

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

FORM 40-F

REGISTRATION STATEMENT PURSUANT TO SECTION 12 OF THE SECURITIES EXCHANGE ACT OF 1934

OR

ANNUAL REPORT PURSUANT TO SECTION 13(a) OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended

December 31, 2021

Commission File Number:

001-39989

PYROGENESIS CANADA INC.

(Exact name of Registrant as specified in its charter)

Canada

(Province or Other Jurisdiction
of Incorporation or
Organization)

3599

(Primary Standard
Industrial Classification Code)

N/A

(I.R.S. Employer Identification
No.)

**1744, William St. Suite 200
Montréal, QC, H3J1R4
CANADA**

**Attention: P. Peter Pascali
Chief Executive Officer**

Tel: 1-514-937-0002

(Address and telephone number of Registrant's principal executive offices)

**National Registered Agents, Inc.
1209 Orange St.**

Wilmington, Delaware 19801

Tel: 202-572-3133

(Name, address (including zip code) and telephone number (including area code) of agent for service in the United States)

Securities registered or to be registered pursuant to section 12(b) of the Act:

Title of Each Class	Trading Symbol(s)	Name of Each Exchange on Which Registered:
Common Shares, no par value	PYR	The Nasdaq Stock Market LLC

Securities registered or to be registered pursuant to Section 12(g) of the Act: **None**

Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act: **None**

For annual reports, indicate by check mark the information filed with this Form:

Annual Information Form

Audited Annual Financial Statements

Indicate the number of outstanding shares of each of the Registrant's classes of capital or common stock as of the close of the period covered by the annual report:

Title of Each Class	Number of outstanding shares
Common Shares, no par value	170,125,795

Indicate by check mark whether the Registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Exchange Act during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the Registrant was required to submit and post such files).

Yes No

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 12b-2 of the Exchange Act.

Emerging growth company

If an emerging growth company that prepares its financial statements in accordance with U.S. GAAP, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report.

EXPLANATORY NOTE

PyroGenesis Canada Inc. (the “Company” or the “Registrant”) is a Canadian issuer that is permitted, under the multijurisdictional disclosure system adopted in the United States, to prepare this Annual Report on Form 40-F pursuant to Section 13 of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), in accordance with Canadian disclosure requirements. The Company is a “foreign private issuer” as defined in Rule 3b-4 under the Exchange Act. Equity securities of the Company are accordingly exempt from Sections 14(a), 14(b), 14(c), 14(f) and 16 of the Exchange Act pursuant to Rule 3a12-3.

FORWARD LOOKING STATEMENTS

This Annual Report, including the exhibits attached hereto and incorporated herein may contain “forward-looking statements” within the meaning of applicable Canadian and United States securities laws. All statements other than statements of historical fact are forward-looking statements. The forward-looking statements contained in this Annual Report are made only as of the date hereof. The forward-looking statements contained in the exhibits incorporated by reference into this Annual Report are made only as of the respective dates set forth in such exhibits. The Registrant does not have, or undertake, any obligation to update or revise any forward-looking statements whether as a result of new information, subsequent events or otherwise, unless otherwise required by law.

Generally, forward-looking information can be identified by the use of forward-looking terminology 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 statements that certain actions, events or results “may”, “could”, “would”, “might” or “will be taken”, “occur” or “be achieved”. Forward-looking statements are based on a number of material assumptions, which management of the Registrant believe to be reasonable, including, but not limited to, the Registrant’s ability to generate sufficient cash flow from operations and obtain financing, if needed, on acceptable terms or at all; the general economic, financial market, regulatory and political conditions in which the Registrant operates; the interest of potential purchasers in the Registrant’s products; anticipated and unanticipated costs; the government regulation of the Registrant’s activities and products; the timely receipt of any required regulatory approvals; the Registrant’s ability to obtain qualified staff, equipment and services in a timely and cost efficient manner; the Registrant’s ability to conduct operations in a safe, efficient and effective manner; and the Registrant’s expansion plans and timeframe for completion of such plans

Forward-looking information is subject to known and unknown risks, uncertainties and other factors that may cause the actual results, level of activity, performance or achievements of the Registrant to be materially different from those expressed or implied by such forward-looking information. Although the Registrant has attempted to identify important factors that could cause actual results to differ materially from those contained in forward-looking statements, there may be other factors that cause results not to be as anticipated, estimated, intended or projected. There is no assurance that such 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. Readers should carefully consider the matters as further discussed under the heading “Risk Factors” in the Registrant’s Annual Information Form for the year ended December 31, 2020, which is filed as Exhibit 99.1 hereto and incorporated by reference herein

The forward-looking statements contained in, or incorporated by reference into, this Form 40-F are made as of the date of this Form 40-F or as otherwise specified. Except as required by applicable securities law, the Registrant undertakes no obligation to update publicly or otherwise revise any forward-looking statements or the foregoing list of factors affecting those statements, whether as a result of new information, future events or otherwise or the foregoing lists of factors affecting this information. All forward-looking statements contained in this Form 40-F are expressly qualified in their entirety by this cautionary statement.

DIFFERENCES IN UNITED STATES AND CANADIAN REPORTING PRACTICES

The Registrant is permitted, under a multijurisdictional disclosure system adopted by the United States, to prepare this report in accordance with Canadian disclosure requirements, which are different from those of the United States. The Registrant prepares its financial statements, which are filed with this Form 40-F in accordance with International Financial Reporting Standards as issued by the International Accounting Standards Board.

PRINCIPAL DOCUMENTS

Annual Information Form

The Registrant’s Annual Information Form for the fiscal year ended December 31, 2021 is filed as Exhibit 99.1 and incorporated by reference in this Annual Report on Form 40-F.

Audited Annual Financial Statements

The audited consolidated financial statements of the Registrant for the fiscal year ended December 31, 2021, including the Independent Auditor's Report with respect thereto, are filed as Exhibit 99.3 and incorporated by reference in this Annual Report on Form 40-F.

Management Discussion and Analysis

The Registrant's Management Discussion and Analysis for the fiscal year ended December 31, 2021 is filed as Exhibit 99.2 and incorporated by reference in this Annual Report on Form 40-F.

CERTIFICATIONS AND DISCLOSURES REGARDING CONTROLS AND PROCEDURES

Certifications

The required certifications are attached hereto as Exhibits 99.4, 99.5, 99.6, and 99.7.

Disclosure Controls and Procedures

The information provided in the section entitled "Controls and Procedures" under the sub-heading "Disclosure Controls and Procedures" contained in the 2021 MD&A filed as Exhibit 99.2 to this Annual Report on Form 40-F is incorporated by reference herein.

Management's Annual Report on Internal Control over Financial Reporting

The information provided in the section entitled "Controls and Procedures" under the sub-headings "Management's Annual Report on Internal Controls over Financial Reporting and Remediation Plan" contained in the 2021 MD&A filed as Exhibit 99.2 to this Annual Report on Form 40-F is incorporated by reference herein.

Attestation Report of Independent Auditor

In accordance with the United States Jumpstart Our Business Startup Act (the "JOBS Act") enacted on April 5, 2012, the Registrant qualifies as an "emerging growth company" (an "EGC"), which entitles the Registrant to take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not EGCs. Specifically, the JOBS Act defers the requirement to have the Registrant's independent auditor assess the Registrant's internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act. As such, the Registrant is exempted from the requirement to include an auditor attestation report in this Form 40-F for so long as the Registrant remains an EGC, which may be for as long as five years following its initial registration in the United States.

Changes in Internal Control over Financial Reporting

The information provided in the section entitled "Controls and Procedures" under the sub-heading "Changes in Internal Controls over Financial Reporting" contained in the 2021 MD&A filed as Exhibit 99.2 to this Annual Report on Form 40-F is incorporated by reference herein.

NOTICES PURSUANT TO REGULATION BTR

The Registrant was not required by Rule 104 of Regulation BTR to send any notices to any of its directors or executive officers during the fiscal year ended December 31, 2021.

AUDIT COMMITTEE FINANCIAL EXPERT

The board of directors of the Registrant has determined that Mr. Andrew Abdalla, the chair of the Registrant's audit committee, qualifies as an audit committee financial expert for purposes of paragraph (8) of General Instruction B to Form 40-F. The board of directors has further determined that Mr. Abdalla is also independent, as that term is defined in the corporate governance requirements of the Nasdaq Capital Market ("Nasdaq"). The Commission has indicated that the designation of Mr. Abdalla as an audit committee financial expert does not make him an "expert" for any purpose, impose any duties, obligations or liabilities on him that are greater

than those imposed on members of the audit committee and the board of directors who do not carry this designation or affect the duties, obligations or liabilities of any other member of the audit committee or the board of directors.

CODE OF ETHICS

The Registrant has adopted a written Code of Business Conduct and Ethics (the "Code") that is applicable to all employees, contractors, consultants, officers and directors of the Registrant, and is filed as an exhibit to this Annual Report on Form 40-F.

All departures from, all amendments to the Code, and all waivers of the Code with respect to any of the senior officers covered by it, which waiver may be made only by the board of directors of the Registrant in respect of senior officers, will be disclosed as required. The Code is located on the Registrant's website at www.pyrogenesis.com. Information contained in or otherwise accessible through the Registrant's website does not form part of this Form 40-F, and is not incorporated into this Form 40-F by reference.

PRINCIPAL ACCOUNTANT FEES AND SERVICES

The fees paid to the independent auditor are included under the heading "Audit Committee - External Fees by Audit Category" in the AIF, which is filed as Exhibit 99.1 hereto and incorporated by reference herein.

The Registrant's audit committee has adopted a pre-approval policy. Under this policy, all non-audit services must be pre-approved by the Audit Committee. The Registrant did not rely on the de minimis exemption provided by Section (c)(7) (i)(C) of Rule 2-01 of Regulation S-X.

OFF-BALANCE SHEET ARRANGEMENTS

The Registrant has not entered into any "off-balance sheet arrangements", that have or are reasonably likely to have a current or future effect on the Registrant's financial condition, changes in financial condition, revenues, expenses, results of operations, liquidity, capital expenditures or capital resources that are material to investors.

CONTRACTUAL OBLIGATIONS

Below is a tabular disclosure of the Registrant's contractual obligations at December 31, 2021:

	Carrying value	Total contractual amount	Less than one year	2-3 years	4-5 years	Over 5 years
	\$	\$	\$	\$	\$	\$
Accounts payable and accrued liabilities	10,069,177	10,069,177	10,069,177	—	—	—
Term loans	190,905	263,232	85,731	67,561	62,823	47,117
Balance due on business combination	3,952,203	4,355,600	2,395,580	1,960,020	—	—
Lease liabilities	5,323,965	6,614,192	3,220,750	710,493	561,628	2,121,321
	<u>19,536,250</u>	<u>21,302,201</u>	<u>15,771,238</u>	<u>2,738,074</u>	<u>624,451</u>	<u>2,168,438</u>

IDENTIFICATION OF THE AUDIT COMMITTEE

The Registrant's Board of Directors has a separately designated standing Audit Committee established in accordance with Section 3(a) (58)(A) of the Exchange Act. The members of the Audit Committee are Andrew Abdalla (Chair of the Committee), Robert Radin and Ben Naccarato.

MINE SAFETY DISCLOSURE

Not applicable

UNDERTAKING

The Registrant undertakes to make available, in person or by telephone, representatives to respond to inquiries made by the Commission staff, and to furnish promptly, when requested to do so by the Commission staff, information relating to: the securities

registered pursuant to Form 40-F; the securities in relation to which the obligation to file an Annual Report on Form 40-F arises; or transactions in said securities.

DISCLOSURE REGARDING FOREIGN JURISDICTION THAT PREVENT INSPECTIONS

Not applicable.

CONSENT TO SERVICE OF PROCESS

The Registrant has previously filed with the Commission a written irrevocable consent and power of attorney on Form F-X. Any change to the name or address of the Registrant's agent for service shall be communicated promptly to the Commission by amendment to the Form F-X referencing the file number of the Registrant.

The following documents are being filed with the Commission as exhibits to this Form 40-F.

EXHIBIT INDEX

<u>Exhibit Number</u>	<u>Exhibit Description</u>
99.1	Annual Information Form for the year ended December 31, 2021
99.2	Management's Discussion and Analysis for the year ended December 31, 2021
99.3	Audited Annual Consolidated Financial Statements for the year ended December 31, 2021
99.4	Certification of The Principal Executive Officer
99.5	Certification of The Principal Financial Officer
99.6	Principal Executive Officer Certification Pursuant to 18 U.S.C. Section 1350
99.7	Principal Financial Officer Certification Pursuant to 18 U.S.C. Section 1350
99.8	Consent of RCGT LLP
99.9	Consent of KPMG LLP
99.10	Code of Business Conduct and Ethics
101	Interactive Data File

SIGNATURES

Pursuant to the requirements of the Exchange Act, the Registrant certifies that it meets all of the requirements for filing on Form 40-F and has duly caused this Annual Report to be signed on its behalf by the undersigned, thereunto duly authorized.

Date: March 31, 2022

PYROGENESIS CANADA INC.

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



PYROGENESIS CANADA INC.

**ANNUAL INFORMATION FORM
FOR THE YEAR ENDED DECEMBER 31, 2021**

Dated March 31, 2022

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1. Explanatory Notes

The information in this annual information form (this “AIF”) of PyroGenesis is stated as at December 31, 2021, unless otherwise indicated.

For an explanation of the capitalized terms and expressions and certain defined terms, please refer to the “Glossary of Terms” at the end of this AIF.

In this AIF, where the context so requires, references to the “Company”, “PyroGenesis”, “it”, “its” or similar expressions refer to PyroGenesis Canada Inc., together with its subsidiaries. All references to the “Company”, “PyroGenesis” “it”, “its” or similar expressions in items 4, 5, 6, 12, 13, 15 and 16 of this AIF apply collectively to PyroGenesis, PyroGenesis’ subsidiaries and joint ventures to which PyroGenesis has an investment accounted for by the equity method.

In this AIF, unless otherwise indicated, all references to “\$”, “C\$” or “dollars” are to Canadian dollars, all references to “US\$” are to U.S. dollars and all references to “€” are to euros. Amounts are stated in Canadian dollars unless otherwise indicated.

This AIF should be read in conjunction with the information contained in the Company’s consolidated financial statements and related notes for the year ended December 31, 2021 and the management’s discussion and analysis thereon.

The Company has certain proprietary or contractual rights to certain company names, product names, trade names and trademarks used in this AIF that are important to its business, including PyroGenesis, PYROGENESIS (LOGO), PYROGENESIS ADDITIVE, PYROGENESIS ADDITIVE (LOGO) PYROGENESIS ALUMINUM, PYRO GREEN-GAS, PYRO GREEN-GAS (LOGO), SPHEROGENESIS, NEXGEN, DROSRITE, PUREVAP, SPARC, APT, APT-HP, RPT, MINIGUN, SPT, PPRS and, PAGV. The Company has omitted the registered trademark (®) and trademark (™) symbols and any other related symbols for such trademarks and all related trademarks, including those related to specific products or services, when used in this AIF.

2. Forward-Looking Statements

This AIF 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 AIF are forward-looking statements, including, without limitation, the Company’s: statements regarding its products and services; the execution of its growth strategy; relations with suppliers and customers; future financial position; business strategy; 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. These forward-looking statements are based on management’s current expectations and are subject to a number of risks, uncertainties, and assumptions, including market and economic conditions, business prospects or opportunities, future plans and strategies, projections and anticipated events and trends that affect the Company and its industry. Although management of the Company believes that the expectations reflected in such forward-looking statements are reasonable and are based on reasonable assumptions and estimates as of the date hereof, there can be no assurance that these assumptions or estimates are accurate or that any of these expectations will prove accurate.

Actual results and developments are likely to differ, and may differ materially, from those anticipated by the Company and expressed or implied by the forward-looking statements contained in this AIF. Such statements are based on a number of assumptions and risks which may prove to be incorrect. Important assumptions relating to the forward-looking statements contained in this AIF include, among other things, assumptions concerning:

the Company’s business strategies, strategic objectives and growth strategy;

the Company’s expected production volumes, rates and costs;

the Company’s current and future capital resources and the need for additional financing;

the Company's ability to increase sales from new and existing customers, and the results of the successful completion of the Company's current projects;

management's expectation that the Company will achieve growth and profitability;

the Company's overall financial performance;

the Company continuing to maintain sufficient and effective production and research and development;

there being no significant reduction in the availability of qualified and cost-effective human resources;

there will be adequate liquidity available to the Company to carry out its operations;

the Company's ability to obtain and retain key personnel; and

the success of intellectual property applications.

By their nature, forward-looking statements require assumptions and are subject to inherent risks and uncertainties including those discussed herein. 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.

The future outcomes that relate to forward-looking statements may be influenced by many factors, including, but not limited to, the risk factors described under the heading "Risk Factors". The Company cautions 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 forward-looking statements contained in this AIF are based upon what management currently believes to be reasonable assumptions, the Company cannot assure investors that actual results, performance or achievements will be consistent with these forward-looking statements and additional risks and uncertainties discussed in the Company's materials filed with the Canadian securities regulatory authorities from time to time, available under the Company's profile on SEDAR at www.sedar.com. 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. Given the impact of the changing circumstances surrounding the ongoing COVID-19 pandemic, including because of the emergence of variants and the related response from the governments (federal, provincial and municipal), regulatory authorities, businesses, suppliers, customers, counterparties and third-party service providers, there is inherently more uncertainty associated with the Company's assumptions as compared to prior years. Accordingly, readers should not place undue reliance on forward-looking statements. Forward-looking statements are provided as of the date of this AIF, 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 in this AIF are expressly qualified in their entirety by this cautionary statement and are made as of the date of this AIF or such other date specified herein.

3. Market and industry data

Unless otherwise indicated, information contained in this AIF concerning the industry and the markets in which the Company operates, including its general expectations, market position and market opportunity, is based on information from industry publications and reports generated by several third parties and management estimates. Unless otherwise indicated, management estimates are derived from publicly available information released by independent industry analysts and third-party sources, as well as data from the Company's internal research, and are based on assumptions made by the Company based on such data and its knowledge of such industry and markets, which the Company believes to be reasonable. These industry publications and reports generally indicate that the information contained therein was obtained from sources believed to be reliable, but do not guarantee the accuracy and completeness of such information. The Company has not independently verified the data in such publications, reports or resources, and such information

is inherently imprecise. In addition, projections, assumptions and estimates of the Company's future performance and the future performance of the industry in which the Company operates are necessarily subject to a high degree of uncertainty and risk due to a variety of factors, including those described under "Forward-Looking Statements" and "Risk Factors".

4. Corporate Structure

4.1. Name, Address and Incorporation

PyroGenesis is a corporation governed by the provisions of the *Canada Business Corporations Act* ("CBCA") and results from an amalgamation completed on July 11, 2011 under the CBCA of Industrial Growth Income Corporation ("IGIC") and PyroGenesis Canada Inc., a predecessor entity incorporated on June 5, 2006, to form the Company. Prior to the amalgamation, which constituted its qualifying transaction, IGIC was a capital pool company listed on the TSX-V.

The Company's head and registered office is located at 1744 William Street, Suite 200, Montréal, Québec, Canada, H3J 1R4.

4.2. Subsidiaries

On August 11, 2021, PyroGenesis acquired all of the issued and outstanding shares of Pyro Green-Gas Inc. (formerly Air Science Technologies Inc.) (hereinafter "**Pyro Green-Gas**"), a private corporation incorporated under the laws of Canada. Pyro Green-Gas has three subsidiaries: 1) Air Science Technologies Private Limited, a private corporation incorporated under the laws of India; 2) Air Science Italia S.r.l., a private corporation incorporated under the laws of Italy and; 3) Alga-Labs Inc., a private corporation incorporated under the laws of Canada. Air Science Technologies Private Limited and Air Science Italia S.r.l. are majority-owned subsidiaries of Pyro Green-Gas Inc. and Alga-Labs Inc. is a wholly owned subsidiary.

5. General Development of the Business

The following is a summary of the significant events that have influenced the general development of the business of the Company over the last three completed years.

5.1. Year Ended December 31, 2019

Expansion & Development of Product Offerings

On March 19, 2019, PyroGenesis unveiled its new NEXGEN plasma atomization system, which produces metal powder at over 25 kilograms/hour for the additive manufacturing ("**AM**") industry, specifically the 3D printing industry.

Contracts and Milestones

Plasma Torch System

On January 7, 2019, PyroGenesis announced it had been awarded under a competitive bid process with RISE Energy Technology Center AB, a Swedish company, a contract for a 900 kilowatts plasma torch system valued at more than \$1,000,000 (the "**2019 RISE Agreement**"). On September 18, 2019, PyroGenesis announced that it had successfully completed the factory acceptance testing witnessed by RISE Energy Technology Center AB at PyroGenesis' facility in Montréal. PyroGenesis received payments from RISE Energy Technology Center AB totaling €643,196 to design, build, test and transfer a 900 kW-gross high air plasma torch system that will be used by RISE Energy Technology Center AB for iron ore pelletization.

Partnership with Aubert & Duval for Titanium Powder

On January 8, 2019, PyroGenesis announced that it had signed a mutually exclusive partnership agreement with Aubert & Duval, a subsidiary of the ERAMET Group. The mutually exclusive agreement, which expires on December 31, 2025, provides that PyroGenesis will supply plasma atomized titanium powder for distribution by Aubert & Duval to the AM market in Europe. There are no minimum commitments under the agreement, and as of the date of this AIF there have been no sales under this agreement.

Agreement with Drosrite International

On October 9, 2019, PyroGenesis announced that Drosrite International LLC (“**Drosrite International**”), a US-based private company, had signed an agreement with Radian Oil & Gas Services Company, an oil and gas services company operating in the Middle East (the “**Dross Processing Service Agreement**”). The Dross Processing Service Agreement was structured as a “BOOT” agreement (build, own, operate and transfer) having a 20-year term and using the Company’s DROSRITE technology.

The Dross Processing Service Agreement provides that Drosrite International will manufacture and deliver to Radian Oil & Gas five DROSRITE TPY systems with an annual treatment capacity of approximately 5,000 tons per year each and two DROSRITE TPY systems with an annual treatment capacity of approximately 10,000 tons per year each, for a total annual treatment capacity of 30,000 to 40,000 tons per year of white and black aluminum dross, all of which will be installed at the aluminium smelting facility of Ma’aden Aluminum Company located at Ras Al-Khair, in Saudi Arabia. In addition, Drosrite International will oversee the installation of the systems at the Ras Al-Khair facility. Drosrite International will also supply spare parts over the 20-year duration of the Dross Processing Service Agreement and be entitled to receive an annual royalty. Total payments of approximately US\$5.5 million have been made as of the date of this AIF for the engineering, design, supply, installation, supervision and commissioning of the systems following the satisfaction of certain milestones. Drosrite International is entitled to receive additional payments in the future for spare parts as well as annual royalty payments during the term of the Dross Processing Service Agreement. The Dross Processing Service Agreement includes customary termination rights, which include termination rights for a material breach of the agreement that is not remedied within a certain period, prolonged force majeure, insolvency events and failure to meet specification requirements.

In connection with the Dross Processing Service Agreement between Drosrite International and Radian Oil & Gas, an agreement dated August 29, 2019 was entered into between PyroGenesis and Drosrite International (the “**Drosrite International Exclusive Agreement**”) under which Drosrite International received the required rights from PyroGenesis to perform its obligations under its agreement with Radian Oil & Gas. Under the Drosrite International Exclusive Agreement, PyroGenesis will receive payments equal to the payments received by Drosrite International under its Dross Processing Service Agreement with Radian Oil & Gas. Based on the estimated payments that it will receive in the future subject to the terms of the agreement, PyroGenesis estimates that the agreement has a total value of over \$55 million. On the date the agreement was entered into, the net present value, using a 5% discount rate, of the subsequent annual payments was estimated at approximately \$35 million.

The sole director, officer and shareholder of Drosrite International is Alex Pascali, an employee of the Company and the son of P. Peter Pascali, Chief Executive Officer of the Company. See “Directors and Executive Officers - Conflicts of Interest”.

Drosrite International does not receive any management, administration or other fee from the Company. Drosrite International is, on an accounting basis, a subsidiary of the Company and not a client, as under applicable accounting standards the Company is considered to effectively control Drosrite International. The Company has to indemnify Drosrite International for any claims and liabilities incurred in connection with the Drosrite systems. The Company’s Drosrite technology was protected by patents until 2017 and new patent applications pertaining to the technology have been filed before 2017, which patent applications are pending.

Financings

May 2019 Private Placement

On May 15, 2019, the Company completed the first tranche of a non-brokered private placement and issued 2,996,500 units at a price of \$0.58 per unit, for total gross proceeds of \$1,737,970 (the “**May 2019 First Tranche Private Placement**”). Each unit consists of one Common Share and one Common Share purchase warrant of the Company. Each warrant entitles the holder thereof to purchase one Common Share at a price of \$0.85 until May 15, 2021 (the “**May 15, 2021 Warrants**”).

On May 28, 2019, the Company completed the second tranche of a non-brokered private placement and issued 2,024,500 units at a price of \$0.58 per unit, for total gross proceeds of \$1,174,210 (the “**May 2019 Second Tranche Private Placement**”). Each unit consists of one Common Share and one Common Share purchase warrant of the Company. Each warrant entitles the holder thereof to purchase one Common Share at a price of \$0.85 until May 28, 2021 (the “**May 28, 2021 Warrants**”).

In the aggregate, the Company issued and sold pursuant to the May 2019 First Tranche Private Placement and May 2019 Second Tranche Private Placement a total of 5,021,000 units for gross proceeds of \$2,912,180 to the Company.

June 2019 Private Placement

On June 19, 2019, the Company completed a non-brokered private placement and issued 1,000,000 units at a price of \$0.58 per unit, for total gross proceeds of \$580,000 (the “**June 2019 Private Placement**”). Each unit consists of one Common Share and one Common Share purchase warrant of the Company. Each warrant entitles the holder to acquire one Common Share at a price of \$0.85 until June 19, 2021 (the “**June 19, 2021 Warrants**”). In connection with the private placement, the Company paid finder’s fees in the amount of \$23,200.

October 2019 Private Placement

On October 23, 2019, the Company completed a non-brokered private placement and issued 300,000 units at a price of \$0.56 per unit, for total gross proceeds of \$168,000 (the “**October 2019 Private Placement**”). Each unit consists of one Common Share and three-quarters (0.75) of a Common Share purchase warrant of the Company. Each warrant entitles the holder to acquire one Common Share at a price of \$0.75 until January 25, 2021.

Scientific Research and Experimental Development Loans

On December 23, 2019, the Company entered into a Scientific Research and Experimental Development (“**SR&ED**”) tax credit loan of \$247,500 bearing interest at a rate of 16.68% and fees totaling \$22,375 paid at the issuance of the loan (the “**2019 SR&ED Loan**”). The 2019 SR&ED Loan is secured by the Company’s 2019 investment tax credit receivable and is repayable on December 23, 2020. As at December 31, 2019, the amount available under the 2019 SR&ED Loan is of \$185,331.

On March 25, 2019, the Company entered into a SR&ED tax credit loan of \$214,000 bearing interest at a rate of 16.68% and fees totaling \$19,260 paid at the issuance of the loan (the “**2018 SR&ED Loan**”). As at December 31, 2019, the amount available under the 2018 SR&ED Loan is of \$199,736. The 2018 SR&ED Loan was repaid on May 21, 2020 and 2019 SR&ED Loan was repaid on July 28, 2020.

The SR&ED tax credit loans are financing, in the form of loans with respect to the Company’s SR&RD tax credits (“**SR&ED Tax Credits**”). The principal of the loans is subject to holdback to be disbursed upon reception of the Company’s notice of assessment. The principal of each loan is subject to repayment at the earlier of (a) receipt of the SR&ED Tax Credits refund or (b) the maturity date of the respective loan.

Pursuant to each of the 2019 SR&ED Loan and the 2018 SR&ED Loan, the Company granted the lender a security interest and movable hypothec on all of its assets excluding its intellectual property but including a first rank claim on the refundable portion of its SR&ED Tax Credits for each of the fiscal years ended December 31, 2018, of \$274,921 and 2019 of \$434,474.

Additional Developments

On September 29, 2019, PyroGenesis announced that Mr. Alan Curleigh, Chair of the Board, and Dr. Christopher Twigge-Molecey, director and a member of the Audit Committee, had resigned. On the same date, the Company announced that Dr. Virendra Jha was appointed to the Board as an independent director and that Mr. Michael Blank was appointed to the Board as a director and as Acting Chief Financial Officer of the Company. Mr. P. Peter Pascali, the Chief Executive Officer of the Company, assumed the role of Chair of the Board.

5.2. Year Ended December 31, 2020

Expansion & Development of Product Offerings

On April 30, 2020, PyroGenesis announced it had successfully completed the first phase of a multi-phase modeling contract aimed at evaluating the performance of PyroGenesis’ proprietary torches in an existing iron ore industrial furnace with the goal of replacing all existing fossil fuel burners with PyroGenesis’ plasma torches. Furthermore, on September 1, 2020, the Company announced the completion and acceptance of its modeling contract, which confirmed, amongst other things, that replacing fossil fuel burners with PyroGenesis’ proprietary plasma torches addresses the greenhouse gas (“**GHG**”) reduction strategy/policy. The modeling contract successfully demonstrated the benefits of replacing fossil fuel burners with PyroGenesis’ proprietary plasma torches. More specifically,

two of the most important benefits demonstrated were (i) that replacing fossil fuel burners with plasma torches was a simple replacement, plug and play process, and (ii) that PyroGenesis' proprietary plasma torches significantly reduces GHG emissions which, as a result, could play a significant role in the GHG reduction strategy/policy of its client.

On June 4, 2020, the Company announced that its quality management system for the production of metal powders for the AM industry had been approved by one of the premier non-European aerospace companies, which may lead to being qualified as a supplier to such company. PyroGenesis' NEXGEN Plasma Atomization System produces metal powder at over 25 kilograms per hour, shattering any published plasma-atomized production rates for titanium known to management.

On June 11, 2020, the Company announced it had signed a second multi-phase torch modeling contract with a customer, aimed at evaluating the performance of PyroGenesis' proprietary torches in an existing iron ore industrial furnace with the goal of replacing the customer's existing fossil fuel burners with PyroGenesis' plasma torches. The modeling contract is geared to demonstrate that replacing fossil fuel burners with PyroGenesis' proprietary plasma torches will not have any detrimental effects on the client's process of its furnace. The switch to plasma torches will also result in the additional benefit of significantly reducing the emission of sulfur dioxide (SO₂).

On September 22, 2020, the Company announced a strategy to become a global on-site dross processor delivering zero-landfill/reduced carbon, and further underscored how DROSRITE reduces GHG emissions.

Contracts and Milestones

On March 4, 2020, the Company announced it had completed all torch tests successfully and had received final payment from RISE Energy Technology Center AB pursuant to the 2019 RISE Agreement.

On March 24, 2020, the Company announced it had received the first payment of approximately \$1.44 million under the Drosrite International Exclusive Agreement.

On April 1, 2020 and April 21, 2020, the Company received US\$400,000 and US\$325,000, respectively, under an agreement with a US-based tunneling company entered into earlier in 2020, under which the Company has demonstrated the feasibility of plasma torch underground tunneling.

On May 19, 2020, the Company announced it had entered into the final stages of negotiation for the supply of iron ore pelletizing equipment to a major iron ore producer. On November 24, 2020, the Company announced it had signed an initial plasma torch contract valued at approximately \$1.8 million to provide one high powered (approximately one megawatt) plasma torch with ancillary equipment to this iron ore producer.

On June 11, 2020, the Company announced it had signed a second multi-phase torch modeling contract, aimed at evaluating the performance of PyroGenesis' proprietary torches in an existing iron ore industrial furnace with the goal of replacing existing fossil fuel burners with PyroGenesis' plasma torches.

On July 2, 2020, the Company announced that it had entered into active discussions with a new potential customer, which is not only a significant player in the iron ore pelletization industry but is also a major player in the steel industry, for the sale of equipment. The Company believes there is a high probability that the customer may bypass the standard modeling phase. Discussions with the customer are ongoing as of the date of this AIF. Although there is no certainty that the discussions and relationships with the clients referred to in the May 19, 2020, June 11, 2020 and July 2, 2020 announcements will result in significant contracts for the Company, the Company estimates that there is an opportunity to enter into contracts with such clients for the sale of plasma torches, and that they collectively could have a need for more than 1,000 torches.

On August 18, 2020, the Company announced it had signed a development agreement with HPQ Nano Silicon Powders Inc. ("**HPQ Nano**"), a wholly owned subsidiary of HPQ Silicon Resources Inc. ("**HPQ**"), covering the PUREVAP Nano Silicon Reactor ("**NSiR Reactor**") development program and the future commercialization of nano silicon materials made with this new, proprietary and low-cost manufacturing process. The process, which is under development, is designed to transform silicon into spherical silicon nano powders and nanowires for use in lithium-ion batteries. The development agreement has an estimated value of approximately \$3 million, including a payment of approximately \$2.4 million to PyroGenesis for the sale of the intellectual property rights to the new system and

a royalty of 10% on the future sales of nano silicon powders and wires by HPQ Nano. The right to receive royalties can at any time be converted by PyroGenesis into a 50% ownership of HPQ Nano. PyroGenesis has retained a royalty-free, exclusive, irrevocable, worldwide license to use the new system for all purposes other than the manufacturing of nano silicon powders and wires.

On September 4, 2020, the Company announced it had signed a contract to provide waste destruction systems for a total consideration of \$11.5 million. The contract is for two systems, one for each ship in the US Navy's current two-ship build. The contract includes a first payment of approximately \$4.8 million and should be completed within 18 months of the date of the contract.

On November 19, 2020, the Company announced that PyroGenesis' technology successfully passed the factory acceptance test conducted by Drosrite International on behalf of Radian Oil & Gas for the first 5,000 TPY DROSRITE System.

On December 16, 2020, the Company announced it had signed an additional contract with a US based tunneling client valued at approximately \$1.1 million. The contract provides that PyroGenesis will design, manufacture, test, and supply the client with a plasma torch tailored specifically for tunneling. Upon mutual agreement between the Company and the client, the Company has not yet initiated the manufacturing of the plasma torch.

Financings

2020 Convertible Loan

On March 18, 2020, the Company completed a \$903,000 non-brokered secured convertible loan with the Pascali Trust (the "**2020 Convertible Loan**"). The 2020 Convertible Loan bears interest at the rate of 12% per annum, with interest payable in cash on a quarterly basis, matures on September 17, 2021, and is convertible into common shares of the Company at a conversion price of \$0.28 per common share. The 2020 Convertible Loan was secured by a hypothec on the universality of all of the present and after acquired moveable property and assets of the Company. The 2020 Convertible Loan was subsequently converted in common shares in accordance with its terms on September 30, 2020, resulting in 3,225,000 common shares being issued.

As the 2020 Convertible Loan was provided by the Pascali Trust, of which P. Peter Pascali, the Chief Executive Officer of the Company, is a trustee, officer and beneficiary, the 2020 Convertible Loan constituted a "related party transaction" as defined in MI 61-101. The related party transaction was exempt from the formal valuation and minority approval requirements of MI 61-101, as the transaction had a value of less than 25% of the Company's market capitalization (calculated in accordance with MI 61-101). The transaction was unanimously approved by the board of directors of the Company. See "Directors and Executive Officers - Conflicts of Interest".

Bought Deal Financing

On November 10, 2020, the Company closed a bought-deal short form prospectus offering (the "**2020 Public Offering**") pursuant to an underwriting agreement dated October 20, 2020, entered into between the Company and Mackie Research Capital Corporation, as sole underwriter and sole bookrunner. Under the 2020 Public Offering, the Company issued 3,354,550 units of the Company ("**Units**") at a price of \$3.60 per Unit for aggregate proceeds of \$12,076,380, including the full exercise of the over-allotment option by the underwriter. Each unit is comprised of one Common Share and one-half of one Common Share purchase warrant. Each whole warrant (a "**2020 Public Offering Warrant**") entitles the holder thereof to purchase one additional Common Share at an exercise price of \$4.50. The 2020 Public Offering Warrants are governed by a warrant indenture dated November 10, 2020 (the "**Warrant Indenture**"). On March 15, 2021, the Company announced it had elected to exercise its right under the Warrant Indenture to accelerate the expiry date of the 2020 Public Offering Warrants, which will expire at 5:00 p.m. (Toronto time) on April 14, 2021 (the "**New Expiry Date**"). The 2020 Public Offering Warrants that have not been exercised prior to the New Expiry Date will expire unexercised and will automatically be void and of no effect whatsoever.

In consideration for the services provided by the underwriter, the Company paid a cash commission equal to 6.5% of the gross proceeds of the 2020 Public Offering and issued to the underwriter an aggregate of 191,414 non-transferable compensation options ("**Compensation Options**"), which are exercisable into Units at a price of \$3.60 per Unit at any time up to 24 months from closing of the 2020 Public Offering.

Additional Developments

On July 28, 2020, the Company requested that the Pascali Trust convert the 2020 Convertible Loan on or before September 30, 2020. The Pascali Trust agreed to such request subject to the prepayment of 5 years rent, plus estimated yearly municipal taxes, as soon as possible but no later than December 31, 2020, for a total prepayment of \$1,438,530. As a result of the conversion of the 2020 Convertible Loan, the Company expects to save approximately \$110,000 of interest payments that would otherwise have been required to be paid under the 2020 Convertible Loan. The agreement with the Pascali Trust in respect of the prepayment of rent constituted a “related party transaction” as defined in MI 61-101. The related party transaction was exempt from the formal valuation and minority approval requirements of MI 61-101, as the transaction had a value of less than 25% of the Company’s market capitalization (calculated in accordance with MI 61-101). The transaction was unanimously approved by the board of directors of the Company. See “Directors and Executive Officers - Conflicts of Interest”.

On September 1, 2020, PyroGenesis announced that it had acquired 4,000,000 units of HPQ in a private placement at a price of \$0.60 per unit for a total investment \$2.4 million. Each unit consists of one common share of HPQ and one common share of HPQ purchase warrant. Each warrant entitles the Company to purchase one common share of HPQ at a price of \$0.61 for a period of 36 months following the issue date.

On September 22, 2020, at the Company’s annual general meeting, the five members of the Board were re-elected and two additional nominees, Ms. Rodayna Kafal and Mr. Rodney Beveridge, were also elected to the Board. On the same date, PyroGenesis also unveiled its strategy to become a global on-site dross processor, delivering zero-landfill and reduced carbon solution.

On November 20, 2020, the Common Shares commenced trading on the TSX under the trading symbol “PYR” at which time the Common Shares were delisted from the TSX-V.

On December 8, 2020, the Company announced that it had been awarded the “Solar Impulse Efficient Solution” label from the Swiss-based Solar Impulse Foundation for PyroGenesis’ proprietary APT high-powered plasma torch for replacing fossil fuel burners. Solar Impulse Foundation’s purpose is to identify existing solutions that are both clean, profitable, and having a positive impact on quality of life.

On December 22, 2020, PyroGenesis announced it had submitted a formal application to list its Common Shares on the NASDAQ.

5.3. Year Ended December 31, 2021

Expansion & Development of Product Offerings

On March 17, 2021, PyroGenesis announced that it has received a grant of \$194,090 from the Ministry of the Economy and Innovation, through the Support for innovation projects component of the Innovation program, administered by Investissement Québec. The grant is used to fund a research and development project aimed at finding a solution to recover the residues of spent pot lining, which are produced in the primary aluminum industry, and which are considered dangerous.

On April 19, 2021, PyroGenesis announced that its cutting-edge AM NEXGEN powder production line, incorporating all the improvements previously announced (increased production rate, lower CAPEX, lower OPEX, narrower particle size distribution) is now in place and producing powders. PyroGenesis’ game-changing NEXGEN plasma atomization system, with its production rate exceeding 25 kg/h, has shattered all published plasma-atomized production rates for titanium known to management.

On May 27, 2021, PyroGenesis announced that it had received a \$700,000 grant from Sustainable Development Technology Canada for the financing of the development of a novel production process to transform quartz into fumed silica using a plasma reactor, thereby reducing hazardous waste and GHG emissions in comparison to the established fumed silica production process. For this project, PyroGenesis and HPQ –a provider of innovative, cost-effective and low carbon emission silicon-based solutions, are collaborating on the design, fabrication and operation of a novel pilot system to demonstrate the production of fumed silica, an inert and non-hazardous substance, using a plasma reactor. Fumed silica is used as a thickening agent in a wide range of applications, such as paints, cosmetics, coatings, inks and resins.

On August 12, 2021, PyroGenesis announced it has finalized its strategic acquisition of Pyro Green-Gas and of its subsidiaries for a total cash consideration of approx. \$4.4MM. Pyro Green-Gas is a Montreal-based company that offers technologies, equipment, and expertise in the area of biogas upgrading, as well as air pollution controls. Pyro Green-Gas designs and builds: (i) gas upgrading systems to convert biogas into renewable natural gas (“RNG”); (ii) pyrolysis-gas purification systems; (iii) biogas and landfill-gas flares and thermal oxidizers; and (iv) systems for the purification of coke-oven gas (a by-product in the primary steel industry arising from the conversion of coal into coke) into high purity hydrogen, which is in high demand across the industry. Pyro Green-Gas is also known for its line of landfill gas flares which reduce GHG emissions specifically from landfills.

On September 7, 2021, the United States Patent and Trademark Office had issued a Notice of Allowance for U.S. Patent No. 11116069, entitled, “High power direct current (DC) non transferred steam plasma torch system”. This new patent covers the Company’s high power DC steam plasma torch system and, relates to a steam plasma torch assembly wherein superheated steam is used as the main plasma forming gas, thereby resulting in a highly reactive steam plasma plume. The system is used to destroy ozone depleting substances. This high-power steam torch system is used in PyroGenesis’ Steam Plasma Arc Refrigerant Cracking (“SPARC”) technology, a patented PyroGenesis process designed to destroy ozone depleting substances such as end-of-life (“EOL”) refrigerants like Chlorofluorocarbons, hydrochlorofluorocarbons and Hydrofluorocarbons, which have high global warming potential (“GWP”). EOL refrigerants are potent GHGs with a GWP that can be thousands of times greater than carbon dioxide (CO₂).

On September 22, 2021, the European Patent Office granted PyroGenesis a patent on “Plasma Apparatus for the Production of High Quality Powders at High Capacity”. This patent relates to the production of high purity spheroidal powders for use in additive (3D printing) manufacturing, but which can also be used in hot isostatic pressing (HIP). Specifically, this patent aims at providing a simplified device geared to increasing productivity while at the same time allowing for further control over particle size distribution, thereby reducing overall costs. This patent has been filed for patent protection in six additional jurisdictions.

On September 27, 2021, PyroGenesis announced that it has signed joint venture and license agreements (collectively, the “**JV Agreements**”) with a leading residue processor to transform dross residues into high value chemical products. This 50:50 joint venture will be geared towards building, installing and operating dross residue valorization facilities worldwide. To this effect, PyroGenesis secured, through the joint venture, an exclusive license to a patented and novel technology which is expected to convert dross residues into high value chemical products. Under the terms of the JV Agreements, the exclusive access to the technology initially applies to projects in North America and in the Gulf Cooperation Council nations. Upon successful completion of the first project, the exclusive access to the technology will expand to include, for all sense and purposes, the majority of the world. These dross residues are currently either being (i) landfilled (which is increasingly becoming banned by regulators) or (ii) sold as cheap flux to the cement industry.

On October 19, 2021, PyroGenesis announced that it has been awarded an Innovative Solutions Canada phase 2 (prototype development) contract of approximately \$ 1.15 MM to develop a unique hybrid ceramic powder (“**HCP**”) processing system for the National Research Council Canada, Canada’s largest federal research and development organization. Carbon nanotubes hold significant potential for mechanical reinforcement in composite materials, including ceramic composites. However, the bundling of the carbon nanotubes has prevented this potential from being realized. The system being currently developed by PyroGenesis utilizes a thermal plasma process to simultaneously synthesize carbon nanotubes and deposit them on a ceramic powder within a single plasma reactor.

On December 8, 2021, PyroGenesis announced the launch of a new zero-carbon emission (“**ZCE**”) hydrogen production technology which is expected to compete with conventional technologies to produce an environmentally friendly hydrogen. PyroGenesis’ new hydrogen production technology is now entering a testing phase and is expected to convert methane (a GHG with a high GWP) to hydrogen, thereby creating a ZCE hydrogen. The conventional ZCE process, water electrolysis, is extremely expensive, requires a lot of energy and uses rare earth materials. The accumulation of GHGs in the atmosphere contributes to global warming. Under the Paris Agreement, 191 countries have committed to limit GHGs, while many territories, including the European Union, have committed to be carbon neutral by 2050.

Contracts and Milestones

On April 20, 2021, PyroGenesis announced the signing of a qualification agreement with a premier global aerospace company for the production of metal powders. Under this agreement, the aerospace company is performing a standard qualification process typically required before the Company can become an approved supplier.

On May 26, 2021, PyroGenesis announced that it had shipped its first commercial samples of plasma atomized titanium powder to a client that serves the aerospace industry.

