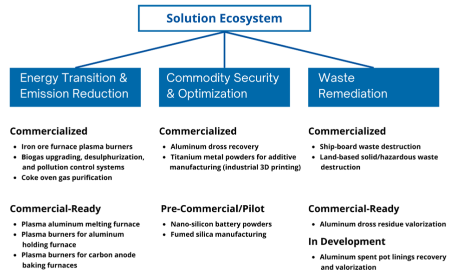
PyroGenesis Announces 2023 Fourth Quarter and Year End Results

April1, 2024

MONTREAL, April 01, 2024 (GLOBE NEWSWIRE) -- PyroGenesis Canada Inc. (http://pyrogenesis.com) (TSX: PYR) (OTCQX: PYRGF) (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) and address environmental pollutants, is pleased to announce its financial and operational results for the fourth quarter and the fiscal year ended December 31st, 2023.

Solution Ecosystem



Solution Ecosystem

"2023 was an interesting year for PyroGenesis, as we dealt with many of the issues associated with the growth and adoption of clean technology in a cautious economic environment," said P. Peter Pascali, President and CEO of PyroGenesis. "We navigated cash management challenges brought about by higher costs associated with commercializing our technologies, continued inflationary pressures on material and labour costs, longer sales cycles for system sales caused by the uncertain economic environment we are all facing, and multiple requests from potential customers to help them in their investigation of using plasma as a solution to their many problems. As much of this type of work is new-use proof-of-concept, profit margins are negligible, and timelines imprecise."

"While many of these efforts did not yield large contracts or system sales during the year, we cannot underestimate the impact these engagements have had and are having," said Mr. Pascali. "In a few short years we have moved front-of-mind to many current and potential heavy industry customers who sought us out as they made their initial steps on their decarbonization journey. Since late 2019, when our work on the first tests of plasma in iron ore pelletization heralded our entry into the field of heavy industry decarbonization, the opportunities have expanded far beyond the one-furnace/one-industry concept, to numerous process heating steps in virtually every heavy industry. The array of opportunities possible within the aluminum industry alone has surpassed that of any one specific technology solution we offered in the past. This is a fundamental change that has taken hold in 2023 which I would suggest significantly de-risks PyroGenesis overall."

Mr. Pascali added, "As the decarbonization trend continues to mature, we are well-positioned as a company with deep experience in the field – a key factor to customers as the scale of projects amplifies. This, along with our continued focus on cost optimization, our strong backlog of almost $29 million, negligible debt, the recent commercialization of our titanium metal powder production system, and a very robust sales pipeline, feeds my optimism for the future. As I have mentioned in the past, our revenue will fluctuate quarter to quarter, but our commitment will not. We are positioning ourselves to become a leader in heavy industry decarbonization technology solutions for many years to come."

The information below represents important highlights from the past year, followed by an outline of the Company's strategy and outlook for 2024.

2023 Q4 Production Highlights

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

In Q4 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 activities under a three tiered solution ecosystem that aligns 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,

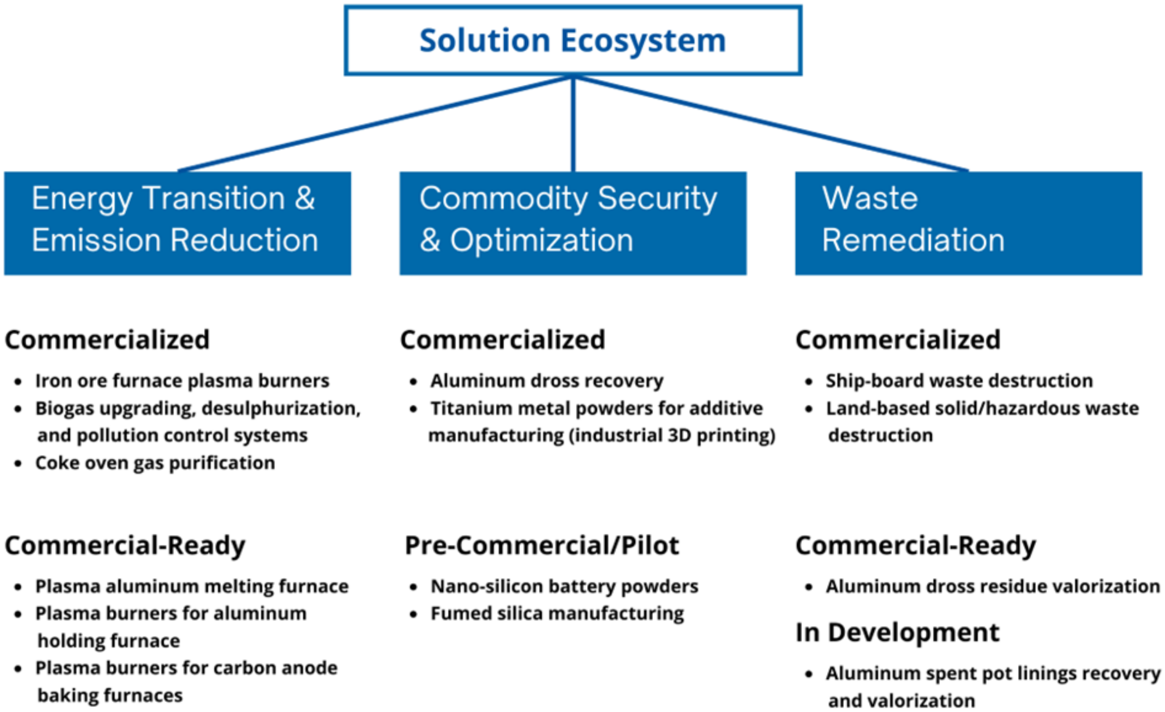
Commodity Security & Optimization:

- recovery of viable metals, and optimization of production methods/processes geared to increase output, 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 of commercialization.



Commodity Security & Optimization

In October, the Company provided an update (Press Release dated October 3, 2023) on two projects: (i) the PUREVAP™ Quartz Reduction Reaction ("QRR") pilot plant and (ii) the Fumed Silica Reactor ("FSR") project.

For the QRR project – an initiative to create high purity silicon from quartz in a single step using a plasma reactor – the noteworthy progress and confirmations included:

- Completion of the scaling up of the QRR process by 2,500x from the previous laboratory scale, validating the original proof of concept.
- Demonstration of operation in a semi-continuous batch cycle.
- Production of silicon from quartz using a one-step direct carbothermal reduction process.
- 25% reduction in raw material use compared with conventional methods.
- Achievement of 3N+ (or 99.9+%) silicon purity, a crucial purity level for battery-grade silicon applications.
- Optimized QRR design for high performance during the tapping process, minimizing silicon contamination.

For the FSR project – an initiative to convert quartz into fumed silica in a single step using a plasma reactor – the Company announced that in a major step towards commercial-scale production, PyroGenesis had successfully deployed the FSR on a laboratory scale, resulting in the milestone production of fumed silica. Preliminary tests and analysis also confirmed that the material produced has chemical and physical characteristics compatible with those of commercially available fumed silica.

In October, the Company announced (Press Release dated October 11, 2023) a successful "pour" of silicon from the PUREVAP™ Quartz Reduction Reaction (QRR), successfully validated 100% of the project's critical milestones.

In November, the Company announced (Press Release dated November 9, 2023) a successful third-party validation of fumed silica, from the FSR project, from lab-scale production. Separately, the Company announced that production of the fumed silica pilot plant was underway, which was announced as intended to be in operation in Q2 of 2024.

In December, the Company announced (Press Release dated December 18, 2023) the successful receipt of a U.S. patent for its innovative NEXGEN Plasma Atomization metal powder production technology for use in additive manufacturing and 3D printing.

Waste Remediation

In October, the Company announced (Press Release dated October 24, 2023) receipt of a $360,000 initial contract from a European engineering services firm undertaking the discovery and safe destruction of chemical warfare agents within the European Union. Under this agreement, as part of a potential three-phase project, PyroGenesis will first provide a lab-scale size plasma arc chemical warfare agent destruction system (the "PACWADS") as part of a multi-partner project aimed at identifying, extracting, and disposing of chemical munitions and chemical warfare agents residing in active marine passageways and corridors. The second phase will consist of testing the system to validate efficiency, performance and capacity. The eventual goal is to develop a full-scale system once results from the lab-scale system are reviewed.

Q4 Financial Highlights

In November, the Company confirmed receipt (Press Release dated November 20, 2023) of a production milestone payment of $520,000 associated with the plasma torch contract with a U.S. corporation for Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) destruction (Press Release dated

September 12, 2023).

In December, the Company announced (Press Release dated December 20, 2023) closing of a $1,250,000 non-brokered private placement of a convertible loan in the amount of $1.25 million with Fiducie de Crédit Mellon Trust, a related party.

Status as a Dual-Listed Publicly Traded Company

As part of the Company's proactive risk management strategy, the Company announced in its Q2 news release (Press Release dated August 10, 2023) that it was evaluating the costs and benefits of maintaining a dual listing on both Nasdaq and the TSX. That evaluation entailed 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.

