UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 6-K

REPORT OF FOREIGN PRIVATE ISSUER PURSUANT TO RULE 13a-16 OR 15d-16 UNDER THE SECURITIES EXCHANGE ACT OF 1934

For the month of November 2022

Commission File Number: **001-39989**

PYROGENESIS CANADA INC.
(Translation of registrant's name into English)

1744, William St. Suite 200
Montreal, QC, H3J1R4
Canada
(Address of principal executive office)

Indicate by check mark whether the registrant files or will file annual reports under cover of Form 20-F or Form 40-F.
Form 20-F [   ]   Form 40-F [X]

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(1): ___

Note: Regulation S-T Rule 101(b)(1) only permits the submission in paper of a Form 6-K if submitted solely to provide an attached annual report to security holders.

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(7): ___

Note: Regulation S-T Rule 101(b)(7) only permits the submission in paper of a Form 6-K if submitted to furnish a report or other document that the registrant foreign private issuer must furnish and make public under the laws of the jurisdiction in which the registrant is incorporated, domiciled or legally organized (the registrant's "home country"), or under the rules of the home country exchange on which the registrant's securities are traded, as long as the report or other document is not a press release, is not required to be and has not been distributed to the registrant's security holders, and, if discussing a material event, has already been the subject of a Form 6-K submission or other Commission filing on EDGAR.

EXHIBIT INDEX

Exhibit Number	**Description**
99.1	Press Release dated November 11, 2022
99.2	Condensed Consolidated Interim Financial Statements Three months ended September 30, 2022
99.3	Management's Discussion and Analysis
99.4	Form 52-109F2 CEO Certification of Interim Filings
99.5	Form 52-109F2 CFO Certification of Interim Filings

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

PYROGENESIS CANADA INC.
(Registrant)

Date: November 14, 2022

/s/ P. Peter Pascali
P. Peter Pascali
Chief Executive Officer

Exhibit 99.1

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

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 spectrum[1],” continued Mr. Pascali. “We remain confident in our positioning and long term plans given (i) our above-industry[2] average margins[3], (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

<u>Post-Quarter End Events</u>

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 operation[4] 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 (SiO_2) 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 CO_2--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 CO_2-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 m^2 and 2,940 m^2 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.

SOURCE PyroGenesis Canada Inc.

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RELATED LINK: http://www.pyrogenesis.com/

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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

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[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**

Exhibit 99.2

PyroGenesis Canada Inc.

Condensed Consolidated Interim

Financial Statements

As at September 30, 2022 and for the three and nine months ended September 30, 2022 and 2021

(Unaudited)

September 30, 2022.

PyroGenesis Canada Inc.
Condensed Consolidated Interim Statements of Financial Position
(Unaudited)

	Notes	September 30, 2022	December 31, 2021
		$	$
Assets			
Current assets			
Cash and cash equivalents	6	**2,364,861**	12,202,513
Accounts receivable	7	**23,788,454**	17,639,616
Costs and profits in excess of billings on uncompleted contracts	8	**2,904,743**	4,922,710
Inventory		**1,717,746**	887,590
Investment tax credits receivable	9	**315,988**	256,513
Income taxes receivable		**46,425**	117,029
Current portion of deposits	11	**1,127,051**	1,328,452
Current portion of royalties receivable		**339,762**	311,111
Contract assets		**302,374**	375,789
Prepaid expenses		**1,352,700**	717,661
Total current assets		**34,260,104**	38,758,984
Non-current assets			
Deposits	11	**41,270**	248,756
Strategic investments	10	**6,698,835**	14,901,659
Property and equipment		**3,505,033**	3,712,937
Right-of-use assets		**4,975,106**	5,765,993
Royalties receivable		**996,904**	947,543
Intangible assets		**2,234,900**	2,774,198
Goodwill	4	**2,660,607**	2,660,607
Total assets		**55,372,759**	69,770,677
Liabilities			
Current liabilities			
Bank indebtedness		**713,046**	–
Accounts payable and accrued liabilities	12	**12,655,409**	10,069,177
Billings in excess of costs and profits on uncompleted contracts	13	**7,363,106**	9,400,231
Current portion of term loans	14	**77,063**	83,004
Current portion of lease liabilities		**2,664,101**	2,934,236
Balance due on business combination	4	**2,915,708**	2,242,503
Income taxes payable		**192,298**	23,048
Total current liabilities		**26,580,731**	24,752,199
Non-current liabilities			
Lease liabilities		**2,965,136**	2,389,729
Term loans	14	**313,224**	107,901
Balance due on business combination	4	**989,027**	1,709,700
Deferred income taxes		**–**	42,394
Total liabilities		**30,848,118**	29,001,923
Shareholders' equity			
Common shares and warrants		**83,229,349**	82,104,086
Contributed surplus		**23,672,034**	19,879,055
Accumulated other comprehensive income		**73,066**	3,444
Deficit		**(82,449,808)**	(61,217,831)
Total shareholders' equity		**24,524,641**	40,768,754
Total liabilities and shareholders' equity		**55,372,759**	69,770,677

Contingent liabilities, Note 22

The accompanying notes form an integral part of the condensed consolidated interim financial statements.

PyroGenesis Canada Inc.
Condensed Consolidated Interim Statements of Comprehensive Income (Loss)
(Unaudited)

	Notes	Three months ended September 30, 2022	Three months ended September 30, 2021	Nine months ended September 30, 2022	Nine months ended September 30, 2021
		$	$	**$**	$
Revenues	5	**5,657,783**	9,317,926	**15,711,726**	23,863,001
Cost of sales and services	17	**1,544,607**	5,265,395	**8,047,554**	12,733,979
Gross profit		**4,113,176**	4,052,531	**7,664,172**	11,129,022
Expenses					
Selling, general and administrative	17	**5,911,488**	4,901,131	**18,615,390**	15,287,141
Research and development, net		**290,374**	389,806	**1,577,370**	1,386,847
		6,201,862	5,290,937	**20,192,760**	16,673,988
Net loss from operations		**(2,088,686)**	(1,238,406)	**(12,528,588)**	(5,544,964)
Changes in fair value of strategic investments	10	**(1,802,477)**	1,868,862	**(8,103,587)**	(10,380,709)
Finance costs, net	18	**(183,694)**	(6,792)	**(523,707)**	(99,965)
Net earnings (loss) before income taxes		**(4,074,857)**	623,664	**(21,155,882)**	(16,025,638)
Income taxes		**–**	–	**76,095**	–
Net earnings (loss)		**(4,074,857)**	623,664	**(21,231,977)**	(16,025,638)
Other comprehensive income (loss)					
Items that will be reclassified subsequently to profit of loss					
Foreign currency translation gain on investments in foreign operations		**21,151**	–	**69,622**	–
Comprehensive income (loss)		**(4,053,706)**	623,664	**(21,162,355)**	(16,025,638)
Earnings (loss) per share					
Basic	19	**(0.02)**	0.00	**(0.12)**	(0.10)
Diluted	19	**(0.02)**	0.00	**(0.12)**	(0.10)

The accompanying notes form an integral part of the condensed consolidated interim financial statements.

PyroGenesis Canada Inc.
Condensed Consolidated Interim Statements of Changes in Shareholders' Equity
Nine months ended September 30, 2022 and 2021
(Unaudited)

	Notes	Number of common shares	Common shares and warrants	Contributed Surplus	Accumulated other comprehensive income	Deficit	Total
			$	$	$	$	$
Balance - December 31, 2021		**170,125,795**	**82,104,086**	**19,879,055**	**3,444**	**(61,217,831)**	**40,768,754**
Shares issued upon exercise of stock options	15	**1,200,000**	**1,125,263**	**(429,263)**	–	–	**696,000**
Share-based payments	15	**–**	**–**	**4,222,242**	**–**	**–**	**4,222,242**
Other comprehensive income for the period		**–**	**–**	**–**	**69,622**	**–**	**69,622**
Net loss and comprehensive loss		**–**	**–**	**–**	**–**	**(21,231,977)**	**(21,231,977)**
Balance – September 30, 2022		**171,325,795**	**83,229,349**	**23,672,034**	**73,066**	**(82,449,808)**	**24,524,641**
Balance - December 31, 2020		159,145,993	67,950,069	10,480,310	–	(19,007,273)	59,423,106
Shares issued upon exercise of stock options	15	3,477,000	1,437,022	(349,254)	–	–	1,087,768
Shares issued upon exercise of warrants and compensation options	15	8,337,897	13,085,197	–	–	–	13,085,197
Share-based payments	15	–	–	4,884,219	–	–	4,884,219
Shares purchased for cancellation	15	(166,684)	(347,019)			(863,440)	(1,210,459)
Net loss and comprehensive loss		–	–	–	–	(16,025,636)	(16,025,636)
Balance – September 30, 2021		170,794,206	82,125,269	15,015,275	–	(35,896,349)	61,244,195

The accompanying notes form an integral part of the condensed consolidated interim financial statements.

PyroGenesis Canada Inc.
Condensed Consolidated Interim Statements of Cash Flows
Three and nine months ended September 30, 2022 and 2021
(Unaudited)

	Notes	Three months ended September 30,		Nine months ended September 30,	
		2022	2021	**2022**	2021
		$	$	**$**	$
Cash flows provided by (used in)					
Operating activities					
Net earnings (loss)		**(4,074,857)**	623,664	**(21,231,975)**	(16,025,636)
Adjustments for:					
Share-based payments	17	**931,572**	673,194	**4,222,242**	4,884,219
Depreciation of property and equipment	17	**155,481**	93,701	**446,883**	254,079
Depreciation of right-of-use assets	17	**157,844**	153,177	**479,466**	404,188
Amortization and write-off of intangible assets	17	**218,760**	91,333	**656,278**	104,892
Amortization of contract assets		**117,070**	118,696	**212,420**	424,765
Finance costs	18	**183,694**	6,792	**523,707**	99,965
Change in fair value of strategic investments		**1,802,477**	(1,868,862)	**8,103,587**	10,380,709
Income taxes		**–**	**–**	**76,095**	**–**
Unrealized foreign exchange		**5,880**	**–**	**48,090**	**–**
		(502,079)	(108,302)	**(6,463,207)**	527,181
Net change in balances related to operations	16	**1,089,162**	(2,324,191)	**(3,439,454)**	(16,877,125)
Investing activities		**587,083**	(2,432,493)	**(9,902,661)**	(16,349,944)
Additions to property and equipment		**(46,753)**	(223,412)	**(238,979)**	(1,408,300)
Additions to right-of-use assets		**–**	–	**–**	(36,903)
Additions to intangible assets		**(54,012)**	(100,964)	**(116,980)**	(208,116)
Purchase of strategic investments	10	**–**	(1,205,011)	**(3,604,000)**	(10,401,522)
Disposal of strategic investments		**750,390**	–	**3,703,237**	12,374,047
Business combination, net of cash acquired		**–**	1,104,393	**–**	1,104,393
Financing activities		**649,625**	(424,994)	**(256,722)**	1,423,599
Bank indebtedness		**(228,134)**	**–**	**713,046**	**(189,207)**
Interest paid		**(179,572)**	(37,571)	**(419,028)**	–
Repayment of term loans		**(8,304)**	(3,078)	**(24,693)**	(9,076)
Repayment of lease liabilities		**(464,138)**	(80,198)	**(656,713)**	(161,249)
Repayment of balance due on business combination		**–**	–	**(217,778)**	–
Proceeds from issuance of other term loans		**–**	–	**203,857**	–
Proceeds from issuance of shares upon exercise of warrants		**–**	–	**–**	13,085,197
Proceeds from issuance of shares upon exercise of stock options		**696,000**	683,323	**696,000**	1,087,768
Shares purchased for cancellation		**–**	–	**–**	(1,210,459)
		(184,148)	562,476	**294,691**	12,602,974
Effect of exchange rate changes on cash denominated in foreign currencies		**20,793**	**–**	**27,040**	**–**
Net increase (decrease) in cash and cash equivalents		**1,073,353**	(2,295,011)	**(9,837,652)**	(2,323,371)
Cash and cash equivalents - beginning of period		**1,291,508**	18,076,539	**12,202,513**	18,104,899
Cash and cash equivalents - end of period		**2,364,861**	15,781,528	**2,364,861**	15,781,528
Supplemental cash flow disclosure					
Non-cash transactions:					
Purchase of intangible assets included in accounts payable		**–**	74,911	**–**	19,372
Purchase of property and equipment included in accounts payable		**–**	72,565	**–**	113,657
Addition of right-of-use assets and lease liabilities		**–**	–	**–**	2,120,894
Accretion of balance due on business combination		**43,222**	–	**170,310**	–
Accretion interest on royalties receivable		**39,099**	–	**78,012**	–
Accretion on term loan		**7,816**	–	**20,197**	–

The accompanying notes form an integral part of the condensed consolidated interim financial statements

1. Nature of operations

PyroGenesis Canada Inc. and its subsidiaries (collectively, the “Company”), incorporated under the laws of the Canada Business Corporations Act, was formed on July 11, 2011. The Company owns patents of advanced waste treatment systems technology and designs, develops, manufactures and commercialises advanced plasma processes and sustainable solutions to reduce greenhouse gases. The Company is domiciled at 1744 William Street, Suite 200, Montreal, Quebec. The Company is publicly traded on the TSX Exchange under the Symbol “PYR” on NASDAQ in the USA under the symbol "PYR" and on the Frankfurt Stock Exchange (FSX) under the symbol “8PY “.

2. Basis of preparation

(a) Statement of compliance

These financial statements have been prepared in accordance with International Accounting Standard (“IAS”) 34 Interim Financial Statements, as issued by the International Accounting Standards Board ("IASB"). These condensed consolidated interim financial statements do not include all of the necessary information required for full annual financial statements in accordance with International Financial Reporting Standards (“IFRS”) and should be read in conjunction with the Company’s audited financial statements for the year ended December 31, 2021.

These financial statements were approved and authorized for issuance by the Board of Directors on November 10, 2022.

(b) Functional and presentation currency

These consolidated financial statements are presented in Canadian dollars, which is the Company’s functional currency.

(c) Basis of measurement

These financial statements have been prepared on the historical cost basis except for:

(i) strategic investments which are accounted for at fair value,
(ii) stock-based payment arrangements, which are measured at fair value on the grant date pursuant to IFRS 2, Share-based Payment; and
(iii) lease liabilities, which are initially measured at the present value of minimum lease payments

(d) Basis of consolidation

For financial reporting purposes, subsidiaries are defined as entities controlled by the Company. The Company controls an entity when it has power over the investee; it is exposed to, or has rights to, variable returns from its involvement with the entity; and it has the ability to affect those returns through its power over the entity.

In instances where the Company does not hold a majority of the voting rights, further analysis is performed to determine whether or not the Company has control of the entity. The Company is deemed to have control when, according to the terms of the shareholder’s and/or other agreements, it makes most of the decisions affecting relevant activities.

These consolidated financial statements include the accounts of the Company and its subsidiaries, Drosrite International LLC and Pyro Green-Gas Inc. and its subsidiaries. Drosrite International LLC is owned by a member of the Company’s key management personnel and close member of the Chief Executive Officer ("CEO") and controlling shareholder’s family and is deemed to be controlled by the Company. Pyro Green-Gas Inc. (formerly AirScience Technologies Inc. until the renaming on September 14, 2021) was acquired by the Company on August 11, 2021 (see note 4). All transactions and balances between the Company and its subsidiaries have been eliminated upon consolidation.

(e) Significant accounting policies

These financial statements have been prepared in accordance with the accounting policies adopted in the Company’s most recent annual financial statements for the year ended December 31, 2021.

3. Significant accounting judgments, estimates and assumptions

The significant judgments, estimates and assumptions applied by the Company's in these condensed consolidated interim financial statements are the same as those applied by the Company in its audited annual financial statements as at and for the year ended December 31, 2021.

4. Business combination in fiscal 2021

On August 11, 2021, the Company completed the acquisition of Pyro Green-Gas Inc. and its subsidiaries (formerly AirScience Technologies Inc. prior to its renaming on September 14, 2021), a Montreal-based company which offers technologies, equipment, and expertise in the area of biogas upgrading, as well as air pollution controls, for a maximum purchase price consideration of $4.4 million in cash, subject to customary post-closing adjustments. In addition, the Company settled a pre-existing loan receivable from Pyro Green-Gas Inc. of approximately $1.7 million. The transaction was executed essentially through a purchase of the entirety of the common class "A" shares of Pyro Green-Gas Inc. This acquisition enables the Company to springboard into the renewable natural gas market and provides an advantage compared to building its own operations. In addition, the Company will now have a presence in Italy and India, and the acquisition will provide potential synergies with the Company's land-based waste destruction offerings. The purchase price will be paid upon the achievement of various contract and business-related milestones by Pyro Green-Gas Inc. The Company's assessment is that these milestones will be realized at various moments during the next 30 months. The contingent consideration was estimated using a discount rate of 8%.