On June 3, 2021, PyroGenesis announced that it had received a request for a cost estimate for thirty-six (36) plasma torches from a major iron ore producer. This iron ore producer is a multi-billion-dollar international producer of iron ore pellets (one of the largest in the industry), whose ultimate objective is to reduce their GHG emissions by replacing their fossil fuel burners with PyroGenesis' plasma torches.

On July 6, 2021, PyroGenesis announced the signature of a contract for approx. \$4MM with HPQ Silica Polvere Inc. ("**HPQ Polvere**"), a wholly owned subsidiary of HPQ. Under this contract, PyroGenesis was tasked to design, develop and manufacture a novel one-step plasma-based reactor and process for the conversion of quartz to fumed silica. The contract includes: i) the sale to HPQ Polvere of a provisional patent application relating to the reactor and process, for 3.3MMS; ii) exclusive rights to HPQ Polvere for the use of the intellectual property in the field of fumed silica manufacturing (the "**Field**"); iii) a royalty-free, exclusive, irrevocable, worldwide license allowing PyroGenesis to use the intellectual property for all activities outside of the Field and; iv) annual royalty payments by HPQ Polvere to PyroGenesis on the HPQ Polvere's future gross sales within the Field, (the payments shall not exceed the total of sales for the annual period). This royalty stream can, at any time, be converted by PyroGenesis into a 50% ownership in HPQ Polvere.

On August 5, 2021, PyroGenesis announced that the Company had successfully produced nano silicon materials with its PUREVAP NSiR for HPQ Nano.

On August 17, 2021, PyroGenesis announced that it had signed a \$1.2MM contract for two air plasma torch systems with an existing Asian client. These torches are to be incorporated into the client's medical waste destruction systems. The name of the client will remain confidential for competitive reasons.

On September 14, 2021, PyroGenesis announced that it had received an order to supply four high powered plasma torches together with ancillary equipment to a client (referred herein and in the Company's news releases as "**Client B**"), for approximately \$6MM. This does not include continued aftersales services, which would be part of a separate services agreement. Client B is a multi-billion-dollar international producer of iron ore, whose name will remain confidential for competitive reasons. Client B's objective is to reduce GHGs by replacing their fossil fuel burners with PyroGenesis' proprietary plasma torches. Client B has advised PyroGenesis that, upon the successful implementation of the torches announced on September 14, 2021, the subsequent orders were expected to be for approximately 130 plasma torches. Notwithstanding this, there is no guarantee that such orders will be placed.

On September 22, 2021, PyroGenesis announced that Pyro Green-Gas had been selected to supply its landfill biogas purification system to Carbonaxion Bioénergies Inc. ("**Carbonaxion**"), the promoter of the GNR Neuville project, which is being carried out at the environmental complex of the Régie régionale de gestion des matières résiduelles de Portneuf ("**Régie**"), located in the province of Québec, Canada. The Régie is a municipal organization that manages the residual materials of 24 municipalities. Carbonaxion previously entered into an agreement with Régie to build, own and operate a landfill gas plant that will convert the waste from the Neuville landfill site into RNG over the next 20 years. Carbonaxion then selected Pyro Green-Gas as the supplier of the biogas purification system. The contract, currently being negotiated between Pyro Green-Gas and Carbonaxion, has an expected value in excess of \$5 million and is expected to be fully commissioned in the first half of 2023.

On October 20, 2021, PyroGenesis announced that it had created a new division, PyroGenesis Aluminum dedicated exclusively to PyroGenesis' environmental offerings related to the aluminum industry. PyroGenesis Aluminum offers five main products and services: i) DROSRITE sales and tolling services; ii) conversion of dross residues into valuable chemicals; iii) upstream applications where plasma-based solutions are expected to reduce GHG emissions; iv) high powered plasma torches geared to replacing fossil fuel burners and; v) conversion of spent pot lining residues into a valuable end-product. The combination of these offerings is intended to position PyroGenesis Aluminum as a unique one-stop shop for zero landfill / reduced carbon service solutions, which cater to the aluminum industry's needs.

On October 28, 2021, PyroGenesis announced that it had been selected to provide a \$9.2MM land-based system to destroy perfluoroalkyl and polyfluoroalkyl substances ("**PFAS**"). The potential client is a large operator of public water systems, whose name will remain confidential for competitive reasons. PyroGenesis was informed that, after a competitive bidding process, it had been selected to provide its plasma based thermal process equipment in a two-phase project geared to providing a land-based system to destroy PFAS. The first phase is to provide pilot testing. The second phase is geared to a full fabrication, refurbishing and commissioning

of a fully commercial land-based system. PyroGenesis and the potential client are currently negotiating the terms of the two-phase agreement. PFAS are man-made chemicals that have been widely used in consumer products in various industries, such as aerospace, automotive, construction, amongst others, for many decades. Products that may contain PFAS include nonstick cookware, stain resistant coatings used on carpets, upholstery, and other fabrics, water resistant clothing, cleaning products, personal care and cosmetics products and any other product that resist grease, water and oil. Because of their widespread use and strong chemical bonds and properties, which account for their persistence in the environment, PFAS are proving to be persistent pollutants that affect humans and wildlife, as they are likely to be exposed to these chemicals by consuming contaminated water or food, using products made with PFAS or, breathing air containing PFAS.

Additional Developments

On January 12, 2021, PyroGenesis announced that it intended to implement a normal course issuer bid (“**NCIB**”) through the facilities of the TSX or alternative trading systems. Pursuant to the NCIB, PyroGenesis may purchase, from time to time, over a period of 12 months starting January 14, 2021 and ending January 13, 2022, up to 5,000,000 common shares (approximately 3.14% of the issued and outstanding as of January 4, 2021). On any given day, during the NCIB, PyroGenesis may only purchase up to 83,342 Common Shares, which is equivalent to 25% of the average daily trading volume of 333,370 Common Shares calculated based on the trading volumes on the TSX from November 20, 2020 (being the first day PyroGenesis was listed on the TSX) to December 31, 2020.

On March 3, 2021, PyroGenesis announced that it appointed Mr. Ben Naccarato as an independent director. Mr. Naccarato, CPA, CMA, is the Executive Vice-President and Chief Financial Officer at Perma-Fix Environmental Services Inc., a NASDAQ-listed, hazardous waste treatment and disposal company.

On March 10, 2021, the Company announced that its application to list its Common Shares on the NASDAQ had been approved. Trading commenced on March 11, 2021, under the ticker symbol “PYR”. The Common Shares ceased to be traded on the OTCQB at the close of markets on March 10, 2021. In connection with the NASDAQ listing, the Company announced that in order to maintain the overall independence of the Board of Directors, Mr. Michael Blank tendered his resignation as a director and member of the Audit Committee effective March 10, 2021 in favor of continuing as acting CFO of the Company. Furthermore, the Company also announced that the Board formed two new committees: (i) a Compensation Committee, responsible for overseeing executive compensation, and (ii) a Nominating and Corporate Governance Committee, responsible for overseeing the director and officer nomination process, as well as developing and monitoring PyroGenesis’ corporate governance.

On March 15, 2021, PyroGenesis announced that it had elected to exercise its right under the Common Share purchase warrant indenture (the “**Warrant Indenture**”) dated November 10, 2020, between the Company and AST Trust Company (Canada), to accelerate the expiry date of the Common Share purchase warrants of the Company (the “**Warrants**”) issued under the Warrant Indenture. The Warrants were issued on November 10, 2020, in connection with the bought-deal short form prospectus offering of units of the Company, of which each unit was comprised of one Common Share of the Company and one-half of one Warrant.

On June 22, 2021, PyroGenesis announced the voting results from its annual meeting of shareholders held on June 22, 2021, in a virtual format. A total of approximately 55% of the issued and outstanding Common Shares of PyroGenesis were represented at the meeting. All of the nominees for election as directors of PyroGenesis referred to in its management information circular for the meeting were elected.

On September 20, 2021, PyroGenesis announced that it has been added to the FTSE Global Total Cap Index and FTSE Global Micro Cap Index. The FTSE Global Total Cap Index is a market-capitalization weighted index representing the performance of large, mid and small cap stocks, across emerging and developed companies. The FTSE Global Micro Cap Index provides deep representation of micro cap stocks. Both indexes are used as the basis for performance benchmarks and investment products, such as funds, derivatives, and exchange-traded funds by investment professionals globally.

On September 27, 2021, PyroGenesis announced the appointment of Mr. Andre Mainella, as Chief Financial Officer (CFO) of the Company.

5.4. Recent Developments

On February 2, 2022, PyroGenesis announced the receipt of a \$4 MM purchase order for the first of three 10-tonne DROSRITE systems from an existing client.

On February 7, 2022, PyroGenesis announced that it had signed a \$273,000 plasma torch contract with a European research center, whose name shall not be disclosed for confidentiality and competitive reasons. The contract, valued at €189,000, or approximately C\$273,000, is for PyroGenesis to manufacture and deliver a 50 kW methane plasma torch, which will be used by the client to develop a process to convert hydrocarbons, including methane (a GHG), into useful chemicals such as olefins (e.g. ethylene, propylene), thereby significantly reducing GHG emissions.

On February 8, 2022, PyroGenesis announced that it had completed the factory acceptance test (“FAT”) relative to a 1 MW plasma torch it had previously sold and installed in the premises of a multi-billion-dollar international producer of iron ore pellets (referred herein and in the Company’s news releases as “Client A”). This successful FAT was conducted at PyroGenesis’ manufacturing facility in Montreal, in the presence of the client.

Global Pandemic (COVID-19)

The COVID-19 pandemic has negatively impacted the global economy, disrupted global supply chains and created significant economic uncertainty and disruption of financial markets. Information about the impact that the COVID-19 pandemic can have on PyroGenesis’ operations can be found in the section "Risk Factors " of the Corporation’s MD&A, which section is incorporated by reference herein.

6. Business of the Company

6.1. General

PyroGenesis is a leader in the design, development, manufacturing and commercialization of advanced plasma processes and products. PyroGenesis provides plasma systems and processes, and technology development services to the defense, environmental, metallurgical, and mining industries, as well as plasma atomized powders for AM (including 3D printing).

With a team of experienced engineers, scientists and technicians working out of our Montreal office and our 3,800 m² and 2,940 m² manufacturing facilities, PCI continuously innovates to provide cutting-edge cleantech products to the marketplace. Our core competencies allow us to lead the way in providing plasma torches, plasma waste processes, high-temperature metallurgical processes, and AM powders to the global marketplace. Our operations are ISO 9001 and AS9100D certified.

6.2. Products and Services

The Company’s highly specialized products and services are commercialized to customers operating in a wide range of industries, including the defense, metallurgical, mining, advanced materials (including 3D printing), oil & gas, and environmental industries. The products and services of PyroGenesis include:

- Plasma torches systems, used for replacing conventional burners in pelletizing of iron ore furnaces (mining sector) and other industrial furnaces (mainly metallurgy sector);
- Waste destruction and waste-to-energy systems, which are predominantly offered to customers in the environmental and defense industries;
- Systems for the recovery of aluminum and other metal from dross (a residue generated by primary and secondary metal producers), which are predominantly offered to customers in the mining and metallurgical industries;
- Production of high purity spherical metal powders, which are predominantly offered to customers in the AM (also known as 3D printing) industry;

- Development of processes to produce high purity silicon metals, nano powders and nanowires, which are proposed to be predominantly offered to customers in the mining and metallurgical industries, including the battery industry;
- Development of a process to produce fumed silica, used in the polymer, cosmetics, and paint industries;
- Systems for upgrading of biogas and landfill gas into RNG, used in the environmental industry;
- Systems for the purification of industrial gases such as: the extraction of hydrogen from coke oven gas, the purification of natural gas into high purity methane, and the purification of pyrolytic gases, mainly used in the petrochemical and metallurgical industries;
- Installation, commissioning and start-up services; and
- Research and development, internal and external funded projects by customers.

Plasma Torches for Iron Ore Pelletization

PyroGenesis manufactures and commercializes proprietary plasma torches that are used to replace fossil fuel burners in industrial iron ore induration (pelletization) process. The plasma torches of PyroGenesis can heat gas up to 10,000°F, which is as hot as the surface of the sun.

Pelletization is the process in which iron ore fines are agglomerated into small balls with some additives. The pellets are then heated to high temperatures in an induration furnace to make them more resistant. The pellets are then used downstream and typically on a different site to make iron and steel in blast furnaces and in direct reduction of iron (DRI). In conventional technology, the process heat is provided by fuel oil or natural gas burners. The combustion, in the burners, of fossil fuels results in the production of GHGs, mainly CO₂. Plasma torches, by the fact that they can convert renewable electricity to heat, offer an environmentally attractive alternative to fossil fuel burners. The plasma torch systems are predominantly offered to customers in the mining industry. The objective of the Company is to be a significant player in the world-wide movement to reduce the carbon footprint in manufacturing.

The Company offers a patented process to replace fossil fuel burners with electrically heated plasma torches, thereby reducing GHG emissions for the iron ore pelletization industry. The Company believes its solutions can be economically superior to other alternatives with greater environment benefits. By using the Company's solutions, manufacturing companies can reduce GHG emissions without being required to shut down their facility for installation and with minimal changes to their processes.

PyroGenesis is currently working on two commercial plasma torch projects for the iron ore induration industry. Client A has contracted PyroGenesis to build, install and test a plasma torch at one of its full-scale induration furnaces. This torch will be installed in late Q2-2022. Client B has hired PyroGenesis to build, install and test 4 plasma torches at its facility. These torches are expected to be installed and in Q4 2022 and operational in Q1 2023. PyroGenesis believes that these first pilot trials of its plasma torches could lead to larger commercial contracts with these two clients. For example, Client A asked PyroGenesis for a cost estimate for up to 36 plasma torches, which would represent a notable upgrade to one of its furnaces, allowing Client A to lower their GHG emissions by a significant amount.

Waste Destruction and Waste-to-Energy Systems

PyroGenesis manufactures and commercializes a broad range of waste destruction and waste-to-energy systems to customers in the environmental and defense industries. At the core of these systems are the Company's plasma torches and plasma gasification reactors. The Company believes it offers one of the most complete, easy-to-operate, high temperature, plasma-based treatment systems. The waste destruction and waste-to-energy systems offered by the Company include the following:

- Plasma Arc Waste Destruction Systems (“PAWDS”), for waste destruction onboard ships;
- Steam Plasma Arc Refrigerant Cracking (“SPARC”) systems, for the destruction of certain refrigerants, including chlorofluorocarbons (“CFCs”), hydrofluorocarbons (“HFCs”) and hydrochlorofluorocarbons (“HCFCs”);

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- Plasma Arc Chemical Warfare Agent Destruction Systems (“**PACWADS**”), which are mobile platforms for the onsite destruction of chemical warfare agents;
- Plasma Resource Recovery Systems (“**PRRS**”), for land-based waste destruction and waste-to-energy applications;
- Plasma torches for waste gasification and combustion; and
- Plasma Arc Gasification and Vitrification (“**PAGV**”).

Plasma Arc Waste Destruction System (PAWDS)

Originally developed by the Company in the late 1990s for the gasification of waste onboard US Navy aircraft carriers, PAWDS was the first plasma destruction system for marine use on the US Navy aircraft carriers. PAWDS uses the plasma eductor for the fast gasification of milled waste. Navy waste is comparable to the combustible fraction of municipal solid waste, comprised of paper, cardboard, plastics, wood and rags. Since launching PAWDS in 1999, the Company received orders for four PAWDS systems for the US Navy, two of which have been delivered and installed on the Gerald R. Ford (CVN-78) and the John F. Kennedy (CVN-79) aircraft carriers, and two of which have recently been ordered. Developed in collaboration with the US Navy, at 1/5th the size and half the weight of a typical marine incinerator, the patented PAWDS has a capacity of 3.5 tons/day. PAWDS is a highly compact, inherently safe and efficient alternative to the shipboard waste incinerators. Due to its unique features of compactness and safety, the system has been fitted into the two forthcoming US Navy Ford-class carriers.

Steam Plasma Arc Refrigerant Cracking (SPARC)

The SPARC process is the Company’s patented technology for the destruction of old refrigerants such as CFCs, HFC and HCFCs. The system is pre-assembled on skids and has demonstrated high destruction and removal efficiency of more than six “nines”, or 99.9999%. SPARC uses a water vapour (steam) torch to destroy the refrigerants quickly and efficiently. The system is designed to handle wastes that have very high chlorine and fluorine content. An integrated caustic scrubber ensures that hydrochloric acid (HCl) and hydrofluoric acid (HF) emissions are well below applicable limits. The system is designed for a destruction capacity of 50 kilograms per hour based on R12, a refrigerant.

Plasma Arc Chemical Warfare Agent Destruction System (PACWADS)

PACWADS was developed by the Company for the US and UK special forces to destroy chemical warfare agents on site. The system is installed on two trailers and can be deployed quickly in areas where chemical warfare agents must be immediately destroyed. Performance tests on simulants have demonstrated destruction and removal efficiency of more than seven “nines”, or 99.99999%. The system is designed to destroy the equivalent of two barrels (or approximately 318 litres) per day of sarin, a deadly nerve gas, and is also suitable for the destruction of a variety of other chemical warfare agents.

Plasma Resource Recovery System (PRRS)

The PRRS is used to convert waste to syngas (synthesis gas) and inert slag (a glass-like by-product left over after a desired metal has been separated (i.e., smelted) from its raw ore). The PRRS combines a direct current graphite arc furnace, where the inorganic portion of waste is vitrified, and the organic portion is gasified. The produced syngas is then cleaned up in a plasma-fired eductor, similar to the one used in the PAWDS technology, where tars are converted into clean syngas (i.e. carbon monoxide (CO) and hydrogen (H₂)). The resulting syngas is further cleaned of contaminants (such as HCl, sulfur compounds, particulates and volatile heavy metals) using filters and scrubbers. The resulting syngas can be used as fuel in a gas engine. The inert slag can be used as construction material.

Plasma Torches for Waste Gasification Systems

PyroGenesis’ plasma torch systems are used in waste-to-energy applications, advanced material production, metallurgical processing, thermal treatment and nanotechnology manufacturing. As a cleantech alternative to fossil fuel burning, PyroGenesis’ electricity-driven plasma torch systems are easy to operate and offer a high level of safety, reliability and service life of wear components.

Plasma Arc Gasification and Vitrification (PAGV)

PAGV systems convert incinerator ash and other hazardous inorganic material to an inert, non-toxic slag. Slag is a glass like material, composed of several oxides, typically silica based. Using the Company's unique furnace design, the proprietary arc plasma technology uses graphite electrodes and an electrical current to create arcs between the electrodes and the melt, generating a high temperature environment (typically above 1500°C), melting the mineral matter into slag. This slag can be used in a wide range of applications, namely as a building material for construction (aggregate asphalt and flooring, partial replacement for cement in concrete). The Company's PAGV systems eliminate future legacy issues for operators of incinerators (i.e. municipalities, along with managers of incineration operations for industrial, hazardous, biomedical, and animal (slaughterhouse) waste) with a simple melting process for their grate and fly ash. Asbestos waste from decommissioning operations is also an excellent use for this technology.

Systems for the Recovery of Aluminum and Other Metal from Dross

The Company produces systems for the recovery of aluminum and other metal from dross (a residue generated by primary and secondary metal producers, as well as metal parts casters) through its DROSRITE process, which systems are predominantly offered to customers in the metallurgical industry.

DROSRITE

DROSRITE is a salt-free, highly cost-effective, sustainable process for maximizing metal recovery from dross without any hazardous by-products, targeting mainly the aluminum and zinc industries. Treating dross at its source of generation in a controlled atmosphere, tilting rotary furnace, DROSRITE eliminates costly loss of metal, while reducing a smelter's carbon footprint and energy consumption, providing customers with a significant return on investment.

Production of High Purity Spherical Metal Powders

The Company produces high purity spherical metal powders through its plasma atomization process, which are predominantly offered to customers in the AM (also known as 3D printing) industry.

PyroGenesis' plasma atomization process, today known as NEXGEN plasma atomization, allows PyroGenesis to produce and offer to the AM market high purity spherical metal powders, including titanium alloy powders. Many existing reactive metals cannot easily be transformed into high purity spherical powders; especially not in the finer size cuts such as -45µm/+15µm. NEXGEN offers an improved yield in the finer size cuts, along with a higher production rate, which allows for increased competitiveness. With its extensive plasma expertise, PyroGenesis can convert many metals and alloys into high purity spherical powders as its plasma torches use argon gas and the reactor is backfilled with argon. This ensures the powders produced are not exposed to any oxygen during the production process and as a result, PyroGenesis is able to produce high purity powder such as titanium alloy powders (Ti 6Al-4V grade 23).

Development of Processes to Produce High Purity Silicon Metals, Nano Powders and Nanowires

The Company is developing processes to produce high purity silicon metals through its PUREVAP process, and nano powders and nanowires through its PUREVAP NSiR process, all of which are expected to be predominantly offered to customers in the mining and metallurgical industries, including the battery industry.

Upgrading of Biogas and Landfill Gas (LFG) Into Renewable Natural Gas (RNG)

Through its subsidiary, Pyro Green-Gas, the Company offers equipment for the upgrading of biogas and landfill gas into RNG. The equipment combines different technologies for the removal of contaminants from biogas and landfill gas, such as hydrogen sulfide, oxygen nitrogen, volatile organic compounds (VOCs) and moisture. Pyro Green-Gas can offer both individual equipment and fully integrated turnkey systems to its customers.

Systems for the Purification of Industrial Gases

Through Pyro Green-Gas, the Company offers different equipment for gas purification and air emission controls. Pyro Green-Gas can offer both individual equipment and fully integrated turnkey systems to its customers. The technologies can be used, for example,

for coke oven gas purification, natural gas purification into high quality methane and purification of pyrolytic gas, as well as syngas, similar to the one produced by the Company's PRRS.

PUREVAP

PUREVAP is a patent pending one-step proprietary process that is being developed by the Company that uses a plasma arc within a vacuum furnace to produce high purity metallurgical grade silicon and solar grade silicon from quartz. PUREVAP reduces the quartz with carbon using a plasma submerged arc. Under vacuum, and at very low operating pressure, the silicon is refined in a one-step process removing all impurities and transforming it to its purest form, resulting in a high purity silicon. The Company expects that the silicon grades produced by PUREVAP will, when commercialized, be used for different applications, including solar energy.

In 2016, the Company and HPQ entered into a contract pursuant to which the Company would develop the PUREVAP process and HPQ would acquire the intellectual property rights to the PUREVAP process, for a total consideration of \$8,070,000 and a 10% royalty on future silicon gross sales proceeds payable to the Company, subject to the terms of the contract. PyroGenesis retained a royalty-free, exclusive, irrevocable, worldwide license to use the process for purposes other than the production of silicon material from quartz.

PUREVAP Nano Silicon Reactor ("NSiR")

The PUREVAP NSiR is designed to transform silicon into spherical silicon nano powders and nanowires for use in lithium-ion batteries. The new proprietary process is designed to be highly scalable and will eventually allow the production of silicon nano powders in large quantities at a competitive cost with other materials used in the lithium-ion space. The PUREVAP NSiR can use different purities of silicon as feedstock.

HPQ Nano acquired the intellectual property rights to the PUREVAP NSiR system in 2020 and PyroGenesis is entitled to a royalty of 10% on the future sales of nano silicon powders and wires by HPQ Nano, subject to the terms of the contract. The royalty stream can, at any time, be converted by PyroGenesis into a 50% ownership of HPQ Nano. PyroGenesis has retained a royalty-free, exclusive, irrevocable, worldwide license to use the new system for all purposes other than the manufacturing of nano silicon powders and wires.

Development of a Process to produce fuming silica from quartz

The new plasma-based process allows a direct Quartz to Fumed silica transformation, removing the usage of hazardous chemical in the conventional making of Fumed silica and eliminating the Hydrogen Chloride Gas (HCl) associated with its manufacturing. Furthermore, the process requires 15,000 kWh to produce a MT of Fumed Silica representing a 86% reduction in the energy footprint associated with manufacturing Fumed Silica. Finally, since the new process uses Quartz as feedstock, it is expected that capital requirements will only be a small fraction of what is required to build a traditional Fumed Silica plant.

HPQ Polvere acquired the intellectual property rights to the fuming silica patent in 2021 and PyroGenesis is entitled to a royalty of 10% on the future annual gross sales of fumed silica by HPQ Polvere, subject to the terms of the contract. The royalty stream can, at any time, be converted by PyroGenesis into a 50% ownership of HPQ Nano. PyroGenesis has retained a royalty-free, exclusive, irrevocable, worldwide license to use the new system for all purposes other than the manufacturing of nano fumed silica.

6.3. Installation & Servicing

As an option in its contracts, PyroGenesis can offer to its client installation, commissioning, and start-up services. These services are typically quoted as an option in equipment sales contracts. Separately, PyroGenesis offers after sales services to its customers. This includes the sale of spare parts, consumable parts and onsite or remote service on installed systems.

6.4. Research and Development, Internal and External Funded Projects by Customers

The Company relies on a combination of internally funded and externally funded R&D to grow its intellectual property portfolio. For externally funded R&D, the company typically retains intellectual property rights for the developed technology, while providing an exclusivity to the client in the sector of application and the geographic area of interest to the client.

6.5. Markets and Opportunities

Waste Destruction and Waste-to-Energy Systems

Marine Waste Treatment Market (PAWDS)

Historically, waste onboard ships were disposed of overboard. In 1973, the *International Convention for the Prevention of Pollution from Ships* was adopted by the International Maritime Organization. This convention is intended to prevent the pollution of the marine environment by discharge of harmful waste and effluents from ships. The storage of waste on a ship takes up valuable space and the eventual disposal in port is costly. Although most modern ships have onboard marine incinerators to treat their waste, these incinerators occupy a lot of space, typically covering three to four decks. PAWDS provides a solution to this problem, as the entire system can fit in the headroom of a single deck and is capable of being started up or shut down in a matter of minutes.

The main target market for PAWDS is the US Navy, and more specifically aircraft carriers. The US Navy typically builds a new aircraft carrier every 5 to 7 years. The price of one PAWDS system for the US Navy is approximately US\$5 to 6 million.

According to the Naval Vessel Register, as of February 2022, the U.S. Navy fleet comprises approximately 250 active in commission ships. Of these active ships, 11 are aircraft carriers, 9 are loading docks (LHA and LHD classes) and 2 are command ships (LCC class)¹. The Company believes these group of ships would be the most likely candidates for a retrofitting of their legacy waste management systems with a PAWDS.

Waste-to-Energy Market (PRRS)

Waste management is a large and growing market on a global scale. The methods of managing waste are shifting from disposal towards recycling and resource recovery. The Company believes that society as a whole is seeking more sustainable waste management practices that have lower environmental impacts than traditional solutions such as landfill or incineration.

In the short to medium term, the Company is targeting markets that are readily accessible for plasma waste-to-energy conversion, which include industrial, hazardous, non-hazardous remote communities, military bases and medical wastes. In the medium to long term, the Company also intends to target the municipal solid waste market with larger system capacities of up to 100 tons/day.

The ability for the PRRS to be a viable and economic alternative at relatively small capacities compared to conventional incinerators, makes it ideally suited for the decentralized treatment of industrial, hazardous and clinical waste. “The global waste to energy market size was valued at \$35.1 billion in 2019, and is projected to reach \$50.1 billion by 2027, growing at a CAGR of 4.6% from 2020 to 2027”²

PyroGenesis is currently engaged in pilot testing of its PRRS technology with two Canadian clients. The aim of the testing is to establish the design basis for larger commercial systems that will be proposed to the customers following the end of pilot testing. One of the clients was identified in a recent press release as Aluminerie Alouette. PyroGenesis is working on a plasma solution to treat the hazardous solid wastes produced by this industrial client. The goal is to produce a valuable, safe material from the waste, as well as an energy rich syngas that the client will use to reduce their consumption of purchased fuels.

¹ <https://www.nvr.navy.mil/NVRSHIPS/FLEETSIZE.HTML>.

² <https://www.alliedmarketresearch.com/waste-to-energy-market#:~:text=The%20global%20waste%20to%20energy,4.6%25%20from%202020%20to%202027.>

Plasma Torch Market

Plasma torches are used for different applications: for waste treatment systems (waste gasification and vitrification), in PyroGenesis' own PAWDS and PRRS systems, in thermal spray (plasma spray) in advanced materials production and in metallurgical applications.

Plasma torches can replace conventional fuel or gas burners in industrial furnaces. For example, the Company sells torches used in a patented pelletizing apparatus to customers which allows them to perform the induration of iron ore concentrate pellets in a tunnel furnace heated by plasma torches. Through this process, the generation of CO₂ by the conventional iron ore pelletizing processes is reduced by using electricity powered plasma torches instead of burning natural gas, heavy oil or pulverized coal in burners, thereby reducing considerably industrial pollution of the atmosphere.

Based on their knowledge of the industry, members of management of the Company estimate that a typical pellet plant producing 10 million metric tonnes of pellets per year emits approximately one million metric tonnes of CO₂. The total world production of such iron pellets is approximately 400 million metric tonnes per year about 20% of the total iron ore production³. Pellet production thermal energy consumption ranges between 600 and 1,000 megajoules/tonne (0.167 to 0.278 MWh/t)⁴. Assuming all of this energy was replaced by a one-megawatt plasma torches, the Company estimates the total number of plasma torches required to satisfy worldwide demand would be in the order of 10,000 units, which represents a potential torch market in excess of \$10 billion.

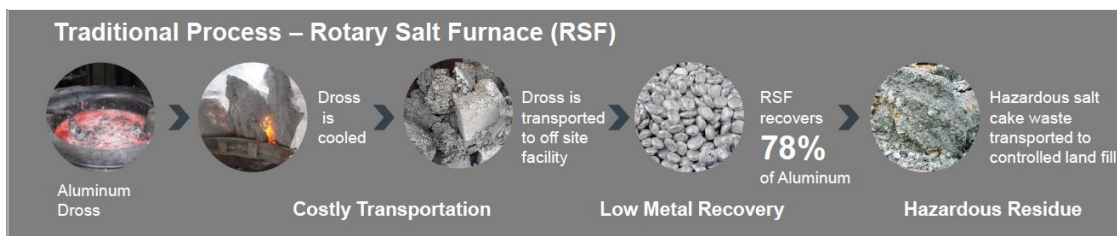
Systems for the Recovery of Aluminum and Other Metal from Dross

The total yearly world production of dross has been estimated at 3 million tonnes per year, slightly less than 5% of the 63 million tonnes of primary aluminum produced annually, which contains up to 80% valuable aluminum. The recent growth rate of primary aluminum has been relatively slow. Aluminum production between 2017 to 2019 has remained relatively flat. From 2006 to 2016, growth rate was a little over 1%.⁵

Based on these figures, the Company estimates the total market for DROSRITE at 600 units of a capacity of 5,000 tonnes per year each. It is important to note that more than half (approximately 56%) of the aluminum today is produced in China, a market that is difficult to enter, due to several factors, namely the lack of intellectual property protection, closed market conditions and the general political environment.

A typical dross is composed of 60% metal and 40% residue. Traditional dross treatment techniques contaminate the residues with salt. DROSRITE allows the recovery of the metal in dross without contamination of the 40% residues with salt, thus presenting a unique additional value-added opportunity. By using the DROSRITE technology, the residues have the capacity to be converted into high-margin chemical and metallurgical products, including ammonium sulphate and aluminum sulphate.

Figure 1- TRADITIONAL PROCESS

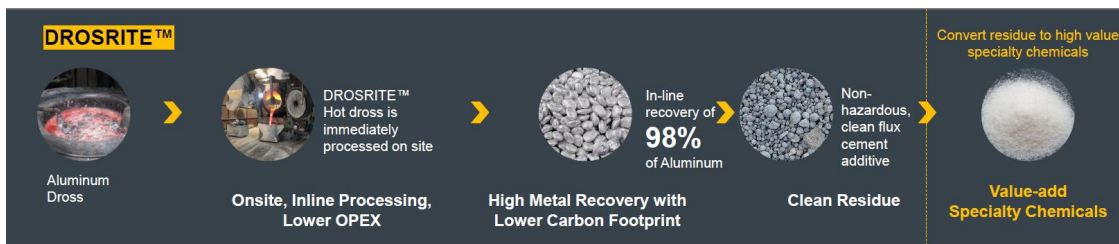


³ M. Huerta, J. Bolen, M. Okrutny, I. Cameron and K. O'Leary, "Guidelines for Selecting Pellet Plant Technology", Iron Ore Conference 2015 Proceedings (2015).

⁴ M. Huerta, J. Bolen, M. Okrutny, I. Cameron and K. O'Leary, "Guidelines for Selecting Pellet Plant Technology", Iron Ore Conference 2015 Proceedings (2015).

⁵ AlCircle: "Sector Focus Report on Aluminium Dross Processing: A Global Review", (2017).

Figure 2 - PYROGENESIS' DROSRITE PROCESS



PyroGenesis has recently refocused its marketing strategy for DROSRITE, transitioning from a model of selling equipment, to instead offering DROSRITE as a service via a tolling agreement. In a tolling arrangement, PyroGenesis would build, own and operate the DROSRITE system and associated equipment for the aluminum smelter on the smelter plant location. Tolling provides the advantage of recurring revenues to PyroGenesis. Tolling revenues can vary widely by sector and geographic location. Based on discussions with potential customers, the Company estimates that usual fees for the treatment of dross vary between approximately US\$250 and US\$450 per tonne of dross treated.⁶

By allowing the combination of treating dross and creating valuable residues, the DROSRITE technology presents the Company the opportunity to create one of the first, if not the first, global onsite dross processor delivering a zero-landfill/reduced carbon solution. To the Company's knowledge, no other companies offer the complete solution that can be offered by the Company with its DROSRITE technology. With its DROSRITE technology, the Company has the potential to become the environmentally friendly solution to a long existing problem.

Production of High Purity Silicon Metals, Nano Powders and Nanowires

Solar Industry

Solar grade silicon metal (SOG Si) is the key material needed to meet the growing demand for solar energy as each new gigawatt of capacity requires 5,000 tonnes of solar grade silicon metal. Canadian Solar estimates that solar energy will grow from ~2% of global electricity generation today to >10% by 2030.⁷ It is expected that at that time, global demand for solar grade silicon metal will reach an annual demand of 540,000 tonnes, compared to the current supply capacity of 350,000 tonnes per annum. The current market price for solar grade silicon metal is between US\$14 and US\$17 per kilogram.

Battery Industry

Research indicates that replacing graphite with nano silicon powders could allow the manufacturing of high-performance lithium-ion batteries with the capability of delivering an almost tenfold (10x) increase in anode capacity, inducing a 20-40% gain in the energy density of the next generation of lithium-ion batteries.⁸ The lithium-ion battery market size is estimated to grow from US\$44.2 billion in 2020 to US\$94.4 billion by 2025, equivalent to a compound annual growth rate of 16.4%.⁹ Manufacturing of silicon nano powders is not yet commercially feasible with selling prices of US\$30,000/kg.¹⁰

⁶ World Aluminium: "Primary Aluminium Production" (August 2020); AlCircle: "Sector Focus Report on Aluminium Dross Processing: A Global Review", (2017).

⁷ Deutsche Bank: "Polysilicon Market: Global Industry Analysis 2013-2017 and Opportunity Assessment 2018-2028".

⁸ Chemical Engineering News: "In the Battery Materials World, the Anode's Time Has Come", Volume 97, Issue 14 (2019).

⁹ MarketsandMarkets: "Lithium-Ion Battery Market – Global Forecast to 2025".

¹⁰ HPQ-Silicon Resources Inc.: Innovative Silicon Solutions, 2020.

Production of Fuming Silica

Fumed silica (pyrogenic silica) is a white microscopic powder with high surface area and low bulk density. Its commercial applications encompass various industries including personal care, pharmaceuticals, agriculture (food & feed), adhesives, sealants, construction, batteries and automotive to name a few. Demand for fumed silica is growing at 6% CAGR, with a global addressable market of US\$ 1.5 billion in 2016 expected to grow to US\$ 2.2 billion in 2022, but present manufacturing processes are hindering its growth potential.¹¹

Production of High Purity Spherical Metal Powders

Plasma atomized powders offer the best quality on the AM market but are limited in their adoption by their relatively higher price, compared to lower-quality gas atomized powders. PyroGenesis' ability with its NEXGEN technology to produce high-quality powder by plasma atomization at rates comparable to gas atomization, while maximizing the yield of powder in the preferred size range for AM, gives the Company a competitive advantage on the market.

The mutually exclusive distribution agreement with Aubert & Duval is meant to support PyroGenesis' sales on the European market. PyroGenesis is continuing its own sales efforts on the North American and Asian markets separately from this agreement and is talking to several high-level players in the aeronautics field. To the Company's knowledge, there are three main players supplying powders via plasma atomization: PyroGenesis, AP&C which is part of GE, and Tekna Advanced Materials. The demand for this product is so significant that all three players are ramping up their production capacity to meet the growing market's needs. PyroGenesis draws on its plasma torch and powder production expertise to design and develop its own torches and equipment.

According to the Wohler's Report (2018) and 3D Printing Metals Market¹², the metals market in 2017 was estimated at US\$183 million (all metals). In 2015 the metals market was estimated at US\$88.37 million. In 2017, the metal materials market grew at an estimated rate of 44.6%. Wohler's expects that the market will continue to grow at a double-digit rate, estimated at \$3.2 billion by 2024, with future opportunities for technology expansion in excess of \$774 million. PyroGenesis is primarily focusing its sales and marketing efforts on titanium and its alloys. Titanium is a highly sought for material in the aeronautics industry. It is also a high quality and high margin material. Additional high value materials will be considered in order to fully maximize the potential of the NEXGEN technology.

Renewable Natural Gas

Investments in biogas production and purification represent 20 billion dollars and 1000 new plants per year. In North America, there are 130 installed RNG plants and more than 100 in development (0-2 year timeframe). It is estimated that North America has the potential to develop another 1000 plants (2-10 year timeframe). The market for RNG purification is highly competitive. For example, there were 40 companies in the biogas upgrading sector in 2020, 5 more than 2 years earlier.¹³

6.6. Growth Strategy

Levering off its expertise in plasma, the Company introduces plasma-based technologies to, preferably, niche market, often times, by partnering with much larger companies who not only bring the credibility sought when introducing new technology, but also invaluable insight into the market and potential customers, while at the same time, providing valuable market feedback. The Company strategy is to leverage off these strategic partnerships and generate aggressive growth strategies geared to (i) broadening the customer base, as well as (ii) increasing sales to existing clients. The Company primarily targets offerings that reduce GHGs as opposed to those who do not. Each of the Company's existing product lines has been vetted or adopted by multi-billion-dollar industry leaders, which supports the Company in the execution of its growth strategy. As part of its growth strategy, the Company will also selectively consider opportunities to broaden and enhance its product and market scope through acquisitions.

¹¹ <https://hpqsilicon.com/press-release/hpq-silicon-and-pyrogenesis-sign-an-agreement-to-develop-a-new-environmentally-friendly-process-to-manufacture-fumed-silica/>

¹² Markets and Markets: "3D Printing Metals Market by form (Powder, Filament), Technology (PBF, DED, Binder Jetting, Metal Extrusion), Metal Type (Titanium, Nickel, Stainless Steel, Aluminum), End-Use Industry (A&D, Automotive, Medical & Dental), Region – Global Forecast to 2024."

¹³ Confidential report to the Company from Biogas World, October 2020.

6.7. Employees

The Company had, as of December 31, 2021, 87 part-time and full-time employees. Pyro Green-Gas has 11 part-time and full-time employees.

The Company prides itself in hiring talented individuals with a complementary mix of professional experience and industry knowledge. The Company continues to develop a working environment wherein everyone is valued for their contribution to the team and rewarded for their accomplishments. The Company believes that it has one of the highest concentrations of plasma expertise under one roof in the world. As of December 31, 2021, all of the Company's employees were non-unionized.

6.8. Facilities

The headquarters of the Company are located at 1744 William Street, Suite 200, Montréal, Québec, Canada, H3J 1R4 in leased premises, which are leased from the Pascali Trust, a related party of which P. Peter Pascali, the Chief Executive Officer of the Company, is a trustee, officer and beneficiary. See "Directors and Executive Officers - Conflicts of Interest".

The Company leases two manufacturing facilities, one facility which is 40,902 sq. ft. (3,800 m²) and is located at 5655 Philippe-Turcot, Montréal, Québec, Canada, H4C 3K8 and the second facility which is 31,632 sq. ft. (2,939 m²) and is located at 9371 Wanklyn Street, LaSalle, Québec, Canada, H8R 1Z2. These facilities are used to manufacture systems, produce powders, and host various pilot systems for demonstration and testing, as well as to provide spare parts to the Company's existing client base.

The Company's subsidiaries Pyro Green-Gas, Air Science Technologies Private Limited and Air Science Italia S.r.l. lease office premises in Montreal (Québec, Canada), India and Italy, respectively.

The Company does not own any real property.

6.9. Distribution Methods

The Company sells its products and systems primarily through direct sales by its own internal sales team. The marketing of the Company's products is provided by its internal sales and marketing group located in Montréal, Canada.

Under a mutual exclusive agreement with Aubert & Duval, PyroGenesis supplies plasma atomized titanium powder to Aubert & Duval for distribution to the AM market in Europe. In addition, Drosrite International has the right to manufacture, market, sell and distribute DROSRITE systems and the DROSRITE technology in the Kingdom of Saudi Arabia and certain other countries in the Middle East, on an exclusive basis.

The business of the Company is neither cyclical nor seasonal. The Company's products have long sales cycles, which are generally unaffected by seasonal variations.

The Company's agreements are typically for the sale of equipment. The Company gets paid on milestone payments that reflect progress on the projects. Usually, the Company tries to also obtain advance payments. For the sale of powders and parts, the Company generally invoices and gets paid upon delivery.

6.10. Intellectual Property and Research and Development

The intellectual property and proprietary rights of PyroGenesis, as well as its research and development ("R&D") efforts, are important to its business. Considering the time and investment required to develop new products and obtain marketing authorization, the Company places considerable importance on protecting its research findings, trade secrets and technologies.

Intellectual Property

In efforts to secure, maintain and protect its intellectual property and proprietary rights, PyroGenesis relies on a combination of trademarks, trade secrets and other rights. The Company relies on a combination of patents, laws, licences, non-disclosure agreements and various contractual arrangements to protect its exclusive technology. Nothing, however, can guarantee that the Company's

protective measures are enforceable or sufficient to prevent illicit appropriation of its technology or development of the same or similar technology by a third party.

Tradenames and Trademarks

PyroGenesis uses the following tradenames and trademarks in connection with the sale of its services and products, some of which are registered. The tradenames and logo are used everywhere the Company does business and the common law trademarks are or have been used in connection to the sale of specific products, notably in the following jurisdictions: Canada, United States, Europe, Brazil, Saudi Arabia, Australia, Israel, Taiwan and Vietnam.

- PYROGENESIS
- PYROGENESIS ADDITIVE
- PYROGENESIS ALUMINUM
- PYRO GREEN-GAS
- AIRSCIENCE TECHNOLOGIES
- NEXGEN
- DROSRITE
- PUREVAP
- SPARC
- APT
- APT-HP
- RPT
- MINIGUN™
- SPT
- PAWDS
- PACWADS
- PPRS
- PAGV
- AVITA



Patents

As of March 1st, 2022, the Company owned a total of 127 patents (26 granted, 101 pending) relating to its products and processes.

Research & Development

The Company's competitive strategy is based on technology leadership of its products and services. This strategy is underpinned by a strong innovation culture and a long-standing commitment to performing research and development. The Company's research and development projects in various areas, including but not limited to, the production of metallic powders and the development of plasma torches, are performed and conducted internally out of its Montréal facility.

As of March 1st, 2022, the Company employed nine engineers, scientists and technicians that are fully dedicated to research and development projects. Separately, the Engineering and Process Startup and Optimization teams are also involved in research and development projects. Most research and development projects are funded by external customers and are initiated to respond to a specific customer need. Follow-on work and equipment sales can often result from these initial research and development projects. Research and development projects are mainly focused on product extension. Internal research and development expenses vary widely from year to year and depend on Company priorities.

6.11. Environmental Protection

The Company currently has two active permits from the City of Montréal for testing on laboratory and pilot scale systems at its manufacturing facility, as well as operation of its powder production system.

The Company needs to apply for a new permit each time a new project involving testing occurs. There are no costs to these permits except the time required to prepare the documentation for the City of Montréal. The time to obtain a permit is usually between two and four months.

6.12. Foreign Operations

The Company, through its subsidiaries Air Science Technologies Private Limited and Air Science Italia S.r.l., carries out operations in Italy and India.

6.13. Competition

PyroGenesis competes with a substantial number of companies in the industries in which it operates, some of 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.

For example, in the waste destruction and waste-to-energy systems markets, the Company faces competition from Europlasma, in the systems for the recovery of aluminum and other metal from dross market, the Company faces competition from Altek, a division of Harsco Corp., and in the production of high purity spherical metal powders market, the Company faces competition from AP&C, a GE Additive company, and Tekna, a portfolio company of Arendals Fossekompagni ASA.

7. Dividends and Distributions

The Company has not paid any dividends, has no policy on paying dividends or distributions, and has no present intention to pay dividends. The Company currently intends to reinvest any earnings to fund the development and growth of its business. Any future payments of dividends will be at the discretion of the Board and will depend on many factors, including, among other things, the Company's financial condition, current and anticipated capital requirements, contractual requirements, solvency tests imposed by applicable corporate law and other factors it may deem relevant.

