

Company Overview:

Xerion Advanced Battery Corporation (XABC) is commercializing two synergistic technologies: first, a manufacturing method which allows for the direct electroplating of Li-ion battery materials in their final form, trademarked as DirectPlate™, and second, StructurePore®, which is a nanostructured, 3-D metallic foam architecture that enables high energy silicon and tin active materials to cycle extremely well. Taken together, these two technologies create a new battery manufacturing platform that allows for significant improvement across a range of properties, including: significantly lower battery materials cost, fast charge, very high power, increased energy density, enhanced safety and longer cycle life. The technologies have been successfully inserted into multi-amp-hour Li-ion batteries, demonstrating charging in 8 minutes to 80% state of charge with minimal degradation to battery performance and cycle life.

The first generation of DirectPlate™ was a high energy density LiCoO₂ (LCO) cathode. Increasing the value proposition of this process, highly pure cobalt metal is formed at the counter-electrode as a by-product of the LCO production even when highly impure cobalt precursors are utilized. We have demonstrated the LCO DirectPlate™ manufacturing process and are moving forward with scale up to focus initially on the electronics, hand tools, UAV (Drones), and US Military markets. The US Military purchases in excess of 10 million cells per year and we believe that we are in the ideal position to service this market. Our current focus on LCO is due to its continued dominance in several of the identified target markets from both a specific energy and cycle life standpoint. Based on these results and our analysis, the XABC Dayton, OH facility is being configured to produce four products: Cobalt metal, active battery material powder, electrodes for lithium-ion battery production, and lithium-ion batteries for the above markets. Secondly, XABC is in discussions with a partner to produce a product for the automotive market. We anticipate that this will be accomplished through a joint venture (JV) with considerable access to the raw materials used in the production of lithium-ion batteries.

Because of the versatile array of improved properties, these battery technologies are demonstrating strong traction across multiple markets. XABC's go-to market plan is to first focus on higher power batteries which tend to support smaller markets, and have strong traction in military, drone, and small-engine applications. As manufacturing continues to grow, XABC will then focus on high-energy, larger markets with longer development times, such as automotive and electronics. XABC plans to pursue a strategy to work with smaller customers and the Military for battery sales, manufactures of batteries for active battery material powder and electrode sales, US Aerospace for cobalt metal powder, and concurrently partnering with a large raw material supplier, through strategic relations, *i.e.* JV, to cover commodity manufacturing for the automotive and electronics markets. Longer term, XABC technologies will address other battery technologies such as flexible batteries for smart watches, solid-state batteries for electronics, and micro-batteries for implementation in electronic circuits and the "Internet of Things" applications.

XABC has just purchased a manufacturing facility with 680,000 sq. ft of production and lab space, with the expectation of opening a battery manufacturing plant with a total active material

capacity of 1 GWh. This plant is on track to start production of 1st Generation pouch cell batteries in 2021.

Market Strategy:

Xerion has been working closely with the DoD for more than 5 years on various projects involving Lithium ion batteries. The DoD applications require lighter, safer, conformable, higher power, and higher energy batteries. Currently, the U.S. military uses approximately 10 million battery cells annually. We will continue our collaboration with the DoD in 2021 and beyond in several important battery applications including: Battery requirements for the warfighter, Unmanned aerial vehicles (UAVs), Unmanned ground and marine vehicles

Xerion is working closely with to commercialize its first-generation LCO battery products in several large private sector markets in parallel with our efforts with the DoD. These private sector markets include: Consumer electronics Power tools, and Automotive electric vehicles – We have ongoing technical exchanges with several major car companies regarding the lithium ion battery needs for their current and future electric vehicle product strategies. Every automobile manufacturer is planning a transition of major portion of its output to be powered electrically in the next decade, with Asia and Europe taking the lead in market adoption.

To scale up the commercialization of our Li-ion product capabilities, we have pilot scale manufacturing capabilities in a 40,000 square foot facility at our headquarters in Kettering, OH. We have begun Phase I of preparing an existing 680,000 sq. ft. facility in Vandalia, OH, purchased in 2019 for our first 1 GWh commercial manufacturing facility. Phase I of this facility will come online in Q1 2022 with an initial annual capacity of 1.5 million small format battery cells, and a final capacity of 10 million small format cells when the facility is fully built out. As Xerion sales volume grows, we will build larger plants in the U.S. and with strategic manufacturing partners in Asia and Europe.

Capabilities:

XABC's main officers are located at 3100 Research Blvd in Kettering OH. This facility has 25,000 ft² dedicated to pilot production and 15,000 ft² dedicated to lab space. We have a wide variety of characterization, prototyping and electroplating equipment including a fully-equipped machine shop. This equipment includes; a fully featured Scanning Electron Microscope (SEM) with Energy Dispersive X-Ray Spectroscopy (EDAX), a desktop SEM, over 500 potentiostat channels that can be used for battery characterization or electrodeposition, a BET surface analyzer, porometer, fully featured cell assembly lab, ultrasonic welders (both for metal and plastic), benchtop X-Ray Diffraction (XRD), four dual gloveboxes, three single gloveboxes, industrial automation equipment from Allen Bradley and a wide variety of other prototyping and analysis equipment.

R&D Personnel and Team Strengths:

As an energy technology company, XABC has significant strengths in both engineering and R&D of battery materials and battery fabrication. The R&D team currently has nearly 20 scientists and technical staff, with 12 team members having obtained Ph.D. degrees in materials science, chemistry and chemical engineering. Core-strengths in our team encompass several major areas of battery research including Li-metal anodes, electrolytes, electrode material synthesis and fabrication, thin film coatings and solid-state batteries. We also have significant expertise in materials characterization including traditional lab-based techniques (see capabilities earlier) as well as more advanced, synchrotron-based x-ray scattering, spectroscopy and microscopy techniques.