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 August 2023

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]

EXHIBIT INDEX

Exhibit Number	Description
99.1	Press Release dated August 10, 2023
99.2	Condensed Consolidated Interim Financial Statements Three and Six-Month Period ended June 30, 2023 and 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: August 10, 2023

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

EXHIBIT 99.1

PyroGenesis Announces 2023 Second Quarter Results

- **The Company continues to expand into new markets and reach full commercialization goals, while maintaining a healthy 37% gross margin.**

MONTREAL, Aug. 10, 2023 (GLOBE NEWSWIRE) -- PyroGenesis Canada Inc. (http://pyrogenesis.com) (TSX: PYR) (NASDAQ: PYR) (FRA: 8PY), a high-tech company (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 second quarter ended June 30, 2023.

“Despite a relatively flat quarter and the continued fluctuations in our quarterly revenues that we had previously acknowledged as possible, we remain confident in our long-term strategy. The opportunities for the Company across the large-scale industrial technology and industrial decarbonization landscapes are significant,” said Mr. P. Peter Pascali, CEO and President of PyroGenesis. “The barriers to entry for gaining a foothold in these markets has always been high, from both a technology and resource perspective – particularly in the energy transition segments, where fundamental structural change to long-established underlying energy and fuel systems are conducted with measured and exacting processes, and where delays are common. We firmly believe that this is where our close to thirty years of R&D, and our long-standing industry relationships, provide a long-term advantage, as we persist in-step with these trends which have been exacerbated by the uncertain economic environment that continues to create volatility in the capital markets.”

“Against much larger competitors, and by using our globally recognized expertise in ultra-high temperature processes such as plasma, along with robust client relationship building, we continue to experience successes that have enabled us to push past the barriers to entry in several of our strategic business lines,” continued Mr. Pascali. “Commercialization results in titanium metal powders, and the opening of new markets for higher power plasma torches (such as the contract which we recently announced with a defense and aeronautics contractor for a next tier 4.5MW plasma torch), underscores that the strategy to maintain our focus on developing technologies and solutions that we believe are certain to take hold with leading global industrial companies during a period of major paradigm shift – namely in Energy Transition & Emissions Reduction, Commodity Security & Optimization, and Waste Remediation – is key to securing PyroGenesis’ future.”

“Despite the quarterly ups and downs, our commitment to supporting heavy industry with customer-ready, low carbon-footprint technology solutions, remains steadfast,” Mr. Pascali added. “Our backlog of signed and/or awarded contracts remains strong, at $33.9 million. Our 37% gross margin is fully in line with the industrial machinery and components industry[1] and well ahead of the gross margins for the industries we serve, such as aluminum[2], iron and steel[3], and even aerospace and defense[4]. We look forward to the remainder of 2023 as our business strategy continues to gain traction.”

The information below represents important highlights from the past quarter, followed by an outline of the company’s strategy and outlook for the next quarter.

Q2 Production Highlights

In Q2 2023, PyroGenesis continued its focus on advancing its updated business strategy that was first outlined in the Company’s 2022 fourth quarter and year-end results.

As noted, as the variety of uses for the Company’s core technologies has expanded, and industry interest has increased, the Company is concentrating its solution ecosystem under three verticals that align with economic drivers that are key to global heavy industry:

1. *Energy Transition & Emission Reduction:*

· fuel switching, utilizing the Company’s electric-powered plasma torches and biogas upgrading technology to help heavy industry reduce fossil fuel use and greenhouse gas emissions,

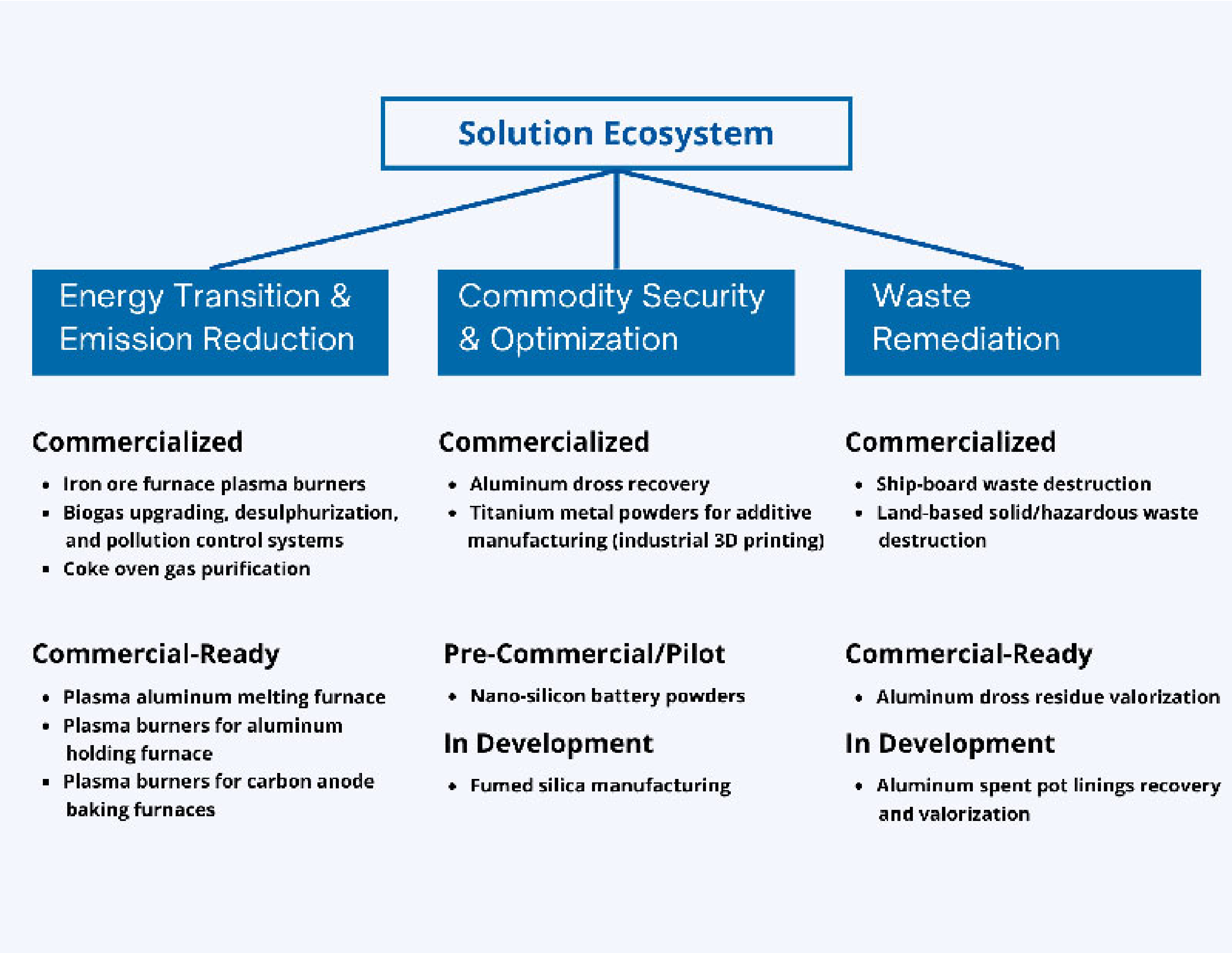
2. *Commodity Security & Optimization:*

· recovery of viable metals, and optimization of production to increase output, to maximize raw materials and improve availability of critical minerals,

3. *Waste Remediation:*

· safe destruction of hazardous materials, and the recovery and valorization of underlying substances such as chemicals and minerals.

Within each vertical the Company offers several solutions at different stages to commercialization.



The information below represents highlights from the past quarter for each of the above verticals, followed by an outline of the Company's strategy, and key developments that will impact the subsequent quarters.

1. *Energy Transition & Emission Reduction*

· **In May**, the Company announced that its subsidiary, Pyro Green-Gas, had successfully completed the integrated cold test (ICT) step under a previously announced $9.3 million project, with a key client – one of the world's top diversified steel producers.

The ICT completion marks a significant milestone towards the completion of the overall project, where Pyro Green-Gas has been mandated to (i) supply coke oven gas purification solutions and (ii) hydrogen production processes that have combined the potential to allow for the extracting of hydrogen with a 99.999% purity level and improve the client's environmental outcome. The ICT confirms that all systems, equipment and their components meet and exceed the required operation and safety standards.

With the implementation of Pyro Green-Gas' hydrogen extraction technology, the client would be able to rely on a cleaner energy source for its annealing, galvanizing and acid recovery processes, furthering its efforts to reduce its carbon footprint.

2. *Commodity Security & Optimization*

· **In May**, the Company announced a major corporate breakthrough with its first commercial by-the-tonne order for titanium metal powder for use in industrial 3D printing, commonly known as additive manufacturing. The contracted order for 5 metric tonnes (or 5,000 kg) also had a provisional order for an additional 6 tonnes.

The order is to be completed using PyroGenesis' NexGen™ plasma atomization system, from the Company's metal powder production facility in Montreal, Quebec. The client is an advanced materials company in the United States, who has requested anonymity.

As noted at the time by Massimo Dattilo, VP PyroGenesis Additive, this order represents the Company's "full entrance into the titanium metal powders marketplace".

· **In June**, the Company announced an achievement regarding its GEN3 PUREVAP™ Quartz Reduction Reactor (QRR) pilot plant (the "GEN3 PUREVAP ™ Pilot Plant" or the "Pilot Plant") project, with material produced by the pilot plant receiving successful laboratory validation of quartz to high-purity 3N+ silicon in one step. During test #5, the pilot plant achieved an average silicon purity (%) of 99.92% across two separate tests. This outcome validates the capability of the QRR process to surpass the minimum purity requirement of 3N needed for battery-grade silicon.

The PUREVAP™ process is an innovative patented process that will enable the one-step conversion of quartz (SiO_2) into high-purity silicon (Si) at reduced costs, energy input and carbon footprint that will propagate its considerable renewable energy potential. As noted at the time in the client's news release, silicon (Si), also known as silicon metal, is a key strategic material needed for the decarbonization of the economy and the Renewable Energy Revolution ("RER"). However, silicon does not exist in its pure state and must be extracted from quartz (SiO_2) in what has historically been a capital and energy-intensive process.

The Client, HPQ Silicon Inc. (TSX-V: HPQ) is an advanced materials engineering provider that offers sustainable silica (SiO_2) and silicon (Si) solutions. Based in Quebec, HPQ Silicon is developing a unique portfolio of value-added silicon products sought after by electric vehicle and battery manufacturers, among other industries. PyroGenesis is the engineering and development producer, but also, as part of the terms of the contract with HPQ, PyroGenesis benefits from a royalty payment representing 10% of the Client's sales, with set minimums.

3. *Waste Remediation*

· **In June**, the Company signed two contracts with Aluminerie Alouette, for projects to valorize residue streams from primary aluminum smelters. Alouette, located in Quebec, is home to the largest aluminum smelter in the Americas.

The first contract is to further advance a spent pot lining (or SPL) valorization technology, originally announced in March of 2021 upon receipt of a research grant to study the concept. Pot linings are the insulating carbon material that helps enable electrical conductivity inside an aluminum smelter cell or pot, for the process of turning aluminum oxide into aluminum. This lining typically has an average lifespan of 5 years, after which it eventually fails from continuous use, causing the spent pot to be put out of service and the highly contaminated linings to be removed.

PyroGenesis' SPL remediation technology has now advanced to the point where full participation of Alouette in partnership with PyroGenesis has commenced. An estimated 1.5 million tons of spent pot linings are produced annually worldwide. If PyroGenesis' proposed process proves successful, it could address a major issue concerning the aluminum industry. The second contract is geared to develop a new valorization solution for excess electrolytic bath. In both instances, the materials, while dangerous, if processed correctly can be recovered and reused by the primary aluminum producer.

Both projects have a commercial end goal with a strategy to market the solutions industry-wide in conjunction with Aluminerie Alouette.

Q2 Financial Highlights

· **In May**, the Company announced the receipt of a $2 million payment (US$1.5 million) under its existing $25 million Drosrite™ contract with Drosrite International LLC, which was in turn contracted by Radian Oil and Gas Services Company for an order of 7 Drosrite™ aluminum dross recovery systems.

The first three Drosrite™ systems are in use at Ma'aden, the largest mining company in the Kingdom of Saudi Arabia, at their Ras Al-Khair location – the world's largest integrated aluminum facility. The remaining four systems under the contract have already been manufactured and are ready for deployment subject to a renewed payment schedule.

· **In June**, the Company announced a "best-efforts" brokered private placement offering of up to 5,000 unsecured convertible debenture units of the Company (the "Convertible Debenture Units") at a price of $1,000 per Debenture Unit, for proceeds of up to $5,000,000 (the "Offering"). In connection with the Offering, P. Peter Pascali, President, CEO, and Director subscribed to $2,000,000 of Convertible Debenture Units. The Company indicated it intends to use the net proceeds from the Private Placement for working capital and general corporate purposes.

· **In July**, the Company announced amended terms of the brokered private placement, and also in July subsequently announced final closing of the placement.

Q2 Operational Highlights

· **In May**, the Company announced receipt of a 180-day extension to meet the Nasdaq minimum US$1 bid requirement under NASDAQ Listing Rule 5550(a)(2).

OUTLOOK

Consistent with the Company's past practice, and in view of the early stage of market adoption of our core lines of business, we are not providing specific revenue or net income (loss) guidance for 2023. However, various events have occurred that allow for a partial window into the remainder of 2023.

Overall Strategy

PyroGenesis provides technology solutions to heavy industry that leverage off of the Company's proprietary position and expertise in ultra-high temperature processes. The Company has evolved from its early roots of being a specialty-engineering firm to being a provider of a robust technology eco-system for heavy industry that helps address key strategic goals.

The Company believes its strategy to be timely, as multiple heavy industries are committing to major carbon and waste reduction targets at the same time as many governments are increasingly funding environmental technologies and infrastructure projects – all while both are making efforts to ensure the availability of critical minerals during the coming decades of increased output demand.

While there can be no guarantee, the Company believes this evolution of its strategy beyond a greenhouse gas emission reduction emphasis, to an expanded focus that encapsulates the key verticals listed above, both improves the Company's chances for success while also providing a clearer picture of how the Company's wide array of offerings work in tandem to support heavy industry goals.

PyroGenesis' market opportunity remains large, as major industries such as aluminum, steelmaking, manufacturing, defense, aeronautics, and government require factory-ready, technology-based solutions to help steer through the paradoxical landscape of increasing demand and tightening regulations and material availability.

As more of the Company's offerings reach full commercialization, PyroGenesis will remain focused on attracting influential customers in broad markets, and ensuring that operating expenses are controlled to achieve profitable growth.

For the remainder of 2023, we will continue to sharpen our focus on our strategy that structures our solution ecosystem under the three verticals noted previously: *energy transition & emission reduction; commodity security & optimization; and waste remediation.*

Some key developments to that end, include:

Enhanced Sales and Marketing

Against the backdrop of this strategy, the Company has been increasing sales, marketing, and R&D efforts in-line – and in some cases ahead of – the growth curve for industrial change related to greenhouse gas reduction efforts.

In May, during the Company's annual general meeting (AGM), the Company released a new corporate presentation that provides a significantly better representation of the Company, its technology offerings, and alignment to customer needs.

The Company intends to develop additional visual material throughout 2023.

Business Line Developments

Upcoming milestones which are expected to confirm the validity of our strategies, are as follows:

Business Line Developments: Near Term (0 – 3 months)

(i) **Financial**

<u>*Payments for Outstanding Major Receivables*</u>: The Company remains in continuous discussions with Radian Oil and Gas Services Company regarding the outstanding receivable of approximately US$8.0 million under the Company's existing $25 million+ Drosrite™ contract. As previously announced, PyroGenesis agreed to a strategic extension of the payment plan, by the customer and its end-customer, geared to better align the pressures on the end-user's operating cash flows created by increased business opportunities.

These discussions are very positive, both in regards to the ongoing payment plan, and in regards to a potential substantial new order of additional Drosrite™ systems, as the client's cash flow pressures and their new business opportunities move closer to resolution.

<u>*Innovation Grants*</u>: as mentioned in the Q1 outlook on May 15 the Company has applied for grants tailored to technology innovation and/or carbon reduction, and expects to have results regarding these applications. This situation has progressed very positively, and the Company is awaiting formal government announcement of the grants before it is legally allowed to indicate specifics.

(ii) **Commodity Security & Optimization**

<u>*Negotiations for Multiple Metal Powder Orders*</u>: Negotiations with companies for commercial orders of the Company's metal powders continues, as projected within the Company's Q1 outlook for Q2. As noted above, in Q2 the Company announced a first by-the-tonne contract for titanium metal powder of 5 metric tonnes, with an option for 6 additional tonnes.

<u>*Product Qualification Process for Global Aerospace Firm*</u>: Based on information flow between the Company and the aerospace client previously announced, the Company believes that the 2-year long qualification process to approve the Company's titanium

metal powers for use by a global aerospace firm and their suppliers, will conclude in the near term. This project continues to move forward positively.

(iii) **Energy Transition & Emission Reduction**

Plasma Torch Order: As mentioned in the Q1 outlook for Q2, on May 15, the Company was in advanced discussions with an international entity, whereby a plasma torch contract, if signed, would be between $3-$4 million. Post quarter end, on August 1, 2023, the Company received a signed contract for this project, for $4.1 million, with a confidential US-based aeronautics and defense client.

Iron Ore Pelletization Torch Trials: As mentioned in the Q1 outlook on May 15, in April 2023, the commissioning of the plasma torch systems, for use in Client B's pelletization furnaces, was underway, with the Company's engineers onsite at the Client's iron ore facility. The commissioning process includes installation, start-up, and site acceptance testing (SAT). "Client B" is the customer to whom the Company previously announced that it had shipped four 1 MW plasma torch systems for use in Client B's iron ore pelletization furnaces, for trials toward potentially replacing fossil-fuel burners with plasma torches in the Client's furnaces.

This project continues to move forward. The Client recently suffered a series of unfortunate technical events that caused delays of several weeks, as a result of damaging regional torrential rain storms and flooding that caused significant impairment to the facility's electrical system and furnace components. Repairs have been ongoing. The Company's plasma torches have been installed and activated, and the final commissioning and site acceptance testing has resumed, with expectation for final SAT completion within the next few weeks or sooner.

Pyro Green-Gas: The Company's wholly-owned subsidiary is expected to sign a contract with an approximate value of between $10-$15 million in connection with a renewable natural gas project.

Aluminum Remelting Furnaces: The Company has been working on the development of aluminum remelting furnace solutions using plasma, for use by secondary aluminum producers or any manufacturer of aluminum components that uses recycled or scrap aluminum.

With gas-fired furnaces responsible for much of the scope 1 emissions of secondary aluminum production, aluminum companies have been searching for solutions that can help in the decarbonization efforts of aluminum remelting and cast houses.

The Company has two concepts: the retro-fitting of plasma torches in existing remelting and cast house furnaces that currently use other forms of heating, such as natural gas; and the manufacturing and sale of a PyroGenesis produced furnace based off the Company's existing Drosrite metal recovery furnace design, which has been in use commercially for several years.

The Company has been working with a number of different companies over the past few years towards these goals. The results from the conclusion of recent major tests, conducted in conjunction with these companies, have been very positive, and negotiations are underway for next step deployments and sales, with announcements forthcoming.

Status as a Dual-Listed Publicly Traded Company

As part of the Company's proactive risk management strategy, it is currently evaluating the costs and benefits of maintaining a dual listing on both Nasdaq and the TSX. This ongoing evaluation entails an analysis of several key factors, including (i) the financial costs associated with being on each exchange, such as insurance costs, regulatory compliance costs, legal fees, and accounting fees, (ii) the volume of trading on both exchanges, and (iii) the regulatory and compliance requirements of each exchange.