8. Description of Capital Structure

The following describes the material terms of the Company's share capital and the number of Common Shares issued and outstanding. The following description may not be complete and is subject to, and qualified in its entirety by reference to, the terms and provisions of the Company's articles (the "Articles").

8.1. Authorized Share Capital

The Company is authorized to issue an unlimited number of Common Shares without par value. Subject to the rights, privileges, restrictions and conditions attaching to any preferred shares authorized in the future, the rights of the holders of Common Shares, as a class, are equal in all respects and include the right:

Voting: to vote at any meeting of shareholders;

Dividends: to receive, as and when declared by the directors of the Company, any dividends payable on such dates, for such amounts and at such place or places as the Board may from time to time determine; and

Liquidation or Dissolution: to receive the remaining property of the Company on liquidation or dissolution.

Share redemptions for cancellation

During 2021, the Company repurchased and cancelled 840,094 common shares at a weighted average price of \$4.96 per share, for total cash considerations of \$4,183,617 including commissions of \$16,678. As at the date of this AIF, there were 170,125,795 Common Shares issued and outstanding.

8.2. Stock Options

The following table sets forth, as of March 31, 2022, the aggregate number of exchangeable securities that are outstanding.

Description of Security	Number of exchangeable securities	Number of listed securities (Common Shares) issuable upon exchange
Stock Options ⁽¹⁾	8,843,000	8,843,000

Notes:

(1) Details of stock options outstanding: (i) 2,400,000 stock options exercisable at a price of \$0.58 until November 3, 2022, (ii) 300,000 stock options exercisable at a price of \$0.51 until July 3, 2023, (iii) 40,000 stock options exercisable at a price of \$0.52 until October 29, 2023, (iv) 100,000 stock options exercisable at a price of \$0.51 until September 29, 2024, (v) 100,000 stock options exercisable at a price of \$0.45 until January 2, 2025, (vi) 2,233,000 stock options exercisable at a price of \$4.41 until July 16, 2025 (vii) 250,000 stock options exercisable at a price of \$4.00 until October 26, 2025, (viii) 550,000 stock options exercisable at a price of \$8.47 until April 6, 2026, (ix) 200,000 stock options exercisable at a price of \$6.59 until June 1, 2026, (x) 100,000 stock options exercisable at a price of \$6.70 until June 14, 2026, (xi) 100,000 stock options exercisable at a price of \$5.04 until October 14, 2026, (xii) 1,920,000 stock options exercisable at a price of \$3.13 until December 17, 2026, (xiii) 100,000 stock options exercisable at a price of \$3.61 until December 30, 2026, (xiv) 450,000 stock options exercisable at a price of \$3.33 until January 3, 2027.

9. Market for Securities

9.1. Trading Price and Volume

The Common Shares are since November 20, 2020 listed on the TSX and were previously listed on the TSX-V under the symbol "PYR". The following table sets forth, for the periods indicated, the reported high and low prices and the aggregate volume of trading

of the Common Shares on the TSX. The Common Shares are also listed on the NASDAQ since March 11, 2021, under the symbol “PYR” and on the Frankfurt (FRA) exchange under the symbol “8PY”.

<u>Period</u>	<u>High (\$)</u>	<u>Low (\$)</u>	<u>Average Daily Trading Volume</u>
January 2021	5.05	3.57	389,010
February 2021	11.88	4.43	1,158,558
March 2021	10.82	7.72	477,727
April 2021	8.82	5.95	473,918
May 2021	6.76	4.86	555,840
June 2021	7.98	6.28	381,422
July 2021	6.28	4.52	311,175
August 2021	5.33	4.40	255,785
September 2021	5.73	5.02	299,649
October 2021	5.16	4.43	205,568
November 2021	5.46	4.13	282,671
December 2021	4.07	3.03	439,138

9.2. Prior Sales

The following table summarizes the issuances of unlisted securities of the Company during the financial year ended December 31, 2021.

<u>Date of Grant</u>	<u>Type of Security Issued</u>	<u>Number of Securities Issued</u>	<u>Price Per Security</u>	<u>Total Consideration</u>
April 6, 2021	Stock Options	550,000	\$ 8.47	n/a
June 1, 2021	Stock Options	200,000	\$ 6.59	n/a
June 14, 2021	Stock Options	100,000	\$ 6.70	n/a
October 14, 2021	Stock Options	100,000	\$ 5.04	n/a
December 17, 2021	Stock Options	1,920,000	\$ 3.13	n/a
December 30, 2021	Stock Options	100,000	\$ 3.61	n/a

10. Directors and Executive Officers

The Articles of the Company provide for a minimum of three directors and a maximum of 15 directors. Each director holds office until the close of the next annual general meeting of the Company, or until his or her successor is duly elected or appointed, unless his or her office is earlier vacated.

10.1. Name and Occupation

The following table lists the names of the directors and executive officers of the Company as of the date of this AIF and their province/state and country of residence, their positions and offices held with the Company, their principal occupations during the past

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five years, the date on which they first became officers or directors of the Company, and the number and percentage of Common Shares which is beneficially owned, directly or indirectly, or over which control or direction is exercised, by each of them.

Name, Province/State and Country	Positions and Offices Held with the Company	Committee (s) of the Board of Directors	Director or Officer of the Company Since/Until	Principal Occupation for the Previous Five Years	Number (and Percentage) of Common Shares Owned or Controlled
P. Peter Pascali Québec, Canada	President Chief Executive Officer Chair of the Board of Directors		2006	President and Chief Executive Officer of the Company since 2006.	79,744,498 ⁽¹⁾ (46.87%)
Pierre Carabin Québec, Canada	Chief Technology Officer & Chief Strategist		2006	Chief Technology Officer & Chief Strategist of the Company since 2018. Previously, Chief Technology officer from 2016 to 2018.	491,500 (0.29%)
Robert M. Radin South Carolina, USA	Lead Independent Director – Board of Directors	Member of the Audit Committee Chair of the Compensation Committee Member of the Nominating and Corporate Governance Committee	2012	President of Radin & Associates Consulting, LLC since 2011.	643,500 (0.38%)

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Name, Province/State and Country	Positions and Offices Held with the Company	Committee (s) of the Board of Directors	Director or Officer of the Company Since/Until	Principal Occupation for the Previous Five Years	Number (and Percentage) of Common Shares Owned or Controlled
Andrew Abdalla, CPA, CA Québec, Canada	Director – Board of Directors	Chair of the Audit Committee Member of the Compensation Committee Member of the Nominating and Corporate Governance Committee	2018	Senior Partner at chartered accountancy and business advisory firm MNP LLP.	107,800 (0.06%)
Dr. Virendra Jha Québec, Canada	Director – Board of Directors	Chair of the Nominating and Corporate Governance Committee Member of the Compensation Committee	2019	Director on the Board of the Atomic Energy of Canada Limited. Member of the Order of Canada. Vice President Canadian Space Agency 2003 to 2008. Acting President of the Canadian Space Agency from 2005 to 2006. Chief Engineering Adviser at the Canadian Space Agency until his retirement in 2014.	100,000 (0.06%)

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Name, Province/State and Country	Positions and Offices Held with the Company	Committee (s) of the Board of Directors	Director or Officer of the Company Since/Until	Principal Occupation for the Previous Five Years	Number (and Percentage) of Common Shares Owned or Controlled
Rodayna Kafal Québec, Canada	Vice President, Investor Relations and Strategic Business Development Director – Board of Directors		Officer since 2016 Director since 2020	Vice President, Investor Relations and Strategic Business Development of the Company.	21,157 (0.01%)
Nannette Ramsey Florida, USA		Member of the Compensation Committee	2021	Site Manager and Associate Director of Engineering at Edgewood Chemical Biological Center Rock Island until her retirement in 2015.	1,000 (0.001%)
Ben Naccarato Georgia, USA	Director – Board of Directors	Member of the Audit Committee Member of the Compensation Committee	2021	Executive Vice President and Chief Financial Officer at Perma-Fix Environmental Services Inc.	350 (0.0002%)

Name, Province/State and Country	Positions and Offices Held with the Company	Committee (s) of the Board of Directors	Director or Officer of the Company Since/Until	Principal Occupation for the Previous Five Years	Number (and Percentage) of Common Shares Owned or Controlled
Andre Mainella Québec, Canada	Chief Financial Officer		2021	Chief Financial Officer since 2021 Director of Consolidation and Corporate accounting, Cogeco Communications Inc.	0 (0.0%)
Sara-Catherine L. Tolszczuk Québec, Canada	Legal Counsel and Corporate Secretary		2020	Legal Counsel and Corporate Secretary of the Company since 2020. Intellectual Property Lawyer at Lavery de Billy, L.L.P. from 2018-2020.	0 (0.0%)

Notes:

Mr. Pascali holds 64,742,941 Common Shares directly, and indirectly holds or controls (i) 7,251,000 Common Shares through a holding company, 8339856 Canada Inc., of which he is the sole shareholder, (ii) 1,000,000 Common Shares through a foundation, The 2 Percent Solution Foundation, and (iii) 6,750,557 Common Shares through the Pascali Trust, a family trust of which he is a trustee, officer and a beneficiary. “Description of Capital Structure - Stock Options”.

All executive officers of the Company are full time employees of the Company and none are independent contractors.

As of March 31, 2022, the directors and executive officers of the Company, as a group, beneficially own, directly or indirectly, or exercise control or direction over, an aggregate of 81,109,805 Common Shares representing 47.68% of the issued and outstanding Common Shares.

10.2. Biographies

The following biographies provide certain selected information in respect of the persons who are serving as directors and executive officers of the Company:

P. Peter Pascali – President, Chief Executive Officer and Chair of the Board of Directors

Mr. P. Peter Pascali, after graduating with an MBA from McGill University in 1983, became an investment banker specializing in mergers and acquisitions and public offerings. He initially worked for the Bank of Nova Scotia and then, in 1987, joined Westpac Banking Company. In 1989, he joined DeGeorge Financial Company as a strategic advisor. Mr. Pascali has been with the Company since its incorporation in 2006 where he has been responsible for developing the business strategy and marketing focus for commercializing the Company’s technologies and running the business. Mr. Pascali continues to develop the Company’s strategy and oversee the operational management as the President and Chief Executive Officer. In his leadership role, Mr. Pascali spearheads the Strategic Management Team which is responsible for the strategic planning and execution of the Company’s business plans.

Robert M. Radin – Director, Member of the Audit Committee, Member of the Nominating and Corporate Governance Committee and Chair of the Compensation Committee

Robert M. Radin, retired from the U.S. Army in 2011 after serving for over 35 years and attaining the rank of Major General. His last assignment was as the U.S. Army Assistant Deputy Chief of Staff, G-4, (Logistics), the Pentagon, Washington, DC. In this position he was responsible for policy development, strategic planning and budget programming for distribution, logistics force structure, readiness reporting, Army pre-positions stocks, contingency contracting and support of U.S. Army worldwide operations. Prior to joining the Army Staff, he served as the Commanding General of the U.S. Army Sustainment Command at Rock Island, Illinois. Other key assignments include: Deputy Chief of Staff for Operations and Logistics for the U.S. Army Materiel Command from 2005 to 2007; Commanding General of the Joint Munitions Command from 2004 to 2005; and from 2003 to 2004 was deployed to Kuwait as the Commanding General, U.S. Army Materiel Command-SWA and was responsible for support of U.S. land forces in Kuwait, Iraq, Afghanistan and Djibouti. After retiring from the Army in June 2011, he founded Radin & Associates Consulting, LLC, a firm that assists clients with supply chain related issues. Mr. Radin has graduated from the U.S. Military Academy at West Point and holds postgraduate degrees from the Florida Institute of Technology and the National Defense University.

Dr. Virendra Jha – Director, Member of the Compensation Committee and Chair of the Nominating and Corporate Governance Committee

Dr. Virendra Jha, member of the order of Canada, has over 42 years of experience in the Canadian Space Program ranging from in-depth engineering work to senior management positions in both the private and the public sectors. Dr. Jha began his space career in 1972 when he joined the aerospace group of RCA Limited Montréal, which later became Spar Aerospace Limited. In 1988, he became the Director of Engineering at Spar Aerospace Limited. In 1991 Dr. Jha joined the Canadian Space Agency as Director of the Space Mechanics Group. In 1996, he was promoted to the position of Director General, Space Technologies Branch of the CSA. From 2003 till 2008, he was the Vice-President responsible for Science, Technology and Programs at the Canadian Space Agency. As Vice President, Dr. Jha provided strategic direction, vision and leadership to all core technical sectors of the Agency. From November 2005 until February 2006, Dr. Jha also served as the Acting President of the Canadian Space Agency. He was Chief Engineering Adviser at the Canadian Space Agency until his retirement in 2014.

Dr. Jha received his B. Tech. degree in Mechanical Engineering from the Indian Institute of Technology Delhi India, his Master's degree in Mechanical engineering from McMaster University, Hamilton, Canada, and his Ph.D. degree in Mechanical Engineering from Concordia University, Montréal, Canada and the C.Dir. (Chartered Director) Degree from McMaster University, Hamilton, Canada. Dr. Jha's technical contributions in Canadian Space Program as well as in International Space activities have been significant. His leadership and commitment to the profession is reflected by his recognition and active participation in many groups, committees and advisory boards.

Dr. Jha currently serves as a director on the Board of the Atomic Energy of Canada Limited, a Canadian federal Crown corporation and Canada's largest nuclear science and technology laboratory.

Andrew Abdalla – Director, Member of the Compensation Committee, Member of the Nominating and Corporate Governance Committee and Chair of the Audit Committee

Andrew Abdalla, CPA, CA, is a partner at MNP LLP, a leading national accounting, tax and business consulting firm in Canada. Mr. Abdalla brings to the Board of Directors more than 20 years of strategic planning, and tax advice, with a specific focus on sales and income tax, acquisitions and divestitures, business valuations, corporate reorganizations and spinoffs. Mr. Abdalla received his Chartered Professional Accountant (CPA, CA) designation in 1987. He holds a Bachelor of Commerce and a graduate diploma in public accounting from Concordia University in Montréal.

Rodayna Kafal – Director, VP, Investor Relations and Strategic Business Development

Upon graduating from McGill University in 2009 (Bachelor's degree in Chemical Engineering), Ms. Kafal took on lead roles in process engineering at the Natural Gas Technologies Centre in Montréal, Québec, where she was responsible for managing a number of high-level projects. Thereafter, she enrolled in a two-year graduate program in Industrial Engineering and Project Management at École Polytechnique de Montréal. Ms. Kafal joined PyroGenesis with a strong background in process engineering, combined with practical experience in sales, promotional activities and business relations. Ms. Kafal has been a member of PyroGenesis' Strategic Management

Group since 2016 where she has been instrumental in providing input into all aspects of PyroGenesis' growth and represented the views of the investor community. As Vice President, Investor Relations and Strategic Business Development, Ms. Kafal continues to oversee PyroGenesis' complete investor relations program, while managing the Company's marketing team.

Ben Naccarato – Director, Member of the Compensation Committee, Member of the Audit Committee

Mr. Naccarato, CPA, CMA, is the Executive Vice-President and Chief Financial Officer at Perma-Fix Environmental Services Inc., a NASDAQ-listed environmental services company, providing unique radioactive mixed and industrial waste management services. Mr. Naccarato brings to the Board more than 30 years of experience in senior financial positions in the environmental industry. Mr. Naccarato is a graduate from the University of Toronto with a Bachelor of Commerce and Finance Degree as well as being a Chartered Professional Accountant and Certified Management Accountant (CPA, CMA)

Nannette Ramsey – Director, Member of the Compensation Committee

Ms. Ramsey holds undergraduate degrees in Economics, Engineering and an MBA. She brings process engineering and machining and materials expertise from Caterpillar Tractor Company, J.I. Case and more recently served as the Site Manager and Associate Director of Engineering for Edgewood Chemical Biological Center's site at the Rock Island Arsenal in Illinois. She was responsible for strategic planning, budgeting, industrial base analysis, engineering and testing, quality assurance and information technology solutions to a variety of customers.

Pierre Carabin – Chief Technology Officer and Chief Strategist

Mr. Pierre Carabin, P. Eng., has over thirty years of experience in process engineering and environmental technologies. Throughout his 23 years at PyroGenesis, he has been instrumental in the development of the Company's various technology platforms. He is the inventor or co-inventor of more than one hundred pending and issued patents relating to high temperature chemical processes. As Chief Technology Officer, he leads PyroGenesis' engineering team in the design and development of plasma systems and is also member of the Company's Strategic Management Team which is responsible for the strategic planning and execution of the Company's business plan.

Prior to joining PyroGenesis in 1998, Pierre worked in the pulp and paper industry for 8 years, notably developing paper recycling machinery. Pierre holds a Master's degree in Chemical Engineering with honors from McGill University, and, to date, he has contributed in more than 50 technical communications for various journals and at technical conferences. Pierre also volunteers for the Air and Waste Management Association (AWMA) and Ecotech Québec, the cleantech cluster in Québec.

Andre Mainella – Chief Financial Officer

Upon graduating from Concordia University, Andre has since then accumulated over 20 years of experience in accounting. Andre began his career at Raymond Chabot Grant Thornton. As a senior audit manager, he worked on a diverse list of audit and non-audit related mandates for private and publicly-traded companies. His broad experience includes clients in various business sectors such as manufacturing, distribution, retail, real estate and airlines. Andre had the opportunity to assist in the implementation of accounting standards, initial public offerings as well as business acquisitions and divestitures.

From 2013 to 2015, Andre occupied the role of finance manager for the Canadian operations of Orica, a provider of commercial explosives and blasting systems for the mining and construction sectors. Andre was responsible for the financial information, budgeting & forecasting, in addition to advising on new sales contracts and capital projects, among others.

Subsequently, Andre joined Cogeco, a telecommunications and media company, as their director of consolidation and corporate accounting. He managed the activities of corporate accounting, shared services, and the consolidation of the Canadian and American financial results. Andre was part of the Cogeco corporate team for 6 years, and also contributed in various manners to the implementation of the company's numerous acquisitions, enterprise resource planning implementation, new accounting standards, and involvement in the corporate insurance policies.

Andre received his Chartered Professional Accountant designation in 2001. He holds a Bachelor of Commerce and a graduate diploma in public accounting from Concordia University in Montreal.

Sara-Catherine L. Tolszczuk – Legal Counsel and Corporate Secretary

Sara-Catherine Tolszczuk joined PyroGenesis Canada Inc. in 2020 as in-house Legal Counsel and Corporate Secretary. She is also a member of the Strategic Management Group which is responsible for the strategic planning and execution of the Company's business plan.

Ms. Tolszczuk is responsible for identifying, assessing and managing legal, reputational and regulatory risks for the Company and providing guidance on a variety of legal matters, including securities, corporate governance, contracts, employment and intellectual property. She is also responsible for drafting legal procedures and documents as well as engaging in contract negotiations with business partners and clients in support of the business objectives of the Company.

Before joining PyroGenesis, Ms. Tolszczuk was part of the intellectual property group of a leading independent law firm in the province of Québec. Her work involved developing strategies for the protection, commercialization and enforcement of patents, trademarks, copyrights, industrial designs and trade secrets. Ms. Tolszczuk also acquired experience in drafting a wide range of contracts, including product development, services, sales, licencing and confidentiality agreements. As a compliment to her intellectual property-centered practice, Ms. Tolszczuk advised clients on matters relating to the compliance with the Consumer Protection Act, the Charter of the French Language, and Canada's Anti-Spam and privacy legislation and participated in the due diligence phase of transaction files.

Ms. Tolszczuk completed a Bachelor of Law and Master's degree in Biology with a concentration in life sciences and law at Université de Sherbrooke and was admitted to the Québec Bar in 2018.

10.3. Cease Trade Orders, Bankruptcies, Penalties or Sanctions

No director, officer, or shareholder of the Company holding a sufficient number of securities of the Company to affect materially the control of the Company: (a) is, or within 10 years before the date of this AIF has been, a director or officer of any other company that, while that person was acting in that capacity, (i) was the subject of a cease trade or similar order, or an order that denied the other issuer access to any exemptions under applicable securities law, for a period of more than 30 consecutive days; or (ii) became bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency or was subject to or instituted any proceedings, arrangement or compromise with creditors or had a receiver, receiver manager or trustee appointed to hold its assets; (b) has been subject to any penalties or sanctions imposed by a court relating to Canadian securities legislation or by a Canadian securities regulatory authority or has entered into a settlement agreement with a Canadian securities regulatory authority; (c) has been subject to any other penalties or sanctions imposed by a court or regulatory body that would be likely to be considered important to a reasonable investor making an investment decision; or (c) is, or has become within 10 years before the date of this AIF, bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency, or been subject to or instituted any proceedings, arrangement or compromise with creditors, or had a receiver, receiver manager or trustee appointed to hold its assets.

10.4. Conflicts of Interest

There are potential conflicts of interest to which the directors and officers of the Company may be subject to in connection with the operations of the Company. In particular, the Pascali Trust, of which P. Peter Pascali, the Chief Executive Officer of the Company, is a trustee, officer and beneficiary is the landlord under the lease regarding the Company's corporate headquarters. See "Business of the Company - Facilities" and "General Development of the Business - Year Ended December 31, 2020 - Additional Developments". Over the past three completed financial years, P. Peter Pascali has also participated in financings of the Company, and he may continue to do so in the future. See "General Development of the Business - Year Ended December 31, 2019 - Financings" and "General Development of the Business - Year Ended December 31, 2020 - Financings". In addition, the son of P. Peter Pascali, Alex Pascali, is the sole director, officer and shareholder of Drosrite International. See "General Development of the Business - Year Ended December 31, 2019 - Contracts and Milestones". In addition to being the Chief Executive Officer of the Company, P. Peter Pascali is also a controlling shareholder of the Company. See "Risk Factors - Influence of the Significant Shareholders".

To the best of the Company's knowledge, other than as disclosed in this AIF, there are no known existing or potential conflicts of interest among the Company, the directors and officers of the Company or other members of management or of any proposed promoter, director, officer or other member of management as a result of their outside business interests except that certain of the directors and

officers serve as directors and officers of other companies, and therefore it is possible that a conflict may arise between their duties to the Company and their duties as a director or officer of such other companies.

A director who has a material interest in a matter before the Board or any committee on which he or she serves is required to disclose such interest as soon as the director becomes aware of it. In situations where a director has a material interest in a matter to be considered by the Board or any committee on which he or she serves, such director may be required to absent himself or herself from the meeting while discussions and voting with respect to the matter are taking place. Directors are also required to comply with the relevant provisions of applicable corporate laws regarding conflicts of interest. Under the CBCA, directors who have a material interest in any person or entity that is a party to a material contract or a proposed material contract with the Company are required under the CBCA, subject to certain exceptions, to disclose that interest and generally abstain from voting on any resolution to approve such a contract. In addition, directors and executive officers are required to act honestly and in good faith with a view to the best interests of the Company.

11. Audit Committee and Other Committees

11.1. Audit Committee

The Company's Audit Committee is responsible for assisting the Board in monitoring the performance of management in ensuring that the Company is operating in an ethical manner and encouraging management to demonstrate a strong commitment to integrity.

The Audit Committee is also responsible for providing assistance to the Board in fulfilling its financial reporting and control responsibilities to the shareholders of the Company and to the investment community. The Audit Committee's primary responsibilities in this regard are to: (i) oversee the accounting and financial reporting process of the Company and the audit of its financial statements; (ii) monitor the Company's financial reporting process and internal control systems; (iii) review and appraise the audit activities of the Company's independent auditors; (iv) meet periodically with management and with the independent auditors; and (v) assess the relevance and reliability of the Company's financial reports to ensure they accurately portray the underlying economic circumstances and financial performance of the Company.

Audit Committee Charter

The Audit Committee's mandate is to promote and ensure that the Company complies with high standards of financial reporting, risk management and ethical behavior. The Audit Committee Charter is attached hereto as Schedule "A".

Composition of the Audit Committee

The Audit Committee is comprised of three directors, Messrs. Abdalla (Chairman of the Audit Committee), Naccarato, and Radin. Messrs. Abdalla, Radin and Naccarato meet the independence requirements for members of the Audit Committee pursuant to NI 52-110, NASDAQ Rule 5605 and Rule 10A-3 under the Securities Exchange Act of 1934, as amended. Each of the three members is financially literate within the meaning of NI 52-110 and NASDAQ Rule 5605 and, has an understanding of the accounting principles used to prepare financial statements and varied experience as to the general application of such accounting principles, as well as an understanding of the internal controls and procedures necessary for financial reporting. For additional details regarding the education and experience of each member of the Audit Committee, see "Directors and Executive Officers".

Pre-Approval Policies and Procedures

The Audit Committee must pre-approve all non-audit services to be provided to the Company by its external auditors.

External Fees by Audit Category

The Audit Committee has reviewed the nature and amount of the non-audit services provided by the Company's external auditors, RCGT LLP and the predecessor auditor KPMG LLP for 2020. Fees incurred with the auditors for audit and non-audit services in the last two fiscal years for audit fees are outlined in the following table.

	Fees paid to RCGT LLP in Fiscal Year ended December 31, 2021	Fees paid to KPMG LLP in Fiscal Year ended December 31, 2020(4)
Audit Fees ⁽¹⁾	\$ 325,500	\$ 719,352
Audit-Related Fees ⁽²⁾	\$ —	\$ 52,938
Tax-Related Fees ⁽³⁾	\$ 9,975	\$ 36,594
All Other Fees	\$ 21,000	\$ —
Total Fees	\$ 356,475	\$ 827,579

Notes:

(1) "Audit Fees" include fees necessary to perform the annual audit of the Company's consolidated financial statements, and for services that are normally provided in connection with statutory and regulatory filings or engagement related to the annual consolidated financial statements.

(2) "Audit-Related Fees" include translation services and fees for accounting consultations on matters reflected in the financial statements.

(3) "Tax-Related Fees" includes fees for tax compliance, tax planning and tax advice. Tax planning and tax advice includes assistance with tax audits and Research and Development tax credits.

(4) 2020 Audit fees have been revised in the current AIF to add additional audit fees related to fiscal 2020.

11.2. Other Committees

The Board believes that sound corporate governance practices are essential to the effective, efficient and prudent operation of the Company and to the enhancement of shareholder value.

Under *National Instrument 58-101 respecting Disclosure of Corporate Governance Practices*, a director is considered to be independent if he or she is independent within the meaning of section 1.4 of National Instrument 52-110 – Audit Committees (the "NI 52-110"). Pursuant to NI 52-110, an independent director is a director who is free from any direct or indirect relationship which could, in the view of the board, be reasonably expected to interfere with a director's independent judgment. Based on information provided by each director concerning his or her background, employment and affiliations, the Board has determined that, of the seven directors on the Company's Board, P. Peter Pascali and Rodayna Kafal are not independent under these standards because they are executive officers of the Company.

In addition to the Audit Committee, the Board has established two other standing committees, namely the Nominating and Governance Committee and the Compensation Committee.

Nominating and Corporate Governance Committee

The Company's Nominating and Corporate Governance Committee consists of three directors, each of whom is a person determined by the Board to be an independent director, and is charged with reviewing, overseeing and evaluating the Company's corporate governance and nominating policies. The Nominating and Corporate Governance Committee comprises Dr. Virendra Jha (Chair), Andrew Abdalla and Robert M. Radin. The Board has adopted a written charter setting forth the purpose, composition, authority and responsibility of the Nominating and Corporate Governance Committee.

Compensation Committee

The Company's Compensation Committee consists of five directors, each of whom is a person determined by our Board to be an independent director, and is charged with reviewing, overseeing and evaluating the Company's compensation policies. The Compensation Committee comprises Robert M. Radin (Chair), Andrew Abdalla, Dr. Virendra Jha, Ben Naccarato and Nannette Ramsey.

The Board has adopted a written charter setting forth the purpose, composition, authority and responsibility of the Compensation Committee.

12. 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 AIF. 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.

12.1. Risks Related to the Company's Business and Industry

Operating Income (Loss) and Negative Operating Cash Flow

The Company has a history of losses and negative cash flows. The Company's operations have not generated sufficient earnings and cash flows to date to result in consistent profitability or positive cash flows. For the year ended December 31, 2021, the Company had net losses of \$38,431,939 (which includes a loss from the change in value of strategic investment of \$21,426,218), cash flows used in operations of \$18,113,432, and an accumulated deficit of \$61,217,831. To the extent that the Company has net losses and negative operating cash flows in future periods, it may need to allocate a portion of its cash reserves to fund such negative cash flows. The Company may also be required to raise additional funds through the issuance of equity or debt securities, or otherwise. There can be no assurance that the Company will be able to generate positive cash flows 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 develop and introduce 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. 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. In addition, the Company may not generate significant gains, and may suffer losses, from the value of its strategic investments in the future.

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 from time to time experienced changes in its operating plans and 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:

- unforeseen engineering and/or environmental problems;

- delays or inability to obtain required financing, licenses, permits and/or regulatory approvals;
- supply interruptions and/or labour disputes;
- foreign exchange fluctuations and/or collection risk; and
- competition from other suppliers and/or alternative energy solutions that are less capital intensive.

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

Concentration Risk

To date, a small number of customers have accounted for a majority of PyroGenesis' revenues. As its business expands, the Company expects that revenue distribution will be over a larger number of different customers. For the year ended December 31, 2021, sales of PyroGenesis to its four principal customers accounted for approximately 79% of its total revenue. For the year ended December 31, 2020, sales to two principal customers accounted for approximately 79% of PyroGenesis' total revenue. The loss of, or a reduction in, purchase orders or anticipated purchase orders from PyroGenesis' principal customers could have a material adverse effect on its business, financial condition and results of operations. Additionally, if one of PyroGenesis' customers is unable to meet its commitments to PyroGenesis, the Company's business, financial condition and results of operations could be adversely affected.

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

Technology Development and Manufacturing Capability Risks

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

Additional financing and dilution

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

The Company does not exclude raising additional funds by equity financing. In addition, at March 31, 2022, 8,843,000 stock options are currently issued and outstanding. The exercise of stock options and/or warrants, as well as any new equity financings, represents dilution factors for present and future shareholders.

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

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

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

Changes to Contracts

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

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

Foreign Exchange Exposure

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

Competition

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

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

Management and Key Personnel

PyroGenesis depends on the skills and experience of its executive and 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 executives and 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 executives and 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 may be detrimental to the Company's interests or that PyroGenesis will continue to have access to the regulatory agencies in the countries in which it sells or seeks to sell, directly or indirectly, its products and services. 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, including in the United States, the European Union and the Middle East. 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;
- any 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 its products are sold due to economic, legislative, political, military and other 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, the Company is subject to routine audit and investigation procedures of government agencies. 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, which may have a negative effect on its results of operations. Contrary to cost-reimbursable contracts, some costs may not be reimbursed or allowed under fixed-price contracts, which may have a negative effect on the Company's results of operations if it experiences costs overruns.

Environmental Liability

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

Product Liability and Other Lawsuits

PyroGenesis is subject to a variety of potential product liabilities claims and other lawsuits related with its operations, including liabilities and expenses associated with product defects. The Company maintains product liability and other insurance coverage that management believes is generally in accordance with the market practice in its industry, but there can be no assurance that the Company will always be adequately insured against all 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 and affect its reputation. 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 or sold by the Company may entail potential liability and possible warranty claims. The Company is also required to indemnify Drosrite International for any claims and liabilities incurred in connection with the Drosrite systems. 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. Security measures may be breached by intentional misconduct by computer hackers, as a result of third-party action, employee errors, 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, business, operations and financial results.

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.

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. Governments and central banks have reacted with significant monetary and fiscal interventions designed to stabilize economic conditions. The duration and full impact of the COVID-19 outbreak continues to remain 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 COVID-19 related impacts on the future financial results and operations of the Company.

As of the date of this AIF, the Company has successfully continued operations under various COVID-19 protocols implemented since the beginning of the outbreak. 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 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 services or products.

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 continues to evolve. 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 has in the past and may in the future acquire other companies 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 any acquisition will be successfully integrated in a timely manner or at all.

Global Economic Uncertainty

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

Furthermore, economic conditions may produce downward pressure on stock prices and on the availability of credit for financial institutions and corporations. If any 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. Any inability to renew a lease, or any renewal of a lease with a rental rate higher than the prevailing rate under the applicable lease prior to expiration, may have an adverse impact on the Company's operations, including disruption of its operations or an increase in its cost of operations. In addition, in the event of non-renewal of any of the Company's leases, the Company may be unable to locate suitable replacement properties for its facilities or it may experience delays in relocation that could lead to a disruption in its operations. Any disruption in the Company's operations could have an adverse effect on its financial condition and results of operations.

Financial Reporting and Other Public Issuer Requirements

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

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

Influence of the Significant Shareholders

To the Company's knowledge, no shareholder beneficially owns, or controls or directs, directly or indirectly, more than 10% of the voting rights attached to the Company's outstanding voting securities, except for Mr. P. Peter Pascali, President and Chief Executive Officer of the Company, who holds or controls, directly or indirectly, 79,744,498 Common Shares, representing in aggregate 46.87% of the total voting rights attached to the outstanding Common Shares, and options to acquire an additional 5,920,000 Common Shares (increasing the total number of Common Shares held or controlled, directly or indirectly, by him to 85,664,498 Common Shares, or 47.87% 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. See "Directors and Executive Officers - Conflicts of Interest".

Joint Venture/Partnership Arrangements

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

Limited Control Over the Company's Operations

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

Change in Tax Laws

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

Forward-Looking Information

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

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 impose covenants and obligations on the Company. 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 the Company's shareholders to lose some or all of their investment.

12.2. 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:

- the public's reaction to the Company's press releases, announcements and filings with regulatory authorities and those of its competitors;
- fluctuations in broader stock market prices and volumes;
- changes in market valuations of similar companies;
- investor perception of the Company, its prospects or the industry in general;
- additions or departures of key personnel;
- commencement of or involvement in litigation;
- announcements by the Company or its competitors of strategic alliances, significant contracts, new technologies, acquisitions, commercial relationships, joint ventures or capital commitments;
- variations in the Company's quarterly results of operations or cash flows or those of other comparable companies;
- revenues and operating results failing to meet the expectations of securities analysts or investors in particular quarter;
- changes in the Company's pricing policies or the pricing policies of its competitors;
- future issuances and sales of Common Shares;
- sales of Common Shares by insiders of the Company;
- third party disclosure of significant short positions;
- demand for and trading volume of Common Shares;
- changes in securities analysts' recommendations and their estimates of the Company's financial performance;
- short-term fluctuation in stock price caused by changes in general conditions in the domestic and worldwide economies or financial markets; and
- the other risk factors described under this heading of the AIF.

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

In addition, broad market and industry factors may harm the market price of the Common Shares. Hence, the price of the Common Shares could fluctuate based upon factors that have little or nothing to do with the Company, and these fluctuations could materially reduce the price of the Common Shares regardless of the Company's operating performance. In the past, following a significant decline in the market price of a company's securities, there have been instances of securities class action litigation having been instituted against

that company. If the Company were involved in any similar litigation, it could incur substantial costs, management's attention and resources could be diverted and it could harm the Company's business, operating results and financial condition.

Market Liquidity

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

Dividends to Shareholders

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

Impact of Future Sales by Existing Shareholders

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

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

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

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

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

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

Loss of Foreign Private Issuer Status in the Future

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

Inability for U.S. Investors to Enforce Certain Judgments

The Company is a corporation existing under the Canada Business Corporations Act. A number of the Company's directors and officers are residents of Canada, and substantially all of the Company's assets are located outside the United States. As a result, it may

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

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

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

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

13. Legal Proceedings

The Company may be, from time to time, involved in legal proceedings of a nature considered normal to its business. The Company is not involved in any legal proceedings which individually or in the aggregate would be material to the Company's consolidated financial condition or results of operations.

14. Interest of Management and Others in Material Transactions

Other than as described elsewhere in this AIF and as described below, there is no material interest, direct or indirect, of: (i) any director or executive officer of the Company; (ii) any person or company that beneficially owns, or controls or directs, directly or indirectly, more than 10% of the Company's outstanding voting securities; or (iii) an associate or any affiliate of any persons or companies referred to above in (i) or (ii), in any transaction within the three years before the date of this AIF that has materially affected or is reasonably expected to materially affect the Company. See "Directors and Executive Officers - Conflicts of Interest".

15. Transfer Agent and Registrar

The transfer agent and registrar of the Company's Common Shares is TSX Trust Company (Canada) having an office at 2001, Robert-Bourassa Boulevard, Suite 1600, Montréal, Québec, H3A 2A6. The transfer agent and registrar of the Company's Common

Shares in the United States is American Stock Transfer & Trust Company, LLC, having an office at 6201 15th Ave, Brooklyn, NY 11219, United States.

16. Auditors

The auditors of the Company are Raymond Chabot Grant Thornton LLP (“RCGT”) at its office located at 600 de la Gauchetiere Street West, Suite 2000, Montréal, Québec. RCGT LLP has informed the Company that it is independent with respect to the Company within the meaning of the relevant rules and related interpretations prescribed by the relevant professional bodies in Canada.

17. Material Contracts

This AIF includes a summary description of certain material contracts. Each summary description discloses all material attributes of the applicable contract but is not complete and is qualified by reference to the terms of the material contracts, which are available under the Company’s SEDAR profile at www.sedar.com. The following are the Company’s only material contracts, other than those contracts entered into in the ordinary course of business, which have been entered into since the beginning of its last financial year, or entered into prior to such date, but which are still in effect and which are required to be filed with Canadian securities regulatory authorities:

- contract between PyroGenesis and HPQ Silica Polvere Inc., a wholly owned subsidiary of HPQ Silicon Resources Inc., dated June 30, 2021 whereby HPQ Silica Polvere Inc. purchased certain intellectual property and the Company contracted to advance the development of a green reactor and process used to produce fumed silica directly from quartz in consideration for \$3,300,000, as described under “Business of the Company - Development of a Process to Produce Fuming Silica from Quartz”;
- contract between PyroGenesis and HPQ Silicon Resources dated July 29, 2016 whereby HPQ purchased certain intellectual property and the Company contracted to build a PUREVAP system for C\$7,070,000, which contract refers to certain terms in a development contract between HPQ (f/k/a Uragold Bay Resources Inc.) dated February 26, 2015, as amended from time to time, as described under the “Business of the Company - Development of Processes to Produce High Purity Silicon Metals, Nano Powders and Nanowires”;
- contract between PyroGenesis and HPQ NANO Silicon Powders dated August 18, 2020 whereby HPQ NANO, a subsidiary of HPQ purchased certain intellectual property and the Company contracted to transform silicon into spherical silicon nanopowders and nanowires for use in lithium-ion batteries for \$3,000,000, as described under “General Development of the Business - Year Ended December 31, 2020 - Contracts and Milestones”; and
- the underwriting agreement in respect of the 2020 Public Offering, as described under “General Development of the Business - Year Ended December 31, 2020 –
- Financings”.

18. Additional Information

Additional information, including with respect to directors’ and executive officers’ remuneration and indebtedness, principal holders of the Company’s securities, and securities authorized for issuance under equity compensation plans, is contained in the Company’s management information circular for its most recent annual meeting of shareholders that involved the election of directors which is available under the Company’s SEDAR profile at www.sedar.com. Additional financial information is contained in the Company’s consolidated financial statements and management’s discussion and analysis for the year ended December 31, 2021. Further information about the Company, filed with Canadian securities regulators, is available online under the Company’s SEDAR profile at www.sedar.com or filed with the Securities and Exchange Commission at www.sec.gov.

19. Glossary of Terms

“2018 SR&ED Loan” has the meaning given to such term under “General Development of the Business - Year Ended December 31, 2019 - Financings”.

“**2019 RISE Agreement**” has the meaning given to such term under “General Development of the Business - Year Ended December 31, 2019 - Contracts and Milestones”.

“**2019 SR&ED Loan**” has the meaning given to such term under “General Development of the Business - Year Ended December 31, 2019 - Financings”.

“**2020 Convertible Loan**” has the meaning given to such term under “General Development of the Business - Year Ended December 31, 2020 - Financings”.

“**2020 Public Offering**” has the meaning given to such term under “General Development of the Business - Year Ended December 31, 2020 - Financings”.

“**2020 Public Offering Warrants**” has the meaning given to such term under “General Development of the Business - Year Ended December 31, 2020 - Financings”.

“**AIF**” means this annual information form.

“**Articles**” has the meaning given to such term under “Corporate Structure”.

“**Audit Committee**” means the Company’s audit committee.

“**Board**” or “**Board of Directors**” means the board of directors of the Company.

“**business day**” means a day other than a Saturday, Sunday or a day on which the principal chartered banks located at Toronto are not open for business.

“**Canadian Securities Laws**” means the securities legislation or ordinance and regulations thereunder of each province of Canada and the rules, instruments, policies and orders of each Canadian securities regulator made thereunder.

“**CAPEX**” means capital expenditures.

“**Cash Consideration**” has the meaning given to such term under “Interest of Management and Others in Material Transactions”.

“**CFC**” means chlorofluorocarbons.

“**Common Share**” means a common share in the capital of the Company, as described under “Description of Capital Structure - Authorized Share Capital”.

“**Company**” means PyroGenesis Canada Inc., a Canadian corporation.

“**DC&P**” disclosure controls and procedures.

“**diluted basis**” means the number of Common Shares outstanding assuming the exercise of all outstanding Options and other rights to acquire Common Shares.

“**Drosrite International**” means Drosrite International LLC, a US-based private company.

“**Drosrite International Exclusive Agreement**” has the meaning given to such term under “General Development of the Business - Year Ended December 31, 2019 - Contracts and Milestones”.

“**Dross Processing Service Agreement**” has the meaning given to such term under “General Development of the Business - Year Ended December 31, 2019 - Contracts and Milestones”.

“**forward-looking statements**” has the meaning given to such term under “Forward-Looking Statements”.

“**HCFC**” means hydrochlorofluorocarbons.

“**HFC**” means hydrofluorocarbons.

“**HPQ**” means HPQ Silicon Resources Inc., a corporation listed for trading on the TSX-V.

“**ISO**” means International Organization for Standardization.

“**June 19, 2021 Warrants**” has the meaning given to such term under “Description of Capital Structure - Stock Options”.

“**May 15, 2021 Warrants**” has the meaning given to such term under “General Development of the Business - Year Ended December 31, 2019 - Financings”.

“**May 2019 First Tranche Private Placement**” has the meaning given to such term under “General Development of the Business - Year Ended December 31, 2019 - Financings”.

“**May 2019 Second Tranche Private Placement**” has the meaning given to such term under “General Development of the Business - Year Ended December 31, 2019 - Financings”.

“**May 28, 2021 Warrants**” has the meaning given to such term under “General Development of the Business - Year Ended December 31, 2019 - Financings”.

“**MI 61-101**” means Multilateral Instrument 61-101 – *Protection of Minority Security Holders in Special Transactions*.

“**NASDAQ**” means the NASDAQ Capital Market.

“**NI 52-110**” means National Instrument 52-110 — *Audit Committees*.

“**Option**” means an option to acquire a Common Share granted pursuant to the Company’s option plan.

“**OPEX**” means operating expenses.

“**PACWADS**” means the Company’s Plasma Arc Chemical Warfare Agent Destruction System.

“**PAGV**” means plasma arc gasification and vitrification.

“**Pascali Trust**” means Fiducie de Crédit Mellon Trust, a trust of which Company’s Chief Executive Officer, P. Peter Pascali, is a trustee, officer and beneficiary.

“**PAWDS**” means the Company’s Plasma Arc Waste Destruction System.

“**Phoenix**” means Phoenix Haute Technology Inc.

“**PRRS**” means the Company’s Plasma Resource Recovery System.

“**R&D**” means research and development.

“**SEDAR**” means the System for Electronic Document Analysis and Retrieval.

“**SPARC**” means Steam Plasma Arc Refrigerant Cracking.

“**SR&ED**” means Scientific Research and Experimental Development.

“**SR&ED Tax Credits**” has the meaning given to such term under “General Development of the Business - Year Ended December 31, 2019 - Financings”.

“**TSX**” means the Toronto Stock Exchange.

“**TSX-V**” means the TSX Venture Exchange.

“**United States**” and “**U.S.**” mean the United States of America, its territories and possessions, including the District of Columbia.

SCHEDULE “A” CHARTER OF THE AUDIT COMMITTEE

PYROGENESIS CANADA INC.

AUDIT COMMITTEE CHARTER

Approved by the Board of Directors
and effective as of October 25th, 2011

PREAMBLE

The Audit Committee’s (the “Committee”) Charter clarifies its responsibilities delegated by the Board of Directors (the “Board”). The Charter is used by the Committee to guide the planning and the performance of its work. The Charter also clarifies the understanding the Committee has with the Company’s auditors and with management about the nature of their involvement with the Committee and its work.

OVERALL MANDATE

Generally, the Committee promotes and ensures a high standard of financial reporting, risk management and ethical behavior for the Company and in doing so shall carry out the duties and responsibilities as set out in this Charter.

