



## 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 six month periods ended June 30, 2016. The MD&A has been prepared in accordance with National Instrument 51-102, Continuous Disclosure Requirements, and should be read in conjunction with the unaudited condensed interim financial statements as at and for the three and the six months period ended June 30, 2016 and related thereto as well as the audited financial statements and related notes thereto of the Company for the year ended December 31, 2015.

The consolidated financial statements and MD&A have been reviewed by PyroGenesis' Audit Committee and were approved by its Board of Directors on August 30, 2016. 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 August 30, 2016, 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](http://www.sedar.com)), OTC Markets ([www.otcmarkets.com](http://www.otcmarkets.com)) and on the Company's website at [www.pyrogenesis.com](http://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<sup>2</sup> 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 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 June 30,			% Change 2016vs2015	Six months ended June 30,			% Change 2016vs2015
	2016	2015	2014		2016	2015	2014	
<b>Revenue</b>	<b>\$ 818 990</b>	\$ 1 533 667	\$ 1 958 534	-47%	<b>\$ 1 835 842</b>	\$ 2 650 144	\$ 2 764 959	-31%
Cost of sales and services before amortization of intangible assets	<b>744 927</b>	1 208 578	833 700		<b>1 468 182</b>	2 022 901	1 316 841	
Gross margin before amortization of intangible assets	<b>74 063</b>	325 089	1 124 834		<b>367 660</b>	627 243	1 448 118	
Amortization of intangible assets	<b>349 269</b>	349 269	349 268		<b>698 537</b>	698 537	698 537	
Gross margin	<b>(275 206)</b>	(24 180)	775 566		<b>(330 877)</b>	(71 294)	749 581	
Selling, general and administrative	<b>999 500</b>	1 107 602	1 078 575		<b>2 048 414</b>	2 298 930	2 025 458	
Research and development	<b>18 712</b>	26 995	29 099		<b>61 589</b>	56 119	128 700	
Financing costs	<b>161 582</b>	137 334	85 045		<b>312 782</b>	148 858	177 304	
	<b>1 179 794</b>	1 271 931	1 192 719		<b>2 422 786</b>	2 503 906	2 331 462	
<b>Loss from operations</b>	<b>(1 455 000)</b>	(1 296 111)	(417 153)	12%	<b>(2 753 663)</b>	(2 575 200)	(1 581 881)	7%
Other income	<b>110 000</b>	-	-		<b>160 000</b>	-	-	
<b>Comprehensive loss</b>	<b>\$ (1 345 000)</b>	\$ (1 296 111)	\$ (417 153)	4%	<b>\$ (2 593 663)</b>	\$ (2 575 200)	\$ (1 581 882)	1%
Basic and diluted loss per share	<b>\$ (0,01)</b>	\$ (0,02)	\$ (0,02)		<b>\$ (0,01)</b>	\$ (0,02)	\$ (0,02)	
<b>Adjusted EBITDA (loss)</b>	<b>\$ (766 029)</b>	\$ (734 512)	138 262	4%	<b>\$ (1 415 536)</b>	\$ (1 463 272)	(493 031)	-3%

Adjusted 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. Adjusted EBITDA 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. 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 :

	June 30, 2016	Dec 31, 2015	Dec 31, 2014
Current assets	<b>2 289 786</b>	3 343 186	3 439 490
Non-current assets	<b>3 400 983</b>	3 778 198	3 495 842
<b>Total assets</b>	<b>\$ 5 690 769</b>	\$ 7 121 384	\$ 6 935 332
Current liabilities	<b>4 103 161</b>	3 177 091	1 997 288
Non-current liabilities	<b>3 463 405</b>	3 328 722	2 059 792
<b>Total liabilities</b>	<b>\$ 7 566 566</b>	\$ 6 505 813	\$ 4 057 080
Shareholders' equity (deficiency)	<b>\$ (1 875 796)</b>	\$ 615 571	\$ 2 878 252

## RESULTS OF OPERATIONS

Operations for the periods under review have been negatively impacted in the short term by the decision to stop working on the previous announced contract to deliver an additional nine (9) Plasma Atomization Systems to an Asian customer for approximately \$10MM.

The decision was made when improvements to the system demonstrated that the revenues and profits from selling powders from one system alone, far exceeded, on an annual basis, the one-time profit from selling an additional nine (9) systems, and, as such, the Company announced, on October 26, 2015, the strategy to move into a potentially lucrative market of producing powders for the Additive Manufacturing industry (3D Printing).



