PYROGENESIS CANADA INC.

MANAGEMENT'S DISCUSSION AND ANALYSIS

This management's discussion and analysis ("MD&A") is intended to assist readers in understanding the business environment, strategies, performance and risk factors of PyroGenesis Canada Inc. ("PyroGenesis", or the "Company"). The MD&A provides the reader with a view and analysis, from the perspective of management, of the Company's financial results for the three and the nine months ended September 30, 2018. 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 financial statements and related notes thereto of the Company for the year ended December 31, 2017.

The condensed financial statements and MD&A have been reviewed by PyroGenesis' Audit Committee and were approved by its Board of Directors on November 28, 2018. 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 and financially literate directors. The Audit Committee reports its findings to the Board of Directors for its consideration when it approves the MD&A and financial statements for issuance to shareholders.

The following information takes into account all material events that took place up until November 28, 2018, 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 SEDAR (www.sedar.com), OTC Markets (www.otcmarkets.com) and on the Company's website at www.pyrogenesis.com.

FORWARD-LOOKING STATEMENTS

This MD&A contains forward-looking statements. 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.

The future outcomes that relate to forward-looking statements may be influenced by many factors, including, but not limited to, the strength of the Canadian, US and Asian economies; operational, funding, and liquidity risks; unforeseen engineering and environmental problems; delays or inability to obtain required financing and/or anticipated contracts; risks associated with licenses, permits and regulatory approvals; supply interruptions or labour disputes; foreign exchange fluctuations and collection risk; competition from other suppliers, or alternative, less capital intensive, energy solutions; and risk factors described elsewhere in this document under the heading "Risk Factors". 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.

OVERVIEW

PyroGenesis Canada Inc. is the world leader in the design, development, manufacturing and commercialization of advanced plasma processes. The Company provides engineering and manufacturing expertise, cutting-edge contract research, as well as turnkey process equipment packages to the defense, metallurgical, mining, advanced materials (including 3D printing), oil & gas, and environmental industries. With a team of experienced engineers, scientists and technicians working from its Montreal office and its 3,800m^2 production facility, PyroGenesis maintains its competitive advantage by remaining at the forefront of technology development and commercialization. PyroGenesis' core competencies allows the Company to be a leader in providing innovative plasma torches, plasma waste processes, plasma atomisation processes, high-temperature metallurgical processes, and engineering services to the global marketplace. PyroGenesis' operations are ISO 9001:2008 certified, and have been ISO certified since 1997. PyroGenesis is a publicly-traded Canadian company on the TSX Venture Exchange (Ticker symbol: PYR.V) and on the OTCQB in the United States (Ticker symbol: PYRNF).

SELECTED FINANCIAL INFORMATION

	Three months ended Sept 30, 2018	2017	% Change 2018vs2017	Nine months ended Sept 30, 2018	2017	% Change 2018vs2017
Revenue	**$ 1,097,726**	$ 2,026,557	$ -46%	**$ 4,579,680**	$ 5,896,092	$ -22%
Cost of sales and services before amortization of intangible assets	**845,575**	870,352	-3%	**3,125,225**	2,820,911	11%
Gross margin	**252,151**	1,156,205	-78%	**1,454,455**	3,075,181	53%
Expenses						
Selling, general and administrative	**1,899,542**	1,160,752	64%	**4,731,004**	3,443,123	37%
Research and development	**177,405**	82,951	114%	**633,920**	213,158	197%
Net finance costs	**934,039**	272,585	243%	**1,412,051**	686,176	106%
	3,010,985	1,516,288	99%	**6,776,975**	4,342,457	56%
Comprehensive loss	**$ (2,758,835)**	$ (360,083)	$ 665%	**$ (5,322,520)**	$ (1,267,276)	$ 320%
Basic and diluted loss per share	**$ (0.02)**	$ (0.00)	$	**$ (0.04)**	$ (0.01)	$
Modified EBITDA (loss)	**$ (1,578,081)**	$ 91,387	-1827%	**$ (3,168,006)**	$ (73,846)	4190%

Modified EBITDA (loss) is not a performance measure defined under IFRS and it is not considered an alternative to Income (Loss) from operations or Comprehensive Earnings (Loss) in the context of measuring a Company's performance. Management believes that providing certain non-GAAP performance measures, in addition to IFRS measures, provides users of the Company's financial statements with an enhanced understanding of their results and related trends, and as such increases transparency and clarity. Modified EBITDA (loss) 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 our return on capital and operating efficiencies, from period to period, by removing the impact of its capital structure (interest expense to service outstanding debt), asset base (depreciation and amortization), tax consequences, and other non-operating items not requiring cash outlays including share-based compensation and change in fair value of investment. 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.

Extract from Statement of Financial Position at:

	Sept 30, 2018	Dec 31, 2017
Current assets	**4,161,644**	2,498,913
Non-current assets	**5,406,002**	3,270,037
Total assets	**$ 9,567,646**	$ 5,768,950
Current liabilities	**7,517,780**	11,902,283
Non-current liabilities	**2,913,038**	10,290
Total liabilities	**$ 10,430,818**	$ 11,912,573
Shareholders' deficiency	**$ (863,172)**	$ (6,143,623)

RESULTS OF OPERATIONS

Revenue

PyroGenesis recorded revenue of $1,097,726 in the third quarter of 2018 ("Q3, 2018"), representing a decrease of 46% compared with $2,026,557 recorded in the third quarter of 2017 ("Q3, 2017"). Revenue for the nine months of fiscal 2018 was $4,579,680 a decrease of 22% over revenue of $5,896,092 during the same period in 2017.