COMPOSITION

The Committee shall consist of at least three Directors appointed by the Board who will serve at the pleasure of the Board and, in any event, only so long as he/she shall be a Board member. The Committee will have an appropriate representation of independent directors as required by law. The composition of the Committee shall comply with the rules and regulations of the stock exchange on which the shares of the Company are listed as well as the Canadian Securities Administrators “Instruments”. The Board may fill vacancies in the Committee by election from their number. The Board shall elect the Chairperson of the Committee. In the absence of the Chairperson, the members of the Committee shall appoint an Acting Chairperson. The President of the Company shall not be an ex-officio member of the Committee, but the Chairperson of the Board may, at his/her discretion, attend meetings as an ex-officio member. An ex-officio member shall be vested with all the rights and powers of appointed members.

To ensure the Committee’s effectiveness, each member will be financially literate and be prepared to spend the time necessary to address complex issues and to challenge both management and the auditors, where necessary.

A quorum of the Committee shall consist of at least two members of the Committee (for this purpose the Committee shall be deemed to consist of at least three members, two being appointed by the Board as aforesaid and one being an ex-officio member as aforesaid). Notwithstanding any vacancy on the Committee, a quorum may exercise all the powers of the Committee.

The Secretary shall be selected from its members or shall be the Corporate Secretary. The Secretary of the Committee shall ensure that minutes of meetings are prepared for distribution to Committee members.

DUTIES AND RESPONSIBILITIES

The Committee shall have the following duties and responsibilities:

OVERSEEING STANDARDS OF INTEGRITY AND BEHAVIOUR

Management is responsible for the Company’s standards of behavior. The Committee assists the Board in obtaining assurances that management is operating the Company in an ethical manner and encourages management to demonstrate a strong commitment to integrity.

The Committee requests that management report periodically on how the Company's systems, practices and controls encourage, monitor and provide assurance of compliance with laws, regulations and standards of ethical conduct, including the control of expenses such as perquisites, expense accounts and out-of-pocket expenses for officers and directors.

The Committee seeks the views of the auditors about the Company's standards of behavior. It discusses with the auditors the adequacy of the systems and controls, and the details of any practices or transactions identified by the auditors as being in potential violation of the legal authorities, as well as the details of any "other matters" they consider bringing to the attention of the Board. The committee seeks the views of auditors on remedies to curtail inappropriate practices and behaviors, as well as alternative remedies to rectify those matters that are not in the Company's best interest.

The Committee values financial integrity and credibility. It actively promotes an overall corporate "tone" for quality financial reporting, sound business risk practices, and ethical behavior.

OVERSEEING FINANCIAL REPORTING

Management is responsible for the Company's financial reporting. This includes preparation of accurate, fair and complete financial reports, the selection of the most appropriate accounting principles and practices, formulation of accounting judgments and estimates, and preparation of the annual report including its management's discussion and analysis (MD&A), budgets and other such reports.

The Committee shall provide assistance to the Board in fulfilling its financial reporting and control responsibilities to the shareholders of the Company and to the investment community. The Committee's primary duties and responsibilities in this regard are to:

- (a) oversee the accounting and financial reporting processes of the Company and the audit of its financial statements including:
 - i. the integrity of the Company's financial statements;
 - ii. the compliance with legal and regulatory requirements; and,
 - iii. the independent auditor's qualifications and independence;
- (b) serve as an independent and objective party to monitor the Company's financial reporting process and internal control systems;
- (c) review and appraise the audit activities of the Company's independent auditors;
- (d) provide open lines of communication among the independent auditors, financial and senior management and the Board for financial reporting and control matters and meet periodically with management and with the independent auditors.

The Committee assesses the relevance and the reliability of the financial reports to ensure that they portray, in the clearest light possible, the underlying economic circumstances and financial performance of the Company.

The Committee promotes accuracy, truthfulness, integrity and credibility in financial reporting.

The Committee discusses with management and auditors the inherent fairness, accuracy and completeness of financial disclosures as well as the Company's compliance with legal and regulatory requirements and may request attestation to this effect from them.

The Committee reviews the key accounting principles and the significant judgments and estimates with management and auditors. It seeks their views with respect to the appropriateness and consistency of the accounting principles and practices, not just their acceptability, and the degree of aggressiveness or conservatism in determining estimates.

As integral components of its financial review processes, the Committee reviews the operating and capital budgets, the borrowing plan, summaries of the corporate plan and budgets, the annual and quarterly financial statements, including the MD&A sections, and any other financial information which will be distributed to the public and requiring approval of the Board.

The Committee assesses how well the Company's financial information reporting package meets the Board's needs by reviewing its form, content and level of details.

OVERSEEING MANAGEMENT CONTROL PRACTICES

Management is responsible for maintaining records and financial management and control systems that provide reasonable assurance that assets are safeguarded and maintained, that Intellectual Property (IP) is identified, protected and secured, that transactions are in accordance with regulations and any government directives issued and that financial, human and physical resources are managed economically and efficiently and that operations are carried out effectively.

Management is responsible for identifying the principal business risks facing the Company and formulating the Company's risk tolerance levels and risk management policies for consideration and approval by the Board. The Committee assists the Board in this function, focusing on the financial risks.

The Committee holds management accountable for the design and functioning of the Company's control framework in order to monitor, assess and mitigate the Company's business risks and uncertainty, as well as legal, environmental, social responsibility and ethical compliance. Periodically, the Committee requests that management provides it with an assessment of the effectiveness of the internal control structure and procedures, and, if warranted, with plans for improving its effectiveness.

The Committee reviews with the auditors (internal, external and special examiners when applicable) their assessments of the design and functioning of the control framework and the systems in place for ensuring that the business risks are identified, monitored, controlled and within the Company's limit of tolerance, and their views on management's plans for improvements.

OVERSEEING WORK OF AUDITORS

The Committee recognizes that the Company's auditors possess substantial expertise and have significant professional responsibilities. It holds the auditors accountable for fulfilling their respective responsibilities.

The Internal auditor (when established) will be accountable to the Committee, in its capacity as a committee of the Board.

The Committee demands independent and objective assessments of the Company's standards of behavior, its compliance with authorities, its financial reporting, and its business risks systems, practices and controls from the auditors.

The Committee oversees audit activities with respect to the following two (2) types of audits:

- (a) the annual audit deals with the fairness of the statements, compliance of transactions with specified legal authorities, and any other matter identified by the external auditor as important,
- (b) the internal audit (when established), which is a part of management's system of internal control, deals with matters similar to those of the annual audit.

The Committee reviews and follows the five (5) generic phases of each of the two (2) types of audits:

1. establishing the purpose and terms of reference for the audit;
2. selection and organization of a team of experienced professionals to plan and conduct the audit;
3. conduct of the audit; and
4. reviews all the audit results and findings, and reports to the Board.

The Committee shall review management's plans to correct any significant problems raised by the internal and external auditors. It shall monitor and review management's progress in implementing its response plan.

The Committee ensures that management has not placed any inappropriate restrictions on the audits and confirms that the external auditor is independent and able to maintain its objectivity.

The Committee approves the mandate of the internal audit function, monitors the long term internal audit plan and ensures that the internal auditor has adequate resources to perform its responsibilities and has direct and open communication with the Committee. It reviews the reporting relationship of the internal auditor to ensure that an appropriate segregation of duties is maintained and that the

internal auditor has an obligation to report directly to the Committee on matters affecting its duties, irrespective of his or her reporting relationships.

The Committee evaluates the work of each of the auditors with a view to determining the level of assurance that can be derived from their work.

Periodically, the Committee evaluates the performance of each auditor.

The Committee shall establish effective communication processes with management and the Company's auditors, to assist it in monitoring objectively the quality and effectiveness of the relationship among the auditors, management and the Audit Committee. It shall be responsible for the resolution of disagreements between management and auditors.

OPERATIONAL RESPONSIBILITIES

Each new member will receive an orientation about the Committee's work and responsibilities and all members are encouraged to keep current about accounting, auditing and financial reporting standards and practices. In recognition of the importance of the financial literacy skills of its members, the Committee relies on the full support of the Board in acquiring and in developing an approach to improve the necessary skills, when required.

Annually, the Committee reviews the Charter setting out the scope of its responsibilities, and, where in the opinion of the Committee, amendments to the Charter are required, may propose such amendments to the Board for consideration and approval.

Annually, the Committee will consider the appropriateness of preparing a report to the Board describing its work.

OTHER RESPONSIBILITIES

Periodically, in consultation with the Chief Financial Officer and the auditors, the Committee seeks reasonable assurance of the quality and sufficiency of the Company's accounting and financial personnel and other resources.

The Committee shall discuss or review in advance the appointment of the Chief Financial Officer.

The Committee shall review procedures established by management for dealing with complaints from employees related to financial reporting, controls and corporate conduct.

The Committee may investigate any matters that, at the Committee's discretion, fall within its duties.

The Committee shall perform such other functions as are assigned to it by law or by the Board.

The Committee shall review with the general counsel, legal and regulatory matters that, in the opinion of management, may have a material impact on the financial statements, related organization compliance policies, and program and reports received from regulators.

OPERATING PROCEDURES

The Committee shall meet quarterly, or more frequently as appropriate, in advance of regularly scheduled Board meetings. Committee meetings shall be called by the Committee Chair or requested by any Committee member or by the Board Chair.

Notice of each meeting of the Committee shall be given to each member of the Committee (including the Chair of the Board as an ex-officio member of the Committee), and except in the case of an in-camera meeting, also to the Auditors, the Chief Executive Officer and the Chief Financial Officer of the Company. Notice of the meeting shall be given either orally or by electronic mail, not less than 48 hours before the time fixed for the meeting. Members may waive notice of a meeting.

Meeting discussions may take place face to face, by teleconference or through a reciprocal interchange of emails.

The agenda for each meeting will be established by the Chair of the Committee.

Any decision made by the Committee shall be determined by a majority vote of the members of the Committee present. A member will be deemed to have consented to any resolution passed or action taken at a meeting of the Committee unless the member dissents.

The Chief Executive Officer and the Chief Financial Officer of the Company shall attend all Audit Committee meetings, with the exception of in-camera meetings.

A matter put to vote at a meeting of the Committee shall be decided by a majority of the votes cast, and in the event of an equality of votes, the Chair has a deciding vote.

The Secretary of the Committee shall ensure that minutes of meetings are prepared for distribution to Committee members, and, except for in-camera meetings, to the Auditors, the Chief Executive Officer and the Chief Financial Officer of the Company.

The Chair of the Committee will report to the Board on proceedings and deliberations of the Committee, either orally or in writing, at the first subsequent meeting of the Board or at such earlier time as the Committee in its discretion may consider advisable.

The Committee may retain at the Company's expense, with prior Board approval, independent consultants and such other persons as the Committee shall determine necessary to fulfill its duties and responsibilities.

LIMITATION ON THE COMMITTEE'S DUTIES

In contributing to the Committee's discharging of its duties under this Charter, each member of the Committee shall be obliged only to exercise the care, diligence and skill that a reasonably prudent person would exercise in comparable circumstances. Nothing in this mandate is intended, or may be construed, to impose on any member of the Committee a standard of care or diligence that is in any way more onerous or extensive than the standard to which all Board members are subject. The essence of the Committee's purpose is to monitor, review and when appropriate, recommend changes to financial and corporate operating standards as they are practiced by the Company's management to gain reasonable assurance (but not to ensure) about fundamental activities of the Company.

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

The 2021 consolidated Financial Statements and MD&A have been reviewed by PyroGenesis' Audit Committee and were approved by its Board of Directors on March 31, 2022. The Board of Directors is responsible for ensuring that the Company fulfills its responsibilities for financial reporting and is ultimately responsible for reviewing and approving the MD&A. The Board of Directors carries out this responsibility principally through its Audit Committee. The Audit Committee is appointed by the Board of Directors and is comprised of independent directors. The Audit Committee reports its findings to the Board of Directors for its consideration when it approves the MD&A and consolidated financial statements for issuance to shareholders.

The following information takes into account all material events that took place up until March 31, 2022, the date on which the Company's Board of Directors approved this MD&A. Unless otherwise indicated, all amounts are presented in Canadian dollars. The Company's functional and reporting currency is the Canadian dollar.

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

FORWARD-LOOKING STATEMENTS

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

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

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

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

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

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

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

BASIS OF PRESENTATION

For reporting purposes, we prepared the 2021 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 2021 consolidated Financial Statements. Unless otherwise indicated, all references to "\$" are to Canadian dollars. Unless otherwise indicated, all references to a specific "note" refer to the notes to the 2021 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, Adjusted EBITDA and Modified EBITDA. EBITDA, Adjusted EBITDA and Modified EBITDA are not considered an alternative to income or loss from operations, or to net earnings or loss, in the context of measuring a company's performance. These non-IFRS measures are used to provide investors with supplemental measures of operating performance and thus highlight trends in our business that may not otherwise be apparent when relying solely on IFRS measures. We also believe that securities analysts, investors and other interested parties frequently use non-IFRS measures in the evaluation of issuers. Our management also uses non-IFRS measures in order to facilitate operating performance comparisons from period to period, to prepare annual operating budgets and forecasts and to determine components of management compensation. Management believes that EBITDA, Adjusted EBITDA and Modified EBITDA are important measures of operating performance because it allows management, investors and others to evaluate and compare the Company's operating results, including its return on capital and operating efficiencies, from period-to-period by removing the impact of the Company's capital structure consequences, and other non-operating items not requiring cash outlays including the adjustment to the fair value of investments and share-based compensation.

EBITDA

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

Adjusted EBITDA and Modified EBITDA)".

Adjusted EBITDA

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

Modified EBITDA

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

OVERVIEW

PyroGenesis Canada Inc. is a leader in the design, development, manufacture and commercialization of advanced plasma processes. We provide engineering and manufacturing expertise, cutting-edge contract research, as well as turnkey process equipment packages to the defense, metallurgical, mining, additive manufacturing (including 3D printing), oil & gas, and environmental industries. With a team of experienced engineers, scientists and technicians working out of our Montreal office and our 40,902 sq. ft. (3,800 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).

INFORMATION FROM STATEMENT OF COMPREHENSIVE INCOME FOR THE QUARTERS AND YEARS ENDED DECEMBER 31:

	Three months ended Dec 31		% Change	Twelve months ended Dec 31		% Change
	2021	2020	2021vs2020	2021	2020	2021vs2020
Revenues	\$ 7,205,349	\$ 6,778,240	6 %	\$ 31,068,350	\$ 17,775,029	75 %
Cost of sales and services	5,902,560	3,542,104	67 %	18,636,539	7,472,361	149 %
Gross margin	1,302,789	3,236,136	(60)%	12,431,811	10,302,668	21 %
Expenses						
Selling, general and administrative (not including share-based expenses)	7,071,471	2,948,488	140 %	17,474,390	8,089,945	116 %
Research and development	1,149,140	(882,253)	230 %	2,535,987	(731,077)	447 %
Total expenses (not including share-based expenses)	8,220,611	2,066,235	298 %	20,010,377	7,358,868	172 %
Net (loss) income from operations (not including share-based expenses)	(6,917,822)	1,169,901	(691)%	(7,578,566)	2,943,800	(357)%
Share-based expenses	(4,878,526)	(1,132,696)	331 %	(9,762,745)	(4,244,608)	130 %
Net (loss) income from operations	(11,796,348)	37,206	(31,805)%	(17,341,311)	(1,300,808)	1,233 %
Changes in fair market value of strategic investments and financial expenses	(11,349,913)	23,967,621	(147)%	(21,830,588)	44,102,624	(149)%
Income taxes	(739,960)	1,033,412	(172)%	(739,960)	1,033,412	(172)%
Net earnings (loss)	\$ (22,406,301)	\$ 22,971,415	(198)%	\$ (38,431,939)	\$ 41,768,404	192 %
Foreign currency translation gain on investments in foreign operations	3,444	—	100 %	3,444	—	100 %
Comprehensive income (loss)	\$ (22,402,857)	22,971,415	(198)%	\$ (38,428,495)	41,768,404	(192)%
Earnings (loss) per share						
Basic	\$ (0.13)	\$ 0.15		\$ (0.23)	\$ 0.28	
Diluted	\$ (0.13)	\$ 0.15		\$ (0.23)	\$ 0.27	
Modified EBITDA ⁽¹⁾	\$ (6,522,877)	\$ 1,302,357	(601)%	\$ (6,182,695)	\$ 3,442,443	(280)%

¹ See "Non-IFRS Measures"

INFORMATION FROM CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME FOR THE YEARS ENDED DECEMBER 31:

	Dec 31, 2021	Dec 31, 2020	Dec 31, 2019
Revenues	\$ 31,068,350	\$ 17,775,029	\$ 4,813,978
Cost of sales and services	<u>18,636,539</u>	<u>7,472,361</u>	<u>3,515,886</u>
Gross margin	<u>12,431,811</u>	<u>10,302,668</u>	<u>1,298,092</u>
Expenses			
Selling, general and administrative (not including share-based expenses)	17,474,390	8,089,945	6,017,091
Research and development	2,535,987	(731,077)	851,512
Impairment of plasma automation system & Write-off of inventories	—	—	2,367,531
Total expenses (not including share-based expenses)	<u>20,010,377</u>	<u>7,358,868</u>	<u>9,236,134</u>
Net (loss) income from operations (not including share-based expenses)	<u>(7,578,566)</u>	<u>2,943,800</u>	<u>(7,938,042)</u>
Share-based expenses	<u>(9,762,745)</u>	<u>(4,244,608)</u>	<u>(171,807)</u>
Net (loss) income from operations	<u>(17,341,311)</u>	<u>(1,300,808)</u>	<u>(8,109,849)</u>
Changes in fair market value of strategic investments and financial expenses	<u>(21,830,588)</u>	<u>44,102,624</u>	<u>(1,061,267)</u>
Income taxes	<u>(739,960)</u>	<u>1,033,412</u>	<u>—</u>
Net income (loss) and comprehensive income (loss)	\$ (38,431,939)	\$ 41,768,404	\$ (9,171,116)
Foreign currency translation gain on investments in foreign operations	3,444	—	—
Comprehensive income (loss)	\$ (38,428,495)	\$ 41,768,404	\$ (9,171,116)
Earnings (loss) per share			
Basic	\$ (0.23)	\$ 0.28	\$ (0.07)
Diluted	\$ (0.23)	\$ 0.27	\$ (0.07)
Modified EBITDA ⁽¹⁾	\$ (6,182,695)	\$ 3,442,443	\$ (5,021,761)

¹ See "Non-IFRS Measures"

SELECTED FINANCIAL INFORMATION

	<u>Dec 31, 2021</u>	<u>Dec 31, 2020</u>	<u>Dec 31, 2019</u>
Current assets	38,758,984	25,336,787	1,324,554
Non-current assets	31,011,693	49,194,591	8,254,675
Total assets	\$ 69,770,677	\$ 74,531,378	\$ 9,579,229
Current liabilities	24,752,199	11,539,208	11,816,655
Non-current liabilities	4,249,724	3,569,064	3,845,497
Total liabilities	\$ 29,001,923	\$ 15,108,272	\$ 15,662,152
Shareholders' equity	\$ 40,768,754	\$ 59,423,106	\$ (6,082,923)

RESULTS OF OPERATIONS

Revenues

PyroGenesis recorded revenues of \$31,068,350 for the year ended December 31, 2021, representing an increase of 75% compared to \$17,775,029 recorded in 2020.

Revenues recorded in fiscal 2021 were generated primarily from:

- (i) PUREVAP™ related sales of \$6,138,111 (2020 - \$4,163,059)
- (ii) DROSRITE™ related sales of \$7,940,771 (2020 - \$9,976,696)
- (iii) support services related to systems supplied to the US Navy \$7,522,809 (2020 - \$1,425,883)
- (iv) torch related sales of \$2,084,511 (2020 - \$1,452,455)
- (v) biogas upgrading & pollution controls of \$6,800,090 (2020 - \$Nil)
- (vi) other sales and services \$582,058 (2020 - \$756,936)

PUREVAP™ related sales includes revenue from the sale of technologies in the amount of \$3,300,000. See note 6 to the 2021 consolidated Financial Statements.

As of March 31, 2022, revenue expected to be recognized in the future related to performance obligations that are unsatisfied (or partially satisfied) is \$47,661,216. 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 Dec 31		% Change	Twelve months ended Dec 31		% Change
	2021	2020	2021vs2020	2021	2020	2021vs2020
Employee compensation	\$ 769,322	\$ 471,893	63 %	\$ 2,650,739	\$ 1,379,637	92 %
Subcontracting	210,848	611,396	(66)%	872,933	1,281,472	(32)%
Direct materials	4,498,835	2,134,300	111 %	14,252,205	4,147,704	244 %
Manufacturing overhead & other	434,778	159,072	173 %	1,111,975	507,217	119 %
Foreign exchange charge on materials	(306,918)	114,237	(369)%	(568,531)	147,561	(485)%
Investment tax credits	(65,326)	44,424	247 %	(148,695)	(18,420)	707 %
Cost of Sales and Services before Amortization of Intangible Assets	\$ 5,541,539	\$ 3,535,322	57 %	\$ 18,170,626	7,445,171	144 %
Amortization of intangible assets	361,021	6,782	5,223 %	465,913	27,190	1,614 %
Total Cost of Sales and Services	\$ 5,902,560	\$ 3,542,104	67 %	\$ 18,636,539	\$ 7,472,361	149 %

Gross Margin

	Three months ended Dec 31		Twelve months ended Dec 31	
	2021	2020	2021	2020
Revenues	\$ 7,205,349	\$ 6,778,240	\$ 31,068,350	\$ 17,775,029
Cost of Sales and Services	5,902,560	3,542,104	18,636,539	7,472,361
Gross Margin	\$ 1,302,789	\$ 3,236,135	\$ 12,431,811	\$ 10,302,668
Gross Margin %	18.1 %	47.7 %	40.0 %	58.0 %

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

Cost of sales and services before amortization of intangible assets was \$18,170,626 in 2021, representing an increase of 144% compared to \$7,445,171 in 2020, primarily due to the additional costs to complete the Pyro Green-Gas contracts following the acquisition. Increases in employee compensation \$2,650,739 (2020 - \$1,379,637), direct materials \$14,252,205 (2020 - \$4,147,704), manufacturing overhead & other \$1,111,975 (2020 - \$507,217), were offset by a decrease in subcontracting \$872,933 (2020 - \$1,281,472), foreign exchange charge on materials (\$568,531) (2020 - \$147,561) and an increase in investment tax credits (\$148,695) (2020 - (\$18,420)).

In 2021, employee compensation, direct materials, manufacturing overhead & other increased to \$18,014,919 (2020 - \$6,034,558), primarily due to the increased amount of contract values in the Company and in the Pyro Green-Gas subsidiaries. Of note, the Company in 2020 applied for an amount of \$775,967 in wage subsidy from the Government of Canada under the CEWS "Canada Emergency Wage Subsidy" program. From this amount, \$118,416 was applied to employee compensation under cost of sales and services. Subcontracting and foreign exchange charge on materials decreased to \$304,402 (2020 - \$1,429,033).

The gross margin for 2021 was \$12,431,811 or 40% of revenue compared to a gross margin of \$10,302,668 or 58% of revenue for 2020. 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, the mix between labour, materials and subcontracts may be significantly different. The cost of sales and services for 2021 and 2020 are in line with management's expectations.

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Investment tax credits recorded against cost of sales are related to projects that qualify for tax credits from the provincial government of Quebec. Qualifying tax credits increased to \$148,695 in 2021, compared to \$18,420 in 2020. The increase is primarily related to more contracts being eligible for qualifying tax credits.

The amortization of intangible assets of \$465,913 in 2021 compared to \$27,190 for 2020 relates mainly to the intangible assets in connection with the Pyro Green-Gas acquisition, patents and deferred development costs. These expenses are non-cash items and will be amortized over the duration of the patent lives.

Selling, General and Administrative Expenses

	Three months ended Dec 31		% Change	Twelve months ended Dec 31		% Change
	2021	2020	2021vs2020	2021	2020	2021vs2020
Employee compensation	\$ 4,648,952	\$ 2,330,825	99 %	\$ 8,664,603	\$ 5,647,759	53 %
Professional fees	998,098	278,730	258 %	3,884,734	1,303,248	198 %
Office and general	125,224	104,720	20 %	609,353	354,453	72 %
Travel	37,193	27,669	34 %	114,206	103,295	11 %
Depreciation of property and equipment	102,024	23,880	327 %	356,103	63,118	464 %
Depreciation of ROU assets	166,223	101,794	63 %	570,411	408,335	40 %
Investment tax credits	(9,007)	17,105	153 %	(32,486)	(30,000)	8 %
Government grants	(32,612)	(7,500)	335 %	(76,845)	(54,228)	42 %
Other expenses	1,035,375	71,266	1,353 %	3,384,311	293,965	1,051 %
Sub-total not including share-based expenses	\$ 7,071,470	\$ 2,948,488	140 %	\$ 17,474,390	\$ 8,089,945	116 %
Share-based expenses	4,878,526	1,132,696	331 %	9,762,745	4,244,608	130 %
Total selling, general and administrative	\$ 11,949,996	\$ 4,081,184	193 %	\$ 27,237,135	\$ 12,334,553	121 %

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 2021 excluding the costs associated with share-based compensation (a non-cash item in which the option expense is amortized over the vesting period) were \$17,474,390 representing an increase of 116% compared to \$8,089,945 reported for 2020.

The SG&A expenses, which now include those of Pyro Green-Gas since the acquisition date, increased in 2021 over the same period in 2020 and the net effect is as follows:

- i) an increase of 53% in employee compensation primarily due to additional head count, an increased in commissions and bonuses,
- ii) an increase of 198% for professional fees, primarily due to an increase in consulting fees, accounting and audit fees, legal fees, investor relation fees and public listing fees,
- iii) an increase of 72% in office and general expenses, is primarily due to computer, and information technology expenses,
- iv) travel costs increased by 11%, due to an increase in travel abroad,
- v) depreciation on property and equipment increased by 464% due to higher amounts of property and equipment being depreciated,
- vi) depreciation on right of use assets increased by 40% due to higher amounts of right of use assets being depreciated,
- vii) investment tax credits increased by 8% to 32,486,
- viii) government grants increased by 42%, due to higher levels of activities supported by such grants,
- ix) other expenses increased by 1,051%, primarily due to an increase in, D&O insurance expense.

Separately, share-based payments increased by \$5,518,137 in 2021 over the same period in 2020 as a result of the stock options granted in 2021. This was directly impacted by the vesting structure of the stock option plan with options vesting between 10% and 100% on the grant date requiring an immediate recognition of that cost.

Depreciation on Property and Equipment

	Three months ended Dec 31		% Change	Twelve months ended Dec 31		% Change
	2021	2020	2021vs2020	2021	2020	2021vs2020
Depreciation of property and equipment	\$ 102,024	\$ 23,880	327 %	\$ 356,103	\$ 63,118	464 %

The depreciation on property and equipment increased to \$356,103 in 2021, compared to \$63,118 in 2020. The 464% increase is due to higher amounts of property and equipment being depreciated.

Research and Development ("R&D") Expenses

	Three months ended Dec 31		% Change	Twelve months ended Dec 31		% Change
	2021	2020	2021vs2020	2021	2020	2021vs2020
Employee compensation	\$ 186,677	\$ 107,130	74 %	\$ 777,870	\$ 529,309	47 %
Investment tax credits	757,946	(1,094,256)	-169 %	684,709	(1,141,468)	-160 %
Subcontracting	14,356	10,187	41 %	135,066	35,578	280 %
Materials and equipment	136,982	64,530	112 %	912,456	176,436	417 %
Other expenses	68,956	29,335	135 %	175,461	34,501	409 %
Sub-total before government grants	\$ 1,164,917	\$ (883,074)	232 %	\$ 2,685,562	\$ (365,644)	834 %
Government grants	(16,115)	821	2,063 %	(149,575)	(365,433)	-59 %
Total net R&D expenses	\$ 1,148,802	\$ (882,252)	230 %	\$ 2,535,987	\$ (731,077)	447 %

The Company incurred \$2,535,987 of R&D expenses, net of government grants, on internal projects in 2021, an increase of 447% compared to (\$731,077) in 2020. The increase in 2021 is due to an increase in R&D activities, the type of contracts being executed, the nature of the project activity, and an increase in employee compensation, subcontracting, materials and equipment and other expenses of \$2,000,853 compared to \$775,824 and a decrease in investment tax credits of 684,709 compared to (1,141,468) reported in 2020.

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

Financial Expenses

	Three months ended Dec 31		% Change	Twelve months ended Dec 31		% Change
	2021	2020	2021vs2020	2021	2020	2021vs2020
Interest on convertible debentures	\$ —	\$ —	0 %	\$ —	\$ 171,042	(100)%
Interest accretion of convertible debentures	—	—	0 %	—	182,700	(100)%
Interest on term loans	87,422	(67,242)	230 %	99,960	20,957	377 %
Interest on lease liabilities	86,177	46,581	85 %	307,691	211,666	45 %
Interest accretion on promissory notes	—	—	0 %	—	17,937	(100)%
Interest on long term debts	110,203	—	100 %	110,203	—	100 %
Accretion of royalty receivable	16,283	—	100 %	(132,808)	—	(100)%
Other interest expenses	4,320	51,439	(92)%	19,324	57,550	(66)%
Capitalized finance costs on borrowing costs	—	—	0 %	—	(137,778)	(100)%
Financial expenses	\$ 304,405	\$ 30,778	889 %	\$ 404,370	\$ 524,074	(23)%

Finance expenses for 2021 totaled \$404,370 as compared with \$524,074 for 2020, representing a decrease of 23% year-over-year. The decrease in finance costs, is primarily attributable to the extinguishment of term loans, other loans, and convertible debentures in 2020.

Strategic Investments

	Three months ended Dec 31		% Change	Twelve months ended Dec 31		% Change
	2021	2020	2021vs2020	2021	2020	2021vs2020
Changes to fair value of strategic investments	\$ (11,045,508)	\$ 23,998,400	(146)%	\$ (21,426,218)	\$ 44,626,698	(148)

The adjustment to the fair market value of strategic investments in 2021 resulted in a loss of \$21,426,218 compared to a gain in the amount of \$44,626,698 in 2020, representing a decrease of \$66,052,916. The decrease is primarily attributable to the decreased market share value of common shares and warrants owned by the Company of HPQ Silicon Resources Inc.

Comprehensive (loss) Income

	Three months ended Dec 31		% Change	Twelve months ended Dec 31		% Change
	2021	2020	2021vs2020	2021	2020	2021vs2020
Comprehensive (loss) income	\$ (22,402,857)	\$ 22,971,415	(198)%	\$ (38,428,495)	\$ 41,768,404	(192)%

The comprehensive loss for 2021 of \$38,428,495 compared to an income of \$41,768,404, in 2020, represents a decrease of 192% year-over-year. The variation of \$80,196,899 in the comprehensive income (loss) in 2021 is primarily attributable to the factors described above, which have been summarized as follows, and includes the profit and loss items of Pyro Green-Gas since the acquisition date:

- (i) an increase in product and service-related revenue of \$13,293,321 arising in 2021,
- (ii) an increase in cost of sales and services of \$11,164,178, primarily due to an increase in employee compensation, direct materials, manufacturing overhead & other, and amortization of intangible assets,
- (iii) an increase in SG&A expenses not including share-based expenses of \$9,384,445 arising in 2021 primarily due to an increase in employee compensations, professional fees, office & general, travel, depreciation of property and equipment, depreciation of ROU assets and other expenses,
- (iv) an increase in R&D expenses of \$3,267,064 primarily related to the increase in employee compensation, subcontracting, materials and equipment, and other expenses and a decrease in investment tax credits, recognition of investment tax credits in 2020 and prior years in the amount of \$1,141,468 which include amounts that reduce Canadian income taxes payable in 2020 and an amount of \$365,433 in government grants,
- (v) an increase in share-based expense of \$5,518,137,
- (vi) a decrease in changes in fair market value of strategic investments and net finance costs of \$65,933,212,
- (vii) a decrease in income taxes of \$1,773,372.

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

	Three months ended Dec 31		% Change	Twelve months ended Dec 31		% Change
	2021	2020	2021vs2020	2021	2020	2021vs2020
Comprehensive income (loss)	\$ (22,402,857)	\$ 22,971,415	(198)%	\$ (38,428,495)	\$ 41,768,404	(192)%
Depreciation of property and equipment	102,024	23,880	327 %	356,103	63,118	464 %
Depreciation of ROU assets	166,223	101,794	63 %	570,411	408,335	40 %
Amortization of intangible assets	353,333	6,782	5,110 %	465,913	27,190	1,614 %
Financial expenses	74,326	30,778	141 %	404,370	\$ 524,074	(23)%
Income taxes	(739,960)	1,033,412	(172)%	(739,960)	1,033,412	(172)%
EBITDA	\$ (22,446,911)	\$ 24,168,061	(193)%	\$ (37,371,658)	\$ 43,824,533	(185)%
Other non-cash items:						
Share-based expenses	4,878,526	1,132,696	331 %	9,762,745	4,244,608	130 %
Adjusted EBITDA	\$ (17,568,385)	\$ 25,300,757	(169)%	\$ (27,608,913)	48,069,141	(157)%
Change in fair value of investments	11,045,508	(23,998,400)	146 %	21,426,218	(44,626,698)	148 %
Modified EBITDA ⁽¹⁾	\$ (6,522,877)	\$ 1,302,357	(601)%	\$ (6,182,695)	\$ 3,442,443	(280)%

¹ See "Non-IFRS Measures"

The EBITDA in 2021 was a \$37,371,658 loss compared to an EBITDA gain of \$43,824,533 for 2020, representing a decrease of 185% year-over-year. The decrease in the EBITDA in 2021 compared to 2020 is due to the decrease in net earnings and comprehensive income of \$80,196,899, offset by an increase in depreciation on property and equipment of \$292,985, an increase in depreciation on right-of-use assets of \$162,076, an increase in amortization of intangible assets of \$438,723, a decrease in finance charges of \$119,704 and a decrease in income taxes of \$1,773,372.

Adjusted EBITDA in 2021 was a \$27,608,913 loss compared to an Adjusted EBITDA gain of \$48,069,141 for 2020. The decrease of \$75,678,054 in the Adjusted EBITDA in 2021 is attributable to a decrease in EBITDA of \$81,196,191, and an increase of \$5,518,137 in share-based payments.

The Modified EBITDA in 2021 was a \$6,182,695 loss compared to a Modified EBITDA gain of \$3,442,443 for 2020, representing a decrease of 280%. The decrease in the Modified EBITDA loss in 2021 is attributable to the decrease as mentioned above in the Adjusted EBITDA loss of \$75,678,054 and an increase in change of fair value of investments of \$66,052,916.

SUMMARY OF QUARTERLY RESULTS

	2021				2020			
	Q4	Q3	Q2	Q1	Q4	Q3	Q2	Q1
Revenues	\$ 7,205,349	\$9,317,926	\$ 8,280,572	\$6,264,503	\$ 6,778,240	\$ 8,149,427	\$2,128,454	\$ 718,908
Gross margin	1,302,789	4,052,531	4,933,481	2,143,010	3,236,136	5,532,526	1,266,592	267,414
Gross margin %	18.1 %	43.5 %	59.6 %	34.2 %	47.7 %	67.9 %	59.5 %	37.2 %
	(22,402,857)	623,664	(20,362,205)	3,712,903	22,971,415	15,325,996	5,228,020	(1,757,027)
Net income (loss) and comprehensive income (loss)								
Earnings (loss) per share	(0.13)	0.00	(0.12)	0.02	0.15	0.10	0.04	(0.01)
Basic	(0.13)	0.00	(0.11)	0.02	0.15	0.09	0.03	(0.01)
Diluted								

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. Revenues in 2021 include revenues from the sale of intellectual property and royalties of \$3,300,000 and \$315,845, respectively.

LIQUIDITY AND CAPITAL RESOURCES

As at December 31, 2021, the Company has cash and cash equivalents of \$12,202,513. In addition, the accounts payable and accrued liabilities of \$10,069,177 are payable within 12 months. The Company expects that its cash position will be able to finance its operations for the foreseeable future.

	Carrying Value \$	Total contractual amount \$	Less than 1 year \$	2-3 years \$	4-5 years \$	Over 5 years \$
Accounts payable and accrued liabilities	10,069,177	10,069,177	10,069,177	—	—	—
Term loans	190,905	263,232	85,731	67,561	62,823	47,117
Balance due on business combination	3,952,203	4,355,600	2,395,580	1,960,020	—	—
Lease liabilities	5,323,965	6,614,192	3,220,750	710,493	561,628	2,121,321
	<u>19,536,250</u>	<u>21,302,201</u>	<u>15,771,238</u>	<u>2,738,074</u>	<u>624,451</u>	<u>2,168,438</u>

SUMMARY OF CASH FLOWS

	Three months ended Dec 31		Twelve months ended Dec 31	
	2021	2020	2021	2020
Cash provided by (used in) operating activities	<u>\$ (1,763,488)</u>	<u>\$ (2,452,405)</u>	<u>\$ (18,113,432)</u>	<u>\$ (814,987)</u>
Cash provided by (used in) investing activities	<u>1,299,358</u>	<u>6,555,839</u>	<u>2,722,957</u>	<u>4,931,532</u>
Cash provided by (used in) financing activities	<u>(3,128,952)</u>	<u>11,936,551</u>	<u>9,474,022</u>	<u>13,984,628</u>
Effect of exchange rate changes on cash denominated in foreign currency	<u>14,067</u>	<u>(30,705)</u>	<u>14,067</u>	<u>(30,705)</u>
Increase (decrease) in cash	<u>(3,579,015)</u>	<u>16,009,280</u>	<u>(5,902,386)</u>	<u>18,070,468</u>
Cash - end of period	<u>12,202,513</u>	<u>10,104,899</u>	<u>12,202,513</u>	<u>10,104,899</u>

On a year-to-date basis, cash flow used by operating activities was \$18,113,432 compared to \$814,987 for the same period in the prior year.

The use of cash during 2021 consists of the net loss of \$38,431,939 (2020 – net earnings of \$41,768,404) plus adjustments for operating activities of \$32,904,463 (2020 - \$38,458,583), including a net change in non-cash operating working capital items of \$12,585,956 (2020 – net change of \$4,124,808).

Investing activities resulted in a net source of funds of \$2,722,957 in 2021, compared to a net source of funds of \$4,931,532 in 2020 resulting from the additions to property and equipment, intangible assets, purchased and disposals of strategic investments and cash acquired through the business combination.

Financing activities in 2021 resulted in a net source of funds of \$9,474,022, compared with a net source of funds of \$13,984,628 for the same period in 2020. In 2021, the Company issued common shares for net cash proceeds of \$14,195,015, repaid an amount of \$283,585 in loans and lease liabilities, and repurchase 840,094 common shares for an amount of \$4,183,617. In 2020, the Company issued common shares for net cash proceeds of \$16,819,050, received \$1,098,919 from the issuance of loans, and repaid loans and lease liabilities in the amount of \$2,573,937 and repurchased 1,285,000 common shares for an amount of \$964,391. Financing activities also include interest paid of \$253,791 in 2021 compared to \$395,013 in 2020.

The net cash position of the Company decreased by \$5,902,386 for 2021 compared to an increase of \$18,070,468 for 2020.

CAPITAL STOCK INFORMATION

The authorized share capital of the Company consists of an unlimited number of common shares. As at March 31, 2022 PyroGenesis had 170,125,795 Common Shares, 8,843,000 outstanding stock options issued, and 7,123,000 exercisable options issued.

GOING CONCERN

The Company presumes it will be able to realize its assets and discharge its liabilities in the normal course of business for the foreseeable future. The Company's management has reviewed the Company's projected cash flow and backlog and is of the opinion that the Company has sufficient cash and cash equivalents and will generate cash flow inflow and profits from operations and strategic investments to meet current and future cash requirements. Management expects that the investments currently being made in accelerating projects under development for various clients, together with executing on its \$47.7MM backlog at March 31, 2022 which is primarily related to the Company's successful diversification into niche markets of the additive manufacturing (including 3D printing), and metals & mining industries, and projects related to biogas upgrading, will continue to improve the Company's cash position.

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

RELATED PARTY TRANSACTIONS

During the year ended December 31, 2021 and 2020, the Company concluded the following transactions with related parties:

In 2021, rent and property taxes were charged by a trust whose beneficiary is the controlling shareholder and CEO of the Company in the amount of \$274,934 (2020 - \$274,106). As of January 1, 2020, a lease for rental of a property with a trust whose beneficiary is the controlling shareholder and CEO of the Company was modified and extended for five years. At the date of modification, the lease liability was using a discounted rate of 4% and an amount of \$366,566 was recorded as an adjustment to the right-of-use asset. The modified agreement included a requirement to prepay rent of \$1,178,529 and municipal tax of \$260,000. In return for the modification of the lease agreement, a 2020 convertible loan of \$903,000 from a trust whose beneficiary is the controlling shareholder and CEO of the Company, was converted into 3,225,000 common shares of the Company. These expenses are recorded in captions cost of sales and selling and general in the statement of comprehensive income (loss). As at December 31, 2021 the right-of-use asset and the lease liabilities amount to \$1,107,131 and \$Nil respectively (2020 - \$1,328,557 and \$221,496).

An amount of \$Nil (December 31, 2020 - \$58,050), of interest payable was accrued on the 2020 convertible loan of \$903,000 from a trust whose beneficiary is the controlling shareholder and CEO of the Company.

A balance due to the controlling shareholder and CEO of the Company amounted to \$144,506 (2020 - \$72,188) is included in accounts payable and accrued liabilities.

An amount of \$Nil (2020 - \$17,937), of interest accretion was expensed in net financing costs on the loan of \$295,000 from the controlling shareholder and CEO of the Company.

The key management personnel is comprised of all members of the Board of Directors and certain Officers of the Company. Total compensation to key management consisted of the following:

	<u>2021</u>	<u>2020</u>
	\$	\$
Salaries – key management	3,049,501	2,148,420
Pension contributions	59,377	18,529
Fees – Board of Directors	187,600	150,000
Share-based compensation – officers	6,182,573	1,989,144
Share-based compensation – Board of Directors	2,338,650	846,410
Other benefits – officers	237,903	544,402
Total compensation	<u>12,055,604</u>	<u>5,696,905</u>

CORPORATE HIGHLIGHTS

On January 12, 2021, the Company announced the intention to implement a Normal Course Issuer Bid (“NCIB”), whereby it may purchase, from time to time, over a period of 12 months starting January 14, 2021, up to 5,000,000 common shares.

On March 10, 2021, the Company announced that the Company’s application to list its common shares on the NASDAQ had been approved. Trading commenced on March 11, 2021, under the ticker symbol “PYR”.

On March 15, 2021, the Company announced that it had elected to exercise its right under the common share purchase warrant indenture dated November 10, 2020, between the Company and AST Trust Company, to accelerate the expiry date of the common share purchase warrants of the Company issued under the Warrant Indenture. The warrants were issued on November 10, 2021, in connection with the bought-deal short form prospectus offering of units of the Company, of which each unit was comprised of one common share of the Company and one-half of one warrant. The warrants new expiry date was moved to April 14, 2021.

On March 17, 2021, the Company announced that it had received a grant of \$194,090 from the Ministry of the Economy and Innovation, through the Support for innovation projects component of the Innovation program, administered by Investissement Québec. The goal of the project is to develop a solution to recover the residues of pot lining, which are produced in the primary aluminum industry, and which are considered dangerous. PyroGenesis will play an important role in eliminating the landfill of this material and potentially other industrial by-products, in addition to significantly reducing specific greenhouse gas emissions.

On April 1, 2021, the Company announced it had appointed DGWA, the German Institute for Asset and Equity Allocation and Valuation (“Deutsche Gesellschaft für Wertpapieranalyse GmbH”, “DGWA”), a German investment banking boutique, as its Investor and Corporate Relations advisor in Europe, effective April 1st, 2021, for a period of twelve months.

On April 19, 2021, the Company announced that its cutting-edge Additive Manufacturing (“AM”) NexGen™ Powder production line, incorporating all the improvements previously announced (increased production rate, lower CAPEX, lower OPEX, narrower particle size distribution) was put in place and producing powders. PyroGenesis’ game-changing NexGen™ Plasma Atomization System, with its production rate exceeding 25k g/h, has shattered all published plasma-atomized production rates for titanium known to management.

On April 20, 2021, the Company announced the signing of a qualification agreement with a premier global aerospace company to produce metal powders. Under this agreement, the customer will perform a standard qualification process typically required before a company can become an approved supplier. The process will, amongst other things, evaluate the Company’s manufacturing methods, test samples of powder for batch-to-batch consistency and determine mechanical and chemical properties.

On April 27, 2021, the Company announced that it had signed a binding Letter of Intent (“LOI”), which outlines the terms and conditions pursuant to which PyroGenesis would acquire AirScience Technologies Inc (“AST”) for an initial purchase price of \$4.8MM. AST is a Montreal-based company that designs and builds (i) gas upgrading systems (specifically from biogas to renewable natural gas, or “RNG”), (ii) Pyrolysis-Gas Purification, (iii) Coke-Oven Gas (“COG”) Purification as well as providing (iv) Biogas & Landfill-Gas Flares and Thermal Oxidizers.

PyroGenesis Canada Inc.
Management's Discussion and Analysis

For the years ended December 31, 2021, and 2020

On May 12, 2021, the Company announced that further to its press release dated April 19, 2021, powder test runs for batch-to-batch consistency using its cutting-edge Additive Manufacturing ("AM") NexGen™ powder production line had been completed successfully, and ahead of schedule. The Company is now producing AM metal powders for clients.