As PyroGenesis moved away from its dependency on the cash flow expected from the Asian contract, significant pressure has been placed on revenues and associated margins for the period under review.

Notwithstanding the above, based on current backlog at August 30, 2016 of \$10.1MM (over 160% of 2015 revenues), together with the pipeline of prospective new projects, cash flow from operations are expected to become positive in the very near future.

### **Revenue**

PyroGenesis recorded revenue of \$818,990 in the second quarter of 2016 ("Q2, 2016"), representing a decrease of 47% compared with \$1,533,667 recorded in the second quarter of 2015 ("Q2, 2015"). Revenues for the six first months of fiscal 2016 were \$1,835,842, a decrease of 31% over revenues of \$2,650,244 reported during the same period in 2015.

Revenues recorded in Q2, 2016 and the six months of fiscal 2016 were generated primarily from:

- (i) the manufacture and further field testing of Tactical PACWADS, the first mobile plasma system for destruction of chemical warfare agents under contract with an international military consortium,
- (ii) the demonstration of the viability of PyroGenesis' existing plasma chemical warfare agent destruction platform with locally available materials, for the complete eradication of chemical warfare agents without creating hazardous by-products,
- (iii) the manufacture and supply of PyroGenesis' first DROSRITE™ Furnace System to a North American automobile parts manufacturer,
- (iv) support services related to PAWDS-Marine systems supplied to the US Navy,

### **Cost of Sales and Services and Gross Margin**

Cost of Sales and Services	Three months ended June 30,			Six months ended June 30,		
	2016	2015	% Change 2016vs2015	2016	2015	% Change 2016vs2015
Employee compensation	\$ 484 604	\$ 484 832	0%	\$ 981 795	\$ 927 893	6%
Subcontracting	52 679	97 139	-46%	128 397	219 295	-41%
Direct materials	76 069	568 466	-87%	189 844	789 122	-76%
Manufacturing overhead & other	162 681	118 873	37%	298 817	238 703	25%
Foreign exchange loss	(4 885)	5 119	-195%	4 365	(29 827)	-115%
Investment tax credits	(26 221)	(65 851)	-60%	(135 036)	(122 285)	10%
<b>Sub-total before amortization of intangible assets</b>	<b>744 927</b>	<b>1 208 578</b>	<b>-38%</b>	<b>1 468 182</b>	<b>2 022 901</b>	<b>-27%</b>
Amortization of intangible assets	349 269	349 269	0%	698 537	698 537	0%
<b>Total Cost of Sales and Services</b>	<b>\$ 1 094 196</b>	<b>\$ 1 557 847</b>	<b>-30%</b>	<b>\$ 2 166 719</b>	<b>\$ 2 721 438</b>	<b>-20%</b>



## Gross Margin

	Three months ended June 30,		Six months ended June 30,	
	2016	2015	2016	2015
Revenue	\$ 818 990	\$ 1 533 667	\$ 1 835 842	\$ 2 650 144
Cost of Sales and Services before amortization of intangible assets	744 927	1 208 578	1 468 182	2 022 901
Gross Margin before amortization of intangible assets	74 063	325 089	367 660	627 243
Gross Margin % before amortization of intangible assets	9,0%	21,2%	20,0%	23,7%
Amortization of intangible assets	349 269	349 269	698 537	698 537
Gross Margin after amortization of intangible assets	\$ (275 206)	\$ (24 180)	\$ (330 877)	\$ (71 294)
Gross Margin % after amortization of intangible assets	-33,6%	-1,6%	-18,0%	-2,7%

Gross margin 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 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 non-operating 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.

Cost of sales and services before amortization of intangible assets was \$744,927 in Q2, 2016, representing a decrease of 38% as compared with \$1,208,578 in Q2, 2015. On a year-to date basis, the cost of sales and services before amortization of intangible assets was \$1,468,182 as compared to \$2,022,901 for the same period in 2015, a decrease of 27%.

In the second quarter of Fiscal 2016 subcontracting costs and cost of direct materials decreased to \$52,679 and \$76,069 respectively, (Q2, 2015: \$97,139 and \$568,466), while manufacturing costs increased to \$162,681 (Q2, 2015: \$118,873) and employee compensation remained at the same level over both periods.