The acquisition was accounted for using the purchase method and the final allocation of the purchase price is as follows:

	$
Total consideration	
Consideration paid at closing	**1**
Contingent consideration	**3,841,999**
Consideration paid at closing and continent consideration	**3,842,000**
Settlement of pre-existing loan receivable from Pyro Green-Gas	**1,744,400**
	5,586,400

	December 31, 2021 Final $
Net assets acquired	
Current assets [1]	**5,186,086**
Right of use asset	**477,608**
Property and equipment	**42,552**
Intangible assets and Goodwill [2]	**4,780,607**
Deferred income tax asset	**79,360**
Current liabilities	**(4,507,907)**
Non-current liabilities	**(471,906)**
	5,586,400

1 Includes $807,946 of cash and trade receivables with a net fair value of $3.3 million, including an allowance for doubtful accounts of $0.5 million.

2 The goodwill of $2.7 million recorded on the transaction is mainly attributable to the expected growth in biogas upgrading market and the expertise of the workforce, and it is not expected to be deductible for tax purposes.

The maximum purchase price consideration of $4,355,600 was discounted to $3,842,000, at August 11, 2021 and an accretion expense of $170,310 was recognized in Net finance costs in the Consolidated Statement of Comprehensive Loss for the nine month period ended September 30, 2022.

5. Revenues

The following is a summary of the Company's revenues by product line:

	Three months ended September 30,		Nine months ended September 30,	
	2022	2021	**2022**	2021
	$	$	**$**	$
Revenue from contracts with customers by product line:				
PUREVAP™	**4,243,138**	999,875	**5,617,942**	5,524,642
DROSRITE™	**71,431**	1,983,524	**1,408,048**	6,373,130
Development and support related to systems supplied to the U.S. Navy	**420,809**	1,957,981	**1,757,168**	6,677,188
Torch related sales	**684,997**	645,894	**3,307,150**	1,398,729
Biogas upgrading and pollution controls	**89,698**	3,712,000	**3,260,850**	3,712,000
Other sales and services	**147,710**	18,652	**360,568**	177,312
	5,657,783	9,317,926	**15,711,726**	23,863,001

The following is a summary of the Company's revenues by revenue recognition method:

	Three months ended September 30,		Nine months ended September 30,	
	2022	2021	**2022**	2021
	$	$	**$**	$
Revenue from contracts with customers:				
Sales of goods under long-term contracts recognized over time	**1,997,474**	8,405,565	**11,406,066**	19,122,840
Sales of goods at a point of time	**60,309**	912,361	**705,660**	1,440,161
Other revenue:				
Sale of intellectual properties	**3,600,000**	–	**3,600,000**	3,300,000
	5,657,783	9,317,926	**15,711,726**	23,863,001

See note 24 for sales by geographic area.

Transaction price allocated to remaining performance obligations

As at September 30, 2022, revenue expected to be recognized in the future related to performance obligations that are unsatisfied (or partially satisfied) at the reporting date is $25,965,367 (2021 - $43,458,148). Revenue will be recognized as the Company satisfies its performance obligations under long-term contracts, which is expected to occur over the next 3 years.

6. Cash and cash equivalents

As at September 30, 2022 and December 31, 2021, cash and cash equivalents include the following components:

	September 30, 2022	December 31, 2021
	$	$
Cash	**1,678,906**	3,568,561
Guaranteed investment certificates	**685,955**	8,633,952
Cash and cash equivalents	**2,364,861**	12,202,513

7. Accounts receivable

The following table provides details on accounts receivable outstanding:

	September 30, 2022	December 31, 2021
	$	$
1 – 30 days	**7,229,866**	2,260,428
31 – 60 days	**273,550**	44,838
61 – 90 days	**30,957**	6,855,822
Greater than 90 days	**14,461,080**	7,357,825
Total trade accounts receivable	**21,995,453**	16,518,913
Other receivables	**202,690**	270,536
Sales tax receivable	**1,590,311**	850,167
	23,788,454	17,639,616

As at September 30, 2022 the allowance for expected credit loss is $551,845 ($520,000 at December 31, 2021), which was included through the business combination, other than from the foreign exchange conversion throughout the nine-month period of fiscal 2022.

8. Costs and profits in excess of billings on uncompleted contracts

As at September 30, 2022, the Company had twenty contracts with total billings of $25,613,149 which were less than total costs incurred and had recognized cumulative revenue of $28,517,892 since those projects began. This compares with fourteen contracts with total billings of $16,676,700 which were less than total costs incurred and had recognized cumulative revenue of $21,599,410 as at December 31, 2021.

Changes in costs and profits in excess of billings on uncompleted contracts during the nine-month period are explained by $2,080,367 (2021 - $983,891) recognized at the beginning of the period being transferred to accounts receivable, and $62,400 (2021 - $4,832,968) resulting from changes in the measure of progress.

9. Investment tax credits

An amount recognized in 2022 included $115,856 (2021 - $202,472) of investment tax credits earned in the period, as well as $Nil (2021 - $706,000) of investment tax credits earned in prior years that no longer met the criteria for recognition in 2021. $46,818 (2021 - $148,695) of the investment tax credits recognized in the period was recorded against cost of sales and services, $46,538 (2021 - ($684,709)) against research and development expenses and $22,500 (2021 - $32,486) against selling general and administrative expenses.

10. Strategic investments

	September 30, 2022	December 31, 2021
	$	$
Beauce Gold Fields (“BGF”) shares – level 1	**41,032**	123,095
HPQ Silicon Resources Inc. (“HPQ”) shares - level 1	**5,846,665**	12,306,196
HPQ warrants – level 3	**811,138**	2,472,368
	6,698,835	14,901,659

The change in the strategic investments is summarized as follows:

	("BGF") shares – level 1		("HPQ") shares - level 1		HPQ warrants – level 3	
	Quantity	$	Quantity	$	Quantity	$
Balance, December 31, 2020	1,025,794	123,095	14,990,200	16,489,220	25,844,600	23,379,435
Additions	—	8,268,000		8,070,109	–	–
Exercised	—	16,250,000		11,700,000	(16,250,000)	(9,181,250)
Disposed	—	(12,755,600)		14,252,732	–	–
Change in the fair value	—	–		(9,700,401)	–	(11,725,817)
Balance, December 31, 2021	**1,025,794**	**123,095**	**26,752,600**	**12,306,196**	**9,594,600**	**2,472,368**
Additions[1]	**–**	–	**6,800,000**	**3,196,000**	**6,800,000**	**408,000**
Disposed	**–**	–	**(10,624,500)**	**(3,703,237)**	**–**	**–**
Change in the fair value	**–**	**(82,063)**	**–**	**(5,952,294)**	**–**	**(2,069,230)**
Balance, September 30, 2022	**1,025,794**	**41,032**	**22,928,100**	**5,846,665**	**16,394,600**	**811,138**

1 On April 20, 2022 the Company participated in an HPQ non-brokered private placement by acquiring 6,800,000 units at a price of $0.53 per unit for a total investment of $3,604,000. Each unit consists of one common share of HPQ and one common share purchase warrant. Each of these warrants entitles the Company to purchase one common share at a price of $0.60 for a period of 24 months from the closing date of the private placement.

At September 30, 2022 and December 31, 2021, the fair value of the HPQ warrants was measured using the Black-Scholes option pricing model using the following assumptions:

	September 30, 2022				**December 31, 2021**		
Number of warrants	1,200,000	4,394,600	4,000,000	6,800,000	1,200,000	4,394,600	4,000,000
Date of issuance	29-Apr-20	2-Jun-20	3-Sep-20	20-Apr-22	29-Apr-20	2-Jun-20	3-Sep-20
Exercise price ($)	0.10	0.10	0.61	0.60	0.10	0.10	0.61
Assumptions under the Back Sholes model:							
Fair value of the shares ($)	0.26	0.26	0.26	0.26	0.46	0.46	0.46
Risk free interest rate (%)	3.72	3.72	3.72	3.72	1.22	1.22	1.22
Expected volatility (%)	84.25	83.67	74.25	75.15	89.88	94.01	110.47
Expected dividend yield	–	–	–	–	–	–	–
Contractual remaining life (in months)	7	8	11	19	16	17	20

As at September 30, 2022, a gain from initial recognition of the warrants of $398,857 ($510,573 at December 31, 2021) has been deferred off balance sheet until realized.

11. Deposits

	September 30, 2022	December 31, 2021
	$	$
Current portion:		
Suppliers	**1,086,810**	1,236,211
Security deposit on leased premises	**40,241**	92,241
Total current	**1,127,051**	1,328,452
Non-current portion:		
Suppliers	**2,467**	1,952
Security deposit on leased premises	**38,803**	246,804
Total non-current	**41,270**	248,756
Total Deposits	**1,168,321**	1,577,208

12. Accounts payable and accrued liabilities

	September 30, 2022	December 31, 2021
	$	$
Accounts payable	**5,356,095**	5,457,259
Accrued liabilities	**6,011,610**	3,730,048
Sale commissions payable[1]	**876,369**	737,364
Accounts payable to the controlling shareholder and CEO	**136,335**	144,506
Accrued liabilities - trust beneficially owned by a shareholder	**275,000**	–
	12,655,409	10,069,177

1 Sale commissions payable relate to the costs to obtain long-term contracts with clients.

13. Billings in excess of costs and profits on uncompleted contracts

The amount to date of costs incurred and recognized profits less recognized losses for construction projects in progress amounted to $18,149,003 (2021 - $21,834,137).

Payments to date received were $25,512,109 on contracts in progress (2021 - $31,234,368).

Changes in billings in excess of costs and profits on uncompleted contracts during the nine-month period are explained by $3,430,725 (2021 - $6,268,910) recognized as revenue at the beginning of the period, and an increase of $1,393,599 (2021 - $9,076,169) resulting from cash received excluding amounts recognized as revenue.

14. Term loans

	Economic Development Agency of Canada Loan[1]	Other Term Loans[2]	Other Term Loans[3]	Canada Emergency Business Account Loan[4]	Total
	$	$	$	$	$
Balance, December 31, 2021	87,985	24,700	28,220	50,000	190,905
Addition	292,942	–	–	–	292,942
Financing costs	(89,085)	–	–	–	(89,085)
Accretion	20,197	–	–	–	20,197
Payments	–	(9,733)	(14,939)	–	(24,672)
Balance, September 30, 2022	312,039	14,967	13,281	50,000	390,287
Less current portion	–	(13,782)	(13,281)	(50,000)	(77,063)
Balance, September 30, 2022	**312,039**	**1,185**	**–**	–	**313,224**

1 Maturing in 2029, non-interest bearing, payable in 60 equal instalments from April 2024 to March 2029. In January 2022 and April 2022, the Company received additional contributions of $155,735 and $137,207, respectively, which were discounted using the effective interest method using a rate of 8%.
2 Maturing October 23, 2023 bearing interest at a rate of 6.95% per annum, payable in monthly instalments of $1,200 (including interest in capital) secured by automobile (carrying amount of $14,033 at September 30, 2022).
3 Maturing in May 2023, payable in monthly instalments of $1,660, bearing interest at 7.45%.
4 Loan bearing no interest and no minimum repayment, if repaid by December 2023.

15. Shareholders' equity

Common shares and warrants

Authorized:

The Company is authorized to issue an unlimited number of common shares without par value.

The following table sets out the activity in stock options:

	Number of options	Weighted average exercise price
		$
Balance – December 31, 2020	9,040,000	1.57
Granted	2,970,000	4.55
Exercised	(3,482,000)	0.32
Forfeited	(125,000)	4.41
Balance, December 31, 2021	8,403,000	3.10
Granted	**2,475,000**	**3.55**
Exercised[1]	**(1,200,000)**	**0.58**
Forfeited	**(240,000)**	**4.07**
Balance, September 30, 2022	**9,438,000**	**3.52**

(1) The weighted fair market value of the share price for options exercised in Q3, 2022 was $1.77.

As at September 30, 2022, the outstanding options, as issued under the stock option plan to directors, officers, employees and consultants for the purchases of one common share per option, are as follows:

Issuance date	Number of stock options 31-Dec-21	Granted	Exercised	Forfeitures	Number of stock options 30-Sep-22	Number of stock options vested [1]	Exercise price per option	Expiry date
							$	
3-Nov-17	2,400,000	–	(1,200,000)	–	1,200,000	1,200,000	0.58	3-Nov-22
3-Jul-18	300,000	–	–	–	300,000	300,000	0.51	3-Jul-23
29-Oct-18	40,000	–	–	–	40,000	40,000	0.52	29-Oct-23
29-Sep-19	100,000	–	–	–	100,000	100,000	0.51	29-Sep-24
2-Jan-20	100,000	–	–	–	100,000	100,000	0.45	2-Jan-25
16-Jul-20	2,243,000	–	–	(40,000)	2,203,000	1,778,000	4.41	16-Jul-25
26-Oct-20	250,000	–	–	(200,000)	50,000	25,000	4.00	26-Oct-25
6-Apr-21	550,000	–	–	–	550,000	410,000	8.47	6-Apr-26
1-Jun-21	200,000	–	–	–	200,000	100,000	6.59	1-Jun-26
14-Jun-21	100,000	–	–	–	100,000	50,000	6.70	14-Jun-26
14-Oct-21	100,000	–	–	–	100,000	10,000	5.04	14-Oct-26
17-Dec-21	1,920,000	–	–	–	1,920,000	1,920,000	3.13	17-Dec-26
30-Dec-21	100,000	–	–	–	100,000	100,000	3.61	30-Dec-26
3-Jan-22	–	450,000	–	–	450,000	450,000	3.36	3-Jan-27
5-Apr-22	–	400,000	–	–	400,000	40,000	2.96	5-Apr-27
2-Jun-22	–	1,500,000	–	–	1,500,000	375,000	3.88	2-Jun-27
13-Jul-22	–	125,000	–	–	125,000	12,500	2.14	13-Jul-27
	8,403,000	**2,475,000**	**(1,200,000)**	**(240,000)**	**9,438,000**	**7,010,500**	**3.52**	

(1) At September 30, 2022, the weighted average exercise price for options outstanding which are exercisable was $3.26.

The fair value of the stock options was estimated by applying the Black Sholes options pricing model using the following assumptions:

Grant Date	January 3, 2022	April 5, 2022	June 2, 2022	July 13, 2022
Number of options granted	450,000	400,000	1,500,000	125,000
Exercise price ($)	3.36	2.96	3.88	2.14
Fair value of each option under the Black Scholes pricing model ($)	2.17	1.98	2.61	1.44
Assumptions under the Back Sholes model:				
Market share ($)	3.33	2.96	3.88	2.14
Risk free interest rate (%)	1.25	2.50	2.87	3.11
Expected volatility (%)	82.45	83.36	83.31	83.31
Expected dividend yield	–	–	–	–
Expected life (number of months)	60	60	60	60
Forfeiture rate (%)	–	–	–	–

For the three-month and nine-month periods ended September 30, 2022, a stock-based compensation expense of $931,572 and $4,222,242, respectively, was recorded in Selling, general and administrative expenses in the Condensed Consolidated Statements of Comprehensive income (loss), ($673,194 and $4,884,219 for the three-month and nine-month periods ended September 30, 2021).

At September 30, 2022, an amount of $4,047,885 ($2,719,354 at December 31, 2021) remains to be amortized until June 2027 related to the grant of stock options.

16. Supplemental disclosure of cash flow information

	Three months ended September 30,		Nine months ended September 30,	
	2022	2021	**2022**	2021
	$	$	**$**	$
Accounts receivable	**(4,582,692)**	(3,827,068)	**(6,148,838)**	(13,292,138)
Costs and profits in excess of billings on uncompleted contracts	**1,290,731**	(2,010,805)	**2,017,967**	(2,220,085)
Inventory	**(168,708)**	(192,192)	**(830,156)**	(548,647)
Investment tax credits receivable	**(44,424)**	(102,727)	**(59,475)**	255,368
Income taxes receivable	**(1,327)**	–	**115,868**	–
Deposits	**(189,942)**	511,182	**1,587,574**	(305,204)
Contract assets & other assets	**(139,005)**	–	**(139,005)**	–
Prepaid expenses	**748,120**	1,452,235	**(635,039)**	(593,106)
Accounts payable and accrued liabilities	**3,353,412**	1,673,971	**2,688,775**	1,177,390
Billings in excess of costs and profits on uncompleted contracts	**822,997**	171,213	**(2,037,125)**	(1,350,703)
	1,089,162	(2,324,191)	**(3,439,454)**	(16,877,125)

17. Supplemental disclosure on statements of comprehensive income

	Three months ended September 30,		Nine months ended September 30,	
	2022	2021	**2022**	2021
	$	$	**$**	$
Inventories recognized in cost of sales	**212,830**	**–**	**626,972**	**–**
Amortization of intangible assets	**218,760**	91,333	**656,278**	104,892
Depreciation of property and equipment	**155,481**	93,701	**446,883**	254,079
Depreciation of right of use assets	**157,844**	153,177	**479,466**	404,188
Employee benefits	**3,200,123**	2,467,185	**8,902,215**	6,488,260
Share-based expenses	**931,572**	673,194	**4,222,242**	4,884,219
Awarded Government grants	**43,012**	30,949	**137,523**	177,693

18. Net finance costs

	Three months ended September 30,		Nine months ended September 30,	
	2022	2021	**2022**	2021
	$	$	**$**	$
Financial expenses				
Interest on term loans	**1,435**	3,100	**3,038**	12,538
Interest on lease liabilities	**94,732**	84,586	**284,190**	221,514
Interest accretion on balance due on business combination	43,222	–	170,310	–
Penalties and other interest expenses	**83,404**	3,868	**144,181**	15,004
	222,793	91,554	**601,719**	249,056
Financial income				
Accretion interest on royalties receivable	**(39,099)**	(84,762)	**(78,012)**	(149,091)
Net finance costs	**183,694**	6,792	**523,707**	99,965

19. Earnings (loss) per share

The following table provides a reconciliation between the number of basic and fully diluted shares outstanding for the three- month and nine-month period ended September 30:

	Three months ended September 30,		Nine months ended September 30,	
	2022	2021	**2022**	2021
	$	$	**$**	$
Weighted daily average of Common shares	**170,621,448**	168,517,657	**170,292,829**	165,369,555
Dilutive effect of stock options	**–**	–	**–**	–
Dilutive effect of warrants	**–**	–	**–**	–
Weighted average number of diluted shares	**170,621,448**	174,385,624	**170,292,829**	165,369,555
Number of anti-dilutive stock options and warrants excluded from fully diluted earnings per share calculation	**9,438,000**	3,545,000	**9,438,000**	6,288,000

20. Related party transactions

During the three and nine-month periods ended September 30, 2022, the Company concluded the following transactions with related parties:

In January 2020, the Company entered into a lease agreement for the rental of a property with a trust whose beneficiary is the controlling shareholder and CEO of the Company. At September 30, 2022 the carrying amount of the ROU asset and lease liabilities are $849,034 and $929,488 ($1,107,131 and $Nil, respectively, at December 31, 2021).