On May 13, 2021, the Company announced that further to its press release dated March 3, 2021 (wherein it was disclosed that PyroGenesis almost doubled its manufacturing footprint by leasing an additional 31,632 sq. ft), the Company announced the successful installation of approximately \$1MM in state-of-the-art plasma torch production equipment in its new facility located in Montreal, Quebec, Canada.

On May 26, 2021, the Company announced, that further to its Press Release dated May 12, 2021, the Company had shipped its first commercial samples of plasma-atomized titanium powder to a client in the aerospace industry (to remain confidential for competitive reasons).

On May 27, 2021, the Company announced that it had received a \$700,000 grant from Sustainable Development Technology Canada for a novel production process to transform quartz into fumed silica using a plasma reactor, thereby reducing hazardous waste and greenhouse gas emissions in comparison to the established fumed silica production process. This project is in partnership with HPQ Silicon Resources, a provider of innovative, cost-effective and low carbon emission silicon-based solutions.

On June 7, 2021, the Company announced that it had received a Letter of Intent (LOI) from an existing client, to purchase three 10-ton DROSRITE™ systems. The contract, if finalized, is expected to be in the range of \$10-15MM.

On July 6, 2021, the Company announced that, further to its press release dated May 27, 2021, wherein it had announced a \$700,000 grant from Sustainable Development Technology Canada to develop a novel production process to transform quartz into fumed silica, PyroGenesis had signed a contract for approx. \$4MM with HPQ Silica Polvere Inc., a wholly owned subsidiary of HPQ Silicon Resources Inc. This contract is part of a project, valued for a total of approx. \$5.3MM. The difference is expected to be funded by an additional government agency for \$630,000 as well as a contribution by PyroGenesis of \$175,000. It is expected that all these amounts will be paid directly to PyroGenesis.

On August 5, 2021, the Company announced that further to HPQ Silicon Resources Inc's press release on August 5, 2021, the Company had successfully produced Nano Silicon materials with its PUREVAP™ Nano Silicon Reactor for HPQ Nano Silicon Powders Inc, a wholly owned subsidiary of HPQ Silicon Resources Inc.

On August 12, 2021, the Company announced that, further to its press release dated April 27, 2021, it had finalized its strategic acquisition of AirScience Technologies Inc. and its subsidiaries for an amended total cash consideration of approx. \$4.4MM payable in instalments upon successful completion of five predetermined milestones. In September 2021, AirScience Technologies Inc. was renamed to Pyro Green-Gas Inc.

On August 17, 2021, the Company announced that it had signed a \$1.2MM contract for two Air Plasma Torch systems with an existing Asian client. These torches are to be incorporated into the client's medical waste destruction systems.

On September 8, 2021, the Company announced that further to its press releases dated May 27 and July 6, 2021, it had received \$630,000 in additional funding from a second government agency for a total project value of approximately \$5.3MM (including sale of IP of \$3.3MM), all to be received by the Company.

On September 14, 2021, the Company announced that it had received an order to supply four (4) high powered plasma torches together with ancillary equipment to a client for approximately \$6MM. This does not include continued after-sale services, which would be part of a separate services agreement. The client is a multi-billion-dollar international producer of iron ore, whose name will remain confidential for competitive reasons. The client's objective is to reduce greenhouse gases by replacing their fossil fuel burners with PyroGenesis' proprietary plasma torches. The client advised PyroGenesis that, upon the successful implementation of the torches, the subsequent orders are expected to be for approximately 130 plasma torches. Notwithstanding this, there is no guarantee that such orders will be placed. The schedule to implement these future orders remains to be determined.

On September 20, 2021, the company announced that it had been added to the FTSA Global Total Cap Index and FTSE Global Micro Cap Index, following the semi-annual reconstitution, which took effect on September 20, 2021.

On September 22, 2021, the Company announced that its subsidiary, Pyro Green-Gas, had been selected to supply its landfill biogas purification system to Carbonaxion Bioénergies Inc., the promoter of GNR Neuville project, which is being developed at the environmental complex of the Régie régionale de gestion des matières résiduelles de Portneuf, located in Quebec, Canada. The Régie is a municipal organization that manages the residual materials of 24 municipalities.

On September 27, 2021, the Company announced that it had signed a joint venture and license agreements (both agreements collectively the "JV") with a leading residue processor to transform dross residues into high value chemical products. The 50:50 JV will be geared towards building, installing and operating dross residue valorization facilities worldwide. To this effect, PyroGenesis secured, through the JV, an exclusive license to a patented and novel technology which is expected to convert dross residues into high value chemical products. Under the terms of the JV, the exclusive access to the technology initially applies to projects in North America and in the Gulf Cooperation Council nations. Upon successful completion of the first project, the exclusive access to the technology will expand to include, for all sense and purposes, most of the world. These dross residues are currently either being (i) landfilled (which is increasingly becoming banned by regulators) or (ii) sold as cheap flux to the cement industry.

On October 18, 2021, the Company announced that its subsidiary, Pyro Green-Gas had received a milestone payment of approximately \$2.5MM under an existing \$9.3MM contract with Tata Steel, one of the world's top diversified steel producers with commercial operations worldwide. In addition to the payment, Pyro Green Gas had signed an additional contract for \$267,000 with Tata Steel. Pyro Green-Gas will provide supplementary engineering improvements to the dry coke oven gas desulfurization and hydrogen production process already under contract. Pyro Green-Gas will supply filters that will further purify the remaining gas, removing condensed hydrocarbons, naphthalene and dust from the coke oven gas infrastructure. This will allow the purified gas to be used as a fuel for galvanizing and annealing furnaces in steel processing.

On October 19, 2021, the Company announced that it had been awarded an Innovative Solutions Canada (ISC) Phase 2 (Prototype Development) contract of approximately \$1.5MM to develop a unique ceramic powder (HCP) processing system for the National Research Council Canada, Canada's largest federal research and development organization.

On October 28, 2021, the Company announced that it has been selected to provide a \$9.2MM land-based system to destroy Perfluoroalkyl and Polyfluoroalkyl Substances. The client is a large operator of public water systems.

SUBSEQUENT EVENTS

On February 2, 2022, the Company announced that it had entered into an agreement with an existing client, to purchase the first of three 10,000 TPY ("10-Ton") Drosrite™ systems. The contract

is for US \$3MM (approximately \$4MM CAD). The execution of this contract follows the receipt of a letter of intent from the existing client on June 7, 2021, in which the client expressed its intention to purchase three 10-ton systems to address an increase in their overall dross processing capacity.

The client is expanding its aluminum processing facilities and, as such, expects to process an additional 30,000 tons/year of dross.

On February 7, 2022, the Company announced it had signed a \$273,000 (€189,000) plasma torch contract with a European research center. The contract is for PyroGenesis to manufacture and deliver a 50-kW methane plasma torch, which will be used by the customer to develop a process to convert hydrocarbons, including methane (a GHG), into useful chemicals such as olefins (e.g., ethylene, propylene), thereby significantly reducing GHGs.

On February 11, 2022, the Company announced the acceptance from the TSX of its Notice of Intention to implement a NCIB. Pursuant to the NCIB, PyroGenesis may purchase, from time to time, over a period of 12 months starting February 15, 2022, up to 7,500,000 common shares.

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

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

CONTROLS AND PROCEDURES

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

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

In accordance with the provisions of National Instrument 52-109 – Issuers' annual and interim filings ("NI 52-109") adopted by Canadian securities regulators and in Rule 13a-15(e) and 15d-15(e) under the U.S. Securities Exchange Act of 1934, as amended (the "Exchange Act"), the Company has

filed certificates signed by the Chief Executive Officer ("CEO") and Chief Financial Officer ("CFO") that report on, among other items, i) their responsibility for establishing and maintaining DC&P and ICFR for the Company, ii) the design of DC&P and the design of ICFR, 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, 2021, an evaluation was carried out under the supervision of the CEO and CFO, of the design and operating effectiveness of the Company's disclosure controls and procedures. Based on this evaluation, the CEO and CFO concluded that due to the material weaknesses in our ICFR as described below in Management's Annual Report on Internal Controls over Financial Reporting, the Company's DC&P were not effective as of December 31, 2021.

Management's Annual Report on Internal Controls over Financial Reporting

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

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

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

- **Control environment:** The Company did not maintain an effective control environment and has identified deficiencies relating to: (i) appropriate organizational structure, reporting lines, and authority and responsibilities, including our Board of Directors' and Audit Committee's oversight and governance of external financial reporting and related party transactions, (ii) lack of senior financial reporting resources for a portion of the year, to deal with complex accounting matters and perform management review controls over period-end consolidated financial statements. The Company did not have a sufficient number of trained resources with the appropriate skills and knowledge with assigned responsibilities and accountability for the design and operation of ICFR; and (iii) holding individuals accountable for their internal control related responsibilities.
- **Control activities:** The Company did not fully design and implement effective control activities and has identified deficiencies relating to: (i) selecting and developing control activities that contribute to the mitigation of risks to acceptable levels, and (ii) deploying control activities through policies that establish what is expected and procedures that put policies into action. For example, control activities related to documentation and consistency in accounting for intangible assets internally generated and revenue recognition were deficient.
- **Journal Entries:** The Company did not effectively design and maintain appropriate segregation of duties and controls over the effective preparation, review and approval, and associated documentation of journal entries, across its ERP platform. The Company did not have adequate review procedures for the recording of manual entries.
- **Complex Spreadsheet Controls:** The Company did not implement and maintain effective controls surrounding certain complex spreadsheets, including addressing all identified risks associated with manual data entry, completeness of data entry, and the accuracy of mathematical formulas, impacting complex spreadsheets used in fixed asset continuity schedules, production and revenue forecasting, and the calculation of the fair value of investments
- **User Access Controls:** The Company did not maintain effective user access controls to adequately restrict user access to financial applications and related data in accordance with job responsibilities. Management did not perform appropriate user access reviews, including superuser access.

As a consequence, the Company did not have effective control activities related to the design, implementation and operation of process-level and management review control activities related to order-to-cash (including revenue trade receivables, and billings in excess of cost/cost in excess of billings), procure-to-pay (including operating expenses, prepaid expenses, accounts payable, and accrued liabilities), hire-to-pay (including compensation expense and accrued liabilities), long-lived assets, significant unusual transactions, related party transactions and other financial reporting processes. The Company's subsidiaries from the Pyro Green-Gas Inc. acquisition were excluded from the evaluation of DC&P and ICFR given that the acquisition occurred during the year and their assets and revenues represent approximately 12% and 22% respectively, of the consolidated amounts.

Aside from these material weaknesses, management has concluded that the Company's consolidated financial statements as at and for the year ended December 31, 2021, present fairly,

in all material respects, the Company's financial position, results of operations, changes in shareholders' equity and cash flows in accordance with IFRS as issued by the IASB. There were

no material adjustments to the Company's consolidated financial statements for the year ended December 31, 2021, 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, 2021, the Company's design and operation of ICFR and DC&P were not effective.

Management's Remediation Measures

During the year ended December 31, 2021, management initiated and continues to implement remediation measures outlined in the 2020 MD&A. Management has performed an initial risk assessment using a top-down, risk-based approach with respect to the risks of material misstatement of the consolidated financial statements. In addition, compensating controls have been applied to the areas where the risks

of material misstatement are considered moderate to high. The Company is using and plans to continue to use outside resources to strengthen the business process documentation and help with management's self-assessment and testing of internal controls.

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

- Continue to establish and improve an appropriate organizational structure and policies that the Board of Directors and Audit Committee will enforce to ensure proper oversight and governance of the external financial reporting process and related party transactions. Awareness by the Audit Committee and support over financial reporting matters has been improved
- Train, and retain individuals with appropriate skills and experience, assign responsibilities and hold individuals accountable for their roles related to ICFR. During the latter part of 2021, a new CFO was retained with the appropriate skills and knowledge to deal with complex accounting matters and perform management review controls over period-end consolidated financial statements as well as skills and knowledge of ICFR which has contributed to mitigating to a certain extent the severity of this control deficiency.
- Design and implement a risk assessment process to identify and assess risks of material misstatement and ensure that the impacted financial reporting processes and related internal controls are properly designed and in place to respond to those risks in our financial reporting; as a result, additional compensating internal controls were implemented in order to address and mitigate such risks, and
- Enhance the design of existing control activities and implement additional process-level control activities (including controls over the order-to-cash, procure-to-pay, hire-to-pay, long-lived assets, inventory, significant unusual transactions, related party transactions and other financial reporting processes) and ensure they are properly evidenced and operating effectively. A firm has been engaged to assist in the selection and testing of key internal controls and validate their effectiveness.

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

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

Changes in internal controls over financial reporting

Other than the material weaknesses described above, and the remediation process described above, there were no changes to the Company's ICFR during the year ended December 31, 2021 that have materially affected, or are reasonably likely to materially affect, the Company's ICFR.

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

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

RISK FACTORS

The Company has identified below certain significant risks relating to the business of the Company and the industry in which it operates. The following information is only a summary of certain risk factors and is qualified in its entirety by reference to, and must be read in conjunction with, the detailed information appearing elsewhere in this MD&A. These risks and uncertainties are not the only ones facing the Company. Additional risks and uncertainties not currently known to the Company, or that the Company currently considers immaterial, may also impair the operations of the Company. If any such risks materialize into actual events or circumstances, the Company's assets, liabilities, financial condition, results of operations (including future results of operations), business and business

prospects, are likely to be materially and adversely affected. There is no assurance that risk management steps taken will avoid future loss due to the uncertainties described below or other unforeseen risks. An investment in the Common Shares or other securities of the Company is highly speculative and involves a high degree of risk. Before making any investment decision, prospective investors should carefully consider all the information contained in this document including, in particular, the risk factors described below.

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

condition, results of operations, and future prospects could be materially and adversely affected. In that event, the trading price of the Common Shares (or the value of any other securities of the Company) could decline, and the Company's securityholders could lose part or all of their investment.

Risks Related to the Company's Business and Industry

Operating Income (Loss) and Negative Operating Cash Flow

Prior to December 31, 2021, the Company had a history of losses and negative cash flows. For the year ended December 31, 2021, the Company has net losses of \$38,431,939, cash flows used in operations of \$18,113,432, and an accumulated deficit of \$61,217,831 at December 31, 2021. 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

To date, a small number of customers have accounted for a majority of PyroGenesis' revenues. As its business expands, the Company expects that revenue distribution will be over a larger number of different customers. For the year ended December 31, 2021, sales of PyroGenesis to its four principal customers accounted for approximately 79% of its total revenue. For the year ended December 31, 2020, sales to two principal customers accounted for approximately 79% of PyroGenesis' total revenue. The loss of, or a reduction in, purchase orders or anticipated purchase orders from PyroGenesis' principal customers could have a material adverse effect on its business, financial condition and results of operations. Additionally, if one of PyroGenesis' customers is unable to meet its commitments to PyroGenesis, the Company's business, financial condition and results of operations could be adversely affected.

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

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 year ended December 31, 2021, the Company has a net loss of \$38,431,939 which includes a loss from the change in value of strategic investment of \$21,426,218 and cash flows used in operations of \$18,113,432. There can be no assurance that the Company will be able to continue to generate significant gains from the value of its strategic investments in the future.

Additional financing and dilution

PyroGenesis may require additional financing. There can be no assurance that additional financing will be available to the Company when needed, or on terms acceptable to the Company.

PyroGenesis' inability to raise financing to support ongoing operations or to fund capital expenditures could limit the Company's growth and may have a material adverse effect upon the Company.

The Company does not exclude raising additional funds by equity financing. In addition, at March 31, 2022, 8,843,000 stock options are currently issued and outstanding. The exercise of stock options and/or warrants, as well as any new equity financings, represents dilution factors for present and future shareholders.

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

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

Manufacturing Facilities

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

Sales Cycle and Fixed Price Contracts

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

Reliance on Technology

PyroGenesis will depend upon continuous improvements in technology to meet client demands in respect of performance and cost, and to explore additional business opportunities. There can be no assurance that the Company will be successful in its efforts in this regard or that it will have the resources available to meet this demand. Whilst management anticipates that the research and

development will allow the Company to explore additional business opportunities, there is no guarantee that such business opportunities will be presented or realized. The commercial advantage of the Company will depend to a significant extent on the intellectual property and proprietary technology of PyroGenesis and the ability of the Company to prevent others from copying such proprietary technologies. PyroGenesis currently relies on intellectual property rights

and other contractual or proprietary rights, including (without limitation) copyright, trade secrets, confidential procedures, contractual provisions, licenses and patents, to protect its proprietary technology. PyroGenesis may have to engage in litigation in order to protect its patents or other intellectual property rights, or to determine the validity or scope of the proprietary rights of others. This type of litigation can be expensive and time consuming, regardless of whether or not the Company is successful. PyroGenesis may seek patents or other similar protections in respect of particular technology; however, there can be no assurance that any future patent applications will actually result in issued patents, or that, even if patents are issued, they will be of sufficient scope or strength to provide meaningful protection or any commercial advantage to the Company.

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

Changes to Contracts

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

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

Foreign Exchange Exposure

PyroGenesis' products and services are increasingly being sold in markets outside of Canada, whilst most of its operating expenses and capital expenditures are denominated in Canadian dollars. As a result, the Company is exposed to fluctuations in the foreign exchange rates between

Canadian dollar and the currency in which a particular sale is transacted, which may result in foreign exchange losses that could affect earnings. Foreign sales are predominantly denominated in U.S. dollars, as well as the Euro and Indian Rupee. The Company has not to date sought to hedge the risks associated with fluctuations in foreign exchange rates.

Competition

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

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

Management and Key Personnel

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

Implementation of a strategic plan

PyroGenesis' commercial strategy aims to leverage its products, consumables, and services whilst focusing on the resolution of problems within niche markets within the industries served by the Company. There can be no assurances as to the success of the Company's strategic plan, which should be considered 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 its products are sold due to economic, legislative, political and military conditions in such countries.

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

Governmental Regulation

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

Government-funded Defense and Security Programs

Like most companies that supply products and services to governments, government agencies routinely audit and investigate government contractors. These agencies may review the Company's performance under its contracts, business processes, cost structure, and compliance with

applicable laws, regulations and standards. The Company's incurred costs for each year are subject to audit by government agencies, which can result in payment demands related to costs they believe should be disallowed. The Company works with governments to assess the merits of claims and where appropriate reserve for amounts disputed. The Company could be required to provide repayments to governments and may have a negative effect on its results of operations.

Contrary to cost-reimbursable contracts, some costs may not be reimbursed or allowed under fixed-price contracts, which may have a negative effect on the Company's results of operations if it experiences costs overruns.

Environmental Liability

PyroGenesis is subject to various environmental laws and regulations enacted in the jurisdictions in which it operates, which govern the manufacturing, processing, importation, transportation, handling and disposal of certain materials used in the Company's operations. Management believes that it has adequate procedures in place to address compliance with current environmental laws and regulations. Furthermore, management monitors the Company's practices concerning the handling of environmentally hazardous materials. However, there can be no assurance that the

Company's procedures will prevent environmental damage occurring from spills of materials handled by the Company or that such damage has not already occurred. On occasion, substantial liabilities to third parties may be incurred. The Company may have the benefit of insurance maintained by it or the operator, however, the Company may become liable for damages against which it cannot adequately insure or against which it may elect not to insure because of high costs or other reasons. The Company's clients are subject to similar environmental laws and regulations, as well as limits on emissions to the air and discharges into surface and sub-surface waters. While regulatory developments that may follow in subsequent years could have the effect of reducing industry activity, the Company cannot predict the nature of the restrictions that may be imposed. The Company may be required to increase operating expenses or capital expenditures in order to comply with any new restrictions or regulations.

Product Liability and Other Lawsuits

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

A malfunction or the inadequate design of the Company's products could result in product liability or other tort claims. Accidents involving the Company's products could lead to personal injury or physical damage. Any liability for damages resulting from

malfunctions could be substantial and could materially adversely affect the Company's business and results of operations. In addition, a well-publicized actual or perceived problem could adversely affect the market's perception of the Company's products. This could result in a decline in demand for the Company's products, which would materially adversely affect the Company's financial condition and results of operations.

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

Information systems disruptions

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

Security Breaches

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

Public Health Crises

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

Subsequent to December 31, 2019, the global emergence of coronavirus (COVID-19) occurred. The global outbreak of COVID-19 has resulted in governments worldwide enacting emergency

measures to protect against the spread of the virus. These measures, which include, among other things, limitations on travel, self-imposed quarantine periods and social distancing measures, have caused material disruption to businesses globally resulting in an

economic slowdown. Global equity markets have experienced significant volatility and weakness. Governments and central banks have reacted with significant monetary and fiscal interventions designed to stabilize economic conditions. The duration and impact of the COVID-19 outbreak is unknown at this time, as is the efficacy of any government and/or central bank interventions. It is not possible to reliably estimate the length and severity of these developments and the impact on the financial results and condition of the Company in future periods.

As of the date of this MD&A, the Company has successfully continued operations under COVID-19 protocols. COVID-19 has not resulted in any material delays in the development or testing of the Company's products or any other material development projects. The Company is not currently experiencing any 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 services or products.

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

Risks Related to Acquiring Companies

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

Global Economic Uncertainty

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

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

Inability to Renew Leases

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

Financial Reporting and Other Public Issuer Requirements

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

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

Influence of the Significant Shareholders

To the Company's knowledge, no shareholder beneficially owns, or controls or directs, directly or indirectly, more than 10% of the voting rights attached to the Company's outstanding voting securities, except for Mr. Photis Peter Pascali, President and Chief Executive Officer of the Company, who holds or controls, directly or indirectly, 79,744,498 Common Shares, representing in aggregate 46.87% of the total voting rights attached to the outstanding Common Shares, and options to acquire an additional 5,920,000 Common Shares (increasing the total number of Common Shares held or controlled, directly or indirectly, by him to 85,664,498 Common Shares, or 47.87% of the Common Shares, on a fully diluted basis). In addition, from time to time, the Company may have other shareholders who have the ability to exercise significant influence over matters submitted to the shareholders of the Company for approval, whether subject to approval by a majority of the shareholders of the Company or subject to a class vote or special resolution.

Limited Control Over the Company's Operations

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

Change in Tax Laws

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

Forward-Looking Information

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

Credit Facilities

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

Risks Related to the Company's Securities

Potential Volatility of Common Share Price

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

- (i) the public's reaction to the Company's press releases, announcements and filings with regulatory authorities and those of its competitors;
- (ii) fluctuations in broader stock market prices and volumes;
- (iii) changes in market valuations of similar companies;
- (iv) investor perception of the Company, its prospects or the industry in general;
- (v) additions or departures of key personnel;
- (vi) commencement of or involvement in litigation;
- (vii) announcements by the Company or its competitors of strategic alliances, significant contracts, new technologies, acquisitions, commercial relationships, joint ventures or capital commitments;
- (viii) variations in the Company's quarterly results of operations or cash flows or those of other comparable companies;
- (ix) revenues and operating results failing to meet the expectations of securities analysts or investors in particular quarter;
- (x) changes in the Company's pricing policies or the pricing policies of its competitors;
- (xi) future issuances and sales of Common Shares;
- (xii) sales of Common Shares by insiders of the Company;
- (xiii) third party disclosure of significant short positions;
- (xiv) demand for and trading volume of Common Shares;
- (xv) changes in securities analysts' recommendations and their estimates of the Company's financial performance;
- (xvi) short-term fluctuation in stock price caused by changes in general conditions in the domestic and worldwide economies or financial markets; and
- (xvii) the other risk factors described under this heading of the MD&A.

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

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

Market Liquidity

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

Dividends to Shareholders

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

Impact of Future Sales by Existing Shareholders

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

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

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

Working Capital and Future Issuances

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

Additional equity financing may be dilutive to holders of Common Shares. Debt financing may involve restrictions on the Company's financing and operating activities. Debt financing may be convertible into other securities of the Company which may result in immediate or resulting dilution. In either case, additional financing may not be available to the Company on acceptable terms or at all.

If the Company is unable to raise additional funds as needed, the scope of its operations or growth may be reduced and, as a result, the Company may be unable to 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 a timely basis when the Company's officers, directors and principal shareholders purchase or sell Common Shares as the reporting periods under the corresponding Canadian insider reporting requirements are longer.

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

under the Exchange Act to file annual and quarterly reports with the SEC as promptly as U.S. domestic companies whose securities are registered under the Exchange Act.

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

Loss of Foreign Private Issuer Status in the Future

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

more detailed and extensive than the forms available to a foreign private issuer. In addition, the Company may lose the ability to rely upon exemptions from Nasdaq corporate governance requirements that are available to foreign private issuers.

Inability for U.S. Investors to Enforce Certain Judgments

The Company is a corporation existing under the Canada Business Corporations Act. A number of the Company's directors and officers are residents of Canada, and substantially all of the Company's assets are located outside the United States. As a result, it may be difficult to effect service within the United States upon the Company or upon its directors and officers. Execution by United States courts of any judgment obtained against the Company or any of the Company's directors or officers in United States courts may be limited to the assets of such companies or such persons, as the case may be, located in the United States. It may also be difficult for holders of securities who reside in the United States to realize in the United States upon judgments of courts

of the United States predicated upon civil liability and the civil liability of the Company's directors and executive officers under the United States federal securities laws. The Company has been advised that a judgment of a U.S. court predicated solely upon civil liability under U.S. federal securities laws or the securities or "blue sky" laws of any state within the United States, would likely be enforceable in Canada if the United States court in which the judgment was obtained has a basis for jurisdiction in the matter that would be recognized by a Canadian court for the same purposes. However, there may be doubt as to the enforceability in Canada against these non-U.S. entities or their controlling persons, directors and officers who are not residents of the United States, in original actions or in actions for enforcement of judgments of courts of the United States, of liabilities predicated solely upon U.S. federal or state securities laws.

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

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

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

OUTLOOK

PyroGenesis completed 2021 having achieved many important accomplishments and milestones. Most importantly, we maintained the accelerated business momentum of the past 18 months despite the challenges of the global marketplace due to Covid, and even introduced new markets and opportunities to provide a broader, stronger platform for 2022 and beyond.

Overall Strategy

Building on its strategy to offer technology solutions that provide benefits from greenhouse gas ("GHG") emissions reduction, the Company increased its offerings in this regard through a series of adjustments, such as internal capacity scaling, diversified sales channel

targeting, and external vision – resulting in, most notably, the doubling of production staff, contract wins in new sectors, and the acquisition of AirScience Technologies and its subsequent re-launch as Pyro Green-Gas.

While we had previously considered our strategy to be timely, as many governments are stimulating their respective economies by promoting and funding both environmental technologies and infrastructure projects, 2021 proved an even greater affirmation of this approach, as major industries and organizations targeted by the Company not only recommitted to their targets, but in some cases raised them significantly. For instance, in the iron ore and steel-making sector, in October 2021, Rio Tinto unveiled new targets to reduce its scope 1 & 2 emissions by 50 per cent by 2030, more than tripling its previous targets. (<https://www.riotinto.com/news/releases/2021/Rio-Tinto-to-strengthen-performance-decarbonise-and-grow>)

As stated, many times, most of PyroGenesis' product lines do not depend on environmental incentives (tax credits GHG certificates, environmental subsidies, etc.) to be economically viable; with the increased commitments by industry to carbon reduction, it is anticipated that the Company's growth drivers will expand, and shareholders will see increased value.

Furthermore, the experience gained over the past two years as we, and our prospective clients, manoeuvred through both the lengthy modelling and business-case development processes, and the government incentive and procurement system, has provided immeasurable insights into various bureaucratic and government processes – affording a much clearer understanding of the process, enhancing our ability to respond to future situations, and giving us better vision and a rebalance of expectations regarding timeline control. This knowledge will only serve to enhance what management has defined as government incentive-related tailwinds into an already strong pipeline, all with a positive impact on revenues and shareholder value.

The Company is not immune to the negative impact that COVID-19 and other external factors brought on businesses, specifically related to the workforce and, more importantly, the supply chain. However, Management believes that the Company is better situated than most, and through various mitigation measures these challenges continue to be dealt with in an effective manner. The Company expects even greater improvements as the impact of COVID-19 and other external factors continues to recede after Q2 2022.

Organic Growth

Organic growth will be spurred on by (i) the natural growth of our existing offerings, which continue to be accelerated given our strong balance sheet (ii) leveraging off our "Golden Ticket" advantage that allows us to see first-hand some of the additional and peripheral needs of our customers, and (iii) exploring new ways scientifically (and corresponding markets laterally) to provide unique solutions and value that helps industries deal with some of the most pressing environmental, engineering, and energy problems.

We have described in the past our Golden Ticket advantage as one which occurs when one sells directly, or is engaged directly, with the end user and, as a result, is regularly on-site in the customer's operations – "inside the fence". A Golden Ticket provides the opportunity to either, (i) cross sell other products or, ideally, (ii) identify new areas of concern that can be addressed uniquely by PyroGenesis.

Over the past several years, PyroGenesis has successfully positioned each of its business lines for rapid growth by strategically partnering with multi-billion-dollar entities. These entities have identified PyroGenesis' offerings to be unique, in demand, and of such a commercial nature as to warrant such unique relationships. We expect that these relationships are now positioned to transition into significant revenue streams.

Regarding how new scientific efforts lead to new markets, in 2021 the Company transitioned its knowledge in waste destruction to consider solving some of the challenges related to polyfluoroalkyl (PFAS), the hazardous "forever chemicals" the EPA has defined as an emerging event requiring fast attention. After winning an initial competitive bidding process to provide a \$9.2MM system, the Company sees continued momentum in this area in 2022 and beyond.

Aluminum Industry Process Improvement

Momentum with PyroGenesis' Aluminum Industry strategy and offering continues to not just bear fruit, but to explode in opportunity in several different directions.

In 2021, the Company concluded a joint venture and a license agreement with an existing and proven technology provider. The technology is geared to uniquely handle the residues resulting from the processing of dross in the aluminum industry. We had previously

announced our intention to secure this technology and would not only make our traditional DROSRITE™ offering more appealing but could also be offered as a stand-alone product. We believe that valorizing the residues and producing high end products will further define us as the go-to company for all dross related processing. This is a prime example of our “Coffee & Donuts” strategy in play. The joint venture will only relate to the new technology and, as such, PyroGenesis will not have to vet in any assets or IP (specifically not the DROSRITE™ technology).

Overall, the Company is now one of the largest and certainly the fastest growing dross recovery solutions in the world, with 13 large DROSRITE™ systems in use or slated for delivery to markets around the world. The Company also continue to increase the price and the efficiency of its systems, and is pitching several more contracts as of the writing of this document.

Steel Industry Process Improvement

With steelmaking one of the most carbon-emission intensive industries in the world, estimated to be responsible for between 7 to 12 per cent of all global fossil fuel and greenhouse gas emissions, that industry continues to be under intense pressure, including huge financial penalties, to find emission reductions.

This pressure on the steel-making industry allows PyroGenesis to expect demand for its upstream, iron ore pelletization solution to increase significantly, as steel-makers look to all aspects of the production lifecycle for carbon reduction opportunities.

Serious consideration is being given to replacing large numbers of the fossil fuel burners in iron ore pelletization with PyroGenesis' proprietary and patented plasma torches. To date, everything is proceeding as expected. Initial discussions with potential customers have evolved into confirmation stages, computer simulations, business case development, and initial torch orders for in-factory testing with two of the largest steel-making and mining companies in the world. As these torches are tested in live settings over the coming months, the company expects a resulting roll-out program to replace many, if not all, fossil fuel burners with PyroGenesis' plasma torches in the customers' iron ore pelletization furnaces – a technology process for which PyroGenesis, as the patent holder, commands a significant competitive advantage.

PyroGenesis expects that the previously mentioned government initiatives, geared to stimulating their respective economies by promoting and funding environmental technologies and infrastructure projects, will only serve to increase interest in PyroGenesis' plasma torch offerings to other companies in this space. While potential clients seeking government support for large initiatives may draw out the onset of large contracts, the sheer number of potential customers, and the fact that the Company will engage with many of them in different stages at different times, will help to ensure a long, overlapping pipeline of potential projects.

In addition, PyroGenesis is proactively targeting other industries which are experiencing significant pressure to reduce GHGs, and which utilize fossil fuel burners as well, such as the cement, aluminum, and automotive industries.

Plasma Torches for Emerging / Niche Markets

Separately, the Company also offers plasma torches to emerging / niche markets where there is a high probability of on-going sales from successful implementation.

One such example is in land-based waste destruction applications, more specifically for medical waste. The Company signed a contract in August 2021 to supply two Air Plasma Torch systems to an existing client to be used in the destruction of such medical waste.

Another example is the previously announced contract with a technology startup to produce a plasma torch ideal for tunneling. PyroGenesis has reason to believe that the real plasma-based tunneling opportunity may lie outside of the scope of the current agreement. As a result, PyroGenesis terminated this arrangement and this project with this client has ended. PyroGenesis is evaluating, and intends to pursue, plasma based tunneling opportunities, specifically those identified to be outside of the scope of the current agreement at a later date.

For each new market, the Company will also benefit from providing proprietary spare parts and service, which generates significant recurring revenue, thus complementing the Company's long-term strategy to build a recurring revenue model.

Additive Manufacturing (Metal Powders for 3D Printing)

With respect to additive manufacturing, we continue to expect to see significant year over year improvements in our 3D metal powders offering as our NexGen™ facility, which incorporates all the previously disclosed benefits (increased production rates and lower capital & operating expenditures), is now officially on-line and operational.

Of note, a major tier-one global aerospace company has already entered into an agreement with the Company to formally qualify its powder, at considerable expense to the global aerospace company, with a view towards having the Company become a supplier.

There are additional major top tier aerospace companies and OEMs, in both Europe and North America, eagerly awaiting powders from this new state-of-the-art production line, and we are currently in the process of supplying sample powders to them for analysis.

The Company expects that such developments will continue and will translate into significant improvements in contributions to revenue by this segment in the mid-long term.

HPQ/PUREVAP™

With respect to HPQ, the goal is to continue to expand our role as HPQ's technology provider for the game changing family of silicon processes which we are developing exclusively for HPQ and its wholly owned subsidiaries HPQ Nano Silicon Powders Inc. and HPQ Silica Polvere Inc., namely:

- The PUREVAP™ "Quartz Reduction Reactors" (QRR), an innovative process (patent pending), which should permit the one step transformation of lower purity quartz (SiO₂) than any traditional processes can handle into a silicon (Si) of a higher purity level (2N-4N) that can be produced by any traditional smelter, at reduced costs, energy input, and carbon footprint. The unique capabilities of this process could position HPQ as a leading provider of the specialised silicon material needed to propagate its considerable renewable energy potential; and
- The PUREVAP™ Nano Silicon Reactor (NSiR), which, if successful, could position itself as a new proprietary low-cost process that can transform the silicon (Si) made by the PUREVAP™ QRR into the nano-silicon materials (spherical silicon powders and silicon nanowires) sought after by energy storage, batteries, electric vehicle manufactures and clean hydrogen sectors participants. The aim of the ongoing work is to position HPQ NANO as the first to market with a commercial scale low-cost nanoparticle production system.
- A new plasma-based process that could convert Silica (Quartz, SiO₂) into fumed silica (Pyrogenic Silica) in one step. This new process could be a low-cost and environmentally friendly option that combines HPQ Silicon High Purity Quartz initiatives with PyroGenesis' industry leading know-how in the development of commercial plasma processes. It is envisioned that the process will eliminate harmful chemicals presently generated by traditional methods. This new process could revolutionize the manufacturing of fumed silica, while repatriating production back to North America.

Government participation in a \$5.3MM funding of the fumed silica project confirms our expectation that 2021 should be a year in which significant developments occur on all these fronts.

Land Based Units/Environmental

The Company did not previously aggressively target the Company's land-based/environmental solutions during the period where the Company's other offerings, such as in steel-making and aluminum industry process improvement, were accelerating.

However, during 2021, interest in the Company's capabilities in this arena was renewed. Besides the interest in niche torch applications mentioned above (ex. medical waste), PyroGenesis' plasma-based solutions have generated interest in processing a waste stream that has recently been classified as hazardous. Management believes that, in a current bidding process, its solution is the technology of choice. If successful, this will represent a significant positioning of PyroGenesis plasma-based solutions not only for this specific product line but, when taken in conjunction with the historic success with its offering on US Aircraft carriers, the land based/environmental segment in general.

Growth through Synergistic Mergers and Acquisitions

As previously disclosed, the Company is conservatively considering synergistic merger and acquisition strategies to augment its growth, and the Company has been very actively involved in pursuing several opportunities to support this strategy. In so doing, the focus has been on private companies exclusively which (i) primarily leverage the Company's Golden Ticket advantage, or (ii) could uniquely benefit from the Company's engineering advantage and/or international relationships.

During 2021, the Company acquired AirScience Technologies Inc. ("AST"), a company with experience in biogas upgrading. PyroGenesis believes that AST's experience in biogas upgrading, combined with PyroGenesis' engineering and multidisciplinary skills, as well as its proven record of meeting the exacting demands of multibillion-dollar companies and the US military, positions the combination well to address the opportunities arising from this growing need to generate renewable natural gas.

The acquisition of AST also provides potential synergies with PyroGenesis' land-based waste destruction offerings which, if successful, will significantly increase their value to the market. AST's technology complements PyroGenesis' existing offerings and further strengthens PyroGenesis' position as an emerging leader in GHG solutions for sustainable long-term growth.

Our objective is to strengthen AST's operations and quality control systems, over the course of the next 12-18 months, while at the same time increasing the backlog of signed contracts and successfully delivering on existing contracts thus positioning AST as a significant and credible player in the marketplace. Once established, we will evaluate our options to accelerate the rollout of these solutions.

Additional Opportunities - Plasma Torches:

Within the Plasma Torch line of business, the Company continues to consider options to leverage its plasma expertise and continue to review torch technologies that could complement existing offerings, leverage off their unique relationships, or explore new opportunities. In early stage discussion across many sectors and many potential customers, no additional details are available at this time.

CONCLUSION

In conclusion, PyroGenesis sees 2022 as a platform from which decades of exponential growth will stem.

The Company plans to take advantage of its unique position in its main business offerings to accelerate growth, with a particular emphasis on offerings geared to aggressively reducing GHG emissions and the world's carbon footprint, while finding and offering solutions to pressing environmental, engineering, and energy challenges.

FURTHER INFORMATION

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

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

PyroGenesis Canada Inc.

**Consolidated Financial Statements
December 31, 2021 and 2020**

PyroGenesis Canada Inc.

Consolidated Financial Statements December 31, 2021 and 2020

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Management's Responsibility

Management is responsible for the preparation and presentation of the accompanying consolidated financial statements, including responsibility for significant accounting judgments and estimates in accordance with International Financial Reporting Standards as issued by the International Accounting Standards Board. This responsibility includes selecting appropriate accounting principles and methods, and making decisions affecting the measurement of transactions in which objective judgment is required.

The Board of Directors and Audit Committee are composed primarily of Directors who are neither management nor employees of the Company. The Board of Directors is responsible for overseeing management in the performance of its financial reporting responsibilities, and for approving the financial information included in the annual report. The Board fulfils these responsibilities by reviewing the financial information prepared by management and discussing relevant matters with management and the external auditor. The Audit Committee has the responsibility of meeting with management and the external auditors to discuss the internal controls over the financial reporting process, auditing matters and financial reporting issues. The Audit Committee is also responsible for recommending the appointment of the Company's external auditor.

Raymond Chabot Grant Thornton LLP, an Independent Registered Public Accounting Firm, is appointed by the shareholders to audit the financial statements and report directly to them; their report follows. The external auditor has full and free access to, and meets periodically and separately with, both the Audit Committee and management to discuss their audit findings.

March 31, 2022

[Signed by P. Peter Pascali]

P. Peter Pascali, Chief Executive Officer

[Signed by Andre Mainella]

Andre Mainella, Chief Financial Officer

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors of PyroGenesis Canada Inc.

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated statements of financial position of PyroGenesis Canada Inc. (the Company) as of December 31, 2021, the related consolidated statements of comprehensive income (loss), changes in shareholders' equity, and cash flows for the year ended December 31, 2021, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Company as of December 31, 2021, and its consolidated operations and its consolidated cash flows for the year ended December 31, 2021, in conformity with International Financial Reporting Standards as issued by the International Accounting Standards Board.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audit. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audit, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audit included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audit provides a reasonable basis for our opinion.

We have served as the Company's auditor since 2021.

Raymond Chabot Grant Thornton LLP

Montréal, Canada
March 31, 2022



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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and Board of Directors of PyroGenesis Canada Inc.

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated statements of financial position of PyroGenesis Canada Inc. (the Company) as of December 31, 2020, the related consolidated statements of comprehensive income, shareholders' equity, and cash flows for the year ended December 31, 2020, and the related notes (collectively, the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Company as of December 31, 2020, and its consolidated financial performance and its consolidated cash flows for the year ended December 31, 2020, in conformity with International Financial Reporting Standards as issued by the International Accounting Standards Board.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audit. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audit included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audit provides a reasonable basis for our opinion.

We served as the Company's auditor from 2015 to 2021.

Montréal, Canada
March 31, 2021

PyroGenesis Canada Inc.
Consolidated Statements of Financial Position

December 31, 2021 and 2020

	December 31, 2021 \$	December 31, 2020 \$
Assets		
<i>Current assets</i>		
Cash and cash equivalents [note 7]	12,202,513	18,104,899
Accounts receivable [note 8]	17,639,616	3,329,653
Costs and profits in excess of billings on uncompleted contracts [note 9]	4,922,710	1,073,633
Inventory [note 24]	887,590	—
Investment tax credits receivable [note 10]	256,513	567,059
Income taxes receivable	117,029	—
Current portion of deposits [note 13]	1,328,452	1,421,246
Current portion of royalties receivable [note 12]	311,111	—
Contract assets	375,789	694,301
Prepaid expenses	717,661	145,996
Total current assets	38,758,984	25,336,787
<i>Non-current assets</i>		
Deposits [note 13]	248,756	301,341
Strategic investments [note 11]	14,901,659	39,991,750
Property and equipment [note 14]	3,712,937	2,529,570
Right-of-use assets [note 15]	5,765,993	3,701,000
Royalties receivable [note 12]	947,543	1,060,000
Investment tax credits receivable [note 10]	—	705,316
Intangible assets [note 16]	2,774,198	905,614
Goodwill [note 17]	2,660,607	—
Total assets	69,770,677	74,531,378
Liabilities		
<i>Current liabilities</i>		
Accounts payable and accrued liabilities [note 18]	10,069,177	4,708,051
Billings in excess of costs and profits on uncompleted contracts [note 19]	9,400,231	6,592,972
Current portion of term loans [note 20]	83,004	12,208
Current portion of lease liabilities [note 15]	2,934,236	225,977
Balance due on business combination [note 5]	2,242,503	—
Income taxes payable	23,048	—
Total current liabilities	24,752,199	11,539,208
<i>Non-current liabilities</i>		
Lease liabilities [note 15]	2,389,729	2,762,565
Term loans [note 20]	107,901	100,499
Balance due on business combination [note 5]	1,709,700	—
Deferred income taxes [note 31]	42,394	706,000
Total liabilities	29,001,923	15,108,272
Shareholders' equity [note 22]		
Common shares and warrants	82,104,086	67,950,069
Contributed surplus	19,879,055	10,480,310
Accumulated other comprehensive income	3,444	—
Deficit	(61,217,831)	(19,007,273)
Total shareholders' equity	40,768,754	59,423,106
Total liabilities and shareholders' equity	69,770,677	74,531,378

Contingent liabilities, subsequent events [notes 29 and 33].