On a year-to-date basis, subcontracting costs and cost of direct materials in 2016 decreased to \$128,397 and \$189,844 respectively, (2015: \$219,295 and \$789,122), while manufacturing costs increased to \$298,818 (2015: \$238,703) and employee compensation increased marginally to \$981,795 (2015: \$927,893).

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 decreased to \$26,221 in Q2, 2016, compared with \$65,851 in Q2, 2015, primarily as a result of the decreased R&D activities within projects under construction for clients in 2016. This represents a decrease of 10% year-over-year. The Company continues to make investments in research and development projects involving of strategic partners and government bodies.

In Q2, 2016, the gross margin before amortization of intangible assets was \$74,063, or 9% of revenue. This compares with a gross margin before amortization of intangible assets of \$325,089 (21.2% of revenue) for Q2, 2015. On a year-to-date basis, the gross margin before amortization represents 20% of revenue versus 23% over the same period in 2015.

The amortization of intangible assets of \$349,269 in Q2, 2016 and Q2, 2015 relates to the licenses and know-how purchased in 2011 from a company under common control. This expense is a non-cash item and the underlying asset will be fully amortized by December 31, 2016.



### ***Selling, General and Administrative Expenses***

	Three months ended June 30,		% Change	Six months ended June 30,		% Change
	2016	2015	2016vs2015	2016	2015	2016vs2015
Employee compensation	\$ 543 852	\$ 540 346	1%	\$ 1 079 324	\$ 975 524	11%
Professional fees	219 013	304 279	-28%	443 400	658 718	-33%
Office and general	96 468	90 518	7%	210 806	204 735	3%
Travel	43 268	68 054	-36%	83 276	117 991	-29%
Depreciation on property and equipment	32 255	41 315	-22%	64 511	81 401	-21%
Government grants	(7 609)	(22 653)	-66%	(28 457)	(39 724)	-28%
Other expenses	36 388	52 062	-30%	93 258	117 153	-20%
<b>Sub-total before Share-based payments</b>	<b>963 635</b>	<b>1 073 921</b>	<b>-10%</b>	<b>1 946 118</b>	<b>2 115 798</b>	<b>-8%</b>
Share-based payments	35 865	33 681	6%	102 296	183 132	-44%
<b>Total selling, general and administrative</b>	<b>\$ 999 500</b>	<b>\$ 1 107 602</b>	<b>-10%</b>	<b>\$ 2 048 414</b>	<b>\$ 2 298 930</b>	<b>-11%</b>

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 Q2, 2016 were \$999,500, representing a decrease of 10% compared with \$1,107,602 reported for Q2, 2015. Excluding the costs associated with share-based compensation (a non-cash item in which options vest over a four year period) SG&A expenses decreased by 10% in Q2, 2016 compared with Q2, 2015.

The decrease in SG&A expenses in Q2, 2016 over the same period in 2015 is attributable to the net effect of:

- an increase of 1% in employee compensation, and an increase of 7% in office and general expenses a decrease of 28% for professional fees, primarily due to decreased levels of external investor relations services, business development and accounting services,
- travel costs decreased by 36%,
- depreciation on property and equipment decreased by 22% due to a reduced level of investment in machinery and equipment since 2010, when major acquisitions were made,
- government grants decreased by 66% due to lower level of activities supported by such grants and
- other expenses decreased by 30%, primarily due to the reduced cost of freight and shipping.

Separately, share based payments increased by 6% in Q2, 2016 over the same period in 2015 as a result of the vesting structure of the stock option plan and the re-evaluation of options as at December 31, 2015 which increased the share-based payments expense in 2016. On a year-to-date basis, share-based payments expense decreased by 44% since there was no options granted in 2016 which was not the case in 2015.