Rent and property taxes charged by a trust whose beneficiary is the controlling shareholder and CEO of the Company, for the three and nine-month periods ended September 30, 2022 amount to $69,054 and $208,334, respectively ($68,825 and $206,310 for the three and nine-month periods ended September 30, 2021, respectively).

A balance due to the controlling shareholder and CEO of the Company amounted to $136,335 ($144,506 at December 31, 2021) and is included in accounts payable and accrued liabilities.

The Key Management Personnel of the Company, in accordance with IAS 24, are the members of the Board of Directors and certain officers. Total compensation to key management consisted of the following:

	Three months ended September 30,		Nine months ended September 30,	
	2022	2021	**2022**	2021
	$	$	**$**	$
Salaries – key management	**270,532**	253,805	**844,374**	714,019
Pension contributions	**4,961**	4,634	**15,641**	13,042
Fees – Board of Directors	**45,700**	72,400	**134,700**	147,400
Share-based compensation – officers	**958,519**	264,736	**1,771,433**	2,057,061
Share-based compensation – Board of Directors	**221,197**	251,467	**1,979,410**	1,963,317
Other benefits – key management	**7,897**	122,867	**21,935**	176,219
Total compensation	**1,508,806**	969,909	**4,767,493**	5,071,058

21. Financial instruments

As part of its operations, the Company carries a number of financial instruments. It is management's opinion that the Company is not exposed to significant interest, currency or credit risks arising from these financial instruments except as otherwise disclosed. The Company's overall risk management program focuses on the unpredictability of the financial market and seeks to minimize potential adverse effects on the Company's financial performance. The Company does not use derivative financial instruments to hedge these risks.

Foreign currency risk

The Company enters into transactions denominated in US dollars for which the related revenues, expenses, accounts receivable and accounts payable and accrued liabilities balances are subject to exchange rate fluctuations.

As at September 30, 2022 and December 31, 2021 the Company's exposure to foreign exchange risk for amounts denominated in US dollars is as follows:

	September 30, 2022	December 31, 2021
	$	$
Cash	**451,897**	1,714,670
Accounts receivable	**14,769,360**	14,465,011
Accounts payable and accrued liabilities	**(989,503)**	(1,023,999)
Total	**14,231,754**	15,155,682

Foreign currency risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in foreign exchange rates.

Sensitivity analysis

At September 30, 2022, if the US Dollar changes by 10% against the Canadian dollar with all other variables held constant, the impact on pre-tax gain or loss and equity for the period ended September 30, 2022 would have been $1,423,175.

Credit risk and credit concentration

Credit risk is the risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation. The maximum credit risk to which the Company is exposed as at September 30, 2022 represents the carrying amount of cash and cash equivalents, accounts receivable (except sales tax receivable), deposits and royalties receivable. Cash and cash equivalents, which only comprise guaranteed investment certificates redeemable on relatively short notice by the Company, are held with major reputable financial institutions. The Company manages its credit risk by performing credit assessments of its customers. The Company does not generally require collateral or other security from customers on accounts receivable. The Company believes that there is no unusual exposure associated with the collection of these receivables. Two customers accounted for 79% (one customer for 73% at December 31, 2021) of trade accounts receivable with amounts owing to the Company of $16,202,736 ($12,063,636 at December 31, 2021), representing the Company's major credit risk exposure.

The following table summarizes the Company’s concentration of credit risk as a percentage of revenue during the three- month and nine-month periods ended September 30, 2022.

	Three months ended September 30, 2022		Nine months ended September 30, 2022	
	Revenues	**% of total revenues**	Revenues	% of total revenues
	$	**%**	**$**	**%**
Customer 1	**3,943,430**	**70**	4,887,541	31
Customer 2	–	**–**	2,291,445	15
Customer 3	–	**–**	1,757,168	11
Total	**3,943,430**	**70**	8,936,154	57

Credit concentration is determined based on customers representing 10% or more of total revenues and/or total accounts receivable.

The royalties receivables are due from a company in which the Company has a strategic investments. The Company does not have collateral or other security associated with the collection of this receivable.

Fair value of financial instruments

The fair value represents the amount that would be received for the sale of an asset or paid for the transfer of a liability in an orderly transaction between market participants at the measurement date. The fair value estimates are calculated at a specific date taking into consideration assumptions regarding the amounts, the timing of estimated future cash flows and discount rates. Accordingly, due to its approximate and subjective nature, the fair value must not be interpreted as being realizable in an immediate settlement of the financial instruments.

There are three levels of fair value that reflect the significance of inputs used in determining fair values of financial instruments:

Level 1 — quoted prices (unadjusted) in active markets for identical assets or liabilities.

Level 2 — inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices).

Level 3 — inputs for the asset or liability that are not based on observable market data. The fair values of cash and cash equivalents, trade accounts receivable, deposits, accounts payable and accrued liabilities and bank indebtedness approximate their carrying amounts due to their short-term maturities.

Royalties receivable are discounted according to their corresponding agreements and are classified as Level 2. Investments in HPQ warrants are valued using the Black-Scholes pricing model and are classified as Level 3.
The fair value of the term loans and the balance due on business combination as at September 30, 2022 is determined using the discounted future cash flows method and management's estimates for market interest rates for similar issuances. Given their recent issuance, their fair market values correspond to their carrying amount.

Interest rate risk

Interest rate risk is the risk that the value of a financial instrument might be adversely affected by a change in interest rates. Changes in market interest rates may have an effect on the cash flows associated with some financial assets and liabilities, known as cash flow risk, and on the fair value of other financial assets or liabilities, known as price risk, and on the fair value of investments or liabilities, known as price risks. The Company is exposed to a risk of fair value on cash equivalents, and term loans as those financial instruments bear interest at fixed rates.

Price risk

Price risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market price (other than those arising from foreign currency risk and interest risk), whether those changes are caused by factors specific to the individual financial instrument or its issuers or factors affecting all similar financial instruments traded in the market. The most significant exposure to the price risk for the Company arises from its investments in shares and warrants of public companies quoted on the TSXV Exchange. If equity prices had increased or decreased by 25% as at September 30, 2022, with all other variables held constant, the Company’s investments would have increased or decreased respectively, by approximately $1,978,000 ($4,042,000 at December 31, 2021).

Liquidity risk

Liquidity risk is the risk that the Company will encounter difficulty in meeting obligations associated with financial liabilities that are settled by delivery of cash or another financial asset. The Company manages its liquidity risk by forecasting cash flows from operations and anticipating any investing and financing activities.

The following table summarizes the contractual amounts payable and maturities of financial liabilities and other liabilities at September 30, 2022:

	Carrying value	Total contractual amount	Less than one year	2-3 years	4-5 years	Over 5 years
	$	**$**	**$**	**$**	**$**	**$**
Bank indebtedness	713,046	713,046	713,046	–	–	–
Accounts payable and accrued liabilities	12,655,409	12,655,409	12,655,409	–	–	–
Term loans	390,287	529,237	35,893	194,116	180,000	119,228
Balance due on business combination	3,904,735	4,137,820	3,048,920	1,088,900	–	–
Lease liabilities	5,629,237	10,600,618	3,342,450	1,831,758	3,477,088	1,949,322
	23,292,714	**28,636,130**	**19,795,718**	**3,114,774**	**3,657,088**	**2,068,550**

The Company's Canadian subsidiary benefits from a line of credit of $500,000, and the Italian subsidiary benefits from a 400,000 Euro ($539,020) line of credit, and security against these credit lines is provided only by the subsidiaries, and not PyroGenesis Canada Inc. At September 30, 2022, $437,121 was drawn on the Canadian facility and 206,176 Euro ($275,925) was drawn on the Italian facility.

22. Contingent liabilities

The Company is currently a party to various legal proceedings. If management believes that a loss arising from these proceedings is probable and can reasonably be estimated, that amount of the loss is recorded. As additional information becomes available, any potential liability related to these proceedings is assessed and the estimates are revised, if necessary. Based on currently available information, management believes that the ultimate outcome of these proceedings, individually and in aggregate, will not have a material adverse effect on the Company's financial position or overall trends in results of operations.

The Company had received a government grant in prior years of approximately $800,000 to assist with the development of a new system of advanced waste treatment systems technology. The grant is potentially repayable at the rate of 3% of any consideration received as a result of the project, for which funding has been received, to a maximum of the actual grant received. This repayment provision will remain in effect until May 30, 2024. The Company abandoned the project in 2011 and accordingly, no amount is expected to be repaid.

23. Capital management

The Company's objectives in managing capital are:

a) To ensure sufficient liquidity to support its current operations and execute its business plan; and

b) To provide adequate return to the shareholders

The Company's primary objectives when managing capital is to ensure the Company continues as a going concern as well as to maintain optimal returns to shareholders and benefits for other stakeholders.

The Company currently funds these requirements from cash flows from operations and with financing arrangements with third parties and shareholders. The Company is not subject to any externally imposed capital requirements.

The Company monitors its working capital in order to meet its financial obligations. On September 30, 2022, the Company's working capital was $7,679,373 ($14,006,785 at December 31, 2021)

The management of capital includes shareholders' equity for a total amount of $24,524,621 and term loans of $390,287 ($40,768,754 and $190,905 respectively at December 31, 2021), as well as cash and cash equivalents amounting to
$2,364,861 ($12,202,513 at December 31, 2021).

There were no significant changes in the Company's approach during the current nine-month period and 2021 fiscal year, however, in order to maintain or adjust the capital structure, the Company may issue new shares, sell portions of its strategic investment and periodically purchase its own shares on the open market.

24. Segment information

The Company operates in one segment, based on financial information that is available and evaluated by the Company's Board of Directors. The Company's head office is located in Montreal, Quebec. The operations of the Company are located in three geographic areas: Canada, Italy and India.

The following is a summary of the Company's revenue from external customers, by geography:

	Three months ended September 30,		Nine months ended September 30,	
	2022	2021	**2022**	2021
	$	$	**$**	$
Canada	**4,908,188**	1,352,895	**8,877,823**	6,089,789
United States	**474,436**	1,957,777	**1,821,310**	6,683,583
Europe	**60,770**	558,430	**1,339,912**	620,673
Mexico	**58,380**	–	**317,772**	137,856
Asia	**65,003**	2,112,481	**1,727,495**	6,364,235
South America	**17,133**	523,254	**179,839**	1,153,284
India	**73,873**	2,813,089	**1,447,575**	2,813,581
	5,657,783	9,317,926	**15,711,726**	23,863,001

Revenue by product line and revenues recognized by revenue recognition method are presented in note 5.

25. Subsequent Events

On October 19, 2022, the Company announced that it had completed a non-brokered Private Placement consisting of the issuance and sale of 1,014,600 units of the Company (the "Units") at a price of $1.30 per Unit, for gross proceeds of $1,318,980 to the Company. Each Unit consists of one Common Share of the Company and one Common Share Purchase Warrant. Each Warrant entitles the holder thereof to purchase one Common Share at a price of $1.75 until October 19, 2024. The Common Shares and Warrants issued in connection with the Private Placement, and the Common Shares underlying the Warrants, are subject to a statutory hold period of four months and one day from the date of the closing, in accordance with applicable securities legislation.

PyroGenesis Canada Inc.
Management's Discussion and Analysis
As at September 30, 2022 and for the three and nine month periods ended September 30, 2022 and 2021
(Unaudited)

This management's discussion and analysis ("MD&A") is intended to assist readers in understanding the business environment, strategies, performance and risk factors of PyroGenesis Canada Inc. ("PyroGenesis", or the "Company"). The MD&A provides the reader with a view and analysis, from the perspective of management, of the Company's financial results for the three and nine months ended September 30, 2022. The MD&A has been prepared in accordance with National Instrument 51-102, Continuous Disclosure Requirements, and should be read in conjunction with the audited consolidated financial statements and related notes thereto of the Company for the year ended December 31, 2021.

The condensed consolidated interim financial statements and MD&A have been reviewed by PyroGenesis' Audit Committee and were approved by its Board of Directors on November 10, 2022. The Board of Directors is responsible for ensuring that the Company fulfills its responsibilities for financial reporting and is ultimately responsible for reviewing and approving the MD&A. The Board of Directors carries out this responsibility principally through its Audit Committee. The Audit Committee is appointed by the Board of Directors and is comprised of independent directors. The Audit Committee reports its findings to the Board of Directors for its consideration when it approves the MD&A and financial statements for issuance to shareholders.

The following information takes into account all material events that took place up until November 10, 2022, the date on which the Company's Board of Directors approved this MD&A. Unless otherwise indicated, all amounts are presented in Canadian dollars. The Company's functional and reporting currency is the Canadian dollar.

Additional information regarding PyroGenesis is available on the System for Electronic Document Analysis and Retrieval ("SEDAR) at www.sedar.com, the Electronic Data Gathering, Analysis, and Retrieval system ("EDGAR") at www.sec.gov, and on the Company's website at www.pyrogenesis.com.

FORWARD-LOOKING STATEMENTS

This MD&A contains forward-looking statements and forward-looking information (collectively,"forward-looking statements") within the meaning of applicable securities legislation. All statements other than statements of historical fact contained in this MD&A are forward-looking statements, including, without limitation, the Company's statements regarding its products and services; relations with suppliers and clients; future financial position; business strategies; potential acquisitions; potential business partnering; litigation; and plans and objectives. In certain cases, forward-looking statements can be identified by the use of words such as "plans", "expects" or "does not expect", "is expected", "budget", "scheduled", "estimates", "forecasts", "intends", "anticipates" or "does not anticipate", or "believes", or variations of such words and phrases or state that certain actions, events or results "may", "could", "would", "might" or "will be taken", "occur" or "be achieved" and similar words or the negative thereof. Although management of the Company believes that the expectations represented in such forward-looking statements are reasonable, there can be no assurance that such expectations will prove to be correct.

In particular, this MD&A contains forward-looking statements that relate, but are not limited, to:

- the Company's business strategies, strategic objectives and growth strategy;
- the Company's current and future capital resources and the need for additional financing;
- the Company's ability to increase sales, including the results of the successful completion of the Company's current projects;
- management's expectation that the Company will achieve sustained annual growth and profitability, and that gross margins will increase resulting in a decrease in cost of sales as a percentage of revenue; and
- the Company's overall financial performance.

By their nature, forward-looking statements require assumptions and are subject to inherent risks and uncertainties including those discussed herein. In particular, forward-looking statements relating to future sales, growth and profitability are based on the assumption that current projects will be completed, and the Company will be awarded certain anticipated contracts pursuant to recent negotiations with, and statements made by, third parties. There is significant risk that predictions and other forward-looking statements will not prove to be accurate. Readers are cautioned to not place undue reliance on forward-looking statements made herein because a number of factors could cause actual future results, conditions, actions or events to differ materially from the targets, expectations, estimates or intentions expressed in the forward-looking statements.

