



## HPQ SIGNS NDA WITH INDUSTRIAL GROUP TO EXPLORE FUMED SILICA PLANT JOINT VENTURE

Montreal, Canada, January 31<sup>th</sup>, 2024 — [HPQ Silicon Inc.](#) (“HPQ” or the “Company”) ([TSX-V: HPQ](#)) ([OTCQB: HPQFF](#)) ([FRA: O08](#)), a technology company specializing in green engineering of silica and silicon-based materials, is pleased to update its shareholders that it signed an NDA with an undisclosed party related to its Fumed Silica initiative.

Following our [press release of January 10, 2024](#), we were approached by an Industrial Group interested in assessing the commercial potential of our Fumed Silica Reactor (FSR) process. To facilitate more formal discussions, HPQ's wholly owned subsidiary, HPQ Silica Polvere Inc. (HPQ Polvere), along with the technology provider and equipment supplier, [PyroGenesis Canada Inc.](#) ([TSX: PYR](#)) ([OTCQX: PYRGE](#)) ([FRA: 8PY](#)) (PyroGenesis) signed a Non-Disclosure Agreement (NDA) [1] with the Industrial Group.

The purpose of the NDA is twofold:

- First, it will enable both parties, HPQ Polvere and the Industrial Group, to conduct mutual due diligence, and
- Second, it will enable both parties to assess the commercial and economic potential for a more formal collaboration regarding the construction and operation of a 1,000 tonnes per year (TPY) Fumed Silica Reactor to be built by PyroGenesis.

*“The NDA, stands as tangible proof of the commercial interest in the potential of our proprietary Fumed Silica Reactor technology,”* said Mr. Bernard Tourillon, President and CEO of HPQ Silica Polvere Inc. and HPQ Silicon Inc. *“While, at this stage, we have no guarantee that a formal commercial venture will emerge from these discussions, we are immensely encouraged by the ongoing talks.”*

### HPQ POLVERE'S DISRUPTIVE ADVANTAGES ATTRACT INDUSTRIAL INTEREST

The table below clearly illustrates the numerous disruptive advantages of HPQ Polvere's Fumed Silica Reactor (FSR) compared to traditional Fumed Silica Manufacturing. The significant opportunities presented contributed to the interest from the Industrial Group.

	FUMED SILICA MANUFACTURING		
	USING TODAY CONVENTIONAL PROCESSES	WITH HPQ POLVERE FUMED SILICA REACTOR	HPQ POLVERE DISRUPTIVE ADVANTAGES
CAPEX (Cost per Kg of capacity)	US\$ 145.91	US\$9.50	93% Less <sup>[2]</sup>
Energy Consumption (kWh / Kg of Fumed Silica)	100 – 120 <sup>[3]</sup>	10 – 15 <sup>[4]</sup>	87.5 to 90% Less
EBITDA Margins	20%	61% - 65%	3X better <sup>[5]</sup>
GHG Impact (Kg CO2 eq / Kg of Fumed Silica)	8 – 17 <sup>[3]</sup>	1 – 2.5 <sup>[6]</sup>	84 to 88% Less
European Carbon Taxes (90€ per tonne released <sup>[7]</sup> )	720€ - 1 530€	90€ - 225€	630€ to 1 350€ Less
HCl Production (Kg / Kg Fumed Silica)	2.4 <sup>[4]</sup>	0	NO HCl GAZ

### A STEP FORWARD IN IMPLEMENTING OUR INCREMENTAL COMMERCIALISATION STRATEGY

The commercial imperative to construct a 1,000 tonnes per year (TPY) Fumed Silica Reactor, driven by the anticipated demand for low carbon fumed silica materials, is evident. HPQ Polvere's commercialization strategy centers on scaling up capacity to meet this demand, including the addition of other 1,000 TPY Fumed Silica Reactor.

