

HPQ Gen1 Nano Silicon Reactor Exceeds Expectations, Produces Sub 100 Nm Spherical Nanopowders & Nanowires

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MONTREAL, Jan. 21, 2021 - Innovative silicon solutions provider [HPQ Silicon Resources Inc.](#) ("HPQ" or "the Company") (TSX-V: HPQ; FWB: UGE; Other OTC : URAGF), through its wholly - owned subsidiary, HPQ Nano Silicon Powders inc ("HPQ NANO"), is pleased to update shareholders on milestones achieved during ongoing *Gen1 PUREVAPTMNSiR* ("NSiR") commissioning tests conducted by technology provider PyroGenesis Canada Inc. (TSX: PYR).

"With the Gen1 PUREVAPTMNSiR operational and exceeding expectations from the start, HPQ NANO is uniquely positioned to be at the forefront of low-cost manufacturing of Nano Silicon for batteries and other applications, as we continue working on scaling up the capabilities of our PUREVAPTMNSiR process." said Bernard Tourillon, President and CEO HPQ Silicon.

PUREVAPTM NSiR LOW-COST PROCESS: FIRST RESULTS ENCOURAGING, MORE TESTING TO FOLLOW

The material produced, under the less than optimum operating conditions of the first commissioning tests, was analysed by scanning electron microscope (SEM) imaging combined with X-ray diffraction (XRD) and yielded the following information:

- Gen1 NSiR system performance exceeded design and modelling expectations:
 - • Successfully produced sub 100 nm silicon - based spherical nanopowders & nanowires.
 - • Computer models suggested that the size limit of the material produced would be between 100 nm and 200 nm.
- SEM-XRD analysis indicates that the < 100 nm Si base spherical nanopowders & nanowires material could be used as anode material for Li-ion batteries, combined with graphite or not.
- Samples from these commissioning tests have been sent to Professor Lionel ROU? of the Centre ?nergie Mat?riaux T?l?communications (EMT) for electro-chemical evaluation.
- Using results from data collected during these preliminary tests, PyroGenesis technical team has improved the design of the system and the operational parameters of the reactor.
 - • It will be possible to provide further inputs and controls on the process to customize the composition and size of the spherical nano powders and nano wires.
- The Gen1 NSiR is now ready to commence further testing of Silicon nano materials under new conditions, with a goal of producing larger size Silicon (Si) nanopowders and nanowires.

A METHODICAL APPROACH TO THE COMMERCIAL DEVELOPMENT OF OUR DISRUPTIVE TECHNOLOGY

Despite massive investment in Silicon material for batteries, current manufacturing processes are simply not scalable or commercially viable. The *PUREVAPTM NSiR* represents a game changing leap forward in resolving the issues of commercial viability and scalability, and with the Gen1 NSiR now operational, HPQ NANO is uniquely well positioned to offer industry participants a wide spectrum of products for testing.

The scale of the *Gen1 PUREVAPTMNSiR* allows HPQ NANO technical provider PyroGenesis to take full advantage of a quick R&D feedback loop during the testing phase. Over short periods, tests are completed, material produced is analysed by scanning electron microscope (SEM) imaging combined with X-ray diffraction (XRD), operational parameters are reviewed and system modifications and/or operational improvements are implemented. This is the key to our methodical approach of developing a truly disruptive low-cost technology that is going to change nano silicon materials manufacturing.

Tourillon added "HPQ's Silicon R&D consortium has the depth and flexibility to meet the challenges as we strive to produce products for renewable energy storage participants and electric vehicle manufacturers, who are searching for cost effective ways of increasing the Silicon contained in their batteries. Silicon's potential to meet energy storage demand is undeniable, generating massive investments, and serious industry interest. We are very confident that the Silicon materials we are producing, with our expected low-cost scalable processes, will be in high demand by batteries, EV manufacturers and other participants in the ongoing renewable energy revolution."

About PyroGenesis Canada Inc.

PyroGenesis Canada Inc., a high-tech company, is a leader in the design, development, manufacture and commercialization of advanced plasma processes and products. The Company provides its engineering and manufacturing expertise and its turnkey process equipment packages to customers in the defense, metallurgical, mining, advanced materials (including 3D printing), and environmental industries. With a team of experienced engineers, scientists and technicians working out of its Montreal office and its 3,800 m² manufacturing facility, PyroGenesis maintains its competitive advantage by remaining at the forefront of technology development and commercialization. The Company's core competencies allow PyroGenesis to provide innovative plasma torches, plasma waste processes, high-temperature metallurgical processes, and engineering services to the global marketplace. PyroGenesis' operations are ISO 9001:2015 and AS9100D certified. For more information, please visit www.pyrogenesis.com.

