

Novacium's Silicon-Anode Batteries Exceed 1,000 Cycles, Outperforming Commercial 18650 Cells

While Maintaining Exceptional Capacity and Durability

Montreal, Canada, March 19th, 2025 — [HPQ Silicon Inc.](#) (“HPQ” or the “Company”) ([TSX-V: HPQ](#), [OTCQB: HPQFF](#), [FRA: O08](#)), a technology company specializing in **green engineering processes** is excited to update shareholders on the latest battery results at the **1,000-cycle milestone** ^[1] from its France-based affiliate, **NOVACIUM SAS (Novacium)**.

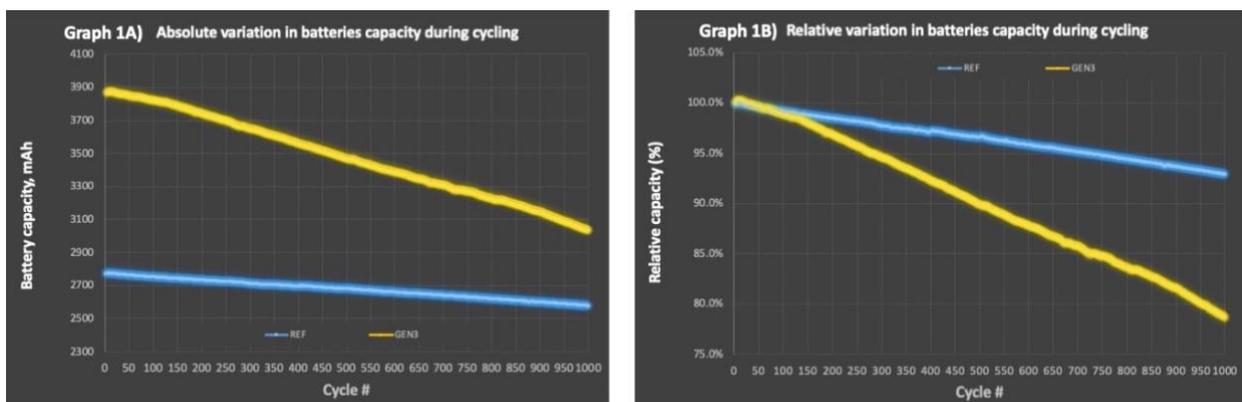
The Novacium GEN3 18650 batteries demonstrate exceptional performance, maintaining a capacity of over 3,000 mAh even after 1,000 cycles. Impressively, these batteries retain approximately 80% of their original capacity at this milestone, delivering 18% more capacity than traditional graphite benchmark batteries. This translates into a substantial cumulative energy gain of 30% over graphite-based alternatives after 1,000 cycles ^[1].

Excellent capacity behaviour during testing

Batteries with Novacium GEN3 silicon-based anode material exhibit a slow and linear capacity decrease over their lifespan (1,000 cycles). This sets them apart from most similar batteries, which typically experience a rapid capacity drop within the first hundred cycles before the decline slows down. A linear degradation profile is advantageous as it **enables precise modeling of capacity** retention over time, facilitating more accurate lifetime performance predictions. Additionally, it **maximizes cumulative energy throughput** by mitigating early-stage capacity losses, thereby enhancing overall battery **efficiency and longevity**.

“Reaching the 1,000-cycle milestone with such outstanding results ^[1], especially under a realistic testing protocol, is a powerful validation of Novacium’s unique and commanding expertise in blending proprietary advanced silicon-based materials with high-grade artificial graphite. This combination creates an anode material that can be seamlessly integrated into commercial lithium-ion batteries, regardless of their size (18650, 21700, 26650, or 4680),” said Dr. Jed Kraiem, COO of Novacium. *“Furthermore, the strength of these results is being reinforced by a new series of tests, for which results which will be communicated very soon.”*

Unmatched Performance of GEN3 Silicon-Anode Material



Graph 1A presents the absolute variation in battery capacity (in mAh) of the 100% graphite reference (the blue line) and GEN3 batteries (the yellow line), over 1,000 cycles ^[1]. Additionally, Graph 1B highlights the relative capacity variation for the same batteries used in Graph 1A.

