



PyroGenesis Announces Q3 2022 Results: Revenues \$5.7M; Gross Margin 73%; Current Backlog of Signed and/or Awarded Contracts \$26M

November 11, 2022

MONTREAL, Nov. 11, 2022 (GLOBE NEWSWIRE) -- PyroGenesis Canada Inc. (<http://pyrogenesis.com>) (TSX: PYR) (NASDAQ: PYR) (FRA: 8PY), a high-tech company (hereinafter referred to as the "Company" or "PyroGenesis"), that designs, develops, manufactures and commercializes advanced plasma processes and sustainable solutions which are geared to reduce greenhouse gases (GHG), is pleased to announce today its financial and operational results for the third quarter ended September 30th, 2022.

"In Q3 we delivered another quarter of strong margins against a difficult logistical and inflationary environment for heavy-industry manufacturers and their customers. With our strong production margins firmly established, and our operational and sourcing approaches proven again as not just viable, but sustainable and secure, we can remain squarely focused on maturing the commercialization plan of the past two years," said Mr. P. Peter Pascali, CEO and Chair of PyroGenesis. "That implies, turning a very large pipeline into signed new business; finalizing various ventures that have been in long-term testing, planning, or negotiation; and moving certain of our R&D initiatives into more fully-realized, customer-ready solutions."

The Company's backlog remains above \$25M, and the potential contract pipeline has expanded significantly, which, along with the 73% quarterly gross margin, serves to demonstrate how the Company's careful yet committed approach to diversification allows for various guards against rising inputs – both direct and macro – such as labor, currency, and supply-chain disruption-related costs.

"Certain of our customers are experiencing implementation/order delays due to the continued infrastructure, personnel, and parts availability challenges affecting industries across the spectrum¹," continued Mr. Pascali. "We remain confident in our positioning and long term plans given (i) our above-industry² average margins³, (ii) continuing introduction of torch niche solutions, and (iii) a focus on large companies seeking technology solutions for GHG reduction and production output optimization. Combined with the upcoming commencement of major trials of our key plasma products, and near completion of various testing and certification processes by other clients, we continue to see a positive future."

Q3 2022 results reflect the following highlights:

- Revenues of \$5.7 M
- Gross margin profit of \$4.1 M or 73% of revenue,
- Cash, cash equivalents and publicly traded shares at September 30, 2022 of \$8.3 M
- Backlog of signed and/or awarded contracts of \$26.0 M

Post-Quarter End Events

On November 10, [the Company announced](#) it **produced hydrogen from methane using this revolutionary ZCE hydrogen production technology**. PyroGenesis' plasma-based hydrogen production process converts methane into a valuable solid carbon and hydrogen, thereby creating a ZCE hydrogen.

On November 3, [the Company announced](#) **participation in a decarbonization "fuel-switching" project** with a major international aluminum company, with a specific goal of investigating the feasibility of applying the Company's plasma torches as a heating source in the aluminum company's cast house furnaces.

On November 2, [the Company announced](#) it **passed its annual quality audit** for two key international standards: ISO 9001:2015, and AS9100D. The audits encompassed all of PyroGenesis' facilities for the purpose of meeting compliance with the existing quality management designations.

On November 2, [the Company provided](#) **an update on its 3D printing metal powders business line:**

- The qualification process for the global aerospace firm, ongoing for 18 months, continues, with recent events that the Company has completed 90% of the adjustments requested by the client as part of its recent in-factory audit of the Company's metal powder production process and facilities. The remaining 10% of recommendations are to be remedied by year's end, with the qualification process still on track for Q4 2022/Q1 2023.
- Early-stage discussions with at least one potential partner has commenced in regards to the potential establishment of a European manufacturing facility for metal powders.
- The Company is currently upgrading and repurposing one of its existing plasma-atomization reactors that was previously used for various R&D activities, in order to be able to product commercial powders for specialty applications.
- The Company is expanding its business development team for metal powders.

