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", the "Company" or "we"). The MD&A provides the reader with a view and analysis, from the perspective of management, of the Company's financial results for the fourth quarter and for the year ended December 31, 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, 2023. (the "2023 consolidated financial statements") and the Company's annual information form for the year ended December 31, 2023 (the "Annual Information Form").

The 2023 consolidated financial statements and MD&A have been reviewed by PyroGenesis' Audit Committee and were approved by its Board of Directors on April 1, 2024. 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 consolidated financial statements for issuance to shareholders.

The following information takes into account all material events that took place up until April 1, 2024, 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.sedarplus.ca, the Electronic Data Gathering, Analysis, and Retrieval system ("EDGAR") at www.sec.gov (up until the NASDAQ voluntary delisting in November 2023) 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; 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 2023 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 2023 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 2023 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 highlights 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 my management as it brings additional clarity to operating performance, as 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 defined 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 m^2) and 31,632 sq. ft. (2,940 m^2) manufacturing facilities, PyroGenesis maintains its competitive advantage by remaining at the forefront of technology development and commercialization. Our core competencies allow PyroGenesis to lead the way in providing innovative plasma torches, plasma waste processes, high-temperature metallurgical processes, and engineering services to the global marketplace. Our operations are ISO 9001:2015 and AS9100D certified, having been ISO certified since 1997. Since our acquisition of Pyro Green-Gas Inc. (formerly AirScience Technologies Inc), we now offer technologies, equipment, and expertise in the area of biogas upgrading, and air pollution control. As a result, we have extended our presence to Italy and India, and this acquisition provides potential synergies with our current land-based waste destruction offerings. Our common shares are listed on the Toronto Stock Exchange (TSX) (Ticker Symbol: PYR) and tradeable through the OTCQX Best Market (Ticker Symbol: PYRGF) and the Frankfurt Stock Exchange (FSX) (Ticker symbol: 8PY). In November 2023, the Company's Common Shares were voluntarily delisted from NASDAQ (see "Market for Securities – Delisting from NASDAQ" in the Annual Information Form).

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 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 AND YEARS ENDED DECEMBER 31 (expressed in dollars)**:**

	Three months ended December 31		Variation	Twelve months ended December 31		Variation
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
Revenues	**$ 3,028,255**	$ 3,301,777	$ (273,522)	**$ 12,345,081**	$ 19,013,503	$ (6,668,422)
Cost of sales and services	**2,324,600**	2,822,062	(497,462)	**8,903,647**	10,869,616	(1,965,969)
Gross profit	**703,655**	479,715	223,940	**3,441,434**	8,143,887	(4,702,453)
Expenses						
Selling, general and administrative (excluding share-based expenses)	**8,676,703**	9,093,820	(417,117)	**27,851,213**	23,486,971	4,364,242
Research and development, net	**465,698**	740,603	(274,905)	**2,212,488**	2,317,973	(105,485)
Total expenses (excluding share-based expenses)	**9,142,401**	9,834,423	(692,022)	**30,063,701**	25,804,944	4,258,757
Net loss from operations (excluding share-based expenses)	**(8,438,746)**	(9,354,708)	(915,962)	**(26,622,267)**	(17,661,057)	8,961,210
Share-based expenses	**(730,039)**	(1,316,221)	(586,182)	**(3,113,040)**	(5,538,463)	(2,425,423)
Net loss from operations	**(9,168,785)**	(10,670,929)	(1,502,144)	**(29,735,307)**	(23,199,520)	6,535,787
Changes in fair market value of strategic investments and net finance income (costs)	**(841,497)**	(264,231)	577,266	**1,009,386**	(8,891,523)	(9,900,909)
Income taxes	**(221,747)**	(189,069)	(32,678)	**(221,747)**	75,984	(297,731)
Net loss	**$ (9,788,535)**	$ (10,746,091)	$ (957,556)	**$ (28,504,174)**	$ (32,167,027)	$ (3,662,853)
Foreign currency translation gain (loss) on investments in foreign operations	**20,296**	(72,664)	(92,960)	**(11,681)**	(3,042)	8,639
Comprehensive loss	**$ (9,768,239)**	$ (10,818,755)	$ (1,050,516)	**$ (28,515,855)**	$ (32,170,069)	$ (3,654,214)
Loss per share						
Basic	**$ (0.06)**	$ (0.06)	$ –	**$ (0.16)**	$ (0.19)	$ 0.03
Diluted	**$ (0.06)**	$ (0.06)	$ –	**$ (0.16)**	$ (0.19)	$ 0.03
Modified EBITDA[(1)]	**$ (7,895,927)**	$ (8,549,513)	$ (653,586)	**$ (24,429,815)**	$ (15,546,347)	$ 8,883,468

[1] See "Non-IFRS Measures"

INFORMATION FROM CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS FOR THE YEARS ENDED DECEMBER 31 (expressed in dollars)**:**

	Three months ended December 31			Twelve months ended December 31		
	2023	2022	2021	**2023**	2022	2021
Revenues	**3,028,255**	3,301,777	7,205,349	**12,345,081**	19,013,503	31,068,350
Cost of sales and services	**2,324,600**	2,822,062	5,902,560	**8,903,647**	10,869,616	18,636,539
Gross profit	**703,655**	479,715	1,302,789	**3,441,434**	8,143,887	12,431,811
Expenses						
Selling, general and administrative (excluding share-based expenses)	**8,676,703**	9,093,820	7,071,471	**27,851,213**	23,486,971	17,474,390
Research and development, net	**465,698**	740,603	1,149,140	**2,212,488**	2,317,973	2,535,987
Total expenses (excluding share-based expenses)	**9,142,401**	9,834,423	8,220,611	**30,063,701**	25,804,944	20,010,377
Net loss from operations (excluding share-based expenses)	**(8,438,746)**	(9,354,708)	(6,917,822)	**(26,622,267)**	(17,661,057)	(7,578,566)
Share-based expenses	**(730,039)**	(1,316,221)	(4,878,526)	**(3,113,040)**	(5,538,463)	(9,762,745)
Net loss from operations	**(9,168,785)**	(10,670,929)	(11,796,348)	**(29,735,307)**	(23,199,520)	(17,341,311)
Changes in fair market value of strategic investments and net finance income (costs)	**(841,497)**	(264,231)	(11,349,913)	**1,009,386**	(8,891,523)	(21,830,588)
Income taxes	**(221,747)**	(189,069)	(739,960)	**(221,747)**	75,984	(739,960)
Net loss and comprehensive loss	**(9,788,535)**	(10,746,091)	(22,406,301)	**(28,504,174)**	(32,167,027)	(38,431,939)
Foreign currency translation gain (loss) on investments in foreign operations	**20,296**	(72,664)	3,444	**(11,681)**	(3,042)	3,444
Comprehensive loss	**(9,768,239)**	(10,818,755)	(22,402,857)	**(28,515,855)**	(32,170,069)	(38,428,495)
Loss per share						
Basic	**(0.06)**	(0.06)	(0.13)	**(0.16)**	(0.19)	(0.23)
Diluted	**(0.06)**	(0.06)	(0.13)	**(0.16)**	(0.19)	(0.23)
Modified EBITDA[1]	**(7,895,927)**	(8,549,513)	(6,522,877)	**(24,429,815)**	(15,546,347)	(6,182,695)