On October 27, 2023, after careful consideration by the Board of Director, the Company announced it would be voluntarily delisting from the Nasdaq exchange.

The Company's shares were subsequently delisted from Nasdaq and shares ceased trading on November 16, 2023. On the same day, the Company's shares began trading on the OTCQX Best Market, under the symbol "PYRGF".

None of these activities had any bearing on the Company's main listing on the TSX, where the Company's stock continued to trade uninterrupted under the symbol "PYR". The Company also trades on the Frankfurt Exchange, under the symbol "8PY".

Financial Summary

Revenues

PyroGenesis recorded revenue of $3.0 million in the fourth quarter of 2023 ("Q4, 2023"), representing a decrease of $0.3 million compared with $3.3 million recorded in the fourth quarter of 2022 ("Q4, 2022"). Revenue for fiscal 2023 was $12.3 million, a decrease of $6.7 million over revenue of $19 million compared to fiscal 2022.

Revenues recorded in fiscal 2023 were generated primarily from:

- PUREVAP™ related sales of $1,660,928 (2022 - $6,272,697)
- DROSRITE™ related sales of $535,868 (2022 - $1,912,807)
- support services related to systems supplied to the US Navy $3,245,618 (2022 - $1,288,356)
- torch related sales of $3,396,458 (2022 - $5,558,210)
- Refrigerant destruction sales of $605,962 (2022 - $Nil)
- biogas upgrading & pollution controls of $1,713,810 (2022 - $3,347,443)
- other sales and services $1,186,437 (2022 - $633,990)

Q4, 2023 revenues decreased by $0.3 million, mainly as a result of:

- PUREVAP™ related sales decreased by $0.6 million due to the completion of the project and the Company announcing the successful silicon "pour" validating all critical milestones and with this achievement, the stage is set for discussions in transitioning to commercial production,
- DROSRITE™ related sales decreased by $0.3 million due to customer delays in funding for the construction of the onsite facility,
- Support services related to systems supplied for the US Navy increased by $1.5 million due to the completion of several milestones and the increase in awarded contracts. In addition, in 2022 a revision in the cost budget affected the revenue recognized by percentage completion. At that time, the customer had yet to provide us with a firm purchase order for the change of scope,
- Torch-related products and services decreased by $1.4 million, due to the completion of the project, with the Company currently providing continuous onsite support,
- SPARC™ related sales increased by $0.2 million due to the advancement of the project, and,
- Biogas upgrading and pollution controls related sales increased by $0.2 million specifically due to the project advancement of our regenerative thermal oxidizer system.

Fiscal 2023 revenues decreased by $6.7 million, mainly as a result of:

- PUREVAP™ related sales decreased by $4.6 million due to the completion of the project and initial phase of testing and one-time $3.6 million sale of IP, in 2022, which was not repeated in the current fiscal year,
- DROSRITE™ related sales decreased by $1.4 million due to the impact of the continued customer delays in funding for the construction of the onsite facility,
- Support services related to systems supplied for the US Navy increased by $2.0 million due to the completion of several milestones and the increase in awarded contracts,
- Torch-related products and services decreased by $2.2 million, due to the completion of the project, with the Company currently providing continuous onsite support,
- SPARC™ related sales increased by $0.6 million due to the advancement of the project, and,
- Biogas upgrading and pollution controls related sales decreased by $1.6 million due to the delivery of and agreed

completion of projects during the comparable period of the previous year.

As of April 1, 2024, revenue expected to be recognized in the future related to backlog of signed and/or awarded contracts is $28.8 million. Revenue will be recognized as the Company satisfies its performance obligations under long-term contracts, which are 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 $2.3 million in Q4 2023, representing an decrease of $0.5 million compared to $2.8 million in Q4, 2022, primarily due to a decrease of $0.1 million in employee compensation, a decrease of $0.3 million in direct materials, and a decrease of $0.2 million in foreign exchange on materials due to the reclassification of the expense from Cost of Sales and Services to Selling, General and Administrative expenses, which is in line with the decrease in product and service-related revenues, but offset by the increase in manufacturing overhead & other of $0.1 million.

The gross profit for Q4, 2023 was $0.7 million or 23% of revenue compared to a gross margin of $0.5 million or 15% of revenue for Q4 2022, the increase in gross margin was mainly attributable a reduction of manufacturing overhead, employee compensation and to the impact on foreign exchange charge on materials.