On October 26, [the Company announced](#) that its **Plasma Arc Waste Destruction System ("PAWDS")** is in operation⁴ on the newly launched USS Gerald R. Ford aircraft carrier that departed Naval Station Norfolk on October 4, 2022 for its initial deployment. The ship – the first of four carriers the US Navy have contracted with the Company to have the PAWDS system on board – will spend the next two months in both the Mediterranean Sea and the Atlantic Ocean as part of a multi-national exercise with eight other countries, including Canada and France, to prepare the crew for real-world scenarios.⁵

On [October 6](#) and then on [November 8](#), the Company announced the **commencement and subsequent successful completion of operational**

testing of the Company's Gen3 PUREVAP™ Quartz Reduction Reactor (QRR) pilot plant for its client, HPQ Silicon. The PUREVAP™ QRR is an innovative process (patent pending), which will permit the one-step transformation of quartz (SiO₂) into high purity silicon (Si) at reduced costs, energy input, and carbon footprint.

OUTLOOK

Despite the world-wide macro-economic headwinds which have been exasperated by international supply chain volatility, both of which have affected our client's planning, logistics, and spending PyroGenesis continues to demonstrate its ability to execute productively in Q3 2022.

While existing and prospective customers saw delays as they continued to manage their own backlog of projects to their resource, personnel, and infrastructure availability, the stage-setting of the first half of the year continued into Q3, the Company maintained its focus on production efficiency, steady progression towards full commercialization for its emerging business lines, the pursuit of innovation, and expanding the relationships with existing and potential clients.

In the face of continued macro uncertainties, the Company remains firm in the belief that it is well positioned and remains confident in the potential sales increases cited in the previous Q2 outlook, through 2023 and beyond.

The reasons for this are four-fold:

First, the Company believes that the heavy industry commitments to fossil fuel-related carbon reduction measures made years ago are here to stay. This commitment has only intensified in the face of increased pressure from rising carbon pollution penalties combined with the significant volatility seen in fossil-fuel availability over the past three years.

Second, concerns focusing on commodity security are driving optimization efforts across the metals sector, with aluminum producers, steelmakers, and other metal producers seeking in-line technology solutions to improve output percentages of primary, secondary, tertiary, and even unprocessed waste from other mineral production sources previously considered as exhausted.

Third, the trending global shift back to increased electricity-based power will result in more major infrastructure creation, across renewables, hydro-electric, and even nuclear installations, benefitting industries and technologies, such as PyroGenesis', with electricity-ready solutions.

Fourth, PyroGenesis' clean electricity-based technology has proven effective, efficient, and to such a degree that even in the absence of the above, its benefit cannot go ignored.

PyroGenesis' research and development, which has been dedicated over the past three decades to plasma based environmental solutions, has made it possible for the Company to play the role it is today. PyroGenesis' innovations are already impacting heavy industry as they prioritize the many issues facing them today; greenhouse gas emissions reduction, fuel switching to combustion-free electric sources, improved value recovery of metal waste-streams, enhanced metal production output from the same input, safe destruction of hazardous waste, and more rapid and higher quality metal powder production for component weight reduction, just to name a few. This underscores our belief that we are well positioned with respect to both our recent critical milestones and our long-term positioning.

We look forward to additional milestones that have been in the works for several quarters, including the first-ever in-factory trials of plasma burners within an iron ore pelletization furnace (a major upstream step in the steelmaking process) with two separate global iron ore producers; the conclusion of the certification process for the Company's titanium metal powders from a major global aerospace firm; and the potential sale of various aluminum-industry solutions related to metal dross processing and fuel-switching.

The Company notes that until such time as it produces consistent recurring revenue or have continuous large-scale orders which would enable it to offer forward-looking guidance, it would not be prudent to provide an Outlook focused on financial numbers. As such the Outlook, will continue to be of a more descriptive nature, focusing on a combination of actual achievements combined with working opportunities.

Overall Strategy

PyroGenesis' goal/target market is to provide technology solutions to heavy industry by leveraging off of the Company's proprietary position in ultra-high temperature processes.

The Company has evolved from its early roots of being a speciality-engineering firm to, today being, a provider of robust technology eco-systems for heavy industry that helps address their strategic goal to reduce their carbon emissions. This is accomplished across a variety of offerings which include, but are not limited to, fuel-switching and metal production optimization.