## Research and Development (“R&D”) Costs

Internal R&D Project Costs	Three months ended June 30,			Six months ended June 30,		
	2016	2015	% Change 2016vs2015	2016	2015	% Change 2016vs2015
Employee compensation	\$ 17 011	\$ 27 905	-39%	\$ 40 982	\$ 54 742	-25%
Subcontracting	-	-		-	9 000	-100%
Materials and equipment	1 507	2 577	-42%	19 046	4 602	314%
Other expenses	194	749	-74%	1 561	1 599	-2%
<b>Sub-total before government grants</b>	<b>18 712</b>	<b>31 231</b>	<b>-40%</b>	<b>61 589</b>	<b>69 943</b>	<b>-12%</b>
Government grants	-	(4 236)	-100%	-	(13 824)	-100%
<b>Total net R&amp;D costs</b>	<b>\$ 18 712</b>	<b>\$ 26 995</b>	<b>-31%</b>	<b>\$ 61 589</b>	<b>\$ 56 119</b>	<b>10%</b>

The Company incurred \$18,712 of R&D costs, net of government grants, on internal projects in Q2, 2016, compared with \$26,995 in Q2, 2015, representing a decrease of 31% year-over-year. During the first six months of 2016, net spending on internal R&D was \$61,589 as compared to \$56,119 (net of \$13,824 government grants ; 2016 nil) for the same period in 2015, an increase of 10%.

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 June 30,			Six months ended June 30,		
	2016	2015	% Change 2016vs2015	2016	2015	% Change 2016vs2015
Finance income	\$ 110 000	\$ -	100%	\$ 160 000	\$ -	100%
Finance costs	\$ 161 582	\$ 137 334	18%	\$ 312 782	\$ 148 858	110%
Net finance costs	\$ 51 582	\$ 137 334	-62%	\$ 152 782	\$ 148 858	3%

Finance income in 2016 resulted from a gain realized on the disposal of an investment in an amount of \$50,000 in Q1, 2016 and the adjustment to the fair market value of an investment in the amount of \$110,000 in Q2, 2016.

Finance costs for Q2, 2016 totaled \$161,582 as compared with \$137,334 for Q2, 2015, represented an increase of 18% year-over-year. Finance costs in Q2, 2015 related entirely to the interest component of the Company’s debt due to a related party, whereas in Q2, 2016 they relate both to the interest on the convertible debenture issued in March 2015, together with the accretion and amortization of finance costs associated with this debenture.

## Depreciation on Property and Equipment

	Three months ended June 30,			Six months ended June 30,		
	2016	2015	% Change 2016vs2015	2016	2015	% Change 2016vs2015
Depreciation on property and equipment	\$ 32 255	\$ 41 315	-22%	\$ 64 511	\$ 81 401	-21%

The depreciation on property and equipment decreased to \$32,255 in Q2, 2016, compared with \$41,315 in Q2, 2015. The decrease reflects a reduced level of investments in machinery and equipment since 2010, when major acquisitions were made. The depreciation on property and



equipment for the six months of fiscal 2016 was \$64,511 a decrease of 21% over depreciation on property and equipment of \$81,401 reported during the same period in 2015.

### **Net loss and comprehensive loss**

	Three months ended June 30,		% Change	Six months ended June 30,		% Change
	2016	2015	2016vs2015	2016	2015	2016vs2015
Loss from operations	\$ (1 345 000)	\$ (1 296 111)	4%	\$ (2 593 663)	\$ (2 575 200)	1%
Comprehensive loss	\$ (1 345 000)	\$ (1 296 111)	4%	\$ (2 593 663)	\$ (2 575 200)	1%

The net loss and comprehensive loss for Q2, 2016 was \$1,345,000 compared to a loss of \$1,296,111, in Q2, 2015, representing an increased loss of 4% year-over-year. Year-to-date, loss from operations was \$2,593,663 as compared to comparable losses of \$2,575,200 for the same period in 2015, an increase of 1%. The net loss from operations includes finance income in the amount of \$110,000 and \$160,000 respectively for 2016, Q2 and year to date.

### **EBITDA and Adjusted EBITDA**

	Three months ended June 30,		% Change	Six months ended June 30,		% Change
	2016	2015	2016vs2015	2016	2015	2016vs2015
Comprehensive loss	\$ (1 345 000)	\$ (1 296 111)	4%	\$ (2 593 663)	\$ (2 575 200)	1%
Depreciation on property and equipment	32 255	41 315		64 511	81 401	
Amortization of intangible assets	349 269	349 269		698 537	698 537	
Financing charges	161 582	\$ 137 334		312 782	\$ 148 858	
EBITDA (loss)	\$ (801 894)	\$ (768 193)	4%	\$ (1 517 832)	\$ (1 646 404)	-8%
Other non-cash items:						
Share-based payments	35 865	33 681		102 296	183 132	
Adjusted EBITDA (loss)	\$ (766 029)	\$ (734 512)	4%	\$ (1 415 536)	\$ (1 463 272)	-3%

EBITDA is defined as Earnings (from operations) before Net Financing Charges, Taxes, Depreciation and Amortization and 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.