*“We are keenly interested in the possibility of implementing a pathway to commercialization and monetization of our Fumed Silica Reactor process that could be less dilutive for HPQ shareholders,”* Mr. Tourillon further emphasized, *“This potential partnership could help us reach that goal faster.”*

## REFERENCE SOURCES

- [1] PyroGenesis participation in the NDA agreements is done at HPQ's express request.
- [2] Traditional Fumed Silica manufacturing involves a complex three-step process. Step 1: Conversion of Quartz to Silicon Metal (Si), with an average Capex of around US\$9.38 per kilogram of annual capacity ([for reference, the PCC BakkiSilicon Plant in Iceland cost US\\$300 million for an annual capacity of 32,000 tonnes](#)). Step 2: Conversion of Si to Silicon Tetrachloride (SiCl<sub>4</sub>), with an average Capex of approximately US\$125.00 per kilogram of annual capacity (e.g., [Wacker Chemie AG Polysilicon's US production plant cost US\\$2.5 billion for an annual capacity of 20,000 tonnes](#)). Step 3: Burning Silicon Tetrachloride (SiCl<sub>4</sub>) with Hydrogen and Oxygen to produce Fumed Silica (SiO<sub>2</sub>), incurring an average Capex of around US\$11.54 per kilogram of annual capacity ([Wacker Chemie AG's US Fumed Silica plant cost US\\$150 million for an annual capacity of 20,000 tonnes](#)). The combined Capex for these three steps averages at US\$145.92 per kilogram of annual capacity. According to a rough order of magnitude study by PyroGenesis, our one-step process for making Fumed Silica is estimated to have an average Capex per kilogram of annual capacity between US\$9.00 and US\$10.00, which is approximately 93% less than traditional processes.
- [3] Frischknecht, Rolf, et al. "Life cycle inventories and life cycle assessment of photovoltaic systems." International Energy Agency (IEA) PVPS Task 12 (2020).
- [4] PyroGenesis Canada Inc
- [5] Average EBITDA margins of 20% are derived from two sources, [with Link #1 leading to Source #1](#) and [Link #2 leading to Source #2 \(Specialty Additives division\)](#). Management has calculated the EBITDA margins for the Fumed Silica Reactor (FSR) based on data derived from third party sources and publicly available information. These figures will be updated upon completion of the pilot testing phase. The 5% range in HPQ Polvere's EBITDA margins considers PyroGenesis' option to convert its 10% royalties into a 50% ownership stake in HPQ Polvere's remaining equity.
- [6] The 1 Kg eq of CO<sub>2</sub> per Kg of Fumed Silica is based on [Hydro Quebec data](#) that indicate in Quebec 1.3 g of CO<sub>2</sub> are generated eq per KWh. While the 2.5 is based on the Canadian average for electricity generation carbon intensity of 150 g per KWh.
- [7] The Wall Street Journal article, April 18, 2023, "[World's First Carbon Import Tax Approved by EU Lawmakers](#)"

### 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

[HPQ Silicon Inc.](#) (TSX-V: HPQ) is a Quebec-based TSX Venture Exchange Tier 1 Industrial Issuer.



HPQ is developing, with the support of world-class technology partners [PyroGenesis Canada Inc.](#) and [NOVACIUM SAS](#), new green processes crucial to make the critical materials needed to reach net zero emissions.

HPQ activities are centred around the following four (4) pillars:

- 1) Becoming a green low-cost (Capex and Opex) manufacturer of Fumed Silica using the **FUMED SILICA REACTOR**, a proprietary technology owned by HPQ being developed for HPQ by PyroGenesis.
- 2) Becoming a zero CO<sub>2</sub> low-cost (Capex and Opex) producer of High Purity Silicon (2N+ to 4N) using our **PUREVAP™ "Quartz Reduction Reactors" (QRR)**, a proprietary technology owned by HPQ being developed for HPQ by PyroGenesis.
- 3) Becoming a producer of silicon-based anode materials for battery applications with the assistance of NOVACIUM SAS.
- 4) HPQ SILICON affiliate NOVACIUM SAS is developing a low carbon, chemical base on demand and high-pressure autonomous hydrogen production system.

For more information, please visit [HPQ Silicon web site](#).

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**Source:** HPQ Silicon Inc.

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