Unmatched Performance at 1,000-cycle

At the 1,000-cycle mark, 18650 batteries equipped with Novacium's GEN3 silicon-based anode materials continue to deliver exceptional performance, maintaining capacities exceeding 3,000 milliampere-hours (mAh) and retaining roughly 80% of their original capacity. In comparison, benchmark batteries made with high-grade artificial graphite provide approximately 2,500 mAh, highlighting GEN3's notable 18% capacity advantage ^[1].

In total energy throughput, Novacium's GEN3 batteries delivered around 3,500 Ampere-hours (Ah) over 1,000 cycles compared to about 2,700 Ah from graphite-based batteries, marking over a 30% increase in total energy output ^[1].

Graph 1B illustrates this advantage by comparing the relative capacity retention over 1,000 cycles for batteries using Novacium's GEN3 material against the graphite benchmark batteries. The GEN3 batteries demonstrate a more stable degradation profile, underscoring significant progress in material reliability and performance.

Further context highlights GEN3's performance advantage when compared to widely used commercial 18650 cells:

- **Panasonic NCR18650GA (3,500 mAh):** Retains 70% capacity after ~300 cycles ^[2,3],
 - At 300 cycles, the GEN3 battery capacity was around 94% ^[6].
- **LG MJ1 (3,500 mAh):** Retains between 70% and 80% capacity between 300 and 400 cycles ^[3,4],
 - Between 300 and 400 cycles, the GEN3 battery capacity was between 92% and 94.5% ^[6]
- **Samsung 30Q (3,000 mAh):** Retains ~60% capacity after 250 cycles ^[5],
 - At 250 cycles, the GEN3 battery capacity was around 96% ^[6].

These benchmarks clearly position Novacium's GEN3 technology as a superior, longer-lasting alternative in lithium-ion battery development ^[7].

"From the outset of our silicon anode material initiative, Novacium and HPQ chose a bold strategy by testing full-size, commercial-grade 18650 batteries to demonstrate the effectiveness of our proprietary silicon-based materials," said Bernard Tourillon, President and CEO of HPQ Silicon Inc. and NOVACIUM SAS. "Direct comparisons with commercially available batteries underscore the real-world advantages and distinctiveness of our approach. By combining Novacium's expertise in silicon-anode technology with HPQ's proprietary high-throughput manufacturing capabilities, we are strategically positioned to meet the rapidly growing demand for silicon-based anode materials across various battery sizes, including 18650, 21700, 26650, and 4680."

Silicon-Based Materials Market Set to Grow Amid Rising Battery Demand

Approximately 95% of the anode material in today's lithium-ion batteries is graphite ^[8]. HPQ-Novacium's silicon-based material seamlessly integrates into existing manufacturing processes, replacing up to 10% of that graphite without requiring costly retooling or process overhauls. This positions us to capture 5% to 10% of the total graphite market, both now and in the future.

According to Benchmark Minerals Intelligence (BMI), the global graphite market is projected to grow from approximately 5.7 million tonnes in 2025 to 11.1 million tonnes by 2030 ^[9]. This expansion translates into an addressable market of 555,000 to 1.1 million tonnes for silicon-based material by 2030 ^[10], valued between **US\$27.5 billion and US\$55.0 billion** ^[11].

With the increasing demand for advanced battery technologies, our solution offers a scalable and cost-effective pathway to enhancing lithium-ion battery performance while tapping into a rapidly growing market.

