

## 18650 TYPE BATTERIES PRODUCED WITH FIRST GEN ENGINEERED SiO<sub>x</sub> MATERIAL DELIVER STRONG PERFORMANCE AT 25 CYCLES

- Testing reveals consistent performance improvement, exceeding 14%, versus graphite benchmark battery, with still no noticeable performance degradation [1].

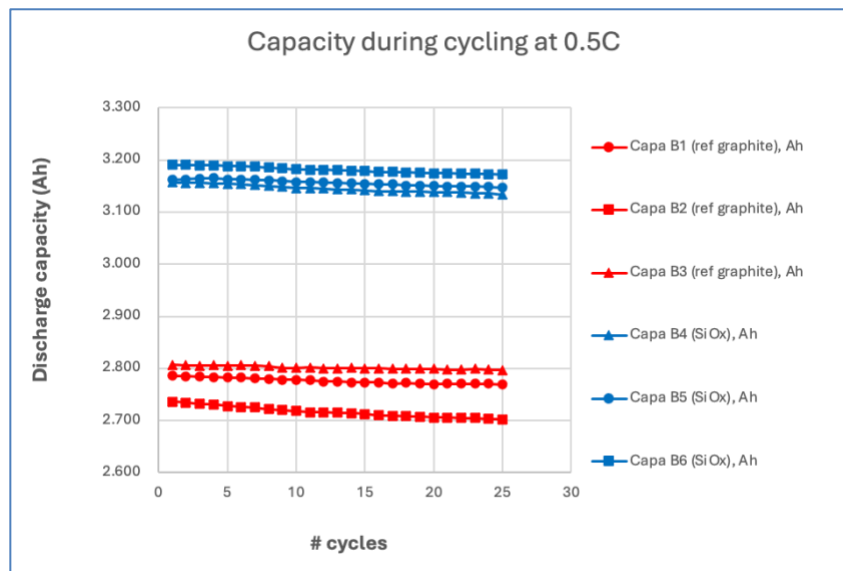
Montreal, Canada, February 28<sup>th</sup>, 2024 — [HPQ Silicon Inc.](#) (“HPQ” or the “Company”) (TSX-V: HPQ) (OTCQB: HPQFF) (FRA: O08), a technology company specializing in green engineering of silica and silicon-based materials is pleased to announce a major milestone achieved by its France-based affiliate, NOVACIUM SAS (“Novacium”). This announcement sheds light on the encouraging outcomes observed at the 25-cycle milestone in the continuous charge-discharge cycle testing of 18650 industrial batteries.

*“The test results continue to exceed our expectations [1],” said Dr. Jed Kraiem Ph.D., COO of Novacium. “The results after 25 cycles keep surpassing our internal theoretical estimate of a 10% improvement in battery performance. These results demonstrate our ability to produce a graphite and engineered SiO<sub>x</sub> anode material blend that can enhance battery performance.”*

### MAINTAINING 14% BATTERY CAPACITY IMPROVEMENT FOR 25 CYCLES

The testing evaluates the performance of batteries composed of a 90% wt graphite and 10% wt Novacium's engineered SiO<sub>x</sub> blend, a material for which HPQ holds exclusive global licenses, comparing them to benchmark batteries with 100% graphite anode material.

The graph displayed below (Figure 1) showcases the capacity outcomes over the initial 25 testing cycles. The three blue lines depict the cycle performance of 18650 batteries comprised of 90% wt graphite and 10% wt Novacium's custom-engineered SiO<sub>x</sub> blend. Conversely, the three red lines illustrate the cycle performance of 18650 batteries utilizing a composition of 100% graphite.

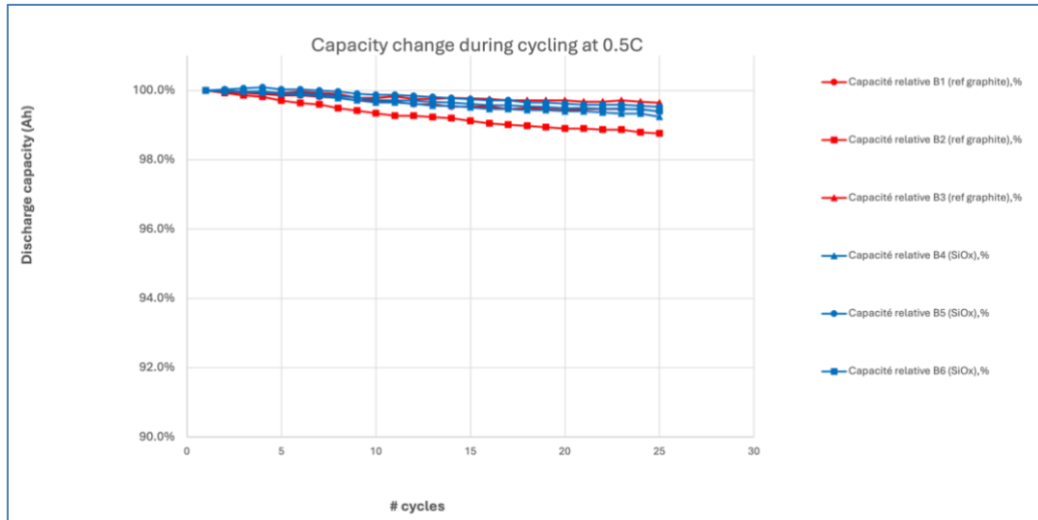


**Figure 1) Capacity during 25 cycles tests of HPQ and Novacium Gen 1 18650 industrial battery [1].**

As shown, the three batteries utilizing Novacium's custom-engineered SiO<sub>x</sub> blend demonstrated a high discharge capacity of approximately 3.18 Ampere-hours (Ah), outperforming the benchmark set by three comparison batteries with a capacity of 2.70 Ah over 25 cycles. This represents a 14% enhancement in the full-battery capacity of industrial-type batteries when compared to those with a 100% graphite anode, marking a significant milestone within the initial 25 cycles.

