

PyroGenesis Canada Inc.

Management's Discussion and Analysis

For the three-month periods ended March 31, 2023, and 2022

(Unaudited)

This management's discussion and analysis ("MD&A") is intended to assist readers in understanding the business environment, strategies, performance and risk factors of PyroGenesis Canada Inc. ("PyroGenesis", or the "Company"). The MD&A provides the reader with a view and analysis, from the perspective of management, of the Company's financial results for the three-month period ended March 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, 2022.

The condensed consolidated interim financial statements and MD&A have been reviewed by PyroGenesis' Audit Committee and were approved by its Board of Directors on May 15, 2023. The Board of Directors is responsible for ensuring that the Company fulfills its responsibilities for financial reporting and is ultimately responsible for reviewing and approving the MD&A. The Board of Directors carries out this responsibility principally through its Audit Committee. The Audit Committee is appointed by the Board of Directors and is comprised of independent directors. The Audit Committee reports its findings to the Board of Directors for its consideration when it approves the MD&A and financial statements for issuance to shareholders.

The following information takes into account all material events that took place up until May 15, 2023, the date on which the Company's Board of Directors approved this MD&A. Unless otherwise indicated, all amounts are presented in Canadian dollars. The Company's functional and reporting currency is the Canadian dollar.

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

FORWARD-LOOKING STATEMENTS

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

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

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

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

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

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

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

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BASIS OF PRESENTATION

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

NON-IFRS MEASURES

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

We use non-IFRS measures, including EBITDA and Modified EBITDA, both of which are not considered an alternative to income or loss from operations, or to net earnings or loss, in the context of measuring a company's performance. EBITDA is used by management in order to facilitate operating performance comparisons from period to period, to prepare annual operating budgets and forecasts and to determine components of management compensation. Management believes that EBITDA is used by investors as it provides supplemental measures of operating performance and thus highlight trends in our business that may not otherwise be apparent when relying solely on IFRS measures, and to compare the results of our operations with other entities with similar structures. Modified EBITDA is used by management as it brings additional clarity to operating performance, 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 m²) and 31,632 sq. ft. (2,940 m²) manufacturing facilities, PyroGenesis maintains its competitive advantage by remaining at the forefront of technology development and commercialization. Our core competencies allow PyroGenesis to lead the way in providing innovative plasma torches, plasma waste processes, high-temperature metallurgical processes, and engineering services to the global marketplace. Our operations are ISO 9001:2015 and AS9100D certified, having been ISO certified since 1997. Since our acquisition of Pyro Green-Gas (formerly AirScience Technologies Inc), we now offer technologies, equipment, and expertise in the area of biogas upgrading, and air pollution control. As a result, we have extended our presence to Italy and India, and this acquisition provides potential synergies with our current land-based waste destruction offerings. Our common shares are listed on the Toronto Stock Exchange (TSX) (Ticker Symbol: PYR), NASDAQ (Ticker Symbol: PYR) and the Frankfurt Stock Exchange (FSX) (Ticker symbol: 8PY).

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

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INFORMATION FROM CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS FOR THE QUARTERS ENDED MARCH 31:

	Three months ended March 31		Variation
	2023	2022	2023 vs 2022
Revenues			
Cost of sales and services	\$ 2,591,622	\$ 4,206,762	\$ (1,615,140)
Gross profit	<u>2,065,049</u>	<u>3,155,039</u>	<u>(1,089,990)</u>
	526,573	1,051,723	(525,150)
Expenses			
Selling, general and administrative (not including share-based expenses)	6,568,946	3,942,738	2,626,208
Research and development, net	<u>323,216</u>	<u>482,432</u>	<u>(159,216)</u>
Total expenses (not including share-based expenses)	<u>6,892,162</u>	<u>4,425,170</u>	<u>2,466,992</u>
Net loss from operations (not including share-based expenses)	(6,365,589)	(3,373,447)	(2,992,142)
Share-based expenses	<u>(988,162)</u>	<u>(1,669,630)</u>	<u>681,468</u>
Net loss from operations	<u>(7,353,751)</u>	<u>(5,043,077)</u>	<u>(2,310,674)</u>
Changes in fair market value of strategic investments and finance income (costs), net	1,215,144	992,855	222,289
Income taxes	—	56,553	(56,553)
Net loss	<u>\$ (6,138,607)</u>	<u>\$ (4,106,775)</u>	<u>\$ (2,031,832)</u>
Foreign currency translation gain (loss) on investments in foreign operations	(19,013)	37,656	(56,669)
Comprehensive loss	<u>\$ (6,157,620)</u>	<u>\$ (4,069,119)</u>	<u>\$ (2,088,501)</u>
Loss per share			
Basic	\$ (0.03)	\$ (0.02)	\$ (0.01)
Diluted	\$ (0.03)	\$ (0.02)	\$ (0.01)
Modified EBITDA⁽¹⁾	<u>\$ (5,846,127)</u>	<u>\$ (2,807,818)</u>	<u>\$ (3,038,309)</u>

¹.See "Non-IFRS Measures"

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INFORMATION FROM CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS FOR THE PERIODS ENDED MARCH 31:

	March 31, 2023	March 31, 2022	March 31, 2021
Revenues	\$ 2,591,622	\$ 4,206,762	\$ 6,264,503
Cost of sales and services	<u>2,065,049</u>	<u>3,155,039</u>	<u>4,121,493</u>
Gross profit	526,573	1,051,723	2,143,010
Expenses			
Selling, general and administrative (not including share-based expenses)	6,568,946	3,942,738	2,803,095
Research and development, net	<u>323,216</u>	<u>482,432</u>	<u>286,307</u>
Total expenses (not including share-based expenses)	<u>6,892,162</u>	<u>4,425,170</u>	<u>3,089,402</u>
Net loss from operations (not including share-based expenses)	(6,365,589)	(3,373,447)	(946,392)
Share-based expenses	(988,162)	(1,669,630)	(922,340)
Net loss from operations	<u>(7,353,751)</u>	<u>(5,043,077)</u>	<u>(1,868,732)</u>
Changes in fair market value of strategic investments and finance income (costs), net	1,215,144	992,855	5,581,635
Income taxes	<u>—</u>	<u>56,553</u>	<u>—</u>
Net income (loss) and comprehensive income (loss)	\$ (6,138,607)	\$ (4,106,775)	\$ 3,712,903
Foreign currency translation gain (loss) on investments in foreign operations	<u>(19,013)</u>	<u>37,656</u>	<u>—</u>
Comprehensive income (loss)	\$ (6,157,620)	\$ (4,069,119)	\$ 3,712,903
Earnings (loss) per share			
Basic	\$ (0.03)	\$ (0.02)	\$ 0.02
Diluted	\$ (0.03)	\$ (0.02)	\$ 0.02
Modified EBITDA⁽¹⁾	\$ (5,846,127)	\$ (2,807,818)	\$ (761,501)

SELECTED FINANCIAL INFORMATION

	March 31, 2023	December 31, 2022	December 31, 2021
Current assets	22,131,357	27,448,182	38,758,984
Non-current assets	<u>19,758,567</u>	<u>20,218,568</u>	<u>31,011,693</u>
Total assets	\$ 41,889,924	\$ 47,666,750	\$ 69,770,677
Current liabilities	21,344,432	25,797,473	24,752,199
Non-current liabilities	<u>3,885,540</u>	<u>5,000,350</u>	<u>4,249,724</u>
Total liabilities	\$ 25,229,972	\$ 30,797,823	\$ 29,001,923
Shareholders' equity	\$ 16,659,952	\$ 16,868,927	\$ 40,768,754

