

HPQ Silicon Resources Inc. and Apollon Solar Strengthen Collaboration to Focus on Porous Silicon for Lithium-ion Battery Market

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MONTREAL, Jan. 27, 2020 - [HPQ Silicon Resources Inc.](#) ("HPQ"; - "The Company"; TSX-V: HPQ; FWB: UGE; Other OTC : URAGF; is pleased to announce the extension of the Development Agreement signed in 2017 with Apollon Solar SAS ("Apollon") from January 1 to June 30, 2020. The biggest change to this fourth renewal is that the Agreement's main focus is now on manufacturing and value generation associated with the deployment of Porous Silicon (PSi) in the Lithium-ion batteries market, using Apollon's patented process to manufacture Porous Silicon Wafers with Silicon Metal (Si) produced by the HPQ PUREVAP[™] Quartz Reduction Reactor ("QRR"). While the agreement is ongoing, HPQ will have a North American exclusivity over the use of Apollo's patented process to manufacture Porous Silicon. If required, the Parties have already agreed to meet in May 2020 to negotiate an extension.

"HPQ and Apollon are consolidating their collaborations in order to take maximum advantage of our pioneering position in the manufacture of Porous Silicon wafers using PUREVAP[™] silicon metal. During 2020, we intend to demonstrate the commercial potential of the technology and Porous material produced" said Bernard Tourillon, President and CEO HPQ Silicon. *"Silicon Metal's potential to meet energy storage demand is undeniable and generating massive investments, as well as, serious industry interest, so our timing could not be better."*

POROUS SILICON - AN ADVANCED MATERIAL WITH CURRENT HIGH COST CONSTRAINTS

Porous silicon is a Silicon Metal (Si) structure in which Nanopores have been formed by electrochemical etching.

FE-SEM Images of Porous Silicon electrochemically etched using the Apollon/CNRS process:
<https://www.globenewswire.com/NewsRoom/AttachmentNg/a67e2e14-f59e-452a-a4ba-4b08b61ae00a>

Market opportunities for porous silicon are massive, ranging from electronics, batteries, environment, consumer goods, sensors and medicine, to name just a few. Their high manufacturing cost, since available electrochemical etching processes require electronic grade silicon (9N to 11N) as a raw material, represent a significant barrier to their commercial application.

APOLLON PATENTED LOW-COST PROCESS TO MANUFACTURING POROUS SILICON (PSI) WAFERS

In 2012, Apollon, working in collaboration with France INSA Lyon ("Centre National de la Recherche Scientifique"), developed and obtained a worldwide patent for a unique low-cost process that uses standard metallurgical Silicon Metal (2N to 4N+ Si) to produce porous Silicon Wafers that can have porous structure sizes of either Microporous (<5nm), Mesoporous (5nm – 50nm) and Macroporous (>50nm) as per end-users requirements.

NDA WITH LITHIUM-ION BATTERY MANUFACTURER LOOKING FOR POROUS SILICON WAFERS

The complement of HPQ and Apollon's unique capabilities attracted the interest of a next generation Lithium-ion battery manufacturer looking for a potential supplier of porous silicon wafers. HPQ and partner Apollon, acting as one party, have already signed a non-disclosure agreement ("NDA") with the battery manufacturer, with discussions and technical information exchanges are now ongoing. The aim of these discussions is to have the technical specifications required in order to provide the battery manufacturer

with the Porous Silicon wafers they are looking for as soon as feasible. For competitive reasons, the name of the battery manufacturer will remain confidential for the time being.

GLOBAL ENERGY STORAGE MARKET READY TO EXPLODE

A recent report by Wood Mackenzie Power projects that energy storage deployments are estimated to grow 1,300% from a 12 Gigawatt-hour market in 2018 to a 158 Gigawatt-hour market in 2024. An estimated US\$71 billion in investments will be made into storage systems where batteries will make up the lion's share of capital deployment.

MASSIVE ENERGY STORAGE DEMAND CANNOT BE MET UNLESS SILICON ANODES REPLACE GRAPHITE

The Li-ion battery is the dominant technology in energy storage while graphite, a fairly low energy density material compared to other anode materials, is the dominant anode material in for Li-Ion batteries.

A photo accompanying this announcement is available at <https://www.globenewswire.com/NewsRoom/AttachmentNg/541a7985-9ceb-4574-a22e-bdfd8ba6cd5f>

Presently, silicon metal powders are blended with graphite to make anodes for Li-ion batteries, resulting in less than 10 wt% Si content in Li-ion batteries. Even with the limited performance improvement achieved to date, demand for Silicon Metal powders is estimated to represent an addressable market of US \$ 1B by 2022¹ expanding at a CAGR of 38.9% between 2019 – 2024.

MANUFACTURING POROUS SILICON POWDERS FOR TRADITIONAL LITHIUM-ION BATTERIES

By crushing porous silicon wafers, it should be possible to make a porous silicon powder that, when combined with graphite, could improve the performance of currently available lithium-ion batteries. Porous silicon wafers (Microporous, Mesoporous and Macroporous) will be manufactured and crushed into powder. Batteries cycling tests will be carried in order to define and validate the characteristics of the powders produced.

About Silicon Metal

Silicon Metal (Si) is one of today's strategic materials needed to fulfil the renewable energy revolution presently under way. Silicon does not exist in its pure state; it must be extracted from quartz, one of the most abundant minerals of the earth's crust and other expensive raw materials in a carbothermic process.

About HPQ Silicon

[HPQ Silicon Resources Inc.](#) (TSX-V: HPQ) is developing, with PyroGenesis Canada Inc. (TSX-V: PYR), a high-tech company that designs, develops, manufactures and commercializes plasma base processes, the innovative *PUREVAP™ “Quartz Reduction Reactors”* (QRR), a truly 2.0 Carbothermic process (patent pending), which will permit the One Step transformation of Quartz (SiO₂) into High Purity Silicon (Si) at prices that will propagate its considerable renewable energy potential. The Gen3 *PUREVAP™* QRR pilot plant that will validate the commercial potential of the process is scheduled to start during Q1 2020.

HPQ, working with PyroGenesis, is also developing a process that can take the High Purity Silicon (Si) made by the *PUREVAP™* and manufacture Spherical Silicon Metal nano-powders for Next Gen Li-ion batteries. During Q1 2020, the plan is to validate our game changing manufacturing approach using a modified Gen2 *PUREVAP™* reactor to produce spherical Silicon Metal (Si) nano-powders samples for industry participants and research institutions’.

Concurrently, HPQ is also working with industry leader Apollon Solar to develop a manufacturing capability

that uses the High Purity Silicon (Si) made with the *PUREVAP*®; to make Porous silicon wafers needed for solid-state Li-ion batteries. The first Silicon wafer should be ready to be ship for testing to a battery manufacture (under NDA) during Q1 2020.

Finally, with Apollon Solar, we are also looking into developing a metallurgical pathway of producing Solar Grade Silicon Metal (SoG Si) that will take full advantage of the *PUREVAP*™ QRR one-step production of Silicon (Si) material of 4N+ purity with low boron count (< 1 ppm).

All in all, HPQ focus is becoming the lowest cost producer of Silicon Metal (Si), High Purity Silicon Metal (Si), Spherical Si nano-powders for Next Gen Li-ion batteries, Porous Silicon Wafers for Solid states Li-ion batteries, Porous Silicon Powders for Li-ion batteries and Solar Grade Silicon Metal (SoG-Si).

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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