EBITDA and Adjusted 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 and Adjusted 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 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 Q2, 2016 was \$801,894 compared with an EBITDA loss of \$768,193 for the same period last year, representing an increase of 4%. Year-to-date, EBITDA loss was \$1,517,832 as compared to \$1,646,404 for the same period in 2015, a decrease of 8%.





The increase of \$33,701 in the EBITDA loss in Q2, 2016 compared with Q2, 2015 is primarily attributable to the increase in net loss and comprehensive loss of \$48,889, less the increased finance costs of \$24,248.

The Adjusted EBITDA loss in Q2, 2016 was \$766,029 compared with an Adjusted EBITDA loss of \$734,512 for the same period last year, representing an increased loss of 4%. Year-to-date, Adjusted EBITDA loss was \$1,415,536 as compared to \$1,463,272 for the same period in 2015. The decrease of \$47,736 in the Adjusted EBITDA loss in 2016 is attributable to the decrease in EBITDA loss of \$128,572 for the period, as previously described, less decreased cost of other non-cash items, specifically share-based payments of \$80,836

## SUMMARY OF QUARTERLY RESULTS

	2016		2015				2014	
	Q2	Q1	Q4	Q3	Q2	Q1	Q4	Q3
Revenues	\$ 818 990	\$ 1 016 852	\$ 2 228 782	\$ 1 363 077	\$ 1 533 667	\$ 1 116 477	\$ 1 784 676	\$ 1 215 261
Gross margin before amortization of intangible assets	74 063	293 597	689 975	373 715	325 089	302 154	1 132 635	492 401
gross margin %	9,0%	28,9%	31,0%	27,4%	21,2%	27,1%	63,5%	40,5%
Loss from operations	(1 345 000)	(1 298 663)	(1 074 831)	(1 267 748)	(1 296 111)	(1 279 089)	(703 083)	(995 742)
Comprehensive loss	(1 345 000)	(1 248 663)	(1 074 831)	(1 267 748)	(1 296 111)	(1 279 089)	(701 034)	(995 695)
Net loss per share - basic and diluted	(0,01)	(0,01)	(0,01)	(0,01)	(0,02)	(0,02)	(0,01)	(0,01)

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 June 30, 2016.

	Total	6 months or less	6 to 12 months	1-2 years
	\$	\$	\$	\$
Accounts payable and accrued liabilities	2,099,481	2,099,481	-	-
Loans	1,317,962	493,940	323,788	500,234
Convertible debentures	4,525,021	150,000	150,000	4,225,021
	7,942,464	2,743,421	473,788	4,725,255

The Company has incurred, in the last several years, operating losses and negative cash flows from operations, resulting in an accumulated deficit of \$32,667,849 as at June 30, 2016. Furthermore, as at June 30, 2016, the Company's current liabilities and expected level of expenses for the next twelve months exceed cash on hand of \$58,512. 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.



The Company's business plan is dependent on raising additional funds to finance operations within and beyond the next 12 months. 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. Until such financing is secured, there exists a material uncertainty that may cast significant doubt about the Company's ability to continue operating as a going concern and realize its assets and settle its liabilities and commitments in the normal course of business.

On July 26, 2016, the Company completed the following transactions (*refer to Subsequent event section*):

- Share for debt transaction to settle outstanding debt whereby the Company issued 2,060,126 common shares of the Company from treasury at a deemed price of \$0.20 per common share in the aggregate amount of \$412,025.
- Private placement whereby the Company issued and sold an aggregate amount of 6,131,579 units of the Company at a price of \$0.19 per unit for gross proceeds of \$1,165,000.

As at June 30, 2016, the Company had cash on hand of \$58,512 and negative working capital of \$1,813,374 compared with a cash balance of \$767,368 and positive working capital of \$166,095 as at December 31, 2015.

Revenue generated from active projects do not yet produce sufficient positive cash flow to fund operations. However, based on current backlog of \$10.1MM at August 30, 2016 (over 160% of 2015 revenues), together with the pipeline of prospective new projects, cash flows from operations are expected to become positive in the very near future.

