in progress. Recent research and development efforts thus far have focused on ensuring the reliability of materials used in fabrication of the systems. To date no significant issues have been identified and there is no expectation of any design changes inclusive of Fuel Cell, Energy Storage and Regenerator Modules prior to approval.

Market Analysis Study

MGXR has retained a leading independent firm to complete an updated market analysis study. Results of the study demonstrate a large and expanding market for long duration energy storage systems ("ESS"). This view was further strengthened recently from a request for proposals issued by the U.S. Department of Energy that defined long duration as a range from 10 to 100 hours- an attribute that is ideal for a zinc-air flow battery as this storage capacity cannot be met economically by any known lithium-ion chemistry.

Thanks to ample opportunities provided by zinc-air flow battery technology to directly integrate into vertical markets, MGXR has commenced selection of markets for early deployment. The Commercial and Industrial (C&I) market is seen as highly favorable with global scale opportunities for both equipment sales and self-owned energy storage systems both as a renewables and peak power provider. Additionally, electricity tariff rates in New York and California have been analyzed in detail to confirm the viability of the business case. A target demonstration site in New York has been contracted and work to refine the system configuration is in progress in cooperation with the customer and local system integrator. Distribution plans for systems to additional states with incumbent and established system integrators continues along with international relationships that will enable markets in Europe, Asia and South America to be served in the near future.



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 Li-ion is a linear power to storage ratio severely limiting flexibility and vastly increasing cost of storage even when limited output wattage is required. This gives an overwhelming advantage to MGXR's zinc-air fuel cell technology in high capacity, long duration commercial and industrial as well as grid scale applications. 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 large scale arbitrage and cost savings opportunities as well as 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 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, zinc particles are regenerated, and 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

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. The zinc-air flow-battery is differentiated from other battery technologies by its ability to decouple the relationship between energy (kWh) and power (kW), by the very low cost of its zinc energy storage medium, and by the inherent safety of its chemistry.

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 and technology company with interests in global advanced material, energy, and water assets. Learn more at www.mgxminerals.com.

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