Revenues recorded in Q3, 2018 and for the nine months of fiscal 2018 were generated primarily from:

(i) the development of a vacuum arc reducing process to convert Silica into high purity Silicon metal,

(ii) the manufacture and sale of a DROSRITE™ System,

(iii) support services related to PAWDS-Marine systems supplied to the US Navy.

Cost of Sales and Services and Gross Margin

		Three months ended Sept 30, 2018		2017	% Change 2018vs2017		Nine months ended Sept 30, 2018		2017	% Change 2018vs2017
Employee compensation	$	454,237	$	477,553	-5%	$	1,318,998	$	1,455,904	-9%
Subcontracting		291,817		9,123	3099%		360,146		75,755	375%
Direct materials		23,845		153,988	-85%		1,183,602		960,705	23%
Manufacturing overhead & other		163,951		279,656	-41%		447,124		628,541	-29%
Foreign exchange loss		17,913		38,370	-53%		49,004		57,583	-15%
Investment tax credits		(106,188)		(88,338)	20%		(233,649)		(357,577)	-35%
Total Cost of Sales and Services	$	845,575	$	870,352	-3%	$	3,125,225		2,820,911	11%

Gross Margin

		Three months ended Sept 30, 2018		2017		Nine months ended Sept 30, 2018		2017
Revenue	$	1,097,726	$	2,026,557	$	4,579,680	$	5,896,092
Cost of Sales and Services		845,575		870,352		3,125,225		2,820,911
Gross Margin	$	252,151		1,156,205	$	1,454,455		3,075,181
Gross Margin %		23.0%		57.1%		31.8%		52.2%

Cost of sales and services was $845,575 in Q3, 2018, representing a decrease of 3% compared with $870,352 in Q3, 2017. On a year-to-date basis, the cost of sales was $3,125,225 an increase of 11% as compared to $2,820,911 for the same period in 2017.

In Q3, 2018 cost of direct materials and manufacturing overhead decreased to $23,845 (Q3, 2017: $153,988), $163,951 (Q3, 2017: $279,656) respectively, while subcontracting increased to $291,817 (Q3, 2017 - $9,123).

On a year-to-date basis, cost of direct materials and subcontracting increased to $1,183,602 (2017: $960,705) and $360,146 (2017: $75,755) respectively, while manufacturing overhead and other decreased to $447,124 (2017 - $628,541).

Investment tax credits recorded against cost of sales are primarily related to client funded projects that qualify for tax credits from the provincial government of Quebec. Qualifying tax credits increased to $106,188 in Q3, 2018, compared with $88,338 in Q3, 2017. This represents an increase of 20%. On a year-to-date basis, qualifying tax credits decreased to $233,649 in 2018, compared with $357,577 in 2017. The Company continues to make investments in research and development projects involving strategic partners and government bodies.

The gross margin for Q3, 2018, was $252,151, or 23% of revenue. This compares with a gross margin of $1,156,205 (57.1% of revenue) for Q3, 2017. On a year-to-date basis, the gross margin represents 31.8% of revenue versus 52.2% over the same period in 2017.

The type of contracts being executed and the nature of the project activity during any given quarter has a significant impact on both the overall level of cost of sales and services reported in a period, as well as the composition of the cost of sales and services, as the mix between labour, materials and subcontracts may be significantly different.

Selling, General and Administrative Expenses

	Three months ended Sept 30, 2018	2017	% Change 2018vs2017	Nine months ended Sept 30, 2018	2017	% Change 2018vs2017
Employee compensation	$ 883,811	$ 598,116	48%	$ 2,206,925	$ 1,704,448	29%
Professional fees	495,393	172,805	187%	887,001	552,664	60%
Office and general	133,412	113,416	18%	393,371	359,434	9%
Travel	37,906	42,521	-11%	235,117	160,498	46%
Depreciation on property and equipment	43,331	27,503	58%	113,577	81,952	39%
Government grants	(19,664)	(4,500)	337%	(39,558)	(9,000)	340%
Other expenses	121,969	59,183	106%	305,683	167,824	82%
Sub-total before Share-based payments	1,696,158	1,009,044	68%	4,102,116	3,017,820	36%
Share-based payments	203,384	151,708	34%	628,888	425,303	48%
Total selling, general and administrative	$ 1,899,542	$ 1,160,752	64%	$ 4,731,004	$ 3,443,123	37%

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 Q3, 2018 excluding the costs associated with share-based payments (a non-cash item in which options vest over a four-year period), were $1,696,158, representing an increase of 68% compared with $1,009,044 reported for Q3, 2017. On a year-to-date basis, SG&A expenses before share-based payments were $4,102,116 compared with $3,017,820 in the same period in 2017.

The increase in SG&A expenses in Q3, 2018 over the same period in 2017 is mainly attributable to the net effect of:

- an increase of 48% in employee compensation,
- an increase of 187% for professional fees, primarily due to an increase in consulting fees,
- an increase of 18% in office and general expenses, due to an increase in courses, seminar, computers and internet expenses,
- travel costs decreased by 11%, due to less travels abroad,
- depreciation on property and equipment increased by 58%, primarily due to an increase in plant and equipment assets. The asset under development in Q3, 2018 will begin to be depreciated when the asset is available or ready for use,
- government grants increased by 337% due to higher level of activities supported by such grants and,
- other expenses increased by 106%, primarily due to higher cost of freight and shipping.