The diversification of the Company's offerings around its core expertise in industrial-grade plasma and related ultra-high temperature processes provides a broader complement of applications that include (i) safe CO₂-free waste destruction systems for land and sea, (ii) renewable natural gas technologies for purifying biogas and coke oven gas, and (iii) titanium metal powders for 3D printing and additive manufacturing. Management believes that this multi-legged stool approach to commercialization de-risks, to some degree, the Company's commercialization strategy.

The Company's strategy seems to be timely, as many governments are increasingly funding, and promoting, environmental technologies and infrastructure projects. Separately, an additional indication of the timeliness of the Company's strategy, is that major industries targeted by the Company not only have recommitted to their previously committed-to targets, but in some cases raised them significantly. Last, but not least, 2022 has brought about more circumstances – such as commodity security and availability – that highlight how technology solutions, like those offered by PyroGenesis, are now in even greater demand.

As an example, as global aluminum demand increases (anticipated to grow by 80% by 2050)⁶, and with industry carbon-reduction targets not yet on track to meet their goals, aluminum producers must find ways to improve their efficiency, and increase their yield of high-quality metal from current production – all while lowering their carbon footprint. PyroGenesis' range of technology solutions provide just such an opportunity, with the Company's DROSRITE™ systems providing industry-leading dross recovery rates of high-quality aluminum, inline and on-site, with a lower operating expense and lower carbon footprint than competing technologies. Concurrently, PyroGenesis' mainstay plasma torch offering provides another technology-driven solution to metal producers seeking to reduce their reliance on volatile natural gas prices and diesel supply chain. These metal producers are targeting all areas of their operations that require metal melting or heating, while concurrently eliminating fossil fuel emissions.

Similar pressures are affecting the global steelmaking industry, PyroGenesis has already sold, and subsequently delivered, initial clean electric, non-combustion plasma torches for in-factory trials to this industry. Management expects that over the next year or so, macroeconomic pressures may in fact serve to expedite the need for faster implementation of such solutions.

For clarity, as stated often, PyroGenesis' product lines, for the most part, do not depend on environmental incentives (tax credits, GHG certificates, environmental subsidies, etc.) to be economically viable. With the increased industry carbon reduction commitments, it is anticipated that the Company's growth drivers will expand, and shareholders should expect to see increased value over time.

While the Company is not immune to continuing macroeconomic headwinds, ongoing resourcing bottlenecks and supply chain issues, and other external factors negatively impacting large industrial customers, such as those seen over the last two years, management believes that, while it can do little about the strain on its prospects/customers, the Company itself is well positioned, and believes that through various mitigation measures these challenges will continue to be dealt with in an effective manner.

Organic Growth

The Company's organic growth actions are centered around:

- (i) the natural growth of existing offerings.
- (ii) leveraging the insider status, the Company has developed with several industrial customers (vs. competitive systems that tend to be installed off-site or are not part of the longer partnership and research agreements such as those that PyroGenesis has often fostered), This enables first-hand knowledge developed on site by the Company to be transformed into technology solutions for other challenges being faced by the customer.
- (iii) exploring ways to sell existing offerings into lateral markets. thereby helping additional industries, not originally targeted, with unique and proven solutions to help them with some of their most pressing environmental, engineering, and energy problems; and
- (iv) building new manufacturing and chemical recovery facilities in overseas markets, as per our recent announcement to pursue the construction of a European production facility for metal powder production.

Over the past several years, PyroGenesis has successfully positioned each of its business lines for rapid growth by strategically partnering with multi-billion-dollar entities. These entities have identified PyroGenesis' offerings to be unique, in demand, and of such a commercial nature as to warrant the long-term, supportive relationships that the Company has experienced while it ramps up various technologies to commercialization. We expect that these relationships have us well positioned to transition into significant revenue streams once full commercialization is achieved.

Aluminum Industry Process Improvement

From the industry relationships the Company has been developing, and a result of the success seen by its technologies in the primary aluminum sector, interest for the Company's products continues to increase, especially among secondary scrap-based producers, as well as tertiary downstream parts manufacturers and cast houses, each of whom have begun seeing fuel-switching (away from fossil-fuels and towards electricity-based solutions such as plasma) as one of the keys to the industry's carbon-reduction goals.