[1] See "Non-IFRS Measures"

SELECTED FINANCIAL INFORMATION (expressed in dollars)

	December 31, 2023	December 31, 2022	December 31, 2021
Current assets	**16,803,425**	27,448,182	38,758,984
Non-current assets	**11,631,926**	20,218,568	31,011,693
Total assets	**28,435,351**	47,666,750	69,770,677
Current liabilities	**23,811,144**	25,797,473	24,752,199
Non-current liabilities	**7,452,784**	5,000,350	4,249,724
Total liabilities	**31,263,928**	30,797,823	29,001,923
Shareholders' equity	**(2,828,577)**	16,868,927	40,768,754

FINANCIAL CONDITION (expressed in dollars)

	December 31, 2023	December 31, 2022	Variation 2023 vs 2022
Current Assets			
Cash	**1,802,616**	3,445,649	(1,643,033)
Accounts receivable	**9,265,665**	18,624,631	(9,358,966)
Costs and profits in excess of billings on uncompleted contracts	**648,813**	1,051,297	(402,484)
Inventory	**1,905,313**	1,876,411	28,902
Investment tax credits receivable	**352,530**	276,404	76,126
Income tax receivable	**15,900**	14,169	1,731
Current portion of deposits	**638,739**	432,550	206,189
Current portion of royalties receivable	**684,651**	455,556	229,095
Contract assets	**615,527**	499,912	115,615
Prepaid expenses	**873,671**	771,603	102,068
Total Current Assets	**16,803,425**	27,448,182	(10,644,757)
Non-Current assets			
Deposits	**46,045**	46,053	(8)
Strategic investments	**2,551,427**	6,242,634	(3,691,207)
Property and equipment	**2,855,226**	3,393,452	(538,226)
Right-of-use-assets	**4,200,635**	4,818,744	(618,109)
Royalties receivable	**529,017**	952,230	(423,213)
Intangible assets	**1,449,576**	2,104,848	(655,272)
Goodwill	**—**	2,660,607	(2,660,607)
Total Non-Current Assets	**11,631,926**	20,218,568	(8,586,642)
Current Liabilities			
Bank indebtedness	**181,267**	991,902	(810,635)
Accounts payable and accrued liabilities	**9,345,134**	10,115,870	(770,736)
Billings in excess of costs and profits on uncompleted contracts	**10,992,126**	9,670,993	1,321,133
Current portion of term loans	**117,500**	69,917	47,583
Current portion of lease liabilities	**524,802**	2,672,212	(2,147,410)
Balance due on business combination	**1,726,510**	2,088,977	(362,467)
Income tax payable	**—**	187,602	(187,602)
Current portion of convertible debenture	**923,805**	—	923,805
Total Current Liabilities	**23,811,144**	25,797,473	(1,986,329)
Non-current Liabilities			
Lease liabilities	**4,582,090**	2,861,482	1,720,608
Term loans	**286,579**	320,070	(33,491)
Balance due on business combination	**—**	1,818,798	(1,818,798)
Convertible debenture	**1,636,416**	—	1,636,416
Convertible debenture loan	**947,699**	—	947,699
Total Non-Current Liabilities	**7,452,784**	5,000,350	2,452,434

Working capital, (expressed as current assets less current liabilities) varied year-over-year by $8.7 million, mainly a result of:

- a decrease of cash and cash equivalents of $1.6 million, explained in the section Summary of Cash Flows,
- a decrease of $9.4 million of accounts receivable as the Company collected amounts from the 2022 year-end and also due to the increase of $3.9 million of allowance for credit loss on these accounts receivable,
- a decrease of $0.4 million in costs and profits in excess of billings on uncompleted contracts related to invoicing to customers upon successfully reaching contract milestones whereby such amounts are converted to accounts receivable and also due to the increase of $0.3 million in allowance for credit loss on costs and profits in excess of billings on uncompleted contracts,
- an increase of $0.2 million in current portion of deposits due to the timing of deposits with suppliers,
- an increase of $0.2 million in current portion of royalty receivables due to accretion and amount carried forward from 2022,
- a decrease of $0.8 million in bank indebtedness, due to the repayment of the credit facilities by Pyro Green-Gas and its Italian subsidiary,
- a decrease of $0.8 million in accounts payable and accrued liabilities due to increased payments to suppliers,

- an increase of $1.3 million in billings in excess of costs and profits in uncompleted contracts due to proceeds received on a contract signed close to the December 31, 2023, year-end, namely the SPARC™ land-based waste destruction system, the 4.5MW plasma torch system, and the plasma torch for PFAS removal,
- a decrease of $2.1 million in current portion of lease liabilities due to the repayment of lease liabilities and the reclassification of the option to buy one of the manufacturing facilities from current to non-current,
- a decrease of $0.4 million on the balance due on business combination caused by a disbursement of an achieved milestone as well as accretion and measurement of the expected disbursements, and,
- an increase of $0.9 million in the current portion of the convertible debentures, issued in July 2023.