Many factors could cause the Company's actual results, performance or achievements to be materially different from any future results, performance or achievements that may be expressed or implied by forward-looking statements, including, without limitation, risks and uncertainties relating to: the strength of the Canadian, US and Asian economies; operational, funding, and liquidity risks; unforeseen engineering and environmental problems; delays or inability to obtain required financing and/or anticipated contracts; risks associated with licenses, permits and regulatory approvals; supply interruptions or labour disputes; the impact of the Coronavirus (COVID-19) outbreak on our business and our operations; foreign exchange fluctuations and collection risk; competition from other suppliers, or alternative, less capital intensive, energy solutions; and risk factors described elsewhere under the heading "Risk Factors" in this MD&A and the Annual Information Form, and elsewhere in this MD&A and other filings that the Company has made and may make in the future with applicable securities regulatory authorities. We caution that the foregoing list of factors is not exhaustive, and that, when relying on forward-looking statements to make decisions with respect to the Company, investors and others should carefully consider these factors, as well as other uncertainties and potential events, and the inherent uncertainty of forward-looking statements.

Although the Company has attempted to identify significant factors that could cause actions, events or results to differ materially from those described in forward-looking statements, there may be other factors that cause actions, events or results not to be as anticipated, estimated or intended. There can be no assurance that forward-looking statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Accordingly, readers should not place undue reliance on forward-looking statements. Forward-looking statements are provided as of the date of this MD&A, and the Company assumes no obligation to update or revise such forward-looking statements to reflect new events or circumstances except as required under applicable securities laws.

The forward-looking statements contained herein are expressly qualified in their entirety by this cautionary statement. The forward-looking statements included in this MD&A are made as of the date of this MD&A or such other date specified herein.

BASIS OF PRESENTATION

For reporting purposes, we prepared the 2022 Q3 condensed consolidated interim Financial Statements in accordance with International Financial Reporting Standards ("IFRS") as issued by the International Accounting Standards Board. The financial information contained in this MD&A was derived from the 2021 Consolidated Financial Statements. Unless otherwise indicated, all references to "$" are to Canadian dollars. Unless otherwise indicated, all references to a specific "note" refer to the notes to the 2022 Q3 condensed consolidated interim Financial Statements. Certain totals, subtotals and percentages throughout this MD&A may not reconcile due to rounding.

NON-IFRS MEASURES

This MD&A makes reference to certain non-IFRS measures. These measures are not recognized measures under IFRS and do not have a standardized meaning prescribed by IFRS and are therefore unlikely to be comparable to similar measures presented by other companies. Rather, these measures are provided as additional information to complement those IFRS measures by providing further understanding of our results of operations from management's perspective. Accordingly, these measures should not be considered in isolation nor as a substitute for analysis of our financial information reported under IFRS.

We use non-IFRS measures, including EBITDA, Adjusted EBITDA and Modified EBITDA. EBITDA, Adjusted EBITDA and Modified EBITDA are not considered an alternative to income or loss from operations, or to net earnings or loss, in the context of measuring a company's performance. These non-IFRS measures are used to provide investors with supplemental measures of operating performance and thus highlight trends in our business that may not otherwise be apparent when relying solely on IFRS measures. We also believe that securities analysts, investors and other interested parties frequently use non-IFRS measures in the evaluation of issuers. Our management also uses non-IFRS measures in order to facilitate operating performance comparisons from period to period, to prepare annual operating budgets and forecasts and to determine components of management compensation. Management believes that EBITDA, Adjusted EBITDA and Modified

EBITDA are important measures of operating performance because it allows management, investors and others to evaluate and compare the Company's operating results, including its return on capital and operating efficiencies, from period-to- period by removing the impact of the Company's capital structure consequences, and other non-operating items not requiring cash outlays including the adjustment to the fair value of investments and share-based compensation.

EBITDA

We define EBITDA as Net Earnings before Net Financing Charges, Taxes, Depreciation and Amortization. See "Results of Operations - Reconciliation of Non-IFRS measures (EBITDA, Adjusted EBITDA and Modified EBITDA)".

Adjusted EBITDA

We define Adjusted EBITDA as Net Earnings before Net Financing Charges, Income Taxes, Depreciation, Amortization and other non-cash items including share-based payment costs, inventory and equipment write-offs. See "Results of Operations - Reconciliation of Non-IFRS measures (EBITDA, Adjusted EBITDA and Modified EBITDA)".

Modified EBITDA

We defined Modified EBITDA as Adjusted EBITDA before the change in fair value of strategic investments. See "Results of Operations - Reconciliation of Non-IFRS measures (EBITDA, Adjusted EBITDA and Modified EBITDA)".

OVERVIEW

PyroGenesis Canada Inc. is a leader in the design, development, manufacture and commercialization of advanced plasma processes. We provide engineering and manufacturing expertise, cutting-edge contract research, as well as turnkey process equipment packages to the defense, metallurgical, mining, additive manufacturing (including 3D printing), oil & gas, and environmental industries. With a team of experienced engineers, scientists and technicians working out of our Montreal office and our 40,902 sq. ft. (3,800 m^2) and 31,632 sq. ft. (2,940 m^2) manufacturing facilities, PyroGenesis maintains its competitive advantage by remaining at the forefront of technology development and commercialization. Our core competencies allow PyroGenesis to lead the way in providing innovative plasma torches, plasma waste processes, high- temperature metallurgical processes, and engineering services to the global marketplace. Our operations are ISO 9001:2015 and AS9100D certified, having been ISO certified since 1997. Since our acquisition of Pyro Green-Gas Inc. (formerly AirScience Technologies Inc), we now offer technologies, equipment, and expertise in the area of biogas upgrading, and air pollution control. As a result, we have extended our presence to Italy and India, and this acquisition provides potential synergies with our current land-based waste destruction offerings. Our common shares are listed on the Toronto Stock Exchange (TSX) (Ticker Symbol: PYR), NASDAQ (Ticker Symbol: PYR) and the Frankfurt Stock Exchange (FSX) (Ticker symbol: 8PY).

SELECTED FINANCIAL INFORMATION

	Three months ended September 30, 2022	Three months ended September 30, 2021	% Change 2022 vs 2021	Nine months ended September 30, 2022	Nine months ended September 30, 2021	% Change 2022 vs 2021
Revenues	**$ 5,657,783**	$ 9,317,926	-39%	**$ 15,711,726**	$ 23,863,001	-34%
Cost of sales and services	**1,544,607**	5,265,395	-71%	**8,047,554**	12,733,979	-37%
Gross margin	**4,113,176**	4,052,531	1%	**7,664,172**	11,129,022	-31%
Expenses						
Selling, general and administrative (not including share-based expenses)	**4,979,916**	4,227,937	18%	**14,393,149**	10,402,921	38%
Research and development, net	**290,374**	389,806	-26%	**1,577,370**	1,386,847	14%
Total expenses (not including share-based expenses)	**5,270,290**	4,617,743	14%	**15,970,519**	11,789,768	35%
Net (loss) income from operations (not including share-based expenses)	**(1,157,114)**	(565,212)	105%	**(8,306,347)**	(660,746)	1157%
Share-based expenses	**(931,572)**	(673,194)	38%	**(4,222,242)**	(4,884,219)	-14%
Net (loss) income from operations	**(2,088,686)**	(1,238,406)	69%	**(12,528,589)**	(5,544,965)	126%
Changes in fair market value of strategic investments and financial expenses	**(1,986,171)**	1,862,070	-207%	**(8,627,294)**	(10,480,673)	-18%
Income taxes	**–**	–	100%	**76,095**	–	100%
Net earnings (loss)	**$ (4,074,857)**	$ 623,664	-753%	**$ (21,231,977)**	$ (16,025,638)	32%
Foreign currency translation gain on investments in foreign operations	**21,151**	–	100%	**69,622**	–	100%
Comprehensive income (loss)	**$ (4,053,706)**	623,664	-750%	**$ (21,162,355)**	(16,025,638)	32%
Earnings (loss) per share						
Basic	**$ (0.02)**	$ 0.00		**$ (0.12)**	$ (0.10)	
Diluted	**$ (0.02)**	$ 0.00		**$ (0.12)**	$ (0.10)	
Modified EBITDA [(1)]	**$ (603,878)**	$ (227,001)	166%	**$ (6,654,097)**	$ 102,416	-6597%

1. See "Non-IFRS Measures"

Extract from Statement of Financial Position at:

	September 30, 2022	December 31, 2021
Current assets	**34,260,104**	38,758,984
Non-current assets	**21,112,655**	31,011,693
Total assets	**$ 55,372,759**	$ 69,770,677
Current liabilities	**26,580,731**	24,752,199
Non-current liabilities	**4,267,387**	4,249,724
Total liabilities	**$ 30,848,118**	$ 29,001,923
Shareholders' equity	**$ 24,524,641**	$ 40,768,754

RESULTS OF OPERATIONS

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)

As of November 10, 2022, revenue expected to be recognized in the future related to performance obligations that are unsatisfied (or partially satisfied) is $25,965,367. Revenue will be recognized as the Company satisfies its performance obligations under long-term contracts, which is expected to occur over a maximum period of approximately 3 years.

Cost of Sales and Services

	Three months ended September 30, 2022	Three months ended September 30, 2021	% Change 2022 vs 2021	Nine months ended September 30, 2022	Nine months ended September 30, 2021	% Change 2022 vs 2021
Employee compensation	**$ 949,443**	$ 749,549	27%	**$ 2,653,898**	$ 1,881,417	41%
Subcontracting	**178,066**	61,587	189%	**1,209,482**	662,085	83%
Direct materials	**997,912**	4,387,047	-77%	**3,693,664**	9,753,370	-62%
Manufacturing overhead & other	**221,119**	221,990	0%	**1,105,883**	677,197	63%
Foreign exchange	**(998,263)**	(200,240)	399%	**(1,224,428)**	(261,613)	368%
Investment tax credits	**(22,430)**	(45,871)	-51%	**(47,223)**	(83,369)	-43%
Cost of Sales and Services before Amortization of Intangible Assets	**$ 1,325,847**	$ 5,174,062	-74%	**$ 7,391,276**	$ 12,629,087	-41%
Amortization of intangible assets	**218,760**	91,333	140%	**656,278**	104,892	526%
Total Cost of Sales and Services	**$ 1,544,607**	$ 5,265,395	-70.66%	**$ 8,047,554**	$ 12,733,979	-37%

Gross Margin

	Three months ended September 30, 2022	Three months ended September 30, 2021	Nine months ended September 30, 2022	Nine months ended September 30, 2021
Revenues	**$ 5,657,783**	$ 9,317,926	**$ 15,711,726**	$ 23,863,001
Cost of Sales and Services	**1,544,607**	5,265,395	**8,047,554**	12,733,979
Gross Margin	**$ 4,113,176**	$ 4,052,531	**$ 7,664,172**	$ 11,129,022
Gross Margin %	**73%**	43%	**49%**	47%

Cost of sales and services before amortization of intangible assets is not a performance measure defined under IFRS and it is not considered an alternative to gross margin in the context of measuring the Company's performance. Management believes that providing certain non-GAAP performance measures, in addition to IFRS measures, provides users of the Company's financial statements with an enhanced understanding of its results and related trends, and increases transparency and clarity. Gross margin before amortization of intangible assets is an important measure of operating performance because it allows management, investors and others to evaluate and compare the Company's core operating results, including its return on capital and operating efficiencies, from period to period, by removing the impact of non-operating items not requiring cash outlays. Securities regulations require that companies caution readers that earnings and other measures adjusted to a basis other than IFRS do not have standardized meanings and are unlikely to be comparable to similar measures used by other companies. Accordingly, they should not be considered in isolation or a substitute for financial measures prepared in accordance with IFRS.

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

	Three months ended September 30,		**% Change 2022 vs**	**Nine months ended September 30,**		**% Change 2022 vs**
	2022	2021	**2021**	**2022**	2021	**2021**
Employee compensation	**$ 2,093,785**	$ 1,507,599	39%	**$ 5,635,739**	$ 4,015,651	40%
Professional fees	**1,253,263**	978,465	28%	**3,656,220**	2,886,636	27%
Office and general	**242,357**	218,455	11%	**699,446**	484,129	44%
Travel	**95,605**	63,871	50%	**203,267**	77,013	164%
Depreciation of property and equipment	**155,481**	93,701	66%	**446,883**	254,079	76%
Depreciation of ROU assets	**157,844**	153,177	3%	**479,466**	404,188	19%
Investment tax credits	**(7,500)**	(7,500)	0%	**(22,500)**	(23,479)	-4%
Government grants	**(43,012)**	(26,999)	59%	**(137,523)**	(44,233)	211%
Other expenses	**1,032,093**	1,247,168	-17%	**3,432,150**	2,348,938	46%
Sub-total not including share-based expenses	**$ 4,979,916**	$ 4,227,937	18%	**$14,393,148**	$10,402,922	38%
Share-based expenses	**931,572**	673,194	38%	**4,222,242**	4,884,219	-14%
Total selling, general and administrative	**$ 5,911,488**	$ 4,901,131	21%	**$18,615,390**	$15,287,141	22%

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.

Depreciation on Property and Equipment

	Three months ended September 30, 2022	2021	% Change 2022 vs 2021	Nine months ended September 30, 2022	2021	% Change 2022 vs 2021
Depreciation of property and equipment	**$ 155,481**	$ 93,701	66%	**$ 446,883**	$ 254,079	76%

The depreciation on property and equipment increased to $155,481 in Q3 2022, compared with $93,701 in Q3 2021. The 66% increase is primarily due to higher amounts of property and equipment being depreciated.

Research and Development ("R&D") Costs

	Three months ended September 30, 2022	2021	% Change 2022 vs 2021	Nine months ended September 30, 2022	2021	% Change 2022 vs 2021
Employee compensation	**$ 156,895**	$ 210,037	-25%	**$ 612,578**	$ 591,193	4%
Investment tax credits	**(14,493)**	(49,357)	-71%	**(46,134)**	(73,237)	-37%
Subcontracting	**7,410**	34,419	-78%	**91,437**	120,710	-24%
Materials and equipment	**129,926**	193,834	-33%	**744,920**	775,474	-4%
Other expenses	**10,636**	4,823	121%	**174,569**	106,167	64%
Sub-total before government grants	**$ 290,374**	$ 393,756	-26%	**$ 1,577,370**	$ 1,520,307	4%
Government grants	**–**	(3,950)	-100%	**–**	(133,460)	-100%
Total net R&D expenses	**$ 290,374**	$ 389,806	-26%	**$ 1,577,370**	$ 1,386,847	14%

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

	Three months ended September 30, 2022	2021	% Change 2022 vs 2021	Nine months ended September 30 2022	2021	% Change 2022 vs 2021
Financial expenses						
Interest on term loans	**1,435**	3,100	-54%	**3,038**	12,538	-76%
Interest on lease liabilities	**94,732**	84,586	12%	**284,190**	221,514	28%
Interest accretion on balance due on business combination	**43,222**	–	100%	**170,310**	–	100%
Penalties and other interest expenses	**83,404**	3,868	2056%	**144,181**	15,004	861%
	222,793	91,554	143%	**601,719**	249,056	142%
Financial income						
Accretion interest on royalties receivable	**(39,099)**	(84,762)	-54%	**(78,012)**	(149,091)	-48%
Financial expenses	**$ 183,694**	$ 6,792	2,605%	**$ 523,707**	$ 99,965	424%

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

	Three months ended September 30, 2022	2021	% Change 2022 vs 2021	Nine months ended September 30, 2022	2021	% Change 2022 vs 2021
Changes to fair value of strategic investments	**$ (1,802,477)**	$ 1,868,862	-196%	**$ (8,103,587)**	$ (10,380,709)	22%

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

	Three months ended September 30, 2022	2021	% Change 2022 vs 2021	Nine months ended September 30, 2022	2021	% Change 2022 vs 2021
Comprehensive (loss) income	**$ (4,053,706)**	$ 623,664	-750%	**$ (21,162,355)**	$ (16,025,638)	32%

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.

Reconciliation of Non-IFRS measures (EBITDA, Adjusted and Modified)

	Three months ended September 30,		% Change 2022 vs	Nine months ended September 30,		% Change 2022 vs
	2022	2021	**2021**	**2022**	2021	**2021**
Comprehensive income (loss)	**$ (4,053,706)**	$ 623,664	-750%	**$ (21,162,355)**	$ (16,025,638)	32%
Depreciation of property and equipment	**155,481**	93,701	66%	**446,883**	254,079	76%
Depreciation of ROU assets	**157,844**	153,177	3%	**479,466**	404,188	19%
Amortization of intangible assets	**218,760**	91,333	140%	**656,278**	104,892	526%
Financial expenses	**183,694**	6,792	2605%	**523,707**	99,965	424%
Income taxes	**–**	–	0%	**76,095**	–	100%
EBITDA	**$ (3,337,927)**	$ 968,667	-445%	**$ (18,979,926)**	$ (15,162,514)	25%
Other non-cash items:						
Share-based expenses	**931,572**	673,194	38%	**4,222,242**	4,884,219	-14%
Adjusted EBITDA	**$ (2,406,355)**	$ 1,641,861	-247%	**$ (14,757,684)**	$ (10,278,295)	44%
Change in fair value of strategic investments	**1,802,477**	(1,868,862)	196%	**8,103,587**	10,380,709	22%
Modified EBITDA (1)	**$ (603,878)**	$ (227,001)	166%	**$ (6,654,097)**	$ 102,416	-6597%

¹ See "Non-IFRS Measures"

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.