Consequently, the Company's pipeline of initial pre-sale discussions, engagement agreements, and active first-step engagements such as computational fluid dynamics modelling, are at an all-time high.

Existing initiatives within PyroGenesis' aluminum industry strategy also continue to progress.

During the quarter, the Company announced that the previously announced joint venture, which was geared to valorizing the residues resulting from the processing of aluminum dross, the final stage of the JV pre-launch requirements and considerations were nearing completion. In particular, the Company announced that the joint venture partner – a leading residue processor – had completed primary testing of residues that originated from aluminum dross processed by PyroGenesis' DROSRITE™ system at a customer's primary aluminum production facility. The results of those tests confirmed that the residues from DROSRITE™ are of such high quality that they are, indeed, able to be processed into marketable chemicals.

With these results in hand, steps to confirm specific techno-economic aspects of the first JV were triggered, and final due diligence commenced. This phase is expected to conclude during Q4 2022, at which point actual factory and business planning will begin. Once the full agreement is concluded, the joint venture's goal is to build and operate facilities in multiple geographies with the goal to transform dross residues into high value chemical and metallurgical products for resale.

As stated previously, the Company believes that this valorizing of residues will provide an exceptional complement to the Company's existing DROSRITE™ dross recovery systems, further defining PyroGenesis as the go-to company for all aspects of dross-related processing.

Separately, the Company continues to receive very strong interest for the DROSRITE™ dross recovery systems, both for system purchase and tolling options, with numerous discussions with potential clients ongoing across the aluminum, automotive, and parts manufacturing industries.

Steel Industry Process Improvement

The intense pressure on the iron ore and steelmaking industries – who combined account for 24% of all industrial emissions – to reduce their fossil fuel and greenhouse gas impact, allows PyroGenesis to expect interest for its upstream, iron ore pelletization plasma burner solution to increase.

As outlined previously, serious consideration is being given by major sector leaders to replace fossil fuel burners, across iron ore pelletization processing, with PyroGenesis' patented plasma torches.

During the quarter, the Company achieved a major milestone when it confirmed delivery of its plasma torch system produced for one of the world's largest producers of iron ore (referred to as "Client A", and whose name remains confidential for competitive reasons). The delivery of this \$1.8M order is in preparation for a first-ever live site usage and site acceptance test (SAT) of plasma in the pelletization process. The delivery comes after the client

– who has over ten (10) iron ore pelletization plants globally, each possibly requiring up to 50 plasma torches, or more than 500 torches in total – conducted extensive modeling, simulations, business case development, and live factory acceptance tests of plasma torches over the course of a year, as a potential solution toward meeting their carbon reduction goals. The Company also previously disclosed that it has provided a cost estimate for 36 plasma torches to that same Client, at a value range of \$95-115 million.

Other previously announced clients – including Client B, who is also one of the largest iron ore processes in the world, and who has signed a \$6M contract with the Company for 4 plasma torches for their pelletization system, and Client C, who is not only a significant player in the iron ore pelletization industry but is also a major player in the steel industry – continue to progress at their own pace. For Client B, production of their four ordered torches is underway. As previously announced, Client B has advised PyroGenesis that, upon the successful implementation of the torches, subsequent orders may be expected for approximately 130 plasma torches. Client C continues their long-term planning and investigation.

PyroGenesis expects that government initiatives targeting carbon reduction and clean technology will only serve to heighten awareness, and interest, in PyroGenesis' plasma torch offerings.

Emerging / Niche Markets

The Company continues to explore the use of its plasma technology for emerging / niche markets where there is high probability of future on-going sales. For each market, the Company will benefit from providing proprietary spare parts and service, as part of the Company's long-term strategy to build recurring revenue streams.

During the quarter, the Company announced being selected by an international producer of magnesium metal to test PyroGenesis' plasma torches as part of their process for transforming mining waste and recycled minerals into high-value metal. As the world's third-most used metal in construction, magnesium alloys have traditionally been driven by aerospace and medical industry requirements for lightweight materials, but with the shift to electric vehicles and the growth of lightweight consumer electronics – and because of its status as a key component in aluminum production – magnesium demand continues to increase.