Separately, share based payments increased by 34% in Q3, 2018 over the same period in 2017 as a result of the vesting structure of the stock option plan including the stock options offered on July 3, 2018.

Research and Development ("R&D") Costs

	Three months ended Sept 30, 2018	2017	% Change 2018vs2017	Nine months ended Sept 30, 2018	2017	% Change 2018vs2017
Employee compensation	$ **258,140**	$ 78,096	231%	$ **604,046**	$ 198,611	204%
Subcontracting	**-**	1,991	100%	**7,920**	3,833	100%
Materials and equipment	**19,591**	2,332	740%	**103,257**	9,538	983%
Other expenses	**8,684**	532	1532%	**27,707**	1,176	2257%
Sub-total before government grants	**286,416**	82,951	245%	**742,930**	213,158	249%
Government grants	**(109,011)**	-	100%	**(109,011)**	-	100%
Total net R&D costs	$ **177,405**	$ 82,951	114%	$ **633,920**	$ 213,158	197%

The Company incurred $177,405 of R&D costs in Q3, 2018, compared with $82,951 in Q3, 2017, representing an increase of 114%. During the first nine months of fiscal 2018, net spending on internal R&D was $633,920 as compared to $213,158 in 2017.

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

Finance Income and Finance Costs

	Three months ended Sept 30, 2018	2017	% Change 2018vs2017	Nine months ended Sept 30, 2018	2017	% Change 2018vs2017
Adjustment to the fair value of investments	$ **756,750**	$ 101,099	649%	$ **909,750**	$ 196,834	362%
Finance expenses	**177,289**	171,160	4%	**502,301**	489,342	3%
Net finance costs	$ **934,039**	$ 272,259	243%	$ **1,412,051**	$ 686,176	106%

Finance expenses for Q3, 2018 totaled $177,289 as compared with $171,160 for Q3, 2017, representing an increase of 4%. The increase in net finance costs in Q3, 2018 is primarily due to the adjustment to the fair value of investments.

Depreciation on Property and Equipment

	Three months ended Sept 30, 2018	2017	% Change 2018vs2017	Nine months ended Sept 30, 2018	2017	% Change 2018vs2017
Depreciation on property and equipment	$ **43,331**	$ 27,503	58%	$ **113,577**	$ 81,951	39%

The depreciation on property and equipment increased to $43,331 and $113,577 in Q3, 2018 and the first nine months of fiscal 2018, compared with $27,503 and $81,951 in the same periods in 2017. The 58% and 39% increase reflect an increased level of investments in plant and equipment. The asset under development in the nine first months of fiscal 2018 will begin to be depreciated when the asset is available or ready for use.

Inventory

	Three months ended September 3		% Change	Nine months ended September 3(		% Change
	2018	2017	2018vs2017	2018	2017	2018vs2017
Inventory	$ 2,889	$ -	100%	$ 614,247	$ -	100%

Spare parts inventory for Q3, 2018 was $2,889 compared to Nil in Q3, 2017 representing an increase of 100% year-over-year. Year-to-date inventory of powders, coil and spare parts increased to $611,359 as compared to Nil for the same period in 2017.

Settlement of a claim related to the long-term debt

	Three months ended September 30,		% Change	Nine months ended September 30,		% Change
	2018	2017	2018vs2017	2018	2017	2018vs2017
Settlement of long-term debt	$ -	$ -		$ 1,885,644	$ -	100%

Subsequent to year end, the Company and Mr. Peter Photis Pascali, the father of CEO Photis Peter Pascali controlling shareholder of the Company, entered into a settlement agreement to resolve a claim in the amount of $5,531,928 filed on or about April, 5, 2018, made by Mr. Peter Photis Pascali, in connection with the share for debt conversion transaction between the parties that took place in 2014. Under the share for debt conversion, the Company issued 7,500,000 common shares in 2014 to settle $6,000,000 of the carrying value of the Balance of sale payable. The current claim was settled for an amount of $3,699,999.80. The settlement agreement also constitutes the final payment of the Balance of sale, and provides for the issuance of units by the Company having a fair value of $3,327,571 to Mr. Peter Photis Pascali as follows: (i) on February 9 and March 7, 2018, issuance of 1,899,999 units at a value of $0.70 per unit with each unit consisting of 1 common share of the Company and 1 common share purchase warrant which entitles the holder to purchase 1 common share at a price of $1.25 until August 9th , 2019, and (ii) on April 30, 2018, issuance of 3,385,715 units at a value of $0.59 per unit with each unit consisting of 1 common share of the Company and 1 common share purchase warrant which entitles the holder to purchase 1 common share at a price of $0.85 until April 19, 2020. As the claim related to a dispute that existed at year-end, a liability and related expense of $3,215,643 was recorded as at December 31, 2017. The liability was measured based on the fair value of the units as at their issuance date, which is $0.70 on February 9 and March 7, 2018 and $0.59 on April 30, 2018.