## SUMMARY OF CASH FLOWS

	Three months ended June 30,		Six months ended June 30,	
	2016	2015	2016	2015
Cash provided by (used in) operating activities	\$ (387 365)	\$ (1 445 987)	\$ (1 485 770)	\$ (1 421 206)
Cash provided by (used in) investing activities	-	(19 132)	-	(31 339)
Cash provided by (used in) financing activities	220 314	(167 711)	776 914	2 299 266
Increase (decrease) in cash	(167 051)	(1 632 830)	(708 856)	846 721
Cash - end of period	58 512	1 208 904	58 512	1 208 904

For the three months ended June 30, 2016, cash flow from operating activities resulted in a net use of cash of \$387,365 compared to a net use of \$1,445,987 for the same period in the prior year.

The use of cash during Q2, 2016 consists of the comprehensive loss of \$1,345,000 (Q2, 2015: \$1,296,111) less adjustment for non-cash items totalling \$468,971 (Q2, 2015: \$561,598) plus a positive net change in non-cash operating working capital items of \$581,961 (Q2, 2015: negative net change in non-cash operating working capital items of \$635,251) plus a negative net change in interest paid of \$93,297 (Q2, 2015: negative net change in interest paid of \$76,223).



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

- a) a decrease in accounts receivable of \$137,481 in Q2, 2016, compared to an increase of \$240,228 in Q2, 2015;
- b) a decrease in sales tax receivable of \$18,807 in Q2, 2016, compared to an decrease of \$6,458 in Q2, 2015;
- c) an increase in costs and profits in excess of billings on uncompleted contracts of \$102,059 in Q2, 2016, compared to an increase of \$185,502 in Q2, 2015;
- d) an increase of inventory of \$52,000 in Q2, 2015 (Q2, 2016 \$Nil);
- e) a decrease in investment tax credits receivable of \$3,103 in Q2, 2016, compared to an increase of \$65,851 in Q2, 2015;
- f) a decrease in prepaid expenses of \$36,023 in Q2, 2016, compared to an increase of \$175,256 in Q2, 2015;
- g) an increase in accounts payable and accrued liabilities of \$35,590 in Q2, 2016, compared to a decrease of \$175,256 in Q2, 2015;
- h) an increase in billings in excess of costs and profits on uncompleted contracts of \$452,016 in Q2, 2016, compared with an increase of \$167,834 in Q2, 2015.

Investing activities resulted in a use of cash of \$Nil in Q2, 2016, compared to a use of cash of \$19,132 in Q2, 2015.

Financing activities in Q2, 2016 resulted in a net source of funds of \$220,314, compared with a net reduction of funds of \$167,711 in Q2, 2015. In 2016, the Company completed loans through which net cash proceeds of \$406,600 and \$150,000 and \$250,000 were raised for general working capital purposes.

For Q2, 2016, the net cash position of the Company decreased by \$167,051, compared to a net decrease of \$1,632,830 for the same period 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") without par value. As at August 30, 2016, PyroGenesis had 101,858,434 Class A Common Shares, 10,287,564 warrants, 6,406,000 outstanding options issued and 4,623,000 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 \$10.1MM backlog at August 30, 2016, (over 160% of 2015 revenues) which is primarily related to the Company's successful diversification into niche markets of the oil & gas, additive manufacturing (including 3D printing), and metals & mining industries, will continue to improve the Company's cash position. However, depending on the outcome of management's negotiations with the Asian customer for the additional 9 systems, \$9.6 million of current backlog would be at risk.

It will be necessary for the Company to raise additional capital to fund its operations and the continued development and introduction of new lines to its family of products. 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 June 30, 2016 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 2016, Q2 and the six months ended June 30, 2016, rent was charged by a trust beneficially owned by a shareholder of the Company in the amount of \$47,765 and \$95,325 respectively (2015 - \$43,943 and \$87,683). A balance due of \$221,124 (December 31, 2015 - \$72,279) is included in accounts payable and accrued liabilities.

During 2016, Q2 and the six months ended June 30, 2016, interest on balance of sale was charged by a company under common control in the amount of \$Nil (2015 - \$Nil). The balance of interest that has not been paid of \$317,319 (December 31, 2015 - \$317,319) is included in loans.

During 2016, Q2 and the six months ended June 30, 2016, interest on balance of sale was charged by a company under common control in the amount of \$Nil and \$Nil respectively (2015 - \$1,223 and \$12,747). The balance of interest that has not been paid is \$Nil (December 31, 2015 - \$Nil).