Fiscal 2023, cost of sales and services were $8.9 million compared to $10.9 million for the same period in the prior year, the $2.0 million decrease is primarily due to a decrease of $0.2 million in employee compensation (twelve-month period ended December 31, 2022 - $3.7 million), a decrease of $1.1 million in subcontracting (twelve-month period ended December 31, 2022 - $1.3 million) attributed to more work being completed in-house, a decrease in direct materials and manufacturing overhead & other of $1.5 million and $0.2 million respectively (twelve-month period ended December 31, 2022 - $4.7 million and $1.4 million respectively), due to lower levels of material required based on the decrease in product and service-related revenues and the positive impact of the foreign exchange charge on material of $Nil due to the reclassification of foreign exchange from Cost of Sales and Services to Selling, General and Administrative expenses.

The amortization of intangible assets for Q4, 2023 was comparable to Q4, 2022 and during the twelve-month period ended December 31, 2023, was $0.9 million compared to $0.9 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 Q4, 2023 were $9.4 million, representing a decrease of $1.0 million compared to $10.4 million for Q4, 2022. The decrease is primarily due to a decrease in share-based expenses of $0.6 million (Q4, 2022 - $1.3 million), a decrease in professional fees of $0.4 million (Q4, 2022 - $1.5 million), a decrease in office and general of $0.1 million (Q4, 2022 - $0.5 million), and a decrease of $4.2 million in expected credit loss & bad debt (Q4, 2022 - $4.5 million) offset by an increase in other expenses of $0.9 million (Q4, 2022 - $(0.1) million), an increase in foreign exchange charge of $0.3 million (Q4, 2022 - $Nil) and an increase in impairment of goodwill and changes in assumptions of cash flows of royalty receivables of $3.2 million (Q4, 2022 - $Nil).

During the twelve-month period ended December 31, 2023, SG&A expenses were $31.0 million, representing an increase of $1.9 million compared to $29.0 million for the same period in the prior year. The increase is mainly a result of employee compensation increasing by $1.5 million to $9.6 million (year ended December 31, 2022 - $8.1 million) mainly caused by additional headcount. As well, travel increased by $0.1 million to $0.4 million, the foreign exchange charge on materials was $0.3 million and goodwill impairment and changes in assumptions of cashflows from royalty receivables increased to $3.2 million. The expected credit loss and bad debt increased by $0.6 million due to an additional expense related to doubtful accounts and an amount related to the Company's Italian subsidiary and a customer who both agreed on the final acceptance of a contract which resulted in the reversal of costs and profits in excess of billings on uncompleted contract. This was offset by the decrease of $1.0 million in professional fees, due to less legal, accounting and investor relation expenses, which are $4.1 million, compared to $5.1 million in the comparable period, a decrease in office and general, mainly related to the decrease of office expenses, to $1.0 million from $1.2 million, a variation of $0.2 million, compared to the year ended December 31, 2022, and to a decrease in government grants of $0.2 million.

Share-based compensation expense for the three and twelve-month periods ended December 31, 2023, was $0.7 million and $3.1 million, respectively (three and twelve-month period ended December 31, 2022 - $1.3 million and $5.5 million, respectively), a decrease of $0.6 million and $2.4 million respectively, which is a non-cash item and relates mainly to 2021, 2022 and 2023 grants.

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 twelve-month periods ended December 31, 2023, remained stable at $0.1 million and $0.6 million, respectively, compared with $0.2 million and $0.6 million for the same periods in the prior year. The expense is determined by the nature and useful lives of the property and equipment being depreciated.

Research and Development ("R&D") Expenses

During the three-months ended December 31, 2023, the Company incurred $0.5 million of R&D costs on internal projects, a decrease of $0.3 million as compared with $0.7 million in Q4, 2022. The decrease in Q4, 2023 is primarily related to a decrease of $0.1 million in materials and equipment (Q4, 2022 - $0.3 million), and a decrease of $0.2 million in other expenses, to $0.04 million (Q4, 2022 - $0.2 million).

During the twelve-months ended December 31, 2023, the Company incurred $2.2 million of R&D costs on internal projects, compared to $2.3 million for the same period in the prior year. The decrease is mainly due to lower levels of R&D activities requiring less materials, equipment and subcontracting, decreasing to $0.6 million as compared with $1.2 million, offset by the increase in employee compensation to $1.1 million compared to $0.8 million for the same period in the prior year and the increase in other expenses to $0.5 million compared to $0.4 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 Q4 2023 represent an expense of $0.3 million, representing an increase year-over-year of approximately $0.3 million. The increase in finance expenses in Q4 2023 is primarily due to the interest and accretion related to the convertible debenture, convertible loan, and the increase in penalties and other interest.