Non-current assets varied year-over-year by $8.6 million, mainly a result of:

- a decrease of $3.7 million in strategic investments mainly attributable to the decrease in the 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 year 2023,
- a decrease of property and equipment of $0.5 million due to recurring depreciation,
- a decrease of $0.6 million in right-of-use-assets due to recurring depreciation,
- a decrease of $0.4 million in royalties receivable due to an impairment following HPQ's announcement that it no longer intended to pursue the development of the technology for the PUREVAP Nano Silicon Reactor, and therefore, the ownership of the intellectual property will revert back to the Company, at no cost,
- a decrease of $0.7 million in intangible assets due to the amortization of the production backlog acquired during the 2021 business combination as well as amortization of patents and development costs, and,
- a decrease of $2.7 million in goodwill, due to the Company determining that the recoverable amounts no longer exceeds the carrying amount, and an impairment was required for the entirety of the balance.

Non-current liabilities varied year-over-year by $2.5 million, mainly a result of:

- a decrease to $1.8 million due to the revaluation of the balance due on business combination as of December 31, 2023, as all milestones are scheduled to be achieved within the next twelve months,
- an increase of $2.6 million due to the issuance of convertible debenture units in July 2023 and the convertible loan in December 2023,
- an increase of $1.7 million due mainly to the reclassification of the option to buy one of the manufacturing facilities from current to non-current.

RESULTS OF OPERATIONS

Revenues (expressed in dollars)

PyroGenesis recorded revenue of $3.0 million in the fourth quarter of 2023 ("Q4, 2023"), representing a decrease of $0.3 million when compared to $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 $19.0 million compared to fiscal 2022.

Revenues recorded in fiscal 2023 were generated primarily from:

	Three months ended December 31		**Variation**	**Twelve months ended December 31**		**Variation**
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
High purity metallurgical grade silicon & solar grade silicon from quartz (PUREVAP™)	**272,074**	824,894	(552,820)	**1,660,928**	6,272,697	(4,611,769)
Aluminium and zinc dross recovery (DROSRITE™)	**211,572**	504,760	(293,188)	**535,868**	1,912,807	(1,376,939)
Development and support related to systems supplied to the U.S. Navy	**1,076,798**	(468,812)	1,545,610	**3,245,618**	1,288,356	1,957,262
Torch-related products and services	**713,479**	2,110,497	(1,397,018)	**3,396,458**	5,558,210	(2,161,752)
Refrigerant destruction (SPARC™)	**245,887**	—	245,887	**605,962**	—	605,962
Biogas upgrading and pollution controls	**294,448**	86,593	207,855	**1,713,810**	3,347,443	(1,633,633)
Other sales and services	**213,997**	243,845	(29,848)	**1,186,437**	633,990	552,447
Revenue	**3,028,255**	3,301,777	(273,522)	**12,345,081**	19,013,503	(6,668,422)

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 (expressed in dollars)

	Three months ended December 31		**Variation**	**Twelve months ended December 31**		**Variation**
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
Employee compensation	**884,656**	1,014,363	(129,707)	**3,514,765**	3,668,261	(153,496)
Subcontracting	**141,087**	113,610	27,477	**271,093**	1,323,092	(1,051,999)
Direct materials	**717,579**	1,005,318	(287,739)	**3,162,876**	4,698,982	(1,536,106)
Manufacturing overhead & other	**366,781**	265,579	101,202	**1,155,564**	1,371,462	(215,898)
Foreign exchange charge on materials	**—**	224,880	(224,880)	**—**	(999,548)	999,548
Investment tax credits	**(22,476)**	(23,440)	964	**(102,880)**	(70,663)	(32,217)
Amortization of intangible assets	**236,973**	221,752	15,221	**902,229**	878,030	24,199
Total Cost of Sales and Services	**2,324,600**	2,822,062	(497,462)	**8,903,647**	10,869,616	(1,965,969)

Gross Margin (expressed in dollars except for gross margin which is expressed as a percentage)

	Three months ended December 31		**Twelve months ended December 31**	
	2023	2022	**2023**	2022
Revenues	**3,028,255**	3,301,777	**12,345,081**	19,013,503
Cost of Sales and Services	**2,324,600**	2,822,062	**8,903,647**	10,869,616
Gross Profit	**703,655**	479,715	**3,441,434**	8,143,887
Gross Margin %	**23**	15	**28**	43

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 to 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 (expressed in dollars)

	Three months ended December 31		**Variation**	**Twelve months ended December 31**		**Variation**
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
Employee compensation	**2,401,137**	2,458,487	(57,350)	**9,578,403**	8,094,226	1,484,177
Share-based expenses	**730,039**	1,316,221	(586,182)	**3,113,040**	5,538,463	(2,425,423)
Professional fees	**1,061,972**	1,473,164	(411,192)	**4,117,213**	5,129,384	(1,012,171)
Office and general	**332,353**	454,881	(122,528)	**957,608**	1,154,327	(196,719)
Travel	**122,191**	79,875	42,316	**388,906**	283,142	105,764
Depreciation of property and equipment	**138,815**	157,011	(18,196)	**615,685**	603,894	11,791
Depreciation of ROU assets	**182,251**	156,362	25,889	**685,854**	635,828	50,026
Investment tax credits	**(7,500)**	(7,500)	—	**(30,000)**	(30,000)	—
Government grants	**(67,594)**	(67,268)	(326)	**(378,282)**	(204,791)	(173,491)
Other expenses	**816,609**	(91,191)	907,800	**3,301,485**	3,340,961	(39,476)
Foreign exchange charge on materials	**252,764**	—	252,764	**342,377**	—	342,377
Expected credit loss & bad debt	**287,798**	4,480,000	(4,192,202)	**5,116,057**	4,480,000	636,057
Goodwill impairment	**2,660,607**	—	2,660,607	**2,660,607**	—	2,660,607
Changes in assumption in cashflows of royalty receivables	**495,300**	—	495,300	**495,300**	—	495,300
Total selling, general and administrative	**9,406,742**	10,410,042	(1,003,300)	**30,964,253**	29,025,434	1,938,819

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. Aswell, 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 (expressed in dollars)

	Three months ended December 31		**Variation**	**Twelve months ended December 31**		**Variation**
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
Depreciation of property and equipment	**138,815**	157,011	(18,196)	**615,686**	603,894	11,792

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") Costs, net (expressed in dollars)