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

Approved on behalf of the Board:

[Signed by P. Peter Pascali] P. Peter Pascali

[Signed by Andrew Abdalla] Andrew Abdalla

PyroGenesis Canada Inc.**Consolidated Statements of Comprehensive Income (Loss)**

For the years ended December 31, 2021 and 2020

	2021	2020
	\$	\$
Revenues [note 6]	31,068,350	17,775,029
Cost of sales and services [note 24]	18,636,539	7,472,361
Gross profit	12,431,811	10,302,668
Expenses		
Selling, general and administrative [note 24]	27,237,135	12,334,553
Research and development, net [note 10]	2,535,987	(731,077)
	29,773,122	11,603,476
Net loss from operations	(17,341,311)	(1,300,808)
Changes in fair value of strategic investments [note 11]	(21,426,218)	44,626,698
Finance costs, net [note 25]	(404,370)	(524,074)
Net earnings (loss) before income taxes	(39,171,899)	42,801,816
Income taxes [note 31]	(739,960)	1,033,412
Net earnings (loss)	(38,431,939)	41,768,404
Other comprehensive income (loss)		
Items that will be reclassified subsequently to profit of loss		
Foreign currency translation gain on investments in foreign operations	3,444	—
Comprehensive income (loss)	(38,428,495)	41,768,404
Earnings (loss) per share [note 26]		
Basic	(0.23)	0.28
Diluted	(0.23)	0.27

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

PyroGenesis Canada Inc.
Consolidated Statements of Changes in Shareholders' Equity

For the years ended December 31, 2021 and 2020

	Number of common shares	Common shares and warrants \$	Contributed Surplus \$	Equity portion of convertible debentures \$	Accumulated other comprehensive income \$	Deficit \$	Total \$
Balance - December 31, 2020	159,145,993	67,950,069	10,480,310	—	—	(19,007,273)	59,423,106
Shares issued upon exercise of stock options [note 22]	3,482,000	1,473,818	(364,000)	—	—	—	1,109,818
Shares issued upon exercise of share purchase warrants and compensation options [note 22]	8,337,897	13,085,197	—	—	—	—	13,085,197
Share redemptions for cancellation [note 22]	(840,094)	(404,998)	—	—	—	(3,778,619)	(4,183,617)
Share-based payments	—	—	9,762,745	—	—	—	9,762,745
Other comprehensive income for the year	—	—	—	—	3,444	—	3,444
Net loss	—	—	—	—	—	(38,431,939)	(38,431,939)
Balance – December 31, 2021	170,125,796	82,104,086	19,879,055	—	3,444	(61,217,831)	40,768,754
Balance - December 31, 2019	141,303,451	47,073,243	6,679,730	401,760	—	(60,237,656)	(6,082,923)
Shares issued upon public issuance [note 22]	3,354,550	12,076,380	—	—	—	—	12,076,380
Share issuance cost	—	(1,640,052)	—	—	—	—	(1,640,052)
Shares issued upon exercise of stock options [note 22]	2,118,000	1,244,207	(484,807)	—	—	—	759,400
Shares issued upon exercise of share purchase warrants [note 22]	7,060,617	5,623,323	—	—	—	—	5,623,323
Issuance of convertible loan – equity component [note 22]	—	—	—	98,422	—	—	98,422
Conversion of loan into shares [note 21]	3,225,000	925,982	—	(98,422)	—	—	827,560
Conversion of debentures into shares [note 21]	3,369,375	3,073,356	—	(360,981)	—	—	2,712,375
Share redemptions for cancellation [note 22]	(1,285,000)	(426,370)	—	—	—	(538,021)	(964,391)
Equity component of convertible debentures [note 22]	—	—	40,779	(40,779)	—	—	—
Share-based payments	—	—	4,244,608	—	—	—	4,244,608
Net earnings and comprehensive income	—	—	—	—	—	41,768,404	41,768,404
Balance – December 31, 2020	159,145,993	67,950,069	10,480,310	—	—	(19,007,273)	59,423,106

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

PyroGenesis Canada Inc.
Consolidated Statements of Cash Flows

For the years ended December 31, 2021 and 2020

	<u>2021</u>	<u>2020</u>
	\$	\$
Cash flows provided by (used in)		
Operating activities		
Net earnings (loss)	(38,431,939)	41,768,404
Adjustments for:		
Share-based payments	9,762,745	4,244,608
Depreciation of property and equipment	356,103	63,118
Depreciation of right-of-use assets	570,411	408,335
Amortization and write-off of intangible assets	465,913	27,190
Amortization of contract assets	513,572	161,291
Finance costs	404,370	524,074
Change in fair value of investments	21,426,218	(44,626,698)
Loss on disposal of property and equipment	—	2,795
Income taxes	(584,246)	706,000
Unrealized foreign exchange	(10,623)	30,704
	<u>(5,527,476)</u>	<u>3,309,821</u>
Net change in balances related to operations [note 23]	<u>(12,585,956)</u>	<u>(4,124,808)</u>
	<u>(18,113,432)</u>	<u>(814,987)</u>
Investing activities		
Additions to property and equipment	(1,502,231)	(702,111)
Additions to intangible assets	(246,630)	(113,564)
Purchase of strategic investments	(10,588,857)	(4,158,240)
Disposal of strategic investments	14,252,730	9,905,447
Business combination, net of cash acquired	807,945	—
	<u>2,722,957</u>	<u>4,931,532</u>
Financing activities		
Interest paid	(253,791)	(395,013)
Repayment of term loans	(20,507)	(117,154)
Repayment of scientific research and experimental development loans	—	(440,233)
Repayment of lease liabilities	(263,078)	(1,363,050)
Repayment of promissory notes	—	(295,000)
Repayment of convertible debentures	—	(358,500)
Proceeds from issuance of convertible loans	—	903,000
Proceeds from issuance of other term loans	—	195,919
Proceeds from issuance of shares upon exercise of warrants	13,085,197	5,623,322
Proceeds from issuance of shares upon exercise of stock options	1,109,818	759,400
Proceeds from issuance of shares [note 22]	—	12,076,380
Share issue costs	—	(1,640,052)
Shares repurchased for cancellation	(4,183,617)	(964,391)
	<u>9,474,022</u>	<u>13,984,628</u>
Effect of exchange rate changes on cash denominated in foreign currencies	14,067	(30,705)
Net increase (decrease) in cash and cash equivalents	(5,902,386)	18,070,468
Cash and cash equivalents - beginning of year	<u>18,104,899</u>	<u>34,431</u>
Cash and cash equivalents - end of year	<u><u>12,202,513</u></u>	<u><u>18,104,899</u></u>

	2021	2020
	\$	\$
Supplemental cash flow disclosure		
Non-cash transactions:		
Purchase of intangible assets included in accounts payable	81,693	113,826
Purchase of property and equipment included in accounts payable	22,557	27,870
Addition to contract assets included in accounts payable	195,060	—
Settlement of accounts receivable on business acquisition	1,744,400	—
Accretion of balance purchase price payable	110,203	—
Accretion interest on royalties receivable	132,809	—
Accretion on term loan	12,185	—
Issuance of common shares upon exercise of convertible debentures	—	2,695,500
Issuance of common shares upon conversion of loan	—	827,560
Initial recognition of contract assets and commissions payables	—	855,592
Proceeds from disposal of strategic investments included in other receivables	—	892,609
HPQ shares received in lieu of payment of accounts receivable	—	395,514
Fair value of HPQ warrants exercised	9,181,250	337,500
Initial recognition or modification of lease liabilities and right-of-use assets [note 15]:		
Right-of-use assets	2,157,796	366,566
Prepaid rent expense	(36,903)	—
Lease liabilities	2,120,893	366,566

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

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

1. Nature of operations

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

2. Basis of preparation

(a) Statement of compliance

These financial statements have been prepared in accordance with International Financial Reporting Standards (“IFRS”) as issued by the International Accounting Standards Board (“IASB”). These financial statements were approved and authorized for issuance by the Board of Directors on March 31, 2022.

(b) Functional and presentation currency

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

(c) Basis of measurement

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

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

(d) Basis of consolidation

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

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

These consolidated financial statements include the accounts of the Company and its subsidiaries, Drosrite International LLC and Pyro Green-Gas Inc. and its subsidiaries. Drosrite International LLC is owned by a member of the Company’s key management personnel and close member of the Chief Executive Officer (“CEO”) and controlling shareholder’s family and is deemed to be controlled by the Company. Pyro Green-Gas (formerly AirScience Technologies Inc. until the renaming on September 14, 2021) was acquired by the Company on August 11, 2021 (see note 5). All transactions and balances between the Company and its subsidiaries have been eliminated upon consolidation.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

2. Basis of preparation (continued)

(d) Basis of consolidation (continued)

The accounting policies set out below have been applied consistently in the preparation of the financial statements of all years presented. Finance costs and changes in fair value of strategic investments are excluded from the loss from operations in the consolidated statement of comprehensive income (loss).

3. Significant accounting policies

(a) Business combinations

Business combinations are accounted for using the acquisition method. Goodwill is measured as the excess of the fair value of the consideration transferred over the net recognized amount of the identifiable assets acquired and liabilities assumed, all measured at the acquisition date.

The consideration transferred is measured as the net of the fair values of assets transferred, liabilities assumed, and equity instruments issued by the Company at the acquisition date, including any asset or liability resulting from a contingent consideration arrangement, in exchange of the acquiree.

The obligation to pay the contingent consideration is classified as a liability, and measured as a financial instrument or as a provision. Changes in fair values that qualify as a measurement period adjustments of preliminary purchase price allocations are adjusted in the current period and such changes are applied on a retroactive basis.

Acquisition costs that the Company incurs in connection with a business combination are recognized in profit or loss as incurred, except for costs associated with the issuance of debt or equity securities.

(b) Revenue recognition

Revenue from contracts is recognized for each performance obligation either over a period of time or at a point in time, depending on which method reflects the transfer of control of the goods and services underlying the particular performance obligation.

i) Long-term contracts

Long-term contracts involve made-to-order customized equipment and machines and are generally priced on a fixed fee basis. Under these contracts, the equipment or machines are made to a customer's specifications and if a contract is terminated by the customer, the Company is entitled to the greater of the amounts invoiced at the termination date and the reimbursement of the costs incurred to date of termination, including a reasonable margin. Agreements that contain multiple deliverables require the Company to determine whether they contain separately identifiable performance obligations and to allocate the consideration received to each performance obligation.

Revenue relating to long-term contracts is recognized over time based on the measure of progress determined by the Company's efforts or inputs towards satisfying the performance obligation relative to the total expected inputs. The degree of completion is assessed based on the proportion of total costs and/or hours incurred to date, compared to total costs and/or hours anticipated to provide the service under the entire contract, excluding the effects of inputs that do not depict performance, e.g. uninstalled materials. For long-term contracts with uninstalled materials, the Company adjusts the transaction price and recognizes revenue on uninstalled materials to the extent of those costs incurred, i.e. at a zero percent profit margin, when certain conditions are met.

Estimates are required to determine anticipated costs and/or hours on long-term contracts. A provision is made for the entire amount of expected loss, if any, in the period in which they are first determinable.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

3. Significant accounting policies (continued)

(b) Revenue recognition (continued)

i) Long-term contracts (continued)

Contract modifications are changes in scope and/or price that are approved by the parties to the contract. Approval may be written, oral or implied by customary business practices, and are legally enforceable. The Company accounts for modifications as a separate contract if the modifications add distinct goods or services that are priced commensurate with stand-alone selling prices or if the remaining goods or services are distinct from those already transferred, otherwise modifications are accounted for as part of the original contract.

Costs and profits in excess of billings on uncompleted contracts and trade receivables are both rights to consideration in exchange for goods or services that the Company has transferred to a customer, however the classification depends on whether such right is only conditional on the passage of time (trade receivables) or if it is also conditional on something else (costs and profits in excess of billings on uncompleted contracts), such as the satisfaction of further performance obligations under the contract. Billings in excess of costs and profits on uncompleted contracts is the cumulative amount received and contractually receivable by the Company that exceeds the right to consideration resulting from the Company's performance under a given contract.

The costs to obtain long-term contracts such as sale commissions are recognized as Contract assets and recognized as selling expenses over time based on degree of completion of the related contract.

ii) Sales of goods

Revenue related to sales of goods, which may include powders and spare parts are measured based on the consideration specified in contracts with customers. The Company recognizes revenue at a point in time when it transfers control of the goods to the buyer. This is generally at the time the customer obtains legal title to the product and when it is physically transferred to the custody transfer point agreed with the customer.

iii) Sale of intellectual property

Sale of intellectual property is recognized at the date the recipient obtains control of the asset. Variable consideration related to the sale of intellectual property is recognized to the extent that it is highly probable that a reversal will not occur when the uncertainty associated with the variable consideration is subsequently resolved.

(c) Foreign currency translation

i) Foreign currency transactions

Revenue and expense transactions in foreign currencies are translated into Canadian dollars using the average exchange rates prevailing at the time of the transaction. Foreign currency balances are translated into Canadian dollars at year end exchange rates for monetary items and at historical rates for non-monetary items. Translation gains or losses are included in the determination of net earnings.

ii) Foreign operations

The assets and liabilities of foreign operations are translated into Canadian dollars using exchange rates prevailing at the end of the reporting period. Revenue and expense items are translated at the average exchange rates for the period. Exchange differences arising from the translation process of foreign operations are recognized as foreign currency translation adjustments in other comprehensive income and accumulated in equity.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

3. Significant accounting policies (continued)

(d) Cash and cash equivalents

Cash and cash equivalents are financial instruments readily convertible to a known amount of cash and not subject to a significant risk of changes in value. Cash equivalents include instruments with a maturity of three months or less from the date of acquisition and instruments with an original term longer than three months if there is no significant penalty for withdrawal within a three-month period from the date of acquisition.

(e) Inventory

Inventory is composed of spare parts for resale. Inventory is valued at the lower of cost and net realizable value. The cost of inventory is based on the first-in, first-out principle and comprises all costs of purchases. Net realizable value is the estimated selling price in the ordinary course of business, less estimated costs of completion and selling costs.

(f) Deferred income taxes

i) Current tax

Current tax assets and liabilities for the current and prior years are measured at the amount expected to be recovered from or paid to the taxation authorities. The tax rates and tax laws used to compute the amount are those that are enacted or substantively enacted by the date of the statements of financial position.

ii) Deferred tax

Deferred tax is provided using the liability method, providing for temporary differences between the tax bases of assets and liabilities and their carrying amounts in the financial statements. The temporary difference is not provided for if it arises from the initial recognition of goodwill or the initial recognition of an asset or liability in a transaction other than a business combination that at the time of the transaction affects neither accounting nor taxable profit or loss. The amount of deferred tax provided is based on the expected manner of realization or settlement of the carrying amount of assets and liabilities, using tax rates enacted or substantively enacted at the financial position reporting date and whose implementation is expected over the period in which the deferred tax is realized or recovered. A deferred tax asset is recognized only to the extent that it is probable that future taxable profits will be available against which the asset can be used.

Deferred tax assets and liabilities are presented as non-current. Assets and liabilities are offset where the entity has a legally enforceable right to offset current tax assets and liabilities or deferred tax assets and liabilities, and the respective assets and liabilities relate to income taxes levied by the same taxation authority on the same taxable entity or different taxable entities which intend to settle the liabilities and assets on a net basis.

(g) Earnings (loss) per share

The Company presents basic earnings (loss) per share data for its common shares. Basic loss per share is computed by dividing net earnings (loss) by the weighted average number of common shares outstanding during the year. Diluted loss per share is computed similarly to basic earnings per share, except that the weighted average number of shares outstanding is increased to include shares from the assumed exercise of stock options and share purchase warrants, if dilutive. The number of additional shares is calculated by assuming that outstanding share options and warrants were exercised and that the proceeds from such exercises were used to acquire common shares at the average market price during the year. Potential shares from all outstanding stock options and share purchase warrants are excluded from the calculation of diluted loss per share as their inclusion is considered anti-dilutive in years when a loss is incurred.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

3. Significant accounting policies (continued)

(h) Property and equipment

Property and equipment are measured at cost less accumulated depreciation and accumulated impairment losses if applicable. Cost includes expenditures that are directly attributable to the acquisition of the asset and bringing the asset into operation. Borrowing costs capitalized to asset under development represents the interest expense calculated under the effective interest method and does not include any fair value adjustments of investments designated at fair value through profit and loss. Government assistance and investment tax credits related to the purchase or development of property and equipment are recorded in reduction of the cost. When major parts of an item of property and equipment have different useful lives, they are accounted for separately. Property and equipment are depreciated from the acquisition date over their respective useful life. Depreciation of an asset under construction begins when it is available for use, i.e. when it is in the location and condition necessary for it to be capable of operating in the manner intended by the Company.

Depreciation is calculated using the following methods and rates:

Computer equipment	Straight line over 3 years
Machinery and equipment	Straight line over 10 years
Automobiles	Straight line over 7 years
Leasehold improvements	Lesser of the lease term or the useful life (20 years)

Impairment – non-financial assets

The carrying amounts of the Company's non-financial assets are assessed at each reporting date to determine whether there is an indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated.

Impairment losses recognized in prior periods are assessed at each reporting date as to whether there are any indications that the previously recognized losses may no longer exist or may be decreased. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation, had no impairment loss been recognized for the asset in prior years.

Depreciation methods, useful lives and residual values are reviewed at each financial year end and adjusted prospectively if appropriate.

(i) Leases

Under IFRS 16, at inception, the Company assesses whether a contract is, or contains, a lease based on whether the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration.

The Company recognizes a right-of-use asset and a lease liability at the commencement date of the lease, i.e. the date the underlying asset is available for use.

Right-of-use assets

Right-of-use assets are measured at cost, less any accumulated depreciation and accumulated impairment losses, and adjusted for any remeasurement of lease liabilities. Cost of right-of-use assets is comprised of:

- the initial measurement amount of the lease liabilities recognized.
- any lease payments made at or before the commencement date, less any lease incentives received; and

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

3. Significant accounting policies (continued)

(i) Leases (continued)

Right-of-use assets (continued)

- any initial direct costs incurred; and
- an estimate of costs to dismantle and remove the underlying asset, restore the site on which it is located or restore the underlying asset to the condition required by the terms and conditions of the lease contract.

Right-of-use assets are depreciated over the shorter period of the lease term and the useful life of the underlying asset. If a lease transfers ownership of the underlying asset or the cost of the right-of-use asset reflects that the Company expects to exercise a purchase option, the related right-of-use asset is depreciated over the useful life of the underlying asset based on periods detailed above. The depreciation starts at the commencement date of the lease. Right-of-use assets are assessed for impairment whenever there is an indication that the right-of-use assets may be impaired.

Lease liabilities

Lease liabilities are initially measured at the present value of the lease payments that are not paid at the commencement date over the lease term. The present value of the lease payments is determined using the lessee's incremental borrowing rate at the commencement date if the interest rate implicit in the lease is not readily determinable. The incremental borrowing rate is a function of the lessee's incremental borrowing rate, the nature of the underlying asset, the location of the asset, the length of the lease and the currency of the lease contract. Generally, the Company uses the lessee's incremental borrowing rate for the present value. At the commencement date, lease payments generally include fixed payments, less any lease incentives receivable, variable lease payments that depend on an index (e.g. based on inflation index) or a specified rate, and payments of penalties for terminating the lease, if the lease term reflects the lessee exercising the option to terminate the lease. Lease payments also include amounts expected to be paid under residual value guarantees and the exercise price of a purchase option if the Company is reasonably certain to exercise that option.

Variable lease payments that do not depend on an index or a specified rate are not included in the measurement of lease liabilities but instead are recognized as expenses in the period in which the event or condition that triggers the payment occurs.

After the commencement date, the carrying amount of lease liabilities is increased to reflect the accretion of interest and reduced to reflect lease payments made. In addition, the carrying amount of lease liabilities is remeasured when there is a change in future lease payments arising from a change in an index or specified rate, if there is a modification to the lease terms and conditions, a change in the estimate of the amount expected to be payable under residual value guarantee, or if the Company changes its assessment of whether it will exercise a termination, extension or purchase option. The remeasurement amount of the lease liabilities is recognized as an adjustment to the right-of-use asset, or in the profit and loss statement when the carrying amount of the right-of-use asset is reduced to zero.

Classification and presentation of lease-related expenses

Depreciation charge for right-of-use assets, expenses related to variable lease payments not included in the measurement of lease liabilities and loss (gain) related to lease modifications are allocated in the Company's profit and loss statement based on their function within the Company, while interest expense on lease liabilities is presented within finance costs.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

3. Significant accounting policies (continued)

(i) Leases (continued)

Cash flow classification

Lease payments related to the principal portion of the lease liabilities are classified as cash flows from financing activities while lease payments related to the interest portion of the lease liabilities are classified as interest paid within cash flows from financing activities. Lease incentives received are classified as cash flows from investing activities. Variable lease payments not included in the measurement of lease liabilities are classified as cash flows from operating activities.

(j) Government assistance and investment tax credits

Investment tax credits are comprised of scientific research and experimental development tax credits. Government assistance and investment tax credits are recognized when there is reasonable assurance of their recovery and recorded as a reduction of the related expense or cost of the asset acquired, as applicable. Investment tax credits are subject to the customary approvals by the pertinent tax authorities. Adjustments required, if any, are reflected in the year when such assessments are received.

(k) Intangible assets and Goodwill

Intangible assets acquired separately are measured at cost on initial recognition. Following initial recognition, intangible assets are carried at cost less any accumulated amortization and any accumulated impairment losses.

Identifiable intangible assets acquired in a business combination are recognized separately from goodwill if they meet the definition of an intangible asset and if their fair value can be measured reliably. The cost of these intangible assets equals their acquisition-date fair value.

Subsequent to initial recognition, identifiable intangible assets acquired in a business combination are recorded at cost less accumulated amortization and impairment losses, if they are amortizable, otherwise only at cost net of accumulated impairment losses. The useful lives of intangible assets are assessed as either finite or indefinite.

Intangible assets with finite lives are amortized over the useful life of the asset and assessed for impairment whenever there is an indication of impairment. Amortization expense on the intangible assets with finite lives is recognized in the statements of comprehensive loss.

Research costs are charged to comprehensive loss in the year they are incurred, net of related investment tax credits. Development costs are charged to comprehensive loss in the year they are incurred net of related investment tax credits unless they meet specific criteria related to technical, market and financial feasibility in order to be recognized as intangible assets which include:

- the technical feasibility of completing the intangible asset so that it will be available for use or sale;
- the Company has the intention to complete and the ability to use or sell the asset;
- the asset will generate future economic benefits;
- the Company has the resources to complete the asset; and
- ability to measure reliably the expenditure during development.

Costs to establish patents for internally developed technology are considered development costs and are charged to comprehensive loss in the year they are incurred unless they meet specific criteria related to technical, market and financial feasibility. Patent costs include legal and other advisor fees to obtain patents, and patent application fees.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

3 Significant accounting policies (continued)

(k) Intangible assets and Goodwill (continued)

Amortization of the development costs is calculated on a straight-line basis over the remaining useful life of the related patent and begins when development is complete. During the period of development, the asset is tested annually for impairment. Residual values and useful lives are reviewed at each reporting date.

Amortization is calculated on a straight-line basis:

	Useful life
Production backlog	30 months
Patents and development costs	1 to 21 years

Goodwill represents the future economic benefits arising from a business combination that are not individually identified and separately recognized. Goodwill is carried at cost less accumulated impairment losses. Goodwill is not amortized, but is tested for impairment annually or if there is an indication of impairment. Impairment losses recognized for goodwill cannot be reversed.

Impairment testing of goodwill, other intangible assets, property and equipment and right-of-use assets

For impairment assessment purposes, assets are grouped at the lowest levels for which there are largely independent cash inflows (cash-generating units). As a result, some assets are tested individually for impairment and some are tested at cash-generating unit level. Goodwill is allocated to those cash-generating units that are expected to benefit from synergies of a related business combination and represents the lowest level within the Company at which management monitors goodwill.

Cash-generating units to which goodwill has been allocated are tested for impairment at least annually. All other individual assets or cash-generating units are tested for impairment whenever events or changes in circumstances indicate the carrying amount may not be recoverable.

The recoverable amount of an asset or cash-generating unit (CGU) is the greater of its value in use and its fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. For the purposes of testing non-financial assets for impairment, management has identified one CGU.

An impairment loss is recognized if the carrying amount of an asset or its CGU exceeds its recoverable amount. Impairment losses are recognized in the statement of comprehensive loss. Impairment losses recognized in respect of the CGU are allocated first to reduce the carrying amount of goodwill allocated to the units, and then to reduce the carrying amounts on a pro-rata basis of the other assets in the unit.

(l) Employee benefits

Share-based payments

The Company applies a fair value-based method of accounting to all share-based payments. Employee and director stock options are measured at their fair value of each tranche on the grant date and recognized in its respective vesting period. Non-employee stock options are measured when the services are rendered by the consultant at the fair value of the services received, if the fair value can be measured reliably. In the case the fair value of the services cannot be measured reliably, the services are measured indirectly using the fair value of the equity instruments granted. If there are unidentifiable services, then they are measured at grant date. The cost of stock options is presented as share-based payment expense. On the exercise of stock options, share capital is credited for the consideration received and for the fair value amounts previously credited to contributed surplus. The Company uses the Black-Scholes option-pricing model to estimate the fair value of share-based payments.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

3. Significant accounting policies (continued)

(l) Employee benefits (continued)

Deferred profit-sharing plan

The Company established a yearly Deferred Profit-Sharing Plan (“DPSP”) for all eligible employees who have materially and significantly contributed to the prosperity and profits of the Company. The significance of any contribution of any employee to the prosperity and profits of the Company for purposes of eligibility in the DPSP is determined by the Board of Directors of the Company upon such relevant information as the Board, in its sole discretion, may find relevant. All related persons to the Company are excluded from participating in the DPSP.

For all eligible employees, the Company is required to contribute to the DPSP out of the profits of the Company. The amount of the Company’s contribution will be such amount which, in the opinion of its Board of Directors, is warranted by the profits and overall financial position of the Company. During the year, the Company contributed \$Nil to the DPSP (\$Nil in 2020). Obligations for contributions to the DPSP are recognized as an employee benefit expense in the statement of comprehensive loss in the periods during which services are rendered by employees.

Short-term employee benefits

Short-term employee benefit obligations are measured on an undiscounted basis and are expensed as the related service is provided.

A liability is recognized for the amount expected to be paid under the short-term incentive plan if the Company has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee, and the obligation can be estimated reliably.

(m) Equity Instruments

Issuance of equity instruments

Incremental costs directly attributable to the issue of equity-classified shares are recognized as a deduction from the common shares and warrants, net of any tax effects.

Extinguishing financial liabilities with equity instruments

When equity instruments issued to a creditor to extinguish all or part of a financial liability are recognized initially, the Company measures them at the fair value of the equity instruments issued, unless that fair value cannot be reliably measured. If the fair value of the equity instruments issued cannot be reliably measured, then the equity instruments shall be measured to reflect the fair value of the financial liability extinguished.

Contributed surplus

Contributed surplus includes amounts related to equity-settled share-based payments until such equity instruments are exercised or settled, in which case the amounts are transferred to common shares or reversed upon forfeiture if not vested. It also includes the unexercised conversion option at the maturity of the convertible debentures.

(n) Financial Instruments

Financial assets are classified at amortized cost, fair value through profit or loss (“FVTPL”) or fair value through other comprehensive income (“FVOCI”) based on the Company’s business model for managing the financial assets and the contractual cash flow characteristics of these assets. Assessment and decision on the business model approach used is an accounting judgment.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

3. Significant accounting policies (continued)

(n) Financial Instruments (continued)

A financial asset is measured at amortized cost if it is held within a business model whose objective is to hold financial assets in order to collect contractual cash flows and its contractual terms give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding. The Company includes in this category cash and cash equivalents, trade accounts receivable, other receivables, royalties receivable and deposits.

A financial asset is measured at fair value through profit or loss (“FVTPL”) if:

- (a) Its contractual terms do not give rise to cash flows on specified dates that are solely payments of principal and interest (SPPI) on the principal amount outstanding; or
- (b) It is not held within a business model whose objective is either to collect contractual cash flows, or to both collect contractual cash flows and sell; or
- (c) At initial recognition, it is irrevocably designated as measured at FVTPL when doing so eliminates or significantly reduces a measurement or recognition inconsistency that would otherwise arise from measuring assets or liabilities or recognizing the gains and losses on them on different bases.

The Company includes in this category strategic investments in equity instruments.

Changes in fair value of financial liabilities attributable to changes in the entity’s own credit risk are to be presented in other comprehensive income unless they affect amounts recorded in income. All financial liabilities, other than those measured at fair value through profit or loss, are included in the financial liabilities measured at amortized cost. The Company includes in this category accounts payable and accrued liabilities, term loans, and convertible debentures. The balance due on business combination is measured at FVTPL.

Recognition:

The Company recognizes a financial asset or a financial liability when it becomes a party to the contractual provisions of the instrument.

Purchases or sales of financial assets that require delivery of assets within the time frame generally established by regulation or convention in the market place (regular way trades) are recognized on the trade date, i.e. the date that the Company commits to purchase or sell the asset.

Initial measurement

Financial assets and liabilities (other than financial assets at FVTPL) are measured initially at their fair value plus any directly attributable incremental costs of acquisition or issue.

Financial assets and financial liabilities at FVTPL are recorded in the statement of financial position at fair value. All transaction costs for such instruments are recognized directly in profit or loss.

Subsequent measurement

Financial assets (other than financial assets at FVTPL) are measured at amortized cost using the effective interest method less any allowance for impairment. Gains and losses are recognized in profit or loss when the debt instruments are derecognized or impaired, as well as through the amortization process.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

3. Significant accounting policies (continued)

(n) Financial Instruments (continued)

Subsequent measurement (continued)

Financial liabilities are measured at amortized cost using the effective interest method except for derivatives and financial liabilities designated at FVTPL. Gains and losses are recognized in profit or loss when the liabilities are derecognized, as well as through the amortization process.

Fair value measurement principles

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.

Where financial assets and financial liabilities measured at fair value through profit or loss have a quoted price in an active market at the reporting date, the fair value is based on this price. A financial instrument is regarded as quoted in an active market if quoted prices are readily and regularly available from a stock exchange and those prices represent actual and regularly occurring market transactions on an arm's length basis.

Securities traded on stock exchanges are stated at market price based on the closing price on the relevant valuation day.

Derecognition

A financial asset is derecognized where the rights to receive cash flows from the asset have expired, or the Company has transferred its rights to receive cash flows from the asset. The Company derecognizes a financial liability when the obligation under the liability is discharged, cancelled or expired.

Offsetting of financial instruments

Financial assets and financial liabilities are offset, and the net amount reported in the statement of financial position if, and only if, there is a currently enforceable legal right to offset the recognized amounts and there is an intention to settle on a net basis, or to realize the assets and settle the liabilities simultaneously.

Impairment of financial instruments

The Company applies the "expected credit loss" ("ECL") model to financial assets measured at amortized cost. The Company's financial assets subject to this impairment model are cash and cash equivalents, trade and other receivables, royalties receivable and deposits.

The trade accounts receivable have no financing component and have maturities of less than 12 months at amortized cost and, as such, the Company applies the simplified approach for expected credit losses (ECLs) to all its trade accounts receivable. Therefore, the Company recognizes a loss allowance based on lifetime ECLs at each reporting date.

The Company's approach to ECLs reflects a probability-weighted outcome, the time value of money and reasonable and supportable information that is available without undue cost or effort at the reporting date about past events, current conditions and forecasts of future economic conditions.

The Company uses the provision matrix as a practical expedient to measure ECLs on trade receivables, based on days past due for groupings of receivables with similar loss patterns. The provision matrix is based on historical observed loss rates over the expected life of the receivables and is adjusted for forward-looking estimates.

Impairment losses are recognized in profit or loss and reflected in an allowance account presented in reduction of receivables.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

3. Significant accounting policies (continued)

(n) Financial Instruments (continued)

Write-off

The gross carrying amount of a financial asset is written off when the Company has no reasonable expectations of recovering a financial asset in its entirety or a portion thereof.

Compound Financial Instruments

Compound financial instruments issued by the Company comprise convertible debentures that can be converted into common shares at the option of the holder, and the number of shares to be issued does not vary with changes in their fair value.

The component parts of the compound instrument issued by the Company are initially classified separately as financial liabilities and equity in accordance with the substance of the contractual arrangements and the definitions of a financial liability and an equity instrument. The conversion option that will be settled by the exchange of a fixed amount of cash or another financial asset for a fixed number of the Company's own equity instruments is an equity instrument.

At the date the convertible debentures are issued, the liability component is initially recognized at the fair value of similar debt instruments which do not have an equity conversion option. The initial amount of the liability component is determined by discounting the face value of the convertible debentures using a rate of interest prevailing for similar non-convertible instruments at the date of issue for instruments of similar terms and risks. The conversion option classified as the equity component is determined by deducting the amount of the liability component from the gross proceeds. The equity component is recognized net of income tax effects within the other equity account.

Subsequently, the liability component is accounted for at amortized cost and is accreted using the effective interest method, up to the face value of the convertible debentures during the period they are outstanding. Interest expense on the convertible debentures is composed of the interest calculated on the face value of the convertible debentures and a non-cash notional interest representing the accretion of the carrying value of the convertible debentures. The equity component is not remeasured.

The conversion option classified as equity remains in the other equity account until the conversion option is exercised, in which case, the balance recognized in other equity is transferred to share capital. When the conversion option remains unexercised at the maturity date of the convertible debentures, the balance recognized in other equity will be transferred to contributed surplus. No gain or loss is recognized in the consolidated income statement upon conversion or expiration of the conversion option.

Transaction costs related to the issuance of convertible debentures are allocated to the liability and equity components in proportion to the allocation of the gross proceeds. Transaction costs relating to the equity component are recognized directly in other equity. Transaction costs relating to the liability component are included in the carrying amount of the liability component and are amortized over the term of the convertible debentures using the effective interest method.

Effective Interest Method

The effective interest method is a method of calculating the amortized cost of a financial asset/financial liability and of allocating interest income/expense over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash receipts/payments (including all fees and points paid or received that form an integral part of the effective interest rate, transaction costs and other premiums or discounts) through the expected life of the financial instrument, or (when appropriate) a shorter period, to the net carrying amount on initial recognition.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

3. Significant accounting policies (continued)

(o) Future Changes and Amendments to Accounting Standards and Interpretations

i) *IAS 1 Presentation of Financial Statements - Accounting Policies*

In 2021, the IASB amended IAS 1, *Presentation of Financial Statements*, to require entities to disclose their material accounting policy information rather than their significant accounting policies. Additional amendments to IAS 1 are made to explain how an entity can identify a material accounting policy. The amendments are effective for annual reporting periods beginning on or after January 1, 2023, with earlier application permitted.

ii) *IAS 1 Presentation of Financial Statements - Classification of Liabilities*

The IASB released *Classification of Liabilities as Current or Non-current (Amendments to IAS 1)*, which clarifies the guidance in IAS 1 *Presentation of Financial Statements* on whether a liability should be classified as either current or non-current relating to the right to defer settlement of the liability for at least twelve months after the reporting date. The amendment is effective for annual reporting periods beginning on or after January 1, 2023, with earlier application permitted.

iii) *IAS 12 Income Taxes*

The IASB released *Deferred Tax Related to Assets and Liabilities Arising from a Single Transaction (Amendments to IAS 12)*. The amendment relates to the recognition of deferred tax when an entity accounts for transactions, such as leases or decommissioning obligations, by recognizing both an asset and a liability. The objective of this amendment is to narrow the initial recognition exemption in paragraphs 15 and 24 of IAS 12, so that it would not apply to transactions that give rise to both taxable and deductible temporary differences, to the extent the amounts recognized for the temporary differences are the same. The amendment is effective for annual reporting periods beginning on or after January 1, 2023, with earlier application permitted.

iv) *IAS 37 Provisions, Contingent Liabilities and Contingent Assets*

The IASB released *Onerous Contracts - Cost of Fulfilling a Contract (Amendments to IAS 37)*. The amendments specify which costs an entity includes in determining the cost of fulfilling a contract for the purpose of assessing whether the contract is onerous. Costs to be included comprise the costs that relate directly to the contract, which include both incremental costs of fulfilling the contract and an allocation of other costs that relate directly to fulfilling the contract. The amendment is effective for annual reporting periods beginning on or after January 1, 2023, with earlier application permitted.

The Company is currently assessing the impact of these future changes and amendments on its consolidated financial statements.

4. Significant accounting judgments, estimates and assumptions

The preparation of financial statements requires management to make judgments, estimates and assumptions based on currently available information that affect the reported amounts of assets, liabilities and contingent assets and liabilities at the date of the financial statements and reported amounts of revenues and expenses during the reporting period. Estimates and judgments are continuously evaluated and are based on management's experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances. However, actual results could differ from those estimated. By their very nature, these estimates are subject to measurement uncertainty and the effect of any changes in estimates on the financial statements of future periods could be material.

In the process of applying the Company's accounting policies, management has made the following judgments, estimates, and assumptions which have the most significant effect on the amounts recognized in the financial statements.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

4. Significant accounting judgments, estimates and assumptions (continued)

Critical judgments in applying accounting policies

(a) Assessment of whether there is any indication that property and equipment, right-of-use assets and intangible asset may be impaired

At each reporting date, the Company reviews the carrying amounts of its property and equipment, right-of-use assets and intangible assets with a finite useful life to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. Management's judgment is required in assessing whether there is any indication that an asset may be impaired.

(b) Intangible assets

The recognition of development costs as intangible assets requires judgments to determine whether the required criteria for recognition are met including management estimates of future economic benefits.

(c) Sale of intellectual property

The recognition of variable consideration related to the sale of intellectual property requires management's judgments to determine whether it is highly probable that a reversal will not occur when the uncertainty associated with the variable consideration is subsequently resolved.

(d) Assessment of investment tax credits

The investment tax credits are estimated by management based on quantitative and qualitative analysis and interpretation of various government programs, related restrictions, limitations, definitions, and eligibility conditions. Uncertainty over the eligibility and final assessment by taxation authorities of investment tax credits requires judgment. Management involves its technical staff and external specialists in determining if the expenditures meet the requirements of the different tax credit claims.

Key sources of estimation uncertainty

(e) Revenue recognition

Revenue recognition for long-term contracts completion requires the use of estimates to determine the recorded amount of revenues, costs in excess of billings and billings in excess of costs and profits on uncompleted contracts.

The determination of anticipated costs for completing a contract is based on estimates that can be affected by a variety of factors, including the cost of materials, labour and sub-contractors, as well as potential claims from customers and subcontractors.

As risks and uncertainties are different for each project, the sources of variations between anticipated costs and actual costs incurred will also vary by project. The determination of estimates is based on the Company's business practices as well as its historical experience. Estimates are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the period in which the estimate is revised.

Given this estimation process, it is possible that changes in future conditions could cause a material change in the recognized amount of revenues and costs and profits in excess of billings on uncompleted contracts and accrued expenses.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

4. Significant accounting judgments, estimates and assumptions (continued)

Key sources of estimation uncertainty (continued)

(e) Revenue recognition (continued)

Agreements that contain multiple deliverables require the use of judgment to determine whether they contain separately identifiable performance obligations and to allocate the consideration received to each performance obligation.

(f) Stock-based payments

The Company uses the fair value method of valuing compensation cost associated with the Company's stock option plan. Estimating fair value requires determining the most appropriate valuation model for a grant of equity instruments, which is dependent on the terms and conditions of the grant. This also requires determining the most appropriate inputs to the valuation model including the expected life of the option and volatility. The assumptions and models are discussed in note 22.

(g) Useful lives of property and equipment and intangible assets

The Company estimates the useful lives of property and equipment based on the period over which the assets are expected to be available for use. The estimated useful lives of property and equipment are reviewed periodically and are updated if expectations differ from previous estimates due to physical wear and tear and legal or other limits on the use of the relevant assets. In addition, the estimation of the useful lives of property and equipment are based on management's experience with similar assets. It is possible, however, that future results of operations could be materially affected by changes in the estimates brought about by changes in factors mentioned above. The amounts and timing of recorded expenses for any period would be affected by changes in these factors and circumstances. Useful lives, depreciation rates and residual values are reviewed at least annually.

(h) Impairment of non-financial assets and goodwill

In assessing impairment, management estimates the recoverable amount of each asset or cash generating unit based on expected future cash flows and uses an interest rate to discount them. Estimation uncertainty relates to assumptions about future operating results and the determination of a suitable discount rate (see Note 3 (k)).

(i) Fair value of investments

Where the fair values of investments recorded in the statement of financial position cannot be derived from active markets, they are determined using valuation techniques including the Black-Scholes models. The inputs to these models are taken from observable markets where possible, but where this is not feasible, a degree of judgment is required in establishing the fair values. The judgments include considerations of inputs such as the expected volatility and the initial allocation of the consideration paid between the fair value of the common shares and warrants received. Should any of the inputs to these models or changes in assumptions about these factors occur, this could affect the reported fair value of the investments.

(j) Right-of-use assets and lease liabilities

In determining the carrying amount of the right-of-use asset and corresponding lease liabilities, assumptions include the non-cancellable term of the lease plus periods covered by an option to renew or purchase the leases, estimated useful lives of the related assets, and incremental borrowing rate. Renewal and purchase options are only included in the lease term if management is reasonably certain to renew. Management considers factors such as market conditions, comparable rental rates and similar property values. The Company is also required to estimate the incremental borrowing rate specific to each portfolio of leased assets with similar characteristics if the interest rate in the lease is not readily determined. Management determines the incremental borrowing rate using base rate for similar loans plus a risk premium.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

4. Significant accounting judgments, estimates and assumptions (continued)

Key sources of estimation uncertainty (continued)

(k) Income taxes

The Company has unused available tax losses, deductible temporary differences and investment tax credits. The Company recognizes deferred income tax assets for these unused tax losses and deductible temporary differences only to the extent that, in management's opinion, it is probable that future taxable profit will be available against which these available tax losses and temporary differences can be utilized. The Company recognizes investment tax credits when it has reasonable assurance that it has complied with the conditions of the program and that the amounts will be realized (i.e. that it will generate future federal income taxes payable against which the tax credits can be applied). The Company's projections of future taxable profit involve the use of significant assumptions and estimates with respect to a variety of factors, including future sales and operating expenses. There can be no assurance that the estimates and assumptions used in our projections of future taxable income will prove to be accurate predictions of the future, and in the event that our assessment of the recoverability of these deferred tax assets and investment tax credits changes in the future, a material increase or reduction in the carrying value of these deferred tax assets and investment tax credits could be required, with a corresponding charge to net earnings.

(l) Business combinations

Fair value of assets acquired and liabilities assumed in a business combination is estimated based on information available at the date of acquisition and involves considerable judgment in determining the fair values assigned to the identifiable assets acquired and liabilities assumed on acquisition. Among other things, the determination of these fair values involves the use of discounted cash flow analyses and estimated profit margins on contracts in progress. In addition, the determination of the contingent consideration due on the business combination is based on the estimations of the probability and timing of completing the predetermined milestones (see note 5);

(m) COVID-19 pandemic

The COVID-19 pandemic continues to cause significant financial market and social dislocation. The situation is dynamic with various cities and countries around the world responding in different ways to address the outbreak. While the Company has experienced the impact of the outbreak of the Coronavirus (COVID 19) on its operations, it had continued to operate during the current pandemic. During the year ended December 31, 2020, the Company recognized payroll subsidies totaling \$775,967 principally under the Canadian Emergency Wage Subsidy program, which amount required estimation (see note 24). In the event of a prolonged continuation of the pandemic, it is not clear what the potential impact may be on the Company's business, financial position and financial performance.

5. Business combination

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

PyroGenesis Canada Inc.
Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

5. Business combination (continued)

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

	December 31, 2021 Final \$
Total consideration	
Consideration paid at closing	1
Contingent consideration	3,841,999
Consideration paid at closing and contingent consideration	3,842,000
Settlement of pre-existing loan receivable from Pyro Green-Gas	1,744,400
	<u>5,586,400</u>
Net assets acquired	
Current assets ¹	5,186,086
ROU asset	477,608
Property and equipment	42,552
Intangible assets and Goodwill ²	4,780,607
Deferred income tax asset	79,360
Current liabilities	(4,507,907)
Non-current liabilities	(471,906)
	<u>5,586,400</u>

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

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

During the period ended December 31, 2021, the Company recognized revenue of \$6.8 million and net earnings of \$0.8 million related to the operations generated by Pyro Green-Gas Inc. since the acquisition date.

In connection with this acquisition, the Company incurred acquisition-related costs of \$0.1 million, recognized within Selling, General and Administrative expenses in the consolidated statement of comprehensive income (loss).

The maximum purchase price consideration of \$4,355,600 was discounted to \$3,842,000, at August 11, 2021 and an accretion expense of \$110,203 was recognized in Net finance costs in the Consolidated Statement of Comprehensive Income for the year ended December 31, 2021.

PyroGenesis Canada Inc.
Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

6. Revenues

Revenues by product line:

The company's revenues are generated primarily from the following:

	2021	2020
	\$	\$
Revenue from contracts with customers by product line:		
PUREVAP™	6,138,111	4,163,059
DROSRITE™	7,940,771	9,976,696
Development and support related to systems supplied to the U.S. Navy	7,522,809	1,425,883
Torch related sales	2,084,511	1,452,455
Biogas upgrading and pollution controls	6,800,090	—
Other sales and services	582,058	756,936
	31,068,350	17,775,029

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

	2021	2020
	\$	\$
Revenue from contracts with customers:		
Sales of goods under long-term contracts recognized over time	25,918,594	12,432,666
Sales of goods at a point of time	1,533,910	1,730,273
Other revenue:		
Sale of intellectual properties (i)	3,615,846	3,612,090
	31,068,350	17,775,029

See note 32 for sales by geographic area.

(i) Sale of intellectual properties

During the year, the Company sold intellectual property to a subsidiary of a company in which it holds a strategic investment for a non-refundable fee of \$3.3 million. Under the terms of the sale agreement, control of the intellectual property was transferred to the purchaser and the Company has no obligation to undertake activities that will significantly affect the intellectual property. The terms of the agreement also include royalty payments based on the percentage of sales. No royalty income was recognized at the time of the transaction.

In September 2020, the Company sold intellectual property to a subsidiary of a company in which it holds a strategic investment for a non-refundable fee of \$2.4 million. Under the terms of the sale agreement, control of the intellectual property was transferred to the purchaser and the Company has no obligation to undertake activities that will significantly affect the intellectual property. The terms of the agreement also include additional variable consideration that can be received based on the greater of 10% of sales made by the purchaser, and minimum royalties of \$50,000 in 2021, \$100,000 in 2022, \$150,000 in 2023, and \$200,000 in 2024 and every year thereafter (see note 11). The Company has also amended a previous agreement with a company in which it holds a strategic investment to reinstate minimum royalties that were previously waived by the Company related to a sale of intellectual property that occurred in 2016. The terms of this agreement also include additional variable consideration that can be received based on the greater of 10% of sales made by the purchaser, and minimum royalties of \$200,000 in 2021 and \$250,000 in 2022 and every year thereafter (see note 12).