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FINANCIAL CONDITION

	March 31, 2023	December 31, 2022	Variation 2023 vs 2022
<i>Current Assets</i>			
Cash	\$ 1,887,021	\$ 3,445,649	\$ (1,558,628)
Accounts receivable	14,914,085	18,624,631	(3,710,546)
Costs and profits in excess of billings on uncompleted contracts	1,193,968	1,051,297	142,671
Inventory	1,823,134	1,876,411	(53,277)
Investment tax credits receivable	189,376	276,404	(87,028)
Income tax receivable	16,470	14,169	2,301
Current portion of deposits	498,314	432,550	65,764
Current portion of royalties receivable	468,980	455,556	13,424
Contract assets	474,314	499,912	(25,598)
Prepaid expenses	665,695	771,603	(105,908)
Total Current Assets	\$ 22,131,357	\$ 27,448,182	\$ (5,316,825)
<i>Non-Current assets</i>			
Deposits	46,272	46,053	219
Strategic investments	6,211,505	6,242,634	(31,129)
Property and equipment	3,278,388	3,393,452	(115,064)
Right-of-use-assets	4,662,383	4,818,744	(156,361)
Royalties receivable	980,291	952,230	28,061
Intangible assets	1,919,121	2,104,848	(185,727)
Goodwill	2,660,607	2,660,607	—
Total Non-Current Assets	\$ 19,758,567	\$ 20,218,568	\$ (460,001)
<i>Current Liabilities</i>			
Bank indebtedness	1,087,253	991,902	95,351
Accounts payable and accrued liabilities	7,483,627	10,115,870	(2,632,243)
Billings in excess of costs and profits on uncompleted contracts	7,874,489	9,670,993	(1,796,504)
Current portion of term loans	61,521	69,917	(8,396)
Current portion of lease liabilities	2,679,987	2,672,212	7,775
Balance due on business combination	1,968,922	2,088,977	(120,055)
Income tax payable	188,633	187,602	1,031
Total Current Liabilities	\$ 21,344,432	\$ 25,797,473	\$ (4,453,041)
<i>Non-current Liabilities</i>			
Lease liabilities	2,755,768	2,861,482	(105,714)
Term loans	328,336	320,070	8,266
Balance due on business combination	801,436	1,818,798	(1,017,362)
Total Non-Current Liabilities	\$ 3,885,540	\$ 5,000,350	\$ (1,114,810)

Working capital, (expressed as current assets less current liabilities) varied since December 31, 2022 by \$0.9 million, mainly a result of:

- a decrease of cash of \$1.6 million, explained in the section Summary of Cash Flows,
- a decrease of \$3.7 million of accounts receivable as the Company has collected the invoicing milestones on contracts in progress, offset by the increase in sales tax receivable \$0.3 million and by \$0.8 million as a result of the increased allowance for expected credit loss,
- an increase of \$0.1 million in costs and profits in excess of billings on uncompleted contracts related to the advancement on paying projects, offset by the decrease of \$0.06 million as a result of the allowance for credit loss on costs and profits in excess of billings on uncompleted contracts,
- an increase in bank indebtedness of \$0.1 million due to the usage of the credit facilities by Pyro Green-Gas and its Italian subsidiary,
- a decrease of \$2.6 million in accounts payable and accrued liabilities due to an increase in payments to suppliers,
- a decrease of \$1.8 million in billings in excess of costs and profits on uncompleted contracts due to the increase in workforce working on progressing customer projects by achieving contract milestones in shorter amounts of time, and
- a decrease in balance due on business combination by \$0.1 million due to disbursement of an achieved milestone.

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Non-current assets varied since December 31, 2022, by \$0.5 million, mainly a result of:

- a decrease of property and equipment of \$0.1 million due to annual depreciation including the assets under construction placed in service,
- a decrease of \$0.2 million in right-of-use-assets due to depreciation and timing of lease maturity dates, and
- a decrease of \$0.2 million in intangible assets due to the amortization of the intangible asset from the 2021 business combination as well as the HP Torch and SPARC patents,

Non-current liabilities varied since December 31, 2022, by \$1.1 million, mainly a result of:

- a repayment of lease liabilities, an increase in the Economic Development Agency of Canada loan, and to the revaluation of the balance due on business combination caused primarily to the agreement between the Company's Italian subsidiary and a customer who both agreed on the final acceptance of a contract, prior to final completion. As a result, the contract did not attain the agreed milestone in connection with the balance due on business combination, and thus a reversal of the liability was recorded.

RESULTS OF OPERATIONS

Revenues

PyroGenesis recorded revenue of \$2.6 million in the first quarter of 2023 ("Q1, 2023"), representing a decrease of \$1.6 million compared with \$4.2 million recorded in the first quarter of 2022 ("Q1, 2022"),

Revenues recorded in the three months ended March 31, 2023, were generated primarily from:

	Three months ended March 31		Variation
	2023	2022	2023 vs 2022
High purity metallurgical grade silicon & solar grade silicon from quartz (PUREVAP™)	\$ 527,600	\$ 441,605	\$ 85,995
Aluminium and zinc dross recovery (DROSRITE™)	90,226	900,079	(809,853)
Development and support related to systems supplied to the U.S. Navy	352,103	745,260	(393,157)
Torch-related sales	1,170,748	1,041,709	129,039
Refrigerant destruction (SPARC™)	67,847	—	67,847
Biogas upgrading and pollution controls	32,895	990,045	(957,150)
Other sales and services	350,203	88,064	262,139
Revenue	\$ 2,591,622	\$ 4,206,762	\$ (1,615,140)

Q1, 2023 revenues decreased by \$1.6 million, mainly as a result of:

- DROSRITE™ related sales decreased by \$0.8 million due to continued customer delays in funding for the construction of the onsite facility,
- Support services related to systems supplied for the US Navy decreased by \$0.4 million due to remaining project milestones mainly related to inspection, packaging and shipment of the equipment to our customer in order to move forward with installation and commissioning,
- Biogas upgrading and pollution controls related sales decreased by \$1.0 million of which \$0.6 million is due to clients requiring additional modifications prior to installation and commissioning, as well as continuous testing to achieve desired results and \$0.4 million due 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 contracts,
- Other sales and services increased by \$0.3 million due to an increase in sales related to spare parts required by our customers.

As of May 15, 2023, revenue expected to be recognized in the future related to backlog of signed and/or awarded contracts is \$30.6 million. Revenue will be recognized as the Company satisfies its performance obligations under long-term contracts, which is expected to occur over a maximum period of approximately 3 years.

Cost of Sales and Services

	Three months ended March 31		Variation
	2023	2022	2023 vs 2022
Employee compensation	\$ 888,435	\$ 802,629	\$ 85,806
Subcontracting	48,573	671,275	(622,702)
Direct materials	614,998	1,082,783	(467,785)
Manufacturing overhead & other	293,637	159,619	134,018
Foreign exchange charge on materials	—	221,803	(221,803)
Investment tax credits	(2,346)	(1,829)	(517)
Amortization of intangible assets	221,752	218,759	2,993
Total Cost of Sales and Services	\$ 2,065,049	\$ 3,155,039	\$ (1,089,990)

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Gross Profit

	Three months ended March 31	
	2023	2022
Revenues	\$ 2,591,622	\$ 4,206,762
Cost of Sales and Services	2,065,049	3,155,039
Gross Profit	\$ 526,573	\$ 1,051,723
Gross Margin %	20.3 %	25.0 %

Cost of sales and services was \$2.1 million in Q1 2023, representing a decrease of \$1.1 million compared with \$3.2 million in Q1 2022, primarily due to a decrease of \$0.6 million in subcontracting attributed to additional work being completed in-house and a decrease in direct materials of \$0.5 million due to lower levels of material required based on the decrease in product and service-related revenues.

