

# HPQ Silicon Receives U.S. Patent for Its PUREVAP™ Quartz Reduction Reactor Technology

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MONTREAL, Nov. 29, 2021 - [HPQ Silicon Resources Inc.](#) ("HPQ" or the "Company") (TSX-V: HPQ) (OTCQX: HPQFF) (FWB: UGE), an innovative silicon solutions and technology development company, is pleased to inform shareholders that the United States Patent and Trademark Office has issued a notice of allowance to [HPQ Silicon Resources Inc.](#) regarding the patent application titled "SILICA TO HIGH PURITY SILICON PRODUCTION PROCESS", and that HPQ patent agent has paid the required fees, the final step before the patent is officially filed online.

## GETTING US PATENT PROTECTION FOR OUR *PUREVAP*®; QRR PROCESS: A BIG MILESTONE REACHED

The US patent covers the *PUREVAP*®; QRR innovative process, which permits the one-step transformation of quartz ( $\text{SiO}_2$ ) into high purity silicon metal (from 99.5% to 99.99% Si) at reduced costs, energy input, and carbon footprint. This game changing advantage means that the *PUREVAP*®; QRR process not only produces a higher purity silicon material than traditional processes, but it does not require the extremely pure feedstock needed by conventional processes. In fact, the process only requires 4.5 MT of raw material to make 1 MT of Silicon, versus the 6 MT required by conventional processes, a 25% reduction which potentially allows a 20% cash cost advantage versus the lowest cost traditional Silicon producer<sup>1</sup>. Furthermore, as part of our ongoing strategy of protecting and strengthening the *PUREVAP*®; Intellectual Property Portfolio, a second patent application, focussed on a new and novel process was filed in 2019 and is presently advancing through the process.<sup>2</sup>

*"HPQ has been at the forefront of Low-Cost Green Silicon innovation developments since 2015, and getting this U.S. patent approval, combined with the ongoing commissioning of the GEN3 *PUREVAP*®; QRR pilot plant, has occurred at an opportune time, as demand continues to rise and bottlenecks we had foreseen are now occurring in the silicon supply chain. With ESG principles playing an active role in materials sourcing, the world is more aware of the difficulty of securing the ESG compliant Silicon needed to meet its renewable energy goals. The reality of chronic underinvestment in new technologies combined with the offshoring of Silicon production capacity, has created a massive opportunity for HPQ and its *PUREVAP*®; QRR patented process, as we are the only company to bring to market a new process to make Silicon that is perfectly suited to the new demands and realities of the Silicon market," said Mr. Bernard Tourillon, President and CEO of HPQ Silicon.*

## Si MARKET DEFICIT AT 92,000 MT, PRICES SOARING, NEW GREENFIELD DEVELOPMENTS NEEDED

Recent market events are focussing attention on the fact that Silicon (Si), also known as silicon metal, is one of today's key strategic energy metals needed to meet the goal of decarbonizing the economy by 2050. High Purity Silicon (2N+) is in very high demand due to the underlying needs for Silicon as feedstock for Polysilicon (Solar and Electronics), the emerging Batteries sectors, and the more typical industrial Silicone applications, at a time when capacity is simply not available to meet demand. This is a result of several of the old energy intensive plants, mothballed during the Covid pandemic, being not economically or environmentally viable to return online. New and efficient greenfield projects will be needed to meet demand, and the *PUREVAP*®; QRR technology is well positioned to eventually become the industry's option of choice.

## Other Corporate news: Modification to the Stock Option Plan

The Board of Directors has approved the modification of the total number of shares that may be issued pursuant to its stock option plan, increasing it by 17,500,000 shares from 4,500,000 shares to 22,000,000 shares and, as a result, the consolidation of its current stock option plan into the new 2021 stock option plan. The maximum number of common shares that may be issued under the plan shall be equivalent to less

than 10% of the issued and outstanding common shares of the Corporation. The modification and new 2021 stock option plan is subject to regulatory approval

#### 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 sustainable solutions which reduce greenhouse gases (GHG) and are economically attractive alternatives to conventional "dirty" processes. PyroGenesis has created proprietary, patented and advanced plasma technologies that are being vetted and adopted by multiple multibillion dollar industry leaders in three massive markets: iron ore pelletization, aluminum, waste management, and additive manufacturing. 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> R&D and manufacturing facilities, PyroGenesis maintains its competitive advantage by remaining at the forefront of technology development and commercialization. The operations are ISO 9001:2015 and AS9100D certified, having been ISO certified since 1997. For more information, please visit: [www.pyrogenesis.com](http://www.pyrogenesis.com).

#### About HPQ Silicon Resources

[HPQ Silicon Resources Inc.](http://www.hpqsilicon.com) (TSX-V: HPQ) is a Quebec-based innovative silicon solutions company that offers innovative silica (SiO<sub>2</sub>), 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) (NASDAQ: PYR), HPQ is developing:

1. 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
2. Through its 100% owned subsidiary, HPQ NANO Silicon Powders Inc., the *PUREVAP*; *Nano Silicon Reactor (NSiR)* is a new proprietary process that can use material produced by the QRR as feedstock, to make a wide range of nano/micro spherical powders of different sizes and nanowires.
3. Through its second 100% owned subsidiary, HPQ Silica POLVERE Inc., HPQ is developing a new plasma-based process that will allow a direct Quartz to Fumed silica transformation, removing the usage of hazardous chemical in the making of Fumed silica and eliminating the Hydrogen Chloride Gas (HCl) associated with its manufacturing.

HPQ is also a technology development company interested in developing hydrogen-based ventures, that could be complementary to the QRR efforts. Currently, HPQ is evaluating two different approaches to reach this goal, those being:

1. Working with Swiss based company EBH2 Systems SAS as it pertains to their proprietary process to manufacture Green Hydrogen via electrolysis, and
2. Developing our own processes of making hydrogen via hydrolysis of nanosilicon materials made by our *PUREVAP*; (*NSiR*).

For more information, please visit HPQ Silicon web site.

#### 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.

Neither the TSX Venture Exchange nor its Regulation Services Provider (as that term is defined in the policies of the TSX Venture Exchange) accepts responsibility for the adequacy or accuracy of this release.

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.

Source: [HPQ Silicon Resources Inc.](#)

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<sup>1</sup> HPQ Silicon June 17<sup>th</sup>, 2019, release

<sup>2</sup> HPQ Silicon Sept 4th, 2019, release

<sup>3</sup> [www.reuters.com/business/energy/solar-industry-demand-raises-temperature-silicon-market-2021-09-21/](http://www.reuters.com/business/energy/solar-industry-demand-raises-temperature-silicon-market-2021-09-21/)

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