	2022			2021				2020
	Q3	Q2	Q1	Q4	Q3	Q2	Q1	Q4
Revenues	**5,657,783**	5,847,180	4,206,762	7,205,349	9,317,926	8,280,572	6,264,503	6,778,240
Gross margin	**4,113,176**	2,499,273	1,051,723	1,302,789	4,052,531	4,933,481	2,143,010	3,236,136
Gross margin %	**72.70%**	42.70%	25.00%	18%	44%	60%	34%	48%
Comprehensive income (loss)	**(4,053,706)**	(13,039,531)	(4,069,119)	(22,402,857)	623,664	(20,362,205)	3,712,903	22,971,415
Earnings (loss) per share								
Basic	**(0.02)**	(0.08)	(0.02)	(0.13)	-	(0.12)	0.02	0.15
Diluted	**(0.02)**	(0.08)	(0.02)	(0.13)	-	(0.11)	0.02	0.15

The majority of PyroGenesis' revenue is recognised over the time of the contract and is dependent on the timing of project initiation and execution, including project engineering, manufacturing, and testing.

LIQUIDITY AND CAPITAL RESOURCES

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.

	Carrying value	Total contractual amount	< 1 year	2-3 years	4-5 years	Over 5 years
	$	$	$	$	$	$
Bank indebtedness	713,046	713,046	713,046	-	-	
Accounts payable and accrued liabilities	12,655,409	12,655,409	12,655,409	-	-	-
Term loans	390,287	529,237	35,893	194,116	180,000	119,228
Balance due on business combination	3,904,735	4,137,820	3,048,920	1,088,900	-	-
Lease liabilities	5,629,237	10,600,618	3,342,450	1,831,758	3,477,088	1,949,322
	23,292,714	**28,636,130**	**19,795,718**	**3,114,774**	**3,657,088**	**2,068,550**

SUMMARY OF CASH FLOWS

	Three months ended September 30,		Nine months ended September 30,	
	2022	2021	**2022**	2021
Cash provided by (used in) operating activities	**$ 587,083**	$ (2,432,493)	**$ (9,902,661)**	$ (16,349,944)
Cash provided by (used in) investing activities	**649,625**	(424,994)	**(256,722)**	1,423,599
Cash provided by (used in) financing activities	**(184,148)**	562,476	**294,691**	12,602,974
Effect of exchange rate changes on cash denominated in foreign currency	**20,793**	–	**27,040**	–
Increase (decrease) in cash	**1,073,353**	(2,295,011)	**(9,837,652)**	(2,323,371)
Cash and cash equivalents - end of period	**2,364,861**	15,781,528	**2,364,861**	15,781,528

During the three months ended September 30, 2022, cash flows provided by operating activities was $587,083 compared to cash flows used of $2,432,492 for the same period in the prior year. The use of cash by operating activities during Q3, 2022 consists of the net loss of $4,074,857 (2021 – net earnings of $623,664) less adjustments for operating activities of $3,572,778 (2021 – increase of $731,966), plus a net change in non-cash operating working capital items of $587,083 (2021 – negative change of $2,432,493).

Investing activities resulted in an inflow of cash of $649,625 in Q3 2022, compared to a use of cash of $424,994 for the same period in the prior year, mainly resulting from the disposal of strategic investments.

Financing activities in Q3, 2022 resulted in a use of funds of $184,148, compared with generated funds of $562,476 for the same period in 2021. In Q3, 2022 the cash used for such Financing activities included the decrease in bank indebtedness of $228,134. In Q3, 2022, the Company also made payment of leases liabilities of $464,138, (compared to $80,198 in Q3, 2021) and received proceeds of $696,000 from the issuance of shares upon exercise of stock options, (compared to $683,323 in Q3, 2021). Interest paid was $179,572 in Q3 2022 compared to $37,571 in Q3 2021.

The net cash position of the Company increased by $1,073,353 for Q3, 2022 compared to a decrease of $2,295,011 for Q3, 2021.

CAPITAL STOCK INFORMATION

The authorized share capital of the Company consists of an unlimited number of common shares (the "Common Shares"). On November 10, 2022, PyroGenesis had 173,540,395 Common shares, 1,014,600 share purchase warrants, 8,238,000 outstanding stock options issued, and 5,748,000 exercisable options issued.

GOING CONCERN

The Company presumes it will be able to realize its assets and discharge its liabilities in the normal course of business for the foreseeable future. The Company's management has reviewed the Company's projected cash flow and backlog and is of the opinion that the Company has sufficient cash and cash equivalents and will generate cash flow inflow and profits from operations and strategic investments to meet current and future cash requirements. Management expects that the investments currently being made in accelerating projects under development for various clients, together with executing on its $26M backlog as of November 10, 2022, which is primarily related to the Company's successful diversification into niche markets of the additive manufacturing (including 3D printing), and metals & mining industries, and projects related to biogas upgrading, will continue to improve the Company's cash position.

The 2021 consolidated Financial Statements have been prepared using IFRS as issued by the IASB applicable to a going concern, which contemplates the realization of assets and settlement of liabilities in the normal course of business as they become due. If the going concern assumption were not appropriate for these consolidated financial statements, then adjustments would be necessary to the carrying value of assets and liabilities, the reported expenses and the statements of financial position classifications used. The impact on the consolidated financial statements could be material.

RELATED PARTY TRANSACTIONS

During the three-month and nine-month period ended September 30, 2022, the Company concluded the following transactions with related parties:

In January 2020, the Company entered into a lease agreement for the rental of a property with a trust whose beneficiary is the controlling shareholder and CEO of the Company. At September 30, 2022 the carrying amount of the ROU asset and lease liabilities are $849,034 and $929,488 ($1,107,131 and $Nil, respectively, at December 31, 2021).

Rent and property taxes were charged by a trust whose beneficiary is the controlling shareholder and CEO of the Company, for the three-and nine-month periods ended September 30, 2022, amount to $69,054 and $208,334 respectively, compared to $68,825 and $206,310 for the three-and nine-month periods ended September 30, 2021, respectively.

A balance due to the controlling shareholder and CEO of the Company amounted to $136,355 ($144,506 at December 31, 2021) and is included in accounts payable and accrued liabilities.

The Key Management Personnel of the Company, in accordance with IAS 24, are the members of the Board of Directors and certain officers. Total compensation to key management, for the three-month periods, consisted of the following:

	2022	2021	**2022**	2021
	$	$	**$**	$
Salaries – key management	**270,532**	253,805	**844,374**	714,019
Pension contributions	**4,961**	4,634	**15,641**	13,042
Fees – Board of Directors	**45,700**	72,400	**134,700**	147,400
Share - based compensation - officers	**958,519**	264,736	**1,771,433**	2,057,061
Share – based compensation – Board of Directors	221,197	251,467	1,979,410	1,963,317
Other benefits – key management	**7,897**	122,867	**21,935**	176,219
Total compensation	**1,508,806**	969,909	**4,767,493**	5,071,058

SUBSEQUENT EVENTS

On October 19, 2022, the Company announced that it had completed a non-brokered Private Placement consisting of the issuance and sale of 1,014,600 units of the Company (the "Units") at a price of $1.30 per Unit, for gross proceeds of $1,318,980 to the Company. Each Unit consists of one Common Share of the Company and one Common Share Purchase Warrant. Each Warrant entitles the holder thereof to purchase one Common Share at a price of $1.75 until October 19, 2024. The Common Shares and Warrants issued in connection with the Private Placement, and the Common Shares underlying the Warrants, are subject to a statutory hold period of four months and one day from the date of the closing, in accordance with applicable securities legislation.

CRITICAL ACCOUNTING ESTIMATES, NEW AND FUTURE ACCOUNTING POLICIES AND FINANCIAL INSTRUMENTS

For a discussion of significant accounting policies, judgements, estimates assumptions and financial instruments, please refer to notes 3, 4 and 28 of the 2021 consolidated Financial Statements.

CONTROLS AND PROCEDURES

In the years prior to, and most of 2020, the Company's shares traded on the TSX Venture Exchange ("TSXV"), and all requirements of the TSXV were attainted by the Company. The Company graduated from the TSXV to the Toronto Stock Exchange ("TSX") on November 20, 2020, and subsequently became listed on the NASDAQ on March 11, 2021. It was recognized by the Company that being listed on the TSX, and NASDAQ would require more stringent disclosure controls, and started implementing such before the NASDAQ listing.

When listed on the TSXV, management was not required to assess disclosure controls and procedures ("DC&P") and internal control over financial reporting ("ICFR"). As a result of the graduation to the TSX and NASDAQ, the Company became subject to additional requirements under applicable securities laws relating to the establishment and maintenance of DC&P and ICFR, as defined in NI 52-109 and the applicable rules of the U.S. Securities and Exchange Commission. Such requirements also include the evaluation of both DC&P and ICFR. Consequently, the Company took and continues to take a number of actions to improve its DC&P and ICFR. The Company is currently implementing measures designed to improve its ICFR environment and remediate the control deficiencies that led to the material weaknesses identified below.

In accordance with the provisions of National Instrument 52-109 – Issuers' annual and interim filings ("NI 52-109") adopted by Canadian securities regulators and in Rule 13a-15(e) and 15d-15(e) under the U.S. Securities Exchange Act of 1934, as amended (the "Exchange Act"), the Company has filed certificates signed by the Chief Executive Officer ("CEO") and Chief Financial Officer ("CFO") that report on, among other items, i) their responsibility for establishing and maintaining DC&P and ICFR for the Company, ii) the design of DC&P and the design of ICFR.

Disclosure controls and procedures

The Company under the supervision of the CEO and CFO, have designed DC&P (as defined in NI-52-109 and Rule 13a- 15(e) and 15d-15(e) under the Exchange Act), in order to provide reasonable assurance that:

- material information relating to the Company is made known to the CEO and CFO by others; and
- information required to be disclosed by the Company in its filings, under applicable securities legislation is recorded, processed, summarized and reported within the time periods specified in securities legislation.

As of September 30, 2022, an evaluation was carried out under the supervision of the CEO and CFO, of the design of the Company's disclosure controls and procedures. Based on this evaluation, the CEO and CFO concluded that due to the material weaknesses in our ICFR as described below, and in Management's Annual Report on Internal Controls over Financial Reporting, at December 31, 2021, the Company's DC&P were not effective as of September 30, 2022, as the controls have not yet been adequately remediated.

Management's Annual Report on Internal Controls over Financial Reporting

The Company under the supervision of the CEO and CFO, are responsible to design ICFR (as defined in NI-52-109 and Rules 13a-15(f) and 15d-15(f) under the Exchange Act) in order to provide reasonable assurance regarding the reliability of financial reporting and the preparation of consolidated financial statements for external purposes in accordance with IFRS as issued by the IASB.

As of December 31, 2021, an evaluation was carried out, under the supervision of the CEO and the CFO, of the effectiveness of the Company's ICFR. Based on this evaluation, the CEO and the CFO concluded that material weaknesses exist, as described below, and due to these material weaknesses, the Company's ICFR is not effective as of December 31, 2021. The control framework used to design and evaluate effectiveness of the Company's ICFR is established under the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) on Internal Control – Integrated Framework (2013 framework). A material weakness is a deficiency, or combination of deficiencies, in ICFR, such that there is a reasonable possibility that a material misstatement of the Company's annual or interim consolidated financial statements will not be prevented or detected on a timely basis.

In connection with the Company's evaluation of ICFR, the following control deficiencies were considered to be material weaknesses:

- **Control environment:** The Company did not maintain an effective control environment and has identified deficiencies relating to: (i) appropriate organizational structure, reporting lines, and authority and responsibilities, including our Board of Directors' and Audit Committee's oversight and governance of external financial reporting and related party transactions, (ii) lack of senior financial reporting resources for a portion of the year, to deal with complex accounting matters and perform management review controls over period-end consolidated financial statements. The Company did not have a sufficient number of trained resources with the appropriate skills and knowledge with assigned responsibilities and accountability for the design and operation of ICFR; and (iii) holding individuals accountable for their internal control related responsibilities.

- **Control activities:** The Company did not fully design and implement effective control activities and has identified deficiencies relating to: (i) selecting and developing control activities that contribute to the mitigation of risks to acceptable levels, and (ii) deploying control activities through policies that establish what is expected and procedures that put policies into action. For example, control activities related to documentation and consistency in accounting for intangible assets internally generated and revenue recognition were deficient.

- **Journal Entries:** The Company did not effectively design and maintain appropriate segregation of duties and controls over the effective preparation, review and approval, and associated documentation of journal entries, across its ERP platform. The Company did not have adequate review procedures for the recording of manual entries.

- **Complex Spreadsheet Controls:** The Company did not implement and maintain effective controls surrounding certain complex spreadsheets, including addressing all identified risks associated with manual data entry, completeness of data entry, and the accuracy of mathematical formulas, impacting complex spreadsheets used in fixed asset continuity schedules, production and revenue forecasting, and the calculation of the fair value of investments

- **User Access Controls:** The Company did not maintain effective user access controls to adequately restrict user access to financial applications and related data in accordance with job responsibilities. Management did not perform appropriate user access reviews, including superuser access.

As a consequence, the Company did not have effective control activities related to the design, implementation and operation of process-level and management review control activities related to order-to-cash (including revenue trade receivables, and billings in excess of cost/cost in excess of billings), procure-to-pay (including operating expenses, prepaid expenses, accounts payable, and accrued liabilities), hire-to-pay (including compensation expense and accrued liabilities), long-lived assets, significant unusual transactions, related party transactions and other financial reporting processes.

Aside from these material weaknesses, management has concluded that the Company's audited consolidated financial statements for the year ended December 31, 2021, present fairly in all material respects, the Company's financial position, results of operations, changes in shareholders' equity and cash flows in accordance with IFRS as issued by the IASB. These material weaknesses did not have an impact on the Company's financial reporting and as a result, there were no material adjustments to the Company's audited consolidated financial statements for the year ended December 31, 2021. In addition, there were no changes to previously released financial results. However, because the deficiencies and material weaknesses create a reasonable possibility that a material misstatement to our consolidated financial statements would not be prevented or detected on a timely basis, the CEO and CFO concluded that as of December 31, 2021, the Company's design of ICFR were not effective.

Management's Remediation Measures

During the three-month and nine-month periods ended September 30, 2022, management continued to implement remediation measures outlined in the 2021 MD&A. Management has performed an initial risk assessment using a top-down, risk-based approach with respect to the risks of material misstatement of the consolidated financial statements. In addition, compensating controls have been applied to the areas where the risks of material misstatement are considered moderate to high. The Company is using and plans to continue to use outside resources to strengthen the business process documentation and help with management's self-assessment and testing of internal controls.

Management, with oversight of the Audit Committee, continue to implement remediation plans for the aforementioned material weaknesses in ICFR and DC&P as follows:

- Continue to establish and improve an appropriate organizational structure and policies that the Board of Directors and Audit Committee will enforce to ensure proper oversight and governance of the external financial reporting process and related party transactions. Awareness by the Audit Committee and support over financial reporting matters has been improved.

- Train, and retain individuals with appropriate skills and experience, assign responsibilities and hold individuals accountable for their roles related to ICFR. During the latter part of 2021, a new CFO was retained with the appropriate skills and knowledge to deal with complex accounting matters and perform management review controls over period-end consolidated financial statements as well as skills and knowledge of ICFR which has contributed to mitigating to a certain extent the severity of this control deficiency.

- Design and implement a risk assessment process to identify and assess risks of material misstatement and ensure that the impacted financial reporting processes and related internal controls are properly designed and in place to respond to those risks in our financial reporting; as a result, additional compensating internal controls were implemented in order to address and mitigate such risks, and

- Enhance the design of existing control activities and implement additional process-level control activities (including controls over the order-to-cash, procure-to-pay, hire-to-pay, long-lived assets, inventory, significant unusual transactions, related party transactions and other financial reporting processes) and ensure they are properly evidenced and operating effectively. A firm has been engaged to assist in establishing, testing, and documenting internal controls and to validate their effectiveness. The Company is focused on the remediation of the material weaknesses and aims to complete the majority of the improvements during fiscal 2023. Such improvements will be done in conjunction with the implementation of an updated ERP system. The remediation process includes improvements to the design and effectiveness of controls, in connection with a thorough ICFR program.

Although the Company can give no assurance that these actions will remediate these material weaknesses in internal controls or that additional material weaknesses in our ICFR will not be identified in the future, management believes the foregoing efforts will, when implemented, strengthen our ICFR and DC&P and effectively remediate the identified material weaknesses.

Management will take additional remedial actions as necessary as they continue to evaluate and work to improve the Company's ICFR environment.

Changes in internal controls over financial reporting

Other than the material weaknesses described above, and the remediation process described above, there were no changes to the Company's ICFR during the three-month and nine-month periods ended September 30, 2022, that have materially affected, or are reasonably likely to materially affect, the Company's ICFR.

Limitations on Effectiveness of Disclosure Controls and Procedures and Internal Control over Financial Reporting

The Company's management recognizes that any disclosure controls and procedures and internal control over financial reporting, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives. Because of their inherent limitations, disclosure controls and procedures and internal control over financial reporting may not prevent or detect all errors or misstatements on a timely basis.