Net comprehensive loss

	Three months ended Sept 30,		% Change	Nine months ended Sept 30,		% Change
	2018	2017	2018vs2017	2018	2017	2018vs2017
Net comprehensive loss	$ (2,758,835)	$ (360,083)	665%	$ (5,322,520)	$ (1,267,276)	320%

The loss from operations and comprehensive loss for Q3, 2018 was $2,758,835 compared to $360,083 in Q3, 2017 representing an increase of 665% year-over-year. Year-to-date, loss from operations was $5,322,520 as compared to a loss of $1,267,276 for the same period in 2017.

The increase in net comprehensive loss in Q3, 2018 compared to the same period in 2017 is primarily attributable to a decrease in revenue of $928,831 and by the factors described above, which have been summarized as follows:

(i) a decrease in cost of sales and services totaling $24,777 in Q3, 2018;
(ii) an increase of SG&A expenses of $738,790 arising in Q3, 2018 as explained above;
(iii) an increase in R&D expenses of $94,454 primarily due to research and development in Q3, 2018 on plasma atomization;
(iv) an increase in net finance costs of $661,454 in Q3, 2018 due to a decrease in the fair value of investments of $655,651.

On a year-to-date basis the increase in net comprehensive loss from operations of $4,055,244 is attributable to a decrease in revenue of $1,316,412 and by the factors described above, which have been summarized as follows:

(i) an increase in cost of sales and services totaling $304,314 in Q3, 2018;
(ii) an increase of SG&A expenses of $1,287,881 arising in Q3, 2018 as explained above;
(iii) an increase in R&D expenses of $420,762 primarily due to the increase in research and development on plasma atomization;
(iv) an increase in net finance costs of $725,875 in Q3, 2018 primarily due to the decrease in the fair value of investments of $712,916.

EBITDA, Adjusted EBITDA and Modified EBITDA

	Three months ended Sept 30, 2018	2017	% Change 2018vs2017	Nine months ended Sept 30, 2018	2017	% Change 2018vs2017
Comprehensive loss	**$ (2,758,835)**	$ (360,083)	665%	**$ (5,322,520)**	$ (1,267,276)	320%
Depreciation on property and equipment	**43,331**	27,503	58%	**113,577**	81,951	39%
Financing charges	**177,289**	$ 171,160	4%	**502,301**	$ 489,342	3%
EBITDA (loss)	**$ (2,538,215)**	$ (161,420)	1472%	**$ (4,706,642)**	$ (695,983)	576%
Other non-cash items:						
Share-based payments	**203,384**	151,708	34%	**628,888**	425,303	48%
Settlement of a claim related to the long-term debt	**-**	-		**-**	-	
Adjusted EBITDA (loss)	**(2,334,831)**	(9,712)	23940%	**(4,077,756)**	(270,680)	1406%
Change in fair value of investments	756,750	101,099	-649%	**909,750**	196,834	362%
Modified EBITDA (loss)	**$ (1,578,081)**	$ 91,387	-1827%	**$ (3,168,006)**	$ (73,846)	4190%

EBITDA is defined as Earnings (from operations) before Net Financing Charges, Taxes, Depreciation and Amortization, Adjusted EBITDA is defined as Earnings (from operations) before Net Financing Charges, Taxes, Depreciation, Amortization and other non-cash items including share-based payment costs, and Modified EBITDA is defined as Earnings (from operations) before Net Financing Charges, Taxes, Depreciation, Amortization and other non-cash items including share-based payment costs and change in fair value of investments.

EBITDA, Adjusted EBITDA and Modified EBITDA are not performance measures defined under IFRS and they are not considered an alternative to income or loss from operations, or to comprehensive earnings or loss, in the context of measuring a company's performance. Management believes that providing certain non-GAAP performance measures, in addition to IFRS measures, provides users of the Company's financial statements with an enhanced understanding of its results and related trends and increases transparency and clarity. 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 (interest expense to service outstanding debt), asset base (depreciation and amortization), tax consequences, and other non-operating items not requiring cash outlays including the adjustment to the fair value of investments and share-based compensation. 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.

The EBITDA loss in Q3, 2018 was $2,538,215 compared with an EBITDA loss of $161,420 for Q3, 2017, representing an increase of 1472%. On a year-to-date basis, the EBITDA loss was $4,706,642 in 2018 compared with $695,983 in 2017, representing an increase of 576%. The increase in the EBITDA loss in Q3, 2018 compared with the same period in 2017 is primarily attributable to lower revenues, an increase in comprehensive loss of $2,398,752, an increase in depreciation on property and equipment of $15,828, and an increase in finance charges of $6,129 in Q3, 2018.

Adjusted EBITDA loss in Q3, 2018 was $2,334,831 compared with an Adjusted EBITDA loss of $9,712 for Q3, 2017. The increase of $2,325,119 in the Adjusted EBITDA loss in Q3, 2018 is mainly attributable to the increased EBITDA loss of $2,376,795, and an increase of $51,676 in share-based payments.

Modified EBITDA loss in Q3, 2018 was $1,578,081 compared with a Modified EBITDA gain of $91,387 for Q3, 2017. On a year-to-date basis, the Modified EBITDA loss was $3,168,006 in 2018 compared with $73,846 in 2017. The increase of $1,669,468 in the Modified EBITDA loss in Q3, 2018 is mainly attributable to the increase in the Adjusted EBITDA loss of $2,325,119 and a decrease in the change in fair value of investments of $655,651.