Costs to PyroGenesis associated to its dual listing in the US are considerable, with incremental US-specific fees related to directors & officer insurance, legal, listing and filings, and accounting, of more than $2.2 million.

The Company has until November 20, 2023 to regain the Nasdaq's minimum US$1 bid compliance for ten consecutive trading days. Management will continue to monitor the situation and conduct its analysis, and will provide material updates as they occur.

Please note that projects or potential projects previously announced that do not appear in the above summary updates should not be considered as at risk. Noteworthy developments can occur at any time based on project stages, and the information presented above is a reflection of information on hand.

Financial Summary

Revenues

PyroGenesis recorded revenue of $3.0 million in the second quarter of 2023 ("Q2, 2023"), representing a decrease of $2.8 million compared with $5.8 million recorded in the second quarter of 2022 ("Q2, 2022"). Revenue for the six-month period ended June 30, 2023, was $5.6 million, a decrease of $4.4 million over revenue of $10.1 million compared to the same period in 2022.

Revenues recorded in the three and six-months ended June 30, 2023, were generated primarily from:

Revenues recorded in Q2 2023 were generated primarily from:

- PUREVAP™ related sales of $445,840 (2022 Q2 - $820,972)
- DROSRITE™ related sales of $115,325 (2022 Q2 - $436,538)
- Development and support services related to systems supplied to the US Navy $813,125 (2022 Q2 - $591,099)
- Torch related sales of $561,942 (2022 Q2 - $1,707,152)
- Refrigerant destruction (SPARC™) related sales of $187,444(2022 Q2 – $0)
- Biogas upgrading & pollution controls of $618,070 (2022 Q2 - $2,181,107)
- Other sales and services $297,733 (2022 Q2 - $110,312)

Q2, 2023 revenues decreased by $2.8 million, mainly as a result of:

- PUREVAP™ related sales decreased by $0.4 million due to the completion of the project and initial phase of testing, with additional three-month testing requested by the customer and currently ongoing,
- DROSRITE™ related sales decreased by $0.3 million due to continued customer delays in funding for the construction of the onsite facility. Based on the customers updated projected schedule and ongoing positive discussions, the new expectation aims to have the equipment installed, commissioned and fully operational by end of the year,
- Torch-related products and services decreased by $1.1 million, due to the final phase of the project being completed with the installation and commissioning at the customers facility. Three-month onsite support currently ongoing and scheduled to be completed by the end of the third quarter, with an option to extend to six and nine-month support at the discretion of the customer,
- Biogas upgrading and pollution controls related sales decreased by $1.6 million due to continuous testing to achieve desired results and due to the Company’s Italian subsidiary and a customer who both agreed on the completion of the project during the first quarter of 2023, with no additional revenues recorded by the Company’s Italian subsidiary for Q2, 2023 ($0.9 million – Q2, 2022),

During the six-month period ended June 30, 2023, revenues decreased by $4.4 million, mainly as a result of:

- PUREVAP™ related sales decreased by $0.2 million due to the completion of the project and initial phase of testing,
- DROSRITE™ related sales decreased by $1.1 million due to the impact of the continued customer delays in funding for the construction of the onsite facility,
- Development and support related to systems supplied to the U.S Navy decreased by $0.2 million due to remaining project milestones mainly related to inspection, packaging and shipment of the equipment to our customer in order to move forward with installation and commissioning,
- Torch-related products and services decreased by $0.9 million, due to the final phase of the project being completed with the installation and commissioning at the customers facility. Three-month onsite support currently ongoing and scheduled to be completed by the end of the third quarter, with an option to extend to six and nine-month support at the discretion of the customer,
- Biogas upgrading and pollution controls related sales decrease of $2.5 million is due to continuous testing to achieve desired results and due to the Company’s Italian subsidiary and a customer who both agreed on the completion of the project during the first quarter of 2023, with no additional revenues recorded by the Company’s Italian subsidiary for the six-month period ended June 30, 2023 ($1.2 million – six-month period ended June 30, 2022),

As of August 10, 2023, revenue expected to be recognized in the future related to backlog of signed and/or awarded contracts is $33.9 million. 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 and Gross Margins

Cost of sales and services were $1.9 million in Q2 2023, representing a decrease of $1.4 million compared to $3.3 million in Q2, 2022, primarily due to a decrease of $0.1 million in subcontracting (Q2, 2022 - $0.4 million), attributed to additional work being completed in-house, a decrease in direct materials and manufacturing overhead & other of $1.3 million and $0.4 million, respectively (Q2, 2022 - $1.6 million and $0.7 million), due to lower levels of material required based on the decrease in product and service-related revenues.

The gross margin for Q2, 2023 was $1.1 million or 37% of revenue compared to a gross margin of $2.5 million or 43% of revenue for Q2 2022, the decrease in gross margin was mainly attributable to the impact on foreign exchange charge on materials.

During the six-month period ended June 30, 2023, cost of sales and services were $4.0 million compared to $6.5 million for the same period in the prior year, the $2.5 million decrease is primarily due to a decrease of $0.8 million in subcontracting (six-month period ended June 30, 2022 - $1.0 million), attributed to additional work being completed in-house, a decrease in direct materials and manufacturing overhead & other of $1.8 million and $0.3 million respectively (six-month period ended June 30, 2022 - $2.7 million and $0.9 million respectively), due to lower levels of material required based on the decrease in product and service-related revenues and the negative impact of the foreign exchange charge on material of $0.2 million.

The amortization of intangible assets for Q2, 2023 was $0.2 million compared to $0.2 million for Q2, 2022, and during the six-month period ended June 30, 2023, was $0.4 million compared to $0.4 million for the same period in the prior year. This expense 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 the intangible assets will be amortized over the expected useful lives.

As a result of 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. The costs of sales and services are in line with management's expectations and with the nature of the revenue.

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 Q2, 2023 were $6.4 million, representing a decrease of $0.7 million compared to $7.1 million for Q2, 2022. The decrease is mainly a result of share-based compensation expense decreased by $0.9 million (Q2, 2022 - $1.6 million), which is a non-cash item and relates mainly to a Q4 2021, and 2022 grants not repeated in 2023. Professional fees are $1.0 million which decreased by $0.8 million (Q2, 2022 - $1.7 million), due to reduction in accounting fees, legal and investor relation expenses. Other expenses were favourable by $0.5 million (Q2, 2022 - $1.3 million) due to a net reduction of insurance expenses, interest and bank charges. Government grants are $0.2 million which increased by $0.2 million ($Q2, 2022 – $0.06 million) due to higher levels of activities supported by such grants. The expected credit loss & bad debt increased to $0.7 million in Q2, 2023 and is due to an increase in the allowance for expected credit loss, whereby no such expense was recorded in the comparable period.

During the six-month period ended June 30, 2023, SG&A expenses were $14.0 million, representing an increase of $1.3 million compared to $12.7 million for the same period in the prior year. The increase is mainly a result of employee compensation increasing to $5.1 million (six-month period ended June 30, 2022 - $3.5 million) mainly caused by additional headcount. Expected credit loss & bad debt increased to $2.1 million and is due to an increase in the allowance for expected credit loss increase of $2.1 million and the increase of the impact on foreign exchange charge on materials of $0.3 million, offset by the decreases of $0.2 million in professional fees which are $2.2 million, compared to $2.4 million in the comparable period, and the decrease in other expenses to $1.6 million from $2.4 million, a variation of $0.7 million, compared to the six-month period ended June 30, 2022.

Share-based compensation expense for the three and six-month periods ended June 30, 2023, was $0.7 million and $1.7 million, respectively (six-month period ended June 30, 2022 - $1.6 million and $3.3 million, respectively), a decrease of $0.9 million and $1.6 million respectively, which is a non-cash item and relates mainly to a Q4 2021, and 2022 grants not repeated in 2023.

Share-based payments expenses as explained above, are non-cash expenses and are directly impacted by the vesting structure of the stock option plan whereby options vest between 10% and up to 100% on the grant date and may require an immediate recognition of that cost.

Depreciation on Property and Equipment

The depreciation on property and equipment for the three and six-month periods ended June 30, 2023, increased to $0.2 million and $0.3 million, respectively, compared with $0.1 million and $0.3 million for the same periods in the prior year. The expense is comparable to the same quarters last year and the increase is primarily due to nature and useful lives of the property and equipment being depreciated.

Research and Development ("R&D") Expenses

During the three-months ended June 30, 2023, the Company incurred $0.7 million of R&D costs on internal projects, a decrease of $0.06 million as compared with $0.8 million in Q2, 2022. The decrease in Q2, 2023 is primarily related to a decrease in subcontracting and materials and equipment to $0.1 million (Q2, 2022 - $0.5 million), which is also attributable to the increase in employee compensation to $0.4 million (Q2, 2022 - $0.2 million) due to an increase in R&D activities which required additional labour resources and other expenses of $0.2 million related to equipment rentals compared to $0.1 million in Q2, 2022, an increase of $0.1 million.

During the six-months ended June 30, 2023, the Company incurred $1.1 million of R&D costs on internal projects, a decrease of $0.2 million as compared to $1.3 million for the same period in the prior year. The decrease is mainly due to lower levels of R&D activities requiring subcontracting and material and equipment, decreasing to $0.2 million as compared with $0.7 million, a decrease of $0.5 million, which is offset by the increase in other expenses to $0.4 million compared to $0.2 million for the same period in the prior year.

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 costs for Q2 2023 represent an income of $0.9 million as compared with an expense of $0.2 million for Q2, 2022, representing a favourable variation of $1.1 million year-over-year. The decrease in finance expenses in Q2 2023, is primarily due as the Company determined that a milestone related to the business combination would not be achieve and therefore, a reversal of the liability was recorded.

During the six-month period ended June 30, 2023, the finance costs represent an income of $1.8 million as compared with an expense of $0.3 million for the 2022 comparable period, representing a favourable variation of $2.2 million year-over-year. The decrease in finance expenses is primarily due to the revaluation of balance due on business combination due to the Company's Italian subsidiary and a customer who both agreed on the final acceptance of a contract, prior to final completion and the Company determined that a milestone related to the business combination would not be achieved. As a result, the contract did not attain the pre-determined milestone in connection with the balance due on business combination, and reversals of the liabilities were recorded.

Strategic Investments

During the three-months ended June 30, 2023, the adjustment to fair market value of strategic investments for Q2, 2023 resulted in a loss of $1.2 million compared to a loss in the amount of $7.5 million in Q2, 2022, a favorable variation of $6.2 million.

During the six-months ended June 30, 2023, the adjustment to fair market value of strategic investments resulted in a loss of $0.9 million compared to a loss in the amount of $6.3 million for the same period in the prior year, a favorable variation of $5.4 million. The decrease in loss for the three and six-month periods ended June 30, 2023, is attributable to the variation of the market value of the common shares and warrants owned by the Company of HPQ Silicon Inc.

Comprehensive Loss

The comprehensive loss for Q2, 2023 of $6.3 million compared to a loss of $13.0 million, in Q2, 2022, represents a variation of $6.7 million, and is primarily attributable to the factors described above, which have been summarized as follows:

- a decrease in product and service-related revenue of $2.8 million arising in Q2, 2023,
- a decrease in cost of sales and services of $1.4 million, primarily due to a decrease in subcontracting, direct materials, and manufacturing overhead and other, offset by the increase in employee compensation, foreign exchange charge on materials, and amortization of intangible assets,
- a decrease in SG&A expenses of $0.7 million arising in Q2, 2023, was primarily due to a decrease in professional fees, office and general and other expenses, offset by increases in employee compensation, travel, depreciation of property and equipment, depreciation of ROU assets, foreign exchange charge on materials, and the allowance for credit loss of $0.7 million,
- a decrease in share-based expenses of $0.9 million
- a decrease in R&D expenses of $0.06 million primarily due to a decrease in subcontracting, materials and equipment, and an increase in employee compensation, investment tax credits and other expenses,
- a decrease in finance costs (income), net of $1.1 million in Q2, 2023 primarily due to the revaluation of balance due on business combination,
- a favourable variation in the fair market value of strategic investments of $6.2 million,
- a decrease in income taxes of $0.02 million in Q2, 2023.

The comprehensive loss for the six-month period ended June 30, 2023, of $12.5 million compared to a loss of $17.1 million, for the same period in the prior year, represents a variation of $4.6 million, and is primarily attributable to the factors described above, which have been summarized as follows:

- a decrease in product and service-related revenue of $4.4 million,
- a decrease in cost of sales and services of $2.5 million, primarily due to a decrease in subcontracting, direct materials, manufacturing overhead and other, and investment tax credits, offset by the increase in employee compensation foreign exchange charge on materials, and amortization of intangible assets,
- an increase in SG&A expenses of $1.3 million was primarily due to an increase in employee compensation, travel, depreciation in property and equipment, foreign exchange charge on materials, and the allowance for credit loss of $2.1 million which is offset by a decrease in professional fees, office and general, and other expenses,
- a decrease in share-based expenses of $1.6 million
- a decrease in R&D expenses of $0.2 million primarily due to a decrease in subcontracting and material and equipment and an increase in employee compensation, investment tax credits and other expenses,
- a decrease in net finance costs (income) of $2.2 million is primarily due to the revaluation of balance due on business combination,
- a favourable variation in the fair market value of strategic investments of $5.4 million,
- a decrease in income taxes of $0.08 million.

Liquidity and Capital Resources

As at June 30, 2023, the Company had cash of $0.8 million, included in the net working capital deficiency of $3.2 million. Certain working capital items such as billings in excess of costs and profits on uncompleted contracts do not represent a direct outflow of cash. The Company expects that with its cash, liquidity position, the proceeds available from the strategic investment and access to capital markets it will be able to finance its operations for the foreseeable future.

The Company's term loan balance at June 30, 2023 was $391,564, and varied only slightly since December 31, 2022. The increase from January 1, 2022 to December 31, 2022, was mainly attributable to the additional proceeds received on the Economic Development Agency of Canada loan, which is interest free and will remain so, until the balance is paid over the 60-month period ending March 2029. The average interest expense on the other term loans was 7.2% in the period. The Company does not expect changes to the structure of term loans in the next twelve-month period. The Company maintained one credit facilities which bears interest at a variable rate of prime plus 1%, therefore 7.95% at June 30, 2023. The Company reimbursed a portion of the credit facilities during Q2 2023, and extended the due date of the remaining balance, while maintaining the similar conditions.

About PyroGenesis Canada Inc.

PyroGenesis Canada Inc., a high-tech company, is a proud 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 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 of PyroGenesis are ISO 9001:2015 and AS9100D certified, having been ISO certified since 1997. For more information, please visit: www.pyrogenesis.com.

Cautionary and Forward-Looking Statements

This press release contains "forward-looking information" and "forward-looking statements" (collectively, "forward-looking statements") within the meaning of applicable securities laws, including, without limitation, statements regarding anticipated use of the net proceeds of the Private Placement. In some cases, but not necessarily in all cases, forward-looking statements can be identified by the use of forward-looking terminology such as "plans", "targets", "expects" or "does not expect", "is expected", "an opportunity exists", "is positioned", "estimates", "intends", "assumes", "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", "will" or "will be taken", "occur" or "be achieved". In addition, any statements that refer to expectations, projections or other characterizations of future events or circumstances contain forward-looking statements. Forward-looking statements are not historical facts, nor guarantees or assurances of future performance but instead represent management's current beliefs, expectations, estimates and projections regarding future events and operating performance.

Forward-looking statements are necessarily based on a number of opinions, assumptions and estimates that, while considered reasonable by the Company as of the date of this release, are subject to inherent uncertainties, risks and changes in circumstances that may differ materially from those contemplated by the forward-looking statements. Important factors that could cause actual results to differ, possibly materially, from those indicated by the forward-looking statements include, but are not limited to, the risk factors identified under "Risk Factors" in the Company's latest annual information form, and in other periodic filings that the Company has made and may make in the future with the securities commissions or similar regulatory authorities, all of which are available under the Company's profile on SEDAR at www.sedar.com, or at www.sec.gov. These factors are not intended to represent a complete list of the factors that could affect the Company. However, such risk factors should be considered carefully. There can be no assurance that such estimates and assumptions will prove to be correct. You should not place undue reliance on forward-looking statements, which speak only as of the date of this release. The Company undertakes no obligation to publicly update or revise any forward-looking statement, 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.

FURTHER INFORMATION

Additional information relating to Company and its business, including the 2022 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.

For further information please contact:

Rodayna Kafal, Vice President, IR/Comms. and Strategic BD

Phone: (514) 937-0002, E-mail: ir@pyrogenesis.com
RELATED LINK: http://www.pyrogenesis.com/

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[1] https://csimarket.com/Industry/industry_Profitability_Ratios.php?ind=207
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[3] https://csimarket.com/Industry/industry_Profitability_Ratios.php?ind=107
[4] https://csimarket.com/Industry/industry_Profitability_Ratios.php?ind=201

A photo accompanying this announcement is available at https://www.globenewswire.com/NewsRoom/AttachmentNg/8558cbbd-e9ed-45db-8b9b-69bdffa486a6

PyroGenesis Canada Inc.

Condensed Consolidated Interim

Financial Statements

As at June 30, 2023 and for the three and six-month period ended June 30, 2023 and 2022

(Unaudited)

The accompanying unaudited condensed consolidated financial statements of PyroGenesis Canada Inc. have been prepared by and are the responsibility of the Company's management. The Company's independent auditor has not performed a review of these unaudited condensed consolidated interim financial statements for the period ended June 30, 2023.

June 30, 2023.