During the twelve-month period ended December 31, 2023, the finance costs represent an income of $1.3 million compared to an expense of $0.6 million for the 2022 comparable period, representing a favourable variation of $1.9 million year-over-year. The decrease in finance expenses is primarily due to the revaluation of the balance due on business combination due to negotiations between 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 offset by the increase in interest and accretion related to the convertible debenture and convertible loan. Finance expenses for fiscal 2023 also increased due to the convertible debenture, convertible loan, and the increase in penalties and other interest.

Strategic Investments

During the three-months ended December 31, 2023, the adjustment to fair market value of strategic investments for Q4, 2023 resulted in a loss of $0.5 million compared to a loss in the amount of $0.2 million in Q4, 2022, a variation of $0.3 million.

During the twelve-months ended December 31, 2023, the adjustment to fair market value of strategic investments resulted in a loss of $0.3 million compared to a loss in the amount of $8.3 million for the same period in the prior year, a favorable variation of $8.0 million. The decrease in loss for the twelve-month periods ended December 31, 2023, is attributable to the variation of the market value of the common shares owned by the Company of HPQ Silicon Inc.

Comprehensive (Loss) Income

The comprehensive loss for Q4, 2023 of $9.8 million compared to a loss of $10.8 million, in Q4, 2022, represents a variation of $1.0 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 $0.3 million arising in Q4, 2023, but with a higher gross margin of 23%, and thus a gross profit of $0.7 million, as opposed to $0.5 million in Q4 of 2022,
- a decrease in SG&A expenses of $1.0 million arising in Q4, 2023 primarily due to a decrease in the allowance for credit loss of $4.2 million, decrease in professional fees, office and general, offset by increases in travel, other expenses, foreign exchange charge on materials, impairments and changes in assumptions in cashflows of royalty receivables,
- a decrease in share-based expenses of $0.6 million,
- a decrease in R&D expenses of $0.3 million primarily due to a decrease in subcontracting, materials and equipment, and other expenses, offset by an increase in employee compensation,
- an increase in finance costs of $0.3 million in Q4, 2023 primarily due to the interest and accretion on the convertible debenture, convertible loan, balance due on business combination and royalty receivable,
- a variation in the fair market value of strategic investments of $0.3 million.

The comprehensive loss for the twelve-month period ended December 31, 2023, of $28.5 million compared to a loss of $32.2 million, for the same period in the prior year, represents a variation of $3.7 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 $6.7 million, and annual gross margin of 28%, thus generating a gross profit of $3.4 million, as opposed to 43% margins in 2022 which generated $8.1 million in gross profit,
- an increase in SG&A expenses of $1.9 million was primarily due to an increase in employee compensation, travel, depreciation in property and equipment, depreciation of right-of-use assets, foreign exchange charge on materials, and the combination of credit loss, impairments and changes in cashflows of royalty receivables of $3.8 million which is offset by a decrease in professional fees, office and general, government grants and, other expenses,
- a decrease in share-based expenses of $2.4 million
- a decrease in R&D expenses of $0.1 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 net finance costs (income) of $1.9 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 $8.0 million

Liquidity and Capital Resources

As at December 31, 2023, the Company had cash of $1.8 million, included in the net working capital deficiency of $7.0 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 December 31, 2023 was $404,079, and varied only slightly since December 31, 2022. The increase from January 1, 2023, to December 31, 2023, was mainly attributable to the accretion 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. In July 2023, the Company closed a brokered private placement for $3,030,000, bearing interest at 10%. During December 31, 2023, the Company closed a non-brokered private placement of a convertible loan for gross proceeds of $1,250,000, and bears interest at 3%. The average interest expense on the other term loans and convertible debenture is approximately 10%. The Company does not expect changes to the structure of term loans and convertible debentures and loans in the next twelve-month period. The Company maintained one credit facility which bears interest at a variable rate of prime plus 1%, therefore 8.20% at December 31, 2023. The Company will continue to reimburse the existing credit facility in 2024.

OUTLOOK

Consistent with the Company's past practice, and in view of the early stage of market adoption of our core lines of business, the Company is not providing specific revenue or net income (loss) guidance for 2024.

Overall Strategy

PyroGenesis provides technology solutions to heavy industry that leverage the Company's expertise in ultra-high temperature processes. The Company has evolved from its early beginnings 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 quite timely, as multiple heavy industries are committing to major carbon and waste reduction programs at the same time as many governments are increasingly funding environmental technologies and infrastructure projects – all the while both are making it a strategy to ensure the availability of critical minerals during the coming decades of increased output demand.

