

## HPQ and Apollon Solar Renew Their Agreement to Pursue the Development of Silicon Materials for Energy Storage and Hydrogen Production

MONTREAL, Feb. 04, 2021 (GLOBE NEWSWIRE) -- Innovative silicon solutions provider [HPQ Silicon Resources Inc.](#) ("HPQ" or the "Company") ([TSX-V: HPQ](#); [FWB: UGE](#); [Other OTC : HPQFF](#)), is proud to announce the sixth renewal of its agreement with [Apollon Solar SAS](#) ("Apollon") to continue developing nanoscale and porous silicon materials for energy storage, hydrogen production and high value-added applications.

The objective of the collaboration is to take full advantage of the ability to produce nanoscale silicon materials at low cost using HPQ's *PUREVAP™ Nano Silicon Reactor* ("NSiR"), while seeking to determine whether the use of silicon produced by HPQ's *PUREVAP™ Quartz Reduction Reactor* ("QRR"), as the raw material for the Apollon process, will lead to the economically viable production of high-quality porous silicon.

*"HPQ continues its research, development and commercialization activities with respect to nano-sized and porous silicon materials in order to be at the forefront of low-cost manufacturing of silicon materials for batteries, clean hydrogen production and other advanced applications. Since 2017, our collaboration with Apollon has allowed us to benefit from its world-renowned expertise in the use of silicon in high value-added applications,"* said Bernard Tourillon, Chairman and CEO of HPQ Silicon Resources Inc.

### **Economically viable green renewable energy**

The work plan for the upcoming months is to produce porous silicon samples with the Apollon process for research centres and industrial companies interested in using them in the manufacture of future generation Li-Ion batteries and supercapacitor development, as well as to collaborate on the development of protocols for encapsulating porous silicon and nanoscale silicon materials produced with HPQ's Nano *PUREVAP™ NSiR* process in carbon. The partners will also use this time to compare the technical and commercial potential of nanoscale and porous silicon materials to create new generations of environmentally friendly powders with better performance for hydrogen production.

### **Porous silicon, a promising material**

Porous silicon is a structure of silicon (Si) in which nanopores have been formed by anodization through electrochemical etching. The currently available anodization processes all use very high purity silicon (9N to 11N) as a raw material, which makes the cost of porous silicon prohibitive. To reduce the production costs of porous silicon, Apollon has developed and patented worldwide an electrochemical anodizing process capable of using silicon (2N to 4N+) to make porous silicon.

By using HPQ's *PUREVAP™ QRR*, a silicon (2N to 4N+) with the lowest manufacturing cost in the industry, as the raw material for Apollon's patented porosification process, it becomes possible to contemplate the economically viable production of porous silicon.

HPQ maintains a North American exclusivity on the use of Apollon's patented porous silicon manufacturing process for the duration of the renewal period, until June 30, 2021.

### **The production of renewable and green hydrogen with silicon**

Over the last few years, Apollon Solar has developed expertise in the production of hydrogen by hydrolysis by creating a reaction in water "H<sub>2</sub>O" with porous silicon nanopowders to release large quantities of hydrogen "H<sub>2</sub>".

Armed with this expertise, Apollon has developed an autonomous system with a simple operation: Hydrogen is generated by hydrolysis, thanks to the use of a chemical powder that, by reacting with water, releases hydrogen, which is then transformed into electricity by means of a fuel cell. In the end, this makes it possible to charge batteries, among other things.

The use of porous silicon nanopowders doubles the amount of hydrogen released by the system. However, the high cost of manufacturing porous silicon nanopowders means that Apollon has chosen to use a less efficient, but more economical, environmentally friendly chemical powder to begin the commercialization of its systems. HPQ and Apollon will compare the technical and commercial potential of nanoscale silicon materials and porous silicon materials to create new generations of green powders with better performance for hydrogen production.

The agreement also gives HPQ the right to commercialize the system developed by Apollon, on an exclusive basis in Canada, and non-exclusively in the United States, while distributing and selling the powders required to produce hydrogen ("H<sub>2</sub>") by hydrolysis. During the term of this renewal, HPQ will have the exclusive Canadian rights to distribute, sell, market, and represent the systems and associated packets to all its customers located in the United States.

### **A methodical approach for other cutting-edge sectors**

The sixth renewal includes a clause regarding the review of other emerging advanced applications that could use micrometer and nanometer silicon materials produced with HPQ's Nano *PUREVAP™ NSiR* for research centres and industrialists working on their uses in high-tech sectors.

*"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 demands 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 for batteries, and by EV manufacturers and other participants in the ongoing renewable energy revolution," added Bernard Tourillon.

#### **About HPQ Silicon Resources**

[HPQ Silicon Resources Inc. \(TSX-V: HPQ\)](#) is a Quebec-based company that offers innovative silicon (Si)-based solutions and is developing a unique portfolio of high value-added silicon (Si) products sought after by battery and electric vehicle manufacturers.

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"). However, silicon does not exist in its pure state and must be extracted from quartz (SiO<sub>2</sub>) in what has historically been a capital and energy-intensive process.

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. Through its 100% owned subsidiary, HPQ NANO Silicon Powders Inc., the **PUREVAP™ Nano Silicon Reactor (NSiR)** is 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 is also working with industry leader [Apollon Solar of France](#) to develop the capability to produce commercially porous silicon (Si) wafers and porous silicon (Si) powders, and to develop the hydrogen generation potential of Silicon nanopowders for use with the Gennao™ system and 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 ("H<sub>2</sub>"). For more information, please visit <https://hpqsilicon.com/>.

#### **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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**Source:** HPQ Silicon Resources Inc.

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