SUMMARY OF QUARTERLY RESULTS

	2018			2017			
	Q3	**Q2**	**Q1**	Q4	Q3	Q2	Q1
Revenues	**$ 1,097,726**	**$ 1,421,352**	**$ 2,060,602**	$ 1,296,768	$ 2,026,557	$ 2,173,397	$ 1,696,138
Gross margin	**252,151**	**496,398**	**705,906**	51,786	1,156,205	1,043,102	875,874
Gross margin %	**23.0%**	**34.9%**	**34.3%**	4.0%	57.1%	48.0%	51.6%
Comprehensive loss	**(2,758,835)**	**(1,534,890)**	**(1,028,795)**	(4,907,028)	(360,083)	(608,584)	(298,610)
Net loss per share - basic and diluted	**(0.02)**	**(0.01)**	**(0.01)**	(0.05)	(0.00)	(0.01)	(0.00)

The majority of PyroGenesis' revenue is recognised using the percentage of completion basis and is dependent on the timing of project initiation and execution, including project engineering, manufacturing, and testing.

LIQUIDITY AND CAPITAL RESOURCES

The following table summarizes the contractual maturities of financial liabilities as at September 30, 2018.

	Total	**6 months or less**	**6 to 12 months**	**1-3 year**
	$	**$**	**$**	**$**
Accounts payable and accrued liabilities	**4,050,967**	**4,050,967**	**-**	**-**
Capital lease obligations	**32,208**	**4,521**	**16,947**	**10,740**
Term loans	**670,533**	**261,200**	**409,333**	**-**
Term loan to the controlling shareholder and CEO	**321,550**	**8,850**	**8,850**	**303,850**
Convertible debentures	**3,427,500**	**142,500**	**142,500**	**3,142,500**
	8,502,758	**4,468,038**	**577,630**	**3,457,090**

The Company has incurred, in the last several years, operating losses and negative cash flows from operations, resulting in an accumulated deficit of $48,523,228 and a negative working capital of $3,651,136 as at September 30, 2018 (December 31, 2017 - $43,200,708 and $9,403,370 respectively). Furthermore, as at September 30, 2018, the Company's current liabilities and expected level of expenses for the next twelve months exceed cash on hand of $1,833,036 (December 31, 2017 - $622,846). The Company has relied upon external financings to fund its operations in the past, primarily through the issuance of equity, debt, and convertible debentures, as well as from investment tax credits.

As at September 30, 2018, the Company had cash on hand of $1,833,036 and negative working capital of $3,651,133 compared with a cash balance of $622,846 and negative working capital of $9,403,370 as at December 31, 2017.

Revenue generated from active projects does not yet produce sufficient positive cash flow to fund operations. However, based on current backlog of $6.7MM at November 28, 2018, together with the pipeline of prospective new projects, cash flow from operations are expected to become positive in the very near future.

OFF-BALANCE SHEET ARRANGEMENTS

The Company had no off-balance sheet arrangements as at September 30, 2018.

SUMMARY OF CASH FLOWS

	Three months ended Sept 30, 2018	Three months ended Sept 30, 2017	Nine months ended Sept 30, 2018	Nine months ended Sept 30, 2017
Cash provided by (used in) operating activities	**$ 3,040,300**	$ (714,479)	**$ (1,100,124)**	$ (541,989)
Cash provided by (used in) investing activities	**(2,252,581)**	(344,015)	**(3,202,822)**	(1,292,407)
Cash provided by (used in) financing activities	**961,193**	1,118,287	**5,513,136**	1,767,070
Increase (decrease) in cash	**1,748,912**	59,793	**1,210,190**	(67,326)
Cash - end of period	**1,833,036**	317,931	**1,833,036**	317,931

For the three months ended Q3, 2018, cash flow provided by operating activities was $3,040,300 compared to use of cash of $714,479 for the same period in the prior year. On a year to date basis, cash flow used from operating activities was $1,100,124 compared to $541,989 for the same period in the prior year.

The use of cash during Q3, 2018 consists of the comprehensive loss of $2,758,835 (Q3, 2017 - $360,083) plus adjustment for non-cash items totalling $1,180,754 (Q3, 2017 – Less $450,470) less a net change in non-cash operating working capital items of $4,700,630 (Q3, 2017 – 713,671) plus interest paid of $82,249 (Q3, 2017 - interest paid of $92,195).

The net change in non-cash operating working capital items in Q3, 2018 was driven by:

a) a decrease in accounts receivable of $73,645 in Q3, 2018, compared to a decrease of $579,530 in Q3, 2017;
b) a decrease in costs and profits in excess of billings on uncompleted contracts of $353,785 in Q3, 2018, compared to a decrease of $108,968 in Q3, 2017;
c) an increase in inventory of $2,888 in Q3 -2018 compared to an increase of $114,091 in Q3 – 2017;
d) an increase in investment tax credits receivable of $106,188 in Q3, 2018, compared to an increase of $88,336 in Q3, 2017;
e) an increase in prepaid expenses of $75,840 in Q3, 2018, compared to an increase of $108,259 in Q3, 2017;
f) an increase in accounts payable and accrued liabilities of $1,715,794 in Q3, 2018, compared to an increase of $360,440 in Q3, 2017;
g) an increase in billings in excess of costs and profits on uncompleted contracts of $2,742,322 in Q3, 2018, compared with a decrease of $1,451,923 in Q3, 2017.