The gross margin for Q1, 2023 was \$0.5 million or 20.3% of revenue compared to a gross margin of \$1.1 million or 25% of revenue for Q1 2022, the decrease in gross margin was mainly attributable to the impact on foreign exchange charge on materials of \$0.2 million and the reversal of costs and profits in excess of billings on uncompleted contracts due to the agreed upon final acceptance prior to final completion of \$0.4 million.

The amortization of intangible assets for Q1, 2023 was \$0.2 million compared to \$0.2 million for Q1, 2022. 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 and sales and services are in line with management's expectations and with the nature of the revenue.

Selling, General and Administrative Expenses

	Three months ended March 31		Variation
	2023	2022	2023 vs 2022
Employee compensation	\$ 2,553,957	\$ 1,671,789	\$ 882,168
Share-based expenses	988,162	1,669,630	(681,468)
Professional fees	1,244,279	661,979	582,300
Office and general	172,263	233,460	(61,197)
Travel	59,793	27,209	32,584
Depreciation of property and equipment	160,363	142,990	17,373
Depreciation of ROU assets	156,362	166,224	(9,862)
Investment tax credits	(7,500)	(7,500)	—
Government grants	(53,511)	(39,434)	(14,077)
Other expenses	885,450	1,086,021	(200,571)
Foreign exchange charge on materials	21,894	—	21,894
Expected credit loss & bad debt	1,375,596	—	1,375,596
Total selling, general and administrative	\$ 7,557,108	\$ 5,612,368	\$ 1,944,740

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 Q1, 2023 were \$7.6 million, representing an increase of 35% compared to \$5.6 million for Q1, 2022. The increase is mainly a result of employee compensation increasing to \$2.6 million mainly caused by additional headcount. Share-based compensation expense decreased by \$0.7 million, which is a non-cash item and relates mainly to a Q4 2021, and 2022 grants not repeated in 2023. Professional fees are \$1.2 million which increased by \$0.6 million, due to additional legal fees, consulting services, public listing expenses and patent expenses. Other expenses were favourable by \$0.2 million due to a net reduction of insurance expenses, taxes, interest and bank charges. The expected credit loss & bad debt increased to \$1.4 million in Q1 2023 and is due to an increase in the allowance for expected credit loss increase of \$0.8 million and to the write-off of the accounts receivable related to the Company's Italian subsidiary subsequent to both parties agreeing on the final acceptance of the contract prior to final completion.

Share-based 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.

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Depreciation on Property and Equipment

	Three months ended March 31		Variation
	2023	2022	2023 vs 2022
Depreciation of property and equipment	\$ 160,363	\$ 142,990	\$ 17,373

The depreciation on property and equipment increased to \$0.2 million in Q1 2023, compared with \$0.1 in Q1 2022. The expense is comparable to the same quarter last year and the increase is primarily due to nature and useful lives of the property and equipment being depreciated.

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

	Three months ended March 31		Variation
	2023	2022	2023 vs 2022
Employee compensation	\$ 16,132	\$ 236,451	\$ (220,319)
Investment tax credits	(10,097)	(1,168)	(8,929)
Subcontracting	31,291	32,054	(763)
Materials and equipment	84,324	144,420	(60,096)
Other expenses	201,566	70,675	130,891
Total net R&D expenses, net	\$ 323,216	\$ 482,432	\$ (159,216)

During the three-months ended March 31, 2023, the Company incurred \$0.3 million of R&D costs on internal projects, a decrease of 33% as compared with \$0.5 million in Q1 2022. The decrease in Q1 2023 is primarily related to a decrease in employee compensation, subcontracting, and materials and equipment, offset by the increase in other expenses of \$0.2 million related to equipment rentals.

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

Finance costs (income), net

	Three months ended March 31		Variation
	2023	2022	2023 vs 2022
Interest on term loans	361	851	(490)
Interest on lease liabilities	93,121	77,465	15,656
Interest accretion on and revaluation of balance due on business combination	(1,037,417)	82,973	(1,120,390)
Interest accretion of royalty receivable	(41,485)	(1,364)	(40,121)
Penalties and other interest	71,167	23,975	47,192
Finance costs (income), net	\$ (914,253)	\$ 183,900	\$ (1,098,153)

Finance expense (income) for Q1 2023 totaled \$0.9 million as compared with an expense of \$0.2 million for Q1 2022, representing a favourable variation of \$1.1 million year-over-year. The decrease in finance expenses in Q1 2023, is primarily due to the revaluation of balance due on business combination due to the Company's Italian subsidiary and a customer who both agreed on the final acceptance of a contract, prior to final completion. As a result, the contract did not attain the pre-determined milestone in connection with the balance due on business combination, and a reversal of the liability was recorded.

Strategic Investments

	Three months ended March 31		Variation
	2023	2022	2023 vs 2022
Changes to fair value of strategic investments	\$ 300,891	\$ 1,176,755	\$ (875,864)

During the three-months ended March 31, 2023, the adjustment to fair market value of strategic investments for Q1 2023 resulted in a gain of \$0.3 million compared to a gain in the amount of \$1.2 million in Q1 2022. The decrease in gain is attributable to the variation of the market value of the common shares and warrants owned by the Company of HPQ Silicon Inc.

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Comprehensive loss

	Three months ended March 31		Variation
	2023	2022	2023 vs 2022
Comprehensive loss	\$ (6,157,620)	\$ (4,069,119)	\$ (2,088,501)

The comprehensive loss for Q1 2023 of \$6.2 million compared to a loss of \$4.1 million, in Q1 2022, represents a variation of \$2.1 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 \$1.6 million arising in Q1 2023,
- a decrease in cost of sales and services of \$1.1 million, primarily due to a decrease in subcontracting, direct materials and foreign exchange charge on materials, offset by the increase in employee compensation and manufacturing overhead,
- an increase in SG&A expenses of \$1.9 million arising in Q1 2023, was primarily due to an increase in employee compensation, professional fees, travel, depreciation in property and equipment, foreign exchange charge on materials, and the allowance for credit loss of \$0.8 million and write-off of \$0.6 million which is offset by a decrease in several non-significant expenses,
- a decrease in share-based expenses of \$0.7 million
- a decrease in R&D expenses of \$0.2 million primarily due to a decrease in employee compensation, subcontracting, material and equipment and an increase in investment tax credits and other expenses,
- a decrease in finance costs (income), net of \$1.1 million in Q1 2023 primarily due to the revaluation of balance due on business combination,
- a decrease in changes in fair market value of strategic investments of \$0.9 million,
- a decrease in income taxes of \$0.06 million in Q1 2023.