## CAPACITY IMPROVEMENT WITHOUT DEGRADATION FOR 25 CYCLES

Figure 2 below displays the changes in capacity during the 0.5C cycle testing. The trio of blue lines depicts 18650 batteries composed of 90% graphite and 10% Novacium's custom-engineered SiO<sub>x</sub> blend. In contrast, the trio of red lines depicts 18650 batteries that are made entirely of graphite.



**Figure 2) Capacity during 25 cycles tests of HPQ and Novacium Gen 1 18650 industrial battery [1].**

*“Silicon’s tendency to expand and contract during charging and discharging cycles often results in a notable loss of capacity when compared to graphite-based batteries,”* added Dr. Kraiem. *“The observation that there is no measurable cycle degradation between the batteries made entirely of graphite (illustrated in red) and those incorporating Novacium’s engineered SiO<sub>x</sub> blend (depicted in blue) after 25 cycles is an encouraging indicator of the material’s commercial viability in the battery manufacturing sector.”*

## NOVACIUM ENGINEERED SiO<sub>x</sub> MATERIAL AND THE HPQ SILICON INITIATIVE

The results obtained to date with a non-optimized version of Novacium's engineered SiO<sub>x</sub> material highlight the adaptability and compatibility of Novacium's methods and suggest the possibility of developing better-performing materials with broader industry applications. Central to HPQ's Silicon Initiative is the goal of creating materials that can be seamlessly integrated into most existing battery manufacturing processes.

The commercial potential of this material will target various industrial applications, including energy storage systems, consumer electronics, and electric vehicles. To implement this, HPQ's strategy is to commence production of this proprietary engineered SiO<sub>x</sub> anode material using cost-effective equipment and highly scalable processes already proven in a multi-ton-scale pilot manufacturing line. This approach should shorten the time to commercial scalability and enables the seamless integration of the anode material into existing electrode mixing and coating equipment. The resulting graphite and SiO<sub>x</sub> mixture will significantly enhance battery capacity and can be utilized without modification by large-scale gigafactories worldwide.

*“I am profoundly encouraged by the results we’ve seen with the initial iterations of Novacium’s engineered SiO<sub>x</sub> material,”* said Mr. Bernard Tourillon, President and CEO of HPQ Silicon Inc. and NOVACIUM SAS. *“Our vision extends beyond mere innovation; we are setting the stage for a new era where our materials will meet and exceed the demands of various industries. As we prepare to scale up our manufacturing capability, we are demonstrating our readiness for large-scale production.”*

## REFERENCE SOURCES

- [1] Novacium technical team analysis of the data from the ongoing charging and discharging cycle tests conducted at a world-leading university, the name of which is kept confidential for competitive reasons.

### About NOVACIUM SAS

Novacium is an HPQ associated company started in Q3 2022. This green technology startup is based in Lyon, France and is a partnership with HPQ and three of France's leading research engineers, Dr. Jed KRAIEM PhD, Novacium's Chief Operating Officer ("COO"), Dr. Oleksiy NICHIPORUK PhD, Novacium's Chief Technical Officer ("CTO"), and Dr. Julien DEGOULANGE PhD, Novacium's Chief Innovation Officer ("CIO"). Novacium is a new Research and Development company which allows the researchers to develop their own technology in high added value fields connected to renewable energy, and allows HPQ Silicon Inc, a Canadian company, to expand the depth and reach of technical team to help develop its silicon and new renewable energy projects.

### About HPQ Silicon

[HPQ Silicon Inc. \(TSX-V: HPQ\)](#) is a Quebec-based TSX Venture Exchange Tier 1 Industrial Issuer.

HPQ is developing, with the support of world-class technology partners [PyroGenesis Canada Inc.](#) and [NOVACIUM SAS](#), new green processes crucial to make the critical materials needed to reach net zero emissions.

HPQ activities are centred around the following four (4) pillars:

- 1) Becoming a green low-cost (Capex and Opex) manufacturer of Fumed Silica using the **FUMED SILICA REACTOR**, a proprietary technology owned by HPQ being developed for HPQ by PyroGenesis.
- 2) Becoming a producer of silicon-based anode materials for battery applications with the assistance of NOVACIUM SAS.
- 3) HPQ SILICON affiliate NOVACIUM SAS is developing a low carbon, chemical base on demand and high-pressure autonomous hydrogen production system.
- 4) Becoming a zero CO<sub>2</sub> low-cost (Capex and Opex) producer of High Purity Silicon (2N+ to 4N) using our **PUREVAP™ "Quartz Reduction Reactors" (QRR)**, a proprietary technology owned by HPQ being developed for HPQ by PyroGenesis.

For more information, please visit [HPQ Silicon web site](#).

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security's regulatory authorities, which filings can be found at [www.sedar.com](http://www.sedar.com). Actual results, events, and performance may differ materially. Readers are cautioned not to place undue reliance on these forward-looking statements. The Company undertakes no obligation to publicly update or revise any forward-looking statements either as a result of new information, future events or otherwise, except as required by applicable securities laws.

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**Source:** HPQ Silicon Inc.

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