	Three months ended December 31		**Variation**	**Twelve months ended December 31**		**Variation**
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
Employee compensation	**261,721**	201,756	59,965	**1,104,507**	814,334	290,173
Investment tax credits	**(18,079)**	(22,637)	4,558	**(50,216)**	(68,771)	18,555
Subcontracting	**16,164**	50,590	(34,426)	**88,104**	142,027	(53,923)
Materials and equipment	**169,444**	288,315	(118,871)	**547,433**	1,033,235	(485,802)
Other expenses	**36,448**	222,579	(186,131)	**522,660**	397,148	125,512
Total net R&D expenses, net	**465,698**	740,603	(274,905)	**2,212,488**	2,317,973	(105,485)

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 costs (income), net (expressed in dollars)

	Three months ended December 31		Variation	Twelve months ended December 31		Variation
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
Interest on term loans	**6**	160	(154)	**597**	3,198	(2,601)
Interest on lease liabilities	**94,547**	94,421	126	**362,051**	378,611	(16,560)
Interest on convertible debentures	**74,067**	—	74,067	**134,667**	—	134,667
Interest on convertible loan	**1,146**		1,146	**1,146**		1,146
Interest accretion on and revaluation of balance due on business combination	**37,480**	3,040	34,440	**(2,081,265)**	173,350	(2,254,615)
Interest accretion on long term loan	**8,594**	8,032	562	**34,009**	28,229	5,780
Interest accretion of convertible debentures	**86,234**	—	86,234	**151,452**	—	151,452
Interest accretion of convertible loan	**5,237**	—	5,237	**5,236**	—	5,236
Penalties and other interest	**27,806**	(38,340)	66,146	**215,664**	85,644	130,020
Interest accretion of royalty receivable	**(24,721)**	(40,278)	15,557	**(145,159)**	(118,290)	(26,869)
Finance costs (income), net	**310,396**	27,035	283,361	**(1,321,602)**	550,742	(1,872,344)

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 (expressed in dollars)

	Three months ended December 31		Variation	Twelve months ended December 31		Variation
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
Changes to fair value of strategic investments	**(531,101)**	(237,194)	(293,907)	**(312,215)**	(8,340,781)	8,028,566

During the three-months ended December 31, 2023, the adjustment to the 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 the 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 (expressed in dollars)

	Three months ended December 31		Variation	Twelve months ended December 31		Variation
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
Comprehensive loss	**(9,788,535)**	(10,818,755)	(1,030,220)	**(28,515,855)**	(32,170,069)	(3,654,214)

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

Reconciliation of Non-IFRS measures: EBITDA and Modified EBITDA) (expressed in dollars)

	Three months ended December 31		Variation	Twelve months ended December 31		Variation
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
Comprehensive loss	**(9,788,535)**	(10,818,755)	(1,030,220)	**(28,515,855)**	(32,170,069)	(3,654,214)
Depreciation of property and equipment	**138,815**	157,011	(18,196)	**615,686**	603,894	11,792
Depreciation of ROU assets	**182,252**	156,362	25,890	**685,855**	635,828	50,027
Amortization and write-off of intangible assets	**221,752**	218,760	2,992	**902,592**	878,030	24,562
Finance costs (income), net	**310,396**	183,694	126,702	**(1,321,602)**	550,742	(1,872,344)
Income taxes	**(221,747)**	—	(221,747)	**(221,747)**	75,984	(297,731)
EBITDA[1]	**(9,157,067)**	(10,102,928)	(945,861)	**(27,855,071)**	(29,425,591)	(1,570,520)
Other non-cash items:						
Share-based expenses	**730,039**	1,316,221	(586,182)	**3,113,040**	5,538,463	(2,425,423)
Change in fair value of investments	**531,101**	237,194	(293,907)	**312,216**	8,340,781	8,028,565
Modified EBITDA [1]	**(7,895,927)**	(8,549,513)	(653,586)	**(24,429,815)**	(15,546,347)	8,883,468

[1] See "Non-IFRS Measures"

The EBITDA in Q4, 2023 was a $9.2 million loss compared to an EBITDA loss of $10.1 million for Q4, 2022, representing a variation of $0.9 million year-over-year. The variation in the EBITDA in the three-months ended December 31, 2023, compared to December 31, 2022, is due mainly to the decrease in comprehensive loss of $0.9 million, and slight decrease in depreciation of property and equipment, and an increase in depreciation on right-of-use assets, amortization of intangible assets, and in net finance costs of $0.1 million.

The Modified EBITDA in Q4, 2023 was a $7.9 million loss compared to a Modified EBITDA loss of $8.5 million for Q4, 2022, representing a decreased loss of $0.65 million. The decrease in the Modified EBITDA loss in Q4, 2023 is attributable to the decrease as mentioned above in the EBITDA of $0.9 million, a decrease in share-based expenses of $0.6 million and by the variation in the change of fair value of investments of $0.3 million, based on the fair value of such investment.

The EBITDA during the twelve-month period ended December 31, 2023, was a $27.9 million loss compared to an EBITDA loss of $29.4 million, representing a variation of $1.6 million year-over-year. The variation in the EBITDA in the twelve-months ended December 31, 2023, compared to December 31, 2022, is due to the decrease in comprehensive loss of $3.7 million, an increase in depreciation of property and equipment, depreciation of right-of-use assets, and amortization of intangible assets, and decrease in net finance costs (income) of $1.9 million and a decrease in income taxes of $0.3 million.

The Modified EBITDA during the twelve-month period ended December 31, 2023, was a $24.4 million loss compared to a Modified EBITDA loss of $15.5 million, representing an increased loss of $8.9 million. The increase in the Modified EBITDA loss is attributable to the decrease as mentioned above in the EBITDA of $1.6 million and a decrease in share-based expenses of $2.4 million and an increase in the change of fair value of investments of $8.0 million, based on the fair value of such investment.

SUMMARY OF QUARTERLY RESULTS (expressed in dollars)

	2023				2022			
	Q4	**Q3**	**Q2**	**Q1**	Q4	Q3	Q2	Q1
Revenues	**3,028,255**	**3,685,725**	**3,039,479**	**2,591,622**	3,301,777	5,657,783	5,847,180	4,206,762
Gross profit	**703,655**	**1,099,392**	**1,927,664**	**526,573**	479,715	4,113,176	2,499,273	1,051,723
Gross margin	**23.0**	**30.0**	**63.0**	**20.3**	14.5	72.7	42.7	25.0
Comprehensive income (loss)	**(9,768,239)**	**(6,256,292)**	**(6,333,708)**	**(6,157,620)**	(10,818,755)	(4,053,706)	(13,039,531)	(4,069,119)
Earnings (loss) per share								
Basic	**(0.06)**	**(0.03)**	**(0.04)**	**(0.03)**	(0.06)	(0.02)	(0.08)	(0.02)
Diluted	**(0.06)**	**(0.03)**	**(0.04)**	**(0.03)**	(0.06)	(0.02)	(0.08)	(0.02)

The majority of PyroGenesis' revenue is recognized 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 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%. On December 20, 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.