A purchase order with the Client for the first of two steps, a method for cleaning and decontamination of particulate matter produced during primary magnesium production, was received. The project has a Q4 2022 targeted end date for conceptual testing. The second step, to process magnesium dross – a waste stream – to recover valuable metal, is expected to follow.

Additional emerging opportunities continue to be investigated.

Land Based Units/Environmental

The Company's land-based plasma-based waste destruction and environmental solutions are experiencing renewed interest. Powered by electricity, these systems substantially reduce carbon footprint compared to combustion-based incineration systems using fossil-fuels.

During the quarter, the Company announced it was chosen by an advanced materials and chemicals trading house in the Southern hemisphere to provide the Company's SPARC™ refrigerant waste system to destroy ozone-depleting refrigerants. The client has indicated a potential requirement of two systems, in addition to setup and supervision services, ancillary equipment options, and after-sales support, with the ultimate project cost now rising to between USD\$3-6M per system depending on final deliverables. The agreement negotiation is in the final stage.

PyroGenesis' patented SPARC™ system is based on the technology platform originally developed by the Company for the U.S. Navy and Air Force base, using inexpensive steam as the plasma-forming gas to generate a hydrolysis reaction that destroys refrigerants, leading to significantly reduced operating costs (versus more expensive gases) and cleaner operations with no incineration. SPARC™ also destroys chemicals such as CFCs, HCFCs, HFCs, Halons, and PFCs.

With more jurisdictions tightening their regulations on landfill usage, and with CO₂-free waste destruction becoming more desirable in regions where carbon reduction is sought, the Company sees the potential for modest future growth of this technologically mature, but relatively latent, division.

Additive Manufacturing (Metal Powders for 3D Printing)

The Company's metal powders business line for 3D printing and additive manufacturing continues to pass significant milestones on its way to full commercialization.

During the quarter, the Company reached the final phase of the lengthy metal powder qualification process with a global aerospace company, with an anticipated end date in Q4 2022/Q1 2023. If successful, the qualification will certify the Company's metal powders for use by the Client and its component suppliers. The final phase included an in-house audit of the Company's metal powder production facilities by the aerospace firm, which was announced as completed on September 21, 2022. Post audit, the Company was, as anticipated, requested by the aerospace firm to complete modifications and adjustments in order to proceed with delivery of final samples of titanium powder for chemical and mechanical testing by the Client. These modifications are ongoing.

Additionally, the Company provided an update that indicated the Company's NexGen plasma atomization system is now capable of producing titanium powder at commercial bulk order scale, and that discussions are underway between the Company and its European commercial partner Aubert & Duval for full distribution agreements, including broader distribution planning, order planning, and logistics. Aubert & Duval is a world leader in industrializing high-performance steel, super alloy, aluminum and titanium alloys for over a century. More specifically, they are a recognized supplier of metal powders for additive manufacturing, serving the Aerospace, Energy, Transport, Medical, Defense, Automotive and other large scale, demanding markets.

As updated during the quarter, discussions for Asian market expansion, pursuance of ISO 13485:2016 certification for medical device usage, intention to produce aluminum alloy powder, and pursuance of a strategy to build and operate a metal powder manufacturing facility in Europe.

The Company expects that such developments will continue and will translate into significant improvements in contributions to revenue by this segment in the mid-long term.

Growth Through Synergistic Mergers and Acquisitions

The Company conservatively considers synergistic acquisitions to augment its growth, with the focus on private companies that could uniquely benefit from the Company's engineering advantage and/or international relationships. While the company has opened discussions with potential target companies, these are very preliminary, and the outcome and probability of success should be considered entirely unknown at this writing.