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

	Three months ended March 31		Variation
	2023	2022	2023 vs 2022
Comprehensive loss	\$ (6,157,620)	\$ (4,069,119)	\$ (2,088,501)
Depreciation of property and equipment	160,363	142,990	17,373
Depreciation of ROU assets	156,361	166,224	(9,863)
Amortization of intangible assets	221,752	218,759	2,993
Finance costs (income), net	(914,253)	183,900	(1,098,153)
Income taxes	—	56,553	(56,553)
EBITDA⁽¹⁾	\$ (6,533,397)	\$ (3,300,693)	\$ (3,232,704)
Other non-cash items:			
Share-based expenses	988,162	1,669,630	(681,468)
Change in fair value of investments	(300,891)	(1,176,755)	875,864
Modified EBITDA⁽¹⁾	\$ (5,846,126)	\$ (2,807,818)	\$ (3,038,308)

¹ See "Non-IFRS Measures"

The EBITDA in Q1, 2023 was a \$6.5 million loss compared to an EBITDA loss of \$3.3 million for Q1, 2022, representing a increase of 98% year-over-year. The variation in the EBITDA in the three-months ended March 31, 2023, compared to March 31, 2022, is due to the increase in comprehensive loss of \$2.1 million, an increase in depreciation on property and equipment of \$0.02, an increase in amortization of intangible assets, a decrease in depreciation on right-of-use assets, a decrease in finance costs (income), net of \$1.1 million and a decrease in income taxes of \$0.06 million.

The Modified EBITDA in Q1, 2023 was a \$5.9 million loss compared to a Modified EBITDA loss of \$2.8 million for Q1, 2022, representing an increased loss of \$3.0 million. The increase in the Modified EBITDA loss in Q1, 2023 is attributable to the increase as mentioned above in the EBITDA of \$3.2 million and a decrease in share-based expenses of \$0.7 million from an expense not recurring in Q1, 2023 and a decrease in the change of fair value of investments of \$0.9 million, based on the fair value of such investment.

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SUMMARY OF QUARTERLY RESULTS

	2023		2022			2021		
	Q1	Q4	Q3	Q2	Q1	Q4	Q3	Q2
Revenues	\$ 2,591,622	\$ 3,301,777	\$ 5,657,783	\$ 5,847,180	\$ 4,206,762	\$ 7,205,349	\$ 9,317,926	\$ 8,280,572
Gross profit	526,573	479,715	4,113,176	2,499,273	1,051,723	1,302,789	4,052,531	4,933,481
Gross margin %	20.3 %	14.5 %	72.7 %	42.7 %	25.0 %	18.1 %	43.5 %	59.6 %
Comprehensive income (loss)	(6,157,620)	(10,818,755)	(4,053,706)	(13,039,531)	(4,069,119)	(22,402,857)	623,664	(20,362,205)
Earnings (loss) per share								
Basic	(0.03)	(0.06)	(0.02)	(0.08)	(0.02)	(0.13)	—	(0.12)
Diluted	(0.03)	(0.06)	(0.02)	(0.08)	(0.02)	(0.13)	—	(0.12)

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

LIQUIDITY AND CAPITAL RESOURCES

As at March 31, 2023, the Company had cash of \$1.9 million, included in the net working capital of \$0.8 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 March 31, 2023 was \$389,857, and varied only slightly since December 31, 2022. The increase from January 1, 2022 to December 31, 2022, was mainly attributable to the additional proceeds received on the Economic Development Agency of Canada loan, which is interest free and will remain so, until the balance is paid over the 60-month period ending March 2029. The average interest expense on the other term loans was 7.2% in the period. The Company does not expect changes to the structure of term loans in the next twelve-month period. The Company maintained two credit facilities which bear interest at variable rates ranging between 7.45% and 8% at March 31, 2023. The Company expects to reimburse a portion of the credit facilities during 2023, and extend the due date of the remaining balance, while maintaining the similar conditions.

	Carrying Value	Total contractual amount	Less than one year	2-3 years	4-5 years	Over 5 years
	\$	\$	\$	\$	\$	\$
Bank indebtedness	1,087,253	1,087,253	1,087,253	—	—	—
Accounts payable and accrued liabilities ¹	6,359,607	6,359,607	6,359,607	—	—	—
Term loans	389,857	511,521	61,521	180,000	180,000	90,000
Balance due on business combination	2,770,358	3,266,700	2,395,580	871,120	—	—
Lease liabilities	5,435,755	6,543,087	2,940,114	1,125,789	642,528	1,834,656
	16,042,830	17,768,168	12,844,075	2,176,909	822,528	1,924,656

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

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SUMMARY OF CASH FLOWS

	Three months ended March 31	
	2023	2022
Cash used in operating activities	\$ (6,530,631)	\$ (7,765,723)
Cash provided by investing activities	250,696	1,274,236
Cash provided by financing activities	4,721,475	898,339
Effect of exchange rate changes on cash denominated in foreign currency	(168)	3,259
Decrease in cash	(1,558,628)	(5,589,889)
Cash - end of period	1,887,021	6,612,624

During the three months ended March 31, 2023, cash flow used by operating activities was \$6.5 million compared to \$7.8 million for the same period in the prior year. The use of cash during Q1, 2023, consists of the net loss of \$6.1 million (Q1, 2022 – net loss of \$4.1 million) plus adjustments for operating activities of \$0.3 million (Q1, 2022 - \$1.4 million), including a net change in non-cash operating working capital items of \$0.7 million (Q1, 2022 – net change of \$5.0 million). The favourable variation is due to collections of accounts receivables and payments made on trade payables.

Investing activities resulted in a net source of funds of \$0.3 million in Q1, 2023, compared to a net source of funds of \$1.3 million in Q1, 2022 resulting from less additions to property and equipment, and less disposals of strategic investments.

Financing activities in Q1, 2023, resulted in a net source of funds of \$4.7 million, compared with a net source of funds of \$0.9 million for the same period in 2022. In Q1, 2023, the Company issued common shares for net cash proceeds of \$4.96 million and repaid an amount of \$0.1 million in loans and lease liabilities and \$0.1 million in balance due on business combination. Financing activities also include interest paid of \$0.1 million in both Q1, 2023 and Q1, 2022.

The net cash position of the Company decreased by \$1.6 million for Q1, 2023, compared to a decrease of \$5.6 million for Q1, 2022.

USE OF PROCEEDS FROM FINANCINGS

<i>Description of intended use of funds from financings in the past 12 months</i>	<i>Proposed use of proceeds from financings completed in the past 12 months</i>	<i>Use of funds to Date</i>
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

CAPITAL STOCK INFORMATION

The authorized share capital of the Company consists of an unlimited number of common shares. As at May 15, 2023 PyroGenesis had 178,580,395 Common Shares, 6,014,600 share purchase warrants, 9,810,500 outstanding stock options issued, and 6,648,000 exercisable options issued.

GOING CONCERN

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

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

The Company has incurred, in the last years, operating losses and negative cash flows from operations, and as a result, the Company has an accumulated deficit of \$99,523,465 as at March 31, 2023 (\$93,384,858 as at December 31, 2022). Furthermore, there have been unexpected delays in the collection of certain accounts receivable from contracts closed in a prior year. This has resulted in a shortfall in cash flows from operating activities that would be used in funding the Company's operations.

As at March 31, 2023, the Company has working capital of \$786,925 (\$1,650,709 as at December 31, 2022) including cash of \$1,887,021 (\$3,445,649 as at December 31, 2022). The working capital is net of an allowance for credit losses amounting to \$5,725,840 (\$5,023,283 as at December 31, 2021) as further described in notes 6 and 7. The Company's business plan is dependent upon the successful completion of contracts and also the receipt of payments from certain contracts closed in a prior year and expects these payments to be made during fiscal 2023, as well as the achievement of profitable

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operations through the signing, completion and delivery of additional contracts or a reduction in certain operating expenses. In the absence of this, the Company is dependent upon raising additional funds to finance operations within and beyond the next twelve months. The Company has been successful in securing financing in the past and has relied upon external financing to fund its operations, primarily through the issuance of equity, debt and convertible debentures. The Company completed a private placement in October 2022 for an amount of \$1,318,980 and also completed another private placement in March 2023 for net proceeds of \$4,960,483 (see note 13). While the Company has been successful in securing financing, raising additional funds is dependent on a number of factors, some of which are outside the Company's control, and therefore there is no assurance that it will be able to do so in the future or that these sources will be available to the Company or that they will be available on terms which are acceptable to the Company. These conditions indicate the existence of a material uncertainty that may cast significant doubt about the Company's ability to continue operating as a going concern.