PyroGenesis Canada Inc.
Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

6. Revenues (continued)

The Company only recognizes variable consideration, including minimum royalties, arising from these agreements in the period(s) when it is highly probable that a reversal will not occur when the uncertainty associated with the variable consideration is subsequently resolved. Minimum royalties are recognized for the period the Company evaluates the collectability of the minimum royalties is probable, which the Company has estimated over four years.

Transaction price allocated to remaining performance obligations

As at December 31, 2021, revenue expected to be recognized in the future related to performance obligations that are unsatisfied (or partially satisfied) at the reporting date is \$43,458,148 (2020 - \$29,999,009). Revenue will be recognized as the Company satisfies its performance obligations under long-term contracts, which is expected to occur over the next 3 years.

7. Cash and cash equivalents

As at December 31, 2021 and 2020, there are no restrictions on cash and cash equivalents. Cash and cash equivalents include the following components:

	2021	2020
	\$	\$
Cash	3,568,561	10,104,899
Guaranteed investment certificates	8,633,952	8,000,000
Cash and cash equivalents	12,202,513	18,104,899

Guaranteed investment certificates are instruments issued by Canadian financial institutions and include \$3,000,000 bearing interest at a rate of 0.37%, \$5,000,000 bearing interest at a rate of 0.86%, and \$633,952 bearing interest at a rate of 0.08%. These instruments are redeemable without penalty 60 days, 30 days and 30 days from the date of acquisition and mature in January 2022, September 2022, and December 2022.

8. Accounts receivable

Details of accounts receivable were as follows:

	December 31, 2021	December 31, 2020
	\$	\$
1 – 30 days	2,260,428	309,362
31 – 60 days	44,838	226,713
61 – 90 days	6,855,822	253,141
Greater than 90 days	7,357,825	218,008
Total trade accounts receivable	16,518,913	1,007,224
Unbilled trade receivables	—	1,132,911
Other receivables ¹	270,536	931,041
Sales tax receivable	850,167	258,477
	17,639,616	3,329,653

¹ At December 31, 2020 comprised mainly of an amount of \$893,000 to be received upon the sale of HPQ concluded prior to year end.

As at December 31, 2021 the allowance for expected credit loss is \$520,000 (2020 - \$Nil), which was included through the business combination and has not changed throughout the period.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

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

As at December 31, 2021, the Company had fourteen contracts with total billings of \$16,676,700 which were less than total costs incurred and had recognized cumulative revenue of \$21,599,410 since those projects began. This compares with seven contracts with total billings of \$8,378,093 which were less than total costs incurred and had recognized cumulative revenue of \$9,451,726 as at December 31, 2020.

Changes in costs and profits in excess of billings on uncompleted contracts during the year are explained by \$983,891 (2020 - \$93,415) recognized at the beginning of the year being transferred to accounts receivable, and \$4,832,968 (2020 - \$1,044,072) resulting from changes in the measure of progress.

10. Investment tax credits

An amount recognized in 2021 included \$202,472 (2020 - \$131,871) of investment tax credits earned in the year, as well as (\$706,000) of investment tax credits earned in prior years that no longer met the criteria for recognition in 2021. \$148,695 (2020 - \$18,420) of the investment tax credits recognized in the year was recorded against cost of sales and services, (\$684,709) (2020 - \$1,141,468) against research and development expenses and \$32,486 (2020 - \$30,000) against selling general and administrative expenses.

Eligible scientific research and experimental development (“SR&ED”) expenses for the year amounted to \$2,000,853 (2020 – \$775,824) less investment tax credits of (\$684,709) (2020 – \$1,141,468), less government grants of \$149,575 (2020 – \$365,433) totalling \$2,535,987 (2020 – (\$731,077)).

11. Strategic investments

	December 31, 2021 \$	December 31, 2020 \$
Beauce Gold Fields (“BGF”) shares – level 1	123,095	123,095
HPQ Silicon Resources Inc. (“HPQ”) shares - level 1	12,306,196	16,489,220
HPQ warrants – level 3	2,472,368	23,379,435
	<u>14,901,659</u>	<u>39,991,750</u>

The change in the strategic investments is summarized as follows:

	(“BGF”) shares – level 1		(“HPQ”) shares - level 1		HPQ warrants – level 3	
	Quantity	\$	Quantity	\$	Quantity	\$
Balance, December 31, 2019	1,025,794	133,354	18,450,000	1,476,000	17,750,000	—
Additions	—	—	7,887,000	3,395,742	5,200,000	560,000
Received in lieu of payment of services rendered	—	—	4,394,600	395,514	4,394,600	—
Exercised	—	—	1,500,000	540,000	(1,500,000)	(337,500)
Disposed	—	—	(17,241,400)	(10,798,056)	—	—
Change in the fair value	—	(10,259)	—	21,480,020	—	23,156,935
Balance, December 31, 2020	1,025,794	123,095	14,990,200	16,489,220	25,844,600	23,379,435
Additions	—	—	8,268,000	8,070,109	—	—
Exercised	—	—	16,250,000	11,700,000	(16,250,000)	(9,181,250)
Disposed	—	—	(12,755,600)	(14,252,732)	—	—
Change in the fair value	—	—	—	(9,700,401)	—	(11,725,817)
Balance, December 31, 2021	<u>1,025,794</u>	<u>123,095</u>	<u>26,752,600</u>	<u>12,306,196</u>	<u>9,594,600</u>	<u>2,472,368</u>

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

11. Strategic investments (continued)

The Company owns 9.64% on a fully diluted basis of HPQ as at December 31, 2021 (2020 – 11.55%) and has other business transactions with this entity– see note 12.

The following table sets out the details and activity of the HPQ warrants:

Expiry date	Number of warrants			Number of warrants		Exercise price (\$)
	Dec. 31, 2020	Additions	Exercised	Dec. 31, 2021		
August 21, 2021	16,250,000	—	(16,250,000)	—		0.16
April 29, 2023	1,200,000	—	—	1,200,000		0.10
June 2, 2023	4,394,600	—	—	4,394,600		0.10
September 3, 2023	4,000,000	—	—	4,000,000		0.61
	<u>25,844,600</u>	<u>—</u>	<u>(16,250,000)</u>	<u>9,594,600</u>		

2021 Transactions

12,755,600 HPQ common shares were disposed for cash amounts totaling \$14,252,732 resulting in a realized gain of \$9,893,900. 16,250,000 shares purchase warrants were exercised in cash for a total amount of \$2,518,750. An amount of \$9,181,250 was transferred to the share value on the exercise of the warrants.

8,268,000 common shares of HPQ were purchased in cash for an amount of \$8,070,109.

2020 Transactions

1,200,000 common shares and 1,200,000 warrants of HPQ were purchased in cash for an amount of \$60,000 in April 2020.

4,394,600 common shares of HPQ and 4,394,600 warrants of HPQ were received in May 2020 to settle trade receivables from HPQ in the amount of \$395,414. At the transaction date, this non-monetary transaction was measured at the fair value of the trade receivables.

4,000,000 common shares and 4,000,000 warrants were purchased in cash for an amount of \$2,400,000 in September 2020.

2,687,000 common shares of HPQ were purchased in cash for an amount of \$1,495,742 and 16,429,400 common shares of HPQ were disposed for an amount of \$10,798,056. The disposal of the common shares of HPQ in 2020 had resulted in a realized gain of \$6,773,512.

1,500,000 HPQ warrants were exercised in cash for an amount of \$202,500 in December 2020.

At inception, the fair value of the HPQ warrants purchased in 2020 was measured using the Black-Scholes option pricing model using the following assumptions:

Number of warrants	1,200,000	4,394,600	4,000,000
Date of issuance	April 29, 2020	June 2, 2020	Sept. 3, 2020
Exercise price (\$)	0.10	0.10	0.61
Assumptions under the Black Scholes model:			
Fair value of the shares (\$)	0.04	1.05	1.05
Risk free interest rate (%)	0.30	0.20	0.20
Expected volatility (%)	97.45	114.80	112.52
Expected dividend yield			
Contractual remaining life (number of months)	36	29	32

PyroGenesis Canada Inc.
Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

11. Strategic investments (continued)

2020 Transactions (continued)

As at December 31, 2021 and 2020, the fair value of the HPQ warrants was measured using the Black-Scholes option pricing model using the following assumptions:

	2021			2020		
Number of warrants	1,200,000	4,394,600	4,000,000	1,200,000	4,394,600	4,000,000
Date of issuance	April 29, 2020	June 2, 2020	Sept. 3, 2020	April 29, 2020	June 2, 2020	Sept. 3, 2020
Exercise price (\$)	0.10	0.10	0.61	0.10	0.10	0.61
Assumptions under the Back Sholes model:						
Fair value of the shares (\$)	0.46	0.46	0.46	1.05	1.05	1.05
Risk free interest rate (%)	1.22	1.22	1.22	0.2	0.2	0.2
Expected volatility (%)	89.88	94.01	110.47	115.3	114.8	112.52
Expected dividend yield						
Contractual remaining life (in months)	19	20	23	28	29	32

As at December 31, 2021, a gain from initial recognition of the warrants of \$510,573 (\$859,998 – 2020) has been deferred off balance sheet until realized.

12. Royalties receivable

	December 31 2021 \$	December 31 2020 \$
Opening balance	1,060,000	—
Accretion interest	132,809	—
Royalties recognized during the year	450,000	1,600,000
Discounting	(134,155)	(390,000)
Amounts received during the year	(250,000)	(150,000)
Balance at end of the year	<u>1,258,654</u>	<u>1,060,000</u>
Current portion	311,111	—
Non-current portion	<u>947,543</u>	<u>1,060,000</u>
	<u>1,258,654</u>	<u>1,060,000</u>

The Company sold intellectual property to HPQ Silicon Resources Inc. (“HPQ”) in 2016 (“HPQ 2016 contract”) and its wholly owned subsidiary, HPQ Nano Silicon Powders Inc. in 2020 (“HPQ Nano contract”). In addition, in 2021 the Company sold intellectual property to HPQ Silica Polvere Inc. (“HPQ Polvere contract”), a wholly owned subsidiary of HPQ. The terms of those sales contracts include, in addition to the purchase price amounts already received of \$1,000,000 in 2016 and \$2,400,000 in 2020 and \$3,300,000 in 2021, respectively, the following variable consideration in the form of royalty payments:

HPQ 2016 contract:

Royalties are 10% of net sales, with minimum payments of \$200,000 in 2021 and \$250,000 in 2022 and every year thereafter. Payment is due no later than 30 days after the year end of HPQ Silicon Resources Inc. An amount of \$200,000 has been received under this agreement in 2021 (\$150,000 was received in 2020).

PyroGenesis Canada Inc.
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12. Royalties receivable (continued)

HPQ Nano contract:

Royalties are 10% of net sales, with minimum payments of \$50,000 in 2021, \$100,000 in 2022, \$150,000 in 2023, and \$200,000 in 2024 and every year thereafter. Payments are due no later than 10 days after the year end of HPQ Nano Silicon Powders Inc. An amount of \$50,000 has been received under this agreement in 2021.

HPQ Polvere contract:

Royalties are 10% of net sales with minimum payments of \$50,000 in 2023, \$100,000 in 2024, \$150,000 in 2025 and \$200,000 in 2026 and every year thereafter. Royalty payments are limited to the total net sales for the period. Payments are due no later than 10 days after the year end of HPQ Silica Polvere Inc.

During the year ended December 31, 2021, the Company recognized an additional \$250,000 and \$200,000 for the HPQ 2016 contract and HPQ Nano contracts, respectively, of royalties receivable, which have been discounted using 12.5% discount rate. See note 6.

During the year ended December 31, 2020, the Company recognized \$1,100,000 and \$500,000 for the HPQ 2016 and HPQ Nano contracts, respectively, of royalties receivable, which amounts have been discounted using a 12.5% rate. See note 6.

The HPQ Nano contract and the HPQ Polvere contract each provide the Company with the option to convert, at any time, the future royalties that would be owed to it into a 50% equity stake in HPQ Nano Silicon Powders Inc. and HPQ Silica Polvere Inc., respectively. Each option is considered an embedded derivative that is initially measured at fair value and subsequently remeasured at fair value at each reporting period. The Company determined that the embedded derivatives had a fair value of \$Nil at the inception of the contracts and \$Nil at each of the reporting dates.

13. Deposits

	December 31 2021	December 31 2020
	<u>\$</u>	<u>\$</u>
Current portion:		
Suppliers	1,236,211	1,421,246
Security deposit on leased premises	92,241	—
Total current	<u>1,328,452</u>	<u>1,421,246</u>
Non-current portion:		
Suppliers	1,952	1,099
Security deposit on leased premises	246,804	300,242
Total non-current	<u>248,756</u>	<u>301,341</u>
Total Deposits	<u>1,577,208</u>	<u>1,722,587</u>

14. Property and equipment

PyroGenesis Canada Inc.
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For the years ended December 31, 2021 and 2020

	Computer equipment \$	Machinery and equipment \$	Automobiles \$	Leasehold improvements \$	Equipment under construction \$	Total \$
Cost						
Balance at December 31, 2019	521,988	1,621,899	21,912	165,006	1,671,962	4,002,767
Additions	27,671	—	306,164	15,895	268,272	618,002
Impairment	—	—	(21,912)	—	—	(21,912)
Balance at December 31, 2020	549,659	1,621,899	306,164	180,901	1,940,234	4,598,857
Acquired through business combination	13,585	28,967	—	—	—	42,552
Additions	245,984	384,092	30,495	752,204	84,143	1,496,918
Balance at December 31, 2021	809,228	2,034,958	336,659	933,105	2,024,377	6,138,327
Accumulated depreciation						
Balance at December 31, 2019	491,906	1,421,613	18,782	92,985	—	2,025,286
Depreciation	17,206	20,029	22,083	3,800	—	63,118
Impairment	—	—	(19,117)	—	—	(19,117)
Balance at December 31, 2020	509,112	1,441,642	21,748	96,785	—	2,069,287
Depreciation	88,410	182,739	59,959	24,995	—	356,103
Balance at December 31, 2021	597,522	1,624,381	81,707	121,780	—	2,425,390
Carrying amounts						
Balance at December 31, 2020	40,547	180,257	284,416	84,116	1,940,234	2,529,570
Balance at December 31, 2021	211,706	410,577	254,952	811,325	2,024,377	3,712,937

Equipment under construction includes the leasehold improvements of a clean room and the costs related to building the new Plasma Powder Production equipment.

15. Leases

The Company has entered into lease contracts mainly for buildings and computer equipment, which expire at various dates through the year 2036. Some leases have extension or purchase options for various terms. Some lease payments are based on changes in price indices. The lease contracts do not impose any financial covenants.

As of January 1, 2020, a lease for rent of a property with a trust whose beneficiary is the controlling shareholder and CEO of the Company was modified to amend the lease term, fix the annual rent increase at a rate of 2%, exercise the option to extend the term of the lease for five years and prepay the rent amount of \$1,178,530, which was presented against the lease liability. At the date of modification, the lease liability was remeasured and an amount of \$366,566 was recorded as an adjustment to the right-of-use asset. The lease liability was recalculated using a discount rate of 4%. As at December 31, 2020, the right-of-use asset and the lease liabilities related to this lease amount to \$1,328,557 and \$221,496 respectively (2019 - \$1,350,487 and 1,218,958). In 2020, the variable components of the leases which are not included in the lease liabilities under IFRS 16, comprise property taxes for an amount of \$258,042 (2019 - \$266,581) which were charged to the Company. In return the trust agreed to convert the 2020 Convertible loan approximately one year before its due date.

PyroGenesis Canada Inc.
Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

15. Leases (continued)

a) Right-of-use assets

	<u>Land and building</u>	<u>Computer equipment</u>	<u>Total</u>
	\$	\$	\$
Balance at January 1, 2020	3,724,696	18,073	3,742,769
Remeasurement of lease liabilities	366,566	—	366,566
Depreciation	(402,947)	(5,388)	(408,335)
Balance at December 31, 2020	3,688,315	12,685	3,701,000
Addition - business combination	477,608	—	477,608
Addition	2,157,796	—	2,157,796
Depreciation	(566,182)	(4,228)	(570,411)
Balance at December 31, 2021	<u>5,757,537</u>	<u>8,457</u>	<u>5,765,993</u>

b) The table below summarizes changes to the lease liabilities:

	\$
Balance at January 1, 2020	3,985,026
Remeasurement	366,566
Payments	(1,363,050)
Balance at December 31, 2020	2,988,542
Addition - business acquisition	477,608
Additions - other	2,120,893
Payments	(263,078)
Balance at December 31, 2021	<u>5,323,965</u>
Current portion	2,934,236
Non-current portion	2,389,729
	<u>5,323,965</u>

c) Amount recognized in the statement of comprehensive loss:

	<u>2021</u>	<u>2020</u>
	\$	\$
Depreciation of right-of-use assets	570,411	408,335
Interest on lease liabilities	307,691	211,666
Expense related to lease payments not included in the measurement of lease liabilities	178,707	118,476

d) Maturity analysis – contractual undiscounted cash flows of lease liabilities as at December 31, 2021

	\$
2022	3,220,750
2023	353,380
2024	357,113
2025	332,296
2026	229,332
Thereafter	2,121,321
	<u>6,614,192</u>

PyroGenesis Canada Inc.
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16. Intangible assets

	<u>Production backlog</u>	<u>Patents</u>	<u>Development costs</u>	<u>Total</u>
	\$	\$	\$	\$
Cost				
Balance at December 31, 2019	—	572,486	244,871	817,357
Additions	—	305,420	—	305,420
Write-off	—	(109,514)	—	(109,514)
Balance at December 31, 2020	—	768,392	244,871	1,013,263
Acquired through business combination	2,120,000	—	—	2,120,000
Additions	—	214,497	—	214,497
Write-off	—	(85,544)	—	(85,544)
Balance at December 31, 2021	<u>2,120,000</u>	<u>897,345</u>	<u>244,871</u>	<u>3,262,216</u>
Accumulated amortization				
Balance at December 31, 2019	—	47,443	33,016	80,459
Amortization	—	10,682	16,508	27,190
Balance at December 31, 2020	—	58,125	49,524	107,649
Amortization	<u>353,333</u>	<u>10,528</u>	<u>16,508</u>	<u>380,369</u>
Balance at December 31, 2021	<u>353,333</u>	<u>68,653</u>	<u>66,032</u>	<u>488,018</u>
Carrying amounts				
Balance at December 31, 2020	—	710,267	195,347	905,614
Balance at December 31, 2021	<u>1,766,667</u>	<u>828,692</u>	<u>178,839</u>	<u>2,774,198</u>

The Company's development costs have been incurred to develop plasma related technologies and the patents protect the design and specification of these technologies.

17. Goodwill

The Company tests goodwill for impairment annually, or more frequently when an indicator of impairment is identified. Goodwill is considered impaired if the recoverable amount is less than the carrying amount.

The recoverable amount of an operating segment is determined based on value-in-use calculations, covering a detailed five-year forecast, followed by an extrapolation of expected cash flows for the remaining useful lives using a declining growth rate determined by management. The present value of the expected cash flows of the operating segment is determined by applying a suitable discount rate reflecting current market assessments of the time value of money and risks specific to the segment.

For the purpose of impairment testing, goodwill is allocated to the sole operating segment, Pyro Green-Gas, which is expected to benefit from the synergies of the business combination in which the goodwill arises, and is compared to its recoverable value.

At December 31, 2021, it was determined that the recoverable amounts exceed the carrying amount, and no impairment was required. The recoverable amount in the most recent impairment test performed was determined using a pre-tax discount rate of 8% and terminal growth rate of 2%.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

18. Accounts payable and accrued liabilities

	December 31 2021 \$	December 31 2020 \$
Accounts payable	5,457,259	2,206,249
Accrued liabilities	3,730,048	1,701,554
Sale commissions payable ¹	737,364	731,671
Accounts payable to the controlling shareholder and CEO	144,506	68,577
	<u>10,069,177</u>	<u>4,708,051</u>

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

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

The amount to date of costs incurred and recognized profits less recognized losses for construction projects in progress amounted to \$21,834,137 (2020 - \$6,831,326).

Payments to date received were \$31,234,368 on contracts in progress (2020 - \$13,424,298).

Changes in billings in excess of costs and profits on uncompleted contracts during the year are explained by \$6,268,910 (2020 - \$1,282,217) recognized at the beginning of the year being recognized as revenue, and an increase of \$9,076,169 (2020 - \$4,790,536) resulting from cash received excluding amounts recognized as revenue.

20. Term loans

	EDC Loan ¹ \$	Other Term Loans ² \$	Other Term Loans ³ \$	Canada Emergency Business Account Loan ⁴ \$	Other Term Loans ⁵ \$	2019 SR&ED Tax Credit loan ⁶ \$	2018 SR&ED Tax Credit loan ⁷ \$	Total \$
Balance, December 31, 2019	—	—	—	—	110,933	185,331	199,736	496,000
Addition	157,058	38,861	—	—	—	—	—	195,919
Financing costs	(83,119)	—	—	—	—	—	—	(83,119)
Accretion	1,861	—	—	—	4,267	40,902	14,264	61,294
Payments	—	(1,954)	—	—	(115,200)	(226,233)	(214,000)	(557,387)
Balance, December 31, 2020	75,800	36,907	—	—	—	—	—	112,707
Assumed through business combination	—	—	36,520	50,000	—	—	—	86,520
Accretion	12,185	—	—	—	—	—	—	12,185
Payments	—	(12,207)	(8,300)	—	—	—	—	(20,507)
Balance, December 31, 2021	87,985	24,700	28,220	50,000	—	—	—	190,905
Less current portion	—	(13,084)	(19,920)	(50,000)	—	—	—	(83,004)
Balance, December 31, 2021	<u>87,985</u>	<u>11,616</u>	<u>8,300</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>107,901</u>

¹ maturing in 2027, non-interest bearing, payable in equal instalments from July 2023 to June 2027

² maturing October 23, 2023 bearing interest at a rate of 6.95% per annum, payable in monthly instalments of \$1,200 secured by automobile (carrying amount of \$23,749 as at December 31, 2021)

³ maturing in May 2023, payable in monthly instalments of \$1,660, bearing interest at 7.45%

⁴ loan bearing no interest and no minimum repayment, if repaid by December 2023

⁵ bore interest at 8% per annum, repaid July 2020.

⁶ bore interest at 16.68%, repaid July 2020.

⁷ bore interest at 16.68%, repaid May 2020.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

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20. Term loans (continued)

EDC Loan

On March 5, 2020, the Company entered into a repayable contribution agreement up to \$450,000 under the Regional Economic Growth through Innovation program from the Economic Development Agency of Canada (“EDC”). The contribution is repayable in 60 equal monthly instalments due and payable 24 months following the completion of the project. During the year ended December 31, 2020, the Company received contributions totaling \$157,058. The loan was discounted using the effective interest method. The effective interest rate on the loan is 15%.

Canada Emergency Business Account (“CEBA”) Loan

The Company's subsidiary participated in the CEBA program whereby it obtained an interest free and partially forgivable loan. The loan bears no interest and no minimum repayment terms, and one third of the loan amount is forgiven if repaid by December 31, 2022. The unpaid balance, if any, at December 31, 2022 would be converted to a 24 month term loan bearing interest at 5% and be reimbursed entirely by December 31, 2024. In January 2022 the Government of Canada amended the program and the repayment date has been extended by 1 year, until December 31, 2023.

21. Convertible debentures

	2020 Convertible loan	2018 Convertible debentures	Total
		\$	
Balance at December 31, 2019	—	2,898,358	2,898,358
Liability component at issuance	804,578	—	804,578
Effective interest accretion	22,982	155,642	178,624
	827,560	3,054,000	3,881,560
Repayment of debentures including accommodation fees, in cash	—	(358,500)	(358,500)
Conversion into common shares	(827,560)	(2,695,500)	(3,523,060)
Balance at December 31, 2020	—	—	—
Balance at December 31, 2021	—	—	—

2020 Convertible loan

On March 18, 2020, the Company closed a \$903,000 non-brokered secured convertible loan (“2020 Convertible loan”) at 12% per annum, with a trust whose beneficiary is the controlling shareholder and CEO of the Company. The loan bore interest at the rate of 12% per annum, with interest payable in cash on a quarterly basis in arrears with an initial maturity date of September 17, 2021. The loan was convertible before maturity, in whole at anytime or in part from time to time at a conversion price of \$0.28 at the option of the lender. The convertible loan was secured by a deed of hypothec charging on the universalities of movable assets.

At the issuance date, the 2020 Convertible loan was recorded as follows:

	\$
Liability component	804,578
Conversion option recognized in equity, net of transaction cost of \$47,338	98,422
Net proceeds	903,000

On September 30, 2020, the 2020 Convertible loan was converted into 3,225,000 common shares. Upon conversion, the equity component of \$98,422 was allocated to share capital. The conversion was performed in return for the modification of a lease agreement for rent of a property with the same trust whose beneficiary is the controlling shareholder and CEO of the Company (note 15).

PyroGenesis Canada Inc.

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21. Convertible debentures (continued)

2018 Convertible debentures

On March 30, 2020, the Company reached an agreement to extend the maturity date of its \$3,000,000 2018 convertible debentures to September 30, 2020, from the original maturity date of March 29, 2020. Under the terms of the agreement, the Company redeemed \$300,000 (representing 10% of the principal amount), paid a onetime accommodation fee of \$54,000, and is no longer subject to any prepayment penalties going forward. Upon redemption, an amount of \$40,779 corresponding to the equity component was reclassified to contributed surplus.

At the date of modification, the fair value of the 2018 Convertible debentures was determined using estimated cash flows discounted using a market interest rate of 17.5%. At the remeasurement date, a residual amount of \$16,875 representing the value of the conversion option equity component was classified in the shareholders' Equity (Deficiency).

Upon conversion of the debentures in May and June 2020, 3,369,375 common shares were issued and the equity component of \$360,981 was classified in share capital.

22. Shareholders' equity

Common shares and warrants

Authorized:

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

Shares issued upon public issuance

On November 3, 2020, the Company closed a bought-deal short form prospectus offering of 3,354,550 units at a price of \$3.60 per unit for aggregate gross proceeds to the Company of \$12,076,380, including the full exercise of the over-allotment option. In connection with the offering, the Company paid issuance costs of \$1,640,052 in cash and issued 191,414 compensation options. Each compensation option entitles the holder thereof to purchase one unit at a price of \$3.60 until November 10, 2022. Each unit is comprised of one common share of the Company and one-half of one common share purchase warrant of the company. Each warrant entitles the holder to purchase one additional common share at an exercise price of \$4.50 for a period of 24 months.

Under the warrant indenture, the Company has the right to accelerate the expiry date of the warrants to the date that is 30 days after delivery of a notice (the "Acceleration Notice") to the holders of warrants and the warrant agent confirming that the volume weighted average trading price of the Company's common shares on the Toronto Stock Exchange is greater than \$6.75 for 20 consecutive trading days (the "VWAP Requirement"). The VWAP Requirement was met as of close of business March 10, 2021. The Company delivered the Acceleration Notice and indicated that the warrants will expire on April 14, 2021.

Shares issued upon exercise of stock options, share purchase warrants and compensation options

During the year ended December 31, 2021, 3,482,000 (2,118,000 - 2020) stock options and 8,146,483 (7,060,617 - 2020) share purchase warrants were exercised for net proceeds of \$1,109,818 and \$12,396,107 (\$759,400 and \$5,623,323 - 2020) respectively. The amounts credited to share capital from the exercise of stock options include an ascribed value from contributed surplus of \$364,000 (\$484,807 - 2020). In addition the 191,414 compensation options were also exercised for net proceeds of \$689,090.

Conversion of loan into shares

On September 30, 2020, the 2020 Convertible loan with a carrying value of \$827,560 was converted into 3,225,000 common shares. Upon conversion, the liability component of \$98,422 was transferred to share capital (note 21).

PyroGenesis Canada Inc.
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22. Shareholders' equity (continued)

Share redemptions for cancellation

In fiscal 2019, the Company had been authorized to repurchase, for cancellation, on the open market, or subject to the approval of any securities authority by private agreements, between November 1, 2019 and October 31, 2020, or at an earlier date if the Company concludes or cancels the offer, up to 6,750,000 of its common Shares. In January 2021, the Company announced it had been authorized to repurchase 5,000,000 Common shares from January 14, 2021 to January 13, 2022.

During the year 2020, the Company repurchased and cancelled 1,285,000 Common shares at a weighted average price of \$0.75, for a total cash consideration of \$964,391 including commissions of \$12,845. The excess of the total consideration over the carrying amount of the shares, in the amount of \$538,021, was applied against deficit.

During the year 2021, the Company repurchased and cancelled 840,094 Common shares at a weighted average price of \$4.96 per share, for a total cash consideration of \$4,183,617 including commissions of \$16,678. The excess of the total consideration over the carrying amount of the shares, in the amount of \$3,778,619 was applied against deficit.

The repurchases were made in the normal course of business at market prices through the TSX. The Company was under no obligation to repurchase its Common Shares as at December 31, 2021.

Stock options

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

The following table sets out the activity in stock options:

	<u>Number of options</u>	<u>Weighted average exercise price</u> \$
Balance – December 31, 2019	8,438,000	0.37
Granted	2,810,000	4.23
Exercised ⁽¹⁾	(2,118,000)	0.36
Forfeited	(90,000)	1.02
Balance, December 31, 2020	<u>9,040,000</u>	<u>1.57</u>
Granted	2,970,000	4.55
Exercised ⁽¹⁾	(3,482,000)	0.32
Forfeited	(125,000)	4.41
Balance, December 31, 2021	<u>8,403,000</u>	<u>3.10</u>

⁽¹⁾ The weighted fair market value of the share price for options exercised in 2021 was \$5.48 (\$1.22 in 2020).

PyroGenesis Canada Inc.

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For the years ended December 31, 2021 and 2020

22. Shareholders' equity (continued)

Grants in 2021

On December 30, 2021, the Company granted 100,000 stock options to a member of its Board of Directors. The stock options have an exercise price of \$3.61 per common share, vest immediately and are exercisable over a period of five (5) years.

On December 17, 2021, the Company granted 1,920,000 stock options to the President and Chief Executive Officer of the Company. The stock options have an exercise price of \$3.13 per common share, vest immediately and are exercisable over a period of five (5) years.

On October 14, 2021, the Company granted 100,000 stock options to the Chief Financial Officer of the Company. The stock options have an exercise price of \$5.04 per common share. The 100,000 options will vest as follows: 10 percent as of the day of the grant, 20 percent at the first anniversary of the date of the grant, 30 percent at the second anniversary of the date of the grant, and 40 percent at the third anniversary of the date of the grant and are exercisable over a period of five (5) years.

On June 14, 2021, the Company granted 100,000 stock options to an officer of the Company. The stock options have an exercise price of \$6.70 per common share. The 100,000 options will vest as follows: 25 percent at the date of the grant, 25 percent at the first anniversary of the date of grant, 25 percent at the second anniversary of the date of grant, and 25 percent at the third anniversary of the date of grant and are exercisable over a period of five (5) years.

On June 1, 2021, the Company granted 200,000 stock options to a member of its Board of Directors. The stock options have an exercise price of \$6.59 per common share. The 200,000 options will vest as follows: 25 percent at the date of the grant, 25 percent at the first anniversary of the date of grant, 25 percent at the second anniversary of the date of grant, and 25 percent at the third anniversary of the date of grant and are exercisable over a period of five (5) years.

On April 6, 2021, the Company granted 150,000 stock options to the President and Chief Executive Officer of the Company, 100,000 and 200,000 stock options to two members of the Board of Directors and 100,000 stock options to an employee of the Company. The stock options have an exercise price of \$8.47 per common share. Of these options, 250,000 will vest immediately, 200,000 options will vest as follows: 30 percent as of the day of the grant, 35 percent at the first anniversary of the date of the grant and 35 percent on the second anniversary of the date of the grant and the remaining 100,000 options will vest as follows: 10 percent as of the day of the grant, 20 percent at the first anniversary of the date of the grant, 30 percent at the second anniversary of the date of the grant, and 40 percent at the third anniversary of the date of the grant. All options mentioned above are exercisable over a period of five (5) years.

Grants in 2020

On October 26, 2020, the Company announced that it granted stock options to acquire 200,000 common shares of the Company to a member of the Board of Directors, and 50,000 common shares to an executive officer of the Company. The stock options have an exercise price of \$4.00 per common shares and are exercisable over a period of five (5) years.

On July 16, 2020, the Company granted an aggregate of 1,700,000 stock options to its directors entitling them to purchase an aggregate of 1,700,000 common shares of the Company, at a price of \$4.41 per common share. The 1,700,000 options will vest as follows: 25 percent at the date of the grant, 25 percent at the first anniversary of the date of grant, 25 percent at the second anniversary of the date of grant, and 25 percent at the third anniversary of the date of grant.

The Company also granted an aggregate of 760,000 stock options to employees entitling them to purchase an aggregate of 760,000 common shares of the Company, at a price of \$4.41 per common share. Of these options, 660,000 will vest as follows: 50 percent as of the date of grant and 50 percent at the first anniversary of the date of grant. The remaining 100,000 will vest as follows: 25 percent as of the date of grant, 25 percent at the first anniversary of the date of grant, 25 percent at the second anniversary of the date of grant and 25 percent at the third anniversary of the date of grant. All option grants disclosed above are exercisable for a period of five years.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

22. Shareholders' equity (continued)

Grants in 2020 (continued)

On January 2, 2020, the Company granted 100,000 stock options to a Board of Directors, in his capacity of Chair of the Audit Committee of the Company. The stock options have an exercise price of \$0.45 per Common Shares, vest immediately and is exercisable over a period of five (5) years.

The weighted average fair value of stock options granted for the year ended December 31, 2021 was \$2.99 (\$2.88 in 2020) per option. The weighted average fair value of each option granted was estimated at the grant date for purposes of determining share-based payment expense using the Black-Scholes option pricing model based on the following weighted-average assumptions:

<u>Years ended December 31,</u>	<u>2021</u>	<u>2020</u>
Number of options granted	2,970,000	2,810,000
Exercise price (\$)	4.55	4.23
Fair value of each option under the Black Scholes pricing model (\$)	2.99	2.88
Assumptions under the Black Scholes model:		
Fair value of the market share (\$)	4.52	4.23
Risk free interest rate (%)	1.11	0.38
Expected volatility (%)	83.00	88.49
Expected dividend yield	—	—
Expected life (number of months)	60	60
Forfeiture rate (%)	—	—

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

PyroGenesis Canada Inc.
Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

22. Shareholders' equity (continued)

As at December 31, 2021, the outstanding options, as issued under the stock option plan to directors, officers, employees and consultants for the purchases of one common share per option, are as follows:

	Number of stock options Dec 31, 2020	Granted	Exercised	Forfeitures	Number of stock options Dec 31, 2021	Number of stock options vested ⁽¹⁾	Exercise price per option \$	Expiry date
September 25, 2016	3,000,000		(3,000,000)		—		0.18	Sept 25, 2021
November 3, 2017	2,420,000		(20,000)		2,400,000	2,400,000	0.58	Nov 3, 2022
May 10, 2018	250,000		(250,000)		—		0.52	May 10, 2023
July 3, 2018	300,000				300,000	300,000	0.51	July 3, 2023
October 29, 2018	70,000		(30,000)		40,000	40,000	0.52	Oct 29, 2023
September 29, 2019	200,000		(100,000)		100,000	100,000	0.51	Sept 29, 2024
January 2, 2020	100,000				100,000	100,000	0.45	Jan 2, 2025
July 16, 2020	2,450,000		(82,000)	(125,000)	2,243,000	1,343,000	4.41	Jul 16, 2025
October 26, 2020	250,000				250,000	125,000	4.00	Oct 26, 2025
April 6, 2021	—	550,000			550,000	320,000	8.47	Apr 6, 2026
June 1, 2021	—	200,000			200,000	50,000	6.59	June 1, 2026
June 14, 2021	—	100,000			100,000	25,000	6.70	June 14, 2026
October 14, 2021	—	100,000			100,000	10,000	5.04	Oct 14, 2026
December 17, 2021	—	1,920,000			1,920,000	1,920,000	3.13	Dec 17, 2026
December 30, 2021	—	100,000			100,000	100,000	3.61	Dec 30, 2026
	<u>9,040,000</u>	<u>2,970,000</u>	<u>(3,482,000)</u>	<u>(125,000)</u>	<u>8,403,000</u>	<u>6,833,000</u>	<u>3.10</u>	

⁽¹⁾ At December 31, 2021, the weighted average exercise price for options outstanding which are exercisable was \$2.59.

For the year ended December 31, 2021, a stock-based compensation expense of \$9,762,745 (2020 - \$4,244,608) was recorded in Selling, general and administrative expenses to the Consolidated Statements of Comprehensive income (loss).

As at December 31, 2021, an amount of \$2,719,354 (2020 - \$3,904,882) remains to be amortized until October 2025 related to the grant of stock options.

PyroGenesis Canada Inc.
Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

22. Shareholders' equity (continued)

Share purchase warrants

The following table reflects the activity in warrants during the years ended December 31, 2021 and the number of issued and outstanding share purchase warrants at December 31, 2021:

	Number of warrants Dec 31, 2020	Issued	Exercised	Expired	Number of warrants Dec 31, 2021	Price per warrant \$	Expiry date
Issuance of units – September 28, 2018	3,448,276		(3,448,276)		—	0.58	Jan 28, 2021
Issuance of units – October 19, 2018	100,000		(100,000)		—	0.58	Feb 13, 2021
Issuance of units – May 15, 2019	1,355,500		(1,355,500)		—	0.85	May 15, 2021
Issuance of units – May 28, 2019	750,000		(750,000)		—	0.85	May 24, 2021
Issuance of units – June 19, 2019	500,000		(500,000)		—	0.85	Jun 19, 2021
Issuance of units – October 25, 2019	225,000		(225,000)		—	0.75	Oct 25, 2021
Issuance of units – November 10, 2020	1,677,275		(1,672,000)	(5,275)	—	4.50	Nov 10, 2022 ¹
Issuance of warrants – November 10, 2020	95,707		(95,707)		—	4.50	Nov 10, 2022 ¹
	<u>8,151,758</u>	<u>—</u>	<u>(8,146,483)</u>	<u>(5,275)</u>	<u>—</u>	<u>1.52</u>	

¹ On March 10, 2021, the Company has delivered the Acceleration Notice to accelerate the expiry date of the warrants to April 14, 2021 issued on November 10, 2020

23. Supplemental disclosure of cash flow information

	2021 \$	2020 \$
Accounts receivable	(12,372,139)	(2,622,018)
Costs and profits in excess of billings on uncompleted contracts	(3,849,077)	(950,653)
Inventory	(839,352)	—
Investment tax credits receivable	1,015,862	(562,980)
Royalties receivable	(65,845)	(1,060,000)
Deposits	145,379	(1,394,160)
Contract assets	—	(855,592)
Prepaid expenses	39,111	(39,042)
Accounts payable and accrued liabilities	1,953,208	(148,678)
Billings in excess of costs and profits on uncompleted contracts	1,485,969	3,508,315
Income taxes	(99,072)	—
	<u>(12,585,956)</u>	<u>(4,124,808)</u>

PyroGenesis Canada Inc.
Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

24. Supplemental disclosure on comprehensive income statement

The amount of inventories recognized in cost of sales is \$326,279 for the year ended December 31, 2021 (\$Nil in 2020).

The aggregate amortization and write-off of intangible assets expense for the year ended December 31, 2021 was \$465,913 (2020 - \$27,190) and was recorded in cost of sales and services.

Depreciation on property and equipment amounted to \$356,103 and ROU assets was \$570,411 for the year ended December 31, 2021, as compared to (2020 - \$63,118 and \$408,335 respectively) and is recorded in selling, general and administrative. During the year ended December 31, 2021 costs to obtain long term contracts of \$Nil (2020 - \$161,219) were recognized to selling, general and administrative expenses.

Employee benefits totaled \$21,855,957 in the year ended December 31, 2021 (2020 - \$11,801,314) and include share-based compensation of \$9,762,745 (2020 - \$4,244,608).

The Company has been awarded various grants during the year, which were recognized when they became receivable. The grants, received in 2021, are unconditional and amounted to \$226,420 (2020 - \$419,661). An amount of \$149,575 (2020 - \$365,433) was recorded as a reduction to the related expenses in research and development, an amount of \$76,845 (2020 - \$54,228) was recorded as a reduction to the related expenses in selling, general and administrative.

The Company in 2020 applied for an amount of \$775,967 in wage subsidy under the CEWS program. An amount of \$118,416 was recorded as a reduction to employee compensation under cost of sales and services, \$504,339 was recorded as a reduction to employee compensation under selling, general and administrative expenses, and \$153,212 was recorded as a reduction to employee compensation under research and development costs.

25. Net finance costs

	<u>2021</u>	<u>2020</u>
	\$	\$
Financial expenses		
Interest and fees on convertible debentures	—	171,042
Interest accretion of convertible debentures	—	182,700
Interest on term loans	99,960	20,957
Interest on lease liabilities	307,691	211,666
Interest accretion on promissory notes and on balance due on business combination	110,203	17,937
Penalties and other interest expenses	19,325	57,550
Capitalized borrowing costs on Equipment under construction	—	(137,778)
	<u>537,179</u>	<u>524,074</u>
Financial income		
Accretion interest on royalty receivable	<u>(132,809)</u>	—
Net finance costs	<u>404,370</u>	<u>524,074</u>

PyroGenesis Canada Inc.
Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

26. Earnings (loss) per share

The following table provides a reconciliation between the number of basic and fully diluted shares outstanding as at December 31, 2021 and 2020:

	<u>2021</u>	<u>2020</u>
	\$	\$
Weighted daily average of Common shares	166,645,546	148,315,445
Dilutive effect of stock options	—	5,375,592
Dilutive effect of warrants	—	4,611,720
Weighted average number of diluted shares	166,645,546	158,302,757
Number of anti-dilutive stock options and warrants excluded from fully diluted earnings per share calculation	8,403,000	4,664,396

27. Related party transactions

During the year ended December 31, 2021 and 2020, the Company concluded the following transactions with related parties:

In 2021, rent and property taxes were charged by a trust whose beneficiary is the controlling shareholder and CEO of the Company in the amount of \$274,934 (2020 - \$274,106). As of January 1, 2020, a lease for rental of a property with a trust whose beneficiary is the controlling shareholder and CEO of the Company was modified and extended for five years. At the date of modification, the lease liability was remeasured using a discount rate of 4% and an amount of \$366,566 was recorded as an adjustment to the right-of-use asset. The modified agreement included a requirement to prepay the rent amount of \$1,178,530 and the municipal tax amount of \$260,000. In return for the modification of the lease agreement, a 2020 convertible loan of \$903,000 from a trust whose beneficiary is the controlling shareholder and CEO of the Company, was converted into 3,225,000 common shares of the Company. These expenses are recorded in captions cost of sales and selling and general in the statement of comprehensive income (loss). As at December 31, 2021 the right-of-use asset and the lease liabilities amount to \$1,107,131 and \$Nil respectively (2020 - \$1,328,557 and \$221,496).

An amount of \$Nil (December 31, 2020 - \$58,050), of interest payable was accrued on the 2020 convertible loan of \$903,000 from a trust whose beneficiary is the controlling shareholder and CEO of the Company.

A balance due to the controlling shareholder and CEO of the Company amounted to \$144,506 (2020 - \$72,188) is included in accounts payable and accrued liabilities.

An amount of \$Nil (2020 - \$17,937), of interest accretion was expensed in net financing costs on the loan of \$295,000 from the controlling shareholder and CEO of the Company.

The key management personnel of the Company are the members of the Board of Directors and certain officers. Total compensation to key management consisted of the following:

	<u>2021</u>	<u>2020</u>
	\$	\$
Salaries – key management	3,049,501	2,148,420
Pension contributions	59,377	18,529
Fees – Board of Directors	187,600	150,000
Share-based compensation – officers	6,182,573	1,989,144
Share-based compensation – Board of Directors	2,338,650	846,410
Other benefits – key management	237,903	544,402
Total compensation	12,055,604	5,696,905

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

28. Financial instruments

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

Foreign currency risk

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

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

	2021 \$	2020 \$
Cash	1,714,670	1,366,627
Accounts receivable	14,465,011	621,817
Accounts payable and accrued liabilities	(1,023,999)	(252,463)
Total	<u>15,155,682</u>	<u>1,735,981</u>

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

Sensitivity analysis

At December 31, 2021, if the US Dollar changes by 10% against the Canadian dollar with all other variables held constant, the impact on pre-tax gain or loss and equity for the year ended December 31, 2021 would have been \$1,516,000 (December 31, 2020 - \$174,000).

Credit risk and credit concentration

Credit risk is the risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation. The maximum credit risk to which the Company is exposed as at December 31, 2021 represents the carrying amount of cash and cash equivalents, accounts receivable (except sales tax receivable), deposits and royalties receivable. Cash and cash equivalents, which only comprise guaranteed investment certificates redeemable on relatively short notice by the Company, are held with major reputable financial institutions. The Company manages its credit risk by performing credit assessments of its customers. The Company does not generally require collateral or other security from customers on accounts receivable. The Company believes that there is no unusual exposure associated with the collection of these receivables. During the year ended December 31, 2021, four customers accounted for 79% (December 31, 2020 – two customers for 79%) of revenues from operations.

