



## HPQ AND APOLLON SOLAR EXTEND AGREEMENT TO WORK ON POROUS SILICON FOR BATTERIES AND EXPAND COLLABORATION TO INCLUDE HYDROGEN PRODUCTION

**Montreal, Quebec, Canada, (September 17, 2020):** [HPQ Silicon Resources Inc.](#) (“HPQ” or “Company”) [TSX-V: HPQ; FWB: UGE; Other OTC : URAGE](#); is pleased to announce the extension, until December 31, 2020, of the Development Agreement signed with [Apollon solar SAS](#) (“Apollon”) in 2017. This fifth renewal will be focused on extremely promising venues for both the renewable energy sector and the decarbonization of the economy, mainly:

1. **Energy Storage** development of a new generation of Lithium-ion batteries made using Porous Silicon manufactured by the transformation of HPQ *PUREVAP™ Quartz Reduction Reactor “QRR”* Silicon (Si) with Apollon patented process;
2. **Clean Renewable Hydrogen Production** using Apollon Solar Gennao H2™ 200W, a fuel cell - based system that can produce hydrogen by hydrolysis simply by combining water with an environmentally friendly<sup>1</sup> chemical powder. Replacing the chemical powder presently used with nano silicon powders, such as those about to be produced by the HPQ *NANO PUREVAP™ Nano Silicon Reactor (“NSiR”)*, could significantly increase the hydrogen generation capacity of the system.

*“Since 2015, HPQ has been working on revolutionizing silicon manufacturing and its applications with the development of our PUREVAP™ technologies, scalable and extremely versatile processes that will allow the production of silicon materials perfectly suited to assist in the goals of decarbonization of the economy and the generation of green renewable energies”* said Bernard Tourillon, President & CEO of HPQ Silicon Resources Inc. *“Since 2017, our collaboration with Apollon has enabled us to benefit from their world-renowned expertise with high value-added Silicon applications. The addition of manufacturing hydrogen by hydrolysis to our collaboration opens up a new and unique business opportunity that could represent a [second multibillion-dollar addressable market](#) for the PUREVAP™ Nano Silicon (Si) Reactor (“NSiR”) nanopowders.”*

### APOLLON PROCESS: MAKING POROUS SILICON MANUFACTURING ECONOMICALLY VIABLE

Porous silicon is a Silicon (Si) structure in which Nanopores have been formed by electrochemical etching. Addressable markets for porous silicon are substantial, but existing electrochemical etching processes require very pure Silicon (Si) feed stock (9N to 11N), making porous Silicon cost prohibitive.

To make affordable porous Silicon, Apollon [developed and obtained](#) a worldwide patent for an electrochemical etching process that can use (2N to 4N) Silicon (Si) to make porous Silicon wafers.

### AIMING TO SEND POROUS SILICON NANOPOWDER SAMPLES TO END USERS BY DECEMBER 2020

Mindful of HPQ's competitive advantage, the ability of *PUREVAP™ QRR* to produce 2N to 4N Silicon (Si) at the lowest cost in the industry, HPQ and Apollon are busy manufacturing samples of porous Si nanopowders of different sizes (2 nm to 1 µm) with porous structure sizes of either Microporous (<5nm), Mesoporous (5nm – 50nm) and Macroporous (>50nm). The aim being to send samples, to end users' specifications, by December 2020. The extension of the agreement continues HPQ's North American exclusivity over the use of Apollon's patented process to manufacture Porous Silicon until at least December 31, 2020.

1 Non-toxic and recyclable



## HYDROLYSIS HYDROGEN PRODUCTION: APOLLON SOLAR'S GENNAO H2™ SYSTEM

Apollon Solar is also active in hydrogen based clean renewable energy. Over the years, they have developed an expertise in hydrogen production by hydrolysis, getting porous silicon nano powders to react with water "H<sub>2</sub>O" and therewith releasing significant quantities of hydrogen "H<sub>2</sub>".