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

	Notes	**June 30, 2023**	December 31, 2022
		$	$
Assets			
Current assets			
Cash		**829,583**	3,445,649
Accounts receivable	6	**11,623,765**	18,624,631
Costs and profits in excess of billings on uncompleted contracts	7	**1,199,614**	1,051,297
Inventory	15	**1,820,248**	1,876,411
Investment tax credits receivable	8	**248,658**	276,404
Income taxes receivable		**16,140**	14,169
Current portion of deposits		**540,621**	432,550
Current portion of royalties receivable		**588,970**	455,556
Contract assets		**472,134**	499,912
Prepaid expenses		**2,205,903**	771,603
Total current assets		**19,545,636**	27,448,182
Non-current assets			
Deposits		**46,107**	46,053
Strategic investments	9	**4,208,521**	6,242,634
Property and equipment		**3,125,423**	3,393,452
Right-of-use assets		**4,565,136**	4,818,744
Royalties receivable		**903,490**	952,230
Intangible assets		**1,775,330**	2,104,848
Goodwill		**2,660,607**	2,660,607
Total assets		**36,830,250**	47,666,750
Liabilities			
Current liabilities			
Bank indebtedness		**332,189**	991,902
Accounts payable and accrued liabilities	10	**9,876,254**	10,115,870
Billings in excess of costs and profits on uncompleted contracts	11	**7,740,905**	9,670,993
Current portion of term loans	12	**77,226**	69,917
Current portion of lease liabilities		**2,794,413**	2,672,212
Balance due on business combination		**1,708,161**	2,088,977
Income taxes payable		**184,854**	187,602
Total current liabilities		**22,714,002**	25,797,473
Non-current liabilities			
Lease liabilities		**2,581,723**	2,861,482
Term loans	12	**314,338**	320,070
Balance due on business combination		**–**	1,818,798
Total liabilities		**25,610,063**	30,797,823
Shareholders' equity	13		
Common shares		**90,670,080**	85,483,223
Warrants		**223,200**	223,200
Contributed surplus		**26,202,688**	24,546,960
Accumulated other comprehensive income		**(3,578)**	402
Deficit		**(105,872,203)**	(93,384,858)
Total shareholders' equity		**11,220,187**	16,868,927
Total liabilities and shareholders' equity		**36,830,250**	47,666,750

The accompanying notes form an integral part of the condensed consolidated interim financial statements. Contingent liabilities, Note 20

PyroGenesis Canada Inc.
Condensed Consolidated Interim Statements of Comprehensive Loss
(Unaudited)
(In Canadian dollars)

	Notes	Three months ended June 30, 2023	Three months ended June 30, 2022	Six months ended June 30, 2023	Six months ended June 30, 2022
		$	$	**$**	$
Revenues	5	**3,039,479**	5,847,180	**5,631,101**	10,053,942
Cost of sales and services	15	**1,927,664**	3,347,907	**3,992,713**	6,502,947
Gross profit		**1,111,815**	2,499,273	**1,638,388**	3,550,995
Expenses					
Selling, general and administrative	15	**6,410,729**	7,091,535	**13,967,837**	12,703,903
Research and development, net		**742,685**	804,564	**1,065,901**	1,286,996
		7,153,414	7,896,099	**15,033,738**	13,990,899
Net loss from operations		**(6,041,599)**	(5,396,826)	**(13,395,350)**	(10,439,904)
Changes in fair value of strategic investments	9	**(1,240,162)**	(7,477,865)	**(939,271)**	(6,301,110)
Finance income (costs), net	16	**933,022**	(156,113)	**1,847,276**	(340,013)
Net loss before income taxes		**(6,348,739)**	(13,030,804)	**(12,487,345)**	(17,081,027)
Income taxes		**–**	19,542	**–**	76,095
Net loss		**(6,348,739)**	(13,050,346)	**(12,487,345)**	(17,157,122)
Other comprehensive income (loss)					
Items that will be reclassified subsequently to profit or loss					
Foreign currency translation gain (loss) on investments in foreign operations		**15,031**	10,815	**(3,980)**	48,471
Comprehensive loss		**(6,333,708)**	(13,039,531)	**(12,491,325)**	(17,108,651)
Loss per share					
Basic	17	**(0.04)**	(0.08)	**(0.07)**	(0.10)
Diluted	17	**(0.04)**	(0.08)	**(0.07)**	(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
(Unaudited)
(In Canadian dollars)

	Notes	Number of common shares	Common shares	Warrants	Contributed surplus	Accumulated other comprehensive income	Deficit	Total
			$	**$**	**$**	**$**	**$**	**$**
Balance - December 31, 2022		**173,580,395**	**85,483,223**	**223,200**	**24,546,960**	**402**	**(93,384,858)**	**16,868,927**
Shares issued upon exercise of stock options	13	**300,000**	**153,000**	–	–	–	–	**153,000**
Private placement, net of issuance costs	13	**5,000,000**	**4,960,483**	–	–	–	–	**4,960,483**
Share-based payments	13	**–**	**73,374**	**–**	**1,655,728**	**–**	**–**	**1,729,102**
Other comprehensive loss		**–**	**–**	**–**	**–**	**(3,980)**	**–**	**(3,980)**
Net loss		**–**	**–**	**–**	**–**	**–**	**(12,487,345)**	**(12,487,345)**
Balance – June 30, 2023		**178,880,395**	**90,670,080**	**223,200**	**26,202,688**	**(3,578)**	**(105,872,203)**	**11,220,187**
Balance - December 31, 2021		170,125,795	82,104,086	–	19,879,055	3,444	(61,217,831)	40,768,754
Share-based payments	13	–	–	–	3,290,670	–	–	3,290,670
Other comprehensive income		–	–	–	–	48,471	–	48,471
Net loss		–	–	–	–	–	(17,157,122)	(17,157,122)
Balance – June 30, 2022		170,125,795	82,104,086	–	23,169,725	51,915	(78,374,953)	26,950,773

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

PyroGenesis Canada Inc.
Condensed Consolidated Interim Statements of Cash Flows
(Unaudited)
(In Canadian dollars)

	Notes	Three months ended June 30, **2023**	2022	Six months ended June 30, **2023**	2022
		$	$	**$**	$
Cash flows provided by (used in)					
Operating activities					
Net loss		**(6,348,739)**	(13,050,346)	**(12,487,345)**	(17,157,122)
Adjustments for:					
Share-based payments	15	**740,940**	1,621,040	**1,729,102**	3,290,670
Depreciation of property and equipment	15	**158,007**	148,412	**318,370**	291,402
Depreciation of right-of-use assets	15	**164,992**	155,398	**321,353**	321,622
Amortization of intangible assets	15	**221,752**	218,759	**443,504**	437,518
Amortization of contract assets		**2,180**	54,221	**27,778**	95,350
Finance costs (income)	16	**(933,022)**	156,113	**(1,847,276)**	340,013
Change in fair value of investments		**1,240,162**	7,477,865	**939,271**	6,301,110
Income taxes		**–**	19,542	**–**	76,095
Unrealized foreign exchange		**32,438**	9,716	**14,290**	42,212
		(4,721,290)	(3,189,280)	**(10,540,953)**	(5,961,130)
Net change to working capital items	14	**3,800,405**	437,164	**3,089,102**	(4,528,614)
		(920,885)	(2,752,116)	**(7,451,851)**	(10,489,744)
Investing activities					
Additions to property and equipment		**(5,042)**	(66,054)	**(50,341)**	(192,226)
Additions to right-of-use assets		**(67,745)**	–	**(67,745)**	–
Additions to intangible assets		**(77,961)**	(38,280)	**(113,986)**	(62,968)
Purchase of strategic investments	9	**(559,460)**	(3,604,000)	**(559,460)**	(3,604,000)
Disposal of strategic investments		**1,322,282**	1,555,846	**1,654,302**	2,952,847
		612,074	(2,152,488)	**862,770**	(906,347)
Financing activities					
Bank indebtedness		**(755,064)**	(2,295)	**(659,713)**	941,180
Interest paid		**(50,569)**	(141,946)	**(186,989)**	(239,456)
Repayment of term loans		**(15,191)**	(8,223)	**(15,191)**	(16,389)
Repayment of lease liabilities		**(59,619)**	(145,415)	**(157,558)**	(192,575)
Repayment of balance due on business combination		**–**	(217,778)	**(100,000)**	(217,778)
Proceeds from issuance of shares upon exercise of stock options		**153,000**	–	**153,000**	–
Proceeds from issuance of term loans		**–**	96,157	**–**	203,857
Proceeds from private placement, net of issuance costs		**–**	–	**4,960,483**	–
		(727,443)	(419,500)	**3,994,032**	478,839
Effect of exchange rate changes on cash denominated in foreign currencies		**(21,184)**	2,988	**(21,017)**	6,247
Net decrease in cash and cash equivalents		**(1,057,438)**	(5,321,116)	**(2,616,066)**	(10,911,005)
Cash and cash equivalents - beginning of period		**1,887,021**	6,612,624	**3,445,649**	12,202,513
Cash and cash equivalents - end of period		**829,583**	1,291,508	**829,583**	1,291,508
Supplemental cash flow disclosure					
Non-cash transactions:					
Interest accretion on and revaluation of balance due on business combination		**(1,062,196)**	44,115	**(2,099,614)**	127,088
Accretion interest on royalties receivable		**43,189**	37,549	**84,674**	38,913
Accretion on term loan		**8,502**	7,601	**16,768**	12,382

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. Going concern

These condensed consolidated financial statements have been prepared on the going concern basis, which presumes that the Company will be able to continue its operations for the foreseeable future and will be able to realize its assets and discharge its liabilities in the normal course of business for the foreseeable future.

The Company is subject to certain risks and uncertainty associated with the achievement of profitable operations such as the successful signing and delivery of contracts and access to adequate financing.

The Company has incurred, in the last years, operating losses and negative cash flows from operations, and as a result, the Company has an accumulated deficit of $105,872,203 as at June 30, 2023, ($93,384,858 as at December 31, 2022). Furthermore, there have been unexpected delays in the collection of certain accounts receivable from contracts closed in a prior year. This has resulted in a shortfall in cash flows from operating activities that would be used in funding the Company's operations.

As at June 30, 2023, the Company has working capital deficiency of $3,168,366 ($1,650,709 as at December 31, 2022) including cash of $829,583 ($3,445,649 as at December 31, 2022). The working capital is net of an allowance for credit losses amounting to $6,303,840 ($5,023,283 as at December 31, 2022) as further described in Notes 6 and 7. The Company's business plan is dependent upon the successful completion of contracts and also the receipt of payments from certain contracts closed in a prior year and expects these payments to be made during fiscal 2023, as well as the achievement of profitable operations through the signing, completion and delivery of additional contracts or a reduction in certain operating expenses. In the absence of this, the Company is dependent upon raising additional funds to finance operations within and beyond the next twelve months. The Company has been successful in securing financing in the past and has relied upon external financing to fund its operations, primarily through the issuance of equity, debt and convertible debentures. The Company completed a private placement in October 2022 for an amount of $1,318,980 and also completed another private placement in March 2023 for net proceeds $4,960,483 (Note 13). In addition, in July 2023, the Company also completed a brokered private placement of convertible debenture units for gross proceeds of $3,030,000 (Note 23). While the Company has been successful in securing financing, raising additional funds is dependent on a number of factors, some of which are outside the Company's control, and therefore there is no assurance that it will be able to do so in the future or that these sources will be available to the Company or that they will be available on terms which are acceptable to the Company. These conditions indicate the existence of a material uncertainty that may cast significant doubt about the Company's ability to continue operating as a going concern.

The condensed consolidated financial statements have been prepared on a going concern basis and do not include any adjustments to the amounts and to classifications of the assets and liabilities that might be necessary should the Company be unable to achieve its plan and continue in business. If the going concern assumption were not appropriate, adjustments, which could be material, would be necessary to the carrying value of assets and liabilities, the reported expenses, and the classification of items on the condensed consolidated statement of financial position.

3. Basis of preparation

(a) Statement of compliance

These financial statements have been prepared in accordance with International Accounting Standards ("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, 2022.

These financial statements were approved and authorized for issuance by the Board of Directors on August 10, 2023.

(b) Functional and presentation currency

These consolidated financial statements are presented in Canadian dollars, which is the functional currency of PyroGenesis, Drosrite International LLC and Pyro Green-Gas Inc. The functional currency of Airscience Italia SRL is the Euro whereas the functional currency of Airscience Technologies Private Limited is the Indian rupee.

(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 PyroGenesis 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. All transactions and balances between the Company and its subsidiaries have been eliminated upon consolidation.

The accounting policies disclosed in the December 31, 2022 year-end consolidated financial statements have been applied consistently in the preparation of these condensed consolidated interim financial statements. Finance income (costs) and changes in fair value of strategic investments are excluded from the loss from operations in the consolidated statements of comprehensive loss.

4. Significant accounting judgments, estimates and assumptions

The significant judgments, estimates and assumptions applied by the Company 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, 2022.

(In Canadian dollars)

5. Revenues

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

	Three months ended June 30,		Six months ended June 30,	
	2023	2022	**2023**	2022
	$	$	**$**	$
High purity metallurgical grade silicon & solar grade silicon from quartz (PUREVAP™)	**445,840**	820,972	**973,439**	1,168,983
Aluminium and zinc dross recovery (DROSRITE™)	**115,325**	436,538	**205,552**	1,336,617
Development and support related to systems supplied to the U.S. Navy	**813,125**	591,099	**1,165,228**	1,336,359
Torch-related products and services	**561,942**	1,707,152	**1,732,690**	2,591,909
Refrigerant destruction (SPARC™)	**187,444**	–	**255,292**	–
Biogas upgrading and pollution controls	**618,070**	2,181,107	**650,965**	3,171,152
Other sales and services	**297,733**	110,312	**647,935**	448,922
	3,039,479	5,847,180	**5,631,101**	10,053,942

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

	Three months ended June 30,		Six months ended June 30,	
	2023	2022	**2023**	2022
	$	$	**$**	$
Revenue from contracts with customers:				
Sales of goods under long-term contracts recognized over time	**2,319,871**	5,735,493	**4,869,091**	9,408,591
Sales of goods at a point of time	**719,608**	111,687	**762,010**	645,351
	3,039,479	5,847,180	**5,631,101**	10,053,942

See Note 22 for sales by geographic area.

Transaction price allocated to remaining performance obligations

As at June 30, 2023, revenue expected to be recognized in the future related to performance obligations that are unsatisfied (or partially satisfied) at the reporting date is $24,752,415 ($26,741,550 as at December 31, 2022). 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.

(In Canadian dollars)

6. Accounts receivable

Details of accounts receivable based on past due terms were as follows:

	June 30, 2023	December 31, 2022
	$	$
Current	**4,364,320**	6,578,269
1 – 30 days	**206,156**	15,959
31 – 60 days	**30**	57,944
61 – 90 days	**16,781**	718,239
Greater than 90 days	**11,538,272**	13,790,716
Holdback receivable[1]	**1,155,508**	1,536,115
Total trade accounts receivable	**17,281,067**	22,697,242
Allowance for expected credit loss	**(5,967,840)**	(4,693,283)
Other receivables	**274,890**	240,560
Sales tax receivable	**35,648**	380,112
	11,623,765	18,624,631

[1] Holdbacks are non-interest bearing, non-secured and represents an amount retained by the customers, based on milestones defined in the contract, and are not due until final acceptance of the contract. stage of the project or the final inspection of the delivered goods. These amounts are agreed in advance and the terms of payment may exceed the general terms of payment of the Company. The Company only recognizes an invoice when it can reasonably determine that these inspection and acceptance steps have been met.

As at June 30, 2023 the allowance for expected credit loss on trade accounts receivable is $5,967,840 ($4,693,283 as at December 31, 2022). The amount as at June 30, 2023, includes $5,061,000 attributable to one specific customer, whereby the carrying amount has been reduced from $10,536,701 to $5,475,701. The remaining credit allowance is $906,840 and attributable to all other trade accounts, whereby the carrying value was reduced from $6,744,367 to $5,837,527. On the basis of the Company's expected credit loss policy, the allowance was determined generally by applying a loss rate of 1% on balances 1-30 days past the invoice date, 2% for 31-60 days, 3% for 61-90 days and a minimum of 10% for those beyond 90 days. Specific consideration was applied for situations where the receivable is a holdback on a contract, and also for customers that have exceeded normal payment terms.

The closing balance of the trade receivables credit loss allowance as at June 30, 2023 reconciles with the trade receivables credit loss allowance opening balance as follows:

	$
Loss allowance at December 31, 2021	**520,000**
Loss recognized during the year	**4,150,000**
Foreign exchange	**23,283**
Loss allowance at December 31, 2022	**4,693,283**
Loss recognized during the year[1]	**1,273,000**
Foreign exchange	**1,557**
Loss allowance at June 30, 2023	**5,967,840**

[1] For the three-month period ended June 30, 2023. the loss recognized was $517,000 and $756,000 for the six-month period ended June 30, 2023.

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

As at June 30, 2023, the Company had sixteen contracts with total billings of $15,770,481 which were less than total costs incurred and had recognized cumulative revenue of $17,306,095 since those projects began. This compares with eighteen contracts with total billings of $10,475,299 which were less than total costs incurred and had recognized cumulative revenue of $11,856,596 as at December 31, 2022.

The net amount of $1,199,614 as at June 30, 2023 includes an expected credit loss allowance of $336,000 ($330,000 as at December 31, 2022). On the basis of the Company's expected credit loss policy, the allowance was determined generally by applying a loss rate of 2% on all balances, and adjusting for specific situations, such as past due customers, whereby the loss rate varied from 25% to 50%.

(In Canadian dollars)

Changes in costs and profits in excess of billings on uncompleted contracts during the six-month period ended June 30, 2023, are explained by $552,422 recognized at the beginning of the period being transferred to accounts receivable, $706,739 resulting from changes in the measure of progress and $6,000 due to the variation of the expected credit loss allowance.

8. Investment tax credits

Investment tax credits earned, for the three and six-month periods ended June 30, 2023, amount to $59,283, and $79,224, respectively ($60,935 and $71,433) for the three and six-month periods ended June 30, 2022, respectively.

In the six-month period ended June 30, 2023, of the $79,224 of investment tax credits earned $44,538 was recorded against cost of sales and services, $19,686 against research and development expenses and $15,000 against selling, general and administrative expenses. During the six-month period ended June 30, 2022, the Company earned $71,433 of investment tax credits, whereby $24,388 was recognized against cost of sales and services, $32,045 against research and development expenses and $15,000 against selling, general and administrative expenses.

9. Strategic investments

	June 30, 2023	December 31, 2022
	$	$
Beauce Gold Fields ("BGF") shares – level 1	**46,160**	56,419
HPQ Silicon Inc. ("HPQ") shares - level 1	**4,162,361**	5,415,749
HPQ warrants – level 3	**–**	770,466
	4,208,521	6,242,634

The change in the strategic investments is summarized as follows:

	("BGF") shares – level 1		("HPQ") shares - level 1		HPQ warrants – level 3		Total
	Quantity	$	Quantity	$	Quantity	$	$
Balance, December 31, 2021	1,025,794	123,095	26,752,600	12,306,196	9,594,600	2,472,368	14,901,659
Additions	–	–	6,800,000	3,196,000	6,800,000	408,000	3,604,000
Disposed	–	–	(11,447,500)	(3,922,244)	–	–	(3,922,244)
Change in the fair value	–	(66,676)	–	(6,164,203)	–	(2,109,902)	(8,340,781)
Balance, December 31, 2022	**1,025,794**	**56,419**	**22,105,100**	**5,415,749**	**16,394,600**	**770,466**	**6,242,634**
Additions	**–**	**–**	**5,594,600**	**651,406**	**(5,594,600)**	**(91,946)**	**559,460**
Disposed	**–**	**–**	**(7,395,500)**	**(1,654,302)**	**–**	**–**	**(1,654,302)**
Change in the fair value	**–**	**(10,258)**	**–**	**(250,493)**	**–**	**(678,520)**	**(939,271)**
Balance, June 30, 2023	**1,025,794**	**46,161**	**20,304,200**	**4,162,360**	**10,800,000**	**–**	**4,208,521**

(In Canadian dollars)

At June 30, 2023 and December 31, 2022, the fair value of the HPQ warrants was measured using the Black-Scholes option pricing model using the following assumptions:

	June 30, 2023		**December 31, 2022**			
Number of warrants	4,000,000	6,800,000	1,200,000	4,394,600	4,000,000	6,800,000
Date of issuance	3-Sep-20	20-Apr-22	29-Apr-20	2-Jun-20	3-Sep-20	20-Apr-22
Exercise price ($)	0.61	0.60	0.10	0.10	0.61	0.60
Assumptions under the Black-Scholes model:						
Fair value of the shares ($)	0.21	0.21	0.25	0.25	0.25	0.25
Risk free interest rate (%)	3.79	3.79	4.03	4.03	4.03	4.03
Expected volatility (%)	75.55	79.28	80.55	73.74	76.85	74.58
Expected dividend yield	–	–	–	–	–	–
Contractual remaining life (in months)	2	10	4	5	8	16

Warrants are subject to a “Holder’s Exercise Limitation” clause, whereby the Company shall not affect any exercise of warrants, nor have the right to exercise any portion of the warrants to the extent that after giving effect to such issuance after exercise, the Company would beneficially own in excess of 9.99% of the HPQ common shares.

As at June 30, 2023, a loss from initial recognition of the warrants of $1,641,109 ($280,926 at December 31, 2022) has been deferred off balance sheet until realized.

10. Accounts payable and accrued liabilities

	June 30, 2023	December 31, 2022
	$	$
Accounts payable	**6,202,482**	6,065,996
Accrued liabilities	**2,393,809**	2,891,053
Sale commissions payable[1]	**817,050**	904,724
Accounts payable to the controlling shareholder and CEO	**462,913**	254,097
	9,876,254	10,115,870

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

11. 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 for the six months ending June 30, 2023, amounted to $30,895,545 ($37,374,909 as at December 31, 2022). Payments to date received for the six months ending June 30, 2023, were $38,636,450 on contracts in progress ($47,045,902 as at December 31, 2022).