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

RELATED PARTY TRANSACTIONS

During the three-month period ended March 31, 2023, the Company concluded the following transactions with related parties:

In 2023, rent and property taxes were charged by a trust whose beneficiary is the controlling shareholder and CEO of the Company in the amount of \$69,891 (\$69,054 for the three-month period ended March 31, 2022).

These expenses are recorded in the captions cost of sales and services and in selling, general and administrative in the consolidated statements of comprehensive loss. As at March 31, 2023 the right-of-use asset and the lease liabilities amount to \$732,500 and \$815,823 respectively, (\$799,090 and \$881,635 respectively at December 31, 2022).

A balance due to the controlling shareholder and CEO of the Company amounted to \$340,156 at March 31, 2023 (\$254,097 at December 31, 2022) and is included in accounts payable and accrued liabilities.

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

	Three months ended March 31		Variation
	2023	2022	2023 vs 2022
Salaries - key management	\$ 305,457	\$ 315,971	\$ (10,514)
Pension contributions	5,657	5,893	(236)
Fees - Board of Directors	48,172	20,000	28,172
Share-based compensation - officers	29,621	326,074	(296,453)
Share-based compensation - Board of Directors	—	652,147	(652,147)
Other benefits - key management	155,257	6,439	148,818
Total compensation	\$ 544,164	\$ 1,326,524	\$ (782,360)

CORPORATE HIGHLIGHTS

On January 10, 2023, PyroGenesis announced signed a \$6,000,000 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 \$5,000,000 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 \$700,000 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 \$9,300,000 project with a key client, one of the world's top diversified steel producers.

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

For a discussion of significant accounting policies, judgements, estimates assumptions and financial instruments, please refer to notes 4, 5 and 28 of the 2022 consolidated Financial Statements.

CONTROLS AND PROCEDURES

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

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

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

Disclosure controls and procedures

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

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

As of December 31, 2022, an evaluation was carried out under the supervision of the CEO and CFO, of the design and operating effectiveness of the Company's DC&P. Based on this evaluation, the CEO and CFO concluded that presence of material weaknesses in our ICFR as described below in Management's Report on Internal Controls over Financial Reporting at December 31, 2022.

Management's Annual Report on Internal Controls over Financial Reporting

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

As of December 31, 2022, an evaluation was carried out, under the supervision of the CEO and the CFO, of the effectiveness of the Company's ICFR. Based on this evaluation, the CEO and the CFO concluded that material weaknesses exist, as described below, and summarised the conclusion below. The control framework used to design and evaluate effectiveness of the Company's ICFR is established under the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) on Internal Control – Integrated Framework (2013 framework). A material weakness is a deficiency, or combination of deficiencies, in ICFR, such that there is a reasonable possibility that a material misstatement of the Company's annual or interim consolidated financial statements will not be prevented or detected on a timely basis.

In connection with the Company's evaluation of ICFR, the following are the control deficiencies that were considered to be material weaknesses in the current quarter and in fiscal 2022 and any remediation that occurred up to March 31, 2023:

- **Control environment:** The Company did not maintain an effective control environment and has identified deficiencies relating to appropriate organizational structure and authority and responsibilities. The Company did not have a sufficient number of trained resources with the appropriate skills and knowledge with assigned responsibilities and accountability for the design and operation of ICFR and for holding individuals accountable for their internal control-related responsibilities.

Nonetheless, as of March 31, 2023 and for a portion of fiscal 2022, the deficiencies related to the control environment over reporting lines as well as authority and responsibilities were improved with the implementation of additional controls. Oversight and governance of financial reporting and related party transactions, including the oversight executed by Board of Directors and the Audit Committee was not indicative of a control environment deficiency. The Company has financial reporting resources internally, or at their disposal to ensure they can deal with complex accounting matters, as well as period-end controls to mitigate the risk of misstatement in the financial information.

- **Control activities:** The Company did not fully design and implement effective control activities and has identified deficiencies relating to: (i) selecting and developing control activities that contribute to the mitigation of risks to acceptable levels, and (ii) deploying control activities through policies that establish what is expected and procedures that put policies into action.

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

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

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

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

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

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

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

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

Aside from these material weaknesses, management has concluded that the Company's consolidated financial statements as at and for the period ended March 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 period ended March 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, 2022, the Company's design and operation of ICFR and DC&P were not effective.

Management's Ongoing Remediation Measures

During the quarter, the year ended December 31, 2022, and beyond, management initiated and continues to implement remediation measures as outlined above, in the 2022 annual MD&A as well as the quarterly MD&A's of 2022. Management has performed an initial risk assessment using a top-down, risk-based approach with respect to the risks of material misstatement of the consolidated financial statements. In addition, compensating controls have been applied to the areas where the risks of material misstatement are considered moderate to high, as throughout the various accounting cycles. The Company is using and plans to continue to use outside resources to strengthen the business process documentation and help with management's self-assessment and testing of internal controls. In 2023, the Company's management, with oversight of the Audit Committee expects to advance the documenting, testing, and refining the internal controls, in addition with the upgrade to the ERP system, which inherently will add additional automated controls. As a result, the Company will improve the design of control activities and strengthen process controls surrounding sales, purchases, payroll, among others, and will be call for fewer compensating controls.

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

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

Changes in internal controls over financial reporting

Other than the material weaknesses described above, and the remediation process described above, there were no changes to the Company's ICFR during the quarter ended March 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.

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RISK FACTORS

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

Certain factors may have a material adverse effect on the Company's business, financial condition and results of operations. Current and prospective investors should carefully consider the risks and uncertainties and other information contained in this MD&A, the 2022 Financial Statements and the Annual Information Form, particularly under the heading "Risk Factors" in the Annual Information Form, and in other filings that the Company has made and may make in the future with applicable securities authorities, Company's website at www.pyrogenesis.com. The risks and uncertainties described herein and therein are not the only ones the Company may face. Additional risks and uncertainties that the Company is unaware of, or that the Company currently believes are not material, may also become important factors that could adversely affect the Company's business. If any of such risks actually occur, the Company's business, financial condition, results of operations, and future prospects could be materially and adversely affected. In that event, the trading price of the Common Shares (or the value of any other securities of the Company) could decline, and the Company's securityholders could lose part or all of their investment.

Risks Related to the Company's Business and Industry

Operating Income (Loss) and Negative Operating Cash Flow

Prior to March 31, 2022, the Company had a history of losses and negative cash flows. For the three-month period ended March 31, 2023, the Company has a net loss of \$6.1 million, cash flows used in operations of \$6.7 million, and an accumulated deficit of \$99.5 million. To the extent that the Company has net losses and negative operating cash flow in future periods, it may need to allocate a portion of its cash reserves to fund such negative cash flow. The Company may also be required to raise additional funds through the issuance of equity or debt securities. There can be no assurance that the Company will be able to generate a positive cash flow from its operations, that additional capital or other types of financing will be available when needed or that these financings will be on terms favourable to the Company.

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

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

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

Revenue Risks

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

- (i) unforeseen engineering and/or environmental problems;
- (ii) delays or inability to obtain required financing, licenses, permits and/or regulatory approvals;
- (iii) supply interruptions and/or labour disputes;
- (iv) foreign exchange fluctuations and/or collection risk; and
- (v) competition from other suppliers and/or alternative energy solutions that are less capital intensive.