Investing activities resulted in a use of cash of $2,252,581 in Q3, 2018, compared to a use of cash of $344,015 in Q3, 2017 resulting from the purchase of property and equipment and additions to deferred development costs.

Financing activities in Q3, 2018 and the first nine months of fiscal 2018 resulted in a net source of funds of $961,193 and $5,513,136 respectively, compared with a net source of funds of $1,118,287 and $1,767,070 for the same periods in 2017. In the first nine months of fiscal 2018, the Company issued common shares upon closing of private placements, exercise of warrants and stock options for cash proceeds of $5,924,126, convertible debentures for a cash proceeds of $2,864,298 and received $3,145,000 in term loans raised for general working capital purposes and repaid of $2,749,145 in loans and capital lease obligations. In 2017, the Company issue common share upon exercise of stock options and warrants for net cash proceeds of $2,133,832 and repaid loans and capital lease obligations of $366,762.

For Q3, 2018 and the first nine months of fiscal 2018, the net cash position of the Company increased by $1,748,912 and $1,210,190, compared to an increase of $59,793 and a decrease of $67,326 for the same periods in the prior year.

CAPITAL STOCK INFORMATION

The authorized share capital of the Company consists of an unlimited number of Class A common shares (the “Common Shares”). As at November 28, 2018, PyroGenesis had 131,254,083 Class A Common Shares, 16,476,503 warrants, 10,022,000 outstanding options issued, and 9,180,000 exercisable options issued.

GOING CONCERN

Cash generated from contracts and from providing engineering services to clients has historically been insufficient to meet the overall cash requirements of the Company to cover operating costs. For the Company to generate sufficient positive cash flows from operations and meet current cash requirements, the level of business must exceed that recorded to date. Management expects that the investments currently being made in accelerating projects under development for various clients, together with executing on the $6.7MM backlog at November 28, 2018, which is primarily related to the Company’s successful diversification into niche markets of the additive manufacturing (including 3D printing), and metals & mining industries, will continue to improve the Company’s cash position.

To date, the Company has raised financing primarily through successive issuances of equity and convertible debentures. There is no certainty that the Company will continue to be able to raise additional financing or expand its sales to fund its operations, although management is confident that it will be able to do so. These conditions indicate the existence of a material uncertainty that may cast significant doubt on the Company’s ability to continue as a going concern.

The September 30, 2018 condensed financial statements have been prepared using International Financial Reporting Standards (“IFRS”) 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 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 financial statements could be material.

RELATED PARTY TRANSACTIONS

During the three and the nine months ended September 30, 2018, the company concluded the following transactions with related parties:

Rent and property taxes were charged by a trust beneficially owned by the controlling shareholder and CEO of the Company in the amount of $70,352 and $211,494 respectively, (2017 - $61,100 and $174,911). A balance due of $Nil (2017 - $119,575) is included in accounts payable and accrued liabilities.

An amount of $240,159 was paid to a trust beneficially owned by the controlling shareholder and CEO of the Company (December 31, 2017 – Nil) and from this amount $232,980 is included in prepaids.

Interest of $Nil and $14,171, (2017 - $14,171 and $42,513) was charged on the $755,000 convertible debentures held by the father of the controlling shareholder and CEO of the Company. Accreted interest related to the convertible debenture held by the father of the of the controlling shareholder and CEO of the Company amounted to $Nil and $11,623(2017 – $11,234 and $31,492).

A balance due to the controlling shareholder and CEO of the Company amounted to $145,173 (December 31, 2017 - $205,641) and is included in accounts payable and accrued liabilities.

During the three months ended September 30, 2018, the Company accrued $2,965 of interest payable on the loan of $295,000 from the controlling shareholder and CEO of the Company.

For clarification, Peter Photis Pascali and Phoenix Haute Technology Inc are no longer related to the Company as per TSX policy and are reflected as such herein.

SUBSEQUENT EVENTS

On October 19, 2018, the Company issued 388,750 Units to unrelated parties at a price of $0.58 per Unit, for gross proceeds of $225,475. 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 $0.58 until February 19th, 2021. Each Unit will be subject to a statutory hold period of four months and one day from the date of closing.

On October 29, 2018, the Company granted to Mr. Pierre Carabin, Chief Technology Officer and Chief Strategist of the Company, stock options to acquire up to 100,000 common shares of the Company. The stock options have an exercise price of $0.52 per common share and are exercisable over a period of five (5) years. The options are granted in accordance with the Company's stock option plan.

In October 2018, the Company entered into four agreements ("Shares for Debt Transactions") with four creditors whereby the creditors agreed to receive 1,168,000 Units of the Company, at $0.58 per Unit in payment of an aggregate amount of $677,440 owed to them by the Company, the whole subject to the approval of the TSX Venture Exchange. Each Unit consisted of one Common Share and one Common share purchase warrant at an exercise price of $0.58 per common share until February 13, 2021. On November 8, 2018, the TSX Venture Exchange conditionally approved three of the aforementioned Shares for Debt Transactions whereby the Company issued 1,112,000 Units to pay three of the four creditors an aggregate amount of $644,960. Each Unit consists of one common share of the Company and one common share purchase warrant. Each warrant entitles the holder thereof to purchase one common share at a price of $0.58 until February 13, 2021. Each Unit will be subject to a statutory hold period of four months and one day from the date of closing.