Changes in billings in excess of costs and profits on uncompleted contracts during the six-month period ended June 30, 2023, is explained by $2,703,293 recognized at the beginning of the period being recognized as revenue, and a decrease of $773,206 resulting from cash received, excluding amounts recognized as revenue. The variation in billings in excess of costs and profits on uncompleted contracts during the six-month period ended June 30, 2022, is explained by $3,430,725 recognized at the beginning of the period being recognized as revenue, and an increase of $570,603 resulting from cash received, excluding amounts recognized as revenue.

(In Canadian dollars)

12. 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, 2022	320,070	11,617	8,300	50,000	389,987
Accretion	16,768	–	–	–	16,768
Payments	–	(6,891)	(8,300)	–	(15,191)
Balance, June 30, 2023	336,838	4,726	–	50,000	391,564
Less current portion	(22,500)	(4,726)	–	(50,000)	(77,226)
Balance, June 30, 2023	**314,338**	**–**	**–**	**–**	**314,338**

[1] Maturing in 2029, non-interest bearing, payable in equal instalments from April 2024 to March 2029.
[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 an automobile with a carrying amount of $4,318 at June 30, 2023.
[3] Matured in May 2023, payable in monthly instalments of $1,660, bore interest at 7.45%.
[4] Loan bearing no interest and no minimum repayment, if repaid by December 2023.

13. Shareholders' equity

Common shares and warrants

Authorized:

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

Issuance of units

On March 8, 2023, the Company completed a non-brokered private placement consisting of the issuance and sale of 5,000,000 units of the Company at a price of $1.00 per unit, for net proceeds of $4,960,483 (gross proceeds of $5,000,000). 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 $1.25 until March 7, 2025. The entire amount is allocated to the common shares as the fair value of the common shares on March 8, 2023 was $1.38.

Stock options

The Company has a stock option plan authorizing the Board of Directors to grant options to directors, officers, employees and consultants to acquire common shares of the Company at a price computed by reference to the closing market price of the shares of the Company on the business day before the Company notifies the stock exchanges of the grant of the option. The number of shares which may be granted to any one person shall not exceed 5% (2% for consultants) of total share capital over a twelve-month period.

(In Canadian dollars)

The following table sets out the activity in stock options:

	Number of options	Weighted average exercise price
		$
Balance – December 31, 2021	8,403,000	3.10
Granted	2,475,000	3.55
Exercised	(2,440,000)	0.58
Forfeited	(242,500)	4.07
Balance, December 31, 2022	8,195,500	3.96
Granted	**1,625,000**	**1.03**
Exercised[1]	**(300,000)**	**0.51**
Forfeited	**(10,000)**	**4.41**
Balance, June 30, 2023	**9,510,500**	**3.57**

[1] The weighted fair market value of the share price for options exercised in 2023 was $1.01.

Grants in 2023

The Company granted 150,000 stock options to the President and Chief Executive Officer of the Company, and 500,000 stock options to members of its Board of Directors. The stock options have an exercise price of $1.03 per common share, vest immediately and are exercisable over a period of five (5) years. The Company recorded an expense amounting to $453,204 related to these options in fiscal 2022 as the stock options granted related to the services rendered in 2022, for which there was a shared understanding of the terms and conditions related to such grant prior to the grant date.

The Company also granted 975,000 stock options to employees of the Company. The stock options have an exercise price of $1.03 per common share. The 975,000 options will vest as follows: 10 percent as of the day of the grant, 20 percent at the first anniversary of the date of the grant, 30 percent on the second anniversary of the date of the grant and 40 percent on the third anniversary of the date of the grant. All options mentioned above are exercisable over a period of five (5) years.

Grants in 2022

On January 3, 2022, the Company granted 150,000 stock options to the President and Chief Executive Officer of the Company, and 300,000 stock options to members of its Board of Directors. The stock options have an exercise price of $3.36 per common share, vest immediately and are exercisable over a period of five (5) years.

On April 5, 2022, the Company granted 400,000 stock options to employees of the Company. The stock options have an exercise price of $2.96 per common share. The 400,000 options will vest as follows: 10 percent as of the day of the grant, 20 percent at the first anniversary of the date of the grant, 30 percent on the second anniversary of the date of the grant and 40 percent on the third anniversary of the date of the grant. All options mentioned above are exercisable over a period of five (5) years.

On June 2, 2022, the Company granted 600,000 stock options to the President and Chief Executive Officer of the Company, and 900,000 stock options to members of its Board of Directors. The 1,500,000 options will vest as follows: 25 percent as of the day of the grant, 25 percent at the first anniversary of the date of the grant, 25 percent on the second anniversary of the date of the grant and 25 percent at the third anniversary of the date of the grant. The stock options have an exercise price of $3.88 per common share and are exercisable over a period of five (5) years.

The weighted average fair value of stock options granted for the six-month period ended June 30, 2023, was $0.70 ($2.42 for the six-month period ended June 30, 2022). The weighted average fair value of each option granted was estimated at the grant date for purposes of determining share-based payment expense using the Black-Scholes option pricing model based on the following weighted-average assumptions:

(In Canadian dollars)

	2023		2022
Number of options granted	**650,000**	**975,000**	450,000
Exercise price ($)	**1.03**	**1.03**	3.36
Fair value of each option under the Black-Scholes pricing model ($)	**0.70**	**0.70**	2.17
Assumptions under the Black-Scholes model:			
Fair value of the shares ($)	**1.03**	**1.03**	3.36
Risk-free interest rate (%)	**3.38**	**3.38**	1.25
Expected volatility (%)	**83.15**	**83.15**	82.45
Expected dividend yield	**—**	**—**	—
Expected life (number of months)	**60**	**60**	60

The underlying expected volatility was determined by reference to historical data of the Company's share price. No special features inherent to the stock options granted were incorporated into the measurement of fair value.

As at June 30, 2023, 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-22**	**Granted**	**Exercised**	**Forfeitures**	**Number of stock options 30-Jun-23**	**Number of stock options vested [1]**	**Exercise price per option**	**Expiry date**
							$	
July 3, 2018	300,000	–	(300,000)	–	–	–	0.51	July 3, 2023
September 29, 2019	100,000	–	–	–	100,000	100,000	0.51	September 29, 2024
January 2, 2020	100,000	–	–	–	100,000	100,000	0.45	January 2, 2025
July 16, 2020	2,200,500	–	–	(10,000)	2,190,500	1,765,500	4.41	July 16, 2025
October 26, 2020	50,000	–	–	–	50,000	37,500	4.00	October 26, 2025
April 6, 2021	550,000	–	–	–	550,000	510,000	8.47	April 6, 2026
June 1, 2021	200,000	–	–	–	200,000	150,000	6.59	June 1, 2026
June 14, 2021	100,000	–	–	–	100,000	75,000	6.70	June 14, 2026
October 14, 2021	100,000	–	–	–	100,000	30,000	5.04	October 14, 2026
December 17, 2021	1,920,000	–	–	–	1,920,000	1,920,000	3.13	December 17, 2026
December 31, 2021	100,000	–	–	–	100,000	30,000	3.61	December 31, 2026
January 3, 2022	450,000	–	–	–	450,000	450,000	3.36	January 3, 2027
April 5, 2022	400,000	–	–	–	400,000	120,000	2.96	April 5, 2027
June 2, 2022	1,500,000	–	–	–	1,500,000	750,000	3.88	June 2, 2027
July 13, 2022	125,000	–	–	–	125,000	12,500	2.14	July 13, 2027
January 2, 2023	–	1,625,000	–	–	1,625,000	747,500	1.03	January 2, 2028
	8,195,500	**1,625,000**	**(300,000)**	**(10,000)**	**9,510,500**	**6,798,000**	**3.57**	

[1] At June 30, 2023, the weighted average exercise price for options outstanding which are exercisable was $3.78.

For the three-month and six-month periods ended June 30, 2023, a stock-based compensation expense of $988,162 and $1,729,102, respectively, was recorded in Selling, general and administrative expenses in the condensed consolidated statements of comprehensive loss, ($1,621,040 and $3,290,670 for the three-month and six-month periods ended June 30, 2022).

At June 30, 2023, an amount of $2,135,300 ($3,184,866 at December 31, 2022) remains to be amortized until January 2026 related to the grant of stock options.

(In Canadian dollars)

Share purchase warrants

The following table reflects the activity in warrants during the period ended June 30, 2023, and the number of issued and outstanding share purchase warrants at June 30, 2023:

	Number of warrants Dec 31, 2022	**Issued**	**Number of warrants Jun 30, 2023**	**Exercise price per warrant $**	**Expiry date**
Issuance of warrants – October 19, 2022	1,014,600	—	**1,014,600**	1.75	October 19, 2024
Issuance of warrants – March 8, 2023	—	5,000,000	**5,000,000**	1.25	March 7, 2025
	1,014,600	**5,000,000**	**6,014,600**		

14. Supplemental disclosure of cash flow information

	Three months ended June 30,		Six months ended June 30,	
	2023	2022	**2023**	2022
	$	$	**$**	$
Accounts receivable	**3,157,064**	(2,028,735)	**6,867,610**	(1,566,146)
Costs and profits in excess of billings on uncompleted contracts	**(5,646)**	1,668,461	**(148,317)**	727,236
Inventory	**2,886**	(275,877)	**56,163**	(661,448)
Investment tax credits receivable	**(59,282)**	(60,936)	**27,746**	(15,051)
Income taxes receivable	**–**	117,195	**–**	117,195
Deposits	**(42,142)**	2,838,936	**(108,125)**	1,777,516
Prepaid expenses	**(1,540,208)**	796,997	**(1,434,300)**	(1,383,159)
Accounts payable and accrued liabilities	**2,421,317**	(82,365)	**(241,587)**	(664,635)
Billings in excess of costs and profits on uncompleted contracts	**(133,584)**	(2,536,512)	**(1,930,088)**	(2,860,122)
	3,800,405	437,164	**3,089,102**	(4,528,614)

15. Supplemental disclosure on statements of comprehensive loss

	Three months ended June 30,		Six months ended June 30,	
	2023	2022	**2023**	2022
	$	$	**$**	$
Inventories recognized in cost of sales	**72,903**	201,547	**214,091**	414,142
Amortization of intangible assets	**221,752**	218,759	**443,504**	437,518
Depreciation of property and equipment	**158,007**	148,412	**318,370**	291,402
Depreciation of ROU assets	**164,992**	155,398	**321,353**	321,622
Employee benefits	**3,895,915**	2,991,223	**7,354,439**	5,702,092
Share-based payments	**740,940**	1,621,040	**1,729,102**	3,290,670
Awarded grants	**221,454**	55,077	**274,965**	94,511

(In Canadian dollars)

16. Net finance costs (income)

	Three months ended June 30,		Six months ended June 30,	
	2023	2022	**2023**	2022
	$	$	**$**	$
Financial expenses				
Interest on term loans	**168**	752	**529**	1,603
Interest on lease liabilities	**93,868**	111,993	**186,989**	189,458
Interest accretion on and revaluation of balance due on business combination[1]	**(1,062,196)**	44,115	**(2,099,614)**	127,088
Interest accretion on long term loans	**8,502**	–	**16,768**	–
Penalties and other interest expenses	**69,825**	36,802	**132,726**	60,777
	(889,833)	193,662	**(1,762,602)**	378,926
Financial income				
Accretion interest on royalty receivable	**(43,189)**	(37,549)	**(84,674)**	(38,913)
Net finance costs (income)	**(933,022)**	156,113	**(1,847,276)**	340,013

[1] During the three-month period ended June 30, 2023, the Company determined that a milestone related to the business combination would not achieve and therefore, a reversal of the liability was recorded. For the three-month period ended March 31, 2023, the Company's Italian subsidiary and a customer agreed on the final acceptance of a contract, prior to final completion. As a result, the contract did not attain the agreed milestone in connection with the balance due on business combination, and a reversal of the liability was recorded.

17. Loss per share

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

	Three months ended June 30,		Six months ended June 30,	
	2023	2022	**2023**	2022
	$	$	**$**	$
Weighted average number of common shares outstanding	**178,623,252**	170,125,795	**176,778,738**	170,125,795
Weighted average number of diluted shares outstanding	**178,623,252**	170,125,795	**176,778,738**	170,125,795
Number of anti-dilutive stock options and warrants excluded from fully diluted earnings per share calculation	**12,812,600**	10,533,000	**12,812,600**	10,533,000

18. Related party transactions

During the three and six-month period ended June 30, 2023, the Company concluded the following transactions with related parties:

Rent and property taxes charged by a trust whose beneficiary is the controlling shareholder and CEO of the Company, for the three and six-month periods ended June 30, 2023 amount to $68,891 and $150,233, respectively ($70,226 and $139,280 for the three and six-month periods ended June 30, 2022, respectively.

These expenses are recorded in the captions *Cost of sales* and *services* and in *Selling, general* and *administrative* in the consolidated statements of comprehensive loss. As at June 30, 2023 the right-of-use asset and the lease liabilities amount to $758,320 and $821,932 respectively, ($799,090 and $881,635 respectively at December 31, 2022).

In June 2023, the terms and conditions of the lease agreement between the Company and the trust were modified, to adjust the base rent and duration. As a result, the ROU asset increased by $67,745, the lease liability increased by $48,023, and a reduction of expense of $19,722 was recorded in the statement of comprehensive loss.

A balance due to the controlling shareholder and CEO of the Company amounted to $462,913 at June 30, 2023 ($254,097 at December 31, 2022) 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 June 30,		Six months ended June 30,	
	2023	2022	**2023**	2022
	$	$	**$**	$
Salaries – key management	**360,577**	257,871	**666,034**	573,842
Pension contributions	**6,663**	4,787	**12,320**	10,680
Fees – Board of Directors	**51,680**	69,000	**99,852**	89,000
Share-based compensation – officers	**486,982**	486,841	**516,603**	812,914
Share-based compensation – Board of Directors	**1,106,066**	1,106,066	**1,106,066**	1,758,213
Other benefits – key management	**1,878**	7,599	**157,135**	14,038
Total compensation	**2,013,846**	1,932,164	**2,558,010**	3,258,687

19. 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 June 30, 2023 and December 31, 2022 the Company's exposure to foreign exchange risk for amounts denominated in US dollars is as follows:

	June 30, 2023	December 31, 2022
	$	$
Cash	**196,424**	2,871,062
Accounts receivable	**10,740,117**	13,537,912
Accounts payable and accrued liabilities	**(2,233,953)**	(1,713,717)
Total	**8,702,588**	14,695,257

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 June 30, 2023, if the US dollar had changed by 10% against the Canadian dollar with all other variables held constant, the impact on pre-tax gain or loss and equity for the three-month period ended June 30, 2023 would have been $870,300.

(In Canadian dollars)

Credit concentration

During the three-month period ended June 30, 2023, three customers accounted for 54%, (Q2, 2022 – five customers for 72%) of revenues from operations.

During the six-month period ended June 30, 2023, three customers accounted for 60%, (Six-month period ended June 30, 2022 – five customers for 68%) of revenues from operations.

	Three months ended June 30, 2023		Six months ended June 30, 2023	
	Revenues	% of total revenues	Revenues	% of total revenues
	$	%	**$**	**%**
Customer 1	856,220	28	1,546,176	27
Customer 2	471,289	16	1,240,340	22
Customer 3	312,491	10	628,341	11
Total	**1,640,000**	**54**	**3,414,857**	**60**

Two customers accounted for 61% and 20%, respectively (December 31, 2022 – three customers for 56%, 16% and 11%, respectively) of the total trade accounts receivable with amounts owing to the Company of $13,966,701 (2022 - $18,894,727), representing the Company's major credit risk exposure. Credit concentration is determined based on customers representing 10% or more of total revenues and/or total accounts receivable.

Credit risk

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 June 30, 2023 represents the carrying amount of cash, accounts receivable (except sales tax receivable), costs and profits in excess of billings on uncompleted contracts, deposits and royalties receivable.

Cash is held with major reputable financial institutions.

Management has established a credit policy under which each new customer is analysed individually for creditworthiness before the Company’s payment and delivery terms and conditions are offered. The Company’s review could include reviewing external ratings, if they are available, financial statements, credit agency information, industry information and in some cases bank references. The Company’s exposure to credit risk is mainly influenced by the individual characteristics of each customer. In monitoring customer credit risk, customers are identified according to their characteristics such as their geographic location, industry, trading history with the Company and existence of previous financial difficulties.

The Company does not generally require collateral or other security from customers on accounts receivable, however, the contract terms may include the possibility of recourse in the event of late payment. The Company believes that there is no unusual exposure associated with the collection of these receivables.

The credit risk associated with costs and profits in excess of billings on uncompleted contracts is similar to that of accounts receivable, as these amounts are accumulated and converted to accounts receivable as invoicing milestones are reached.

The royalties receivable 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. The carrying amount of the royalties receivable have been discounted to reflect the time value of money and credit risk of the counterparty.

The deposits are payments made to suppliers and entities from which the Company leases property. The Company does not have collateral or other security associated with the collection of these deposits. As at June 30, 2023 and December 31, 2022, no loss allowance has been recognized in connection with these deposits and the maximum exposure is the carrying amount of these deposits.

(In Canadian dollars)

During the six-month period ended June 30, 2023, and the year-end December 31, 2022, provisions for expected credit losses were recorded, however, the accounts provisioned by the loss are still subject to enforcement activity in order to collect the balances due.

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 term loans as those financial instruments bear interest at fixed rates and to cash flow risk from the variable interest rate of the bank indebtedness.

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 TSX Venture Exchange. If equity prices had increased or decreased by 25% as at June 30, 2023, with all other variables held constant, the Company’s investments would have increased or decreased respectively, by approximately $1,102,000 (December 31, 2022 - $1,841,484).

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 June 30, 2023:

	Carrying value	**Total contractual amount**	**Less than one year**	**2-3 years**	**4-5 years**	**Over 5 years**
	$	**$**	**$**	**$**	**$**	**$**
Bank indebtedness	332,189	332,189	332,189	–	–	–
Accounts payable and accrued liabilities[1]	8,526,239	8,526,239	8,526,239	–	–	–
Term loans	391,564	454,794	77,226	180,000	90,000	107,568
Balance due on business combination	1,708,161	1,860,020	1,708,161	–	–	–
Lease liabilities	5,376,136	6,543,087	2,940,114	1,125,789	642,528	1,834,656
	16,334,289	**17,716,329**	**13,583,929**	**1,305,789**	**732,528**	**1,942,224**

1 Accounts payable and accrued liabilities exclude amounts which are not financial liabilities.

At June 30, 2023, the Company's Canadian subsidiary benefits from a line of credit of $500,000, of which $332,189 was drawn on this faculty. The Italian subsidiary previously benefited from a 400,000 Euros line of credit which was paid in full and extinguished in June 2023. The Canadian facility bears interest at a variable rate which is the bank’s prime rate plus 1%, therefore, 7.95%. There are no imposed financial covenants on the credit facilities.

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.

(In Canadian dollars)

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, trade accounts receivable, other receivables, deposits, bank indebtedness, accounts payable and accrued liabilities approximate their carrying amounts due to their short-term maturities.

Investments in BGF and HPQ shares are valued at quoted market prices and are classified as Level 1.

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 (Note 9).

The fair value of the term loans and the balance due on business combination as at June 30, 2023 is determined using the discounted future cash flows method and management's estimates for market interest rates for similar issuances. Accordingly, as a result, their fair market values correspond to their carrying amount. The term loans are classified as level 2 and the balance due on business combination as level 3.