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

Concentration Risk and Credit Risk

To date, a small number of customers have accounted for a majority of PyroGenesis' revenues. As its business expands, the Company expects that revenue distribution will be over a larger number of different customers. The loss of, or a reduction in, purchase orders or anticipated purchase orders from

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PyroGenesis' principal customers could have a material adverse effect on its business, financial condition and results of operations. Additionally, if one of PyroGenesis' customers is unable to meet its commitments to PyroGenesis, the Company's business, financial condition and results of operations could be adversely affected.

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

Credit risk is the risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation. The maximum credit risk to which the Company is exposed as at March 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 March 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 three-month period ended March 31, 2023, and the year-end December 31, 2022, provisions for expected credit losses were recorded, however, the accounts provisioned by the loss are still subject to enforcement activity in order to collect the balances due.

Technology Development and Manufacturing Capability Risks

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

Product Revenues/History of Losses

PyroGenesis has incurred losses in the majority of years since its inception. In the past the Company's operations have not generated sufficient earnings and cash flows to date to result in consistent profitability or positive cash flow. For the three months ended March 31, 2023, the Company had a net loss of \$6.1 million, which includes a gain from the change in fair value of strategic investments of \$300,891 and cash flows used in operations of \$6.5 million. There can be no assurance that the Company will be able to continue to generate significant gains from the value of its strategic investments in the future.

Additional financing and dilution

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

The Company does not exclude raising additional funds by equity financing. In addition, as of March 31, 2023, 9,810,500 stock options are currently issued and outstanding, together with 6,014,600 share purchase warrants. The exercise of stock options and/or warrants, as well as any new equity financings, represents dilution factors for present and future shareholders.

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

The Company's direct and indirect suppliers, service providers, distributors and manufacturers may elect, at any time, to breach or otherwise cease to participate in supply, service, distribution or manufacturing agreements, or other relationships, on which the Company's operations rely. Loss of its suppliers, service providers, distributors and manufacturers could have a material adverse effect on the Company's business and operational results. Further, any disruption in the manufacturing process done by third party manufacturers could have a material adverse effect on the business, financial

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condition and results of operations of the Company. The Company cannot ensure that alternative production capacity would be available in the event of a disruption, or if it would be available, if it could be obtained on favorable terms.

Manufacturing Facility

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

Sales Cycle and Fixed Price Contracts

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

Reliance on Technology

PyroGenesis will depend upon continuous improvements in technology to meet client demands in respect of performance and cost, and to explore additional business opportunities. There can be no assurance that the Company will be successful in its efforts in this regard or that it will have the resources available to meet this demand. Whilst management anticipates that the research and development will allow the Company to explore additional business opportunities, there is no guarantee that such business opportunities will be presented or realized. The commercial advantage of the Company will depend to a significant extent on the intellectual property and proprietary technology of PyroGenesis and the ability of the Company to prevent others from copying such proprietary technologies. PyroGenesis currently relies on intellectual property rights and other contractual or proprietary rights, including (without limitation) copyright, trade secrets, confidential procedures, contractual provisions, licenses and patents, to protect its proprietary technology. PyroGenesis may have to engage in litigation in order to protect its patents or other intellectual property rights, or to determine the validity or scope of the proprietary rights of others. This type of litigation can be expensive and time consuming, regardless of whether or not the Company is successful. PyroGenesis may seek patents or other similar protections in respect of particular technology; however, there can be no assurance that any future patent applications will actually result in issued patents, or that, even if patents are issued, they will be of sufficient scope or strength to provide meaningful protection or any commercial advantage to the Company.

Moreover, the process of seeking patent protection can itself be long and expensive. In the meantime, competitors may develop technologies that are similar or superior to PyroGenesis' technology or design around the patents owned by the Company, thereby adversely affecting the Company's competitive advantage in one or more of its areas of business. Despite the efforts of the Company, its intellectual property rights may be invalidated, circumvented, challenged, infringed or required to be licensed to others. It cannot be assured that any steps the Company may take to protect its intellectual property rights and other rights to such proprietary technologies that are central to the Company's operations will prevent misappropriation or infringement of its technology.

Changes to Contracts

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

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

Foreign Exchange Exposure

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

Competition

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

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

Management and Key Personnel

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

Implementation of a strategic plan

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

Adverse Decisions of Sovereign Governments

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

Risks Related to International Operations

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

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

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

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

Governmental Regulation

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

Government-funded Defense and Security Programs

Like most companies that supply products and services to governments, government agencies routinely audit and investigate government contractors. These agencies may review the Company's performance under its contracts, business processes, cost structure, and compliance with applicable laws, regulations and standards. The Company's incurred costs for each year are subject to audit by government agencies, which can result in payment demands related to costs they believe should be disallowed. The Company works with governments to assess the merits of claims and where appropriate reserve for amounts disputed. The Company could be required to provide repayments to governments and may have a negative effect on its results of operations.

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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.

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

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

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

Litigation

The Company may from time to time become party to litigation in the ordinary course of business which could adversely affect its business. Should any litigation in which the Company becomes involved be determined against the Company, such a decision could adversely affect the Company's ability to continue operating and the market price for the Common Shares and could use significant resources. Even if the Company is involved in litigation and wins, litigation can redirect significant Company resources. Litigation may also create a negative perception of the Company's brand.

Trade Secrets May Be Difficult to Protect

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

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

Risks Related to Acquiring Companies

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

Global Economic Uncertainty

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

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

Inability to Renew Leases

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

Financial Reporting and Other Public Issuer Requirements

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

The Company has identified certain material weaknesses in its internal controls, as more fully explained in its management's discussion and analysis for the quarter ended March 31, 2023 and the year ended December 31, 2022 under "Controls and Procedures". Additional weaknesses in the Company's disclosure controls and internal control over financial reporting may also be discovered in the future. Any failure to develop or maintain effective controls or any difficulties encountered in their implementation or improvement could harm the Company's results of operations or cause the Company to fail to meet its reporting obligations and may result in a restatement of the Company's financial statements for prior periods. Any failure to improve and maintain effective internal control over financial reporting also could adversely affect the results of periodic management evaluations and annual independent registered public accounting firm attestation reports regarding the effectiveness of the Company's internal control over financial reporting that the Company will eventually be required to include in its periodic reports that will be filed with the CSA. Ineffective disclosure controls and procedures and internal control over financial reporting could also cause investors to lose confidence in the Company's reported financial and other information, which could have a negative effect on the trading price of the Common Shares. In addition, if the Company is unable to continue to meet these requirements, or other requirements imposed by security regulators, even with the Company's best efforts, it may not be able to remain listed on the TSX and/or NASDAQ.

Influence of the Significant Shareholders

To the Company's knowledge, no shareholder beneficially owns, or controls or directs, directly or indirectly, more than 10% of the voting rights attached to the Company's outstanding voting securities, except for Mr. Photis Peter Pascali, President and Chief Executive Officer of the Company, who holds or controls, directly or indirectly, 80,613,298 Common Shares, representing in aggregate 45.14% of the total voting rights attached to the outstanding Common Shares, and options and warrants to acquire an additional 6,770,000 Common Shares (increasing the total number of Common Shares held or controlled, directly or indirectly, by him to 87,383,298 Common Shares, or 44.95% of the Common Shares, on a fully diluted basis). In addition, from time to time, the Company may have other shareholders who have the ability to exercise significant influence over matters submitted to the shareholders of the Company for approval, whether subject to approval by a majority of the shareholders of the Company or subject to a class vote or special resolution.