Drawing on this unique expertise, Apollon was approached by the French government to develop a compact and portable hydrogen-based electricity generation system that must be reliable and efficient enough to charge military personnel batteries on missions. This work led to the creation of the Gennao H2™ a self-contained system that integrates a fuel cell. The system operation is simple; a chemical powder is introduced, and as the powder reacts with water, hydrogen is generated by hydrolysis and converted into electricity by the integrated fuel cell, thus allowing the system to charge several batteries at once.

The operational capabilities of the system having reached the validation phase of the French military program, Apollon Solar is now ready to start the commercialization of a civilian version of its Gennao™ H2 system.

## COLLABORATION WITH HPQ SILICON TO CREATE MORE EFFICIENT AND ECONOMICAL HYDROGEN

With Apollon Solar's Hydrogen business having entered the commercial phase, HPQ took advantage of the 5th renewal to include it in the scope of the agreement.

Even though using porous silicon nanopowders would double the amount of hydrogen released by the system, the high costs of making porous silicon nanopowders required Apollon to use a less efficient, but more economical and environmentally friendly chemical powder to launch its Gennao™ H2 system.

With a goal of increasing the efficiency of the system, HPQ and Apollon will explore the technical and commercial potential of creating a new generation of more efficient, economical and environmentally friendly powders for the Gennao™ system using either:

1. Silicon nanopowders made by HPQ's *PUREVAP™ Nano Silicon Reactor* to increase the H<sub>2</sub> generation potential of the Gennao™ H2 system by 40% (based on the mass capacity production of H<sub>2</sub> of 14% of Silicon Nanopowders);
  - a. By December 2020, HPQ-NANO plans to send Apollon the first samples of silicon nanopowders manufactured by *PUREVAP™ NSiR* for H<sub>2</sub> generation testing;
2. Porous silicon nanopowders manufactured with the transformation of Silicon produced by HPQ's *PUREVAP™ QRR* process in Apollon's patented process, to increase the H<sub>2</sub> generation potential of the Gennao™ H2 system by 100% (based on the mass capacity production of H<sub>2</sub> of 20% of Silicon Nanopowders);

Also included in the agreement is the right for HPQ to commercialize, exclusively in Canada, and non-exclusive in the U.S.A., the Gennao™ H2 system, as well as, also distribute and sell the powders required for the hydrolysis production of Hydrogen ("H<sub>2</sub>").

Apollon will support HPQ North American marketing of the Gennao™ H2 system and the powder bags. By November 2020, Apollon will make available to HPQ a Gennao™ H2 system and the bags of powder needed for demonstration to potential buyers.

During the term of this fifth renewal, Apollon and HPQ will work to finalize a long-term commercial agreement that will grant HPQ (or one of its subsidiaries) a Canadian exclusivity for the sale of Gennao™ H2 system and associated powders bags, and the exclusivity for all customers located in the United States to whom HPQ is marketing Gennao™ H2 system.



Finally, the parties have agreed that during the renewal period, or until the date of the signing of a long-term commercial agreement, that HPQ will have Canadian exclusivity on the distribution, sale, marketing and representation of Gennao™ H2 system and associated powders, and that it will be able to distribute, sell, market and represent Gennao™ H2 system and associated powders with customers in the United States.

### About Silicon

Silicon (Si), also known as silicon metal, is one of today's strategic materials needed to fulfil the Renewable Energy Revolution ("RER") and the decarbonization of the economy presently under way. Silicon does not exist in its pure state; it must be extracted from quartz (SiO<sub>2</sub>), in what has historically been a capital and energy intensive process.

### About HPQ Silicon

[HPQ Silicon Resources Inc. \(TSX-V: HPQ\)](#) is a Canadian producer of Innovative Silicon Solutions, based in Montreal, building a portfolio of unique high value specialty silicon products needed for the coming RER.

Working with [PyroGenesis Canada Inc. \(TSX-V: PYR\)](#), 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);
- The **PUREVAP™ Nano Silicon Reactor (NSiR)**, a new proprietary process that can use different purities of silicon (Si) as feedstock, to make spherical silicon nanopowders 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 usage 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](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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