Technical Update: NEO Battery Advances Silicon Anode Technology with Extended Battery Capacity Performance

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- Silicon Anode Technology Advancement with Extended Capacity Performance & Sustained Low-Cost Advantage
    - Record-High Battery Performance Metric that Meets or Exceeds Industry Standards and Similar Commercial Products
    - Two-Way Coating Enhancement: Simple, Feasible, and Low-Cost

- Planned Release of New Silicon-Carbon (Si-C) Anode Product Due to High Working Party & Industry Demand
- Recycled Silicon Evaluation In-Progress with Lotus Energy & INNOX eco-M Products
- South Korea Ministry of Science & ICT Certification as Recognized Corporate Research Institute

NEO Battery Materials Ltd. (“**NEO**” or the “**Company**”), a low-cost silicon anode materials developer that enables longer-running, rapid-charging lithium-ion batteries, is pleased to announce technological advancements in the Company’s silicon anode technology – longer battery capacity retention while sustaining low costs.

NEO’s engineering team successfully modified the properties of

existing additives to achieve the two-way coating enhancements. The new coating methods are simple yet feasible and employ widely-used additives to maintain low manufacturing costs. Implementation improves critical battery cell performance metrics – i) longer capacity retention, ii) higher, steady Coulombic efficiency[1] (a measure of capacity retention), and iii) faster-charging rates.

Coulombic efficiency[1] is the foremost metric that determines capacity retention in battery cycling tests. NEO's silicon anode, NBMSiDE®, demonstrated record-high Coulombic efficiency levels that meet or exceed industry standards and similar commercial products. This result demonstrates the product's potency in full cell[2] designs based on pure 100% silicon or silicon-graphite mixture anodes. With optimism in advancements, NEO is reproducing and optimizing the product for the subsequent phases of NBMSiDE® commercialization.

Mr. Spencer Huh, Director, President and CEO of NEO, commented, *"We are highly proud of NEO's engineering team and enthusiastic about the results achieved with our NBMSiDE® products. Incremental improvements are leading to performance milestones. This year, we plan to reach new technology highs with silicon-graphite anodes and in full cells. Additionally, our team has initiated recycled silicon evaluations with Lotus Energy and INNOX eco-M products."*

The two-way coating enhancement also enables NBMSiDE® to be compatible with carbon-based (carbonaceous) materials. This implies that silicon-carbon composite (Si-C) and silicon-graphite anode development are now feasible for full cell designs. Due to mounting working partner and industry demand, NEO Battery Materials will release a new Si-C anode product into

the NBMSiDE® portfolio, with sample tests to be conducted soon.

Two-Way Coating Enhancement: Technical Details

The first coating enhancement extensively utilizes the advantages of polymer characteristics to maximize the polymer coating processibility. This further stabilizes the silicon surface during volume expansion in battery cycling tests. Intensely prohibiting adverse side reactions (i.e., irreversible lithium consumption) on the silicon surface also suppresses anode delamination from the current collector. As a result, battery cell performance is directly improved with enhanced Coulombic efficiency and rate capability levels with reasonable overall specific capacity.

The second coating enhancement deploys additional protective layers on the silicon surface. Like the first enhancement, the additional layers suppress adverse side reactions in which lithium-ions are consumed on the silicon surface. The layers also add mechanical strength to hamper rapid anode delamination. This coating method has exhibited increased Coulombic efficiencies with prolonged capacity retention.

R&D Scale-Up Centre: Government-Certified Corporate Research Institute

In July, the South Korean Ministry of Science, Information, and Communication Technology (MSIT), through the Korean Industrial Technology Association (KOITA), has certified NEO’s R&D Scale-Up Centre as a recognized “Corporate Research Institute”.

Along with the Venture Enterprise Certification, this governmental certification enables NBM Korea to receive various governmental support, including benefits in national R&D projects, intellectual property rights programs, and government grants and funding. This certification will help nurture a

highly effective environment for R&D and commercialization.

[1]Coulombic Efficiency: Ratio of electrons transferred out from an electrode material/battery during discharging to the number transferred into the material during charging over a full charging cycle (Discharging Capacity-to-Charging Capacity). Ex. If the current discharging capacity is 2,000 mAh/g and the preceding charging capacity was 2,500 mAh/g, the Coulombic efficiency is 80%.

[2]Full Cell: Lithium-ion battery comprises all four core materials (cathode, anode, separator, and electrolyte). Generally, battery anode materials proof-of-concept and optimization are initiated with half cells in which only the anode, separator, and electrolyte are used with a lithium-metal counter electrode that may supply an infinite number of lithium-ions. Full cells have a limited number of lithium-ions given that commercial-level cathode materials retain trivial amounts of lithium-ions compared to lithium-metal. Consequently, capacity retention is heavily affected by Coulombic efficiency at every charging cycle.

About NEO Battery Materials Ltd.

NEO Battery Materials is a Canadian battery materials technology company focused on developing silicon anode materials for lithium-ion batteries in electric vehicles, electronics, and energy storage systems. With a patent-protected, low-cost manufacturing process, NEO Battery enables longer-running and ultra-fast charging batteries compared to existing state-of-the-art technologies. The Company aims to be a globally-leading producer of silicon anode materials for the electric vehicle and energy storage industries. For more information, please visit the Company's website at: https://www.neobatterymaterials.com/.

On Behalf of the Board of Directors

Spencer Huh
Director, President, and CEO

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