The following table presents the variation of the balance due on business combination:

	$
Balance due on business combination at December 31, 2021 - Current and Non-Current	3,952,203
Disbursement	(217,778)
Interest accretion	173,350
Balance due on business combination at December 31, 2022 - Current and Non-Current	3,907,775
Disbursement	**(100,000)**
Interest accretion on and revaluation of balance due on business combination	**(2,099,614)**
Balance due on business combination at June 30, 2023 - Current and Non-Current	**1,708,161**

20. 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.

(In Canadian dollars)

21. 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 June 30, 2023, the Company's working capital deficiency was $3,168,366 (working capital of $1,650,709 at December 31, 2022).

The management of capital includes shareholders' equity for a total amount of $11,220,187 and term loans of $391,564 ($16,868,927 and $389,987 respectively at December 31, 2022), as well as cash amounting to $829,583 ($3,445,649 at December 31, 2022).

There were no significant changes in the Company's approach during the current six-month period and preceding 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.

22. 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 June 30,		Six months ended June 30,	
	2023	2022	**2023**	2022
	$	$	**$**	$
Brazil	**7,473**	40,235	**14,661**	162,706
Canada	**1,370,893**	2,601,841	**3,423,564**	3,969,633
France	**52,839**	–	**52,839**	–
India	**82,960**	35,466	**276,499**	58,029
Israel	**(1,505)**	13,853	**(1,505)**	20,661
Italy[1]	**20,823**	855,009	**(374,867)**	1,211,032
Mexico	**28,682**	82,884	**58,866**	259,392
Netherlands	**8,867**	16,388	**31,235**	30,242
New Zealand	**187,444**	–	**255,292**	–
Poland	**6,108**	22,395	**25,621**	30,512
Saudi Arabia	**86,643**	353,654	**146,685**	1,077,225
United States of America	**1,185,712**	1,566,808	**1,714,694**	2,662,546
Vietnam	**2,540**	255,584	**7,517**	564,607
Other	**–**	3,063	**–**	7,357
	3,039,479	5,847,180	**5,631,101**	10,053,942

[1] The Q1 2023 revenue attributable to Italy was reduced following the agreement between the Company's Italian subsidiary and their customer to deliver a project prior to final completion, which resulted in an adjustment to revenue and to costs and profits in excess of billings on uncompleted contracts.

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

23. Subsequent Events

On July 21, 2023, the Company announced that it had completed a brokered private placement offering of 3,030 unsecured convertible debenture units of the Company at a price of $1,000 per debenture unit, for aggregate gross proceeds of $3,030,000. In connection with the offering, P. Peter Pascali, President, CEO, and Director subscribed for $2,000,000 of convertible debenture units.

Each convertible debenture unit consists of one 10.0% unsecured convertible debenture of the Company with a maturity of 36 months from the date of issuance and 1,000 common share purchase warrants of the Company. Each Warrant shall entitle the holder thereof to acquire one common share at an exercise price of $1.25 for a period of 24 months following the closing date.

The principal amount of each convertible debenture shall be convertible, for no additional consideration, into Common Shares at the option of the holder based on certain conditions. The convertible debentures shall bear interest at a rate of 10.0% per annum, payable in cash or shares at the discretion of the Company and subject to certain criteria.

PyroGenesis Canada Inc.

Management's Discussion and Analysis

As at June 30, 2023 and for the three and six month periods ended June 30, 2023 and 2022

(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 six-month periods ended June 30, 2023. 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, 2022.

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 August 10, 2023. 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 August 10, 2023, 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, European 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 consolidated 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 2022 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 consolidated 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 and Modified EBITDA, both of which 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. EBITDA is used by management 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 is used by investors as it provides supplemental measures of operating performance and thus highlight trends in our business that may not otherwise be apparent when relying solely on IFRS measures, and to compare the results of our operations with other entities with similar structures. Modified EBITDA is used by management as it brings additional clarity to operating performance, and it eliminates variations in the fair value of strategic investments, among others, which may be beyond the control of the Company. Management believes that investors use Modified EBITDA for similar purposes as management and to evaluate performance while adjusting for non-cash discretionary expenses. Modified EBITDA allows a more appropriate comparison to other companies whose earnings or loss is not adjusted by fair value adjustments from strategic investments. The Company also uses "Backlog" or "Backlog of signed and/or awarded contracts" interchangeably, as a non-IFRS measure. Backlog figures allow management of the Company to foresee and predict their future needs and resource planning. Management believes that "Backlog" is used by investors to evaluate the Company, their future performance and better understand the production capacity.

EBITDA: We define EBITDA as net earnings before net financing costs, income taxes, depreciation and amortization. See "Results of Operations - Reconciliation of Non-IFRS measures (EBITDA and Modified EBITDA)".

Modified EBITDA: We define Modified EBITDA as EBITDA and adjust for non-cash items namely share-based payments expenses and changes in fair value of strategic investments. See "Results of Operations - Reconciliation of Non-IFRS measures (EBITDA and Modified EBITDA)".

Backlog or **Backlog of signed and/or awarded contracts:** This measure is defined as contracts with customers, firm purchase order and contracts agreed between us and the customer, whereby we can determine the proceeds and the obligations to perform.

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 m²) and 31,632 sq. ft. (2,940 m²) 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 (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).

This MD&A includes the accounts of the Company, Pyro Green-Gas Inc (including the subsidiaries in Italy and India) as well as Drosrite International LLC ("Drosrite International). Drosrite International is owned by a member of the Company's key management personnel and close family member of the Chief Executive Officer ("CEO") and controlling shareholder and is deemed for the purposes of the consolidated financial statements to be controlled by the Company. Unless otherwise stated, reference to subsidiaries in the consolidated financial statements and this MD&A shall include Drosrite International and/or Pyro Green-Gas Inc. All transactions and balances between the Company and its subsidiaries have been eliminated upon consolidation.

INFORMATION FROM CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS FOR THE QUARTERS ENDED JUNE 30:

	Three months ended June 30 2023	Three months ended June 30 2022	Variation 2023 vs 2022	Six months ended June 30 2023	Six months ended June 30 2022	Variation 2023 vs 2022
Revenues	**$ 3,039,479**	$ 5,847,180	$ (2,807,701)	**$ 5,631,101**	$ 10,053,942	$ (4,422,841)
Cost of sales and services	**1,927,664**	3,347,907	(1,420,243)	**3,992,713**	6,502,947	(2,510,234)
Gross profit	**1,111,815**	2,499,273	(1,387,458)	**1,638,388**	3,550,995	(1,912,607)
Expenses						
Selling, general and administrative (excluding share-based expenses)	**5,669,789**	5,470,495	199,294	**12,238,735**	9,413,233	2,825,502
Research and development, net	**742,685**	804,564	(61,879)	**1,065,901**	1,286,996	(221,095)
Total expenses (excluding share-based expenses)	**6,412,474**	6,275,059	137,415	**13,304,636**	10,700,229	2,604,407
Net loss from operations (excluding share-based expenses)	**(5,300,659)**	(3,775,786)	(1,524,873)	**(11,666,248)**	(7,149,234)	(4,517,014)
Share-based expenses	**(740,940)**	(1,621,040)	880,100	**(1,729,102)**	(3,290,670)	1,561,568
Net loss from operations	**(6,041,599)**	(5,396,826)	(644,773)	**(13,395,350)**	(10,439,904)	(2,955,446)
Changes in fair market value of strategic investments and net finance income (costs)	**(307,140)**	(7,633,978)	7,326,838	**908,005**	(6,641,123)	7,549,128
Income taxes	**—**	19,542	(19,542)	**—**	76,095	(76,095)
Net loss	**$ (6,348,739)**	$ (13,050,346)	$ 6,701,607	**$ (12,487,345)**	$ (17,157,122)	$ 4,669,777
Foreign currency translation gain (loss) on investments in foreign operations	**15,031**	10,815	4,216	**(3,980)**	48,471	(52,451)
Comprehensive loss	**$ (6,333,708)**	$ (13,039,531)	$ 6,705,823	**$ (12,491,325)**	$ (17,108,651)	$ 4,617,326
Loss per share						
Basic	**$ (0.04)**	$ (0.08)	$ 0.04	**$ (0.07)**	$ (0.10)	$ 0.03
Diluted	**$ (0.04)**	$ (0.08)	$ 0.04	**$ (0.07)**	$ (0.10)	$ 0.03
Modified EBITDA[1]	**$ (4,740,877)**	$ (3,242,402)	$ (1,498,475)	**$ (10,587,001)**	$ (6,050,221)	$ (4,536,780)

[1] See "Non-IFRS Measures"

INFORMATION FROM CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS FOR THE PERIODS ENDED JUNE 30:

	Three months ended June 30			Six months ended June 30		
	2023	2022	2021	**2023**	2022	2021
Revenues	**$ 3,039,479**	$ 5,847,180	$ 8,280,572	**$ 5,631,101**	$ 10,053,942	$ 14,545,075
Cost of sales and services	**1,927,664**	3,347,907	3,347,091	**3,992,713**	6,502,947	7,468,584
Gross profit	**1,111,815**	2,499,273	4,933,481	**1,638,388**	3,550,995	7,076,491
Expenses						
Selling, general and administrative (excluding share-based expenses)	**5,669,789**	5,470,495	3,371,888	**12,238,735**	9,413,233	6,174,984
Research and development, net	**742,685**	804,564	710,734	**1,065,901**	1,286,996	997,041
Total expenses (excluding share-based expenses)	**6,412,474**	6,275,059	4,082,622	**13,304,636**	10,700,229	7,172,025
Net loss from operations (excluding share-based expenses)	**(5,300,659)**	(3,775,786)	850,859	**(11,666,248)**	(7,149,234)	(95,534)
Share-based expenses	**(740,940)**	(1,621,040)	(3,288,685)	**(1,729,102)**	(3,290,670)	(4,211,025)
Net loss from operations	**(6,041,599)**	(5,396,826)	(2,437,826)	**(13,395,350)**	(10,439,904)	(4,306,559)
Changes in fair market value of strategic investments and net finance income (costs)	**(307,140)**	(7,633,978)	(17,924,379)	**908,005**	(6,641,123)	(12,342,743)
Income taxes	**—**	19,542	—	**—**	76,095	—
Net loss and comprehensive loss	**$ (6,348,739)**	$ (13,050,346)	$ (20,362,205)	**$ (12,487,345)**	$ (17,157,122)	$ (16,649,302)
Foreign currency translation gain (loss) on investments in foreign operations	**15,031**	10,815	—	**(3,980)**	48,471	—
Comprehensive loss	**$ (6,333,708)**	$ (13,039,531)	$ (20,362,205)	**$ (12,491,325)**	$ (17,108,651)	$ (16,649,302)
Loss per share						
Basic	**$ (0.04)**	$ (0.08)	$ (0.12)	**$ (0.07)**	$ (0.10)	$ (0.10)
Diluted	**$ (0.04)**	$ (0.08)	$ (0.11)	**$ (0.07)**	$ (0.10)	$ (0.09)
Modified EBITDA	**$ (4,740,877)**	$ (3,242,402)	$ 1,090,915	**$ (10,587,001)**	$ (6,050,221)	$ 329,416

SELECTED FINANCIAL INFORMATION

	June 30, 2023	December 31, 2022	December 31, 2021
Current assets	**19,545,636**	27,448,182	38,758,984
Non-current assets	**17,284,614**	20,218,568	31,011,693
Total assets	**$ 36,830,250**	$ 47,666,750	$ 69,770,677
Current liabilities	**22,714,002**	25,797,473	24,752,199
Non-current liabilities	**2,896,061**	5,000,350	4,249,724
Total liabilities	**$ 25,610,063**	$ 30,797,823	$ 29,001,923
Shareholders' equity	**$ 11,220,187**	$ 16,868,927	$ 40,768,754

FINANCIAL CONDITION

	June 30, 2023	December 31, 2022	Variation 2023 vs 2022
Current Assets			
Cash	$ **829,583**	$ 3,445,649	$ (2,616,066)
Accounts receivable	**11,623,765**	18,624,631	(7,000,866)
Costs and profits in excess of billings on uncompleted contracts	**1,199,614**	1,051,297	148,317
Inventory	**1,820,248**	1,876,411	(56,163)
Investment tax credits receivable	**248,658**	276,404	(27,746)
Income tax receivable	**16,140**	14,169	1,971
Current portion of deposits	**540,621**	432,550	108,071
Current portion of royalties receivable	**588,970**	455,556	133,414
Contract assets	**472,134**	499,912	(27,778)
Prepaid expenses	**2,205,903**	771,603	1,434,300
Total Current Assets	$ **19,545,636**	$ 27,448,182	$ (7,902,546)
Non-Current assets			
Deposits	**46,107**	46,053	54
Strategic investments	**4,208,521**	6,242,634	(2,034,113)
Property and equipment	**3,125,423**	3,393,452	(268,029)
Right-of-use-assets	**4,565,136**	4,818,744	(253,608)
Royalties receivable	**903,490**	952,230	(48,740)
Intangible assets	**1,775,330**	2,104,848	(329,518)
Goodwill	**2,660,607**	2,660,607	—
Total Non-Current Assets	$ **17,284,614**	$ 20,218,568	$ (2,933,954)
Current Liabilities			
Bank indebtedness	**332,189**	991,902	(659,713)
Accounts payable and accrued liabilities	**9,876,254**	10,115,870	(239,616)
Billings in excess of costs and profits on uncompleted contracts	**7,740,905**	9,670,993	(1,930,088)
Current portion of term loans	**77,226**	69,917	7,309
Current portion of lease liabilities	**2,794,413**	2,672,212	122,201
Balance due on business combination	**1,708,161**	2,088,977	(380,816)
Income tax payable	**184,854**	187,602	(2,748)
Total Current Liabilities	$ **22,714,002**	$ 25,797,473	$ (3,083,471)
Non-current Liabilities			
Lease liabilities	**2,581,723**	2,861,482	(279,759)
Term loans	**314,338**	320,070	(5,732)
Balance due on business combination	**—**	1,818,798	(1,818,798)
Total Non-Current Liabilities	$ **2,896,061**	$ 5,000,350	$ (2,104,289)

Working capital, (expressed as current assets less current liabilities) varied since December 31, 2022 by $4.8 million, mainly a result of:

- a decrease of cash of $2.6 million, explained in the section Summary of Cash Flows,
- a decrease of $7.0 million of accounts receivable, as the Company has collected the invoicing milestones on contracts in progress, as a result trade receivables decreased by $5.4 million, and a decrease in sales tax receivable of $0.3 million, offset by an increase of $1.3 million as a result of the increased allowance for expected credit loss,
- an increase of $0.1 million in costs and profits in excess of billings on uncompleted contracts related to the advancement on paying projects, offset by the decrease of $0.03 million as a result of the allowance for credit loss on costs and profits in excess of billings on uncompleted contracts,
- an increase of $0.1 million in current portion of deposits due to timing of deposits with suppliers,
- an increase of $0.1 million in current portion of royalties receivable due to accretion and amount carried forward from 2022,
- an increase of $1.4 million in prepaid expenses due to the prepayment of D&O insurance and software licenses,
- a decrease in bank indebtedness of $0.7 million due to the repayment of the credit facility by Pyro Green-Gas's Italian subsidiary,

- a decrease of $0.2 million in accounts payable and accrued liabilities due to the increase in payments to suppliers,
- a decrease of $1.9 million in billings in excess of costs and profits on uncompleted contracts due to the increase in workforce working on progressing customer projects by achieving contract milestones in shorter amounts of time, and
- a decrease in balance due on business combination caused by a $0.1 million disbursement of an achieved milestone as well as recurring quarterly accretion and measurement of expected disbursements. During the current period the Company determined that an additional milestone liability from the business combination could be reversed as it would not be achieved, thus favourably impacting the income statement and financial position.

Non-current assets varied since December 31, 2022, by $2.9 million, mainly a result of:

- a decrease in strategic investments is mainly attributable to the $2.0 million decrease in fair value of the common shares and warrants owned of HPQ Silicon Inc. and the net result of purchases and disposition of common share of HPQ Silicon Inc. during the first half of 2023,
- a decrease of property and equipment of $0.3 million due to depreciation including the assets under construction placed in service,
- a decrease of $0.3 million in right-of-use-assets due to depreciation and leases approaching their maturity dates, and conditions of the lease agreement between the Company and the trust were modified, to adjust the base rent and duration and,
- a decrease of $0.3 million in intangible assets due to the amortization of the intangible asset from the 2021 business combination as well as the HP Torch and SPARC patents,

Non-current liabilities varied since December 31, 2022, by $2.1 million, mainly a result of:

- a repayment of lease liabilities and the decrease to the revaluation of the balance due on business combination as of June 30, 2023, as all milestones are schedule to be achieved within the next twelve months.

RESULTS OF OPERATIONS

Revenues

PyroGenesis recorded revenue of $3.0 million in the second quarter of 2023 ("Q2, 2023"), representing a decrease of $2.8 million compared with $5.8 million recorded in the second quarter of 2022 ("Q2, 2022"). Revenue for the six-month period ended June 30, 2023, was $5.6 million, a decrease of $4.4 million over revenue of $10.1 million compared to the same period in 2022.

Revenues recorded in the three and six-months ended June 30, 2023, were generated primarily from:

	Three months ended June 30		**Variation**	**Six months ended June 30**		**Variation**
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
High purity metallurgical grade silicon & solar grade silicon from quartz (PUREVAP™)	**$ 445,840**	$ 820,972	$ (375,132)	**$ 973,439**	$ 1,168,983	$ (195,544)
Aluminium and zinc dross recovery (DROSRITE™)	**115,325**	436,538	(321,213)	**205,552**	1,336,617	(1,131,065)
Development and support related to systems supplied to the U.S. Navy	**813,125**	591,099	222,026	**1,165,228**	1,336,359	(171,131)
Torch-related products and services	**561,942**	1,707,152	(1,145,210)	**1,732,690**	2,591,909	(859,219)
Refrigerant destruction (SPARC™)	**187,444**	—	187,444	**255,292**	—	255,292
Biogas upgrading and pollution controls	**618,070**	2,181,107	(1,563,037)	**650,965**	3,171,152	(2,520,187)
Other sales and services	**297,733**	110,312	187,421	**647,935**	448,922	199,013
Revenue	**$ 3,039,479**	$ 5,847,180	$ (2,807,701)	**$ 5,631,101**	$ 10,053,942	$ (4,422,841)

Q2, 2023 revenues decreased by $2.8 million, mainly as a result of:

- PUREVAP™ related sales decreased by $0.4 million due to the completion of the project and initial phase of testing, with additional three-month testing requested by the customer and currently ongoing,
- DROSRITE™ related sales decreased by $0.3 million due to continued customer delays in funding for the construction of the onsite facility. Based on the customers updated projected schedule and ongoing positive discussions, the new expectation aims to have the equipment installed, commissioned and fully operational by end of the year,
- Torch-related products and services decreased by $1.1 million, due to the final phase of the project being completed with the installation and commissioning at the customers facility. Three-month onsite support currently ongoing and scheduled to be completed by the end of the third quarter, with an option to extend to six and nine-month support at the discretion of the customer,
- Biogas upgrading and pollution controls related sales decreased by $1.6 million due to continuous testing to achieve desired results and due to the Company's Italian subsidiary and a customer who both agreed on the completion of the project during the first quarter of 2023, with no additional revenues recorded by the Company's Italian subsidiary for Q2, 2023 ($0.9 million – Q2, 2022),

During the six-month period ended June 30, 2023, revenues decreased by $4.4 million, mainly as a result of:

- PUREVAP™ related sales decreased by $0.2 million due to the completion of the project and initial phase of testing,

- DROSRITE™ related sales decreased by $1.1 million due to the impact of the continued customer delays in funding for the construction of the onsite facility,
- Development and support related to systems supplied to the U.S Navy decreased by $0.2 million due to remaining project milestones mainly related to inspection, packaging and shipment of the equipment to our customer in order to move forward with installation and commissioning,
- Torch-related products and services decreased by $0.9 million, due to the final phase of the project being completed with the installation and commissioning at the customers facility. Three-month onsite support currently ongoing and scheduled to be completed by the end of the third quarter, with an option to extend to six and nine-month support at the discretion of the customer,
- Biogas upgrading and pollution controls related sales decrease of $2.5 million is due to continuous testing to achieve desired results and due to the Company's Italian subsidiary and a customer who both agreed on the completion of the project during the first quarter of 2023, with no additional revenues recorded by the Company's Italian subsidiary for the six-month period ended June 30, 2023 ($1.2 million – six-month period ended June 30, 2022),

As of August 10, 2023, revenue expected to be recognized in the future related to backlog of signed and/or awarded contracts is $33.9 million. 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 June 30		Variation	Six months ended June 30		Variation
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
Employee compensation	**$ 923,465**	$ 901,826	$ 21,639	**$ 1,811,900**	$ 1,704,455	$ 107,445
Subcontracting	**230,728**	360,140	(129,412)	**279,301**	1,031,416	(752,115)
Direct materials	**296,421**	1,612,969	(1,316,548)	**911,419**	2,695,752	(1,784,333)
Manufacturing overhead & other	**297,490**	725,145	(427,655)	**591,127**	884,764	(293,637)
Foreign exchange charge on materials	**—**	(447,968)	447,968	**—**	(226,165)	226,165
Investment tax credits	**(42,192)**	(22,964)	(19,228)	**(44,538)**	(24,793)	(19,745)
Amortization of intangible assets	**221,752**	218,759	2,993	**443,504**	437,518	5,986
Total Cost of Sales and Services	**$ 1,927,664**	$ 3,347,907	$ (1,420,243)	**$ 3,992,713**	$ 6,502,947	$ (2,510,234)

Gross Profit

	Three months ended June 30		Six months ended June 30	
	2023	2022	**2023**	2022
Revenues	$ 3,039,479	$ 5,847,180	$ 5,631,101	$ 10,053,942
Cost of Sales and Services	**1,927,664**	3,347,907	**3,992,713**	6,502,947
Gross Profit	$ 1,111,815	$ 2,499,273	$ 1,638,388	3,550,995
Gross Margin %	**% 37**	% 43	**% 29**	% 35

Cost of sales and services were $1.9 million in Q2 2023, representing a decrease of $1.4 million compared to $3.3 million in Q2, 2022, primarily due to a decrease of $0.1 million in subcontracting (Q2, 2022 - $0.4 million), attributed to additional work being completed in-house, a decrease in direct materials and manufacturing overhead & other of $1.3 million and $0.4 million, respectively (Q2, 2022 - $1.6 million and $0.7 million), due to lower levels of material required based on the decrease in product and service-related revenues.