During 2016, Q2 and the six months ended June 30, 2016, the portion of interest on the convertible debentures which was charged by a shareholder of the Company was \$14,156 and \$28,312 (2015 - \$14,156 for both period respectively).

During 2016, Q2 and the six months ended June 30, 2016, fees of \$22,000 and \$53,000 respectively were charged for services rendered by the independent directors who are members of the Company's Board of Directors (2015 - \$21,000 and \$52,000). A balance of \$33,000 (December 31, 2015 - \$Nil) is included in accounts payable and accrued liabilities.

During 2016, Q2 and the six months ended June 30, 2016, fees of \$17,000 and \$47,000 respectively, were charged for professional services rendered by a company controlled by a director of the Company (2015 - \$24,514 and \$72,514).

### SUBSEQUENT EVENTS

On July 25, 2016, the Company signed a Military contract for US \$950,000. The contract is expected to be completed within six months.

On July 26, 2016, the Company completed a share for debt transaction to settle outstanding debt whereby the Company issued 2,060,126 Common Shares of the Company from treasury at a deemed price of \$0.20 per Common Share in the aggregate amount of \$412,025 (the "Share for Debt Transaction"). The Common Shares issued are subject to a statutory hold period of four months and one day from the date of issuance. The transaction was approved by TSXV on August 12, 2016.



On July 26, 2016, the Company amended the terms of certain common share purchase warrants (the “Warrants”) issued by the Company in connection with a private placement completed on November 26, 2014. In connection with this amendment, the exercise price of the Warrants was reduced from \$0.55 to \$0.26 and in accordance with the policies of the TSXV, the Warrants are subject to an accelerated expiry provision such that the exercise period of the Warrants will be reduced to thirty days if, for any ten consecutive trading days during the unexpired term of the Warrants (the “Premium Trading Days”), the closing price of the Company’s common shares is \$0.325 or more, with the 30-days expiry period to begin no more than seven calendar days after the 10<sup>th</sup> Premium Trading Day. The expiry date of the Warrants remains November 26, 2016. The Warrant amendment was approved by the TSXV on August 8, 2016.

On July 26, 2016, the Company completed a private placement offering whereby the Company issued and sold an aggregate amount of 6,131,579 units of the Company (a “Unit”) at a price of \$0.19 per Unit for gross proceeds to the Company of \$1,165,000 (the “Private Placement”). Each Unit consists of one Common Share of the Company and one half of one Common Share purchase warrant (the “Warrants”). Each Warrant entitles the holder thereof to purchase one Common Share at a price of \$0.35 until January 26, 2018. Each Unit is subject to a statutory hold period of four months and one day from the date of closing. In connection with the Private Placement, the Company paid finder fees in the amount of \$15,960.

On August 2, 2016, the Company signed a contract for \$8,260,000 with HPQ Silicon Resources Inc., formally Uragold Bay Resources Inc., to provide a 200 metric tonne per year PUREVAP™ pilot system (the “Pilot System”) to produce silicon metal directly from quartz (the “Contract”). The Contract is for the design, fabrication, assembly, commissioning and testing of the Pilot System and is expected to be completed in the next eighteen (18) months, with a final testing period expected to last ten (10) months. The Client will acquire the intellectual property rights to the PUREVAP™ process developed by PyroGenesis as it relates exclusively to the production of silicon metal from quartz. PyroGenesis will retain a royalty-free, exclusive, irrevocable, worldwide license to use the System for all other purposes, other than the production of silicon metal from quartz.

On August 30, 2016, the Company announced that as a result of the completion of the Share for Debt Transaction and Private Placement, and the signing of the Contract with HPQ Resources Inc., it has decided to withdraw its previously announced private placement offering of \$3MM secured, subordinated convertible debenture.

#### **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 2015 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.

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.

In addition, as previously explained, the Company has experienced and has been dealing with technical issues under an existing contract with a customer based in Asia since December 31, 2015. At the date of this MD&A, these differences have not yet been resolved and the timing of the resolution remains uncertain. Management believes that the Company has respected the terms of the contract and expect to recover the full amounts owing under the contract from the customer. As such, the timing of the delivery of the remaining nine units, which was initially expected in 2016 for an amount of \$9.6 million, is also dependent on the resolution of the differences between the Company and the customer. There is no assurance that the Company will be able to resolve these differences with the customer in its favour either through settlement or litigation. If the Company is unable to resolve these differences with the customer, this will adversely affect the Company's financial position, financial performance and cash flows.