Limited Control Over the Company's Operations

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

Change in Tax Laws

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

Forward-Looking Information

The forward-looking information included in this MD&A relating to, among other things, the Company's future results, performance, achievements, prospects, targets, intentions or opportunities or the markets in which it operates and the other statements listed is based on opinions, assumptions and estimates made by the Company's management in light of its experience and perception of historical trends, current conditions and expected future developments, as well as other factors that the Company believes are appropriate and reasonable in the circumstances. However, there can be no

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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

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current shareholders, and many other factors could have considerable repercussions on the price of the Common Shares. In addition, the financial markets may experience significant price and value fluctuations that affect the market prices of equity securities of companies that sometimes are unrelated to the operating performance of these companies. Broad market fluctuations, as well as economic conditions generally may adversely affect the market price of the Common Shares.

Dividends to Shareholders

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

Impact of Future Sales by Existing Shareholders

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

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

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

Working Capital and Future Issuances

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

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

Securities or Industry Analysts

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

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

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

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

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

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

Loss of Foreign Private Issuer Status in the Future

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

Inability for U.S. Investors to Enforce Certain Judgments

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

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

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

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

Q1 Production Highlights

In Q1 2023, PyroGenesis focused on advancing its updated business strategy that was first outlined in the Company's 2022 fourth quarter and year-end results.

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

Energy Transition & Emission Reduction:

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

Commodity Security & Optimization:

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

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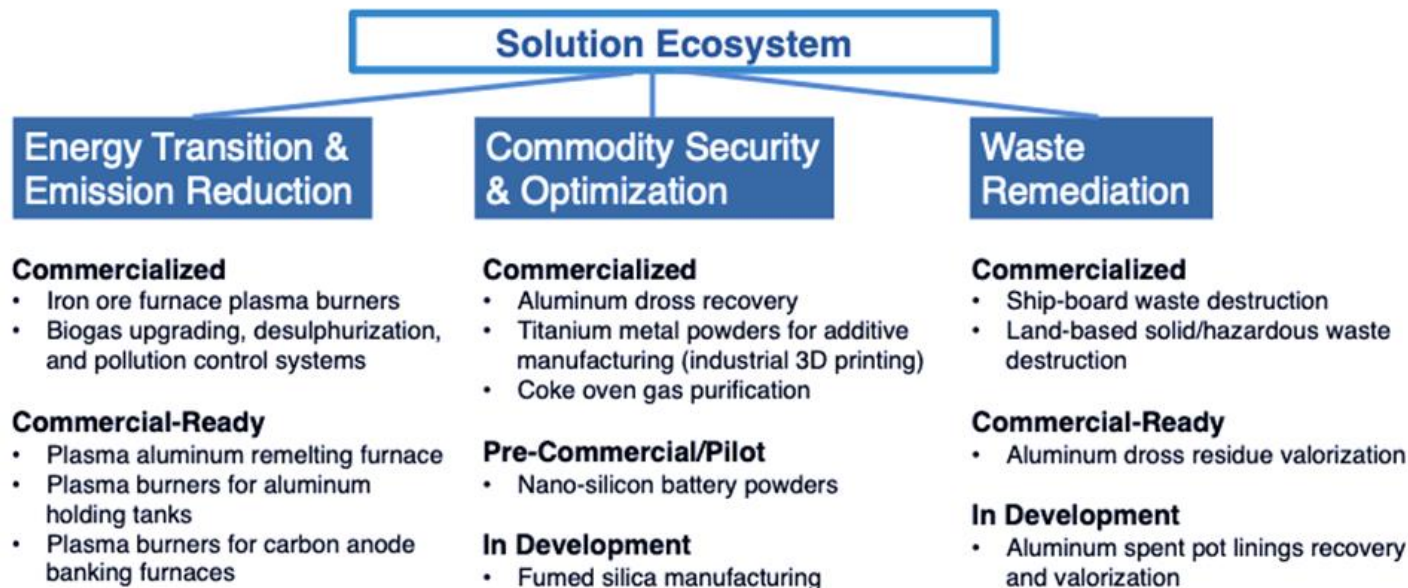
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Waste Remediation:

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

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



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

Waste Remediation

- **In January**, the Company signed a contract to provide the Company's SPARC™ hazardous refrigerant waste destruction system to an advanced materials entity in New Zealand.

The purchasing entity was subsequently revealed in February to be The Trust for the Destruction of Synthetic Refrigerants, who will use PyroGenesis' SPARC™ system as the core technology for New Zealand's national hazardous refrigerant collection and destruction initiative. The SPARC™ system will be managed and operated by a wholly owned subsidiary of the Trust, for use by the New Zealand government-accredited product stewardship programme known as Cool-Safe, run by the Trust. Cool-Safe, also previously known as the Recovery Trust or RECOVERY, has been managing refrigerant gas collection and destruction in New Zealand since 1993. Cool-Safe's mission is to be a significant factor in the government of New Zealand's stated goal to reduce synthetic refrigerant greenhouse gas emissions by 2035 by at least 35%. This will be achieved by implementing their own 90% reduction target for hazardous refrigerants.

Up until now any of the refrigerants collected by Cool-Safe for safe destruction have had to be shipped to Australia. With the purchase of the SPARC™ system, New Zealand will have its own on-shore destruction capabilities. With the shift from voluntary to regulated handling of these waste streams in New Zealand, scheduled for 2024, combined with the relaunch and marketing of the Cool-Safe initiative, the collection and safe disposal of hazardous refrigerants in New Zealand is anticipated to be widespread, and the organization had indicated to PyroGenesis that they may require additional SPARC™ systems as the initiative grows.

- **In March**, the Company received an order for three (3) waste-destructing plasma torches from the US Navy's shipbuilder, Newport News Shipbuilding

The three plasma torches ordered are for the USS Gerald R. Ford aircraft carrier, the largest and most technologically advanced warship ever built, valued at approximately \$13 billion. The plasma torches are to be used in PyroGenesis' proprietary Plasma Arc Waste Destruction System ("PAWDS") that the Company previously built and delivered to the US Navy.

As noted in the Q&A portion of the 2022 fiscal year end financial results conference call, the order was for plasma torches alone, and included none of the large ancillary equipment such as power supplies that comprise a significant portion of an entire PAWDS system.

Commodity Security & Optimization

- **In January**, the Company announced that, further to its press releases dated September 21, 2022, and November 2, 2022, all of the findings and recommendations made by a global aerospace company as part of their on-site audit of PyroGenesis' NexGen™ metal powder production facility, had been successfully completed and accepted.

With that approval and acceptance, PyroGenesis' moved to the next and final step in a two-year long supplier qualification process: to provide sample titanium metal powder for verification and confirmation of their chemical and mechanical properties.

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As noted at the time by Massimo Dattilo, VP PyroGenesis Additive, the Client "is a very discerning aerospace company with some of the most stringent and demanding standards", and PyroGenesis "are very proud to have gained their confidence and to be moving forward to the final phase".

- **In February**, the Company provided an update on its Gen3 PUREVAP™ Quartz Reduction Reactor (QRR) pilot plant (the "Gen3 PUREVAP™ Pilot Plant" or the "Pilot Plant") project.

The update confirmed that process testing referred to in the press release dated January 19th, 2023, from the client HPQ Silicon, is moving forward as expected and represents, in PyroGenesis' management's opinion, a key development in the overall project. The tests were geared to not only confirm that the technology works as expected, but also to give input into the subsequent engineering study which will be geared to determining amongst other things, the actual number of systems required for commercialization and the profitability of each.