RISK FACTORS

The Company has identified below certain significant risks relating to the business of the Company and the industry in which it operates. The following information is only a summary of certain risk factors and is qualified in its entirety by reference to, and must be read in conjunction with, the detailed information appearing elsewhere in this MD&A. These risks and uncertainties are not the only ones facing the Company. Additional risks and uncertainties not currently known to the Company, or that the Company currently considers immaterial, may also impair the operations of the Company. If any such risks materialize into actual events or circumstances, the Company's assets, liabilities, financial condition, results of operations (including future results of operations), business and business prospects, are likely to be materially and adversely affected. There is no assurance that risk management steps taken will avoid future loss due to the uncertainties described below or other unforeseen risks. An investment in the Common Shares or other securities of the Company is highly speculative and involves a high degree of risk. Before making any investment decision, prospective investors should carefully consider all the information contained in this document including, in particular, the risk factors described below.

Certain factors may have a material adverse effect on the Company's business, financial condition and results of operations. Current and prospective investors should carefully consider the risks and uncertainties and other information contained in this MD&A, the 2021 Financial Statements and the Annual Information Form, particularly under the heading "Risk Factors" in the Annual Information Form, and in other filings that the Company has made and may make in the future with applicable securities authorities, Company's website at www.pyrogenesis.com. The risks and uncertainties described herein and therein are not the only ones the Company may face. Additional risks and uncertainties that the Company is unaware of, or that the Company currently believes are not material, may also become important factors that could adversely affect the Company's business. If any of such risks actually occur, the Company's business, financial condition, results of operations, and future prospects could be materially and adversely affected. In that event, the trading price of the Common Shares (or the value of any other securities of the Company) could decline, and the Company's securityholders could lose part or all of their investment.

Risks Related to the Company's Business and Industry

Operating Income (Loss) and Negative Operating Cash Flow

Prior to December 31, 2021, the Company had a history of losses and negative cash flows. For the year ended December 31, 2021, the Company has net losses of $38,431,939, cash flows used in operations of $18,113,432, and an accumulated deficit of $61,217,831. To the extent that the Company has net losses and negative operating cash flow in future periods, it may need to allocate a portion of its cash reserves to fund such negative cash flow. The Company may also be required to raise additional funds through the issuance of equity or debt securities. There can be no assurance that the Company will be able to generate a positive cash flow from its operations, that additional capital or other types of financing will be available when needed or that these financings will be on terms favourable to the Company.

The Company's ability to continue as a going concern is dependent upon its ability in the future to grow its revenue, achieve profitable operations, successfully developing and introducing new products and, in the meantime, to obtain the necessary financing to meet its obligations and repay its liabilities when they become due. While the Company has been successful in securing financing in the past, raising additional funds is dependent on a number of factors outside the Company's control, and as such there is no assurance that it will be able to do so in the future. External financing, predominantly by the issuance of equity and debt, might be, sought to finance the operations of the Company; however, there can be no certainty that such funds will be available at terms acceptable to the Company, or at all. If the Company is unable to obtain sufficient additional financing, it may have to curtail operations and development activities, any of which could harm the business, financial condition and results of operations.

Actual Financial Position and Results of Operations May Differ Materially from the Expectations of the Company's Management

The Company's actual financial position and results of operations may differ materially from management's expectations. The Company has experienced some changes in its operating plans and certain delays in the timing of its plans. As a result, the Company's revenue, net income and cash flow may differ materially from the Company's projected revenue, net income and cash flow. The process for estimating the Company's revenue, net income and cash flow requires the use of judgment in determining the appropriate assumptions and estimates. These estimates and assumptions may be revised as additional information becomes available and as additional analyses are performed. In addition, the assumptions used in planning may not prove to be accurate, and other factors may affect the Company's financial condition or results of operations.

Revenue Risks

PyroGenesis may experience delays in achieving revenues, particularly with plasma gasification projects which have a long sales cycle. Revenues may be delayed or negatively impacted by issues encountered by the Company or its clients including:

(i) unforeseen engineering and/or environmental problems;

(ii) delays or inability to obtain required financing, licenses, permits and/or regulatory approvals;

(iii) supply interruptions and/or labour disputes;

(iv) foreign exchange fluctuations and/or collection risk; and

(v) competition from other suppliers and/or alternative energy solutions that are less capital intensive.

There is no assurance that the business will perform as expected or that returns from the business will support the expenditures needed to develop it.

Concentration Risk and Credit Risk

To date, a small number of customers have accounted for a majority of PyroGenesis' revenues. As its business expands, the Company expects that revenue distribution will be over a larger number of different customers. For the three months ending September 30, 2022, sales of PyroGenesis to one principal customer accounted for approximately 70% of its total revenue. For the three months ending September 30, 2021, sales to three principal customers accounted for approximately 57% of PyroGenesis' total revenue. The loss of, or a reduction in, purchase orders or anticipated purchase orders from PyroGenesis' principal customers could have a material adverse effect on its business, financial condition and results of operations. Additionally, if one of PyroGenesis' customers is unable to meet its commitments to PyroGenesis, the Company's business, financial condition and results of operations could be adversely affected.

As a result of the Drosrite International Exclusive Agreement and the Dross Processing Service Agreement, the Company generates significant revenues from payments made to Drosrite International under the Dross Processing Service Agreement. The Company will no longer receive payments under such arrangement if the Dross Processing Service Agreement, which involves a third party in a foreign jurisdiction, is terminated, which could have a material adverse effect on the business, financial condition and results of operations of the Company.

Credit risk is the risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation. The maximum credit risk to which the Company is exposed on September 30, 2022, represents the carrying amount of cash and cash equivalents, trade accounts receivable, deposits and royalties receivable. Cash and cash equivalents, which comprise guaranteed investment certificates, are held with major reputable financial institutions. The Company manages its credit risk by performing credit assessments of its customers and does not generally require collateral or other security from customers on accounts receivable. The Company believes that there is no unusual exposure associated with the collection of these receivables and mitigates the risk by monitoring factors such as the current economic conditions, forward-looking macroeconomic data and historical information (collection history). On September 30, 2022, the Company's major credit risk exposure is a result or two customers which represent 79% of trade accounts receivable with amounts owing to the Company of $16.2 million.

Technology Development and Manufacturing Capability Risks

PyroGenesis recently expanded into new areas of business and, as a result, many of the Company's products are at various stages of the development cycle. The Company may be unable to commercialise such products, or it may be unable to manufacture such products in a commercially viable manner. Whilst management is confident in both its technology and in its team of experienced engineers, scientists and technicians, it cannot know with certainty, which of its products will be commercialised, when such products will be commercialised, or whether such products will be able to be manufactured and distributed profitably.

Product Revenues/History of Losses

PyroGenesis has incurred losses in the majority of years since its inception. In the past the Company's operations have not generated sufficient earnings and cash flows to date to result in consistent profitability or positive cash flow. For the three months ending September 30, 2022, the Company has net losses of $4,074,857, which includes a loss from the change in value of strategic investment of $1,802,477 and cash flows generated in operations of $587,083. There can be no assurance that the Company will be able to continue to generate significant gains from the value of its strategic investments in the future.

Additional financing and dilution

PyroGenesis may require additional financing. There can be no assurance that additional financing will be available to the Company when needed, or on terms acceptable to the Company. PyroGenesis' inability to raise financing to support ongoing operations or to fund capital expenditures could limit the Company's growth and may have a material adverse effect upon the Company.

The Company does not exclude raising additional funds by equity financing. In addition, as of September 30, 2022, 9,438,000 stock options are currently issued and outstanding. The exercise of stock options and/or warrants, as well as any new equity financings, represents dilution factors for present and future shareholders.

Reliance on Third Party Suppliers, Service Providers, Distributors and Manufacturers

The Company's direct and indirect suppliers, service providers, distributors and manufacturers may elect, at any time, to breach or otherwise cease to participate in supply, service, distribution or manufacturing agreements, or other relationships, on which the Company's operations rely. Loss of its suppliers, service providers, distributors and manufacturers could have a material adverse effect on the Company's business and operational results. Further, any disruption in the manufacturing process done by third party manufacturers could have a material adverse effect on the business, financial condition and results of operations of the Company. The Company cannot ensure that alternative production capacity would be available in the event of a disruption, or if it would be available, it could be obtained on favorable terms.

Manufacturing Facility

The vast majority of the Company's products are manufactured in its manufacturing facility located in Montreal, Quebec. Accordingly, the Company is highly dependent on the uninterrupted and efficient operation of its manufacturing facility. If for any reason the Company is required to discontinue production at its facility, it could result in significant delays in production of the Company's products and interruption of the Company's sales as it seeks to resume production. The Company may be unable to resume production on a timely basis. If operations at the facility were to be disrupted as a result of equipment failures, natural disasters, fires, accidents, work stoppages, power outages or other reasons, the Company's business, financial condition and/or results of operations could be materially adversely affected.

Sales Cycle and Fixed Price Contracts

PyroGenesis sales cycle is long and the signing of new contracts is subject to delay, over which the Company has little control. The Company also enters into sales contracts with fixed pricing, which may be impacted by changes over the period of implementation. There is no assurance that delays or problems in fulfilling contracts with clients will not adversely affect the Company's activities, operating results or financial position.

Reliance on Technology

PyroGenesis will depend upon continuous improvements in technology to meet client demands in respect of performance and cost, and to explore additional business opportunities. There can be no assurance that the Company will be successful in its efforts in this regard or that it will have the resources available to meet this demand. Whilst management anticipates that the research and development will allow the Company to explore additional business opportunities, there is no guarantee that such business opportunities will be presented or realized. The commercial advantage of the Company will depend to a significant extent on the intellectual property and proprietary technology of PyroGenesis and the ability of the Company to prevent others from copying such proprietary technologies. PyroGenesis currently relies on intellectual property rights and other contractual or proprietary rights, including (without limitation) copyright, trade secrets, confidential procedures, contractual provisions, licenses and patents, to protect its proprietary technology. PyroGenesis may have to engage in litigation in order to protect its patents or other intellectual property rights, or to determine the validity or scope of the proprietary rights of others. This type of litigation can be expensive and time consuming, regardless of whether or not the Company is successful. PyroGenesis may seek patents or other similar protections in respect of particular technology; however, there can be no assurance that any future patent applications will actually result in issued patents, or that, even if patents are issued, they will be of sufficient scope or strength to provide meaningful protection or any commercial advantage to the Company. Moreover, the process of seeking patent protection can itself be long and expensive. In the meantime, competitors may develop technologies that are similar or superior to PyroGenesis' technology or design around the patents owned by the Company, thereby adversely affecting the Company's competitive advantage in one or more of its areas of business. Despite the efforts of the Company, its intellectual property rights may be invalidated, circumvented, challenged, infringed or required to be licensed to others. It cannot be assured that any steps the Company may take to protect its intellectual property rights and other rights to such proprietary technologies that are central to the Company's operations will prevent misappropriation or infringement of its technology.

Changes to Contracts

PyroGenesis is dependent upon its ability to establish and develop new relationships and to build on existing relationships with current clients. The Company cannot provide assurance that it will be successful in maintaining or advancing its relationships with current clients or procure additional clients. In addition, PyroGenesis cannot provide assurance that its customers and the end users of its products will continue to provide the Company with business, or that existing customers and end users will not seek to renegotiate or terminate existing contracts providing for the sale of the Company's products and technology based on circumstances on which the Company is not currently aware. Any termination or amendment of a contract under which the Company derives an important portion of its revenues, including the Drosrite International Exclusive Agreement and the Dross Processing Service Agreement, and any adverse change in the relationship of the Company with its customers and end users, will have an adverse effect on the Company's business, financial condition and results of operations.

Sales to governments and governmental entities are subject to specific additional risks, such as delays in funding, termination of contracts or sub-contracts at the convenience of the government, termination, reduction or modification of contracts or sub-contracts in the event of changes in the government's policies or as a result of budgetary constraints and increased or unexpected costs resulting in losses or reduced profits under fixed price contracts.

Foreign Exchange Exposure

PyroGenesis' products and services are increasingly being sold in markets outside of Canada, whilst most of its operating expenses and capital expenditures are denominated in Canadian dollars. As a result, the Company is exposed to fluctuations in the foreign exchange rates between Canadian dollar and the currency in which a particular sale is transacted, which may result in foreign exchange losses that could affect earnings. Foreign sales are predominantly denominated in U.S. dollars. The Company has not to date sought to hedge the risks associated with fluctuations in foreign exchange rates.

Competition

The industry is competitive and PyroGenesis competes with a substantial number of companies which have greater technical and financial resources. There can be no assurance that such competitors will not substantially increase the resources devoted to the development and marketing of products and services that compete with those of the Company or that new or existing competitors will not enter the various markets in which PyroGenesis is active. There can be no assurance that competitors will not develop new and unknown technologies with which the Company may have difficulty competing. Furthermore, failure to remain cost competitive may result in PyroGenesis losing business to its competitors.

The plasma technology of PyroGenesis competes against other plasma and conventional technologies. Without limitation, the demand for the plasma technology of PyroGenesis, particularly in waste destruction and waste-to-energy systems, can be impacted by the commodity prices of the energy source used for the process and the price at which waste is accepted by landfills and traditional waste processing plants. While the Company believes that demand for sustainable waste management practices that have lower environmental impacts than traditional solutions such as landfill or incineration is increasing, the high flows of electricity necessary to operate the waste destruction and waste-to-energy systems of PyroGenesis have an impact on the operational costs of the Company's systems, and traditional solutions may constitute lower-cost solutions, particularly if commodity prices (including of oil and natural gas) remain low or experience a decline.

Management and Key Personnel

PyroGenesis depends on the skills and experience of its management team and other key employees. The Company relies heavily on its ability to attract and retain highly skilled personnel in a competitive environment. PyroGenesis may be unable to recruit, retain, and motivate highly skilled employees in order to assist the Company's business, especially activities that are essential to the success of the Company. Failure to recruit and retain highly-skilled employees may adversely affect PyroGenesis' business, financial condition and results of operations.

Implementation of a strategic plan

PyroGenesis' commercial strategy aims to leverage its products, consumables, and services whilst focusing on the resolution of problems within niche markets within the industries served by the Company. There can be no assurances as to the success of the Company's strategic plan, which should be considered under the risks perspective and difficulties frequently encountered by a developing business.

Adverse Decisions of Sovereign Governments

PyroGenesis conducts an increasing portion of its business internationally. There is no assurance that any sovereign government, including Canada's, will not establish laws or regulations that will not be detrimental to the Company's interests or that, as a foreign corporation, it will continue to have access to the regulatory agencies in other countries. Governments have, from time to time, established foreign exchange controls, which could have a material adverse effect on the Company's business, financial condition and results of operations.

Risks Related to International Operations

A substantial portion of the Company's sales are made to customers and end users outside Canada. The Company conducts its international operations directly or through distributors or other agents or intermediaries, including Drosrite International. The Company plans to continue to expand its international sales and marketing efforts. International operations are subject to a number of inherent risks, and the Company's future results could be adversely affected by a number of factors, including:

- unfavorable political or economic environments; requirements or preferences for domestic products or solutions, which could reduce demand for the Company's products;
- differing existing or future regulatory and certification requirements;
- unexpected legal or regulatory changes;
- greater difficulty in collecting accounts receivable and longer collection periods;
- difficulties in enforcing contracts; an inability to effectively protect intellectual property;
- tariffs and trade barriers, export regulations and other regulatory and contractual limitations on the Company's ability to sell its products; and
- potentially adverse tax consequences, including multiple and possibly overlapping tax structures.

Fluctuations in currency exchange rates could materially adversely affect sales denominated in currencies other than the Canadian dollar and cause a reduction in revenues derived from sales in a particular country. Financial instability in foreign markets could also affect the sale of the Company's products in international jurisdictions. In addition, the Company may be denied access to its end customers as a result of a closing of the borders of the countries in which it its products are sold due to economic, legislative, political and military conditions in such countries.

There can be no assurance that such factors will not materially adversely affect the operations, growth prospects and sales of the Company and, consequently, its results of operations. In addition, revenues the Company earns in other jurisdictions may be subject to taxation by more than one jurisdiction, which could materially adversely affect the Company's earnings. Each of these factors could have an adverse effect on the Company's business, financial condition and results of operations.

Governmental Regulation

PyroGenesis is subject to a variety of federal, provincial, state, local and international laws and regulations relating namely to the environment, health and safety, export controls, currency exchange, labour and employment and taxation. These laws and regulations are complex, change frequently and have tended to become more stringent over time. Failure to comply with these laws and regulations may result in a variety of administrative, civil and criminal enforcement measures, including assessment of monetary penalties, imposition of remedial requirements and issuance of injunctions as to future compliance. The Company may be subject to compliance audits by regulatory authorities in the various countries in which it operates.