HPQ/PUREVAP™

With respect to HPQ, a Company client, and one in which PyroGenesis owns significant shares and options, the stated goal is to continue to expand the Company's role as HPQ's technology and engineering provider for the game-changing family of silicon conversion processes developed exclusively for HPQ and its wholly owned subsidiaries HPQ Nano Silicon Powders Inc. and HPQ Silica Polvere Inc., namely:

1. The PUREVAP™ Quartz Reduction Reactor (QRR), an innovative process (patent pending), which should permit the one step transformation of lower purity quartz (SiO_2) than any traditional processes can handle into a silicon (Si) of a higher purity level (2N-4N) that can be produced by any traditional smelter, at reduced costs, energy input, and carbon footprint. The unique capabilities of this process could position HPQ as a leading provider of the specialised silicon material needed to propagate its considerable renewable energy potential; and
2. The PUREVAP™ Nano Silicon Reactor (NSiR), which, if successful, could position itself as a new proprietary low-cost process that can transform the silicon (Si) made by the PUREVAP™ QRR into the nano-silicon materials (spherical silicon powders and silicon nanowires) sought after by energy storage, batteries, electric vehicle manufactures and clean hydrogen sectors' participants. The aim of the ongoing work is to position HPQ NANO as the first to market with a commercial scale, low-cost nanoparticle production system.
3. A new plasma-based process that could convert Silica (Quartz, SiO_2) into fumed silica (Pyrogenic Silica) in one step. This new process could be a low-cost and environmentally friendly option that combines HPQ Silicon High Purity Quartz initiatives with PyroGenesis' industry leading know-how in the development of commercial plasma processes. It is envisioned that the process will eliminate harmful chemicals presently generated by traditional methods. This new process could revolutionize the manufacturing of fumed silica, while repatriating production back to North America.

During the quarter, the PUREVAP™ Quartz Reduction Reactor (QRR) completed a validation of its systems integration and entered reactor start-up phase, where various process improvement tests were slated to take place over a period of a few months. Subsequently, the integrity of the reactor's full operational ability will be tested over a multi-day, continuous run period at high temperatures; thereafter, quartz will be added to the system for processing and testing.

CONCLUSION

PyroGenesis considers 2022 to be a strong platform from which future growth will stem.

In the face of global headwinds and uncertainty, we are committed to focusing on the production efficiency, steady progression towards full commercialization for emerging business lines, the pursuit of innovation, and deepening the relationships with existing and potential clients that has served us successfully to this point.

Providing heavy industry with technology solutions to pressing environmental, engineering, and energy challenges while meeting their carbon reduction goals, remains PyroGenesis' primary goal and focus.

Financial Summary

Revenues

PyroGenesis recorded revenue of \$5,657,783 in the third quarter of 2022 ("Q3, 2022"), representing a decrease of 39% compared with \$9,317,926 recorded in the third quarter of 2021 ("Q3, 2021"), Revenue for the nine months of fiscal 2022 was \$15,711,726 a decrease of 34% over revenue of \$23,863,001 during the same period in 2021.

Revenues recorded in the three and nine months ended September 30, 2022, were generated from:

- (i) DROSRITE™ related sales of \$71,431, \$1,408,048 (2021 Q3 - \$1,983,524, \$6,373,130)
- (ii) PUREVAP™ related sales of \$4,243,138, \$5,617,942 (2021 Q3 - \$999,875, \$5,524,642)
- (iii) torch related sales of \$684,997, \$3,307,150 (2021 Q3 - \$645,894, \$1,398,729)
- (iv) development and support related to systems supplied to the U.S. Navy of \$420,809, \$1,757,168 (2021 Q3 - \$1,957,981, \$6,677,188)
- (v) biogas upgrading and pollution controls of \$89,698, \$3,260,850 (2021 Q3 - \$3,712,000, \$3,712,000)
- (vi) other sales and services of \$147,710, \$360,568 (2021 Q3 - \$18,652, \$177,312)

Cost of Sales and Services and Gross Margins

Cost of sales and services before amortization of intangible assets was \$1,325,847 in Q3 2022, representing a decrease of 74% compared with \$5,174,062 in Q3 2021, primarily due to a decrease in direct materials and manufacturing overhead and other, \$1,219,031 (Q3 2021 - \$4,609,037) and increases in employee compensation and subcontracting \$1,127,509 (Q3 2021 - \$811,136), offset by the increase in foreign exchange of (\$998,263) (Q3 2021 - (\$200,240)).