The PUREVAP™ process is an innovative patented process that will enable the one-step conversion of quartz (SiO₂) into high-purity silicon (Si) at reduced costs, energy input and carbon footprint that will propagate its considerable renewable energy potential. PyroGenesis is the engineering and development producer, but also, as part of the terms of the contract with HPQ, PyroGenesis benefits from a royalty payment representing 10% of the Client's sales, with set minimums.

The Client, HPQ Silicon Inc. (TSX-V: HPQ) is an advanced materials engineering provider that offers sustainable silica (SiO₂) and silicon (Si) solutions. Based in Quebec, HPQ Silicon is developing a unique portfolio of value-added silicon products sought after by electric vehicle and battery manufacturers, among other industries.

- **In March**, the Company announced that, further to its press release dated July 18, 2022, the Company was expanding its European strategy team for its PyroGenesis Additive division, by retaining Mr. Olivier Dubois as the Company's Principal Advisor for European Operations and Sales. Mr. Dubois is well known to the Company from his time at Aubert & Duval as VP Business Unit Metal Powders.

As part of his contract with PyroGenesis Additive, Mr. Dubois will support broadening the Company's global strategy, with an initial goal to help structure the Company's plan for establishing European operations.

Energy Transition & Emission Reduction

- **In January**, the Company announced that it had signed an initial energy transition contract with a major European multinational chemical, oil, and gas conglomerate to assess the applicability of PyroGenesis' electric plasma torches for use in the Client's chemical production process.

The agreement outlined initial steps for supporting the Client's energy-transition goals, with the first step being a computational fluid dynamics ("CFD") study to gather initial data to evaluate the use of plasma in chemical production boilers. Depending on the results, the Client indicated that it may proceed to a live experimental validation study within their facilities, using PyroGenesis' plasma torches, as per a separate to-be-negotiated agreement.

- **In January**, the Company announced it had signed, through Pyro Green-Gas, a wholly owned subsidiary of PyroGenesis, an emissions reduction contract with a North American lithium-ion battery recycler.

The contract was for the delivery of a system to decontaminate the dust generated during the battery recycling process, resulting in highly effective destruction of airborne contaminants with minimal energy use, reduced operating costs, and environmental impact.

- **In January**, the Company provided an update on its iron ore pelletization torch business line.

The update indicated the successful completion and delivery of four (4) 1-MW plasma torch systems to a major international iron ore producer, Client B (the "Client"), for use in the Client's iron ore pelletization furnaces – a key upstream process in the steelmaking industry that traditionally relies on fossil-fuel burners. With the completion of this delivery, Client B now has all the necessary components related to the Company's plasma torch systems on site at one of their key integrated iron ore mining and processing locations, allowing for the installation and trials (also known as site acceptance testing or "SAT") to then proceed at the Client's discretion.

The Company also reported that the value of the contract had increased by approximately \$500,000 as a result of additional modifications requested by the Client during manufacturing, with total value of the project now exceeding \$6.5 million.

The update also confirmed that the previously announced contract and planned trials of its plasma torch system with another very large global iron ore client, Client A, continued to advance, as the Client informed PyroGenesis that, despite the Client's own operational delays, all objectives remain the same, and the trials will be going ahead as designed. That client has already received the contracted plasma system from PyroGenesis in advance of the trials.

Q1 Operational Highlights

- **In February**, the Company announced the return of Mr. Alan Curleigh as Chair of the board of directors. Mr. Curleigh previously was Chair of the Company's board until his departure in 2019 after a 9-year tenure.

With Mr. Curleigh's return, Mr. P. Peter Pascali stepped down as Chair of PyroGenesis to pursue his regular duties as CEO, President and Director of PyroGenesis. The Board now has eight directors, of which 6 are independent directors.

- **In March**, the Company announced the hiring and appointment of Mr. Mark Paterson as General Counsel.

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- **In March**, the Company announced that, further to its press release dated July 18, 2022, the Company was expanding its European strategy team for its PyroGenesis Additive division, by retaining Mr. Olivier Dubois as the Company's Principal Advisor for European Operations and Sales.

Q1 Financial Highlights

- **In February**, the Company announced the withdrawal of financing after the Autorité des marchés financiers (the "AMF"), the securities regulatory authority in the Province of Québec, had issued an order suspending the private placement of units previously announced by PyroGenesis on February 14, 2023 for a period of 15 days – based on concerns from the AMF that PyroGenesis did not satisfy all of the requirements necessary to complete the financing under the listed issuer financing exemption under Part 5A of National Instrument 45-106 – Prospectus Exemptions, namely that PyroGenesis will not have available funds to meet its business objectives and liquidity requirements for a period of 12 months. As such, PyroGenesis and its investment banking partner Cormark Securities Inc. agreed that they will not proceed with the financing.
- **In March**, the Company announced the closure of a \$5 million non-brokered private placement. The Company indicated it intended to use the net proceeds from the Private Placement for working capital and general corporate purposes.

OUTLOOK

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

Overall Strategy

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

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

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

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

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

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

Enhanced Sales and Marketing

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

Some initial marketing efforts can be seen with the development of promotional videos and video presentations that are currently in use by the Company's New Zealand-based waste destruction client Cool-Safe, who has embarked on a promotional road-show to introduce their nation-wide hazardous synthetic waste reduction programme to industry and consumers. PyroGenesis has partnered with the Client on this roadshow, as the events feature prominently a showcase of the SPARC™ waste destruction technology that is central to the initiative. An introductory video made for that promotional tour can be viewed online, and other material that has been developed by the Company and is in use will be made available to the general public at a later date.

The Company intends to develop additional visual material along these lines for the Company's other verticals, throughout 2023.

Separately, the Company's involvement with key industry trade shows has ramped up with the Spring season, with attendance at shows for additive manufacturing and aluminum production already secured and more scheduled.

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

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

Financial

Payments for Outstanding Major Receivables: The Company was notified that Radian Oil and Gas Services Company has commenced transfer of the US\$1.5MM (approximately CA\$2MM) against the outstanding receivable of approximately US\$9.5MM under the Company's existing CA\$25MM+

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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.

Innovation Grants: The Company has applied for grants tailored to technology innovation and/or carbon reduction and expects to have results regarding these applications.

Commodity Security & Optimization

Negotiations for Multiple Metal Powder Orders: concurrent negotiations are underway with several companies for commercial orders of the Company's metal powders, which are expected to be in excess of \$1million.

Product Qualification Process for Global Aerospace Firm: Based on information flow between the Company and the Client, the Company believes that the previously announced 2-year long qualification process to approve the Company's titanium metal powders for use by a global aerospace firm and their suppliers, will conclude in the near term.

Energy Transition & Emission Reduction

Plasma Torch Order: The Company is in advanced discussions with an international entity, whereby a plasma torch contract, if signed, will be between CDN\$3-\$4million.

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

Business Line Developments: Mid Term (4 – 6 months)

Energy Transition & Emission Reduction

Pyro Green-Gas: The Company's wholly-owned subsidiary is expected to sign a contract with a value of approximately between CDN\$10-\$15 million.

Please note: 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 information presented above is a reflection of information on hand.

FURTHER INFORMATION

Additional information relating to Company and its business, including the 2022 consolidated Financial Statements, the Annual Information Form and other filings that the Company has made and may make in the future with applicable securities authorities, may be found on or through SEDAR at www.sedar.com, EDGAR at www.sec.gov or the Company's website at www.pyrogenesis.com.

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