Government-funded Defense and Security Programs

Like most companies that supply products and services to governments, government agencies routinely audit and investigate government contractors. These agencies may review the Company's performance under its contracts, business processes, cost structure, and compliance with applicable laws, regulations and standards. The Company's incurred costs for each year are subject to audit by government agencies, which can result in payment demands related to costs they believe should be disallowed. The Company works with governments to assess the merits of claims and where appropriate reserve for amounts disputed. The Company could be required to provide repayments to governments and may have a negative effect on its results of operations. Contrary to cost-reimbursable contracts, some costs may not be reimbursed or allowed under fixed-price contracts, which may have a negative effect on the Company's results of operations if it experiences costs overruns.

Environmental Liability

PyroGenesis is subject to various environmental laws and regulations enacted in the jurisdictions in which it operates, which govern the manufacturing, processing, importation, transportation, handling and disposal of certain materials used in the Company’s operations. Management believes that it has adequate procedures in place to address compliance with current environmental laws and regulations. Furthermore, management monitors the Company’s practices concerning the handling of environmentally hazardous materials. However, there can be no assurance that the Company’s procedures will prevent environmental damage occurring from spills of materials handled by the Company or that such damage has not already occurred. On occasion, substantial liabilities to third parties may be incurred. The Company may have the benefit of insurance maintained by it or the operator, however, the Company may become liable for damages against which it cannot adequately insure or against which it may elect not to insure because of high costs or other reasons. The Company’s clients are subject to similar environmental laws and regulations, as well as limits on emissions to the air and discharges into surface and sub-surface waters. While regulatory developments that may follow in subsequent years could have the effect of reducing industry activity, the Company cannot predict the nature of the restrictions that may be imposed. The Company may be required to increase operating expenses or capital expenditures in order to comply with any new restrictions or regulations.

Product Liability and Other Lawsuits

PyroGenesis is subject to a variety of potential product liabilities claims and other lawsuits related with its operations, including liabilities and expenses associated with product defects. The Company maintains product liability and other insurance coverage that management believes is generally in accordance with the market practice in its industry, but there can be no assurance that the Company will always be adequately insured against all such potential liabilities.

A malfunction or the inadequate design of the Company’s products could result in product liability or other tort claims. Accidents involving the Company’s products could lead to personal injury or physical damage. Any liability for damages resulting from malfunctions could be substantial and could materially adversely affect the Company’s business and results of operations. In addition, a well-publicized actual or perceived problem could adversely affect the market’s perception of the Company’s products. This could result in a decline in demand for the Company’s products, which would materially adversely affect the Company’s financial condition and results of operations.

The sale and use of products and processes developed by the Company may entail potential liability and possible warranty claims. The Company may be subject to personal injury claims for injuries resulting from use of its products. Although the Company maintains product liability insurance, there can be no assurance that such insurance will continue to be available on commercially reasonable terms or that the risks covered, or coverage amounts will be sufficient to cover all claims.

Information systems disruptions

The Company relies on various information technology systems to manage its operations. Over the last several years, the Company has implemented, and it continues to implement, modifications and upgrades to such systems, including changes to legacy systems, replacing legacy systems with successor systems with new functionality, and acquiring new systems with new functionality. These types of activities subject the Company to inherent costs and risks associated with replacing and changing these systems, including impairment of the Company’s ability to fulfill customer orders, potential disruption of its internal control structure, substantial capital expenditures, additional administration and operating expenses, retention of sufficiently skilled personnel to implement and operate the new systems, demands on management time and other risks and costs of delays or difficulties in transitioning to or integrating new systems into the Company’s current systems. These implementations, modifications, and upgrades may not result in productivity improvements at a level that outweighs the costs of implementation, or at all. In addition, the difficulties with implementing new technology systems may cause disruptions in the Company’s business operations and have a material adverse effect on its business, financial condition, or results of operations.

Security Breaches

As part of its day-to-day business, the Company stores its data and certain data about its customers in its global information technology system. Unauthorized access to the Company’s data, including any regarding its customers, could expose the Company to a risk of loss of this information, loss of business, litigation and possible liability. These security measures may be breached by intentional misconduct by computer hackers, as a result of third-party action, employee error, malfeasance or otherwise. Additionally, third parties may attempt to fraudulently induce employees or customers into disclosing sensitive information such as usernames, passwords or other information in order to gain access to the data of the Company’s customers or the Company’s data, including the Company’s intellectual property and other confidential business information, or the Company’s information technology systems. Because the techniques used to obtain unauthorized access, or to sabotage systems, change frequently and generally are not recognized until launched against a target, the Company may be unable to anticipate these techniques or to implement adequate preventative measures. Any security breach could result in a loss of confidence by the Company’s customers, damage its reputation, disrupt its business, lead to legal liability and negatively impact its future sales.

Public Health Crises

Public health crises, including local, regional, national or international outbreak of a contagious disease, could have an adverse effect on local economies, the global economy, and the markets in which the Company operates and markets its products, and may adversely impact the price and demand for the Company's products and the ability of the Company to operate and market its products. Any such alterations or modifications could cause substantial interruption to the Company's business, any of which could have a material adverse effect on the Company's operations or financial results, and could include temporary closures of one or more of the Company's or its partner's offices or facilities; temporary or long-term labor shortages; temporary or long-term adverse impacts on the Company's supply chain and distribution channels; the potential of increased network vulnerability and risk of data loss resulting from increased use of remote access and removal of data from the Company's facilities.

Subsequent to December 31, 2019, the global emergence of coronavirus (COVID-19) occurred. The global outbreak of COVID-19 has resulted in governments worldwide enacting emergency measures to protect against the spread of the virus. These measures, which include, among other things, limitations on travel, self-imposed quarantine periods and social distancing measures, have caused material disruption to businesses globally resulting in an economic slowdown. Global equity markets have experienced significant volatility and weakness. Governments and central banks have reacted with significant monetary and fiscal interventions designed to stabilize economic conditions. The duration and impact of the COVID-19 outbreak is unknown at this time, as is the efficacy of any government and/or central bank interventions. It is not possible to reliably estimate the length and severity of these developments and the impact on the financial results and condition of the Company in future periods.

As of the date of this MD&A, the Company has successfully continued operations under COVID-19 protocols. COVID-19 has not resulted in any material delays in the development or testing of the Company's products or any other material development projects. The Company is not currently experiencing any material delays or interruptions in service or product delivery. At the outset of the COVID-19 pandemic, certain of the Company's operations were negatively impacted, but have since normalized. The Company has not experienced any material disruption in its supply chain, and the pandemic has not materially impacted the Company's business.

The Company's production schedule has continued throughout COVID-19 on a modified employee schedule, with certain non-production employees working remotely. The Company has been able to operate largely unaffected by the COVID-19 pandemic. Notwithstanding the foregoing, if the Company or its vendors and suppliers are unable to continue operations or keep up with increasing demands as a result of COVID-19, customers may experience delays or interruptions in service or the delivery of products, which may be detrimental to the Company's reputation, business, results of operations and financial position. The Company cautions that it is impossible to fully anticipate or quantify the effect and ultimate impact of the COVID-19 pandemic as the situation is rapidly evolving. The extent to which COVID-19 impacts the Company's results will depend on future developments, which are highly uncertain and cannot be predicted, including new information that may emerge concerning the severity of COVID-19 and the actions taken by governments to contain it or treat its impact, including shelter in place directives, which, if extended, may impact the economies in which the Company now operates, or may in the future operate, key markets into which the Company sells products and delivers services, and markets through which the Company's key suppliers source their products.

Litigation

The Company may from time to time become party to litigation in the ordinary course of business which could adversely affect its business. Should any litigation in which the Company becomes involved be determined against the Company, such a decision could adversely affect the Company's ability to continue operating and the market price for the Common

Shares and could use significant resources. Even if the Company is involved in litigation and wins, litigation can redirect significant Company resources. Litigation may also create a negative perception of the Company's brand.

Trade Secrets May Be Difficult to Protect

The Company's success depends upon the skills, knowledge and experience of its scientific and technical personnel, consultants and advisors, as well as contractors. Because the Company operates in a highly competitive industry, it relies in part on trade secrets to protect its proprietary products and processes. However, trade secrets are difficult to protect. The Company generally enters into confidentiality or non-disclosure agreements with its corporate partners, employees, consultants, outside scientific collaborators, developers and other advisors. These agreements generally require that the receiving party keep confidential, and not disclose to third parties, confidential information developed by the receiving party or made known to the receiving party by the Company during the course of the receiving party's relationship with the Company. These agreements also generally provide that inventions conceived by the receiving party in the course of rendering services to the Company will be its exclusive property, and the Company enters into assignment agreements to perfect its rights.

These confidentiality, inventions, and assignment agreements, where in place, may be breached and may not effectively assign intellectual property rights to the Company. The Company's trade secrets also could be independently discovered by competitors, in which case the Company would not be able to prevent the use of such trade secrets by its competitors. The enforcement of a claim alleging that a party illegally obtained and was using the Company's trade secrets could be difficult, expensive and time consuming and the outcome could be unpredictable. The failure to obtain or maintain meaningful trade secret protection could adversely affect the Company's competitive position.

Risks Related to Acquiring Companies

The Company may acquire other companies in the future and there are risks inherent in any such acquisition. Specifically, there could be unknown or undisclosed risks or liabilities of such companies for which the Company is not sufficiently indemnified. Any such unknown or undisclosed risks or liabilities could materially and adversely affect the Company's financial performance and results of operations. The Company could encounter additional transaction and integration related costs or other factors such as the failure to realize all of the benefits from such acquisitions. All of these factors could cause dilution to the Company's earnings per share or decrease or delay the anticipated accretive effect of the acquisition and cause a decrease in the market price of the Company's securities. The Company may not be able to successfully integrate and combine the operations, personnel and technology infrastructure of any such acquired company with its existing operations. If integration is not managed successfully by the Company's management, the Company may experience interruptions in its business activities, deterioration in its employee and customer relationships, increased costs of integration and harm to its reputation, all of which could have a material adverse effect on the Company's business, financial condition and results of operations. The Company may experience difficulties in combining corporate cultures, maintaining employee morale and retaining key employees. The integration of any such acquired companies may also impose substantial demands on the management. There is no assurance that these acquisitions will be successfully integrated in a timely manner.

Global Economic Uncertainty

Demand for the Company's products and services are influenced by general economic and consumer trends beyond the Company's control. There can be no assurance that the Company's business and corresponding financial performance will not be adversely affected by general economic or consumer trends. In particular, global economic conditions are still tight, and if such conditions continue, recur or worsen, there can be no assurance that they will not have a material adverse effect on the Company's business, financial condition and results of operations.

Furthermore, such economic conditions have produced downward pressure on stock prices and on the availability of credit for financial institutions and corporations. If these levels of market disruption and volatility continue, the Company might experience reductions in business activity, increased funding costs and funding pressures, as applicable, a decrease in the market price of the Common Shares, a decrease in asset values, additional write-downs and impairment charges and lower profitability.

Inability to Renew Leases

The Company may be unable to renew or maintain its leases (commercial or real property) on commercially acceptable terms or at all. An inability to renew its leases, or a renewal of its leases with a rental rate higher than the prevailing rate under the applicable lease prior to expiration, may have an adverse impact on the Company's operations, including disruption of its operations or an increase in its cost of operations. In addition, in the event of non-renewal of any of the Company's leases, the Company may be unable to locate suitable replacement properties for its facilities or it may experience delays in relocation that could lead to a disruption in its operations. Any disruption in the Company's operations could have an adverse effect on its financial condition and results of operations.

Financial Reporting and Other Public Issuer Requirements

As a public company, the Company is subject to the reporting requirements of the Canadian Securities Administrators, or the CSA, and the U.S. Securities Exchange Act of 1934, as amended, and the rules and regulations of the listing standards of the TSX and NASDAQ and the U.S. Sarbanes-Oxley Act. The requirements of these laws, rules and regulations have increased and will continue to increase the Company's legal, accounting, and financial compliance costs, make some activities more difficult, time-consuming, and costly, and place significant strain on the Company's personnel, systems, and resources. The Company is continuing to develop and refine its disclosure controls and other procedures that are designed to ensure that information required to be disclosed by the Company in the reports that it will file with the CSA is recorded, processed, summarized, and reported within the time periods specified in CSA rules and forms and that information required to be disclosed in reports under applicable securities laws is accumulated and communicated to the Company's principal executive and financial officers. The Company is also continuing to improve its internal control over financial reporting. In order to improve the effectiveness of its disclosure controls and procedures and internal control over financial reporting, the Company has expended, and anticipate that it will continue to expend, significant resources, including accounting-related costs and significant management oversight.

The Company has identified certain material weaknesses in its internal controls, as more fully explained in its management's discussion and analysis for the year ended December 31, 2021 under "Disclosure Controls and Procedures". Additional weaknesses in the Company's disclosure controls and internal control over financial reporting may also be discovered in the future. Any failure to develop or maintain effective controls or any difficulties encountered in their implementation or improvement could harm the Company's results of operations or cause the Company to fail to meet its reporting obligations and may result in a restatement of the Company's financial statements for prior periods. Any failure to improve and maintain effective internal control over financial reporting also could adversely affect the results of periodic management evaluations and annual independent registered public accounting firm attestation reports regarding the effectiveness of the Company's internal control over financial reporting that the Company will eventually be required to include in its periodic reports that will be filed with the CSA. Ineffective disclosure controls and procedures and internal control over financial reporting could also cause investors to lose confidence in the Company's reported financial and other information, which could have a negative effect on the trading price of the Common Shares. In addition, if the Company is unable to continue to meet these requirements, it may not be able to remain listed on the TSX and/or NASDAQ.

Influence of the Significant Shareholders

To the Company's knowledge, no shareholder beneficially owns, or controls or directs, directly or indirectly, more than 10% of the voting rights attached to the Company's outstanding voting securities, except for Mr. Photis Peter Pascali, President and Chief Executive Officer of the Company, who holds or controls, directly or indirectly, 79,871,798 Common Shares, representing in aggregate 46.02% of the total voting rights attached to the outstanding Common Shares, and options to acquire an additional 4,120,000 Common Shares (increasing the total number of Common Shares held or controlled, directly or indirectly, by him to 83,991,798 Common Shares, or 46.21% or the Common Shares, on a fully diluted basis). In addition, from time to time, the Company may have other shareholders who have the ability to exercise significant influence over matters submitted to the shareholders of the Company for approval, whether subject to approval by a majority of the shareholders of the Company or subject to a class vote or special resolution.

Limited Control Over the Company's Operations

Holders of the Common Shares have limited control over changes in the Company's policies and operations, which increases the uncertainty and risks of an investment in the Company. The Board determines major policies, including policies regarding financing, growth, debt capitalization and any future dividends to shareholders of the Company. Generally, the Board may amend or revise these and other policies without a vote of the holders of the Common Shares. The Board's broad discretion in setting policies and the limited ability of holders of the Common Shares to exert control over those policies increases the uncertainty and risks of an investment in the Company.

Change in Tax Laws

New income, sales, use or other tax laws, statutes, rules, regulations or ordinances could be enacted at any time. Further, existing tax laws, statutes, rules, regulations or ordinances could be interpreted, changed, modified or applied adversely to the Company. These enactments and events could require the Company to pay additional tax amounts on a prospective or retroactive basis, thereby substantially increasing the amount of taxes the Company is liable to pay in the relevant tax jurisdictions. Accordingly, these events could decrease the capital that the Company has available to operate its business. Any or all of these events could harm the business and financial performance of the Company.

Forward-Looking Information

The forward-looking information included in this MD&A relating to, among other things, the Company's future results, performance, achievements, prospects, targets, intentions or opportunities or the markets in which it operates and the other statements listed is based on opinions, assumptions and estimates made by the Company's management in light of its experience and perception of historical trends, current conditions and expected future developments, as well as other factors that the Company believes are appropriate and reasonable in the circumstances. However, there can be no assurance that such estimates and assumptions will prove to be correct. The Company's actual results in the future may vary significantly from the historical and estimated results and those variations may be material. The Company makes no representation that its actual results in the future will be the same, in whole or in part, as those included in this MD&A.

Credit Facilities

The Company's credit facilities and financing agreements mature on various dates. There can be no assurance that such credit facilities or financing agreements will be renewed or refinanced, or if renewed or refinanced, that the renewal or refinancing will occur on equally favourable terms to the Company. The Company's ability to continue operating may be adversely affected if the Company is not able to renew its credit facilities or arrange refinancing, or if such renewal or refinancing, as the case may be, occurs on terms materially less favorable to the Company than at present. The Company's current credit facilities and financing agreements have no imposed financial covenants and obligations on the Company. In the event of the contrary, there is a risk that such loans may go into default if there is a breach in complying with such covenants and obligations, which could result in the lenders realizing on their security and causing our shareholders to lose some or all of their investment.