About HPQ Silicon

[HPQ Silicon Resources Inc. \(TSX-V: HPQ\) is a Canadian Innovative Silicon Solutions Provider.](http://HPQ Silicon Resources Inc. (TSX-V: HPQ) is a Canadian Innovative Silicon Solutions Provider.)

Silicon (Si), also known as silicon metal, is one of today's key strategic materials needed for the decarbonization of the economy and the Renewable Energy Revolution ("RER").

Silicon is the most abundant element in earth's crust but does not exist in its pure state and must be extracted from quartz (SiO₂) in what has historically been a capital and energy intensive process. HPQ is building a portfolio of silicon-based products using innovative scalable processes. The target objective is to produce high value speciality Silicon products using technologies that will reduce energy consumption, GHG's, and carbon footprint.

Working with PyroGenesis Canada Inc. (TSX: PYR), a high-tech company that designs, develops, manufactures and commercializes plasma - based processes, HPQ is developing:

- The *PUREVAP™ "Quartz Reduction Reactors"* (QRR), an innovative process (patent pending), which will permit the one step transformation of quartz (SiO₂) into high purity silicon (Si) at reduced costs, energy input, and carbon footprint that will propagate its considerable renewable energy potential.
 - • HPQ believes it will become the lowest cost (Capex and Opex) producer of silicon (Si) and high purity silicon metal (3N - 4N Si).
- Through its 100% owned subsidiary HPQ NANO Silicon Powders Inc, the *PUREVAP™ Nano Silicon Reactor (NSiR)*, a new proprietary process that can use different purities of silicon (Si) as feedstock, to make a wide range of nano/micro spherical powders of different sizes and nanowires.
 - • HPQ believes it can also become the lowest cost manufacturer of spherical Si nanopowders and silicon-based composites needed by manufacturers of next-generation lithium-ion batteries.
 - • During the coming months, spherical Si nanopowders and nanowires silicon-based composite samples requested by industry participants and research institutions' will be produced using *PUREVAP™ SiNR*.

HPQ is also working with industry leader Apollon Solar of France to:

- Use their patented process and develop a capability to produce commercially porous silicon (Si) wafers and porous silicon (Si) powders.
- • The collaboration will allow HPQ to become the lowest cost producer of porous silicon wafers for all-solid -state batteries and porous silicon powders for Li-ion batteries.
- • Develop the hydrogen generation potential of Silicon nanopowders for use with the Gennao™ system.
- • Commercialize, exclusively in Canada, and non-exclusive in the U.S.A., the Gennao™ H₂ system and the chemical powders required for the hydrolysis production of Hydrogen ("H₂").

This News Release is available on the company's CEO Verified Discussion Forum, a moderated social media platform that enables civilized discussion and Q&A between Management and Shareholders.

Disclaimers:

The Corporation's interest in developing the PUREVAP®; QRR and any projected capital or operating cost savings associated with its development should not be construed as being related to the establishing the economic viability or technical feasibility of any of the Company's Quartz Projects.

This press release contains certain forward-looking statements, including, without limitation, statements containing the words "may", "plan", "will", "estimate", "continue", "anticipate", "intend", "expect", "in the process" and other similar expressions which constitute "forward-looking information" within the meaning of applicable securities laws. Forward-looking statements reflect the Company's current expectation and assumptions and are subject to a number of risks and uncertainties that could cause actual results to differ materially from those anticipated. These forward-looking statements involve risks and uncertainties including, but not limited to, our expectations regarding the acceptance of our products by the market, our strategy to develop new products and enhance the capabilities of existing products, our strategy with respect to research and development, the impact of competitive products and pricing, new product development, and uncertainties related to the regulatory approval process. Such statements reflect the current views of the Company with respect to future events and are subject to certain risks and uncertainties and other risks detailed from time-to-time in the Company's on-going filings with the security's regulatory authorities, which filings can be found at 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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A photo accompanying this announcement is available at
<https://www.globenewswire.com/NewsRoom/AttachmentNg/8789420b-d52c-4857-958a-35969cdc309a>

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