*"We are ready to leverage the battery expertise and silicon anode innovations developed throughout 2024 to deliver materials with **low operating costs, minimal carbon footprints, and exceptional performance**. HPQ's strategy remains focused on producing **silicon-based materials** for the **3C markets (Computer, Consumer, and Communication)**—a **US\$12 billion** market today, projected to grow to **US\$38.3 billion by 2030** ^[12]. This market is perfectly suited for the materials we have already validated at this stage of our development," said **Bernard Tourillon, President and CEO of HPQ Silicon Inc. and NOVACIUM SAS**. "Our next step will be to establish, either independently or through partnerships with industrial players, a pilot plant capable of manufacturing **silicon-based anode materials** at scale."*

Acquisition of full ownership of the provisional patent to produces fumed alumina (Al₂O₃) and fumed titanium (TiO₂) with no royalties or other obligations required

HPQ Silicon announces that it has acquired all rights, title, and interest held by the inventors in the provisional patent and devices for an innovative one-step manufacturing process to make fumed alumina (Al₂O₃) and fumed titanium (TiO₂)—two materials essential for the advancement of next-generation lithium-ion (Li-ion) battery cathodes, (refer to the [February 19, 2025, release](#)).

The company thus becomes the owner of the Patent, the intellectual property and the attached priority rights, free of any assignment or charge of any kind whatsoever.

This arm's length acquisition will be completed and paid by means of the issuance of 1,254,545 units by the Company, priced at \$0.22 per share for a total value of \$276,000, with the units to be distributed among the inventors. Each unit consists of one (1) common share and one-half (1/2) warrant of the Company's capital stock. Each full warrant grants the holder thereof the right to purchase one common share at \$0.285 per share for a period of four years from the date of the closing of the transaction.

All shares issued as part of this transaction are subject to a mandatory hold period of four months and one day, in accordance with applicable Canadian securities laws. The transaction and unit issuance are subject to customary regulatory approvals, including approval by the TSX Venture Exchange.

"Having full ownership of the provisional patent to produces fumed alumina (Al₂O₃) and fumed titanium (TiO₂), with no royalties or other obligations, addresses a key question raised by potential technical and financial partners interested in our silicon-based anode materials," said Bernard Tourillon, President and CEO of HPQ Silicon Inc.

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.
- [2] <https://www.orbtronic.com/content/Datasheet-specs-Sanyo-Panasonic-NCR18650GA-3500mah.pdf>
- [3] <https://www.farnell.com/datasheets/2634739.pdf>
- [4] <https://www.dnkpowers.com/lg-inr18650-mj1-battery-3500mah-3-635v/>
- [5] https://e2e.ti.com/cfs-file/_key/communityserver-discussions-components-files/196/INR18650_2D00_30Q_5F00_datasheet.PDF

- [6] Information provided "as is" and for reference purposes only, as there is no way to confirm that the testing protocol used by Panasonic, LG, and Samsung is the same as the one used for GEN3 batteries.
- [7] Management's opinion is based on a review of capacity and durability data from commercially available 18650 batteries
- [8] Link to source for [Graphite in batteries](#)
- [9] Source: Benchmark Mineral Intelligence, December 2024 from NMG February 2025 Investor deck page 22.
- [10] The addressable market of 555,000 to 1.1 million tonnes per year are based on Management assumptions that the Graphite conversion will range between 5% to 10% of the annual graphite market in 2030.
- [11] The US \$ 25.7 Billions is taken by multiplying 550,000 t by US\$ 50 per Kg, while the US\$ 55.0 Billions is taken by multiplying 1,100,000 t by US\$ 50 per Kg.
- [12] Link to source for [3C market date](#).

About NOVACIUM SAS

Novacium is an HPQ - affiliated company that 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 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 its technical team to help develop its silicon and new renewable energy projects.

About HPQ Silicon

HPQ activities are centred around the following five (5) 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 Silica Polvere Inc being developed for HSPI 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 based on demand and high-pressure autonomous hydrogen production system.
- 4) HPQ SILICON affiliate NOVACIUM SAS is developing a new process to transform black aluminium dross into a valuable resource.
- 5) Becoming a zero CO₂ 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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This press release contains certain forward-looking statements, including, without limitation, statements containing the words "may", "plan", "will", "estimate", "continue", "anticipate", "intend", "expect", "in

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