Risks Related to the Company's Securities

Potential Volatility of Common Share Price

The market price of the Common Shares could be subject to significant fluctuations. Some of the factors that may cause the market price of the Common Shares to fluctuate include:

(i) the public's reaction to the Company's press releases, announcements and filings with regulatory authorities and those of its competitors;

(ii) fluctuations in broader stock market prices and volumes;

(iii) changes in market valuations of similar companies;

(iv) investor perception of the Company, its prospects or the industry in general;

(v) additions or departures of key personnel;

(vi) commencement of or involvement in litigation;

(vii) announcements by the Company or its competitors of strategic alliances, significant contracts, new technologies, acquisitions, commercial relationships, joint ventures or capital commitments;

(viii) variations in the Company's quarterly results of operations or cash flows or those of other comparable companies;

(ix) revenues and operating results failing to meet the expectations of securities analysts or investors in particular quarter;

(x) changes in the Company's pricing policies or the pricing policies of its competitors;

(xi) future issuances and sales of Common Shares;

(xii) sales of Common Shares by insiders of the Company;

(xiii) third party disclosure of significant short positions;

(xiv) demand for and trading volume of Common Shares;

(xv) changes in securities analysts' recommendations and their estimates of the Company's financial performance;

(xvi) short-term fluctuation in stock price caused by changes in general conditions in the domestic and worldwide economies or financial markets; and

(xvii) the other risk factors described under this heading of the MD&A.

The realization of any of these risks and other factors beyond the Company's control could cause the market price of the Common Shares to decline significantly.

In addition, broad market and industry factors may harm the market price of the Common Shares. Hence, the price of the Common Shares could fluctuate based upon factors that have little or nothing to do with the Company, and these fluctuations could materially reduce the price of the Common Shares regardless of the Company's operating performance. In the past, following a significant decline in the market price of a company's securities, there have been instances of securities class action litigation having been instituted against that company. If the Company were involved in any similar litigation, it could incur substantial costs, management's attention and resources could be diverted and it could harm the Company's business, operating results and financial condition.

Market Liquidity

The market price for the Common Shares could be subject to wide fluctuations. Factors such as the announcement of significant contracts, technological innovations, new commercial products, patents, a change in regulations, quarterly financial results, future sales of Common Shares by the Company or current shareholders, and many other factors could have considerable repercussions on the price of the Common Shares. In addition, the financial markets may experience significant price and value fluctuations that affect the market prices of equity securities of companies that sometimes are unrelated to the operating performance of these companies. Broad market fluctuations, as well as economic conditions generally may adversely affect the market price of the Common Shares.

Dividends to Shareholders

The Company does not anticipate paying cash dividends on the Common Shares in the foreseeable future. The Company currently intends to retain all future earnings to fund the development and growth of its business. Any payment of future dividends will be at the discretion of the directors and will depend on, among other things, the Company's earnings, financial condition, capital requirements, level of indebtedness, statutory and contractual restrictions applying to the payment of dividends, and other considerations that the directors deem relevant.

Impact of Future Sales by Existing Shareholders

If the Company's shareholders sell substantial amounts of the Common Shares in the public market, the market price of the Common Shares could decrease. The perception among investors that these sales will occur could also produce this effect. All currently outstanding Common Shares other than those subject to lock-up agreements executed by certain existing shareholders will, subject to applicable securities laws, generally be immediately available for resale in the public markets.

Subject to compliance with applicable securities laws, the Company's officers, directors and their affiliates may sell some or all of their Common Shares in the future. No prediction can be made as to the effect, if any, such future sales of Common Shares will have on the market price of the Common Shares prevailing from time to time. However, the future sale of a substantial number of Common Shares by the Company's officers, directors and their affiliates, or the perception that such sales could occur, could materially adversely affect prevailing market prices for the Common Shares.

Additional Common Shares issuable upon the exercise of stock options may also be available for sale in the public market, which may also cause the market price of the Common Shares to fall. Accordingly, if substantial amounts of Common Shares are sold in the public market, the market price could fall.

Working Capital and Future Issuances

The Company may issue additional Common Shares in the future which may dilute a shareholder's holdings in the Company. The Articles permit the issuance of an unlimited number of Common Shares, and shareholders of the Company will have no pre-emptive rights in connection with any further issuances The directors of the Company have the discretion to determine the provisions attaching to the Common Shares and the price and the terms of issue of further Common Shares.

Additional equity financing may be dilutive to holders of Common Shares. Debt financing may involve restrictions on the Company's financing and operating activities. Debt financing may be convertible into other securities of the Company which may result in immediate or resulting dilution. In either case, additional financing may not be available to the Company on acceptable terms or at all. If the Company is unable to raise additional funds as needed, the scope of its operations or growth may be reduced and, as a result, the Company may be unable to fulfil its long-term goals. In this case, investors may lose all or part of their investment. Any default under such debt instruments could have a material adverse effect on the Company, its business or the results of operations.

Securities or Industry Analysts

The trading market for Common Shares could be influenced by the research and reports that industry and/or securities analysts may publish about the Company, its business, the market or competitors. If any of the analysts who may cover the Company's business change their recommendation regarding the Common Shares adversely, or provide more favourable relative recommendations about its competitors, the share price would likely decline. If any analyst who may cover the Company's business were to cease coverage or fail to regularly publish reports on the Company, it could lose visibility in the financial markets, which in turn could cause the share price or trading volume to decline.

Risks Related to the Company’s Status as a Foreign Private Issuer

Information Publicly Available to the Company’s U.S. shareholders

The Company is a foreign private issuer under applicable U.S. federal securities laws. As a result, the Company does not file the same reports that a U.S. domestic issuer would file with the U.S. Securities and Exchange Commission (the “SEC”), although the Company is required to file with or furnish to the SEC the continuous disclosure documents that the Company is required to file in Canada under Canadian Securities Laws, in certain respects the reporting obligations are less detailed and less frequent than those of U.S. domestic reporting companies. In addition, the Company’s officers, directors and principal shareholders are exempt from the reporting and short-swing profit recovery provisions of Section 16 of the U.S. Exchange Act. Therefore, the Company’s shareholders may not know on as timely a basis when the Company’s officers, directors and principal shareholders purchase or sell Common Shares as the reporting periods under the corresponding Canadian insider reporting requirements are longer.

As a foreign private issuer, the Company is exempt from the rules and regulations under the Exchange Act related to the furnishing and content of proxy statements. The Company is also exempt from Regulation FD, which prohibits issuers from making selective disclosures of material non-public information. While the Company complies with the corresponding requirements relating to proxy statements and disclosure of material non-public information under Canadian securities laws, these requirements differ from those under the Exchange Act and Regulation FD and shareholders should not expect to receive the same information at the same time as such information is provided by U.S. domestic companies. In addition, the Company may not be required under the Exchange Act to file annual and quarterly reports with the SEC as promptly as
U.S. domestic companies whose securities are registered under the Exchange Act.

In addition, as a foreign private issuer, the Company has the option to follow certain Canadian corporate governance practices, except to the extent that such laws would be contrary to U.S. securities laws, and provided that the Company discloses the requirements it is not following and describe the Canadian practices it follows instead. The Company plans to rely on this exemption. As a result, the Company’s shareholders may not have the same protections afforded to shareholders of U.S. domestic companies that are subject to all U.S. corporate governance requirements.

Loss of Foreign Private Issuer Status in the Future

In order to maintain its status as a foreign private issuer, a majority of the Company's Common Shares must be either directly or indirectly owned by non-residents of the U.S. unless the Company also satisfies one of the additional requirements necessary to preserve this status. The Company may in the future lose its foreign private issuer status if a majority of the Common Shares are held in the United States and the Company fails to meet the additional requirements necessary to avoid loss of foreign private issuer status. The regulatory and compliance costs to the Company under U.S. federal securities laws as a U.S. domestic issuer may be significantly more than the costs the Company incurs as a Canadian foreign private issuer eligible to use the multi-jurisdictional disclosure system ("MJDS"). If the Company is not a foreign private issuer, it would not be eligible to use the MJDS or other foreign issuer forms and would be required to file periodic and current reports and registration statements on U.S. domestic issuer forms with the SEC, which are more detailed and extensive than the forms available to a foreign private issuer. In addition, the Company may lose the ability to rely upon exemptions from NASDAQ corporate governance requirements that are available to foreign private issuers.

Inability for U.S. Investors to Enforce Certain Judgments

The Company is a corporation existing under the Canada Business Corporations Act. A number of the Company’s directors and officers are residents of Canada, and substantially all of the Company’s assets are located outside the United States. As a result, it may be difficult to effect service within the United States upon the Company or upon its directors and officers. Execution by United States courts of any judgment obtained against the Company or any of the Company’s directors or officers in United States courts may be limited to the assets of such companies or such persons, as the case may be, located in the United States. It may also be difficult for holders of securities who reside in the United States to realize in the United States upon judgments of courts of the United States predicated upon civil liability and the civil liability of the Company’s directors and executive officers under the United States federal securities laws. The Company has been advised that a judgment of a U.S. court predicated solely upon civil liability under U.S. federal securities laws or the securities or “blue sky” laws of any state within the United States, would likely be enforceable in Canada if the United States court in which the judgment was obtained has a basis for jurisdiction in the matter that would be recognized by a Canadian court for the same purposes. However, there may be doubt as to the enforceability in Canada against these non-U.S. entities or their controlling persons, directors and officers who are not residents of the United States, in original actions or in actions for enforcement of judgments of courts of the United States, of liabilities predicated solely upon U.S. federal or state securities laws.

Risks Relating to the Company's Status as an "Emerging Growth Company" Under U.S. Securities Laws

The Company is an "emerging growth company" as defined in section 3(a) of the Exchange Act (as amended by the JOBS Act, enacted on April 5, 2012), and the Company will continue to qualify as an emerging growth company until the earliest to occur of: (a) the last day of the fiscal year during which the Company has total annual gross revenues of US$1,070,000,000 (as such amount is indexed for inflation every five years by the SEC) or more; (b) the last day of the fiscal year of the Company following the fifth anniversary of the date of the first sale of common equity securities of the Company pursuant to an effective registration statement under the United States Securities Act of 1933, as amended; (c) the date on which the Company has, during the previous three year period, issued more than US$1,000,000,000 in non- convertible debt; and (d) the date on which the Company is deemed to be a "large accelerated filer", as defined in Rule 12b-2 under the Exchange Act. The Company will qualify as a large accelerated filer (and would cease to be an emerging growth company) at such time when on the last business day of its second fiscal quarter of such year the aggregate worldwide market value of its common equity held by non-affiliates will be US$700,000,000 or more.

For so long as the Company remains an emerging growth company, it is permitted to and intends to rely upon exemptions from certain disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include not being required to comply with the auditor attestation requirements of Section 404 of the JOBS Act. The Company takes advantage of some, but not all, of the available exemptions available to emerging growth companies. The Company cannot predict whether investors will find the Common Shares less attractive because the Company relies upon certain of these exemptions. If some investors find the Common Shares less attractive as a result, there may be a less active trading market for the Common Shares and the Common Share price may be more volatile. On the other hand, if the Company no longer qualifies as an emerging growth company, the Company would be required to divert additional management time and attention from the Company's development and other business activities and incur increased legal and financial costs to comply with the additional associated reporting requirements, which could negatively impact the Company's business, financial condition and results of operations.

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 CO_2--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)1, 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.

[1] **https://international-aluminium.org/iai-releases-aluminium-sectors-decarbonisation-dataset-in-line-with-the-international-energy-agencys-beyond-2-degrees-findings**

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 tol 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 CO_2-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 focussing 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.

FURTHER INFORMATION

Additional information relating to Company and its business, including the 2021 consolidated Financial Statements, the Annual Information Form and other filings that the Company has made and may make in the future with applicable securities authorities, may be found on or through SEDAR at www.sedar.com, EDGAR at www.sec.gov or the Company's website at www.pyrogenesis.com.

Additional information, including directors' and officers' remuneration and indebtedness, principal holders of the Company's securities and securities authorized for issuance under equity compensation plans, is also contained in the Company's most recent management information circular for the most recent annual meeting of shareholders of the Company.

Exhibit 99.4

Form 52-109F2

Certification of Interim Filings

Full Certificate

I, P. Peter Pascali, Chief Executive Officer of PyroGenesis Canada Inc., certify the following:

1. ***Review:*** I have reviewed the interim financial report and interim MD&A (together, the "interim filings") of PyroGenesis Canada Inc. (the "issuer") for the interim period ended September 30, 2022.

2. ***No misrepresentations:*** Based on my knowledge, having exercised reasonable diligence, the interim filings do not contain any untrue statement of a material fact or omit to state a material fact required to be stated or that is necessary to make a statement not misleading in light of the circumstances under which it was made, with respect to the period covered by the interim filings.

3. ***Fair presentation:*** Based on my knowledge, having exercised reasonable diligence, the interim financial report together with the other financial information included in the interim filings fairly present in all material respects the financial condition, financial performance and cash flows of the issuer, as of the date of and for the periods presented in the interim filings.

4. ***Responsibility:*** The issuer's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (DC&P) and internal control over financial reporting (ICFR), as those terms are defined in National Instrument 52-109 *Certification of Disclosure in Issuers' Annual and Interim Filings*, for the issuer.

5. ***Design:*** Subject to the limitations, if any, described in paragraphs 5.2 and 5.3, the issuer's other certifying officer(s) and I have, as at the end of the period covered by the interim filings

   (a) designed DC&P, or caused it to be designed under our supervision, to provide reasonable assurance that

      (i) material information relating to the issuer is made known to us by others, particularly during the period in which the interim filings are being prepared; and

      (ii) information required to be disclosed by the issuer in its annual filings, interim filings or other reports filed or submitted by it under securities legislation is recorded, processed, summarized and reported within the time periods specified in securities legislation; and

   (b) designed ICFR, or caused it to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with the issuer's GAAP.

5.1. ***Control framework:*** The control framework the issuer's other certifying officer(s) and I used to design the issuer's ICFR is the Internal Control – Integrated Framework (2013 COSO Framework) published by The Committee of Sponsoring Organizations of the Treadway Commission.

5.2. ***ICFR – material weakness relating to design:*** The issuer has disclosed in its interim MD&A for each material weakness relating to design existing at the end of the interim period

(a) a description of the material weakness;

(b) the impact of the material weakness on the issuer's financial reporting and its ICFR; and

(c) the issuer's current plans, if any, or any actions already undertaken, for remediating the material weakness.

5.3. ***Limitation on scope of design:*** N/A

6. ***Reporting changes in ICFR:*** The issuer has disclosed in its interim MD&A any change in the issuer's ICFR that occurred during the period beginning on July 1, 2022 and ended on September 30, 2022 that has materially affected, or is reasonably likely to materially affect, the issuer's ICFR.

Date: November 11, 2022

/s/ P. Peter Pascali
P. Peter Pascali
Chief Executive Officer

Exhibit 99.5

Form 52-109F2

Certification of Interim Filings

Full Certificate

I, Andre Mainella, Chief Financial Officer of PyroGenesis Canada Inc., certify the following:

1. ***Review:*** I have reviewed the interim financial report and interim MD&A (together, the "interim filings") of PyroGenesis Canada Inc. (the "issuer") for the interim period ended September 30, 2022.

2. ***No misrepresentations:*** Based on my knowledge, having exercised reasonable diligence, the interim filings do not contain any untrue statement of a material fact or omit to state a material fact required to be stated or that is necessary to make a statement not misleading in light of the circumstances under which it was made, with respect to the period covered by the interim filings.

3. ***Fair presentation:*** Based on my knowledge, having exercised reasonable diligence, the interim financial report together with the other financial information included in the interim filings fairly present in all material respects the financial condition, financial performance and cash flows of the issuer, as of the date of and for the periods presented in the interim filings.

4. ***Responsibility:*** The issuer's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (DC&P) and internal control over financial reporting (ICFR), as those terms are defined in National Instrument 52-109 *Certification of Disclosure in Issuers' Annual and Interim Filings*, for the issuer.

5. ***Design:*** Subject to the limitations, if any, described in paragraphs 5.2 and 5.3, the issuer's other certifying officer(s) and I have, as at the end of the period covered by the interim filings

   (a) designed DC&P, or caused it to be designed under our supervision, to provide reasonable assurance that

      (i) material information relating to the issuer is made known to us by others, particularly during the period in which the interim filings are being prepared; and

      (ii) information required to be disclosed by the issuer in its annual filings, interim filings or other reports filed or submitted by it under securities legislation is recorded, processed, summarized and reported within the time periods specified in securities legislation; and

   (b) designed ICFR, or caused it to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with the issuer's GAAP.

5.1. ***Control framework:*** The control framework the issuer's other certifying officer(s) and I used to design the issuer's ICFR is the Internal Control – Integrated Framework (2013 COSO Framework) published by The Committee of Sponsoring Organizations of the Treadway Commission.

5.2. ***ICFR – material weakness relating to design:*** The issuer has disclosed in its interim MD&A for each material weakness relating to design existing at the end of the interim period

(a) a description of the material weakness;

(b) the impact of the material weakness on the issuer's financial reporting and its ICFR; and

(c) the issuer's current plans, if any, or any actions already undertaken, for remediating the material weakness.

5.3. ***Limitation on scope of design:*** N/A

6. ***Reporting changes in ICFR:*** The issuer has disclosed in its interim MD&A any change in the issuer's ICFR that occurred during the period beginning on July 1, 2022 and ended on September 30, 2022 that has materially affected, or is reasonably likely to materially affect, the issuer's ICFR.

Date: November 11, 2022

/s/ Andre Mainella
Andre Mainella
Chief Financial Officer