The gross margin for the Q3 2022 three-month period was \$4,113,176 or 73% of revenue compared to a gross margin of \$4,052,531 or 43% of revenue for Q3 2021.

As a result of the sale of Intellectual Property and the type of contracts being executed, the nature of the project activity, as well as the composition of the cost of sales and services, as the mix between labour, materials and subcontracts may be significantly different. In addition, due to the nature of these long-term contracts, the Company has not necessarily passed on to the customer, the increased cost of sales which was attributable to inflation, if any.

Investment tax credits related to qualifying projects from the provincial government in Q3 2022 were \$22,430 (Q3 2021 - \$45,871). The Company also recorded for the nine months ended September 30, 2022, \$47,223 (2021 - \$83,369) of the investment tax credits against cost of sales and services, \$46,134 (2021 - \$73,237) against research and development expenses and \$22,500 (2021 - \$23,479) against selling general and administrative expenses.

The amortization of intangible assets of \$218,760 in Q3 2022 compared to \$91,333 for Q3 2021 relates mainly to the intangible assets in connection with the Pyro Green-Gas acquisition, patents and deferred development costs. These expenses are non-cash items and will be amortized over the duration of their expected lives.

Selling, General and Administrative Expenses

Included within Selling, General and Administrative expenses ("SG&A") are costs associated with corporate administration, business development, project proposals, operations administration, investor relations and employee training.

SG&A expenses for Q3 2022 excluding the costs associated with share-based compensation (a non-cash item in which options vest principally over a four-year period), were \$4,979,916 representing an increase of 18% compared with \$4,227,937 reported for Q3 2021.

The increase in SG&A expenses in Q3 2022 over the same period in 2021 is mainly attributable to the Pyro Green-Gas acquisition and the net effect of:

- (i) an increase of 39% in employee compensation due primarily to salary compensation and the growing workforce,
- (ii) an increase of 28% for professional fees, primarily due to an increase in accounting fees, legal and patent fees,
- (iii) an increase of 11% in office and general expenses, is due to an increase in computer and internet expenses, security expenses and stationary and office related expenses,
- (iv) travel costs increased by 50%, due to an increase in travel abroad,
- (v) depreciation on property and equipment increased by 66% due to higher amounts of property and equipment being depreciated,
- (vi) depreciation on right of use assets increased by 3% due to higher amounts of right of use assets being depreciated,
- (vii) Investment tax credits remained the same,
- (viii) government grants increased by 59% due to higher levels of activities supported by such grants,
- (ix) other expenses decreased by 17%, primarily due to a decrease in couriers & freight,

Separately, share based payments increased by 38% in Q3 2022 over the same period in 2021.

Research and Development ("R&D") Costs

The Company incurred \$290,374 of R&D costs, net of government grants, on internal projects in Q3 2022, a decrease of 26% as compared with \$393,756 in Q3 2021. The decrease in Q3 2022 is primarily related to the decrease in employee compensation, investment tax credits, subcontracting, materials and equipment, and government grants recognized and an increase in other expenses. During the first nine months of fiscal 2022, net spending on internal R&D was \$1,577,370 as compared to \$1,520,307 in 2021, primarily due to an increase in R&D activities performed.

In addition to internally funded R&D projects, the Company also incurred R&D expenditures during the execution of client funded projects. These expenses are eligible for Scientific Research and experimental Development ("SR&ED") tax credits. SR&ED tax credits on client funded projects are applied against cost of sales and services (see "Cost of Sales" above).

Financial Expenses

Finance expenses for Q3 2022 totaled \$183,694 as compared with \$6,792 for Q3 2021, representing an increase of 2,605% year-over-year. The increase in finance expenses in Q3 2022, is primarily attributable to higher interest and accretion due on the business combination.

Strategic Investments

The adjustment to fair market value of strategic investments for Q3 2022 resulted in a loss of \$1,802,477 compared to a gain in the amount of \$1,868,862 in Q3 2021. The loss is attributable to the decreased market share value of common shares and warrants owned by the Company of HPQ Silicon Resources Inc.