While there can be no guarantees, the Company believes the evolution of its strategy beyond greenhouse gas emission reduction, to an expanded focus that encapsulates the key verticals listed in the section “Q4 Production Highlights”, both (i) improves the Company’s chances for success while (ii) 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 is significant, as major industries such as aluminum, steelmaking, manufacturing, cement, chemicals, 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 while at the same time ensuring that operating expenses are controlled to achieve profitable growth.

For 2024, the Company will continue to sharpen the focus on the strategy that structures the Company’s solution ecosystem under the three verticals noted previously: (i) energy transition & emission reduction, (ii) commodity security & optimization, and (iii) waste remediation, while introducing new solutions within each category – some self-initiated, and some in conjunction with (or at the behest of) industry partners.

Cost Controls and Efficiencies

PyroGenesis is competing hard while closely scrutinizing both potential and existing projects to ensure that the utilization of our labour and financial resources are optimized. As we have shown in the past, we will only engage in projects if the potential benefits to PyroGenesis is significant and well-understood. We continue to intensify our focus on project and budgetary clarity during this persistent period of elevated global inflationary pressures, by sourcing alternative suppliers and constantly adjusting project resources. We have also refined our early-stage project assessment process to allow for faster “go / no-go” decisions on project viability.

Enhanced Sales and Marketing

Against the backdrop of this 3-tiered strategy, the Company has been increasing sales, marketing, and R&D efforts in-line with – and in some cases ahead of – the growth curve for industrial change related to greenhouse gas reduction efforts.

Macroeconomic Conditions

With some continued uncertainty in the macroeconomic environment, including ambiguity in the banking sector with regard to interest rate adjustments, and the continued inflationary pressures causing shifting demand dynamics across various industries at different times, it may be difficult to assess the future impact these events and conditions will have on our customer base, the end markets we serve and the resulting effect on our business and operations, both in the short term and in the long term.

Despite these uncertainties, we continue to believe there is an accelerated need for our solutions in the industries we serve as heavy industry looks to continue the now global trends to decarbonization / energy transition, manufacturing utilizing both lighter metals (such as aluminum) and additive manufacturing, and tightening regulations around hazardous waste.

We expect the uncertainties or other macroeconomic conditions in the various geographies in which we operate to continue to cause variability in our revenue quarter to quarter; however, we believe our diversity in both customer base and solution set will continue to be a strong asset of the business.

The various military conflicts in the middle east and Eastern Europe continue to create some level of global economic uncertainty, as well as supply chain disruptions that can change at any time. However, it’s important to note that the Company does not have any operations, customers or supplier relationships in Russia, Belarus or Ukraine, and as such are not directly impacted at a customer level in these countries. The Company does have customer relationships and projects in Poland and will continue to monitor the situation in the region regarding challenges to the completion of current projects, which at this time are not inhibited.

As always, the Company monitors the impact of macroeconomic events and conditions on the business, operations, and financial or potential financial conditions.

Generally, the Company believes that broad-based threats to global supply chains can afford the Company additional prominence, especially to the minerals and metals industries, as manufacturers seek alternatives to off-shore suppliers as well as technology that can optimize output or regain critical material or minerals from byproducts or waste – solutions that the Company currently offers.

Business Line Developments

The upcoming milestones which are expected to confirm the validity of our strategies are outlined below (please note that these timelines are estimates based on information provided to us by the clients/potential clients, and while we do our best to be accurate, timelines can and will shift, due to protracted negotiations, client technical and resource challenges, or other unexpected situations beyond our or the clients' control):

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

Energy Transition & Emission Reduction

Aluminum Remelting Furnaces: As mentioned in the Q2 2023 Outlook, 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.

Also as mentioned in the Q2 2023 and Q3 2023 Outlooks, 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/or sales, with more detailed announcements on these projects expected during Q2 2024.

Aluminum Furnace Tests: The Company is in final discussions with two (2) major aluminum companies for live furnace tests of plasma as a process heat source in melting and holding furnaces. If confirmed, these companies will each ship aluminum furnaces to PyroGenesis for installation at PyroGenesis' factory, where plasma will be tested within the furnaces as a potential replacement for natural gas. These tests are similar to furnace tests that occurred during 2023 on site at PyroGenesis with another client, but these new potential tests will be conducted using larger furnaces.

Steel Industry Energy Transition: the Company has received notice from one of the top 5 largest steelmakers globally of its intent to engage the Company in respect of a fuel transition study, to examine the potential use of plasma torches as a heat source at a major steel production facility. Contractual discussions in this regard are set to commence in the short term.