PyroGenesis Canada Inc.
Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

28. Financial instruments (continued)

	Revenues	2021 % of total revenues	Revenues	2020 % of total revenues
	\$	%	\$	%
Customer 1	7,308,191	24	9,523,353	53
Customer 2	7,019,953	23	4,444,022	26
Customer 3	6,417,373	21	—	—
Customer 4	3,551,900	11	—	—
Total	24,297,417	79	13,967,375	79

One customer accounted for 73% (December 31, 2020 – two customers for 69%) of trade accounts receivable with amounts owing to the Company of \$12,063,636 (2020 - \$1,211,177), representing the Company's major credit risk exposure. Credit concentration is determined based on customers representing 10% or more of total revenues and/or total accounts receivable.

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

Fair value of financial instruments

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

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

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

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

Level 3 — inputs for the asset or liability that are not based on observable market data.

The fair values of cash and cash equivalents, trade accounts receivable, deposits, accounts payable and accrued liabilities approximate their carrying amounts due to their short-term maturities.

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

Royalties receivable are discounted according to their corresponding agreements and are classified as Level 2.

Investments in HPQ warrants are valued using the Black-Scholes pricing model and are classified as Level 3.

The fair value of the term loans and the balance due on business combination as at December 31, 2021 is determined using the discounted future cash flows method and management's estimates for market interest rates for similar issuances. Given their recent issuance, their fair market values correspond to their carrying amount.

PyroGenesis Canada Inc.
Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

28. Financial instruments (continued)

Interest rate risk

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

Price risk

Price risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market price (other than those arising from foreign currency risk and interest risk), whether those changes are caused by factors specific to the individual financial instrument or its issuers or factors affecting all similar financial instruments traded in the market. The most significant exposure to the price risk for the Company arises from its investments in shares and warrants of public companies quoted on the TSXV Exchange. If equity prices had increased or decreased by 25% as at December 31, 2021, with all other variables held constant, the Company's investments would have increased or decreased respectively, by approximately \$4,042,000 (December 31, 2020 25% - \$11,874,375).

Liquidity risk

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

The following table summarizes the contractual amounts payable and maturities of financial liabilities and other liabilities as at December 31, 2021:

	<u>Carrying value</u> \$	<u>Total contractual amount</u> \$	<u>Less than one year</u> \$	<u>2-3 years</u> \$	<u>4-5 years</u> \$	<u>Over 5 years</u> \$
Accounts payable and accrued liabilities	10,069,177	10,069,177	10,069,177	—	—	—
Term loans	190,905	263,232	85,731	67,561	62,823	47,117
Balance due on business combination	3,952,203	4,355,600	2,395,580	1,960,020	—	—
Lease liabilities	5,323,965	6,614,192	3,220,750	710,493	561,628	2,121,321
	<u>19,536,250</u>	<u>21,302,201</u>	<u>15,771,238</u>	<u>2,738,074</u>	<u>624,451</u>	<u>2,168,438</u>

A standby letter of credit issued by the Company's subsidiary, in the amount of USD \$66,300 (\$84,055) was outstanding at December 31, 2021. In addition, the subsidiary has a maximum available line of credit of \$500,000, expiring in January 2023. At December 31, 2021, \$436,000 was drawn against this facility.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

29. Contingent liabilities

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

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

30. Capital management

The Company's objectives in managing capital are:

- a) To ensure sufficient liquidity to support its current operations and execute its business plan; and
- b) To provide adequate return to the shareholders

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

The Company currently funds these requirements from cash flows from operations and with financing arrangements with third parties and shareholders.

The Company is not subject to any externally imposed capital requirements. The Company monitors its working capital in order to meet its financial obligations. As at December 31, 2021, the Company's working capital was \$14,006,785 (2020 - \$13,797,579).

The management of capital includes shareholders' equity for a total amount of \$40,768,754 (2020 - \$59,423,106) and term loans of \$190,905 (2020 - \$112,707), as well as cash and cash equivalents amounting to \$12,202,513 (2020 - \$18,104,899).

Although there were no significant changes in the Company's approach during the current and preceding fiscal year, in 2020 the Company was able to retire its term loans and convert its convertible debentures to common shares. In order to maintain or adjust capital structure, the Company may issue new shares, sell portions of its strategic investment and periodically purchase its own shares on the open market.

PyroGenesis Canada Inc.
Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

31. Income taxes

a) Income tax expenses is comprised of the following:

	<u>2021</u>	<u>2020</u>
	\$	\$
Current tax		
Current year	(155,714)	327,412
Deferred tax		
Origination and reversal of temporary differences	(5,095,595)	6,816,080
Recognition of previously unrecognized tax assets	—	(170,082)
Change in unrecognized deductible temporary differences	4,511,349	(5,939,998)
	(584,246)	706,000
Income tax expense (recovery)	(739,960)	1,033,412

b) Reconciliation of effective tax rate

	<u>2021</u>	<u>2020</u>
	\$	\$
Income (loss) before income taxes	(39,171,899)	42,801,816
Income tax rates	26.5 %	26.5 %
Income tax expense (recovery) at the combined basic Federal and Provincial tax rates	(10,380,553)	11,342,481
Permanent differences	5,079,805	(5,072,219)
Tax rate changes	8,334	37,443
Prior year adjustment	60,533	835,787
Recognition of previously unrecognized tax assets	—	(170,082)
Change in unrecognized deductible temporary differences	4,511,349	(5,939,998)
Other	(19,428)	—
Income tax expense (recovery)	(739,960)	1,033,412

The applicable statutory tax rates are 26.5% in 2021 and 26.5% in 2020. The Company's applicable tax rate is the Canadian combined rates applicable in the jurisdiction in which the Company operates.

PyroGenesis Canada Inc.
Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

31. Income taxes (continued)

c) Deferred tax assets and liabilities

Recognized deferred tax assets and liabilities:

As at December 31, 2021 and 2020, recognized deferred tax assets and liabilities are attributable to the following:

	Assets		Liabilities		Net	
	2021	2020	2021	2020	2021	2020
	\$	\$	\$	\$	\$	\$
Non-capital losses carried forward	1,705,073	4,982,328	—	—	1,705,073	4,982,328
Strategic investments	—	—	(656,507)	(4,919,499)	(656,507)	(4,919,499)
Investment tax credits	—	—	—	(273,854)	—	(273,854)
Royalty receivable	—	—	(333,543)	(280,900)	(333,543)	(280,900)
Property and equipment	—	—	(147,127)	(25,273)	(147,127)	(25,273)
Intangibles	—	—	(468,167)	—	(468,167)	—
Deferred income	—	—	(21,000)	—	(21,000)	—
Right-of-use assets net of liabilities	—	—	(121,123)	(188,802)	(121,123)	(188,802)
Tax assets (liabilities)	1,705,073	4,982,328	(1,747,467)	(5,688,328)	(42,394)	(706,000)
Set off of tax	(1,705,073)	(4,982,328)	1,705,073	4,982,328	—	—
Net tax assets (liabilities)	—	—	(42,394)	(706,000)	(42,394)	(706,000)

Deferred taxes from temporary differences and unused tax losses and tax credits are summarized as follows:

	January 1, 2020	Recognized in profit or loss	December 31, 2020	Recognized in profit or loss	Recognized in business combination	December 31, 2021
	\$	\$	\$	\$	\$	\$
Deferred tax assets (liabilities)						
Property and equipment	—	—	—	621	(2,840)	(2,219)
Intangible assets	—	—	—	93,583	(559,949)	(466,366)
Deferred income	—	—	—	(21,000)	—	(21,000)
Non-capital losses carried forward	—	—	—	(194,958)	642,149	447,191
Investment tax credit	—	(706,000)	(706,000)	706,000	—	—
	—	(706,000)	(706,000)	584,246	79,360	(42,394)

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For the years ended December 31, 2021 and 2020

31. Income taxes (continued)

As at December 31, 2021 and 2020, the amounts and expiry dates of tax attributes and temporary differences for which no deferred tax assets were recognized are as follows:

	December 31, 2021		December 31, 2020	
	Federal	Provincial	Federal	Provincial
	\$	\$	\$	\$
Research and development expenses, Without time limitation:	11,399,104	—	9,917,779	9,511,671
Federal research and development investment tax credits:				
2029	299,881	—	—	—
2030	89,879	—	—	—
2031	223,759	—	—	—
2032	186,031	—	—	—
2033	105,216	—	—	—
2034	212,609	—	361,430	—
2035	488,555	—	488,555	—
2036	359,594	—	359,594	—
2037	253,885	—	253,885	—
2038	186,015	—	186,015	—
2039	465,535	—	411,540	—
2040	101,562	—	142,367	—
2041	359,115	—	—	—
	<u>3,331,636</u>	<u>—</u>	<u>2,203,386</u>	<u>—</u>

	December 31, 2021		Italy	December 31, 2020	
	Federal	Provincial		Federal	Provincial
	\$	\$	\$	\$	\$
Tax losses carried forward:					
2032	628,948	—	—	—	—
2033	2,047,643	1,490,639	—	—	—
2034	589,007	589,007	—	—	—
2035	703,664	416,827	—	—	—
2036	3,579,827	3,440,527	—	—	—
2037	1,577,876	1,568,739	—	—	—
2038	5,716,536	5,650,620	—	3,715,297	—
2039	4,163,315	4,079,919	—	4,163,315	1,108,382
2040	2,710,255	2,659,255	—	—	—
Indefinite	—	—	815,620	—	—
	<u>21,717,071</u>	<u>19,895,533</u>	<u>815,620</u>	<u>7,878,612</u>	<u>1,108,382</u>

31. Income taxes (continued)

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

	December 31, 2021		December 31, 2020	
	Federal	Provincial	Federal	Provincial
	\$	\$	\$	\$
Other deductible temporary differences, Without time limitation:				
Financing costs	1,100,504	1,100,504	1,538,633	1,538,633
Intangible assets	3,712,181	3,431,133	3,908,608	3,599,602
Capital losses	464,768	464,768	—	—
	<u>5,277,453</u>	<u>4,996,405</u>	<u>5,447,241</u>	<u>5,138,235</u>

Deferred tax assets and investment tax credits have not been recognized in respect to these items because it is uncertain that future taxable profit will be available against which the Company can utilise the benefits therefrom. The generation of future taxable profit depends on the successful commercialisation of the Company's products and technologies.

32. Segment information

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

The following is a summary of the Company's total revenues by geography:

	2021	2020
	\$	\$
Canada	7,395,312	5,828,186
United States	7,535,411	1,463,510
Europe	2,576,884	265,711
Mexico	786,154	174,818
Asia	420,268	—
Israel	491	4,007
Saudi Arabia	7,019,954	9,523,353
China	134,664	296,031
South America	1,475,607	181,184
India	3,723,605	—
Africa	—	38,229
	<u>31,068,350</u>	<u>17,775,029</u>

Revenue by product line and revenues recognized by revenue recognition method are presented in note 6.

PyroGenesis Canada Inc.

Notes to the Consolidated Financial Statements

For the years ended December 31, 2021 and 2020

32. Segment information (continued)

The following is a summary of selected asset categories by geographic market, at December 31:

	2021			2020	
	\$	\$	\$	\$	
	Canada	Italy	India	Total	
Property and equipment	3,685,974	—	26,963	3,712,937	2,529,570
Right-of-use assets	5,765,993	—	—	5,765,993	3,701,000
Intangible assets	2,774,198	—	—	2,774,198	905,614
Goodwill	2,660,607	—	—	2,660,607	—

In 2020, the asset categories above were all located in Canada.

33. Subsequent event

On February 11, 2022, the Company announced that it has received acceptance from the TSX of its notice of intention for a Normal Course Issuer Bid, enabling it to acquire for cancellation up to 7,500,000 common shares from February 15, 2022 to February 14, 2023.

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002

I, P. Peter Pascali, certify that:

1. I have reviewed this annual report on Form 40-F of PyroGenesis Canada Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal year that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 31st, 2022

By: /s/ P. Peter Pascali

P. Peter Pascali
Chief Executive Officer
(Principal Executive Officer)

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER

I, Andre Mainella, certify that:

1. I have reviewed this annual report on Form 40-F of PyroGenesis Canada Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal year that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 31st, 2022

By: /s/ Andre Mainella

Andre Mainella
Chief Financial Officer
(Principal Financial Officer)

**CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER TO
18 U.S.C. Section 1350, As Adopted Pursuant to
Section 906 of the Sarbanes-Oxley Act of 2002**

In connection with the Annual Report of PyroGenesis Canada Inc. (the "Registrant") on Form 40-F for the annual period ended December 31, 2021 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, P. Peter Pascali, Chief Executive Officer, certify, pursuant to 18 U.S.C. Sec. 1350, as adopted pursuant to Sec. 906 of the Sarbanes-Oxley Act of 2002, that:

- (1) The Report fully complies with the requirements of Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934, as amended; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Registrant.

Date: March 31st, 2022

By: /s/ P. Peter Pascali

P. Peter Pascali
Chief Executive Officer
(Principal Executive Officer)

**CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER TO
18 U.S.C. Section 1350, As Adopted Pursuant to
Section 906 of the Sarbanes-Oxley Act of 2002**

In connection with the Annual Report of PyroGenesis Canada Inc. (the "Registrant") on Form 40-F for the annual period ended December 31, 2021 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Andre Mainella, Chief Financial Officer, certify, pursuant to 18 U.S.C. Sec. 1350, as adopted pursuant to Sec. 906 of the Sarbanes-Oxley Act of 2002, that:

- (1) The Report fully complies with the requirements of Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934, as amended; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Registrant.

Date: March 31st, 2022

By: /s/ Andre Mainella

Andre Mainella
Chief Financial Officer
(Principal Financial Officer)



**Consent of Independent
Registered Public Accounting Firm**

**Raymond Chabot
Grant Thornton LLP**

Suite 2000

National Bank Tower
600 De La Gauchetière Street West

Montréal, Quebec

H3B 4L8

T 514-878-2691

We have issued our report dated March 31, 2022, with respect to the consolidated financial statements included in the Annual Report of PyroGenesis Canada Inc. on Form 40-F for the year ended December 31, 2021.

We hereby consent to the inclusion of said report in the Annual Report of PyroGenesis Canada Inc. for the fiscal year ended December 31, 2021.

Raymond Chabot Grant Thornton LLP

Montreal, Canada
March 31, 2022



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CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors
PyroGenesis Canada Inc.

We, KPMG LLP, consent to the use of our report dated March 31, 2021 with respect to the consolidated statements of financial position as of December 31, 2020, the related consolidated statements of comprehensive income, shareholders' equity and cash flows for the year ended December 31, 2020, and the related notes, which report is included in the annual report on Form 40-F of PyroGenesis Canada Inc. for the year ended December 31, 2021.

A handwritten signature in black ink that reads 'KPMG LLP' with a horizontal line underneath.

March 31, 2022
Montréal, Canada



CODE OF BUSINESS CONDUCT AND ETHICS

Adopted by Resolution of the Board of Directors on: March 30, 2021

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CODE OF BUSINESS CONDUCT AND ETHICS

INTRODUCTION

Every employee, officer and director of PyroGenesis Canada Inc. (the “**Company**”) and its subsidiaries occupies a position of trust. In varying measures, individuals, as well as certain contractors and agents, represent the Company in its relations with others whether with customers, suppliers, employees, competitors, governments, investors or the general public. Whatever the area of activity and whatever the degree of responsibility, such persons are expected to act honestly, ethically, with integrity and in compliance with applicable laws and regulations.

This Code of Business Conduct and Ethics (this “**Code**”) was adopted by the board of directors of the Company (the “**Board**”) as a guide that is intended, among other things, to sensitize such individuals to significant legal and ethical issues that arise frequently and to the mechanisms available to report illegal or unethical conduct, and provide assurance that reporting of questionable behavior is protected and encouraged. It does not purport to address every legal or ethical issue that may be encountered. Moreover, the specific requirements of applicable law in certain jurisdictions where we currently operate or may operate in the future may impose a higher standard than is specifically set forth in this Code. Ultimately, no code of conduct can replace the thoughtful behavior of a person acting honestly, ethically and with integrity.

Compliance with this Code is mandatory for all employees, officers and directors of the Company. Certain contractors, agents and other representatives of the Company may also be required to comply with this Code. Failure to comply with this Code, including a failure to report a violation of this Code, can have severe consequences. Conduct that violates this Code may violate applicable laws and subject both the Company and its employees, officers and directors to prosecution and legal sanctions. The Company may discipline those who violate this Code, up to and including discharge from office or termination of employment or engagement with the Company.

The Company has set forth in writing numerous policies, procedures, codes, rules and standards of performance (all of which continue in force) and may create new policies, procedures, codes, rules and standards in the future. This Code supplements, but does not replace such other policies, procedures, codes, rules and standards of performance. In the event of a conflict or inconsistency between this Code and any other written policies, procedures, codes, rules or standards of performance of the Company this Code shall prevail unless the conflicting or inconsistent policy, procedure, code, rule or standard of performance imposes an additional and/or higher obligation or standard, in which case the conflicting or inconsistent policy, procedure, code, rule or standard of performance shall control.

Employees, officers or directors with questions about this Code or any policies, rules and employee performance standards should consult a senior officer. Any employee, officer or director who is concerned about conduct that they believe may violate this Code, such policies, rules and employee performance standards or applicable law, should consult a senior officer. Procedures for reporting suspected violations of this Code are set out under “Compliance” below.

NO RETALIATION

The Company will not permit any form of retaliation (including discharge, demotion, suspension, threats, harassment or any other form of discrimination) against an employee who has truthfully and in good faith:

- (a) reported violations of this Code;
 - (b) lawfully sought advice about providing information, expressed an intention to provide information or provided information or assistance regarding any conduct which the employee reasonably believes constitutes a criminal offense or other violation of law;
 - (c) cooperated, filed, caused to be filed, testified, participated in or otherwise assisted in, or expressed an intention to do any of the foregoing, in an investigation or proceeding related to a criminal offense or other violation of law; or
-

- (d) provided a law enforcement officer with truthful information regarding the commission or possible commission of a criminal offence or other violation of law, unless the individual reporting is one of the violators.

Any retaliation against an employee who has truthfully and in good faith done any of the foregoing in accordance with this Code will result in discipline, up to and including dismissal.

CONFLICT OF INTEREST AND DISCLOSURE ISSUES

Conflicts of Interest

Employees, officers and directors owe a duty to the Company to advance its legitimate interests when the opportunity to do so arises and to refrain from activities which could hinder their ability to act in the Company's best interest or have the potential or could be perceived as doing so, including to avoid all situations in which their personal interests conflict, might conflict or could be perceived to conflict with their duties to the Company. In particular, employees, officers and directors should seek to avoid acquiring any interests or participating in any activities that would tend to:

- (a) deprive the Company of the time or attention required to perform their duties properly; or
- (b) create an obligation or distraction which would affect their judgement or ability to act solely in the Company's best interest.

Employees charged with executive, managerial or supervisory responsibility are required to see that actions taken and decisions made within their jurisdiction are free from the influence of any interests that might reasonably be regarded as conflicting with those of the Company.

Employees, officers and directors owe a duty to the Company to advance its legitimate interests when the opportunity to do so arises and to refrain from activities which could hinder their ability to act in the Company's best interest or have the potential or could be perceived as doing so. Employees are required to disclose in writing to the Company all business, commercial or financial interests or activities that might reasonably be regarded or perceived as creating an actual or potential conflict with such duties. In addition, directors and officers are required under corporate law to disclose any interest in and refrain from voting on any material contracts or transactions relating to the Company in which they are a party or have a material interest. A senior officer must be contacted in advance to co-ordinate the approval of such material contracts or transactions.

Outside Employment and Business Activities

Employees may take on employment and engage in or otherwise invest in business ventures, partnerships or enterprises, but only outside their working hours and with the approval of a senior officer. However, employees must avoid outside employment, businesses and other activities which would impair their effective performance as a Company employee, which could have an adverse impact on the business or reputation of the Company or which might create or appear to create a conflict with the best interests of the Company.

For these reasons, it is important for there to be current and complete disclosure of any such outside employment or business ventures, partnerships or enterprises that any employee, officer or director may have. Such disclosure should be made promptly to a senior officer and should also be listed in any acknowledgement of this Code requested by the Company. See also "Personal Gain", "Company Confidential Information", "Intellectual Property", "Use of Company Assets" and "Use of Technology" below.

Community Activities

Employees, officers and directors may, and are encouraged to, engage in community and volunteer work and activities outside their working hours, and to uphold a commitment to community in all their activities. Requests for donation or sponsorship by the Company or from Company assets, including employee work time, must be made only in accordance with the Company's applicable established policies, procedures, codes, rules and standards and within any established budget therefor or, alternatively, may be submitted to a senior officer and, in such case, may only be approved by the Chief Executive Officer, Chief Financial Officer or another senior officer designated by the Chief Executive Officer or Chief Financial Officer for such purpose. See also "Lobbying Activities and Political and Charitable Contributions" below.

Board Appointments

An employee may not sit on the board of a publicly-traded company or other entity (other than the Company and its affiliates) without the permission of a senior officer or in the case of a senior officer, the Chief Executive Officer. Membership on charitable or community boards does not require pre-approval but such activity must not interfere with duties and obligations to the Company and must not reflect negatively on the Company.

An employee who sits on the board of a company or other entity (other than the Company and its affiliates) must abstain from voting on any matter that directly or indirectly concerns the Company or would be contrary to the Company's interests or would give the appearance or perception of a conflict of interest.

Personal Gain

Employees, officers and directors must not directly or indirectly use their status or position with the Company to obtain personal gain in any manner, including from those doing or seeking to do business with the Company. Applicable law provides that if personal financial benefit is improperly gained by an employee, officer or director directly or indirectly, through a spouse or child or a relative sharing the same residence as the individual, as a result of his employment or position or by the use or misuse of the Company's property or of information that is confidential to the Company's business, then the employee, officer or director must account to the Company for any benefit received.

Company Confidential Information

Employees, officers and directors must safeguard the Company's Confidential Information. "**Confidential Information**" includes, but is not limited to, trade secrets, know how, records, data, plans, strategies, processes, business opportunities and ideas relating to present and contemplated products and services and financial affairs of the Company, its customers, its suppliers and/or employees, as well as information relating to cybersecurity risks and incidents, which information is not generally known to the public.

Employees, officers and directors are prohibited from disclosing Confidential Information or other information which might impair the Company's competitive position or which might violate the private rights of individuals, enterprises or institutions without appropriate authorization in accordance with the Company's Disclosure, Confidentiality and Trading Policy, and must take the appropriate steps to protect such information. The above rules also apply to confidential information of a Company customer or supplier (or prospective customer or supplier). These confidentiality obligations continue even after an individual's service as an employee, officer or director of the Company has ceased.

If the decision is made to disclose Confidential Information to any person or entity outside of the Company (such as a potential vendor or business partner), it should be done only after appropriate confidentiality agreements are executed. These agreements must document the need to maintain confidentiality of the Confidential Information that is disclosed and copies of all confidentiality agreements must be forwarded to a senior officer. The amount of Confidential Information shared with any person or entity outside of the Company should, in any case, be kept to the minimum necessary to address the applicable business need.

All employees, officers and directors must also adhere to the Company's policies, procedures, and rules on confidentiality, disclosure and insider trading as set out in the Company's Disclosure, Confidentiality and Trading Policy. A copy of such policy is available on the Company's intranet, but it may also be obtained from a senior officer. Nothing in such policy or this Code restricts an employee from reporting potential violations of law to securities regulators or other governmental agencies or self-regulatory authorities without notice or permission from the Company, or providing disclosures that are protected or required under applicable whistleblower laws and cooperating voluntarily with or responding to any inquiry from securities regulators or other governmental agencies or self-regulatory organizations.

Intellectual Property

Intellectual property refers to any creations of the mind, such as inventions, literary or artistic works, programs, databases, designs, symbols, names and images. Intellectual property is protected in law by rights such as patents, copyright and trademarks, which enable the creations to be protection from unauthorized use by third parties. All intellectual property developed by an employee in his or her role during the course of his or her employment with the Company belongs to the Company and all employees assign to the Company all rights the employee may have in such intellectual property. All materials documenting intellectual property must remain with the Company following termination of employment and employees must delete copies from personal devices. Employees must take such reasonable steps as requested by the Company to confirm ownership of any intellectual property in the Company and assist the Company

to perfect and maintain its title to such intellectual property and bring or defend cases involving such intellectual property. All employees waive all authors' and moral rights which they may have in such intellectual property.

Use of Company Assets

Each employee, officer and director has a responsibility to prevent misuse, loss, unauthorized destruction or damage or theft of the Company's assets. Reasonable precautions should be taken to secure the Company premises and assets.

Company assets should be used solely for the benefit of the Company. Use of the Company's funds or assets for any unlawful or improper purpose is prohibited. Claims for business expenses must be made consistent with the Company's expense policies. Excessive, fictitious or unnecessary claims are prohibited.

Use of Technology

Improper use of the Company's IT resources can create legal liability and these resources should generally be used for Company purposes only.

Information transmitted through Company resources implies affiliation with the Company and should therefore reflect positively upon the Company. Sending, receiving, displaying, printing, or otherwise engaging in any communications that are in violation of applicable law or this Code, or any other the Company policy, including, but not limited to, communications that are unlawful, libellous, invasive of another's privacy, threatening, fraudulent, harassing, sexually explicit, defamatory, or otherwise objectionable, or that infringe or may infringe the intellectual property or other rights of another person or company, are prohibited. Employees are expected to discourage others from transmitting such information.

Subject to applicable laws, all information of any kind (including without limitation voice communications and electronic messages) stored or transmitted on Company systems is the property of the Company and the Company has the right to monitor, inspect and/or audit any communication or material stored, downloaded, accessed, posted, transmitted or distributed on an employee's computer, phone or voicemail at any time for any purpose, without prior notice to the employee. Communications of any nature on these systems should not be considered private communications.

WORK ENVIRONMENT

The Company is committed to respecting human rights both within the Company and with those with whom the Company does business and the Board oversees this commitment and the Company policies in which it is reflected.

The Company respects human rights by seeking to avoid infringing on the rights of others and seeks to address adverse human rights impacts with which the Company may become involved. The Company prohibit the use of any forced, compulsory or child labor.

The Company respects the rights of Company employees and seeks to provide fair and safe working conditions, including a work environment that is free from discrimination and harassment and affords equal opportunity to all. This commitment is supported by a broad range of programs for employees and their family members, including employee benefits focused on health, personal wellness, parental leave, diversity and inclusion, and education.

Discrimination- and Harassment-Free Work Environment

The Company strives to maintain a work environment free of violence, discrimination against and harassment of employees or non-employees with whom the Company has a business service or professional relationship and in which individuals are accorded equality of employment opportunity based upon merit and ability. Discriminatory practices based on race, ancestry, place of origin, color, national or ethnic origin, citizenship, creed, sex, sexual orientation, gender identity, gender expression, religion, marital status, family status, same-sex partnership status, age, record of offenses, disability or other prohibited grounds of discrimination under applicable law will not be tolerated.

It is the responsibility of each employee, officer and director of the Company to help the Company provide a work atmosphere free of harassing (sexual or otherwise), abusive, disrespectful, disorderly, violent, hostile, disruptive or other non-professional conduct. Harassment in any form, verbal or physical, by any employee, will not be tolerated. The Company requires every person to show sound judgment and respect for the feelings and sensibilities of all other employees.

If an employee feels that another employee's conduct is discriminatory, harassing, improper or offensive, the offended employee should promptly and firmly tell the offender that his or her behavior is unwelcome. Doing so places the offender on notice that his or her conduct is inappropriate. However, any employee who believes he or she has been subject to harassment or offensive conduct, or who believes he or she has been a witness to such conduct, may report the offense to the Human Resources Department or pursuant to the mechanisms for reporting suspected violations of this Code set out in "Compliance".

Equal Opportunity

The Company is committed to fair employment practices, including equal treatment in hiring, promotion, training and compensation, termination, and disciplinary action.

Employee Privacy and Personal Information

The Company believes in taking steps to protect the privacy of its employees, officers, directors, contractors, agents and other representatives. The Company will not interfere in the personal lives of such individuals unless their conduct impairs their work performance or adversely affects the work environment or business or reputation of the Company or is otherwise a violation of this Code.

The Company limits the collection of personal information to that which is necessary for business, legal, security or contractual purposes and collection of personal information is to be conducted by fair and lawful means with the knowledge and consent of the individual from whom the information is being collected. Access to employee personnel and medical records and the information contained therein must be limited to those with a need to know for a legitimate business purpose. All employees have the right to see their own personnel record. Personal information must not be used or disclosed for purposes other than those for which it was collected, except with the knowledge and consent of the individual or as required by law. Personal information must be retained only as long as necessary for the fulfillment of those purposes and must be kept sufficiently accurate, complete and up-to-date to minimize the possibility that inappropriate information may be used or disclosed. The Company and its employees must observe obligations of confidentiality and non-disclosure of personal information, including information of its employees and customers, with the same degree of diligence that employees are expected to use in protecting Confidential Information. All employees must adhere to the Company's policies, procedures, codes, rules and standards in place to protect personal information against loss or theft, as well as unauthorized access, disclosure, copying, use or modification of personal information of others, as the Company is responsible for all personal information in its possession or custody. The Company and all employees shall also comply with all applicable laws regulating the disclosure of personal information.

Substance and Alcohol Abuse

The use, possession, sale, purchase and the negotiation for sale or purchase of illegal substances or alcohol in the workplace or on or through Company property is prohibited unless otherwise authorized. The abuse or improper use of prescription or over-the-counter drugs while in the workplace or on or through Company property is also prohibited. Employees are prohibited against using drugs or alcohol in a manner, whether before, during or after work hours, which adversely affects job performance or customer or supplier relations or compromises the safety of other persons.

HEALTH, SAFETY & THE ENVIRONMENT

The health and safety of employees is a vital concern for the Company and all Company employees share a responsibility to promote a workplace free of preventable safety and health hazards that complies with all applicable laws and regulations governing workplace health and safety. This commitment encompasses all of the Company's facilities and operations. Each employee must be proactive and follow all of the Company's safety and health rules and report possible safety and health issues and concerns to appropriate management personnel.

The Company is committed to conducting operations and activities in a manner that protects the environment. Company policy is that no employee shall engage in conduct that violates environmental laws or regulations or is otherwise inconsistent with the health and safety needs of our employees and the environmental needs of our communities. The Company's employees are expected to take steps to conserve energy resources to the fullest extent possible consistent with sound business operations and the Company encourages its offices, employees, suppliers and vendors to participate in energy and water conservation and recycling programs.

The Company is also committed to the continuous improvement of its environmental management systems, its environmental, health and safety programs, and to the prevention of pollution.

ETHICAL BUSINESS PRACTICES

Compliance with Laws

The Company conducts business in jurisdictions where laws, customs and social requirements vary considerably. It is the Company's policy to operate in material compliance with all applicable domestic and foreign laws, including applicable anti-corruption and anti-bribery laws. Any employee, officer or director becoming aware of a conflict between foreign laws, customs or social requirements and applicable domestic or other laws should consult a senior officer promptly. If there is a conflict between laws, customs or social requirements, employees, officers and directors should in all cases always comply with all legal requirements. If there are no directly applicable legal requirements, employees, officers and directors should always comply with applicable Company policies, guidance and expectations.

Gifts, Benefits and Entertainment

Except as set forth herein and in accordance herewith, employees, officers and directors are strictly prohibited from furnishing or providing, directly or indirectly on behalf of the Company, gifts, entertainment or benefits to other persons including public officials (as defined below). Similarly, employees, officers and directors must not accept or give anything that will compromise, or be seen to compromise their judgement or inappropriately influence themselves or others. Any gifts, entertainment or other benefits offered or received that do not comply with these restrictions must be disclosed to a senior officer and should be declined or returned, if possible.

Those individuals whose duties permit them to do so may furnish or accept certain gifts, favors and entertainment to or from persons, other than public officials (as defined below), if all the following tests are met:

- (a) the gift or other benefit is not cash, a gift certificate or other negotiable instrument;
- (b) the gift, other benefit or entertainment cannot reasonably be interpreted as an improper payment or inducement and is of nominal value;
- (c) the gift, other benefit or entertainment does not contravene any law and, in addition, is made in accordance with generally-accepted local ethical practices;
- (d) the gift, other benefit or entertainment does not influence Company business decisions or impact independent judgement;
- (e) the gift, other benefit or entertainment occurs or is given or accepted infrequently;
- (f) the gift, other benefit or entertainment arises out of the ordinary course of business;
- (g) the gift, other benefit, or entertainment involves reasonable expenditures; and
- (h) if subsequently disclosed to the public, the provision or acceptance of the relevant gift, other benefit or entertainment would not in any way embarrass the Company, its employees, officers or directors or the recipient.

For the avoidance of doubt, this section is not intended to apply to planned promotional or other similar activities of the Company, including the offering of incentives to customers of the Company, which have been approved in accordance with the Company's applicable policies and procedures. Any questions regarding the interpretation of this section and its requirements should be directed to a senior officer prior to accepting or giving the gift or other benefit to the extent reasonably practicable.

Recording of Transactions and Reporting of Financial Information

The integrity of the Company's record keeping and reporting systems shall be maintained at all times, as these systems are required for the Company to meet its financial, legal and other business obligations.

Employees must document and record all transactions in accordance with the Company's internal control procedures and in compliance with all applicable accounting principles, laws, rules and regulations, and employees with responsibility for reporting financial information must provide information that is accurate, complete, objective, timely and understandable and that complies with all

applicable laws relating to the recording and disclosure of financial information. Employees and managers are forbidden to use, authorize, or condone the use of "off-the-books" record-keeping or any other device that could be utilized to distort records or reports of the Company's true operating results and financial conditions. Employees must not fraudulently influence, coerce, manipulate or mislead any independent public or certified accountant engaged in the performance of an audit, review, compilation or other service with respect to the financial statements for the purpose of rendering such financial statements misleading.

Use of Written Agreements; No Side Deals or Side Letters

The Company documents business transactions with full and complete written agreements that set out the terms and conditions of the agreement and understandings between the parties. No new agreement can be created, or an existing agreement modified, without approval of a senior officer. All new agreements should also be reviewed by the relevant functional areas, including finance, as the terms and conditions of the agreement may affect how the Company records and reports the transaction for accounting or other purposes. No oral contracts, informal letters of understanding or intent, "handshake deals" or side letters are permitted. Where the Company has developed standard written agreements and other provisions, schedules, riders and appendices, Company employees must use these standard forms except to the extent that changes are authorized by a senior officer.

Records Retention and Destruction

Legal and regulatory practice requires the retention of certain records, such as certain tax, personnel health and safety, and financial records, for various periods of time and employees, officers and directors are required to comply with Company controls for the retention and timely destruction of records. In addition, when litigation or a governmental investigation or audit is pending or imminent, relevant records must not be altered or destroyed until the matter is closed. Alteration or destruction of records in a legal or governmental proceeding may constitute a criminal offense.

A senior officer will notify employees when records have been placed on a "legal hold". Such records cannot be altered, destroyed, deleted or modified in any manner for the duration of the "legal hold". Questions regarding records retention should be addressed to a senior officer, particularly if any litigation, investigation, inquiry or administrative action involving the Company or any of its employees, suppliers or customers is pending or threatened.

Cybersecurity

Cyber-attacks may be carried out by third parties or insiders using techniques that range from highly sophisticated efforts to electronically circumvent network security or overwhelm websites to more traditional intelligence gathering and social engineering aimed at obtaining information necessary to gain access. In addition, third parties may attempt to fraudulently induce employees or customers to, or the Company's employees or customers themselves may, disclose information in order to gain access to the Company's data or its customers' information and potentially use such data or information improperly.

Employees must not engage in or otherwise aid, assist or ignore any potential or actual cyber-attacks or other cyber incidents or otherwise exploit any cybersecurity vulnerabilities of the Company, and employees must report any such threatened or actual cyber-attacks or cybersecurity vulnerabilities.

Ethical Competitive Practices and Third-Party Intellectual Property

The Company competes vigorously and creatively in its business activities, but does so in a fair, lawful and ethical manner. Employees must not use improper or illegal means of gathering information about competitors or other third parties, and must not exchange information or agree with competitors in connection with pricing or other matters that are prohibited by applicable law. Theft or illegal entry and electronic eavesdropping are unacceptable means of searching for competitive intelligence. Employees must neither offer a bribe or a gift in exchange for a competitor's information nor otherwise solicit information from current or former employees of a competitor. Employees, officers and directors of the Company must also not knowingly use or bring onto the Company's computer systems intellectual property belonging to third parties without the applicable third party's consent, a license or other legal right.

Crime and Money-Laundering Prevention

The Company is committed to comply fully with all applicable anti-money laundering laws, both domestically and internationally. The Company will conduct business only with reputable customers who are involved in legitimate business activities and whose funds are

derived from legitimate sources. All employees are to take reasonable steps to ensure that the Company does not aid or take part in any illegal activities or accept payments that have been identified as a means of laundering money.

DEALINGS WITH PERSONS OUTSIDE THE COMPANY

The honesty and integrity of those who represent the Company must underlie all of the Company's relationships with persons outside the Company.

Dealing with Public Officials

As a general matter, all dealings between employees, officers and directors of the Company and public officials are to be conducted in a manner that will not compromise the integrity or impugn the reputation of the Company, its employees, officers or directors or any public official. The Company specifically prohibits bribery of public officials and third parties anywhere in the world and requires compliance with all applicable laws in the countries in which the Company does business, including, without limitation, Canada's Corruption of Foreign Public Officials Act ("**CFPOA**") and the U.S. Foreign Corrupt Practices Act ("**FCPA**"), which prohibit bribery and corruption. This legislation also requires the Company to keep accurate books and records and maintain effective internal controls. The CFPOA and the FCPA each have a broad scope, and apply to the activities of the Company and activities carried out through its subsidiaries and affiliates anywhere in the world.

Even the appearance of impropriety in dealing with public officials is improper and unacceptable. Any participation, whether directly or indirectly, in any bribes, kickbacks, improper profit-sharing arrangements, illegal gratuities, indirect contributions, improper inducements, "facilitation payments" or similar payments to any public official is expressly forbidden, notwithstanding that they might further the business interests of the Company and notwithstanding that such practices may be considered to be a way of "doing business" or necessary in a particular country in question, including where the making small "facilitation payments" to foreign public officials to secure a routine business service or have routine administrative actions performed by public officials is local custom. Furthermore, certain laws, such as the CFPOA, apply to dealings with foreign public officials in Canada and in the official's own state.

It is the Company's policy that no payments or offers to make payments whatsoever, regardless of amount or purpose, shall be made either directly or through third parties to officials or employees of government agencies or instrumentalities (including government monopolies) without an express authorization from a senior officer following consultation with the appropriate compliance personnel. Any approved arrangements must be documented in accordance with the Company legal and accounting requirements and ethical business practices.

The Company may hire former public officials from time to time, but because of the restrictions that applicable laws can place on such arrangements in certain circumstances, employees, officers and directors must first consult with a senior officer prior to hiring a current or former public official, or their family members and the Company will not hire any such official if he or she is participating in a matter reasonably regarded as involving the Company's interests.

For purposes of this Code, a "**public official**" should be interpreted broadly and includes any official or employee of a government or of a department, organization or agency of a government (or any department, organization or agency thereof); any employee of any company owned or controlled by a government; any official who holds a legislative or judicial position; any official of a public international organization; any political party or official of a political party; any candidate for political office; and any person or firm acting in an official capacity, including for, or on behalf of, any of the following: a government, a department or agency of a government, a company owned or controlled by a government, a legislator, a judicial officer, a public international organization, or any political party.

The Company and its representatives will not engage in or undertake lobbying activities as defined under applicable laws unless all requirements under such applicable laws have been satisfied and the prior express approval of a senior officer has been obtained following consultation with appropriate compliance personnel.

Dealing with the Media and Communications Generally

The Company is committed to providing, as appropriate, full and prompt disclosure to the public of material developments and events. However, all media, public and investor relations and communications are to be co-ordinated through a senior officer and the Investor Relations, as applicable, in accordance with the Company's Disclosure, Confidentiality and Trading Policy and applicable laws. Employees should not comment on any inquiry from the media, no matter how innocuous the inquiry may appear. Any employee who

is asked by the media or otherwise for a statement or to give a presentation should explain that he or she is subject to this Code and the Disclosure, Confidentiality and Trading Policy and refer the matter to a senior officer.

Dealings with Suppliers, Agents and Representatives

Selection of suppliers to the Company will be based on merit after due consideration of alternatives. The Company will only deal with suppliers who comply with applicable legal requirements (including any applicable regulations requiring, for example, the conduct of background checks) and the Company's standards relating to, among other things, labor, including not using child or forced labor, environment, health and safety, intellectual property rights and refraining from improper payments. Confidential information received from a supplier shall be treated as if it were the Company's Confidential Information (see "Conflicts of Interest and Disclosure Issues – Company Confidential Information").

The Company will enter into representation agreements only with companies or persons believed to have a record of and commitment to integrity. Efforts will be taken by the Company and its employees to ensure that agents, consultants, independent contractors, representatives and suppliers are aware of this Code. A senior officer should be contacted prior to retaining any individual who is to act as an agent, consultant, independent contractor or representative, and such individual should be retained only pursuant to a written contract that has been approved by a senior officer.

In cases where an agent, consultant, independent contractor, or a representative is engaged to provide services to the Company and that individual deals on behalf of the Company with public officials, has access to Confidential Information or where the Company otherwise determines it is necessary or advisable, such person will be provided with a copy of this Code and be required to acknowledge the same and be bound by its terms.

Political and Charitable Contributions

The use of the Company's funds, goods or services as contributions to political parties, candidates, campaigns or charities is forbidden, unless authorized by a senior officer, and the contribution is in accordance with any approved political donations or charitable donations budget. Contributions include money or anything having value, such as loans, services, entertainment, trips, employee work time and the use of the Company's facilities or assets.

No corporate action, direct or indirect, will be allowed that infringes on the right of any employee individually to decide whether, to whom, and in what amount, he or she will make personal political or charitable contributions. The same is true of volunteer political or charitable donations of personal service time, so long as it does not interfere with the working status of employees and is not during employee work time. Employees, officers and directors who participate in political or charitable activities on their own behalf and on their own time must not purport to speak or act for the Company or in any way use Company property or assets. It is illegal for the Company to reimburse an employee for a contribution in the nature of those listed above.

Investigations

The Company will fully cooperate with any appropriate governmental or regulatory investigation. Any time an employee, officer or director receives information about a new government, regulatory or other investigation or inquiry, this information should be communicated immediately to a senior officer.

Employees, officers and directors should never, under any circumstances:

- (a) destroy or alter any the Company documents or records in anticipation of a request for those documents from any government agency or a court;
- (b) lie or make any misleading statements to any governmental investigator (including routine as well as non-routine investigations); or
- (c) attempt to cause the Company, any employee or any other person, to fail to provide information to any government investigator or to provide any false or misleading information.

Should any governmental, regulatory or other inquiry be made through the issuance of a written or oral request for information, such request should immediately, and before any action is taken or promised, be submitted to a senior officer.

COMPLIANCE

This Code will be posted to the Company's website and filed under the Company's profile at www.sedar.com. A copy of this Code will also be made available to each Company employee and made available to each director as part of his or her orientation materials.

From time to time as may be requested by the Company, each employee, officer and director, as applicable, must complete an acknowledgement and disclosure statement attesting to that individual's compliance with this Code. All such acknowledgements will be retained by the Human Resources Department for purposes of confirming that each employee, officer and director has acknowledged this Code.

The Company reserves the right to audit compliance with this Code. Accordingly, all employees, officers and directors must afford any external or internal auditors full, free and unrestricted access to all the Company operations, records, facilities and personnel and will take appropriate measures to safeguard information obtained through the audit process.

An employee, officer or director or other representative who becomes aware of a violation or possible violation of this Code or any of the Company's statements and policies must report that information immediately to a senior officer or a director of the Company. Senior officers and directors may be subject to disciplinary action if they condone misconduct or do not demonstrate the appropriate leadership to ensure compliance with this Code.

An employee may report questionable accounting or auditing matters, on an anonymous basis, by sending a letter to "The Board of Directors of PyroGenesis Canada Inc. c/o Chair, Audit Committee, 1744 William Street, Suite 200, Montréal, Québec H3J 1R4, Canada". Employees, officers and directors must cooperate fully in any Company investigation and must take all reasonably steps necessary to safeguard the integrity of the investigation.

WAIVER, AMENDMENTS AND INTERPRETATION OF THIS CODE

The Company retains sole discretion in interpreting and applying this Code. The Company will periodically review this Code and make appropriate additions or changes. This Code may be updated, modified or withdrawn by the Company at any time in its sole discretion. Any waiver of this Code for executive officers or directors may be made only by the Board and will be publicly disclosed, together with the reasons for such waiver, in accordance with all applicable securities laws and stock exchange rules. Any waivers of this Code will only be granted where such waiver is both necessary and appropriate, and it will be qualified in scope so as to protect the Company to the greatest extent practicable. Amendments or other modifications of this Code will also be publicly disclosed in accordance with all applicable securities laws and stock exchange rules.