	Carrying Value	**Total contractual amount**	**Less than one year**	**2-3 years**	**4-5 years**	**Over 5 years**
Bank indebtedness	181,267	181,267	181,267	—	—	—
Accounts payable and accrued liabilities[1]	8,006,660	8,006,660	8,006,660	—	—	—
Term loans	404,079	450,000	67,500	180,000	180,000	22,500
Balance due on business combination	1,726,510	1,860,020	1,860,020	—	—	—
Lease liabilities	5,106,892	6,032,233	713,194	3,197,718	458,664	1,662,657
Convertible debenture and loan	3,507,920	4,757,748	1,409,929	3,347,819	—	—
	18,933,328	**21,287,928**	**12,238,570**	**6,725,537**	**638,664**	**1,685,157**

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

SUMMARY OF CASH FLOWS (expressed in dollars)

	Three months ended December 31		**Twelve months ended December 31**	
	2023	2022	**2023**	2022
Cash provided / (used) in operating activities	**(1,320,634)**	(1,226,224)	**(12,045,503)**	(11,128,885)
Cash provided / (used) by investing activities	**1,479,439**	(111,458)	**3,054,212**	(368,180)
Cash provided / (used) by financing activities	**782,258**	2,346,316	**7,374,452**	2,641,007
Effect of exchange rate changes on cash denominated in foreign currency	**(12,045)**	72,154	**(26,194)**	99,194
Increase (decrease) in cash	**929,018**	1,080,788	**(1,643,033)**	(8,756,864)
Cash - end of period	**1,802,616**	3,445,649	**1,802,616**	3,445,649

During the three-months ended December 31, 2023, cash flow used in operating activities was $1.2 million compared with cash flows used in operating activities of $1.2 million in the same period of the previous year. The use of cash during Q4, 2023, consists of the net loss of $9.8 million (Q4, 2022 – net loss of $10.8 million) plus adjustments for operating activities of $0.3 million (Q4, 2022 - $15.9 million), including a net change in non-cash operating working capital items of $2.7 million (Q4, 2022 – net change of $7.8 million). The variation is due to the net loss and to the increase in customer deposits received and recognized in Billings in excess of costs and profits on uncompleted contracts.

Investing activities resulted in a net source of funds of $1.5 million in Q4, 2023, compared to a net use of funds of $0.1 million in Q4, 2022. This was caused by an increase in the proceeds received from the disposal of strategic investments, fewer additions to property and equipment, offset by a slight increase in additions to intangible assets.

Financing activities in Q4, 2023, resulted in a net source of funds of $0.7 million, compared to a net source of funds of $2.3 million for the same period in 2022. In Q4, 2023, the net source of funds was mainly due to the proceeds from the issuance of the convertible loan. The favourable variation of cash provided by financing activities was also a result of a decrease in repayments of credit facilities, interest, and lease liabilities, offset by the proceeds received in Q4 2022 related to the exercise of stock options which did not recur in Q4 2023.

As a result, the net cash position of the Company increased by $0.9 million during the three-month period ended December 31, 2023, compared to an increase of $1.1 million for the same period of the previous year.

During the twelve-months ended December 31, 2023, cash flow used by operating activities was $12 million compared to $11.1 million in the same period of the previous year. The use of cash consists of the net loss of $28.5 million (2022 – net loss of $32.2 million) plus adjustments for operating activities of $7.0 million (twelve-month period ended December 31, 2022 - $16.6 million), including a net change in non-cash operating working capital items of $9.8 million (2022 – net change of $4.4 million). The variation is due to the reduction of the net loss and significantly impacted by the collection of accounts receivable and customer deposits received and recognized in Billings in excess of costs and profits on uncompleted contracts.

Investing activities resulted in a net source of funds of $3.1 million compared to a use of funds of $0.4 million, and mainly due to a reduction in purchases of strategic investments and fewer additions to property and equipment, and intangible assets.

Financing activities resulted in a net source of funds of $7.4 million during the twelve-month period ended December 31, 2023, compared with a net source of funds of $2.6 million for the same period in 2022. The Company issued common shares in connection with a private placement and with an issuance of convertible debenture units and convertible loan for net cash proceeds of $9.1 million. In addition, the Company repaid loans and lease liabilities totaling $0.5 million as well as $0.1 million of the balance due on the business combination and repaid credit facilities for an amount of $0.8 million during the twelve-month period.

During the twelve-month period ended December 31, 2023, the net cash position of the Company decreased by $1.6 million compared to a decrease of $8.8 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	$ 3,030,000
December 20, 2023: Private Placement of Convertible Debenture loan for total gross proceeds of $1,250,000	Proceeds were intended and used for working capital and general corporate purposes	$ 1,250,000

CAPITAL STOCK INFORMATION

The authorized share capital of the Company consists of an unlimited number of common shares. As at April 1, 2024 PyroGenesis had 178,880,395 Common Shares, 9,720,843 share purchase warrants, 11,377,500 outstanding stock options issued, and 9,452,500 exercisable options issued.

GOING CONCERN

These 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 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 $121.9 million as at December 31, 2023 ($93,4 million 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 December 31, 2023, the Company has working capital deficiency of $7,007,719 ($1,650,709 as at December 31, 2022) including cash and cash equivalents of $1,802,616 ($3,445,649 as at December 31, 2022). The working capital is net of an allowance for credit losses amounting to $9,278,135 ($5,023,283 as at December 31, 2022) as further described in notes 9 and 10. 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 21). 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 20), the Company also completed a brokered private placement of convertible debenture units for gross proceeds of $1,250,000 in December 2023 (note 20). 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 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 year ended December 31, 2023 and 2022, the Company concluded the following transactions with related parties:

In 2023, rent and property taxes for the rental of property were charged by a trust whose beneficiary is the controlling shareholder and CEO of the Company in the amount of $352,721 (2022 - $277,389). On January 1, 2022, the lease agreement for rent of such property was modified to extend the lease term until December 2026. The lessor also reimbursed an amount of $1,070,264 representing the balance at the date of modification of the original prepayment amount of $1,178,530 made in 2020. At the date of modification, the lease liability was remeasured using a discount rate of 4%. As a result, the lease liability was increased by an amount of $1,070,264 and the right-of-use assets was decreased by an amount of $108,267. 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 right-of-use 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. In November 2023, the property held by the trust was sold to a third party.

