



## HPQ FILES PROVISIONAL PATENT APPLICATION FOR SILICON BY-PRODUCT CREATED BY *PUREVAP<sup>TM</sup>* QRR AS ANODE MATERIAL FOR LITHIUM-ION BATTERIES

### PRELIMINARY BUT PROMISING RESULTS DEMONSTRATE A CAPACITY 3-4 TIMES GREATER THAN GRAPHITE FOR LITHIUM-ION BATTERIES

Montreal, QC, Dec 29, 2020 – Innovative silicon solutions provider [HPQ Silicon Resources Inc.](#) ("HPQ" or "the Company") ([TSX-V: HPQ](#); [FWB: UGE](#); [Other OTC : URAGF](#)), is pleased to inform shareholders that promising results from electrochemical performance tests made with silicon-based by-products manufactured by the *GEN2 PUREVAP<sup>TM</sup> Quartz Reduction Reactor* ("QRR") motivated the company to file a provisional patent application regarding their manufacturing, assembly and usage as anode materials for Lithium-ion batteries.

The patent application follows the completion of a series of tests made on the material produced by the *GEN2 PUREVAP<sup>TM</sup> QRR* at the Centre Énergie Matériaux Télécommunications (EMT) of the INRS by Professor Lionel ROUÉ under an NSERC Engage Grant and a NSERC Engage plus Grant.

#### ***PUREVAP<sup>TM</sup> QRR SILICON BY-PRODUCTS: A SUPERIOR ANODE MATERIAL THAN GRAPHITE***

Although preliminary, the results obtained are more than promising since the silicon-based by-product made with the *Gen2 PUREVAP<sup>TM</sup> QRR* maintained a gravimetric capacity  $\geq 1,200$  mAh/g for more than 100 charge/discharge cycles, a capacity 3-4 times greater than that of graphite currently used in commercial Li-ion batteries. This material is also promising in terms of high-speed performance. (See Figure 1 below)

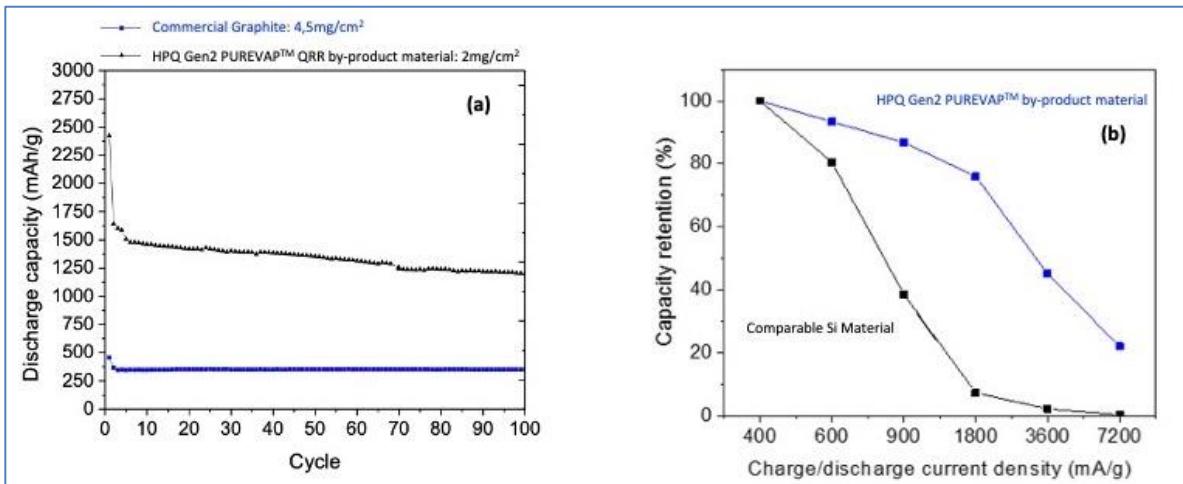


Figure 1. (a) Comparing electrode performance of HPQ Gen2 *PUREVAP<sup>TM</sup>* by-product versus graphite electrodes during cycling tests and (b) power response versus electrodes made with comparable silicon (Si).

"This is another demonstration of our multi-prong approach to becoming a key silicon based material provider for the battery industry and beyond. The unique capabilities of the *PUREVAP<sup>TM</sup> Nano Silicium Reactor (Si)* ("NSiR") will enable us to fully exploit the potential of the Silicon and its by-products manufactured by the *PUREVAP<sup>TM</sup> Quartz Reduction Reactor* ("RRQ")" said Bernard Tourillon, President and CEO HPQ Silicon. "Silicon's potential to meet energy storage demand is



*undeniable, generating [massive investments](#), and serious industry interest. We are very confident that demand for the Silicon materials we will produce, with our low-cost scalable processes, will be high demand by batteries and EV manufacturers in this renewable energy revolution.”*

## 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”).

Silicon is the most abundant element in earth's crust but does not exist in its pure state and must be extracted from quartz ( $\text{SiO}_2$ ) 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 ( $\text{SiO}_2$ ) 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 difference 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™ H<sub>2</sub> 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 ongoing 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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**For further information contact**

Bernard J. Tourillon, Chairman, President and CEO Tel (514) 907-1011

Patrick Levasseur, Vice-President and COO Tel: (514) 262-9239

<http://www.hpqsilicon.com> Email: Info@hpqsilicon.com