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

For a discussion of critical accounting estimates, new and future accounting policies and financial instruments, please refer to notes 4, 5 and 21 of the annual 2017 Consolidated Financial Statements.

RISK FACTORS

PyroGenesis is subject to a number of risks and uncertainties that could significantly affect the Company's financial condition and performance. This list of risk factors may not be exhaustive as the Company operates in a rapidly changing business environment and new risk factors emerge from time to time. The Company cannot predict such risk factors, nor can the Company assess the impact, if any, of such risk factors or uncertainties on its business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those projected in any forward-looking statements. Accordingly, neither shareholders of the Company nor purchasers of securities of the Company should rely on forward-looking statements as a prediction of actual results. If any of these risks actually occur, the Company's business, results of operations, financial position and cash flows could be adversely affected. In any such case, the market price of the Company's common shares could decline and investors may lose all or part of their investment.

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:

- (a) unforeseen engineering and/or environmental problems;
- (b) delays or inability to obtain required financing, licenses, permits and/or regulatory approvals;
- (c) supply interruptions and/or labour disputes;
- (d) foreign exchange fluctuations and/or collection risk; and
- (e) competition from other suppliers and/or alternative energy solutions that are less capital intensive.
- (f) trade and tariffs

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.

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.

Lack of Product Revenues/History of Losses

PyroGenesis has incurred losses in the majority of years since its inception. The Company's operations have not generated sufficient earnings and cash flows to date to result in consistent profitability or positive cash flow. Consequently, the Company's continued existence is dependent upon its ability to generate profitable operations by establishing and expanding its client base and/or raising adequate long-term financing. PyroGenesis has relied primarily on equity financing, debt financing, partner funding and government funding to carry on its business to date. The ability of the Company to achieve profitable sustainable operations in the future is uncertain. PyroGenesis has not yet demonstrated its ability to consistently achieve positive gross margins and its ongoing efforts to improve product gross margins may be insufficient to result in profitability.

Additional financing and dilution

PyroGenesis will require additional financing to support ongoing operations and to undertake capital expenditures. 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 November 28, 2018, 10,022,000 stock options are currently issued and outstanding, together with 16,476,503 warrants and 3,750,000 convertible debentures. The exercise of stock options and/or warrants, together with the conversion of debentures, as well as any new equity financings, represents dilution factors for present and future shareholders.

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 realised. 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 the U.S. Military and/or other military clients will continue to provide the Company with business. 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.

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.

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.

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.

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.

Market Liquidity

The market price for the common shares of the Company 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 Company's 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 Company's common shares.

Information systems disruptions

The Company's business depends on the efficient and uninterrupted operation of its computer and communications software, hardware systems, and its other information technology. If such systems were to fail, or the Company was unable to successfully expand the capacity of these systems or integrate new technologies into its existing systems, its operations and financial results could be adversely affected.

OUTLOOK

The following is a non-exhaustive review of PyroGenesis' main commercial activities:

A) DROSRITE™:

As the Company positioned itself, during 2017, to become a significant powder producer to the Additive Manufacturing industry, it also successfully positioned its DROSRITE™ furnace system to become a fully commercial product line in and of its own right.

2017 saw the commercial acceptance of PyroGenesis' patented DROSRITE™ system with, not only an acceptance of its first commercial sale, but a subsequent re-order by the same client at a higher price. Since that time a separate client has ordered 2 additional systems, the Company's demonstration system is fully booked and a second is being constructed.

PyroGenesis originally focused on selling systems by aggressively targeting both primary aluminum smelters, as well as tertiary casting producers worldwide. During this time the Company also added zinc recovery from dross as a target market.

At the request of several smelters, PyroGenesis started to consider tolling arrangements. A tolling service agreement is one in which a smelter provides dross to a third party to be processed either on or off-site. In our case, PyroGenesis would provide a tolling service using its proprietary DROSRITE™ system to process the dross and recover valuable metals for a fee. The benefits would be shared with the smelter.

It quickly became apparent to the Company that the best way to maximize the return from its DROSRITE™ product line would be to enter into tolling service agreements with smelters.

PyroGenesis is currently in various stages of negotiating tolling service agreements with four (4) different smelters for a total of eleven (11) 5,000 tpd DROSRITE™ furnace systems dedicated to tolling. Each 5,000 tpd DROSRITE™ furnace system has the potential to generate approx. $3.7 million of annual recurring benefits.

Tolling has become the most important element in PyroGenesis' overall strategy. It provides for higher recurring revenues over a longer period of time. With long term contacts in hand, it also derisks the technology from the customary threats, which a strategy of selling systems alone would be challenged with.

In order to accelerate this tolling strategy, the Company announced on November 6th, 2018 that it had signed with a Japanese multi-billion-dollar corporation (Revenues > Can$5.4 Billion; Profit > Can$2.0 Billion; Assets > Can$25 Billion; Subsidiaries & Affiliates: > 400) to move forward to jointly toll worldwide. It is expected that this arrangement, with a large multi-national corporation, who has the experience, organizational depth, balance sheet, and credibility required to execute this strategy, will accelerate our time to market.

B) Powder Production:

2018 became the year in which the Company went from relative obscurity within the additive manufacturing industry, to being nominated "Materials Company of the Year" at the 3D Printing Industry Awards.