As at December 31, 2023 the right-of-use asset and the lease liabilities amount to $606,656 and $668,475 respectively (2022 - $680,980 and $799,090).

A balance due to the controlling shareholder and CEO of the Company amounted to $676,778 (2022 - $254,097) is included in accounts payable and accrued liabilities.

In October 2022, a close family member of the President and CEO participated in a non-brokered private placement for gross proceeds of $369,980. Certain officers and a director of the Company also participated for an amount totalling $42,250.

In March 2023, the President and CEO, along with a close family member, participated in a non-brokered private placement for gross proceeds of $2,500,000 and $99,650, respectively. A director of the Company also participated for an amount of $20,000.

In July and December 2023, the President and CEO, participated in a brokered private placement for 2,000 unsecured convertible debenture units for gross proceeds of $2,000,000 and a non-brokered private placement of a convertible loan in the amount of $1,250,000.

The key management personnel of the Company, in accordance with IAS 24 Related Party Disclosures, are the members of the Board of Directors and certain officers. Total compensation to key management consisted of the following:

	Three months ended December 31		**Variation**	**Twelve months ended December 31**		**Variation**
	2023	2022	**2023 vs 2022**	**2023**	2022	**2023 vs 2022**
Salaries - key management	**216,937**	359,932	(142,995)	**1,236,804**	1,204,306	32,498
Pension contributions	**3,926**	6,838	(2,912)	**22,859**	22,479	380
Fees - Board of Directors	**41,700**	23,200	18,500	**182,252**	157,900	24,352
Share-based compensation - officers	**224,121**	245,915	(21,794)	**1,234,783**	2,017,348	(782,565)
Share-based compensation - Board of Directors	**397,042**	313,757	83,285	**1,305,746**	2,293,167	(987,421)
Other benefits - key management	**12,474**	222,686	(210,212)	**169,609**	244,621	(75,012)
Total compensation	**896,200**	1,172,328	(276,128)	**4,152,053**	5,939,821	(1,787,768)

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 a $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 the closing of brokered private placement of convertible debenture units, including participation by the CEO.
On August 1, 2023, PyroGenesis signed a $4.1 million contract for 4.5MW Plasma Torch System with Aeronautics and Defense client.

On August 22, 2023, PyroGenesis confirmed receipt of $826,000 down payment for 4.5MW High Power Plasma Torch System.

On August 24, 2023, PyroGenesis confirmed receipt of $445,200 milestone payment for SPARC™ Land-Based Waste Destruction System.

On September 12, 2023, PyroGenesis signed a $2.25 Million Plasma Torch Contract for PFAS removal.

On September 19, 2023, PyroGenesis signed an initial order with Global Aerospace firm for "coarse cut" Titanium Metal Powder for 3D printing.

On October 11, 2023, PyroGenesis announced successful silicon "Pour" validating all critical milestones from the Purevap Quartz Reduction Reactor (QRR).

On October 24, 2023, PyroGenesis announced a $360,000 initial contract for a Plasma-Based PACWAD System for chemical warfare waste destruction.

On November 9, 2023, PyroGenesis announced successful third-party validation of Fumed Silica from lab-scale production.

On November 16, 2023, PyroGenesis announced commencement of trading on the OTCQX Best Market in the United States.

On November 20, 2023, PyroGenesis announced receipt of a second $520,000 milestone payment under the plasma torch contract for PFAS removal.

On December 18, 2023, PyroGenesis received new U.S. Patent for Its innovative NexGen™ Plasma Atomization Metal Powder Production Technology for use in additive manufacturing and 3D printing.

On December 20, 2023, PyroGenesis announced the closing of a $1.25 million Private Placement.

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 27 of the 2023 consolidated financial statements.

CONTROLS AND PROCEDURES

The Company's shares are listed on the Toronto Stock Exchange ("TSX") since November 2020 and, from March 2021 until November 2023, on the NASDAQ. 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, while its shares were listed on NASDAQ, 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, 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), 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, 2023, 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 due to the material weaknesses in our ICFR as described below in Management's Annual Report on Internal Controls over Financial Reporting, the Company's DC&P were not effective as of December 31, 2023.

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) 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, 2023, an evaluation was carried out, under the supervision of the CEO and the CFO, of the effectiveness of the Company's ICFR. Based on this evaluation, the CEO and the CFO concluded that material weaknesses exist, as described below, and due to these material weaknesses, the Company's ICFR is not effective as of December 31, 2023. 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 year, and in 2022 and any remediation that occurred during fiscal 2021:

- **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.

  During 2023 there have been significant improvements 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.

  As of December 31, 2023, the Company can affirm that numerous internal controls were added, including compensating controls to mitigate these risks, as well as adding additional levels of review and approval in order to reduce the risk related to control activities thereby improving the quality and reliability 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.

  As of December 31, 2023, the Company has improved their processes to ensure that journal entries are sufficiently reviewed and approved, supporting analysis is 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.

  As of December 31, 2023, the Company has significantly improved the safeguarding of spreadsheets and data, through the addition of various controls, password protections, limiting access, 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, for the entirety of 2023.

  Throughout fiscal 2023 the Company has continued to implement controls to limit 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. The Company has selected the software and well advanced in the training and integration phase, and expected to be deployed in mid-2024.

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 year ended December 31, 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 year ended December 31, 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, 2023, the Company's design and operation of ICFR and DC&P were not effective.

Management's Ongoing Remediation Measures

During the year ended December 31, 2023, and beyond, management initiated and continues to implement remediation measures as outlined above, in the 2023 annual MD&A as well as the quarterly MD&A's of 2023. 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 2024, 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 year ended December 31, 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 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 2023 consolidated Financial Statements and the Annual Information Form, particularly under the heading "Risk Factors" in the Annual Information Form, and in other filings that the Company has made and may make in the future with applicable securities authorities, Company's website at www.pyrogenesis.com.