The gross margin for Q2, 2023 was $1.1 million or 37% of revenue compared to a gross margin of $2.5 million or 43% of revenue for Q2 2022, the decrease in gross margin was mainly attributable to the impact on foreign exchange charge on materials.

During the six-month period ended June 30, 2023, cost of sales and services were $4.0 million compared to $6.5 million for the same period in the prior year, the $2.5 million decrease is primarily due to a decrease of $0.8 million in subcontracting (six-month period ended June 30, 2022 - $1.0 million), attributed to additional work being completed in-house, a decrease in direct materials and manufacturing overhead & other of $1.8 million and $0.3 million respectively (six-month period ended June 30, 2022 - $2.7 million and $0.9 million respectively), due to lower levels of material required based on the decrease in product and service-related revenues and the negative impact of the foreign exchange charge on material of $0.2 million.

The amortization of intangible assets for Q2, 2023 was $0.2 million compared to $0.2 million for Q2, 2022, and during the six-month period ended June 30, 2023, was $0.4 million compared to $0.4 million for the same period in the prior year. This expense 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 the intangible assets will be amortized over the expected useful lives.

As a result of 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. The costs of sales and services are in line with management's expectations and with the nature of the revenue.

Selling, General and Administrative Expenses

	Three months ended June 30 2023	2022	Variation 2023 vs 2022	Six months ended June 30 2023	2022	Variation 2023 vs 2022
Employee compensation	**$ 2,532,157**	$ 1,870,165	$ 661,992	**$ 5,086,114**	$ 3,541,954	$ 1,544,160
Share-based expenses	**740,940**	1,621,040	(880,100)	**1,729,102**	3,290,670	(1,561,568)
Professional fees	**987,285**	1,740,978	(753,693)	**2,231,564**	2,402,957	(171,393)
Office and general	**197,281**	223,629	(26,348)	**369,544**	457,089	(87,545)
Travel	**110,888**	80,453	30,435	**170,681**	107,662	63,019
Depreciation of property and equipment	**158,007**	148,412	9,595	**318,370**	291,402	26,968
Depreciation of ROU assets	**164,991**	155,398	9,593	**321,353**	321,622	(269)
Investment tax credits	**(7,500)**	(7,500)	—	**(15,000)**	(15,000)	—
Government grants	**(221,454)**	(55,077)	(166,377)	**(274,965)**	(94,511)	(180,454)
Other expenses	**783,868**	1,314,037	(530,169)	**1,669,317**	2,400,058	(730,741)
Foreign exchange charge on materials	**282,023**	—	282,023	**303,918**	—	303,918
Expected credit loss & bad debt	**682,243**	—	682,243	**2,057,839**	—	2,057,839
Total selling, general and administrative	**$ 6,410,729**	$ 7,091,535	$ (680,806)	**$ 13,967,837**	$ 12,703,903	$ 1,263,934

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 Q2, 2023 were $6.4 million, representing a decrease of $0.7 million compared to $7.1 million for Q2, 2022. The decrease is mainly a result of share-based compensation expense decreased by $0.9 million (Q2, 2022 - $1.6 million), which is a non-cash item and relates mainly to a Q4 2021, and 2022 grants not repeated in 2023. Professional fees are $1.0 million which decreased by $0.8 million (Q2, 2022 - $1.7 million), due to reduction in accounting fees, legal and investor relation expenses. Other expenses were favourable by $0.5 million (Q2, 2022 - $1.3 million) due to a net reduction of insurance expenses, interest and bank charges. Government grants are $0.2 million which increased by $0.2 million ($Q2, 2022 – $0.06 million) due to higher levels of activities supported by such grants. The expected credit loss & bad debt increased to $0.7 million in Q2, 2023 and is due to an increase in the allowance for expected credit loss, whereby no such expense was recorded in the comparable period.

During the six-month period ended June 30, 2023, SG&A expenses were $14.0 million, representing an increase of $1.3 million compared to $12.7 million for the same period in the prior year. The increase is mainly a result of employee compensation increasing to $5.1 million (six-month period ended June 30, 2022 - $3.5 million) mainly caused by additional headcount. Expected credit loss & bad debt increased to $2.1 million and is due to an increase in the allowance for expected credit loss increase of $2.1 million and the increase of the impact on foreign exchange charge on materials of $0.3 million, offset by the decreases of $0.2 million in professional fees which are $2.2 million, compared to $2.4 million in the comparable period, and the decrease in other expenses to $1.6 million from $2.4 million, a variation of $0.7 million, compared to the six-month period ended June 30, 2022.

Share-based compensation expense for the three and six-month periods ended June 30, 2023, was $0.7 million and $1.7 million, respectively (six-month period ended June 30, 2022 - $1.6 million and $3.3 million, respectively), a decrease of $0.9 million and $1.6 million respectively, which is a non-cash item and relates mainly to a Q4 2021, and 2022 grants not repeated in 2023.

Share-based payments expenses as explained above, are non-cash expenses and are directly impacted by the vesting structure of the stock option plan whereby options vest between 10% and up to 100% on the grant date and may require an immediate recognition of that cost.

Depreciation on Property and Equipment

	Three months ended June 30 2023	2022	Variation 2023 vs 2022	Six months ended June 30 2023	2022	Variation 2023 vs 2022
Depreciation of property and equipment	**$ 158,007**	$ 148,412	$ 9,595	**$ 318,370**	$ 291,402	$ 26,968

The depreciation on property and equipment for the three and six-month periods ended June 30, 2023, increased to $0.2 million and $0.3 million, respectively, compared with $0.1 million and $0.3 million for the same periods in the prior year. The expense is comparable to the same quarters last year and the increase is primarily due to nature and useful lives of the property and equipment being depreciated.

Research and Development ("R&D") Costs, net

	Three months ended June 30		Variation	Six months ended June 30		Variation
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
Employee compensation	**$ 440,293**	$ 219,232	$ 221,061	**$ 456,425**	$ 455,683	$ 742
Investment tax credits	**(9,589)**	(30,473)	20,884	**(19,686)**	(31,641)	11,955
Subcontracting	**6,252**	51,973	(45,721)	**37,543**	84,027	(46,484)
Materials and equipment	**91,375**	470,574	(379,199)	**175,699**	614,994	(439,295)
Other expenses	**214,354**	93,258	121,096	**415,920**	163,933	251,987
Total net R&D expenses, net	**$ 742,685**	$ 804,564	$ (61,879)	**$ 1,065,901**	$ 1,286,996	$ (221,095)

During the three-months ended June 30, 2023, the Company incurred $0.7 million of R&D costs on internal projects, a decrease of $0.06 million as compared with $0.8 million in Q2, 2022. The decrease in Q2, 2023 is primarily related to a decrease in subcontracting and materials and equipment to $0.1 million (Q2, 2022 - $0.5 million), which is also attributable to the increase in employee compensation to $0.4 million (Q2, 2022 - $0.2 million) due to an increase in R&D activities which required additional labour resources and other expenses of $0.2 million related to equipment rentals compared to $0.1 million in Q2, 2022, an increase of $0.1 million.

During the six-months ended June 30, 2023, the Company incurred $1.1 million of R&D costs on internal projects, a decrease of $0.2 million as compared to $1.3 million for the same period in the prior year. The decrease is mainly due to lower levels of R&D activities requiring subcontracting and material and equipment, decreasing to $0.2 million as compared with $0.7 million, a decrease of $0.5 million, which is offset by the increase in other expenses to $0.4 million compared to $0.2 million for the same period in the prior year.

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).

Finance costs (income), net

	Three months ended June 30		Variation	Six months ended June 30		Variation
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
Interest on term loans	**168**	752	(584)	**529**	1,603	(1,074)
Interest on lease liabilities	**93,868**	111,993	(18,125)	**186,989**	189,458	(2,469)
Interest accretion on and revaluation of balance due on business combination	**(1,062,196)**	44,115	(1,106,311)	**(2,099,614)**	127,088	(2,226,702)
Interest accretion of royalty receivable	**(43,189)**	(37,549)	(5,640)	**(84,674)**	(38,913)	(45,761)
Interest accretion on long term loan	**8,502**	—	8,502	**16,768**	—	16,768
Penalties and other interest	**69,825**	36,802	33,023	**132,726**	60,777	71,949
Finance costs (income), net	**$ (933,022)**	$ 156,113	$ (1,089,135)	**$ (1,847,276)**	$ 340,013	$ (2,187,289)

Finance costs for Q2 2023 represent an income of $0.9 million as compared with an expense of $0.2 million for Q2, 2022, representing a favourable variation of $1.1 million year-over-year. The decrease in finance expenses in Q2 2023, is primarily due as the Company determined that a milestone related to the business combination would not be achieve and therefore, a reversal of the liability was recorded.

During the six-month period ended June 30, 2023, the finance costs represent an income of $1.8 million as compared with an expense of $0.3 million for the 2022 comparable period, representing a favourable variation of $2.2 million year-over-year. The decrease in finance expenses is primarily due to the revaluation of balance due on business combination due to the Company's Italian subsidiary and a customer who both agreed on the final acceptance of a contract, prior to final completion and the Company determined that a milestone related to the business combination would not be achieved. As a result, the contract did not attain the pre-determined milestone in connection with the balance due on business combination, and reversals of the liabilities were recorded.

Strategic Investments

	Three months ended June 30		Variation	Six months ended June 30		Variation
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
Changes to fair value of strategic investments	**$ (1,240,162)**	$ (7,477,865)	$ 6,237,703	**$ (939,271)**	$ (6,301,110)	$ 5,361,839

During the three-months ended June 30, 2023, the adjustment to fair market value of strategic investments for Q2, 2023 resulted in a loss of $1.2 million compared to a loss in the amount of $7.5 million in Q2, 2022, a favorable variation of $6.2 million.

During the six-months ended June 30, 2023, the adjustment to fair market value of strategic investments resulted in a loss of $0.9 million compared to a loss in the amount of $6.3 million for the same period in the prior year, a favorable variation of $5.4 million. The decrease in loss for the three and six-month periods ended June 30, 2023, is attributable to the variation of the market value of the common shares and warrants owned by the Company of HPQ Silicon Inc.

Comprehensive loss

	Three months ended June 30 2023	2022	Variation 2023 vs 2022	Six months ended June 30 2023	2022	Variation 2023 vs 2022
Comprehensive loss	**$ (6,333,708)**	$ (13,039,531)	$ 6,705,823	**$ (12,491,325)**	$ (17,108,651)	$ 4,617,326

The comprehensive loss for Q2, 2023 of $6.3 million compared to a loss of $13.0 million, in Q2, 2022, represents a variation of $6.7 million, and is primarily attributable to the factors described above, which have been summarized as follows:

- a decrease in product and service-related revenue of $2.8 million arising in Q2, 2023,
- a decrease in cost of sales and services of $1.4 million, primarily due to a decrease in subcontracting, direct materials, and manufacturing overhead and other, offset by the increase in employee compensation, foreign exchange charge on materials, and amortization of intangible assets,
- a decrease in SG&A expenses of $0.7 million arising in Q2, 2023, was primarily due to a decrease in professional fees, office and general and other expenses, offset by increases in employee compensation, travel, depreciation of property and equipment, depreciation of ROU assets, foreign exchange charge on materials, and the allowance for credit loss of $0.7 million,
- a decrease in share-based expenses of $0.9 million
- a decrease in R&D expenses of $0.06 million primarily due to a decrease in subcontracting, materials and equipment, and an increase in employee compensation, investment tax credits and other expenses,
- a decrease in finance costs (income), net of $1.1 million in Q2, 2023 primarily due to the revaluation of balance due on business combination,
- a favourable variation in the fair market value of strategic investments of $6.2 million,
- a decrease in income taxes of $0.02 million in Q2, 2023.

The comprehensive loss for the six-month period ended June 30, 2023, of $12.5 million compared to a loss of $17.1 million, for the same period in the prior year, represents a variation of $4.6 million, and is primarily attributable to the factors described above, which have been summarized as follows:

- a decrease in product and service-related revenue of $4.4 million,
- a decrease in cost of sales and services of $2.5 million, primarily due to a decrease in subcontracting, direct materials, manufacturing overhead and other, and investment tax credits, offset by the increase in employee compensation foreign exchange charge on materials, and amortization of intangible assets,
- an increase in SG&A expenses of $1.3 million was primarily due to an increase in employee compensation, travel, depreciation in property and equipment, foreign exchange charge on materials, and the allowance for credit loss of $2.1 million which is offset by a decrease in professional fees, office and general, and other expenses,
- a decrease in share-based expenses of $1.6 million
- a decrease in R&D expenses of $0.2 million primarily due to a decrease in subcontracting and material and equipment and an increase in employee compensation, investment tax credits and other expenses,
- a decrease in net finance costs (income) of $2.2 million is primarily due to the revaluation of balance due on business combination,
- a favourable variation in the fair market value of strategic investments of $5.4 million,
- a decrease in income taxes of $0.08 million.

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

	Three months ended June 30 2023	2022	Variation 2023 vs 2022	Six months ended June 30 2023	2022	Variation 2023 vs 2022
Comprehensive loss	**$ (6,333,708)**	$ (13,039,531)	$ 6,705,823	**$ (12,491,325)**	$ (17,108,651)	$ 4,617,326
Depreciation of property and equipment	**158,007**	148,412	9,595	**318,370**	291,402	26,968
Depreciation of ROU assets	**164,992**	155,398	9,594	**321,353**	321,622	(269)
Amortization of intangible assets	**221,752**	218,759	2,993	**443,504**	437,518	5,986
Finance costs (income), net	**(933,022)**	156,113	(1,089,135)	**(1,847,276)**	340,013	(2,187,289)
Income taxes	**—**	19,542	(19,542)	**—**	76,095	(76,095)
EBITDA[1]	**$ (6,721,979)**	$ (12,341,307)	$ 5,619,328	**$ (13,255,374)**	$ (15,642,001)	$ 2,386,627
Other non-cash items:						
Share-based expenses	**740,940**	1,621,040	(880,100)	**1,729,102**	3,290,670	(1,561,568)
Change in fair value of investments	**1,240,162**	7,477,865	(6,237,703)	**939,271**	6,301,110	(5,361,839)
Modified EBITDA [1]	**$ (4,740,877)**	$ (3,242,402)	$ (1,498,475)	**$ (10,587,001)**	$ (6,050,221)	$ (4,536,780)

¹ See “Non-IFRS Measures”

The EBITDA in Q2, 2023 was a $6.7 million loss compared to an EBITDA loss of $12.3 million for Q2, 2022, representing a variation of $5.6 million year-over-year. The variation in the EBITDA in the three-months ended June 30, 2023, compared to June 30, 2022, is due to the decrease in comprehensive loss of $6.7 million, an increase in depreciation of property and equipment, depreciation on right-of-use assets and, amortization of intangible assets, a decrease in net finance costs (income) of $1.1 million and a decrease in income taxes of $0.02 million.

The Modified EBITDA in Q2, 2023 was a $4.7 million loss compared to a Modified EBITDA loss of $3.2 million for Q2, 2022, representing an increased loss of $1.5 million. The increase in the Modified EBITDA loss in Q2, 2023 is attributable to the decrease as mentioned above in the EBITDA of $5.6 million, a decrease in share-based expenses of $0.9 million from an expense not recurring in Q2, 2023 and a decrease in the change of fair value of investments of $6.2 million, based on the fair value of such investment.

The EBITDA during the six-month period ended June 30, 2023, was a $13.3 million loss compared to an EBITDA loss of $15.6 million, representing a variation of $2.4 million year-over-year. The variation in the EBITDA in the six-months ended June 30, 2023, compared to June 30, 2022, is due to the decrease in comprehensive loss of $4.6 million, an increase in depreciation of property and equipment, an increase in amortization of intangible assets, a decrease in depreciation of right-of-use assets, a decrease in net finance costs (income) of $2.2 million and a decrease in income taxes of $0.08 million.

The Modified EBITDA during the six-month period ended June 30, 2023, was a $10.6 million loss compared to a Modified EBITDA loss of $6.1 million, representing an increased loss of $4.5 million. The increase in the Modified EBITDA loss is attributable to the decrease as mentioned above in the EBITDA of $2.4 million and a decrease in share-based expenses of $1.6 million from an expense not recurring in the six-month period ended June 30, 2023 and a decrease in the change of fair value of investments of $5.4 million, based on the fair value of such investment.

SUMMARY OF QUARTERLY RESULTS

	2023		2022				2021	
	Q2	**Q1**	Q4	Q3	Q2	Q1	Q4	Q3
Revenues	$ 3,039,479	$ 2,591,622	$ 3,301,777	$ 5,657,783	$ 5,847,180	$ 4,206,762	$ 7,205,349	$ 9,317,926
Gross profit	**1,111,815**	**526,573**	479,715	4,113,176	2,499,273	1,051,723	1,302,789	4,052,531
Gross margin %	**37.0%**	**20.3%**	14.5%	72.7%	42.7%	25.0%	18.1%	43.5
Comprehensive income (loss)	**(6,333,708)**	**(6,157,620)**	(10,818,755)	(4,053,706)	(13,039,531)	(4,069,119)	(22,402,857)	623,664
Earnings (loss) per share								
Basic	**(0.04)**	**(0.03)**	(0.06)	(0.02)	(0.08)	(0.02)	(0.13)	—
Diluted	**(0.04)**	**(0.03)**	(0.06)	(0.02)	(0.08)	(0.02)	(0.13)	—

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 June 30, 2023, the Company had cash of $0.8 million, included in the net working capital deficiency of $3.2 million. Certain working capital items such as billings in excess of costs and profits on uncompleted contracts do not represent a direct outflow of cash. The Company expects that with its cash, liquidity position, the proceeds available from the strategic investment and access to capital markets it will be able to finance its operations for the foreseeable future.