Not only, during this period, did the Company successfully assemble and commission its first metal powder production system, but also (i) successfully delivered orders for Titanium and Inconel powders, all while still in the ramp up phase, (ii) generated new, game changing, IP which provides for more control over particle size distribution, with little to no waste, while increasing powder production even further, and (iii) entered into several NDA's with significant players in the industry (end users, printer manufacturers, and distributors) all with a view of providing sample orders, repeat orders, long term orders, contract R&D, and/or strategic partnerships for long term powder supply contracts, some with a view to a possible acquisition. Given the level of activity, and the prospect of significant orders in the near term, management decided to order the long lead items for two powder production systems, both of which were scheduled to be fully operational before the end of September 2018-beginning of October 2018. There were additional small delays as personnel were reallocated to more important needs, the nature of which should be disclosed by year end. We now expect these systems to be operational over the next few weeks. These units will incorporate some of the cutting-edge IP that has recently been developed and/or is in development. We expect these units will cost significantly less to manufacture, generate higher production rates, and provide greater control over particle size distributions.

Of note, although the Company's strategic plan has always been based on its existing IP, know-how, and system (the economics of which remain true to this day), management has decided to leverage off of its significant advantage in plasma technology and dedicate certain limited assets to increasing its IP base with the goal of further significantly reducing capital and operating costs of the powder production system while at the same time improving production rates even further. PyroGenesis is confident that these goals once achieved will significantly impact the build out strategy for the better.

The Company's press release dated May 17th, 2018 (which announced a commercial agreement for a minimum order of 10,000 kg of Titanium powder over two years from Asia), together with those issued on August 14th and 20th (which announced results of powder testing by a top OEM as well as their recommendation to their clients to use such powder), has underscored the need for PyroGenesis to be even more focused than ever before on addressing market demand for its powder.

The Company decided to have, at the ready, an optimum industrialization plan for multiple powder production units (in multiples of 1, 3, and 5 units), to be executed on the back of a significant take-or-pay contract. This has now been completed and the Company is continuing to look at ways to accelerate the technological advances mentioned above.

PyroGenesis has mentioned on several occasions that the Company has been looking to partner with significant players in the industry who bring credibility to its product offering, provide a strong balance sheet plus the integrity that comes with working in the industry for many years, all with the sole purpose of accelerating PyroGenesis' market penetration with a quality product.

This strategy of teaming up with significant players has worked well for the Company in dealings with the US Military for its waste management vertical, and it is expected that the recently announced relationship with a multi-billion-dollar japanese trading house will work equally well for the DROSRITE™ product line. In both cases these partnerships not only provided validation of PyroGenesis' product lines, but also provided a strong balance sheet, and a knowledge and business depth within their respective industries.

Management believes that the Company is in the final days/weeks of concluding a similar arrangement with a global player in the AM industry and expects something definitive to be signed by year end.

C) US Military:

Originally it was thought that just one new US Aircraft Carrier would be ordered in 2018, with an estimated value of approximately $6MM, but the interest is now for two, for an estimated value of between $10-12 MM. This contract is now expected Q1 2019.

The chemical warfare destruction unit, that PyroGenesis developed for a consortium involving various groups within the US military, and was in the process of being tested, continues to have its schedule delayed accommodating other unrelated testing needs by the group. This testing timeline is out of the Company's control.

Revenues from military contracts in 2017 were over $4,300,000, mainly related to providing technical support, training services and sale of spare parts. Over the past three years, revenues from military contracts have typically represented more than $2,000,000 per year of PyroGenesis' revenues. As the PAWDS technology becomes fully operational on US Navy ships, management expects the level of recurring revenues from the sale of parts and services to increase over the next 2 to 5 years.

The Company is looking at ways to establish a presence in the USA to, amongst other things, better serve the US Military's needs arising from having multiple systems in operation.

D) HPQ:

On August 2nd, 2016, PyroGenesis announced that it had signed contracts totaling $8,260,000 with HPQ Silicon Resources Inc., formally Uragold Bay Resources Inc. (“HPQ”) for the sale of IP and to provide a pilot system to produce high purity silicon metal directly from quartz. Of particular note, if successful, PyroGenesis benefits from a 10% royalty on all revenues derived from the use of this system by HPQ, subject to annual minimums.

E) Torch/Equipment Sales:

Consistent with the Company’s overall strategy to (i) remain focused on reducing PyroGenesis’ dependency on long-cycle projects by developing a strategic portfolio of volume driven, high margin/low risk products that resolve specific problems within niche markets and doing so by introducing these plasma-based technologies to industries that have yet to consider such solutions, and (ii) to actively target recurring revenue opportunities that will generate a growing, and profitable, regular cash flow to the Company, the Company continues to market its torch/equipment capabilities and expects this to start becoming a revenue contributor, with its recurring revenue stream, in the very near future. The recent torch sale announced on October 23rd, 2018 is a good example of this.

PyroGenesis has one of the largest concentrations of plasma expertise in the world, with over 250 years of accumulated technical experience and supporting patents, combined with unique relationships with major universities performing cutting edge plasma research and development, positions the Company well to execute its strategies.

Management’s focus will continue to be to generate an improved mix of short and long-term projects that will, in turn, facilitate operational and financial planning. Repeat orders for the same, or similar, products will further result in the standardization of manufacturing processes which will lead to improved gross margins.

Additional information regarding the Company can be found on SEDAR at www.sedar.com,OTC Markets (www.otcmarkets.com), and on the Company’s website at www.pyrogenesis.com