



Magnis Resources
L I M I T E D

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C4V Delivers Lithium-ion Battery for Smart Grid Connected Environment

Magnis Resources Limited (“**Magnis**” or the “**Company**”) [ASX: MNS] is pleased to advise that exclusive battery manufacturing partner and investee company, Charge CCCV [C4V], has achieved a major milestone in delivering its first battery towards a demonstration project that was approved under a New York State Government entity.

As detailed in the C4V press release overleaf, the project relates to the development of a software system that combines renewable energy sources with lithium-ion batteries and demand management to create a low cost Distributed Energy Resource [DER] System. This system essentially assists in the integration of renewables into the power grid by mitigating instabilities arising from short-term fluctuations in renewable energy generation. This is of particular relevance to the New York State region, due to the large number of cloudy or overcast days that cause such short-term fluctuations.

Partners in this project include the New York State Government entities, Binghamton University, Ioxus and C4V.

Magnis announced via an ASX release on 29 March 2018 that it has made a strategic investment to acquire a 10% interest in C4V and secure an exclusive agreement over selective patents, which will assist in driving the Company’s growth in the lithium-ion battery sector

A full version of C4V’s press release is attached overleaf for convenience.

Travis Peluso

Investor Relations Director
Magnis Resources Limited
Ph: +61 411 404 814
www.magnis.com.au



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PRESS RELEASE



C4V Delivers Lithium-ion Battery for Smart Grid Connected Demonstration Project

Binghamton, NY, August 21, 2018– Charge CCCV, C4V, today announced its first article as prototype for delivery towards a demonstration project being led by Binghamton University for New York State.

C4V brings its patented intellectual property in advanced lithium-ion materials to the New York State's goals of developing an in-state, volume, li-ion battery production capability.

New York (NY) State is in the top five states of distributed energy installations including significant potential for additional solar photovoltaic (PV) and wind. However, the high penetration of intermittent distributed energy resource (DER) generation also introduces unprecedented levels of variation and uncertainty into the power grid. For example, the power output forecast errors of a PV system can be very high on a cloudy day. The problem becomes especially challenging in the regions with large number of cloudy days. From the utilities' perspective, the rapid changes of behind-the-meter DER generation may incur rapid variation of voltages at feeders and substations. Integrating energy storage systems with DER generation is one of the promising solutions. However, there are two main challenges:

- The high levelized cost of energy storage system can make the storage related solution less economic attractive compared to alternatives; and
- Difficulty in coordination of many geographically distributed inverter-controlled DERs for utilities.



Purpose of this demonstration project is an inverter-centric design framework that integrates cooperative energy management algorithm and passive anti-islanding protection with high detectability and small detection delay that can support high penetration of renewable energy in distribution system. The proposed system is designed for behind-the-meter applications such as small commercial buildings or multifamily buildings. The solution integrates made-in-NY advanced Li-ion batteries and ultra-capacitors to help DER generation units achieve higher capacity

value, higher efficiency, and higher reliability. The proposed system is a software-defined system that is programmable to respond to particular needs of consumers and utilities, and scalable to span a wide range of grid services.

This project proposed to develop a low-cost active DER system, which will address and resolve the challenges from both power grid side and end consumer side. In order to develop a battery for the project, C4V has been working with the supply chain that constitutes more than 40 companies which supply various components of the battery. A robust supply chain that C4V has been able to put together also brings next generation, ready to go on production floor, Cathode chemistry, Graphite Anode, Internet of Thing based Battery Management Systems and a state of the art battery manufacturing plant that is moved to New York from North Carolina.

“From the start, C4V initiated activities have shared a common vision of helping develop a domestic commercial-scale supply chain. We believe that in many cases we can now make raw material qualification process more efficient and accelerate launch cycles to only a couple of months,” said Shailesh Upreti, President of C4V. “We are also working directly with product OEMs and have several major contracts in hand internally as well as via our consortium Imperium3 New York to make this supply chain more sustainable. Delivering first article of small 1KWh size is a big milestone in terms of demonstrating viability of a commercial supply chain and its cohesive impact. C4V is now gearing toward 10KWh, 50KWh, 5000 KWh and 1-3 MWh demonstration projects in coming months”.

Funded by the New York State Energy Research and Development Authority (NYSERDA), this demonstration project supports Governor Andrew M. Cuomo’s nation-leading energy storage target of 1,500 megawatts by 2025. Achieving New York State’s ambitious target will deliver approximately \$2 billion gross lifetime benefits to New Yorkers, including electric distribution system savings and reduced greenhouse gas emissions.

Other members of the team for this demonstration project include:

- **Binghamton University:**
 - Ziang Zhang, Assistant Professor, renewable energy integration, distributed energy management;
 - Ning Zhou, Assistant Professor, storage system dynamics, modelling, and health data analysis;
 - N. Eva Wu, Professor, monitoring, protection, and control of PV-grid interconnections;
- **NYSEG (New York State Electric & Gas) the utility partner**, serves nearly 900,000 customers in New York and is one of four utility companies held by AVANGRID.
- **IOXUS, Oneonta, NY**, Ultra-capacitor manufacture.

About C4V: C4V™ is an intellectual property company based in Binghamton, New York with expertise and patented discoveries in Lithium-Ion battery composition and manufacture. C4V leverages its expertise in electrode design and process development to create next-generation storage materials that can be seamlessly integrated into current cell manufacturing lines.

About Binghamton University: A world-class institution, Binghamton University offers students a broad, interdisciplinary education with an international perspective and one of the most vibrant research programs in the

nation. Ranked among the elite public universities in the country, Binghamton challenges students academically, not financially, in its unique, best-of-both-worlds environment.

About NYSEG: New York State Electric and Gas (NYSEG) is an electric and gas utility company owned by **Avangrid** that serves customers in New York. NYSEG was incorporated in 1852 as the Ithaca Gas Light Company. Throughout the end of the 19th century and the early part of the 20th century, the corporation went through mergers and acquisitions that combined about 200 utility companies under the name NYSEG. In 1975 the corporation became an 18% partner in the Niagara Mohawk Power Corporation's Nine Mile Point nuclear plant, and in the 1980s NYSEG completed a series of hydroelectric power plants. In 2008 NYSEG became part of Iberdrola, when Iberdrola bought Energy East.

About Ioxus: Founded in 2007, Ioxus is a smart power company that designs and manufactures intelligent power and energy storage technology for transportation, alternative energy, medical, industrial and grid-connected markets. Designed and manufactured in the U.S., the company's uSTART and X-Series products are based on patented ultracapacitor technology. Ioxus is headquartered in Oneonta, NY, with sales, service and quick-delivery inventory.