The Company’s term loan balance at June 30, 2023 was $391,564, and varied only slightly since December 31, 2022. The increase from January 1, 2022 to December 31, 2022, was mainly attributable to the additional proceeds received on the Economic Development Agency of Canada loan, which is interest free and will remain so, until the balance is paid over the 60-month period ending March 2029. The average interest expense on the other term loans was 7.2% in the period. The Company does not expect changes to the structure of term loans in the next twelve-month period. The Company maintained one credit facilities which bears interest at a variable rate of prime plus 1%, therefore 7.95% at June 30, 2023. The Company reimbursed a portion of the credit facilities during Q2 2023, and extended the due date of the remaining balance, while maintaining the similar conditions.

	Carrying Value	**Total contractual amount**	**Less than one year**	**2-3 years**	**4-5 years**	**Over 5 years**
	$	**$**	**$**	**$**	**$**	**$**
Bank indebtedness	332,189	332,189	332,189	—	—	—
Accounts payable and accrued liabilities[1]	8,526,239	8,526,239	8,526,239	—	—	—
Term loans	391,564	454,794	77,226	180,000	90,000	107,568
Balance due on business combination	1,708,161	1,860,020	1,708,161	—	—	—
Lease liabilities	5,376,136	6,543,087	2,940,114	1,125,789	642,528	1,834,656
	16,334,289	**17,716,329**	**13,583,929**	**1,305,789**	**732,528**	**1,942,224**

[1] Accounts payable and accrued liabilities exclude amounts which are not financial liabilities.

SUMMARY OF CASH FLOWS

	Three months ended June 30		Six months ended June 30	
	2023	2022	**2023**	2022
Cash provided / (used) in operating activities	**$ (920,885)**	$ (2,752,116)	**$ (7,451,851)**	$ (10,489,744)
Cash provided / (used) by investing activities	**612,074**	(2,152,488)	**862,770**	(906,347)
Cash provided / (used) by financing activities	**(727,443)**	(419,500)	**3,994,032**	478,839
Effect of exchange rate changes on cash denominated in foreign currency	**(21,184)**	2,988	**(21,017)**	6,247
Decrease in cash	**(1,057,438)**	(5,321,116)	**(2,616,066)**	(10,911,005)
Cash - end of period	**829,583**	1,291,508	**829,583**	1,291,508

During the three-months ended June 30, 2023, cash flow used by operating activities was $0.9 million compared to $2.8 million for the same period in the prior year. The use of cash during Q2, 2023, consists of the net loss of $6.3 million (Q2, 2022 – net loss of $13.1 million) plus adjustments for operating activities of $5.4 million (Q2, 2022 - $10.3 million), including a net change in non-cash operating working capital items of $3.8 million (Q2, 2022 – net change of $0.4 million). The favourable variation is due to collections of accounts receivables and payments made on trade payables, offset by prepaid expenses, mainly D&O insurance.

Investing activities resulted in a net source of funds of $0.6 million in Q2, 2023, compared to a use of funds of $2.2 million in Q2, 2022 resulting from less additions to property and equipment, an increase to ROU assets due to terms and conditions of the lease agreement that were modified to adjust the base rent and duration, an increase in intangible assets, and less purchases and disposals of strategic investments.

Financing activities in Q2, 2023, resulted in a use of funds of $0.7 million, compared with a use of funds of $0.4 million for the same period in 2022. In Q2, 2023, bank indebtedness decreased due to the Company's Italian subsidiary's repayment and extinguishment of the line of credit and to the increase in proceeds from issuance of shares upon exercise of stock options. The Company issued common shares for net cash proceeds of $0.2 million and repaid an amount of $0.08 million in loans and lease liabilities. Financing activities also include interest paid of $0.05 million in both Q2, 2023 compared to $0.2 million Q2, 2022.

The net cash position of the Company decreased by $1.1 million for Q2, 2023, compared to a decrease of $5.3 million for Q2, 2022.

During the six-months ended June 30, 2023, cash flow used by operating activities was $7.5 million compared to $10.5 million for the same period in the prior year. The use of cash consists of the net loss of $12.5 million (2022 – net loss of $17.2 million) plus adjustments for operating activities of $5.0 million (six-month period ended June 30, 2022 - $6.7 million), including a net change in non-cash operating working capital items of $3.1 million (2022 – net change of $4.5 million).

Investing activities resulted in a net source of funds of $0.9 million compared to a use of funds of $0.9 million, and caused mainly from the less net purchases and disposal of strategic investments.

Financing activities resulted in a net source of funds of $4.0 million during the six-month period ended June 30, 2023, compared with a net source of funds of $0.5 million for the same period in 2022. The Company issued common shares and private placements for net cash proceeds of $5.1 million and repaid an amount of $0.2 million in loans and lease liabilities and $0.1 million in balance due on business combination. Financing activities also include interest paid of $0.2 million.

During the six-month period ended June 30, 2023, the net cash position of the Company decreased by $2.6 million compared to a decrease of $10.9 million for the same period in the prior year.

USE OF PROCEEDS FROM FINANCINGS

Description of intended use of funds from financings in the past 12 months	**Proposed use of proceeds from financings completed in the past 12 months**	**Use of funds to Date**
October 19, 2022: Private Placement for total gross proceeds of $1,318,980	Proceeds were intended and used for working capital and general corporate purposes	$ 1,318,980
March 8, 2023: Private Placement for total gross proceeds of $5,000,000	Proceeds were intended and used for working capital and general corporate purposes	$ 5,000,000
July 21, 2023: Private Placement of Convertible Debenture Units for total gross proceeds of $3,030,000	Proceeds were intended and used for working capital and general corporate purposes	N/A

CAPITAL STOCK INFORMATION

The authorized share capital of the Company consists of an unlimited number of common shares. As at August 10, 2023 PyroGenesis had 178,880,395 Common Shares, 9,044,600 share purchase warrants, 51,423 broker warrants which entitles the holder to acquire one broker unit (each broker unit consist of one common share and one warrant), 9,510,500 outstanding stock options issued, and 7,273,000 exercisable options issued.

GOING CONCERN

These condensed consolidated financial statements have been prepared on the going concern basis, which presumes that the Company will be able to continue its operations for the foreseeable future and will be able to realize its assets and discharge its liabilities in the normal course of business for the foreseeable future.

The Company is subject to certain risks and uncertainty associated with the achievement of profitable operations such as the successful signing and delivery of contracts and access to adequate financing.

The Company has incurred, in the last years, operating losses and negative cash flows from operations, and as a result, the Company has an accumulated deficit of $105,872,203 as at June 30, 2023 ($93,384,858 as at December 31, 2022). Furthermore, there have been unexpected delays in the collection of certain accounts receivable from contracts closed in a prior year. This has resulted in a shortfall in cash flows from operating activities that would be used in funding the Company's operations.

As at June 30, 2023, the Company has working capital deficiency of $3,168,366 (working capital of $1,650,709 as at December 31, 2022) including cash of $829,583 ($3,445,649 as at December 31, 2022). The working capital is net of an allowance for credit losses amounting to $6,303,840 ($5,023,283 as at December 31, 2021) as further described in notes 6 and 7. The Company's business plan is dependent upon the successful completion of contracts and also the receipt of payments from certain contracts closed in a prior year and expects these payments to be made during fiscal 2023, as well as the achievement of profitable operations through the signing, completion and delivery of additional contracts or a reduction in certain operating expenses. In the absence of this, the Company is dependent upon raising additional funds to finance operations within and beyond the next twelve months. The Company has been successful in securing financing in the past and has relied upon external financing to fund its operations, primarily through the issuance of equity, debt and convertible debentures. The Company completed a private placement in October 2022 for an amount of $1,318,980 and also completed another private placement in March 2023 for net proceeds of $4,960,483 (see note 13). In addition, in July 2023, the Company also completed a brokered private placement of convertible debenture units for gross proceeds of $3,030,000 (note 23). While the Company has been successful in securing financing, raising additional funds is dependent on a number of factors, some of which are outside the Company's control, and therefore there is no assurance that it will be able to do so in the future or that these sources will be available to the Company or that they will be available on terms which are acceptable to the Company. These conditions indicate the existence of a material uncertainty that may cast significant doubt about the Company's ability to continue operating as a going concern.

The condensed consolidated financial statements have been prepared on a going concern basis and do not include any adjustments to the amounts and to classifications of the assets and liabilities that might be necessary should the Company be unable to achieve its plan and continue in business. If the going concern assumption were not appropriate, adjustments, which could be material, would be necessary to the carrying value of assets and liabilities, the reported expenses, and the classification of items on the consolidated statement of financial position.

RELATED PARTY TRANSACTIONS

During the three and six-month period ended June 30, 2023, the Company concluded the following transactions with related parties:

Rent and property taxes charged by a trust whose beneficiary is the controlling shareholder and CEO of the Company, for the three and six-month periods ended June 30, 2023, amount to $68,891 and $150,233, respectively ($70,226 and $139,280 for the three and six-month periods ended June 30, 2022, respectively.

These expenses are recorded in the captions *Cost of sales* and *services* and in *Selling, general* and *administrative* in the consolidated statements of comprehensive loss. As at June 30, 2023 the right-of-use asset and the lease liabilities amount to $758,320 and $821,932 respectively, ($799,090 and $881,635 respectively at December 31, 2022).

In June 2023, the terms and conditions of the lease agreement between the Company and the trust were modified, to adjust the base rent and duration. As a result, the ROU asset increased by $67,745, the lease liability increased by $48,023, and a reduction of expense of $19,722 was recorded in the statement of comprehensive loss.

A balance due to the controlling shareholder and CEO of the Company amounted to $462,913 at June 30, 2023 ($254,097 at December 31, 2022) 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 June 30		Variation	Six months ended June 30		Variation
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
Salaries - key management	**$ 360,577**	$ 257,871	$ 102,706	**$ 666,034**	$ 573,842	$ 92,192
Pension contributions	**6,663**	4,787	1,876	**12,320**	10,680	1,640
Fees - Board of Directors	**51,680**	69,000	(17,320)	**99,852**	89,000	10,852
Share-based compensation - officers	**486,982**	486,841	141	**516,603**	812,914	(296,311)
Share-based compensation - Board of Directors	**1,106,066**	1,106,066	—	**1,106,066**	1,758,213	(652,147)
Other benefits - key management	**1,878**	7,599	(5,721)	**157,135**	14,038	143,097
Total compensation	**$ 2,013,846**	$ 1,932,164	$ 81,682	**$ 2,558,010**	$ 3,258,687	$ (700,677)

CORPORATE HIGHLIGHTS

On January 10, 2023, PyroGenesis announced signed a $6.0 million contract with advanced materials firm to supply SPARC™ land-based waste destruction system.

On January 12, 2023, PyroGenesis announced an "Energy Transition" contract with a major European multinational chemical and energy conglomerate.

On January 17, 2023, PyroGenesis announced signed emissions reduction contract with North American lithium-ion battery recycler.

On January 24, 2023, PyroGenesis announced the approval of NexGen™ facility by global aerospace client for 3D metal powder production.

On January 24, 2023, PyroGenesis confirms receipt of milestone payments from client B.

On March 8, 2023, PyroGenesis announced that it has completed a non-brokered private placement consisting of the issuance and sale of 5,000,000 units of the Corporation at a price of $1.00 per unit, for gross proceeds of $5.0 million to the Company. Each unit consisted of one Common Share and one warrant entitling the holder thereof to purchase one Common Share at a price of $1.25 until March 7, 2025.

On March 21, 2023, PyroGenesis received $0.7 million purchase order for three plasma torches.

On May 3, 2023, PyroGenesis announced that its subsidiary, Pyro Green-Gas Inc had successfully completed the Integrated Cold Test under a previously announced $9.3 million project with a key client, one of the world's top diversified steel producers.

On May 18, 2023, PyroGenesis announced receipt of $2.0 million payment under existing DROSRITE™ contract.

On May 30, 2023, PyroGenesis signed breakthrough contract for first commercial by-the-tonne order for titanium metal powder for 3D printing.

On June 1, 2023, PyroGenesis announced important achievement in silicon production process for HPQ Silicon using PyroGenesis' PUREVAP™ quartz reduction reactor.

On June 22, 2023, PyroGenesis signed two contracts with Aluminerie Alouette for $2.7 million.

On July 21, 2023, PyroGenesis announced closing of brokered private placement of convertible debenture units, including participation by the CEO.

On August 1, 2023, PyroGenesis signed $4.1 million contract for 4.5MW Plasma Torch System with Aeronautics and Defense client.

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 4, 5 and 28 of the 2022 consolidated Financial Statements.

CONTROLS AND PROCEDURES

The Company's shares are traded on the Toronto Stock Exchange ("TSX") since November 2020 and on the NASDAQ since March 2021. Prior to November 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 acknowledged that being listed on the TSX, and NASDAQ would require more stringent disclosure controls, and started implementing such before the NASDAQ listing.

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 disclosure controls and procedures ("DC&P") and internal control over financial reporting ("ICFR"), as defined in NI 52-109 and the applicable rules of the U.S. Securities and Exchange Commission. Such requirements also include the assessment and evaluation of both DC&P and ICFR, which was not required while the Company was listed on the TSXV. Consequently, the Company continues to take several actions to improve its DC&P and ICFR, in accordance with the thresholds provided by the regulators. 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, and the effectiveness of DC&P and 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 December 31, 2022, an evaluation was carried out under the supervision of the CEO and CFO, of the design and operating effectiveness of the Company's DC&P. Based on this evaluation, the CEO and CFO concluded that presence of material weaknesses in our ICFR as described below in Management's Report on Internal Controls over Financial Reporting at December 31, 2022.

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, 2022, 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 summarised the conclusion below. 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 are the control deficiencies that were considered to be material weaknesses in the current quarter and in fiscal 2022 and any remediation that occurred up to June 30, 2023:

- **Control environment:** The Company did not maintain an effective control environment and has identified deficiencies relating to appropriate organizational structure and authority and responsibilities. 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 for holding individuals accountable for their internal control-related responsibilities.

  Nonetheless, as of June 30, 2023 and for a portion of fiscal 2022, the deficiencies related to the control environment over reporting lines as well as authority and responsibilities were improved with the implementation of additional controls. Oversight and governance of financial reporting and related party transactions, including the oversight executed by Board of Directors and the Audit Committee was not indicative of a control environment deficiency. The Company has financial reporting resources internally, or at their disposal to ensure they can deal with complex accounting matters, as well as period-end controls to mitigate the risk of misstatement in the financial information.

- **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.

  During the course of the 2022 fiscal year, and the current six-month reporting period, the Company continued to implement numerous internal controls, including compensating controls to mitigate these risks as well as adding sufficient levels of review and approval in order to reduce the risk related to control activities thereby improving the quality of financial information.

- **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.

  Throughout 2022, and including the period ended June 30, 2023, the Company continues to modify their processes to ensure that journal entries are sufficiently reviewed and approved, and compensating controls exist to ensure the financial information is free of misstatement.

- **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.

  During the course of 2022, the Company continued to improve the safeguarding of spreadsheets and data, through various controls, password protections and improved segregation of duties with the objective of reducing the possibility of error.

- **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.

  In response to this, and as part of the improvement process the Company has continued to implement controls to limit the access to financial and non-financial applications, based on employee profile. The Company continues to implement IT environment best practices for access controls, including prompt changes, access limitation to appropriate users and systematic periodic reviews of account privileges. Automated access controls are being integrated into the new ERP system.

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 for the entire year.

Aside from these material weaknesses, management has concluded that the Company’s consolidated financial statements as at and for the period ended June 30, 2023, 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. There were no material adjustments to the Company’s consolidated financial statements for the period ended June 30, 2023, and 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, 2022, the Company’s design and operation of ICFR and DC&P were not effective.

Management’s Ongoing Remediation Measures

During 2022, the 2023 quarters and beyond, management initiated and continues to implement remediation measures as outlined above, in the 2022 annual MD&A as well as the past quarterly MD&A’s. 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, as throughout the various accounting cycles. 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. In 2023, the Company’s management, with oversight of the Audit Committee expects to advance the documenting, testing, and refining the internal controls, in addition with the upgrade to the ERP system, which inherently will add additional automated controls. As a result, the Company will improve the design of control activities and strengthen process controls surrounding sales, purchases, payroll, among others, and will be call for fewer compensating controls.

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 quarter ended June 30, 2023 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 DC&P and ICFR, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives. Because of their inherent limitations, DC&P and ICFR 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 2022 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 June 30, 2022, the Company had a history of losses and negative cash flows. For the six-month period ended June 30, 2023, the Company has a net loss of $12.5 million, cash flows used in operations of $7.5 million, and an accumulated deficit of $105.9 million. 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. 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 as at June 30, 2023 represents the carrying amount of cash, accounts receivable (except sales tax receivable), costs and profits in excess of billings on uncompleted contracts, deposits and royalties receivable.

Cash is held with major reputable financial institutions.

Management has established a credit policy under which each new customer is analysed individually for creditworthiness before the Company's payment and delivery terms and conditions are offered. The Company's review could include reviewing external ratings, if they are available, financial statements, credit agency information, industry information and in some cases bank references. The Company's exposure to credit risk is mainly influenced by the individual characteristics of each customer. In monitoring customer credit risk, customers are identified according to their characteristics such as their geographic location, industry, trading history with the Company and existence of previous financial difficulties.

The Company does not generally require collateral or other security from customers on accounts receivable, however, the contract terms may include the possibility of recourse in the event of late payment. The Company believes that there is no unusual exposure associated with the collection of these receivables.

The credit risk associated with costs and profits in excess of billings on uncompleted contracts is similar to that of accounts receivable, as these amounts are accumulated and converted to accounts receivable as invoicing milestones are reached.

The royalties receivable 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. The carrying amount of the royalties receivable have been discounted to reflect the time value of money and credit risk of the counterparty.

The deposits are payments made to suppliers and entities from which the Company leases property. The Company does not have collateral or other security associated with the collection of these deposits. As at June 30, 2023 and 2022, no loss allowance has been recognized in connection with these deposits and the maximum exposure is the carrying amount of these deposits.

During the three and six-month periods ended June 30, 2023, and the year-end December 31, 2022, provisions for expected credit losses were recorded, however, the accounts provisioned by the loss are still subject to enforcement activity in order to collect the balances due

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 six-months ended June 30, 2023, the Company had a net loss of $12.5 million, which includes a loss from the change in fair value of strategic investments of $0.9 million and cash flows used in operations of $7.5 million. 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 June 30, 2023, 9,510,500 stock options are currently issued and outstanding, together with 9,044,600 share purchase warrants and 51,423 broker warrants which entitles the holder to acquire one broker unit (each broker unit consist of one common share and one warrant). 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, if 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, or delivery of products and services.

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 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 quarter ended June 30, 2023 and the year ended December 31, 2022 under “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, or other requirements imposed by security regulators, even with the Company’s best efforts, 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, 80,097,898 Common Shares, representing in aggregate 44.78% of the total voting rights attached to the outstanding Common Shares, and options and warrants to acquire an additional 8,770,000 Common Shares (increasing the total number of Common Shares held or controlled, directly or indirectly, by him to 88,867,898 Common Shares, or 47.36% of 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.