New Industry Contract for Plasma Torches: as noted in the Q3 Outlook, the Company has been negotiating a large first-phase contract with a client (whose name is being withheld at present) in excess of $10 million that would signal PyroGenesis' resumption of work in an industry that previously showed promise. Important players in this industry, which shall remain confidential at present, had previously heralded the potential use of plasma torches in conducting its primary objective, due to the increased speed and other advanced criteria at which the projects could be completed by using plasma torches compared to traditional approaches.

In January 2024, the Company announced the signing of a framework master agreement with this client, which included the payment to the Company of a non-refundable downpayment of $667,000. Negotiations of a first substantial statement of work are ongoing and remain positive but depend in large part on the client's ability to secure funding in a timely manner. While there is no guarantee this statement of work will be completed, if successful the Company foresees the potential for a multi-phase, multi-year partnership with the client that may result in many additional plasma torch orders over the next few years.

Iron Ore Pelletization Torch Trials: as mentioned in previous Outlooks, the commissioning of the plasma torch systems – for use in the pelletization furnaces of a client previously identified as Client B – was underway, with the Company's engineers onsite at Client B's iron ore facility. The commissioning process includes installation, start-up, and site acceptance testing (SAT). 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.

As mentioned in the Q3 2023 Outlook, this project continues to move forward, however the commissioning suffered a series of unforeseeable delays caused by, among other things, damaging regional torrential rainstorms that flooded and damaged the facility's electrical system and furnace components.

Client B has informed the Company that they continued to experience technical challenges of its own at different stages during Q4, and the SAT was not completed as expected during the quarter. While frustrating, Client B has assured the Company that the project is not in jeopardy, and it remains committed to the trials.

As of the date of this MD&A, Client B has indicated that they were continuing to move forward in resolving their own technical issues, and that the acceptance testing, and full trials will regain momentum. Although the timeframe remains uncertain, it is moving forward, and the Company believes the series of stops and starts are indicative of most if not all paradigm-shifting innovations within complex heavy industry factory settings, where the effects of existing atmospheric pollutants on new technology installations are unknown until attempted. In short, the factory settings of these trials are by nature extremely dirty and hazardous, which can cause a variety of unplanned, unforeseen challenges, each of which are dealt with by the committed group of scientists and engineers of both Client B and PyroGenesis.

The client previously identified as Client A, a large international mining company which has also purchased a full plasma torch system for use in trials in its pelletization furnaces, continues its plasma torch initiative at its own pace, with no recent developments to report as per project timing or completion.

Pyro Green-Gas: The Company's wholly owned subsidiary, Pyro Green-Gas, is in advanced discussions with an international steel company for a project with a value of approximately $1.1 million.

Aluminum Cast House Decarbonization: The Company is part of a tendered bid process for the testing of plasma within an aluminum cast house of a leading global aluminum company.

Mining Industry Parts Manufacturer Decarbonization: The Company is in advanced discussions with a global parts manufacturer that supplies the metals and mining industries, to test plasma as a heat source in the client's cast furnaces.

Commodity Security & Optimization

New Laser Cut Titanium Metal Powder Order: the Company has received notice from a global organization for a potential initial order of titanium metal powder "laser cut" that, if completed, is expected to occur in Q2 2024.

Additive for Green Cement: the Company had previously announced a project with client Progressive Planet, for the development of amorphous silica from crystalline silica, for use as an additive to replace fly ash in cement, thereby creating green cement. With recent results announced by the Client showing promise, the Company expects additional information and next steps to be announced in Q2 2024.

Product Qualification Process for Global Aerospace Firm: As mentioned in the Q3 2023 Outlook, 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. The Company continues to have strong confidence in this endeavour and that the final decision from the client is slated for the very near future.

Of note, the Company previously confirmed that the qualification process includes both PyroGenesis' "coarse cut" titanium metal powder, in addition to the "fine cut" titanium metal powder that had been previously discussed as undergoing the qualification process. The Company has some expectations that the course cut may receive qualification first, which would be advantageous to the Company, as the course cut has been produced and stockpiled in large amounts at the PyroGenesis facility, so delivery readiness would be enhanced.

"FSR" Project: Fumed Silica (also known as Pyrogenic Silica) is a particle-size food-safe additive with a large surface area, used worldwide as a thickening agent in thousands of products such as milkshakes, adhesives, powdered foods, paints, inks, cosmetics, and beverages, to increase strength, viscosity, and flow control.