The risks and uncertainties described herein and therein are not the only ones the Company may face. Additional risks and uncertainties that the Company is unaware of, or that the Company currently believes are not material, may also become important factors that could adversely affect the Company's business. If any of such risks actually occur, the Company's business, financial condition, results of operations, and future prospects could be materially and adversely affected. In that event, the trading price of the Common Shares (or the value of any other securities of the Company) could decline, and the Company's securityholders could lose part or all of their investment.

Risks Related to the Company's Business and Industry

Operating Income (Loss) and Negative Operating Cash Flow

Prior to December 31, 2023, the Company had a history of losses and negative cash flows. For the year ended December 31, 2023, the Company has a net loss of $28.5 million, cash flows used in operations of $12 million, and an accumulated deficit of $121.9 million at December 31, 2023. To the extent that the Company has net losses and negative operating cash flow in future periods, it may need to allocate a portion of its cash reserves to fund such negative cash flow. The Company may also be required to raise additional funds through the issuance of equity or debt securities. There can be no assurance that the Company will be able to generate a positive cash flow from its operations, that additional capital or other types of financing will be available when needed or that these financings will be on terms favourable to the Company.

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

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

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

Revenue Risks

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

(i) unforeseen engineering and/or environmental problems;

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

(iii) supply interruptions and/or labour disputes;

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

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

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

Concentration Risk and Credit Risk

To date, a small number of customers have accounted for a majority of PyroGenesis' revenues. As its business expands, the Company expects that revenue distribution will be over a larger number of different customers. For the year ended December 31, 2023, sales of PyroGenesis to its two principal customers accounted for approximately 44% of its total revenue. For the year ended December 31, 2022, sales to two principal customers accounted for approximately 52% of PyroGenesis' total revenue. The loss of, or a reduction in, purchase orders or anticipated purchase orders from PyroGenesis' principal customers could have a material adverse effect on its business, financial condition and results of operations. Additionally, if one of PyroGenesis' customers is unable to meet its commitments to PyroGenesis, the Company's business, financial condition and results of operations could be adversely affected.

The Company and Drosrite International are parties to the Drosrite International Exclusive Agreement dated August 29, 2019 (the "Drosrite International Exclusive Agreement"), according to which Drosrite International had received the required rights from the Company to perform Drosrite International's obligations under a 2019 agreement it had entered into with Radian Oil & Gas Services Company, an oil and gas services company operating in the Middle East (the "Dross Processing Service Agreement"). 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.
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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 December 31, 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 December 31, 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 years 2023 and 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 commercialize 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 commercialized, when such products will be commercialized, 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 year ended December 31, 2023, the Company has a net loss of $28.5 million which includes a loss from the change in value of strategic investment of $0.3 million and cash flows used in operations of $12 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, at April 1, 2024, 11,377,500 stock options are currently issued and outstanding, together with 9,720,843 share purchase warrants. In addition, the Company issued convertible debentures in July 2023, and a convertible loan in December 2023 (refer to note 20 of the 2023 consolidated financial statements), whereby warrants were issued in these offerings. The exercise of stock options and/or other exchangeable securities, as well as any new equity financing, represents dilution factors for present and future shareholders.

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

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

Manufacturing Facilities

The vast majority of the Company's products are manufactured in its manufacturing facilities located in Montreal, Quebec, as well as in Italy and India. Accordingly, the Company is highly dependent on the uninterrupted and efficient operation of its manufacturing facilities. If for any reason the Company is required to discontinue production at its facilities, 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 facilities 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, as well as the Euro and Indian Rupee. 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 from 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.

***Litigation and* Administrative Proceedings**

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. A summary of certain important legal proceedings is contained in the Company's Annual Information Form under the heading "Legal Proceedings".

As previously announced by the Company (see Press Release dated August 31, 2023), in August 2023, the Autorité des marchés financiers (the "AMF") initiated administrative proceedings against Mr. P. Peter Pascali, President and CEO, Mr. Alan Curleigh, Chair of the Board of Directors, and the Company with the Tribunal administratif des marchés financiers. The allegations largely relate to a series of connected transactions that occurred in 2018. The administrative penalty sought by the AMF and attributable to the Company is $550,000. The Company remains of the view that the AMF's allegations are without merit, and, like Mr. Pascali and Mr. Curleigh, the Company looks forward to having the opportunity to defend itself, and be vindicated, before the tribunal. Further details are contained in the Annual Information Form.

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

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

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, 78,460,498 Common Shares, representing in aggregate 43.86% of the total voting rights attached to the outstanding Common Shares, and 5,125,000 share purchase warrants and options to acquire an additional 4,770,000 Common Shares (increasing the total number of Common Shares held or controlled, directly or indirectly, by him to 88,355,498 Common Shares, or 44.18% or the Common Shares, on a fully diluted basis). He also indirectly holds convertible debentures issued by the Company as part of the Company's July 2023 offering and controls the lending party a convertible loan executed in December 2023 (refer to note 20 of the 2023 consolidated financial statements). 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.

Joint Venture/Partnership Arrangements

The Company may participate in joint ventures and partnerships with third parties. A joint venture or partnership arrangement involves certain additional risks including: (i) the possibility that a partner may at any time have economic or business interests or goals that are inconsistent with those of the Company or take actions contrary to the instructions or requests of the Company or contrary to the Company's objectives; (ii) the risk that the partner could experience financial difficulties or seek the protection of bankruptcy, insolvency or other laws, which could result in additional financial demands on the Company; and (iii) the need to obtain the partner's consent with respect to certain major decisions. In addition, the sale or transfer of an interest in joint ventures and partnerships will generally be subject to rights of first refusal or first offer and certain other joint venture or partnership agreements may provide for buy-sell or similar arrangements. Such rights may be triggered at a time when the Company may not desire the sale but may be forced to do so because it does not then have the financial resources with which to purchase the other parties' interests. The terms of any joint venture or partnership arrangement may not allow the Company to realize anticipated benefits and may adversely affect the Company and its business.

