



## HPQ GEN 1 NANO SILICON REACTOR EXCEEDS PHASE 1 PRODUCTION RATE TARGET BY 67%

### PRODUCTION RATE: KEY TO COMMERCIAL VIABILITY OF NANO SILICON MATERIALS

**MONTREAL, Canada, April 22<sup>nd</sup>, 2021** — [HPQ Silicon Resources Inc.](#) (“HPQ” or the “Company”) ([TSX-V: HPQ](#)) ([OTCQX: HPQFF](#)) ([FWB: UGE](#)), an innovative silicon solutions company, through its wholly – owned subsidiary HPQ Nano Silicon Powders inc (“HPQ NANO”), is pleased to update its shareholders on the recent milestones achieved by the *Gen1 PUREVAP™ Nano Silicon Reactor (“NSiR”)* process validation and optimization tests. The ongoing tests are conducted by the technology provider, [PyroGenesis Canada Inc.](#) ([TSX: PYR](#)) ([NASDAQ: PYR](#)) ([FRA: 8PY](#)), as per the agreement announced on August 18<sup>th</sup>, 2020.

#### PRODUCTION RATE:

The *Gen1 PUREVAP™ NSiR* test bed, is a batch process system with an originally targeted design output production rate of 30 kg/month of nano silicon powders. The *Gen1 NSiR* recently achieved a production rate equivalent to 50 kg/month of nano powders, a result that exceeded the design output by 67%. The significance of this is twofold:

1. Expectation of greater throughput than originally planned for the commercial tests,
2. Expectation of reduced unit costs and production costs as a result of increased throughput.

#### PRODUCTION RATE: KEY TO COMMERCIAL VIABILITY OF NANO SILICON MATERIALS

NSiR test bed work results to date leads us to conclude that the *Gen2 NSiR* semi-continuous proof of commercial scalability system will be able to have an ultimate monthly increased production rate of 500 kg/month (or about 6 MT/year) of nano silicon powders or nanowires. This is substantially greater than the originally stated 300 kg/month (or about 3,5 MT/year) mentioned in our press release dated August 18<sup>th</sup>, 2020.

*“HPQ NANO Gen1 PUREVAP™ NSiR testing program is moving forward, and we are very pleased that with each test completed, we are reaching new operational milestones exceeding our original expectations. With these new results, HPQ NANO is confident that it can achieve the desired nano silicon material for batteries which will be cost competitive with graphite”,* said Bernard Tourillon, President and CEO HPQ Silicon. *“With the use of silicon in batteries anodes expected to increase from less than 5% today to over 30% by 2030<sup>1</sup>, HPQ NANO is very well positioned to become the nano silicon provider of choice for the industry. HPQ’s silicon R&D consortium continues to strive for cost effective ways of increasing the silicon contained in batteries.”*

#### PROCESS VALIDATION AND OPTIMIZATION TESTS ARE GENERATING VALUABLE DATA

The ongoing tests are crucial as they allow PyroGenesis to progress on the project while identifying and resolving normal R&D issues systematically. The main segments of the ongoing process validation and optimization tests can be summarized as follows:

1. Validation that the system can produce < 150nm nano materials,
2. Validation that the system can reach its design production parameters, and
3. Production of qualified samples.

<sup>1</sup> [Source Roskill.com](#)



The ongoing tests have achieved significant results and have generated extremely valuable information that will be applied to future developments. Despite the difficulties of operating under the stress of COVID-19, PyroGenesis' team has achieved outstanding results while maintaining strict and new operating procedures to protect all of its staff from the effects of the virus. In addition, several unexpected issues occurred during the conversion of the *Gen2 PUREVAP™ QRR* reactor into the *Gen1 PUREVAP™ NSiR*, which modeling and computer simulation did not foresee. These were overcome by the professional team at PyroGenesis. The results also demonstrated that our *PUREVAP™ QRR* has a unique ability to produce a low-cost HPQ battery grade silicon for less than commercially available metallurgical grade silicon.

Since the start of the testing program, we have demonstrated the following positive results from the *PUREVAP™ NSiR* process:

1. Production of nano silicon powders of less than 150 nm, the threshold above which silicon fracturing occurs.
  - a. Further efforts will focus on improved measures and control the size distribution of our material, a critical criterion for battery manufacturers.
2. Production rate achieved exceeded the original goal.
  - a. Continuous process improvements to further increase the production capacity, and thereby reducing future commercial production cost.

Once the final equipment modifications are completed, the goal of the program will be to produce qualified samples which will then be tested by a third-party, the Institut National de Recherche Scientifique (INRS), and subsequently to awaiting battery manufacturers and automobile manufacturers.

*“As experts in successfully taking lab scale concepts to commercialization, we can confirm that these results not only demonstrate that we are on the right track but that the project is progressing as expected.”* said P. Peter Pascali, President and CEO of PyroGenesis. *“It is even more exciting when one considers the impact this could have on addressing the challenges facing the EV battery space. We are proud to be using our plasma expertise in support of, and advancing, green initiatives.”*

### About HPQ Silicon

[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”).

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 (SiO<sub>2</sub>) 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**.

#### **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 m<sup>2</sup> and 2,940 m<sup>2</sup> manufacturing facilities, 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](http://www.pyrogenesis.com).

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](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 Resources Inc.

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