PyroGenesis, on behalf of its client HPQ Silicon Inc., developed the Fumed Silica Reactor ("FSR"), a plasma-based process that creates fumed silica from quartz in a single and eco-friendly step. By eliminating the use of harmful chemicals generated by conventional fumed silica production methods, the groundbreaking FSR approach, if successful, will help contribute to the repatriation of silica production to North America while lowering the CO_2 emissions and carbon footprint of the process.

In a major step towards commercial-scale production, PyroGenesis successfully deployed [news release dated Oct 3, 2023] the FSR on a laboratory scale to produce fumed silica. A subsequent independent analysis [news release dated Nov 9, 2023] of the material conducted by McGill University confirmed the commercial-quality and thickening efficiency of the fumed silica produced by the FSR.

The build of a pilot plant has commenced for pre-commercial sample batch production, for launch in Q2 2024.

In addition to being the engineering services provider and developer of the forthcoming pilot plant, PyroGenesis owns a 10% royalty of client HPQ's eventual fumed silica sales, with set minimums. This royalty stream, can, at any time, be converted by PyroGenesis into a 50% ownership in HPQ Silica Polvere Inc., the wholly owned subsidiary of HPQ Silicon that controls the fumed silica initiative and rights.

Waste Remediation

SPARC Refrigerant Waste Destruction System: The Company is in the final phase of a tendered bid process for the safe destruction of hazardous end-of-life refrigerants, such as CFCs, HCFCs, and HFCs, for a contract amount of approximately $6.5 million. The Company's Steam Plasma Refrigerant Cracking (SPARC) system is a finalist for this Asian client's initiative.

Financial

Payments for Outstanding Major Receivables: The Company has remained 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 have been positive, both in regard to the ongoing payment plan, and in regard to a potential new order of additional Drosrite™ systems, as the client's cash flow situation and their new business opportunities move closer to resolution.

The Company now expects payment of this receivable to be received in full within Q2 2024.

Innovation Grants: as mentioned in the Q1 and Q2 Outlooks, the Company has applied for grants tailored to technology innovation and/or carbon reduction and expects to have results regarding these applications. Indications are positive and the Company expects to be in a position to make an announcement on these grants in Q2 2024. These grants are in the order of $1-2 million.

Business Line Developments: Mid Term (3 – 6 months)

Energy Transition & Emission Reduction

Pyro Green-Gas: The Company previously announced that its wholly-owned subsidiary, Pyro Green-Gas, is expected to sign a contract with a value of approximately between $10-15 million. The Company has significant doubts that, if the project commences, Pyro Green-Gas will participate. This project is not reflected in the stated backlog of either the financial statement or the MD&A.

Commodity Security & Optimization

Drosrite ™ Factory Trials: The Company is in discussions with multiple aluminum manufacturers to conduct paid tests of its Drosrite™ aluminum dross processing systems within client factories, as a first step towards potential purchase of Drosrite™ systems. These potential clients are in France, the United States, southern Europe and Central Europe.

Drosrite ™ Systems: Separately, the Company is in various stage discussions with multiple aluminum manufacturers for potential purchase of Drosrite™ aluminum dross processing systems.

Waste Remediation

Plasma Resource Recovery System (PRRS): The Company is in early-stage discussions for the sale of a PRRS system, to a European entity, to transform municipal solid waste (MSW) into both energy and chemical products. PyroGenesis' PRRS system is designed to process MSW, industrial waste, and hazardous waste, transforming them into commercially valuable products. These products include gaseous fuel for electricity and heat generation, slag, aggregates suitable for construction, and recoverable metals for recycling. The value for this potential contract is between approximately $25 to $30 million.

Potential PAWDS Order: The Company is in initial negotiations with a company that conducts cleanup and destruction of waste from seawater. It has also indicated interest in carrying out similar initiatives on land in remote locations. Negotiations for a PyroGenesis Plasma Arc Waste Destruction System (PAWDS), similar to the type the Company designed and built for several of the U.S. Navy aircraft carriers, are in early stage. While there is no guarantee this contract is completed, if successful the Company may be contracted for multiple PAWDS systems over time.

***** 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 reflects information on hand. Projects not mentioned may have simply not concluded or not passed milestones worthy of discussion.***

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 multiple multibillion dollar industry leaders in four massive markets: iron ore pelletization, aluminum, waste management, and additive manufacturing. With a team of experienced engineers, scientists and technicians working out of its Montreal office, and its 3,800 m^2 and 2,940 m^2 manufacturing facilities, PyroGenesis maintains its competitive advantage by remaining at the forefront of technology development and commercialization. The operations are ISO 9001:2015 and AS9100D certified, having been ISO certified since 1997. For more information, please visit: www.pyrogenesis.com.

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. 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.sedarplus.ca, 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.

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