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 are 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 deems 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 fulfill 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 Previous Status as a Foreign Private Issuer

Information Publicly Available to the Company's U.S. Shareholders Prior to its Voluntary Delisting

Until its voluntary delisting from NASDAQ in November 2023, the Company was a foreign private issuer under applicable U.S. federal securities laws. As a result, the Company did 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 was required to file with or furnish to the SEC the continuous disclosure documents that the Company was 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 were exempt from the reporting and short-swing profit recovery provisions of Section 16 of the U.S. Securities Exchange Act of 1934, as amended (the "Exchange Act"). Therefore, the Company's shareholders may not have known on as timely a basis when the Company's officers, directors and principal shareholders purchased or sold Common Shares as the reporting periods under the corresponding Canadian insider reporting requirements are longer.

While a foreign private issuer the Company was exempt from the rules and regulations under the Exchange Act related to the furnishing and content of proxy statements. The Company was also exempt from Regulation FD, which prohibits issuers from making selective disclosures of material non-public information. While the Company complied 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 would not have received the same information at the same time as such information would have been provided by U.S. domestic companies. In addition, the Company was not necessarily 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 had 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 disclosed the requirements it was not following and described the Canadian practices it followed instead. Until its voluntary delisting from NASDAQ, the Company relied on this exemption. As a result, the Company's shareholders would not have had the same protections afforded to shareholders of U.S. domestic companies that are subject to all U.S. corporate governance requirements.

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.

OUTLOOK AND RECENT DEVELOPMENTS

In 2023, PyroGenesis continued to build and develop critical factory-ready technology solutions that can power the future of heavy industry's decarbonization and energy transition efforts.

Over the past twelve months, the Company remained focused on driving its major lines of business toward widespread acceptance, moving its newer innovations closer to commercialization, finding efficiencies, and maintaining margin – all while providing the type of superior service and solutions that have endeared the Company to large global public, private, and government partners.

As the year progressed, the Company strengthened existing partnerships, grew the client base among military and defense, aerospace, government, aluminum, and chemical industries, and found increased overall awareness due to expanded business development efforts as well as public acknowledgments by influential industrial leaders to test all-electric plasma as a possible replacement for fossil fuel-based systems in their process steps.

The Company moved closer to the completion of, and commercial validation stemming from, its numerous industrial trials currently ongoing, and the certification of more specific technologies and products, particularly in metal powders for additive manufacturing (industrial scale 3D printing).

While the business focus remained on expanding the acceptance of commercial solutions and innovating and commercializing of commercial-ready and pilot stage solutions, the Company saw resurgence of some older business lines, such as waste remediation, where multiple projects were contracted for the first time in several years, encompassing a range of different safe destruction solutions for eliminating hazardous refrigerants in New Zealand, to removing chemical warfare agents from seaways in the European Union.

A cost rationalization effort, particularly within the Company's procurement activities, aimed at finding an overall 10% reduction while maintaining and improving quality, with strong results so far in this ongoing process – much of which is centered around eventually moving certain key production elements to lower cost geographical locations.

An additional cost savings measure was taken when the Company announced its delisting from the Nasdaq exchange, and commencement of trading on the OTCQX Best Market.

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

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 three ecosystem-solution 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,

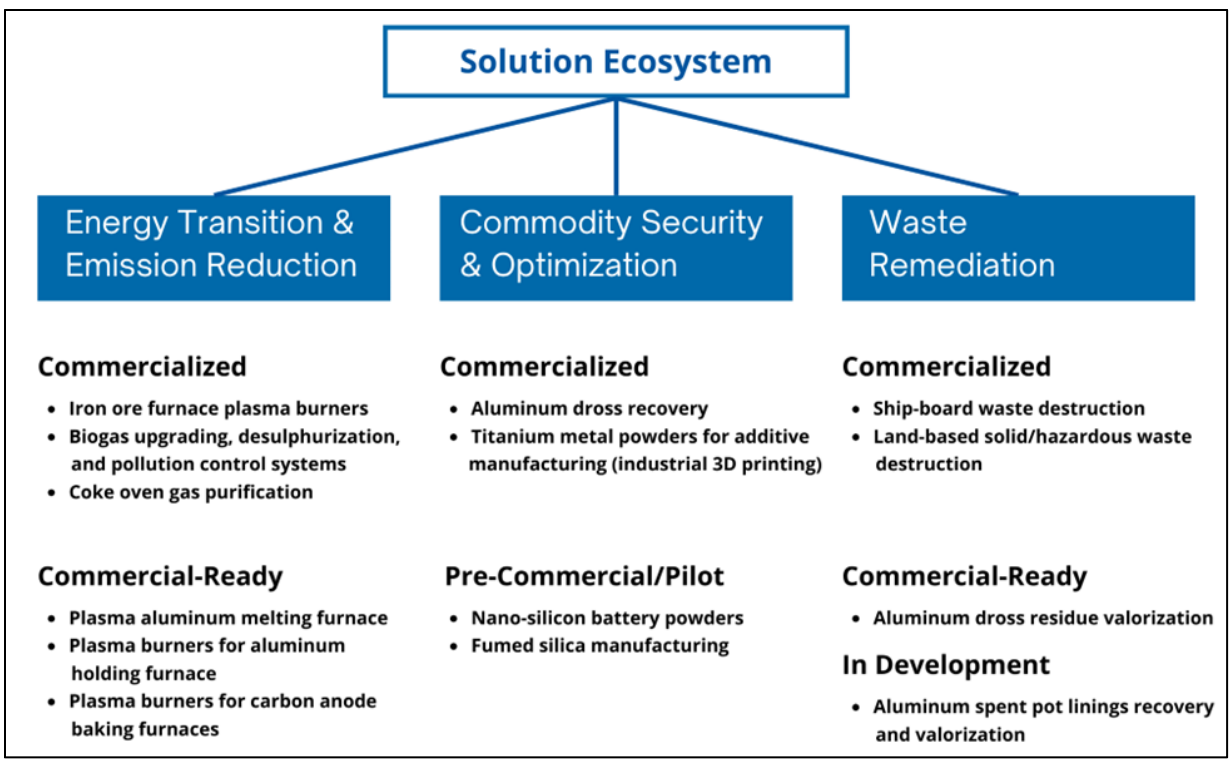
Commodity Security & Optimization:

- recovery of viable metals, and optimization of production 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 its 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".

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 my 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 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 and Q3 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 for $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 Q3 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 CAD$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 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 CO2 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 CDN$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 particular potential clients are located 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 some 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.**

FURTHER INFORMATION

Additional information relating to Company and its business, including the 2023 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.sedarplus.ca, 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.