Comprehensive (Loss) Income

The comprehensive loss for Q3 2022 of \$4,053,706 compared to a gain of \$623,664, in Q3 2021, represents a decrease of 750% year-over-year. The decrease of \$4,677,370 in the comprehensive loss in Q3 2022 is primarily attributable to the factors described above, which have been summarized as follows:

- (i) a decrease in product and service-related revenue of \$3,660,143 arising in Q3 2022,
- (ii) a decrease in cost of sales and services of \$3,720,788, primarily due to increase in foreign exchange and the decrease in direct materials and overhead & other, offset by the increase in employee compensation, subcontracting, investment tax credits, and amortization of intangible assets,
- (iii) an increase in SG&A expenses of \$1,010,357 arising in Q3 2022 primarily due to an increase in employee compensation, professional fees, office and general, travel, depreciation of property and equipment, depreciation of right of use assets, government grants, and share-based expenses which is offset by a decrease in other expenses,
- (iv) a decrease in R&D expenses of \$99,432 primarily due to a decrease in employee compensation, investment tax credits, subcontracting, material and equipment, government grants which is offset by an increase in other expenses,
- (v) an increase in financial expenses of \$176,902 in Q3 2022 primarily due to interest on lease liabilities, interest accretion on balance due on business combination and other interest expenses,
- (vi) a decrease in fair value adjustment of strategic investments of \$3,671,339 in Q3 2022.

EBITDA

The EBITDA in Q3 2022 was a loss of \$3,337,927 compared with an EBITDA gain of \$968,667 for Q3 2021, representing a decrease of 445% year-over-year. The \$4,306,594 decrease in the EBITDA loss in Q3 2022 compared with Q3 2021 is due to the decrease in comprehensive loss of \$4,677,371, an increase in depreciation on property and equipment of \$61,780, an increase in depreciation ROU assets of \$4,667, an increase in amortization of intangible assets of \$127,427, and an increase in financial expenses of \$176,902.

Adjusted EBITDA loss in Q3 2022 was \$2,406,355 compared with an Adjusted EBITDA gain of \$1,641,861 for Q3 2021. The decrease of \$4,048,216 in the Adjusted EBITDA loss in Q3 2022 is attributable to a decrease in EBITDA loss of \$4,306,594, and by an increase of \$258,377 in share-based payments.

The Modified EBITDA loss in Q3 2022 was \$603,878 compared with a Modified EBITDA loss of \$227,001 for Q3 2021, representing a decrease of 166%. The increase of \$376,878 in the Modified EBITDA loss in Q3 2022 is attributable to the decrease as mentioned above in the Adjusted EBITDA of \$4,048,216 and a decrease in the change of fair value of strategic investments of \$3,671,339.

Liquidity

As at September 30, 2022, the Company has cash and cash equivalents of \$2,364,861. In addition, the accounts payable and accrued liabilities of \$12,655,409 are payable within 12 months.

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 four 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 m² and 2,940 m² 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.

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 securities regulatory authorities, which filings can be found at www.sedar.com, or at www.sec.gov. 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 Toronto Stock Exchange, its Regulation Services Provider (as that term is defined in the policies of the Toronto Stock Exchange) nor the NASDAQ Stock Market, LLC accepts responsibility for the adequacy or accuracy of this press release.

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¹ <https://www.sourcetoday.com/supply-chain/article/21251411/supply-chain-disruptions-may-follow-manufacturers-right-into-2023>

² <https://insight.factset.com/sp-500-reporting-a-lower-net-profit-margin-for-5th-straight-quarter>

³ https://csimarket.com/Industry/industry_Profitability_Ratios.php?ind=201

⁴ <https://scnewsltr.dodlive.mil/Latest-Issue/Article-Display/Article/2612544/uss-gerald-r-fords-cvn-78-lesser-known-trash-disposal-technology-plasma-arc-was/>

⁵ <https://www.cnn.com/2022/10/04/politics/uss-gerald-ford-deploys>

⁶ <https://international-aluminium.org/iai-releases-aluminium-sectors-decarbonisation-dataset-in-line-with-the-international-energy-agencys-beyond-2-degrees-findings>