Risk related to NASDAQ Listing Non-Compliance and Dual Listing Evaluation

The Company faces a risk related to its NASDAQ listing status, as it has been unable to meet the minimum closing bid price of US$1.00 per share listing requirement under NASDAQ Listing Rule 5550(a)(2). In May 2023, NASDAQ approved the Company’s request for a 180-extension to meet this requirement and, as a result, the Company has until November 20, 2023, to regain compliance. It is the second extension granted to the Company by NASDAQ. If at any time prior to November 20, 2023, the Company’s closing bid price is at least US$1.00 for a minimum of 10 consecutive business days, NASDAQ may provide PyroGenesis with a written confirmation of renewed compliance and the matter will be resolved. There is no certainty that this will occur. As a result, the Company is at risk of being delisted from NASDAQ. This situation may negatively impact investor confidence and lead to potential adverse consequences on this stock’s liquidity and trading activity.

Furthermore, as part of the Company’s proactive risk management strategy, it is currently evaluating the costs and benefits of maintaining a dual listing on both NASDAQ and the TSX. This ongoing evaluation entails an analysis of several key factors, including (i) the financial costs associated with being on each exchange, such as insurance costs, regulatory compliance costs, legal fees, and accounting fees, (ii) the volume of trading on both exchanges, and (iii) the regulatory and compliance requirements of each exchange, (iv) additional benefit of access to capital, among others.

It is essential for investors to understand that the outcome of this evaluation remains uncertain. The decision to maintain a dual listing or adhere to Nasdaq’s listing standards will depend on various internal and external factors, market conditions, and regulatory considerations. Therefore, investors should exercise caution and avoid assuming that the Company will continue to be listed on Nasdaq without any potential challenges.

Q2 Production Highlights

In Q2 2023, PyroGenesis continued its focus on advancing its updated business strategy that was first outlined in the Company’s 2022 fourth quarter and year-end results.

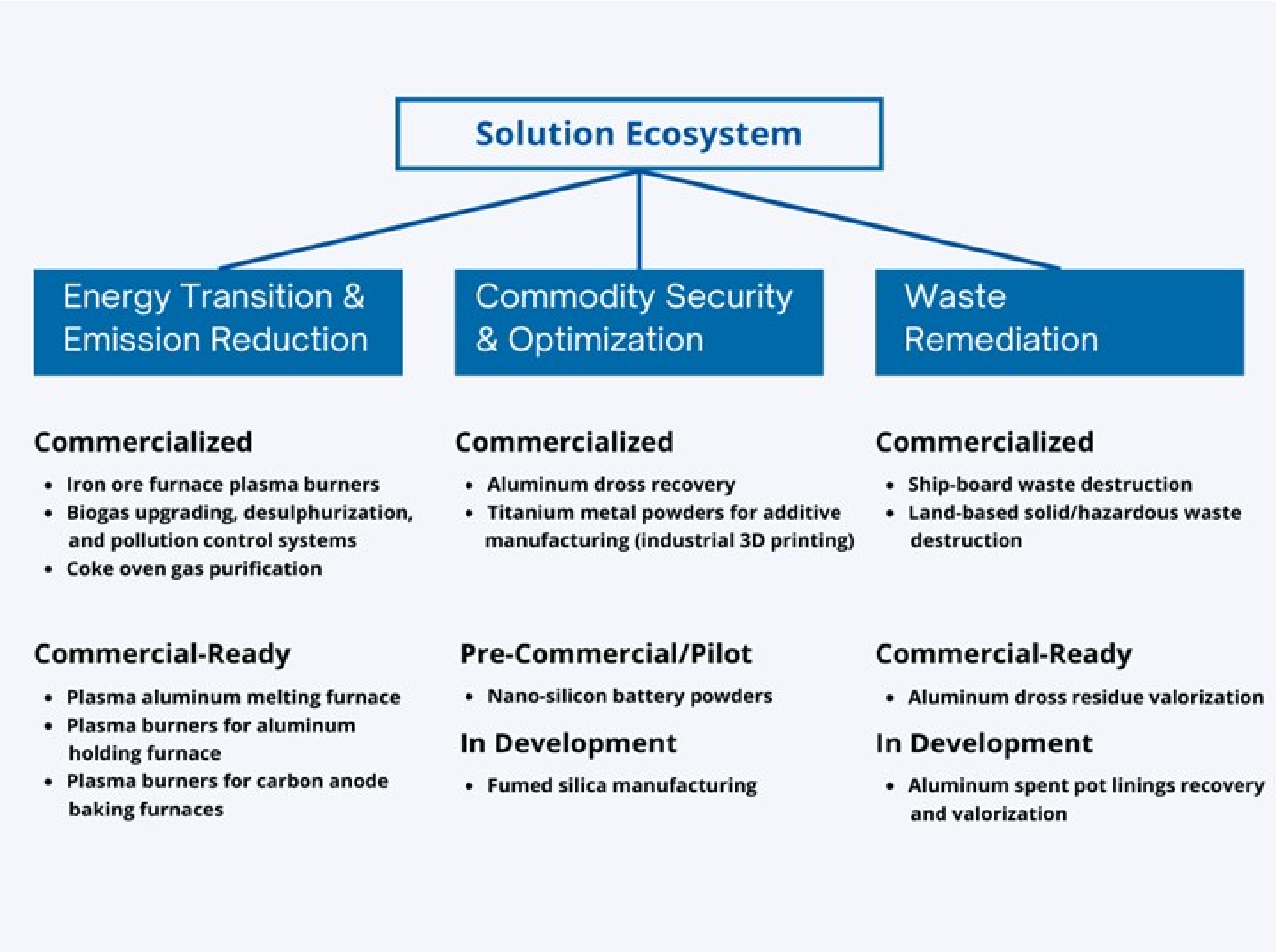
As noted, as the variety of uses for the Company’s core technologies has expanded, and industry interest has increased, the Company is concentrating its solution ecosystem under three verticals that align with economic drivers that are key to global heavy industry:

Energy Transition & Emission Reduction:
- fuel switching, utilizing the Company's electric-powered plasma torches and biogas upgrading technology to help heavy industry reduce fossil fuel use and greenhouse gas emissions,

Commodity Security & Optimization:
- recovery of viable metals, and optimization of production to increase output, to maximize raw materials and improve availability of critical minerals,

Waste Remediation:
- safe destruction of hazardous materials, and the recovery and valorization of underlying substances such as chemicals and minerals.

Within each vertical the Company offers several solutions at different stages to commercialization.



The information below represents highlights from the past quarter for each of the above verticals, followed by an outline of the Company's strategy, and key developments that will impact the subsequent quarters.

Energy Transition & Emission Reduction

- **In May**, the Company announced that its subsidiary, Pyro Green-Gas, had successfully completed the integrated cold test (ICT) step under a previously announced $9.3 million project, with a key client – one of the world's top diversified steel producers.

  The ICT completion marks a significant milestone towards the completion of the overall project, where Pyro Green-Gas has been mandated to (i) supply coke oven gas purification solutions and (ii) hydrogen production processes that have combined the potential to allow for the extracting of hydrogen with a 99.999% purity level and improve the client's environmental outcome. The ICT confirms that all systems, equipment and their components meet and exceed the required operation and safety standards.

With the implementation of Pyro Green-Gas' hydrogen extraction technology, the client would be able to rely on a cleaner energy source for its annealing, galvanizing and acid recovery processes, furthering its efforts to reduce its carbon footprint.

Commodity Security & Optimization

- **In May**, the Company announced a major corporate breakthrough with its first commercial by-the-tonne order for titanium metal powder for use in industrial 3D printing, commonly known as additive manufacturing. The contracted order for 5 metric tonnes (or 5,000 kg) also had a provisional order for an additional 6 tonnes.

  The order is to be completed using PyroGenesis' NexGen™ plasma atomization system, from the Company's metal powder production facility in Montreal, Quebec. The client is an advanced materials company in the United States, who has requested anonymity.

  As noted at the time by Massimo Dattilo, VP PyroGenesis Additive, this order represents the Company's "full entrance into the titanium metal powders marketplace".

- **In June**, the Company announced an achievement regarding its GEN3 PUREVAP™ Quartz Reduction Reactor (QRR) pilot plant (the "GEN3 PUREVAP ™ Pilot Plant" or the "Pilot Plant") project, with material produced by the pilot plant receiving successful laboratory validation of quartz to high-purity 3N+ silicon in one step. During test #5, the pilot plant achieved an average silicon purity (%) of 99.92% across two separate tests. This outcome validates the capability of the QRR process to surpass the minimum purity requirement of 3N needed for battery-grade silicon.

  The PUREVAP™ process is an innovative patented process that will enable the one-step conversion of quartz (SiO_2) into high-purity silicon (Si) at reduced costs, energy input and carbon footprint that will propagate its considerable renewable energy potential. As noted at the time in the client's news release, silicon (Si), also known as silicon metal, is a key strategic material needed for the decarbonization of the economy and the Renewable Energy Revolution ("RER"). However, silicon does not exist in its pure state and must be extracted from quartz (SiO_2) in what has historically been a capital and energy-intensive process.

  The Client, HPQ Silicon Inc. (TSX-V: HPQ) is an advanced materials engineering provider that offers sustainable silica (SiO_2) and silicon (Si) solutions. Based in Quebec, HPQ Silicon is developing a unique portfolio of value-added silicon products sought after by electric vehicle and battery manufacturers, among other industries. PyroGenesis is the engineering and development producer, but also, as part of the terms of the contract with HPQ, PyroGenesis benefits from a royalty payment representing 10% of the Client's sales, with set minimums.

Waste Remediation

- **In June**, the Company signed two contracts with Aluminerie Alouette, for projects to valorize residue streams from primary aluminum smelters. Alouette, located in Quebec, is home to the largest aluminum smelter in the Americas.

  The first contract is to further advance a spent pot lining (or SPL) valorization technology, originally announced in March of 2021 upon receipt of a research grant to study the concept. Pot linings are the insulating carbon material that helps enable electrical conductivity inside an aluminum smelter cell or pot, for the process of turning aluminum oxide into aluminum. This lining typically has an average lifespan of 5 years, after which it eventually fails from continuous use, causing the spent pot to be put out of service and the highly contaminated linings to be removed.

  PyroGenesis' SPL remediation technology has now advanced to the point where full participation of Alouette in partnership with PyroGenesis has commenced. An estimated 1.5 million tons of spent pot linings are produced annually worldwide. If PyroGenesis' proposed process proves successful, it could address a major issue concerning the aluminum industry. The second contract is geared to develop a new valorization solution for excess electrolytic bath. In both instances, the materials, while dangerous, if processed correctly can be recovered and reused by the primary aluminum producer.

  Both projects have a commercial end goal with a strategy to market the solutions industry-wide in conjunction with Aluminerie Alouette.

Q2 Financial Highlights

- **In May**, the Company announced the receipt of a $2 million payment (US$1.5 million) under its existing $25 million Drosrite™ contract with Drosrite International LLC, which was in turn contracted by Radian Oil and Gas Services Company for an order of 7 Drosrite™ aluminum dross recovery systems.

  The first three Drosrite™ systems are in use at Ma'aden, the largest mining company in the Kingdom of Saudi Arabia, at their Ras Al-Khair location – the world's largest integrated aluminum facility. The remaining four systems under the contract have already been manufactured and are ready for deployment subject to a renewed payment schedule.

- **In June**, the Company announced a "best-efforts" brokered private placement offering of up to 5,000 unsecured convertible debenture units of the Company (the "Convertible Debenture Units") at a price of $1,000 per Debenture Unit, for proceeds of up to $5,000,000 (the "Offering"). In connection with the Offering, P. Peter Pascali, President, CEO, and Director subscribed to $2,000,000 of Convertible Debenture Units. The Company indicated it intends to use the net proceeds from the Private Placement for working capital and general corporate purposes.

- **In July**, the Company announced amended terms of the brokered private placement, and also in July subsequently announced final closing of the placement.

Q2 Operational Highlights

- **In May**, the Company announced receipt of a 180-day extension to meet the Nasdaq minimum US$1 bid requirement under NASDAQ Listing Rule 5550(a)(2).

OUTLOOK

Consistent with the Company's past practice, and in view of the early stage of market adoption of our core lines of business, we are not providing specific revenue or net income (loss) guidance for 2023. However, various events have occurred that allow for a partial window into the remainder of 2023.

Overall Strategy

PyroGenesis provides technology solutions to heavy industry that leverage off of the Company's proprietary position and expertise in ultra-high temperature processes. The Company has evolved from its early roots of being a specialty-engineering firm to being a provider of a robust technology eco-system for heavy industry that helps address key strategic goals.

The Company believes its strategy to be timely, as multiple heavy industries are committing to major carbon and waste reduction targets at the same time as many governments are increasingly funding environmental technologies and infrastructure projects – all while both are making efforts to ensure the availability of critical minerals during the coming decades of increased output demand.

While there can be no guarantee, the Company believes this evolution of its strategy beyond a greenhouse gas emission reduction emphasis, to an expanded focus that encapsulates the key verticals listed above, both improves the Company's chances for success while also providing a clearer picture of how the Company's wide array of offerings work in tandem to support heavy industry goals.

PyroGenesis' market opportunity remains large, as major industries such as aluminum, steelmaking, manufacturing, defense, aeronautics, and government require factory-ready, technology-based solutions to help steer through the paradoxical landscape of increasing demand and tightening regulations and material availability.

As more of the Company's offerings reach full commercialization, PyroGenesis will remain focused on attracting influential customers in broad markets, and ensuring that operating expenses are controlled to achieve profitable growth.

For the remainder of 2023, we will continue to sharpen our focus on our strategy that structures our solution ecosystem under the three verticals noted previously: *energy transition & emission reduction; commodity security & optimization; and waste remediation.*

Some key developments to that end, include:

Enhanced Sales and Marketing

Against the backdrop of this strategy, the Company has been increasing sales, marketing, and R&D efforts in-line – and in some cases ahead of – the growth curve for industrial change related to greenhouse gas reduction efforts.

In May, during the Company's annual general meeting (AGM), the Company released a new corporate presentation that provides a significantly better representation of the Company, its technology offerings, and alignment to customer needs.

The Company intends to develop additional visual material throughout 2023.

Business Line Developments

Upcoming milestones which are expected to confirm the validity of our strategies, are as follows:

Business Line Developments: Near Term (0 – 3 months)

Financial

> Payments for Outstanding Major Receivables: The Company remains in continuous discussions with Radian Oil and Gas Services Company regarding the outstanding receivable of approximately US$8.0 million under the Company's existing $25 million+ Drosrite™ contract. As previously announced, PyroGenesis agreed to a strategic extension of the payment plan, by the customer and its end-customer, geared to better align the pressures on the end-user's operating cash flows created by increased business opportunities.
>
> These discussions are very positive, both in regards to the ongoing payment plan, and in regards to a potential substantial new order of additional Drosrite™ systems, as the client's cash flow pressures and their new business opportunities move closer to resolution.
>
> Innovation Grants: as mentioned in the Q1 outlook on May 15 the Company has applied for grants tailored to technology innovation and/or carbon reduction, and expects to have results regarding these applications. This situation has progressed very positively, and the Company is awaiting formal government announcement of the grants before it is legally allowed to indicate specifics.

Commodity Security & Optimization

> Negotiations for Multiple Metal Powder Orders: Negotiations with companies for commercial orders of the Company's metal powders continues, as projected within the Company's Q1 outlook for Q2. As noted above, in Q2 the Company announced a first by-the-tonne contract for titanium metal powder of 5 metric tonnes, with an option for 6 additional tonnes.
>
> Product Qualification Process for Global Aerospace Firm: Based on information flow between the Company and the aerospace client previously announced, the Company believes that the 2-year long qualification process to approve the Company's titanium metal powers for use by a global

aerospace firm and their suppliers, will conclude in the near term. This project continues to move forward positively.

Energy Transition & Emission Reduction

Plasma Torch Order: as mentioned in the Q1 outlook for Q2, on May 15, the Company was in advanced discussions with an international entity, whereby a plasma torch contract, if signed, would be between $3-$4 million. Post quarter end, on August 1, 2023, the Company received a signed contract for this project, for $4.1 million, with a confidential US-based aeronautics and defense client.

Iron Ore Pelletization Torch Trials: as mentioned in the Q1 outlook on May 15, in April 2023, the commissioning of the plasma torch systems, for use in Client B's pelletization furnaces, was underway, with the Company's engineers onsite at the Client's iron ore facility. The commissioning process includes installation, start-up, and site acceptance testing (SAT). "Client B" is the customer to whom the Company previously announced that it had shipped four 1 MW plasma torch systems for use in Client B's iron ore pelletization furnaces, for trials toward potentially replacing fossil-fuel burners with plasma torches in the Client's furnaces.

This project continues to move forward. The Client recently suffered a series of unfortunate technical events that caused delays of several weeks, as a result of damaging regional torrential rain storms and flooding that caused significant impairment to the facility's electrical system and furnace components. Repairs have been ongoing. The Company's plasma torches have been installed and activated, and the final commissioning and site acceptance testing has resumed, with expectation for final SAT completion within the next few weeks or sooner.

Pyro Green-Gas: the Company's wholly-owned subsidiary is expected to sign a contract with an approximate value of between $10-$15 million in connection with a renewable natural gas project.

Aluminum Remelting Furnaces:

The Company has been working on the development of aluminum remelting furnace solutions using plasma, for use by secondary aluminum producers or any manufacturer of aluminum components that uses recycled or scrap aluminum.

With gas-fired furnaces responsible for much of the scope 1 emissions of secondary aluminum production, aluminum companies have been searching for solutions that can help in the decarbonization efforts of aluminum remelting and cast houses.

The Company has two concepts: the retro-fitting of plasma torches in existing remelting and cast house furnaces that currently use other forms of heating, such as natural gas; and the manufacturing and sale of a PyroGenesis produced furnace based off the Company's existing Drosrite metal recovery furnace design, which has been in use commercially for several years.

The Company has been working with a number of different companies over the past few years towards these goals. The results from the conclusion of recent major tests, conducted in conjunction with these companies, have been very positive, and negotiations are underway for next step deployments and sales, with announcements forthcoming.

Status as a dual-listed publicly traded Company

As part of the Company's proactive risk management strategy, it is currently evaluating the costs and benefits of maintaining a dual listing on both Nasdaq and the TSX. This ongoing evaluation entails an analysis of several key factors, including (i) the financial costs associated with being on each exchange, such as insurance costs, regulatory compliance costs, legal fees, and accounting fees, (ii) the volume of trading on both exchanges, and (iii) the regulatory and compliance requirements of each exchange.

Costs to PyroGenesis associated to its dual listing in the US are considerable, with incremental US-specific fees related to directors & officer insurance, legal, listing and filings, and accounting, of more than $2.2 million.

The Company has until November 20, 2023 to regain the Nasdaq's minimum US$1 bid compliance for ten consecutive trading days. Management will continue to monitor the situation and conduct its analysis, and will provide material updates as they occur.

Please note that projects or potential projects previously announced that do not appear in the above summary updates should not be considered as at risk. Noteworthy developments can occur at any time based on project stages, and the information presented above is a reflection of information on hand.

FURTHER INFORMATION

Additional information relating to Company and its business, including the 2022 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 June 30, 2023.

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 April 1, 2023, and ended on June 30, 2023, that has materially affected, or is reasonably likely to materially affect, the issuer's ICFR.

Date: August 10, 2023

/s/ P. Peter Pascali

P. Peter Pascali
Chief Executive Officer

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 June 30, 2023.

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 April 1, 2023, and ended on June 30, 2023, that has materially affected, or is reasonably likely to materially affect, the issuer's ICFR.

Date: August 10, 2023

/s/ Andre Mainella

Andre Mainella
Chief Financial Officer