### ***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 August 30, 2016, 6,406,000 stock options are currently issued and outstanding, together with 10,329,564 warrants and 4,000,000 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**

Management remains 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 solutions to industries that have not yet had the opportunity to consider such solutions.

The fact that PyroGenesis has one of the largest concentrations of plasma expertise in the world, with over 250 years of accumulated technical experience and 49 patents, combined with unique relationships with major Universities performing cutting edge plasma research and development, positions the company well to execute this strategy.

At the same time, management is actively targeting recurring revenue opportunities that will generate a growing and profitable, regular cash flow to the Company.

The most significant recurring revenue stream is expected to be from the construction of PyroGenesis' own Plasma Atomization Systems, which will allow the Company to produce specialty powders for the Additive Manufacturing industry, specifically for 3D printing.

As previously noted, recent operations have been negatively impacted by the decision to move away from supplying powder producing equipment for 3D printing (and as such stop working on the previous announced contract to deliver an additional nine (9) plasma Atomization Systems to an Asian customer for approximately \$10MM) and move into the lucrative market of producing powders, which strategy was announced by the Company on October 26, 2015. Until this decision was made, PyroGenesis had been a fabricator of plasma-based systems that produced unique titanium powders which are greatly sought after by the Additive Manufacturing industry. These powders are unique in that they are small, spherical, and uniform, allowing them to flow like water; a characteristic that is extremely important in industries such as 3D printing.

The strategic decision to move into powder production was made when improvements to the system demonstrated that the revenues and profits from selling powders from one system alone far exceeded, on an annual basis, the one-time profit from selling an additional nine (9) systems. Management expects to commence supplying titanium metal powders to Additive Manufacturing clients in 2017.

Other examples of recurring revenue streams being pursued by PyroGenesis include royalties generated from the sale of metals refined from ore through utilisation of PyroGenesis' technologies and royalties generated from the recovery of valuable metals from waste streams.

Separately, PyroGenesis recently supplied its first commercial DROSRITE™ Furnace System to a North American automobile parts manufacturer. The system was installed and commissioned at the client's facility during the first quarter of 2016 and is currently undergoing performance testing, which is expected to be completed late 2016. Early yields from operating the system exceed expectations. If confirmed during the official performance testing phase, these increased yields would improve upon the already impressive return on investment previously demonstrated. As a result, the client recently indicated the requirement for a further 3 DROSRITE™ systems. Furthermore, management believes that the supply and installation of this first commercial sale in



North America will enable the Company to leverage this reference site to generate a continued flow of orders for additional DROSRITE™ systems from primary and/or secondary aluminum smelters, and large finished goods manufacturers, primarily in the transportation sector. The market potential for PyroGenesis' DROSRITE™ system exceeds \$400MM.

Another project, reflecting both the diversification and recurring revenue strategy noted earlier, is the PUREVAP™ process developed by PyroGenesis; a one-step process that uses a plasma arc within a vacuum furnace to produce high purity, metallurgical grade silicon (MG-Si), solar grade silicon (UMG Si) and polysilicon from quartz. As noted above, on August 2, 2016, the Company announced that it had signed a contract for CDN\$8,260,000 with HPQ Silicon Resources Inc., formally Uragold Bay Resources Inc., to provide a 200 metric tonne (MT) per year PUREVAP™ pilot system to produce silicon metal directly from quartz.

In conclusion, the Company's focus will continue to be to generate an improved mix of short and longer term projects that will, in turn, facilitate operational and financial planning. Repeat orders for the same, or similar, products will further result in the standardisation of manufacturing processes and, as such, are expected to yield higher gross margins.

Based on current backlog at August 30, 2016 of \$10.1MM (over 160% of 2015 revenues), together with the pipeline of prospective new projects, cash flow from operations are expected to become positive in the very near future.

Additional information regarding the Company can be found on SEDAR at [www.sedar.com](http://www.sedar.com) OTC Markets ([www.otcmarkets.com](http://www.otcmarkets.com)) and on the Company's website at [www.pyrogenesis.com](http://www.pyrogenesis.com)